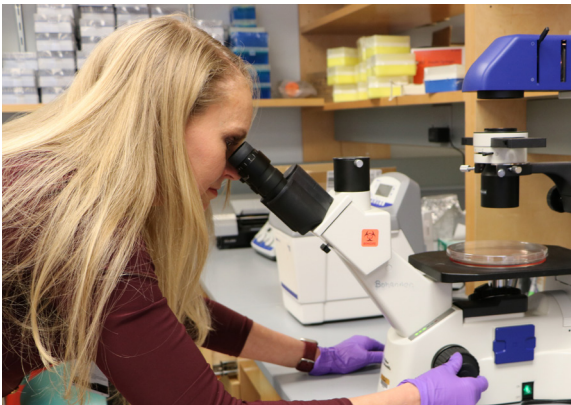


Department Profile

2023-2024



VANDERBILT  UNIVERSITY
MEDICAL CENTER

Department of Anesthesiology

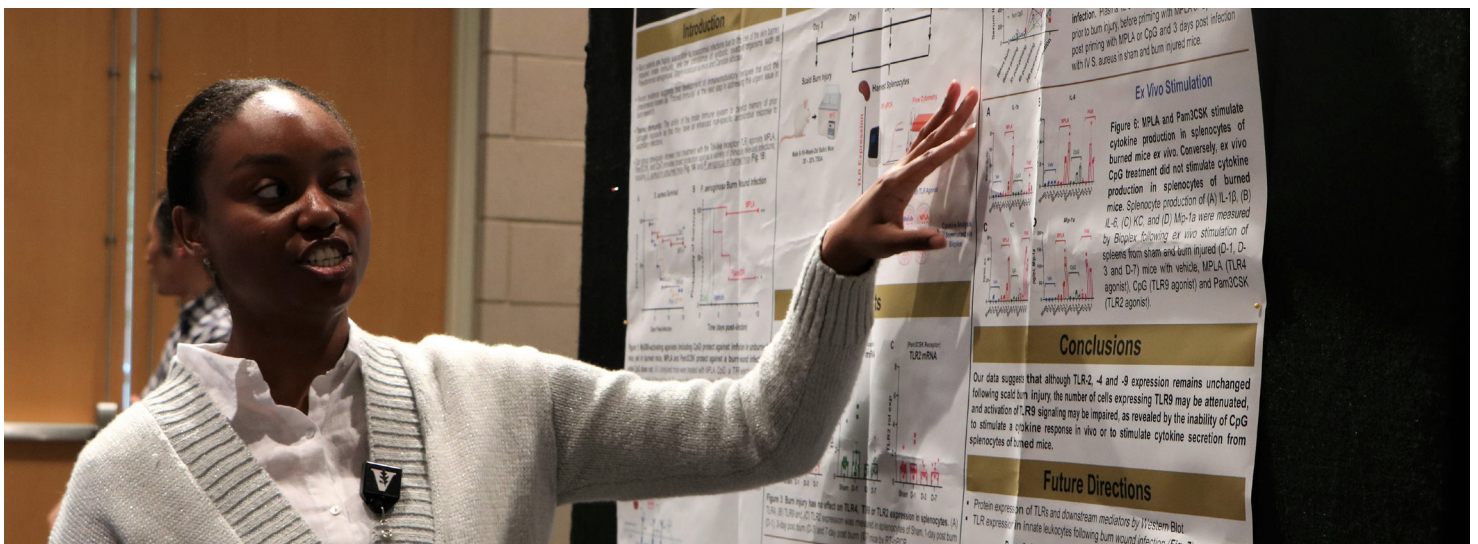
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Clinical Care

Education

Research



Message from the Chair



Thank you for your interest in the Vanderbilt University Medical Center Department of Anesthesiology. Our growth and success stem from Vanderbilt University Medical Center's five-pillar commitment to excellence: people, service, quality, growth & finance, and innovation. Vanderbilt's credo drives us to achieve excellence in healthcare, research and education; we continuously evaluate and improve our performance, and we always treat others as we wish to be treated. We value human diversity in all its forms as a source of innovation, strength and resiliency for the department as it strives to meet the needs of VUMC and our nation. As the role of the anesthesiologist evolves into that of a perioperative consultant, our ever-developing team of experts remains at the forefront of knowledge and technology in patient care, research and education.

This year marks the beginning of a new phase on VUMC's main hospital campus. Middle Tennessee's population is booming, and so is demand for patient care. Preparation began last year to demolish an old administrative office building and make way for a new inpatient tower. The 15-level, 470,000-square-foot tower will provide additional adult inpatient beds, operating rooms, clinics and office space. The department is prepared for the growth that is coming to the Vanderbilt Health

System, and I am optimistic that we have the structures to support that growth. Our training programs as well as outstanding recruitment and retention in all areas position us well to meet new demands for anesthesia services.

Our values—compassion, creativity, commitment and collaboration—are the keystones of our structure and systems. You will see evidence of this throughout this guide. Our patients are recovering faster and with greater comfort through implementation of Enhanced Recovery After Surgery (ERAS) protocols, a collaborative effort led by our faculty, trainees and surgical colleagues. Our informatics infrastructure uses innovative data analyses to increase patient safety and clinician effectiveness.

Our investigators successfully competed for more than \$11 million in extramural research funding in federal fiscal year 2022, including more than \$8.1 million in awarded NIH grants—placing Vanderbilt Anesthesiology 9th among U.S. academic anesthesiology departments for NIH funding. The department's research productivity, determined by publication in peer-reviewed journals, grant dollars and ongoing research studies, continues to be strong. Forty-six members of the department have been elected to the Association of University Anesthesiologists (AUA).

Our dedicated faculty is committed to equipping graduates for a promising future in anesthesiology. We offer training using cutting edge technology along with opportunities to improve systems of care. We provide a closely guided mentorship program, balancing clinical training and experience with a broad range of academics. Career development for all role groups in the department assures that everyone has the potential and the opportunity to continually fulfill the best of their potential.

We attribute our success to the collaboration that occurs across Vanderbilt University Medical Center and beyond. Our clinical teams participated in more than 133,000 patient encounters last year, caring for patients along their journey to wellness within and beyond Vanderbilt's traditional walls. The Vanderbilt Health Affiliated Network is the largest of its kind and growing rapidly, and our department is leading telemedicine and remote-presence projects that bring our expertise to more patients.

I invite you to peruse this guide and visit www.vumc.org/anesthesiology to learn more about our programs.

Warren Sandberg MD PhD

**Chair, Department of Anesthesiology
Vanderbilt University Medical Center
Chief of Staff, Vanderbilt University Adult Hospital
Professor of Anesthesiology, Surgery and Biomedical Informatics
Vanderbilt University School of Medicine**

Leadership



Bret Alvis, MD
Associate Division Chief,
Anesthesiology Critical Care
Medicine



Arna Banerjee, MD, MMHC
Assistant Vice Chair,
Anesthesiology Faculty
Affairs



Christopher Canlas, MD
Division Chief, Ambulatory
Anesthesiology



Eric Delpire, PhD
Director, Basic Science
Research;
BH Robbins Director in
Anesthesiology Research



*Amanda Dickert, CRNA,
DNAP*
Chief CRNA;
Director, Anesthesiology
Advanced Practice Nursing



Stephen Doherty, MMHC
Department Administrator



Susan Eagle, MD
Assistant Vice Chair,
Anesthesiology Faculty
Affairs



David A. Edwards, MD, PhD
Division Chief, Pain Medicine



Holly Ende, MD
Division Chief, Obstetric
Anesthesiology



Andrew Franklin, MD, MBA
Interim Division Chief,
Pediatric Anesthesiology



*Robert Freundlich, MD, MS,
MSCI*
Division Chief, Informatics
Research



Brian Gelfand, MD
Vice Chair, Educational
Affairs



Douglas Hester, MD
Division Chief, Multispecialty
Anesthesiology



Christopher Hughes, MD
Division Chief,
Anesthesiology Critical Care
Medicine



Miklos Kertai, MD, PhD
Assistant Vice Chair, Quality and
Safety



*Frederick Lombard, MBChB,
FANZCA*
Assistant Vice Chair,
VUAH Anesthesia Clinical
Operations



Bevan Londergan, MD
Division Chief, Pediatric
Cardiac Anesthesiology



Thomas Long, MD
Executive Vice Chair,
Pediatric Anesthesiology;
Anesthesiologist-in-Chief,
Monroe Carell Jr. Children's
Hospital at Vanderbilt



Letha Mathews, MBBS
Division Chief,
Neuroanesthesiology



Matthew McEvoy, MD
Vice Chair, Perioperative
Medicine



Pratik Pandharipande, MD, MSCI
Vice Chair, Anesthesiology
Faculty Affairs;
James Tayloe Gwathmey
Director in Anesthesiology



Mias Pretorius, MBChB, MSCI
Division Chief, Cardiothoracic
Anesthesiology



Mark Rice, MD
Executive Vice Chair,
Anesthesiology



Amy Robertson, MD
Vice Chair, Clinical Affairs



Edward Sherwood, MD, PhD
Vice Chair, Research;
Cornelius Vanderbilt Chair in
Anesthesiology



Ann Walia, MBBS
Chief, Veterans Affairs
Anesthesiology Service



Edward Yaghmour, MD
Assistant Vice Chair, Perioperative
Medicine;
Associate Division Chief,
Multispecialty Anesthesiology

About Nashville

Music has been a common thread connecting the cultural, business and social fabric of Nashville since the 1800s when the city became a national center for music publishing. The city boasts a diverse soundtrack, mixing the past, present and future with cuts of country, bluegrass, rock, pop, Americana, gospel, classical, jazz and blues.

Visitors and residents can enjoy what is considered a growing food city. Nearly 200 new restaurants have opened in the past two years, making Nashville a culinary destination. Hot chicken, barbecue, meat & three, vegan, and locally sourced menus are offered for the adventurous foodie.

Sports fans have plenty to enjoy in Nashville with several professional sports teams. From football to hockey to soccer to baseball, there is something for everyone. The city also boasts several college teams for even more options.

The city has many family-friendly activities as well. Check out Centennial Park, Adventure Science Center, Cheekwood Estate & Gardens and the Nashville Zoo at Grassmere. Nashville also offers a variety of cultural experiences, such as the Nashville Symphony at the Schermerhorn Symphony Center, the Frist Art Museum, the National Museum of African American Music, the Tennessee Performing Arts Center and an award-winning public library.

Nashville typically enjoys a mild and pleasant climate, with only a few days a year having either very hot or very cold conditions and most rainfall occurring in the spring months.



A growing population of
2,013,506
in the metropolitan statistical area

Nashville ranked #5 in list of the
South's Best Cities
by *Southern Living*

Nashville named one of the
**Top 10 Friendliest Cities
in the United States**
by *Conde Nast Traveler*

Nashville ranked #7 in list of the
**Top Destinations for Food Lovers in
the United States**
by *TripAdvisor*

Nashville named one of the
Great American Cities for Creatives
by *Thrillist*

About Vanderbilt University Medical Center

VUMC named a
Leader in LGBTQ+ Healthcare Equality
by the *Human Rights Campaign Healthcare Equality Index*

nearly
40,000
VUMC employees

nearly
3 million
patient visits per year

VUMC named to the
Honor Roll of America's Best Hospitals
by *U.S. News & World Report*

Monroe Carell Jr. Children's Hospital
at Vanderbilt named
Best Children's Hospital in Tennessee
by *U.S. News & World Report*



Department History

The Vanderbilt Department of Anesthesiology was one of the first independent departments of anesthesiology in the United States, established on December 12, 1945.

After observing that the battlefield-wounded of World War II were more likely to survive if they received immediate, skilled anesthesia care, Vanderbilt physicians advocated that anesthesiology be established as an autonomous department. At that time, few medical schools possessed an academic anesthesiology service of any type. This tradition of pioneering in our specialty continues today.

Our exemplary faculty provide top-quality clinical services for a full spectrum of medical specialties. Vanderbilt Anesthesiology is recognized as an innovator in perioperative management, healthcare information technology, clinical outcomes research, education and international capacity building. We also have high-caliber basic science and clinical research teams pursuing fundamental and translational knowledge to directly improve patient safety and care.

Previous Department Chairs



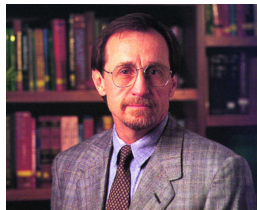
Dr. Benjamin H. Robbins
1946-1961



Dr. Charles B. Pittinger
1962-1969



Dr. Bradley E. Smith
1969-1993



Dr. Charles Beattie
1994-2001



Dr. Jeffrey R. Balsler
2001-2004



Dr. Michael S. Higgins
2004-2010

Clinical Care

Serving in one of the largest clinical programs in the nation, Vanderbilt University Medical Center Department of Anesthesiology's clinicians provide procedural, critical care, pain management and all perioperative anesthesia services for more than 133,000 adult and pediatric patient encounters annually at more than 140 anesthetizing locations. Of these, more than 16,000 patients are seen annually in the Vanderbilt Interventional Pain Clinic, and approximately 56,000 Vanderbilt adult and pediatric patients receive anesthetic care during a radiologic, gastrointestinal, interventional or other diagnostic or therapeutic procedure.

The department's faculty, residents, fellows, certified registered nurse anesthetists (CRNAs) and nurse practitioners provide care in our operating rooms and five adult intensive care units. All surgical specialties are represented, including adult and pediatric cardiac surgery, organ transplantation, robotic surgery, neurosurgery, and high-risk obstetrics. Anesthetics are provided by one of our highly skilled trainees or CRNAs under the direction of an anesthesiologist. We deliver the highest quality care in a safe and effective manner according to the Anesthesia Care Team model, using the unique skills of all team members.

Members of our department actively participate in the multidisciplinary perioperative care of complex patient populations, including trauma and organ transplantation. VUMC provides trauma care for patients within 80,000 square miles and manages close to 8,000 acute trauma cases, admitting 5,000 of those annually. Last year approximately 800 patients were transferred directly to the OR from the emergency department to receive care for their acute traumatic injuries. Performing 625 heart, liver, kidney, lung, and pancreas transplants in 2022 and more than 10,000 since 1962, VUMC ranks as the nation's sixth largest transplant program by volume. Vanderbilt's heart transplant program performed a combined total of 429 transplants during the past three years, more than any other center in the country.

The Vanderbilt Preoperative Evaluation Center (VPEC) offers preoperative evaluation before patients undergo procedures at VUMC. VPEC faculty, nurse practitioners and staff perform comprehensive preoperative assessments, including interfacing with primary care physicians, specialist consultants and surgeons, while also making direct decisions regarding preoperative testing. VPEC offers both in-person and telehealth visits. Our center has expanded rapidly to meet increasing surgical demand. With a more than 85% growth in volume in the past 3 years, the number of VPEC encounters now exceeds 25,000 annually.

Launched in July 2019, the Department of Anesthesiology Hi-RiSE (High-Risk Surgical Encounter) Service focuses on providing personalized, evidence-based perioperative medical care—from preoperative evaluation and optimization of underlying comorbidities to postoperative recovery—for patients at the highest risk of perioperative morbidity and mortality.

As the role of the anesthesiologist evolves into that of a perioperative consultant, our diverse team of experts remains at the forefront of knowledge and is fully engaged in patient care, from diagnosis to operative recovery. A full-time perioperative teaching service is available 24/7 for consultation, utilizing system-wide information technology and mobile applications to support clinical decision-making, capture data and measure outcomes such as the quality of recovery after surgery.

Each of our anesthesiologists is a member of one of our nine divisions, with many providing care in a secondary division. Our divisions include ambulatory anesthesiology, anesthesiology critical care medicine, cardiothoracic anesthesiology, multispecialty anesthesiology, neuroanesthesiology, obstetric anesthesiology, pain medicine, pediatric cardiac anesthesiology, and pediatric anesthesiology.

HiRiSE visit growth:

3,000 in 2020

2,900 in 2021

3,500 in 2022

--

VPEC visit growth:

14,052 in 2019

20,054 in 2020

26,012 in 2021

27,959 in 2022

More than

10,000

solid organ transplants since 1962

194

faculty in the department

--

more than

230

CRNAs in the department

--

75

residents in the department

--

29

fellows in the department

Ambulatory Anesthesiology

DIVISION CHIEF: CHRISTOPHER CANLAS, MD

The Division of Ambulatory Anesthesiology, which comprises seven faculty members and 29 nurse anesthetists, provided over 23,000 anesthetics in the past year. These anesthetics occurred in five ambulatory surgery center locations, including Spring Hill Surgery Center, Vanderbilt Outpatient Surgery, Vanderbilt Surgery Center-Cool Springs, Vanderbilt Surgery Center-Franklin and Vanderbilt Health Belle Meade (VHBM). As more cases migrate from the main hospital to our ambulatory surgery centers, the division continues to pioneer cutting edge patient selection criteria to provide safe yet efficient care.

A major factor that allows for the increase in off-campus caseloads is a strong emphasis on regional anesthesia. The division performs over 4,500 single shot nerve blocks annually, including nerve catheters to facilitate a patient's discharge home. Our ambulatory surgery centers provide a fertile teaching ground for our three regional anesthesia fellows and three rotating anesthesiology residents. Our fellows spend a combined 48 weeks with the Ambulatory Division to refine their procedural skills while also teaching junior residents.

The Ambulatory Division's members teach not only fellows and residents but also other learners in both the international and national classrooms. Kaylyn Sachse, MD, traveled to both Kenya and Tanzania to teach ultrasound guided regional anesthesia skills to eager student nurse anesthetists. In addition to teaching, she provided clinical care in a limited-resource environment during her two months with Vanderbilt International Anesthesia. Rajnish Gupta, MD, delivered lectures at both the annual meeting of ASRA Pain Medicine in Florida (Spring 2023) and the annual congress of the European Society of Regional Anaesthesia & Pain Therapy in Paris, France (September 2023). Closer to home, Jeffery Clemmons, MD, lectured on health care disparities at the meeting of the American Society for Enhanced Recovery and Perioperative Medicine in Nashville. In addition, Dr. Clemmons' renowned teaching skills netted him a second consecutive Golden Apple Teaching Award, as voted by his residents.

As Vanderbilt University Medical Center continues to expand its footprint throughout Middle Tennessee, the ASC volumes will continue to rise. Our division is prepared for the inevitable increase in outpatient cases involving orthopedics, ophthalmology, neurosurgery, spine, urology, otorhinolaryngology, gynecology, plastic surgery, pediatrics, general surgery, podiatry, interventional pain management and gastroenterology.

5,695
total cases at Vanderbilt Health Belle Meade
--
3,255
total cases at Vanderbilt Surgery
Center – Franklin
--
23,037
anesthetics provided by the division
--
over
4,500
nerve blocks performed annually

totals based on FY2023



Anesthesiology Critical Care Medicine

DIVISION CHIEF: CHRISTOPHER HUGHES, MD

ASSOCIATE DIVISION CHIEF: BRET ALVIS, MD

Clinical

The Division of Anesthesiology Critical Care Medicine (ACCM) provides critical care services in the burn ICU, cardiovascular ICU, neurological ICU, and surgical ICU at Vanderbilt University Medical Center; the surgical ICU at the Tennessee Valley Healthcare System (TVHS) Veterans Administration Medical Center in Nashville (Nashville VA); and the medical/surgical ICU at Vanderbilt Wilson County Hospital (VWCH). Additionally, division members provide intraoperative anesthetic care for diverse surgical specialties and perioperative consult service care for patients undergoing major surgeries. Clinical care includes proficiency in echocardiography, bedside procedures, shock resuscitation, advanced ventilator techniques, and management of patients with mechanical circulatory support.

Education

Our ACGME-accredited ACCM fellowship provides an unparalleled innovative and in-depth critical care training opportunity. Rotations include VUMC and Nashville VA ICUs, critical care echo, and a diverse array of electives such as international experiences, medical subspecialties,

and research. The teaching curriculum includes daily didactic sessions consisting of lectures, research studios, quality improvement training, echo case review, journal clubs, mortality and morbidity conferences, board preparation, simulation training, and many others.

Leadership

Division faculty have leadership roles in organizations such as Society of Critical Care Medicine, American Society of Anesthesiologists, Society of Critical Care Anesthesiologists, Society of Cardiovascular Anesthesiologists, Early-Stage Anesthesiology Scholars, Society for Technology in Anesthesia, and American Delirium Society. Division clinical administration leadership includes director of the Operations Control Center at VUH; executive medical director of the Critical Care Clinical Service Center; medical directorship of the cardiovascular, neurological, and surgical ICUs at VUMC; medical directorship of the perioperative service and surgical ICU at Nashville VA; medical directorship of the medical/surgical ICU at VWCH. Additionally, division faculty are active in directorship of the Center for Experiential Learning

and Assessment; the Critical Illness, Brain Dysfunction, and Survivorship Center; the Vanderbilt Anesthesiology & Perioperative Informatics Research group; the Department of Anesthesiology BH Robbins Scholar Program; the VUMC Institutional Review Board; and the Vanderbilt University School of Medicine critical care immersion science programs.

Research

Division faculty present at regional, national, and international academic conferences and publish in major general medical, critical care, anesthesiology, and surgery journals. Faculty have received funding from the NIH (including R01, R21, K23, STTR/SBIR grants), Department of Defense, FAER, and industry and are on numerous study review sections and data safety monitoring boards. Areas of investigation include mechanistic work (acute kidney injury, delirium, cognitive and functional impairment, fluid status, sepsis), clinical management strategies (sedation, oxygen tension, rapid response teams, alarms and monitoring, cognitive and physical training, medication reconciliation), and education (simulation, evaluation processes).

ACCM Fellowship Details

- ACGME- accredited program
- Ten positions available each year
- Core rotations include CVICU, SICU, NCU, Trauma ICU, Burn ICU, VA-SICU, ECHO/Ultrasound
- Electives include intraoperative TEE, MICU, PICU, perioperative medicine, international rotation, palliative care, medical subspecialties and research

9 independent investigator grants

3 career development awards

35 faculty

10 fellows

more than 40 advanced practice providers

more than 75 publications



Cardiothoracic Anesthesiology

DIVISION CHIEF: MIAS PRETORIUS, MBChB, MSCI

The Division of Cardiothoracic Anesthesiology provides anesthetic care for adult cardiac surgery, thoracic surgery, electrophysiology, and structural heart disease at Vanderbilt University Medical Center (VUMC). A subset of the division's faculty members also provides care for liver transplantation and critical care services in the adult cardiovascular intensive care unit.

The division provides anesthetic care for patients undergoing coronary artery bypass graft (on- and off-pump) surgery, valvular surgery, heart and lung transplantation, heart-liver transplantation, ECMO, adult congenital procedures, pulmonary endarterectomies, hybrid procedures, aortic surgery, and ventricular assist device (VAD) insertions. VUMC tied for first place as the busiest heart transplant program by volume in the United States in 2019 and was the busiest program in the world for the past 3 years.

VUMC performed 142 heart transplants in 2021 and 144 in 2022, the most of any transplant center in the world. Of the 286 transplants performed over the past two years, 249 were adult hearts, and 37 were pediatric hearts. This growth in the heart transplant program is in part due to the innovative use of hearts from hepatitis C-positive donors, Donation after Circulatory Death (DCD), which expands the donor pool by 30 to 40 percent, and use of the TransMedics Organ Care System. The VAD program at Vanderbilt currently places about 30 devices per year. Concomitantly with the heart transplant program, the lung transplant program has also seen significant growth, with more than 60 transplants performed in 2022.

The structural heart disease program employs the newest techniques involving transcatheter aortic valve replacement, transcatheter edge-to-edge valve repair and left atrial appendage occlusion devices. In addition, we participate in large clinical trials investigating transcatheter mitral and tricuspid valve replacement. Intraoperative transesophageal echocardiography (TEE) is an integral part of the division's clinical practice and is performed on all adult cardiac surgery patients, in electrophysiology to guide placement of left atrial appendage occlusion devices and to guide transcatheter valve procedures. With the addition of two additional state-of-art hybrid operating rooms in 2021, VUMC is set to further grow the structural heart disease program.

Division faculty members conduct research in clinical transthoracic ultrasound, vascular biology, precision perioperative medicine, acute kidney injury and the perioperative inflammatory response. Extramural grant support comes from industry, the Department of Defense, and the National Institutes of Health.



124 adult heart transplants 2022

--

20 pediatric heart transplants in 2022

--

66 lung transplants in 2022

Cardiothoracic Anesthesiology Fellowship Details

- ACGME-accredited program
- Five positions available each year
- Core rotations include adult cardiac, thoracic, pediatric cardiac, TEE and ICU
- Electives include heart failure, TEE, CT surgery and research

Multispecialty Anesthesiology

DIVISION CHIEF: DOUGLAS HESTER, MD

ASSOCIATE DIVISION CHIEF: EDWARD YAGHMOUR, MD

The Division of Multispecialty Anesthesiology (MSA) is the Department of Anesthesiology's largest division, providing perioperative anesthetic care in 60 operating rooms and procedure suites for a wide variety of surgical services, including general surgery, trauma, orthopedics, urology, plastic surgery, ophthalmology, vascular surgery, otolaryngology, gastroenterology, pulmonology, hepatobiliary surgery, liver and renal transplantation and oral/maxillofacial surgery. The division has 55 faculty members, most of whom have significant subspecialty training and expertise.

MSA division faculty provide our anesthesiology residents a variety of both introductory and advanced clinical experiences and make numerous contributions to the department's educational programs for medical students, residents and fellows. Additionally, MSA faculty members teach and supervise residents from other specialties, as well as student registered nurse anesthetists who rotate in the MSA division. Faculty regularly give invited lectures regionally and nationally. In addition, numerous faculty participate in a wide array of workshops nationally, with content focused on regional anesthesia, airway management and simulation education.

MSA faculty serve the specialty by participating on many boards and committees for the American Board of Anesthesiology and the American Society of Anesthesiologists. Faculty create and administer exams for the board certification process. Faculty also work in advocacy for the specialty both locally and nationally.

Division faculty members pursue a wide range of academic interests, including perioperative cognitive dysfunction, echocardiography, ultrasound imaging, regional anesthesia, anesthesiology pedagogy, airway management, information technology, point-of-care diagnostics, perioperative medicine and the medical humanities, with a common goal of providing safer and more efficient perioperative care and throughput.

Since 2014, our Perioperative Consult Service (PCS) has provided co-management of surgical patients, beginning with the decision to operate and continuing throughout the period after hospital discharge. Starting from a pilot program involving colorectal surgical patients, the PCS has quickly grown to include care of orthopedic trauma, abdominal wall reconstruction, surgical weight loss, hepato-biliary-pancreatic/surgical oncology, gynecologic oncology and urology patients.



VUMC covers trauma care for patients within
80,000
square miles

--
VUMC trauma center has approximately
5,000
admissions per year

60
total number of operating rooms and procedure suites in
which MSA provides perioperative anesthetic care

Acute Pain Service

Perioperative Consult Service

DIRECTOR: EDWARD YAGHMOUR, MD

DIRECTOR: MATTHEW McEVOY, MD

The Vanderbilt Department of Anesthesiology provides both an Acute Pain Service (APS) and a Perioperative Consult Service (PCS). APS is led by Edward Yaghmour, MD, and PCS is led by Matthew McEvoy, MD. Together these services provide preoperative evaluation and preparation, intraoperative care, acute postoperative care and pain management at Vanderbilt University Adult Hospital in Nashville. By providing care before, during and after surgery, these services give patients better, more personalized care throughout the entire perioperative care period. With widespread use of regional anesthesia and other opioid-sparing pain management techniques, these services have led to a more than 80 percent reduction of in-hospital opioid use and a more than 66 percent reduction in opioids prescribed at discharge.

Enhanced Recovery After Surgery (ERAS) care pathways are evidence-based protocols designed to improve pain control and facilitate faster recovery for patients.

PCS/APS is a national leader in ERAS implementation. Across the Vanderbilt Adult Hospital, the department cares for several thousand patients each year, and APS and PCS perform over 7,000 regional blocks (not including our ambulatory locations). PCS/APS continues to develop ERAS protocols that improve patient outcomes and address the common reasons for prolonged hospital length of stay. Beyond this clinical work, the clinicians routinely give presentations at national and international meetings related to ERAS and non-opioid pain management. APS and PCS at VUMC are staffed by 24 anesthesiologists, with representation from multiple divisions. APS and PCS also include 10 advanced practice providers, fellows and residents.



Edward Yaghmour, MD



Matthew McEvoy, MD

Regional Anesthesia & Acute Pain Medicine Fellowship Details

- ACGME-accredited program
- Three positions available each year
- Core rotations include anesthesiology perioperative consult service, OR anesthesia, oromaxillofacial surgery, addiction psychiatry, ambulatory regional anesthesia, pediatric pain management, inpatient chronic pain and international anesthesia
- Electives include research and obstetric anesthesia

more than
80%
reduction of in-hospital opioid use

--
more than
66%
reduction in opioids prescribed at discharge

--
15-20%
reduction in cost through PCS collaborations

Perioperative Medicine Fellowship Details

- One year program (*accreditation not offered by ACGME*)
- Four positions available each year
- Core rotations include perioperative consult service, high-risk preoperative evaluation clinic, echocardiography and cardiac device management, geriatrics and research

more than
7,000
regional blocks performed each year
by APS and PCS

--
3,500
APS and PCS patients per year

Neuroanesthesiology

DIVISION CHIEF: LETHA MATHEWS, MBBS

The Neuroanesthesiology Division provides perioperative care for patients undergoing complex intracranial and spine surgeries and staffs 9 to 12 operating rooms daily. Neurosurgery and other neurologic services continue to expand at VUMC, in keeping with the complexity of the patients and procedures.

Three neurointerventionalists run a busy neurovascular service in state-of-the-art interventional hybrid operating rooms dedicated solely to neurosurgical procedures. VUMC is certified as a comprehensive stroke center and provides care for patients requiring acute stroke interventions.

VUMC has designated neurosurgical operating rooms where anesthesia services are provided for operations, including brain tumors, blood vessel malformation, aneurysms, stroke intervention, trauma, complex spinal procedures, functional neurosurgery, and chronic pain management. The Division of Neuroanesthesiology also provides specialized anesthesia services for “awake craniotomies,” when patients are kept under sedation rather than general anesthesia to facilitate speech and motor mapping during surgery in order to preserve the most vital areas of the brain.

Development and practice of evidence-based perioperative ERAS pathways and guidelines have improved patient outcomes and reduced length of ICU stay and overall hospital length of stay. The division includes five

full time faculty and six CRNAs, as well as CRNAs from other divisions. Additionally, several faculty from the ACCM and MSA Divisions contribute significantly to the division’s work.

Faculty are actively engaged in fellow, resident, medical student and allied health professional education. The division offers one Neuroanesthesiology fellowship position each year, and it is certified by the International Council on Perioperative Neurosciences Training (ICPNT). The Neuroanesthesiology faculty make significant contributions at national and international meetings, such as SNACC, SEA, IARS, AACD and NCCS, and provide leadership in these organizations.

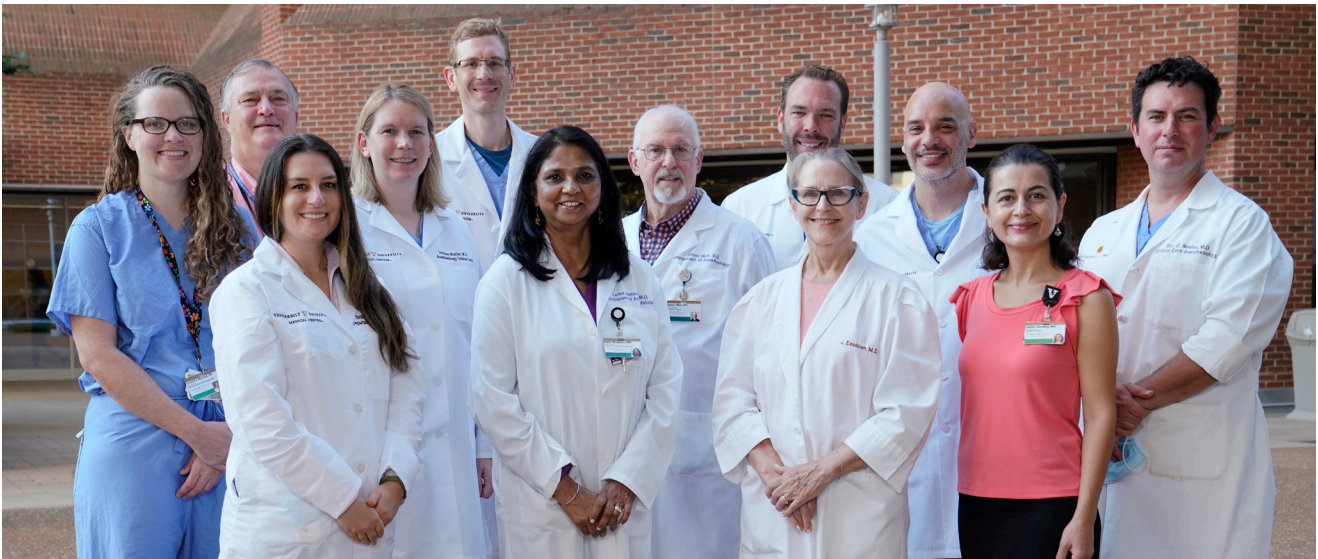
Neuroanesthesiologists face many unique challenges, including lengthy procedures (which may last more than 16 hours), unusual patient positioning and unexpected intraoperative events, such as seizures or intracranial hemorrhage. Residents on the neuroanesthesia rotation, as well as the faculty leading the training, discover that the ability to make an immediate impact on an operation and enhance the patient’s long-term outcome is both exciting and gratifying.

Neuroanesthesiology Fellowship Details

- One year program (ICPNT-certified; accreditation not offered by ACGME)
- One position available each year
- Core rotations include adult ORs, neuroICU, neuromonitoring and research
- Elective rotations include stroke neurology, neuroradiology and pediatric neuroanesthesia

nearly
4,000
neurosurgical cases annually

--
1,300
spine surgeries annually



Obstetric Anesthesiology

DIVISION CHIEF: HOLLY ENDE, MD

The Division of Obstetric Anesthesiology, led by Division Chief, Holly Ende, MD, provides dedicated, 24-hour, in-house obstetric anesthesia care for over 5,000 deliveries at Vanderbilt University Medical Center annually—over half of the deliveries are considered high risk. The division provides a full complement of techniques for labor analgesia and operative deliveries. The faculty are consultants and critical care specialists for high-risk obstetric patients, abnormal placentation cases and intrauterine fetal surgeries. The division performs anesthesia services for gynecological surgeries in a suite of three operating rooms adjacent to the labor and delivery unit. The division faculty also assume leadership roles in quality initiatives to improve maternal health, including the use of multidisciplinary simulation training for obstetric emergencies and management of postoperative analgesia for women with opioid use disorder.

The division works collaboratively with other medical specialties to ensure women in the perioperative period have optimal outcomes. The division collaborates with the VUMC maternal-fetal medicine (MFM) group in caring for mothers with congenital heart defects and other co-morbidities. The obstetric anesthesiologists work with the MFM, gynecologic oncology, urology and emergency general surgery physicians in the care of patients with abnormal placentation and fetal surgery. In conjunction with the department's perioperative consult service, division faculty and staff provide anesthesia care using multimodal, enhanced recovery after surgery (ERAS) protocols for gynecological cases and cesarean deliveries.

The division sponsors a highly regarded, ACGME-accredited obstetric anesthesiology fellowship led by Fellowship Director Britany Raymond, MD. Recent research projects include investigations on optimal analgesia in women with opioid use disorder, anemia treatments in pregnancy, risk prediction for uterine atony and outcomes using enhanced recovery after cesarean delivery and gynecological surgery.

Obstetric Anesthesiology Fellowship Details

- ACGME-accredited program
- Two positions available each year
- Core rotations include experiences in maternal-fetal medicine and neonatology, with abundant time for research and training

more than **5,000**
deliveries annually

--

2,800
gynecological surgical cases annually

--

more than **50%**
of deliveries are high-risk

--

20
abnormal placentation cases annually



SOCIETY FOR OBSTETRIC
ANESTHESIA AND PERINATOLOGY

**CENTER of
EXCELLENCE**



Pain Medicine

DIVISION CHIEF: DAVID A. EDWARDS, MD, PHD

Clinical

Clinicians from the Division of Pain Medicine come from multiple specialties including Anesthesiology, Physical Medicine and Rehabilitation, Neurology, Emergency Medicine, and Pain Psychology. Each clinic is set up to be multidisciplinary to provide a rich learning environment and to make incredible resources available to patients to manage their pain. Our providers see over 35,000 clinic visits annually. Our specialty pain clinics include: the Vanderbilt Center for Neuromodulation, Complex Cancer Pain Clinic, Pediatric Pain Management Clinic, Bridge Clinic (Addiction Medicine), Transitional Pain Services (Complex Perioperative Management for Patients with Chronic Pain or Use Disorders), and the Spine Clinic.

We offer care in pain management centers at several locations: Nashville One Hundred Oaks, Clarksville, Franklin, Spring Hill, Vanderbilt Ingram Cancer Center, The Village at Vanderbilt, Lebanon, Monroe

Carell Jr. Children's Hospital at Vanderbilt and on inpatient Comprehensive Pain Services (Chronic Pain, Transitional Pain and Cancer Pain).

Education

Our ACGME-accredited Pain Medicine fellowship provides exceptional training and exposure to high volume complex and common pain treatments/interventions, cancer pain, addiction medicine, pediatric pain, and complex spine. Members of the Pain Division teach approximately one third of the medical school class each year in a course entitled Pain, Policy, and Addiction, where students learn to be leaders and impact policy that affects patients. Residents and students from all specialties frequently rotate in our clinics.

Leadership

Division faculty have leadership roles in national and local organizations, including the American Academy of Pain Medicine, the Tennessee Pain Society (President, Board

of Directors), the Society of Pain Fellowship Directors, among others. At Vanderbilt, we are active leaders involved in oversight of controlled substances, teaching CME courses on prescribing, and development of hospital-wide policies.

Research

The division is active in research and innovation encompassing clinical trials to develop new treatment modalities in peripheral ablation and neuromodulation, therapies for opioid use disorder, safety with intrathecal drug delivery devices, acupuncture and acupressure, mindfulness, population health, drug development, perioperative acute and chronic pain transitions, opioid epidemiology, financial models of care, and more. Faculty have funding from the NIH (R01, U), AHRQ, RTI, Amazon, and investigator designed industry funded trials. No faculty accept payment from industry outside of sponsorship for research that we design and carry out.

Interventional Pain Fellowship Details

- ACGME-accredited program
- Five positions available each year
- Focus on comprehensive, multi-disciplinary treatment of acute, sub-acute, and chronic pain
- Rotations in interventional pain, psychiatry, addiction medicine, neurology, radiology, physical therapy, cancer pain, integrative medicine, and international pain delivery
- High volume training exposure with state-of-the-art therapies such as implantable spinal and peripheral stimulators, ablative/lytic therapies, fluoroscopic and ultrasound-guided procedures, neurosurgical treatments, intrathecal drug delivery systems
- Completion of publishable academic projects



Pediatric Cardiac Anesthesiology

DIVISION CHIEF: BEVAN LONDERGAN, MD

The Division of Pediatric Cardiac Anesthesiology is made up of five faculty members and nine certified registered nurse anesthetists whose primary anesthesia care sites are the two cardiac operating rooms and three catheterization laboratories at the Monroe Carell Jr. Children's Hospital at Vanderbilt. The division's average annual case volume is approximately 480 cardiac surgeries and 1,200 cardiac catheterizations and electrophysiologic procedures. Our program performed 20 pediatric heart transplants in 2022, ranking 3rd in the United States. We are also among the busiest centers in the country for pediatric ventricular assist device placement.

Division faculty members oversee the care of the congenital cardiac population for noncardiac operations and procedures, providing or coordinating the appropriate anesthesia care for each child. The division also provides care for the growing and increasingly complex adult cardiac population in a collaborative effort with specialists at both VUMC and the Children's Hospital.

Beyond the operating rooms, members of the division are involved in providing care for patients undergoing procedures in the pediatric cardiac intensive care unit and are called upon for their vascular access expertise and teaching throughout Children's Hospital.

The educational mission of the division is multifaceted. We provide an advanced fellowship in Pediatric Cardiac Anesthesiology, and the

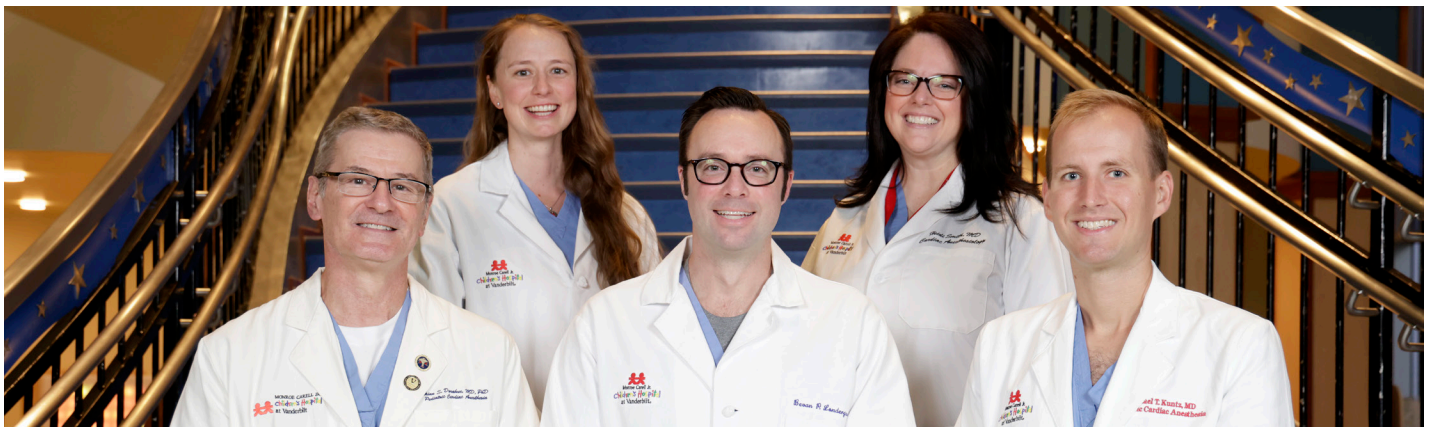
Pediatric Anesthesiology and adult Cardiothoracic Anesthesiology fellows rotate on the service. Senior Anesthesiology residents rotate with the service on an elective basis. The division additionally provides educational experiences to student nurse anesthetists, Emergency Medicine fellows, Critical Care fellows and Pediatrics residents. Our faculty participates in departmental didactics including the pediatric anesthesia rotation lecture series, basic resident lecture series, pediatric fellow lecture series, resident and fellow journal clubs and mock oral board sessions.

Division faculty members are involved in a range of research activities. Heidi Smith, MD, MSCI, has been awarded an R01 grant for a randomized controlled trial studying pediatric critical care delirium, and she was the co-chair and lead author for the recently published PANDEM guidelines providing recommendations for management of pain, agitation, withdrawal, delirium and early mobility in critically ill infants and children. Brian Donahue, MD, PhD, serves as research mentor in both the Pediatric Anesthesiology and the Pediatric Cardiac Anesthesiology Divisions. Division faculty work within the Pediatric Heart Institute at Children's Hospital on research and quality improvement initiatives including lesion-specific care pathways, coagulation therapies and postoperative pain management. Faculty members are also involved in multi-institution research and quality initiatives in congenital cardiac care with peer institutions throughout the country.

3rd busiest in the nation for
pediatric heart transplants with
20
transplants in 2022
--
480
pediatric cardiac surgeries annually
--
1,200
pediatric cardiac catheterization
procedures annually

Pediatric Cardiac Anesthesiology Fellowship Details

- One year advanced fellowship program (*accreditation not offered by ACGME*)
- One fellowship position available per year
- Core rotations include: pediatric cardiac OR, pediatric cardiac cath lab, pediatric cardiac ICU, congenital echocardiography, and pediatric perfusion
- Electives include: fetal cardiology and imaging, transplant cardiology, additional advanced imaging, transfusion medicine, quality improvement or research, and adult congenital heart disease



Pediatric Anesthesiology

INTERIM DIVISION CHIEF: ANDREW FRANKLIN, MD, MBA

The Division of Pediatric Anesthesiology provides perioperative care for more than 28,000 patients annually at the Monroe Carell Jr. Children's Hospital at Vanderbilt (Middle Tennessee's only comprehensive regional pediatric center) and at the affiliated free-standing pediatric ambulatory surgery center in Murfreesboro.

Academic interests of the division include best practice in handovers of care, outcomes research for pediatric craniofacial surgery, enhanced recovery after surgery, pediatric chronic pain management, non-invasive monitoring of volume status in the pediatric population, noise reduction in the OR, machine learning, and international educational efforts to improve the care of children worldwide.

We have a robust fellowship program that trains four future pediatric anesthesiologists annually, with Jenna Sobey, MD, at the helm as program director. Dr. Sobey's efforts help ensure that the field of pediatric anesthesiology remains vibrant into the future and continues to provide specialized care to neonates and children with very complex medical diseases.

The Pediatric Pain Service, led by Andrew Franklin, MD, MBA, provides comprehensive acute pain management services to children throughout the hospital, utilizes regional anesthesia and enhanced recovery pathways to optimize recovery for children having surgery, and provides outpatient chronic pain management. Formed in the fall of 2022, the new Multidisciplinary Assessment of Pain (MAP) clinic, led by Amanda Stone, PhD, and Alan Hoang, MD, provides team-based chronic pain management for the most complex patients by utilizing the skills of many medical providers, including physicians, nurses, psychologists, physical therapists and occupational therapists.

Some of the division's most complex patients are cared for by special clinical teams, including our pediatric liver transplant team led by Amanda Lorinc, MD, our craniofacial reconstruction team led by Srijaya Reddy, MD, MBA, and the pediatric spine surgery team led by Tom Romanelli, MD. Dr. Lorinc also serves as the division's Director of Clinical Operations and interfaces with perioperative surgical and nursing leadership to ensure that patients flow seamlessly through all phases of perioperative care. Jon Niconchuk, MD, leads anesthesiology services at the pediatric ambulatory surgery center in Murfreesboro, which provides anesthesia care to children in three operating rooms, a GI suite and a radiology suite.

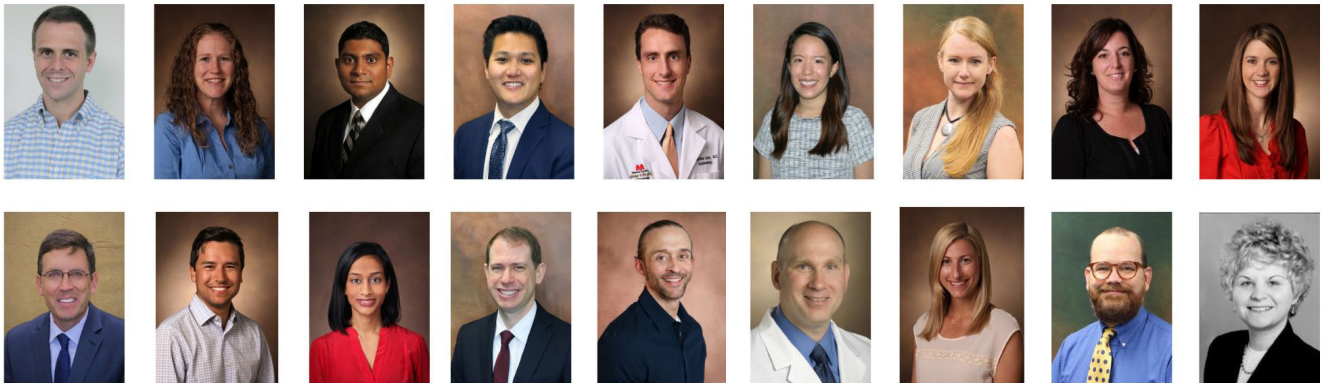
Enhancement of the perioperative experience for our pediatric patients is guided by quality and safety initiatives, efficiency and patient-centered care. These efforts are led by Carrie Menser, MD, who serves as the Perioperative Anesthesia Medical Director as well as the Executive Medical Director of Patient Safety at Children's Hospital. In order to prepare children and their families for their perioperative experience and to ensure that they are optimized prior to surgery, the Preoperative Assessment & Teaching for Children's Hospital (PATCH) team, directed by Clay Adams, MD, makes sure procedures go smoothly. To provide the safest, best care practices for patients in the postoperative recovery room (PACU) area, the division has a robust nursing-anesthesia collaboration led by Christy Crockett, MD. J. Matthew Kynes, MD, and Mark Newton, MD, lead the division's international anesthesia efforts and have deep rooted clinical and academic collaborations with medical centers in Kenya and other locations worldwide, working toward a future where safe anesthesia care is a possibility for children across the globe.

Pediatric Anesthesiology Fellowship Details

- ACGME-accredited program
- Four positions available each year
- Electives include ability to travel to Guatemala and/or Kenya for international care experiences
- Core rotations include pediatric OR & pediatric cardiac OR, PICU, NICU, pediatric pain service, preoperative evaluation clinic, & recovery room management
- Final month dedicated to 'supervisory' role to foster transition to the attending role

25,178
total anesthetics in operating and sedation rooms at Monroe Carell Jr. Children's Hospital at Vanderbilt
--
3,261
total anesthetics in operating and sedation rooms at the pediatric ambulatory surgery center in Murfreesboro
--
517
anesthetics for neonates (< 1 month old)
--
173
spine fusions
--
39
craniofacial surgeries

all stats based on annual numbers



Perioperative Medicine

VICE CHAIR: MATTHEW McEVOY, MD

ASSISTANT VICE CHAIR:
EDWARD YAGHMOUR, MD

ASSISTANT VICE CHAIR:
MIKLOS KERTAI, MD, PhD

The Perioperative Optimization leadership team, spearheaded by **Assistant Vice Chair for Perioperative Medicine Edward Yaghmour, MD**, is advancing perioperative medicine as a core mission of not only our department but also the institution. This team has created seamless collaboration with surgeons, nurses and other key stakeholders through our Enhanced Recovery Program, which includes rigorous care standardization and evaluation of outcomes across many surgical populations. These efforts have led to the creation of improved care processes to generate better operational throughput across the enterprise, resulting in reduced length of stay, decreased readmissions and improved patient outcomes. As a part of these programs, we have established performance monitoring of process, outcome, quality and safety metrics across the entire perioperative care arc. This teamwork allows for promotion of faculty through mentoring of activities such as scholarship, educational programming and research initiatives and importantly forms a core component of our residency and fellowship training.

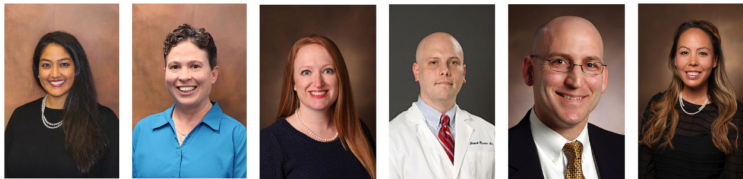
Perioperative Optimization Team Leaders

- **Sheena Weaver, MD: Medical Director, Vanderbilt Preoperative Evaluation Center (VPEC)**
- **Matthew McEvoy, MD: Medical Director, High-Risk Surgical Encounter (Hi-RiSE) Service**
- **Patrick Henson, DO: Medical Director, PreOp/Post-Anesthesia Care Unit**
- **Chris Sobey, MD: Medical Director, Pain Medicine Clinics**
- **Christina Jelly, MD, and Amanda Shakal, DO: Co-Directors, Point-of-Care Ultrasound (POCUS)**
- **Amanda Toye, MD: Chief, Comprehensive Pain Service/ Transitional Pain Service**
- **Susan Eagle, MD: Medical Director, Adult Congenital Cardiothoracic Anesthesiology**
- **Edward Yaghmour, MD: Director, Acute Pain Service**
- **Matthew McEvoy, MD: Director, Perioperative Consult Service**

The Quality, Safety and Outcomes (QSO) leadership team, spearheaded by **Assistant Vice Chair for Quality and Safety Miklos Kertai, MD, PhD**, is proactively integrating the efforts of the quality and safety portfolio with the perioperative optimization portfolio. This team interacts with our department's division chiefs to proactively identify areas for improvement in quality, safety and outcomes across the entire perioperative care arc. Creating and continuing to develop structured review processes for providers and perioperative systems concerning quality, safety and outcomes of a specific event or practice pattern generates improved care processes for our patients and providers. Additionally, this team develops new opportunities for monitoring and improving education and feedback related to quality, safety and outcomes throughout the perioperative period for all the team members. The Center for Evidence-Based Anesthesia (CEBA) is an important part of QSO and includes the creation and maintenance of over 153 adult and 70 pediatric documents (e.g., guidelines, clinical pathways and ERAS protocols) on SparkLearn. The Multicenter Perioperative Outcomes Group (MPOG) Anesthesiology Performance Improvement and Reporting Exchange (ASPIRE) task force is another important portfolio of QSO. The task force has worked on implementing department-wide educational initiatives and reporting for seven anesthesia quality and safety processes and two outcome measures. Faculty representing each clinical division, CRNAs, advanced practice providers and anesthesiology trainees are routinely involved in the teamwork and projects led by the QSO portfolio.

Quality, Safety and Outcomes Team Leaders

- **Paul St. Jacques, MD: Patient Safety Officer**
- **Aditi Balakrishna, MD: Associate Patient Safety Officer**
- **Michael Mantinan, MD, and Jordan Miller, CRNA, DNAP: Senior Quality and Patient Safety Advisors**
- **Michael Higgins, MD, MPH: Chair, Peer Review Committee**
- **Brian Tinch, MD: Co-Director, CEBA (Pediatric)**
- **Matthew Zapf, MD: Co-Director, CEBA (Adult)**
- **Leslie Fowler, EdD: Director, Educational Development and Research**
- **Patrick Henson, DO: Director, MPOG ASPIRE Program**
- **LaManda Watson, Project Manager, PM Portfolios**



Veterans Affairs Anesthesiology Service

CHIEF: ANN WALIA, MBBS

The Anesthesiology Service at the Tennessee Valley Healthcare System (TVHS) provides a variety of anesthesia services for over 145,000 veterans across its three main campuses in Nashville, Clarksville and Murfreesboro.

The service includes 25 full-time anesthesiologists, 10 part-time anesthesiologists, 20 CRNAs, 23 nurse practitioners, 2 anesthesiology residents, 1 fellow, 8 medical instrument technicians and 14 administrative support staff. The service is heavily engaged in educational activities within TVHS as well as nationally.

The TVHS Anesthesiology Service has been recognized nationally as best practice for its Preoperative Evaluation Clinic as well as the Perioperative Care Service, which was started in 2016. Since implementation, this service has been credited with savings in excess of \$10 million/year by decreasing patient ICU and hospital length of stay to well below national benchmarks. This service has also been instrumental in decreasing in-hospital and long-term opioid use by greater than 80 percent of baseline in the surgical patient population.

TVHS has the only service in the Veterans Integrated Service Network (VISN) 9 that provides comprehensive complex pain management, including invasive procedures like radiofrequency ablation, spinal cord and peripheral stimulator implantation, kyphoplasty and vertebroplasty, tumor ablation, suboxone implants and inpatient ketamine infusions for unremitting pain and detoxification. The ketamine clinic has been successful in many ways, including helping veterans wean themselves from their narcotics completely and improve quality of life. At our two main facilities, we are working closely with the Psychiatry Service to expand the electroconvulsive therapy program and low dose ketamine infusion program for depression.

The service is credited with over 10,000 surgical and 8,000 non-OR procedures, 10,000 pain clinic visits, 7,500 interventional procedures and 20,000 telehealth and videoconnect visits across three campuses. In addition, the Anesthesiology Service is responsible for oversight of the facility surgical intensive care, perioperative service, Rapid Response Team, moderate sedation program, and resuscitation and airway management activities.

Faculty members teach at national conferences and the national simulation center, along with serving as a resource to several other facilities in key areas such as the ERAS protocols, ketamine infusion program for complex chronic pain and opioid detoxification, labor mapping and workload capture. The chief serves as chair of the National Anesthesiology Surgical Advisory Board and Field Advisory Committee, as well as VISN 9 Anesthesiologist-in-Chief.

	17,500
pain clinic & interventional visits	--
	10,000
operating room procedures	--
	8,000
non-operating room procedures	--
	20,000
telehealth & videoconnect visits	



Certified Registered Nurse Anesthetists

CHIEF: AMANDA DICKERT, CRNA, DNAP



The Vanderbilt University Medical Center (VUMC) Department of Anesthesiology continues to set the nationwide standard for true collaborative practice and innovation in its approach to patient care, involving anesthesiologists and residents, certified registered nurse anesthetists (CRNAs), student registered nurse anesthetists (SRNAs) and anesthesia technicians and technologists. Serving as Chief CRNA, Amanda Dickert, CRNA, DNAP, leads the division.

The past year was one of continued tremendous clinical growth for VUMC. From 2022-2023, 70 new CRNAs were added to accommodate continued growth on campus, in our ambulatory centers and in our regional hospital. Now, over 230 CRNAs in the nurse anesthesia division provide anesthesia for all types of surgical procedures, including cardiac, pediatrics, vascular, trauma, neurosurgery, plastics, radiologic and special procedures throughout the medical center. CRNAs administer general, regional, and monitored anesthesia care for scheduled and emergency surgical, obstetric, and diagnostic procedures. Our nurse anesthesia professionals have a “can-do” attitude and are always ready for the challenges that come from working in a complex academic medical center that cares for the most challenging patients in Tennessee and beyond.

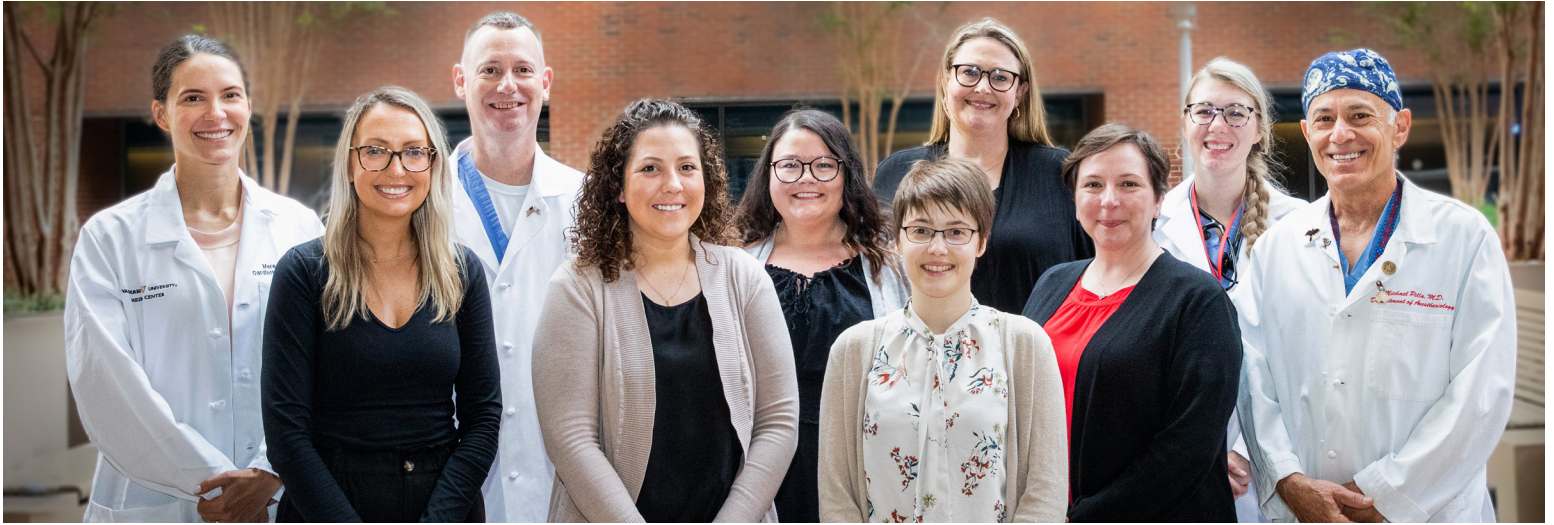
Six CRNAs serve as divisional managers to facilitate practice evolution, education, and professional development of their respective teams. Thus, the CRNAs are essential to many core endeavors, with a sharp focus on patient experience and outcomes. In terms of personnel, the CRNA Division is the largest within the Department of Anesthesiology. We have an active CRNA manager of education, who facilitates onboarding, student affiliations and

professional development. Our senior quality and patient safety advisor CRNA is an integral member of our quality team within the department.

Vanderbilt is proud to serve in a teaching capacity for three different nurse anesthesia programs that are clinical affiliates. Middle Tennessee School of Anesthesia (MTSA), based in Madison, Tennessee, is the second largest nurse anesthesia program in the country. Vanderbilt is also a clinical affiliate for Emory University Nurse Anesthesia Program in Atlanta, Georgia, and Marian University, based in Indianapolis, Indiana. Student nurse anesthetists participate in over 7,000 anesthetics per year while on Vanderbilt rotations. Both CRNAs and anesthesiologists provide expert clinical teaching to these learners, who are highly sought after in the marketplace upon graduation. CRNA leaders oversee and coordinate the student rotations through mentoring, orientation and evaluation. Additionally, CRNAs are involved in both onsite and remote teaching of nurse anesthesia students in Kijabe, Kenya, through the sustainable Vanderbilt International Anesthesia program.

VUMC is staffed by over 40 anesthesia technicians who contribute to safe, efficient anesthesia care by providing highly skilled assistance to our anesthesia professionals at both on- and off-campus clinical locations. In recent years, we have partnered with the anesthesia technology program at Columbia State Community College in Columbia, Tennessee, as a clinical affiliate for student rotations in both adult and pediatric anesthesiology.

Education



Residents

The VUMC Anesthesiology Department's residency program is rated among the top 15 training program in the United States and is highly sought after by the nation's top medical students.

The physician educators in the Anesthesiology Department are nationally and internationally recognized as leaders in their fields, and the department successfully supports residents interested in academic anesthesiology so they can develop careers focused on advancing knowledge in the specialty. Peer-reviewed publications and the presentation of research by residents at national meetings are clear indications that the department's educational programs are creating physician-scholars who are prepared for medical practice, peer-education, and scientific investigation.

The educational program for residents and fellows consists of a combination of comprehensive didactic conferences, hands-on workshops, mentored clinical training by subspecialists in every domain of anesthesiology, simulation training and self-study. Simulation training features prominently in the cognitive, procedural and teamwork aspects of anesthesia education, and the Center for Experiential Learning and Assessment (CELA) is a nationally renowned, on-campus resource for this training. Additionally, transesophageal echocardiography (TEE) and point-of-care ultrasound (POCUS) training are now core educational aspects in our residents' curriculum.

The goal of ongoing curriculum development and revision in the Milestones era is to continue to reach the highest level of educational achievement using modern learning techniques. Accordingly, Leslie Fowler, EdD, Director of Educational Development and Research, is overseeing departmental curriculum advancements along with Vice Chair for Educational Affairs Brian Gelfand, MD, and the core education faculty. Among other projects, Leslie and the Vanderbilt University School of Medicine Spark team have worked together utilizing VUSM's IT platform for education management to develop multimodal models of learning for anesthesiology education. This has been expanded across varying learner groups both within our institution and internationally.

Fellows

Building from the department's strength in subspecialties, fellowships in 11 clinical areas are offered to individuals seeking advanced, focused subspecialty training.

CLINICAL FELLOWSHIPS OFFERED:

- Anesthesiology Critical Care Medicine: 10 fellowships
- Cardiothoracic Anesthesiology: 5 fellowships
- Clinical Informatics: 1-2 fellowships
- Global Anesthesiology*: 1-2 fellowships
- Interventional Pain: 5 fellowships
- Neuroanesthesiology*: 1 fellowship
- Obstetric Anesthesiology: 2 fellowships
- Pediatric Anesthesiology: 4 fellowships
- Pediatric Cardiac Anesthesiology*: 1 fellowship
- Perioperative Medicine*: 4 fellowships
- Regional Anesthesia & Acute Pain Medicine: 3 fellowships

**Indicates ACGME accreditation not offered. All other fellowships listed are ACGME accredited.*

Nurse Anesthetists

The continuing education of more than 200 certified registered nurse anesthetists (CRNAs) in the department is supported with recurring programs, including Grand Rounds and Mortality, Morbidity & Improvement (MM&I) Conferences. In addition, Vanderbilt is a clinical affiliate for Middle Tennessee School of Anesthesia, Emory University Nurse Anesthesia Program (Atlanta, Georgia) and Marian University (Indianapolis, Indiana). On-campus training is coordinated by CRNA leaders in the Department of Anesthesiology.

Advanced Practice Nurses

The Department of Anesthesiology has a unique partnership with the Vanderbilt University School of Nursing to offer an Acute Care Nurse Practitioner (ACNP) Intensivist track as part of the ACNP master's degree program. The program combines the didactic training of the School of Nursing's ACNP Program with supplemental specialty lectures in critical care medicine. Students perform their clinical rotations in seven of the

Vanderbilt and VA ICUs. Students also receive additional exposure to ICU medicine through twice-monthly simulation sessions and weekly clinical case conferences, taught jointly by members of both faculties.

Additional partnership programs between the Anesthesiology Department and the School of Nursing are being planned. Vanderbilt University Medical Center is one of the largest employers of nurse practitioners in the country. The Division of Anesthesiology Critical Care Medicine has 30 acute care nurse practitioners who work in intensive care settings. The Preoperative Evaluation Clinic and Perioperative Consult Service include another 17 nurse practitioners as an integral part of these teams.

The Center for Experiential Learning and Assessment

Under the leadership of Arna Banerjee, MD, MMHC, CELA offers medical learners at all levels simulation education on computerized, life-like mannequins. CELA was endorsed by the American Society of Anesthesiologists (ASA) as one of approximately 40 centers in the nation officially approved to deliver certified educational programs. At CELA, anesthesiologists can receive continuing medical education (CME) simulation training that qualifies for American Board of Anesthesiology Maintenance of Certification in Anesthesiology (MOCA®) credit. To achieve the ASA endorsement, the CELA program met strict criteria, which include having strong leadership and the necessary equipment, facilities, and personnel to provide consistent, effective training.

Multicenter Perioperative Outcomes Group (MPOG) ASPIRE (Anesthesiology Performance Improvement and Reporting Exchange) Quality Improvement Project

ASPIRE is the quality improvement (QI) arm of the MPOG. The goal is to improve the care of patients undergoing anesthesia by reducing unexplained variation in practice and collaborating with anesthesia providers to define best practices. Participating sites work together to build quality measures, review best practices and exchange ideas for improving patient outcome. ASPIRE has developed numerous quality measures, spanning several anesthesia care domains.

The Department of Anesthesiology at VUMC joined MPOG ASPIRE in 2020 and has the full support of departmental leaders. To mobilize resources and develop a cohesive plan for implementation of ASPIRE quality measures department wide, the ASPIRE Task Force was created. The task force, led by Miklos Kertai, MD, PhD, identified 3 adult specific measures and 3 pediatric specific measures on which a QI project would initially focus.

Of note, there are 22 ASPIRE measures that have been identified. A key component of ASPIRE includes monthly feedback emails showing departmental compliance with ASPIRE measures and then later provider level performance data. The project vision and timeline were introduced at Grand Rounds in January of 2021 to department groups: attending physicians, CRNAs, fellows, residents and SRNAs.

Ultimately, this QI project will improve patient care with the delivery of detailed feedback to anesthesia providers. In addition, the provision of education that is ASPIRE measure specific will further enhance best practices in anesthesia.

The Academy for Excellence in Education

A collective of outstanding faculty educators in the School of Medicine, the AEE provides a forum to foster higher levels of participation and promote excellence and scholarship in the delivery of education to health professionals. The mission of the AEE is to enhance the educational environment in Vanderbilt University School of Medicine and VUMC by advocating for the development, support and recognition of dedicated educators; by sustaining a community of educators; and by fostering educational excellence, innovation, leadership and scholarship. The AEE elected 13 new members in 2023, one of whom is from our department: Roy Neeley, MD. The AEE collective currently consists of 110 faculty, 18 of whom are Anesthesiology Department faculty members.

Educational Research

The department is a national leader in rigorous educational research, and numerous faculty are involved with the latest in pedagogical and educational implementation science research. Leslie Fowler, EdD, J. Matthew Kynes, MD, Matthew McEvoy, MD, Mark Newton, MD, Britany Raymond, MD, Brian Allen, MD, Amy Robertson, MD, Jonathan Wanderer, MD, MPhil, Brian Gelfand, MD, and Bantayehu Sileshi, MD, are the current education researchers.

Dr. Kynes' research focuses on the impact of high-fidelity simulation workshops on clinical skills for providers involved in obstetric care in Kenya. He also studies the preparation and experience of anesthesiology residents participating in international rotations and their impact on improving clinical exposure and long-term engagement in humanitarian activities. Dr. Kynes' research includes the FAER grant impact of and utilization of online curricula in pediatric anesthesiology by providers in low- and middle-income countries.

Dr. Sileshi has funded research investigating the effects of education capacity-building efforts and the implementation of a novel perioperative data collection tool in low- and middle-income countries, including Kenya and Ethiopia.



Special Lectureships and Awards

The department hosts special lectureships throughout the year and presents distinct recognitions to department members who have provided exemplary service both to their patients and to their colleagues.

Many of these are a direct result of philanthropic support from our alumni, as well as from current department members and other program supporters. Funding is provided by private donors, whose gifts materially improve the academic life of the Vanderbilt Department of Anesthesiology.

Dr. James Phythyon Endowed Lectureship in Pediatric Anesthesiology

The lectureship was established by the family of Dr. James Phythyon, a founding member of the Pediatric Anesthesiology Division. Dr. Phythyon's widow, Mrs. Marlin Sanders, and the couple's daughters, Mary Neal Meador, Elizabeth Donner and Sarah Miller, are strong department supporters.

The Sandidge Pediatric Pain Management Endowed Fund

Retired Vanderbilt anesthesiologist Paula C. Sandidge, MD, created The Sandidge Pediatric Pain Management Endowed Fund at Monroe Carell Jr. Children's Hospital at Vanderbilt in 2010 to recognize and encourage progress in pain management for children. Dr. Sandidge passed away in September 2018.

The Dila Vuksanaj Memorial Fund for Resident Education

Pediatric anesthesiologist Dila Vuksanaj, MD, practiced at Children's Hospital for 13 years, dedicating herself to her patients and to the hundreds of trainees who looked to her as a role model, mentor and friend. Following her death in 2009, her family, including her husband, Jacques Heibig, MD, founded the Dila Vuksanaj Memorial Fund for Resident Education.

Dr. Bradley E. Smith Endowed Lectureship on Medical Professionalism

Former chairman Bradley E. Smith, MD, defined what it means to be a true professional, and in 2009 a lectureship on medical professionalism was established in his name by then department chairman Michael Higgins, MD, MPH. The goal of the lectureship is to reflect on the characteristics, responsibilities and rewards of professionalism as applied to the practice of anesthesiology.

Dr. Charles Beattie Endowed Lectureship on Perioperative Medicine and Systems-Based Practice

Established by Warren Sandberg, MD, PhD, the lectureship is intended to bring innovators in anesthesiology from unique backgrounds and compelling world views to Vanderbilt as visiting professors.



On Friday, January 20, 2023, Selwyn M. Vickers, MD, presented the 14th annual Dr. Bradley E. Smith Endowed Lectureship on Medical Professionalism. His presentation was titled "*History worth Remembering: Lessons for Today Learned from a Period and Ongoing Process in American History Called Reconstruction.*"



On Friday, April 7, 2023, Tarun Bhalla, MD, MBA, FASA, FAAP, presented the 17th annual Dr. James Phythyon Endowed Lectureship in Pediatric Anesthesiology. His presentation was titled "*Transformational Change Through a Pediatric Accountable Care Organization: A Maintenance Plan for Population Health.*"



On Friday, September 8, 2023, Sachin Kheterpal, MD, MBA, presented the 4th annual Dr. Charles Beattie Endowed Lectureship on Perioperative Medicine and Systems-Based Practice. His presentation was titled "*From Big Data to Small Decisions: Using Data to Collaborate and Improve Care.*"



Vanderbilt International Anesthesia



Five billion people around the world do not have access to safe surgery and anesthesia. Through Vanderbilt International Anesthesia (VIA), the Department of Anesthesiology is committed to improving perioperative and anesthetic care in underserved regions of the world to help close this gap through service, education and research. The commitment of our department is shown through the involvement of faculty, trainees and staff in a variety of innovative projects across many low- and middle-income countries. From long-established partnerships of educational capacity-building to short-term service trips to international advocacy and research, VIA has invested in improving anesthesia care to save lives, promote health and impact the healthcare systems of countries in need.

Among these initiatives is the ImPACT Africa (Improving Perioperative and Anesthesia Care and Training in Africa) program, which continues to expand. Supported by grants from GE Foundation and The ELMA Foundation and led by Mark Newton, MD, and Bantayehu Sileshi, MD, the program works with local institutions, hospitals, and ministries of health in Ethiopia and Tanzania to train physician and non-physician anesthesia providers and build capacity for education, empowering educators with tools and techniques to teach anesthesia in the classroom, simulation center and operating room.

The department's newest global education initiative, launched in 2022, is the Pediatric Anesthesia Training in Africa (PATA) collaborative, led by Mark Newton, MD. PATA aims to improve perioperative care for children by building education capacity for advanced subspecialty training at teaching hospitals across the continent. Over the next five years, the PATA collaborative will develop five new pediatric anesthesiology fellowship programs in five African countries. In the fall of 2022, PATA launched the first three of five planned fellowships in Nigeria, Uganda, and Zambia. The PATA Collaborative is funded by The ELMA Foundation and Smile Train.

In addition to these educational programs, VIA offers an ACGME-/ABA-accredited elective rotation to Kenya for the department's residents and fellows. Since the rotation began in 2009, VIA has sent 112 residents

and fellows to AIC Kijabe Hospital in Kenya to provide anesthesia care and education. While in Kenya, the department's trainees are supervised by faculty member J. Matthew Kynes, MD, who is based full-time in Kijabe. The rotation is a highlight for many of the department's trainees and helped pave the way for the Global LEAP (Global Leadership in Anesthesia Pathway) program, an advanced track for residents interested in developing in-depth global health expertise and extensive international experience. Directed by Jon Niconchuk, MD, the track is now in its sixth year.

The department is also proud of the on-going global health contributions of our CRNA team members. Our CRNAs have traveled to underserved countries of the world, including Guatemala, Kenya, Nigeria, Uganda and others, for teaching and service projects and have participated in tele-education lecture series for anesthesia providers and trainees in East Africa.

The Department of Anesthesiology's on-going global advocacy efforts include advising ministries of health in low- and middle-income countries in the development of National Surgery, Obstetric and Anesthesia Plans (NSOAPs). Through VIA, the Department of Anesthesiology also offers the Vanderbilt Global Anesthesiology Fellowship, hosts visiting ASA Global Scholars and convenes the quarterly Vanderbilt International Journal Club.

The department looks forward to continuing to expand efforts to improve anesthesia care across the globe in 2024 and beyond.

Research

The vision of the Research Division is to advance knowledge in the fields of perioperative medicine, critical care, pain medicine and related disciplines by fostering collaboration and research excellence. The underlying goal of our research program is to improve patient care.

In federal fiscal year 2022, the Vanderbilt University School of Medicine (VUSM) ranked 11th among U.S. medical schools for National Institutes of Health (NIH) funding, with more than \$483 million in funding. VUSM funding from all sources has more than doubled since 2001. Investigators in the Department of Anesthesiology successfully competed for more than \$11 million in extramural research funding. This included more than \$8.1 million in awarded NIH grants, which placed Vanderbilt Anesthesiology 9th among U.S. academic anesthesiology departments in NIH funding.

Vanderbilt Anesthesiology faculty published 234 peer-reviewed papers in fiscal year 2022, up from 69 papers in fiscal year 2010, within the peer-reviewed literature.

The department's Clinical Research program focuses on advancing knowledge and improving healthcare. The program supports investigator-initiated studies, including NIH-supported single center and multicenter clinical trials, and industry-sponsored clinical projects. Our research is advancing medical practice in the fields of perioperative care, critical care, chronic pain and medical devices. Investigators are practicing physicians who use clinical expertise to develop research protocols to answer clinically significant questions and investigate novel treatments.

The clinical research program is supported and facilitated by the Perioperative Clinical Research Institute (PCRI), the Vanderbilt Anesthesiology Clinical Research Advisory Committee (VACRAC) and the Vanderbilt Anesthesiology & Perioperative Informatics Research (VAPIR) group.

PCRI supports successful clinical research by providing key services to clinical investigators. The services include regulatory management, data management, contracts management, biostatistics, bioinformatics, study execution and financial oversight. The PCRI oversees more than 85 active clinical studies, with many more studies in development. The PCRI is led

by Medical Director David McIlroy, MB.BS., MD, MClInEpi, Vice Chair for Research Edward Sherwood, MD, PhD, and PCRI Director Mari Egan, RN, MS. The research team consists of highly trained and broadly experienced professionals, including research nurses, clinical trial coordinators, research assistants, regulatory specialists and administrative assistants.

VACRAC is composed of a panel of experienced clinical investigators who review research protocols and work with investigators to optimize study design and implementation. This process consists of a rapid initial review process followed by formal discussion of projects and protocols to optimize study design and mobilize resources to support successful completion of projects. The support provided by VACRAC improves the design and execution of clinical research projects, resulting in more rapid and effective study origination and completion.

VAPIR provides support to optimize informatics-focused projects and dissemination of knowledge and information throughout the department. Through the development of automated email systems and dashboards, VAPIR has strengthened internal communication and plays a vital role in providing near real time feedback to clinicians to help them improve perioperative care. VAPIR is led by Director Robert Freundlich, MD, MS, MSCI. VAPIR supports department research efforts by working with investigators to optimize the design and execution of informatics- and artificial intelligence-based studies. The VAPIR group collaborates internally with other departments at Vanderbilt to facilitate information analysis and dissemination, with the goal of improving outcomes for surgical patients. VAPIR also supports access to the electronic medical record to allow for high quality data acquisition and analysis to support research and quality improvement initiatives.

Investigators in the Basic Science Division conduct high quality basic and translational research, with the goal of advancing current knowledge and improving patient care. Specific areas of interest include ion transport, cell signaling, drug discovery, organ protection, pain management, the neurobiology of addiction, innate immunity and device development.

The Vanderbilt Department of Anesthesiology has a strong, multifaceted approach to research, which can be viewed on the following pages.

Vanderbilt University School of Medicine ranked
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with more than
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in NIH funding

anesthesia investigators successfully competed for more than
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\$8.1 million
in awarded NIH grants
--
in FY2022 department faculty published
234
peer-reviewed papers

Lab Research Advancing Medical Science

DIRECTOR: ERIC DELPIRE, PhD

The work of the Basic Science Research Division is diverse and ranges from ion channel physiology and pharmacology to immunology to pain. Multiple projects by investigators are sponsored by the National Institutes of Health. Brief descriptions of work within the Research Division and its core investigators are provided here.

Stephen Bruehl, PhD, Professor of Anesthesiology, has identified pain-related alterations in interacting cardiovascular-pain modulatory systems that contribute to enhanced pain responsiveness.

Eric Delpire, PhD, Professor of Anesthesiology, Molecular Physiology and Biophysics, Director of Basic Science Research and BH Robbins Director in Anesthesiology Research, utilizes genetically modified mouse models and a variety of molecular techniques to investigate how neuronal Cl⁻ transporters modulate inhibitory synaptic transmission and how renal Na⁺ transporters and associated proteins regulate salt reabsorption and blood pressure.

Jerod Denton, PhD, Professor of Anesthesiology and Pharmacology, is doing early-stage drug discovery for a family of potassium

channels involved in renal, endocrine, cardiac and brain function. The goal is to develop sharp pharmacological tools for exploring the integrative physiology and, ultimately, drugability of these channels.

Brad Grueter, PhD, Associate Professor, and **Carrie Grueter, PhD**, Research Assistant Professor, are researching the neurobiology of addiction and reward-related behaviors. They utilize state-of-the-art electrophysiology techniques, including optogenetics, as well as a battery of specialized neurobehavioral tests performed in genetically modified mouse models.

Matthias Riess, MD, PhD, Professor of Anesthesiology and Pharmacology, is investigating the mechanisms of cardio- and neuroprotection following cardiac arrest, myocardial infarction and stroke in various translationally relevant cell, isolated organ and animal models.

Edward Sherwood, MD, PhD, Professor of Anesthesiology, Pathology, Microbiology and Immunology, Cornelius Vanderbilt Chair in Anesthesiology and Vice Chair for Research, **Julia Bohannon, PhD**, Associate Professor of

Anesthesiology, and **Antonio Hernandez, MD, MSCI**, Professor of Anesthesiology, are studying several aspects of sepsis and burn injury and the application of immunotherapy in critically ill patients.

Josh Billings IV, MD, MSCI, Associate Professor of Anesthesiology and Medicine, is developing new therapy for perioperative organ injury by conducting clinical trials and evaluating mechanisms of surgery-induced organ injury. Broadly this includes studying and manipulating the patient response to acute surgical stress to reduce morbidity, but specifically he is investigating the impact of perioperative oxidative damage as a mechanism of acute kidney and brain injury in patients having surgery.



Advancing Technology & Improving Patient Care

The perioperative informatics groups advance patient care through innovations in patient safety and quality. By harnessing innovative technology into clinical applications, VAPIR and Perioperative Informatics are advancing the frontiers of science and healthcare. Through the Division of Informatics Research, faculty members collaborate to improve education, clinical care and research within informatics. The Division of Informatics Research's first NIH-T32 fellow, Matthew Zapf, MD (now faculty member), is working on leveraging cutting-edge machine learning and predictive modeling to improve clinical care at Vanderbilt.

Perioperative Informatics

Perioperative Informatics, led by Jonathan Wanderer, MD, MPhil, designs, develops and implements system enhancements for the periprocedural and inpatient care areas. The team supports vendor products and integrates them with the Epic unified application suite. Using health information technology solutions, the Perioperative Informatics group supports best practice care and workflows to improve patient safety, care quality, efficiency and communication through accurate and reliable real-time data acquisition and delivery.

Recent accomplishments include:

- Implementation of automated extended hours time punch process.
- Improved pre-procedure workflow with real-time tracking of patient readiness for surgery.
- Participation in the VUMC/Epic Collaborative to extend notification and communication functionality within Epic.

Vanderbilt Anesthesiology & Perioperative Informatics Research (VAPIR)

VAPIR, led by Director Robert Freundlich, MD, MS, MSCI; Associate Director for VAPIR Research and Education, Christina Boncyk, MD; Associate Director for VAPIR Quality and Safety, Jeanette Bauchat, MD; and Assistant Director Karen McCarthy, EdD, collaborates broadly to better understand perioperative care. Trainees can participate in seminars, journal clubs and a structured summer research training program. Experts in biomedical informatics and clinical research share their research at monthly seminars as visiting scholars.

Among its many ongoing projects, VAPIR has:

- Created the informatics backbone that supports the Vanderbilt Perioperative Consult Service.
- Analyzed the impact of real-time decision support tools created by the Perioperative Informatics team.
- Worked closely with Perioperative Informatics to develop a common data architecture, enabling seamless data analysis from our legacy Electronic Health Record, VPIMS (Vanderbilt Perioperative Information Management System) and current eStar (Epic) system.
- Participated in multiple large, NIH-, AHRQ-, and PCORI-funded research projects, providing a critical informatics backbone to support innovative research.

Operations Research

The Operations Research group, led by Analytics Senior Director Vikram Tiwari, PhD, performs implementable research using management sciences to design better healthcare delivery systems and operational processes. The group exemplifies the department's stated goal of fostering innovation in all aspects of the delivery of excellent clinical care.

The group has an active post-doctoral fellowship program. Incoming fellows have either MD or PhD degrees and an interest in pursuing analytics-based research. To date, the group has guided three research fellows.

Investigators in Operations Research use diverse research methodologies—linear and non-linear optimization, simulation and systems dynamics modeling, econometric and statistical modeling. Implemented projects include predicting day-of-surgery case volume, perioperative capacity planning, provider scheduling and innovative efficiency metrics.



informatics database size:

26 terabytes

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26

current active projects

--

2,005,367

cases contained in the perioperative data warehouse

Perioperative Clinical Research Institute

The Perioperative Clinical Research Institute (PCRI) is led by David McIlroy, MB.BS., MD, MClinEpi, Edward Sherwood, MD, PhD, and Mari Egan, RN, MS. The mission of PCRI is to:

- Promote a culture of large and robust clinical trials that, in turn, provide high-quality evidence to inform perioperative practice world-wide.
- Promote high-quality, high-impact clinical and informatics research tailored to the experience and expertise of individual clinicians and accessible to all members of the department, with the goal of answering important questions related to perioperative care, critical care and pain management.
- Create opportunities for junior investigators to learn the process of and gain experience in conducting clinical research.
- Mentor investigators throughout the research development and implementation process.
- Promote Good Clinical Practice (GCP) and ensure regulatory compliance.

All clinical research for which the PI is a member of the Department of Anesthesiology is routed through PCRI with the electronic submission

of a brief and focused proposal (<https://redcap.vanderbilt.edu/surveys/?s=XE44E798XF>).

The PCRI team provides a full range of support services, including development and submission of the IRB application, contracts management, initiation and execution of clinical studies, regulatory and compliance oversight, data management, biostatistics and biomedical informatics support. The end-goal is execution and publication of well-designed clinical research studies that address important questions, from smaller studies designed to generate preliminary, pilot or feasibility data in support of subsequent grant applications through to multi-center investigator-initiated studies.

Most of the department's investigators are practicing physicians who use their clinical expertise to develop research protocols that answer clinically important questions. The PCRI team consists of highly trained and broadly experienced research professionals, including research nurses, clinical trial coordinators, a regulatory specialist and administrative support.

86

active clinical
research trials

41

clinical trial
researchers



Key Clinical Research Studies

Brian Allen, MD

Effect of A Novel Educational Offering on Knowledge Acquisition and Behavior Change Concerning Opioid Prescribing Practices

Bret Alvis, MD

Non-Invasive Venous waveform Analysis (NIVA)-a proof of concept study

Christina Bonczyk, MD

A Phase 3, Multicenter, Randomized, Controlled, Open-Label, Assessor-Blinded Study to Evaluate the Efficacy and Safety of Inhaled Isoflurane Delivered via the Sedaconda ACD-S Compared to Intravenous Propofol for Sedation of Mechanically Ventilated Intensive Care Unit Adult Patients

Stephen Bruehl, PhD

Stress and Opioid Misuse Risk: The Role of Endogenous Opioid and Endocannabinoid Mechanisms

Evaluating Specific and Non-Specific Mechanisms in Two Distinct Complementary/Integrative Interventions for Chronic Pain

David Edwards, MD, PhD

A Randomized, Double-Blind, 2-Way Crossover Trial to Assess the Efficacy of Guanfacine and Lidocaine Combination versus Lidocaine Alone in Trigeminal Nerve Block for Pain Management in Painful Trigeminal Neuropathy Patients

Holly Ende, MD

Comparison of a novel risk prediction model with published risk tools for postpartum hemorrhage

Robert Freundlich, MD, MS, MSCI

Reducing Reintubation Risk in High-Risk Cardiac Surgery Patients with High-Flow Nasal Cannula

Christopher Hughes, MD

COgnitive and Physical Exercise to improve Outcomes after Surgery (COPE-iOS) study

Miklos Kertai, MD, PhD

Preemptive Pharmacogenetic-guided Metoprolol Management for Postoperative Atrial Fibrillation in Cardiac Surgery: the PREEMPTIVE-Pilot Trial

Daniel Larach, MD, MSTR

A Clinician-Focused Nudging Intervention to Optimize Post-Surgical Prescribing

Low-dose buccal buprenorphine: relative abuse potential and analgesia

Frederick Lombard, MBChB

Temperature During Cardiopulmonary Bypass and Adverse Outcomes After Cardiac Surgery

Marcos Lopez, MD

The effects of soluble guanylyl cyclase stimulation on perioperative vascular reactivity and organ injury in cardiac surgery trial

David McIlroy, MB.BS., MD, MClInEpi

Evaluating the association between mean arterial blood pressure through the first 24 hours after cardiac surgery and postoperative acute kidney injury

Tranexamic acid to Reduce Infection after Gastrointestinal Surgery: the TRIGS Trial

A Sequenced-Strategy for Improving Outcomes in People with Knee Osteoarthritis Pain (SKOAP)

Mark Newton, MD

Evaluation of Mobile Obstetric Simulation Training (MOST) on Multidisciplinary Team Management and Outcomes of Obstetrical Emergencies in the Lake Region of Tanzania

Pratik Pandharipande, MD, MSCI

The MENDS2 Study (Maximizing the Efficacy of Sedation and Reducing Neurological Dysfunction and Mortality in Septic Patients With Acute Respiratory Failure)

Britany Raymond, MD

Perioperative Ketamine Infusion and Inpatient Opioid Consumption

Srijaya Reddy, MD, MBA

Pediatric Craniofacial Surgery Perioperative Registry (PCSPR)

Kimberly Rengel, MD

Systemic Inflammation and Biology in Acute Respiratory Failure--Relationship with Treatment Response and Outcomes in the INSPiRE-ICU Trials

Joseph Schlesinger, MD

ICU Noise and Delirium

Heidi Smith, MD, MSCI

Maximizing the Efficacy of Goal-Directed Sedation to Reduce Neurological Dysfunction in Mechanically Ventilated Infants and Children Study (mini-MENDS)

Loren Smith, MD, PhD

High Density Lipoprotein Characteristics and the Risk of Acute Kidney Injury Following Cardiac and Vascular Surgery

Amanda Stone, PhD

Experiences of Functional Nausea in Adolescent Girls and their Parents

Matthew Weinger, MD

Improving Medical Performance during Acute Crises Through Simulation (IMPACTS)

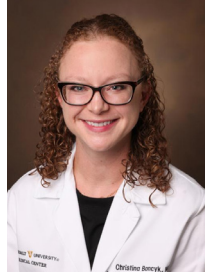
Key Clinical Researchers



Brian Allen, MD



Bret Alvis, MD



Christina Boncyk, MD



Stephen Bruehl, PhD



David A. Edwards,
MD, PhD



Holly Ende, MD



Robert Freundlich,
MD, MS, MSCI



Christopher Hughes, MD



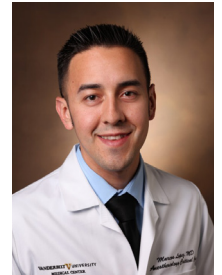
Miklos Kertai, MD,
PhD



Daniel Larach, MD,
MSTR



Frederick Lombard,
MBChB



Marcos Lopez, MD



David McIlroy,
MB.BS., MD,
MClinEpi



Mark Newton, MD



Pratik
Pandharipande,
MD, MSCI



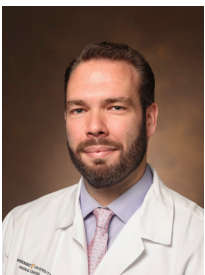
Britany Raymond,
MD



Srijaya Reddy, MD,
MBA



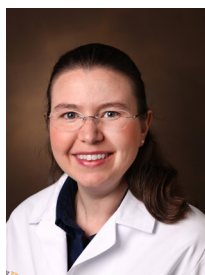
Kimberly Rengel,
MD, MSCI



Joseph Schlesinger,
MD



Heidi Smith, MD,
MSCI



Loren Smith, MD,
PhD



Amanda Stone, PhD



Matthew Weinger, MD



Bret Alvis, MD

Bret Alvis, MD, was awarded a five year NIH grant to study non-invasive venous waveform analysis (NIVA) as a means of quantifying intravascular volume status in critically ill and perioperative patients. His group works to better understand the entire spectrum of intravascular volume status through clinical and translational research of venous waveforms and device development.

Frederic T. (Josh) Billings IV, MD, MSCI

The research of Dr. Billings focuses on the prevention and treatment of perioperative organ injury. His research includes surgical patients and their tissues, preclinical models, and clinical trials. Broadly this includes studying and manipulating the patient response to acute surgical stress, but specifically he is investigating the impact of variable oxygen administration on putative mechanisms of organ injury. These mechanisms include excess production of reactive oxygen species, impaired vascular function, and heme-protein mediated tissue damage. His group studies the impact of oxygen on these processes so that they can determine the optimal oxygen administration throughout the perioperative period to reduce organ injury. This addresses a large unmet need for millions of patients, because oxygen administration during surgery is highly variable, unguided, often excessive, and potentially harmful.

Julia Bohannon, PhD

Dr. Bohannon's NIGMS-funded research seeks to understand how severe burn injury impacts innate immune cell function, metabolism and mitochondrial integrity and determine their contributions to greater susceptibility to infection in these patients. Her lab is investigating toll-like receptor signaling pathways and how these pathways can be harnessed for therapeutic benefit in reversing immunometabolic dysfunction after severe burns to enhance resistance to infection. Using mouse models of burn injury and infection, as well as immune cells collected from human burn patients, her lab is studying the therapeutic impact of toll-like receptor agonists on improving immune function and protection against infection after severe burn injury.

Carrie Brintz, PhD

Dr. Brintz's research aims to test and optimize psychosocial, mind-body interventions to improve outcomes and accessibility

for people with chronic pain and post-surgical pain. Her work is currently funded by an NIH K23 Career Development Award to adapt and test a mindfulness-based intervention to enhance patient recovery after lumbar spine surgery.

Stephen Bruehl, PhD

Dr. Bruehl is principal investigator on two active NIH studies. The first study is titled "Evaluating Specific and Non-Specific Mechanisms in Two Distinct Complementary Integrative Interventions for Chronic Pain." This project evaluates the role of both specific (theory-related) and non-specific mechanisms underlying the beneficial effects in Mindfulness-Based Stress Reduction and Spinal Manipulation Therapy for improving function and reducing pain in chronic low back pain patients. The second study is titled "Stress and Opioid Misuse Risk: The Role of Endogenous Opioid and Endocannabinoid Mechanisms." This project tests the role of endogenous opioid and endocannabinoid mechanisms as contributors to observed associations between elevated stress and opioid misuse risk.

Eric Delpire, PhD

Dr. Delpire's research is funded by two NIH grants and a Leducq Foundation network for excellence grant, the goal of which is to expand the NIH funded research. He studies the regulation of transporters involved in salt reabsorption in kidney with a focus on protein kinases and adaptor proteins. The kinases serve as rheostats stimulating sodium reabsorption in conditions of potassium deficiency. The research also involves cotransporters involved in the control and maintenance of cell volume.

Jerod Denton, PhD

The Denton lab does early stage drug discovery and target validation for ion channels implicated in various cardiovascular, metabolic, and neurological diseases. The team utilizes high-throughput screening, electrophysiology, medicinal chemistry, and molecular modeling to develop first-in-class pharmacological probes of potassium and chloride channels to explore their drugability and therapeutic potential in pre-clinical models.

Robert Freundlich, MD, MS, MSCI

Dr. Freundlich utilizes informatics and big data to answer important questions in the fields of perioperative medicine and critical care. His NIH-funded research examines factors contributing to reintubation in patients undergoing cardiac surgery, with the goal of identifying risk factors and decreasing the incidence of reintubation, which is an important contributor to extended hospital stays and delayed recovery.

Brad Grueter, PhD

The nucleus accumbens is an essential hub in the reward system, integrating cognitive, contextual, sensory, and affective information into behavioral outcomes. The proposed work will test the hypothesis that feed forward microcircuits within the nucleus accumbens regulate motivated behavior and are hijacked

by drugs of abuse. By defining circuits and synaptic mechanisms recruited by drugs of abuse, the proposed research is relevant to the NIH and NIDA's mission that pertains to developing fundamental knowledge that will help reduce the burdens of addiction.

Christopher Hughes, MD

Dr. Hughes is investigating cognitive and physical prehabilitation as a means of improving outcomes in elderly surgical patients. His NIH-funded clinical trial will enroll 250 patients over the age of 60 who are undergoing major non-cardiac surgery. His team will investigate the impact of prehabilitation on global cognition, disability and markers of organ injury at baseline and up to 12 months after hospital discharge.

Daniel Larach, MD, MSTR

Dr. Larach's research investigates alternative pain management strategies, with the goal of optimizing the treatment of pain and decreasing opioid requirements. His NIH-funded study is investigating the efficacy of buccal buprenorphine for management of post-operative pain.

Marcos Lopez, MD

Dr. Lopez investigates the contributions of endothelial dysfunction to perioperative organ injury, especially in patients undergoing cardiac surgery. His NHLBI-funded research is testing the hypothesis that administration of a soluble guanylyl cyclase stimulator prior to surgery will enhance perioperative vascular reactivity and decrease cellular markers of renal tubule and neuronal injury.

Matthew Morris, PhD

Dr. Morris' research examines racial disparities in the transition from acute to chronic pain in trauma patients. His NIH-funded research will enroll 300 patients suffering level 1 trauma to assess differences in pain transition among non-Hispanic black and white populations and test the hypothesis that potential differences are impacted, in part, by biobehavioral risk factors.

Edward Sherwood, MD, PhD

Dr. Sherwood's lab investigates the impact of innate immune memory on the host response to infection. Emphasis is placed on understanding metabolic reprogramming in innate leukocytes as a mechanism underlying innate immune memory. His work shows that activation of innate immune memory greatly augments our ability to respond to infection via augmentation of leukocyte recruitment to sites of infection and enhancement of the antimicrobial functions of innate leukocytes. Dr. Sherwood's work utilizes experimental models of infection, cell culture systems and clinical samples obtained from patients with serious infections and sepsis.

Heidi Smith, MD, MSCI

Dr. Smith's research seeks to optimize sedation protocols in critically ill and mechanically ventilated children. Her NIH

funded clinical trial will randomize 372 pediatric patients on mechanical ventilation to alpha-2 agonist vs GABAergic agent to test the hypothesis that optimized sedation will decrease delirium prevalence, decrease the length of mechanical ventilation and improve recovery.

Loren Smith, MD, PhD

Dr. Smith's research examines the impact of high density lipoproteins on perioperative acute kidney injury (AKI). Her NIH-funded research tests the hypothesis that higher perioperative concentrations of apolipoprotein A-I and specific HDL microRNAs are associated with less perioperative AKI and that higher HDL functional capacity will decrease kidney inflammation in the perioperative setting. Further studies examine the impact of exogenous HDL treatment on AKI in experimental models of kidney ischemia-reperfusion injury.

Jenna Sobey, MD

Dr. Sobey's research examines the efficacy of non-invasive venous waveform analysis (NIVA) in quantifying intravascular volume in pediatric patients. Her NIH-funded research utilizes experimental models of pediatric hemorrhage, resuscitation and volume overload to assess the application of NIVA to measure volume status. Further studies will apply NIVA in the setting of complex pediatric surgical procedures.

Amanda Stone, PhD

Dr. Stone's research focuses on perioperative pain management in children. Her NIH-funded research investigates biopsychosocial predictors of opioid use in pediatric surgical patients, with the goal of gaining information that will optimize perioperative pain management in children, decrease waste and minimize opioid exposure.



Center For Research and Innovation in Systems Safety

DIRECTOR: MATTHEW WEINGER, MD

VUMC's Center for Research and Innovation in Systems Safety (CRISS), directed by Matthew Weinger, MD, is a highly interdisciplinary and collaborative center, with projects spanning numerous clinical domains and disciplines. CRISS investigators include anesthesiologists, PhD researchers, nursing and design staff, and faculty collaborators across Health Sciences, numerous hospital settings, and the School of Engineering.

CRISS applies human factors, usability and systems engineering, cognitive psychology, and implementation science techniques to improve patient safety and care quality. Researchers study care processes and clinician performance both during actual patient care and in realistic simulations to better understand how and why care deviates from optimal, then design and study interventions to improve care safety and quality.

Our research team designs and evaluates both patient-facing and clinician-facing medical technologies and interfaces, including those using artificial intelligence/machine learning. We also use electronically generated clinical data to identify evolving events and support decision-making.

CRISS explores the nature of expertise, clinician communication, situational awareness, the workload and stress of individual clinicians and of teams, teamwork, individual and group performance-shaping factors, alarms, human-technology interactions and novel methods of information presentation to improve care processes and outcomes.

We provide internal and external consulting services for numerous customers. Internally, CRISS faculty and staff currently provide support for myriad safety, informatics and quality improvement initiatives and projects across the medical center and university. CRISS also conducts formal usability testing of software applications and of medical devices.

Externally, CRISS is involved in numerous academic collaborations to re-engineer medical processes, improve clinician decision-making

and enhance the usability and usefulness of clinical technology. For example, CRISS has supported the Department of Veterans Affairs for nearly two decades to improve its national EHR system, including the development, testing and implementation of decision support tools in several clinical domains.

CRISS also helped to create a national standardized approach to human factors and user-centered design in VA healthcare. Further, CRISS conducts FDA-compliant human factors engineering consulting for proprietary medical devices and medical software systems.

Faculty also teach courses in the Department of Biomedical Informatics, the School of Nursing and the School of Engineering.

\$2 million
annual research budget
--
50
external collaborators
--
63
internal collaborators
--
28
peer-reviewed publications
--
12
invited talks



Vanderbilt Anesthesiology Clinical Research Advisory Committee

VACRAC (Vanderbilt Anesthesiology Clinical Research Advisory Committee), in partnership with the Perioperative Clinical Research Institute (PCRI) and Vanderbilt Anesthesiology & Perioperative Informatics Research (VAPIR), supports new and established investigators as they develop clinical research projects. The committee oversees the development and execution of industry-sponsored and investigator-initiated research by providing guidance to assure optimal study design and protocol development, as well as managing essential research services and programs to assure effective resource utilization.

The mission of VACRAC is to:

- Promote a culture of large and robust clinical trials that, in turn, provide high-quality evidence to inform perioperative practice world-wide.
- Promote high-quality, high-impact clinical and informatics research tailored to the experience and expertise of individual clinicians and accessible to all members of the department, with the goal of answering important questions related to perioperative care, critical care and pain management.
- Create opportunities for junior investigators to learn the process of and gain experience in conducting clinical research.
- Mentor investigators throughout the research development and implementation process.
- Promote Good Clinical Practice (GCP) and ensure regulatory compliance.

VACRAC is co-chaired by Edward Sherwood, MD, PhD (Vice Chair, Research), David McIlroy, MB.BS., MD, MClInEpi (Medical Director, Perioperative Clinical Research Institute), Pratik Pandharipande, MD, MSCI (Vice Chair, Anesthesiology Faculty Affairs Office), and Matthew Shotwell, PhD (Department of Biostatistics). The committee's membership is composed of established clinical investigators in the Department of Anesthesiology.

Any member of the Department of Anesthesiology may submit a clinical research proposal that includes a brief background and significance of the clinical problem, a primary hypothesis for testing, a research strategy to test the hypothesis, and resources needed to pursue the project. All proposals undergo rapid review by a research committee, with written feedback provided, including a traffic-light style triage system and advice on what is required to advance the project. Resource intensive projects are typically triaged into a more intensive VACRAC studio where investigators present their proposals to senior clinical researchers within the department for real-time discussion and dialogue aimed at refining the study methodology.

Currently active studies include a mix of extramurally and department funded studies, investigator-initiated and industry-sponsored studies, single-center and multicenter clinical trials, observational studies and retrospective data analyses. The department and medical center strongly support the initiation, development and execution of large pragmatic trials. Recent or current clinical trials with which we are involved include the multicenter REGAIN trial of regional anesthesia vs general anesthesia after hip fracture, the single-center COPE-iOS trial testing the effectiveness of cognitive and physical exercise to improve outcomes after surgery, a single-center study of pharmaco-genomic guided beta-blocker administration in patients undergoing cardiac surgery, large pragmatic trials of intraoperative ketamine and high-flow nasal cannula to reduce re-intubation after cardiac surgery, and the TRIGS trial assessing the impact of tranexamic acid on surgical site infections in patients undergoing abdominal surgery.



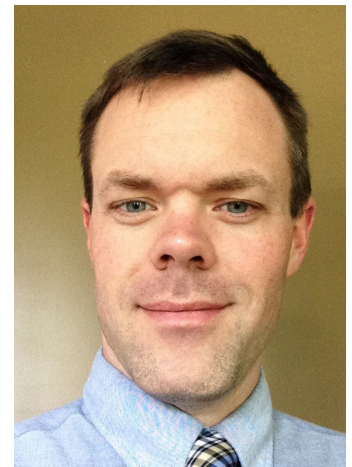
David McIlroy, MB.BS., MD, MClInEpi



Pratik Pandharipande, MD, MSCI



Edward Sherwood, MD, PhD



Matthew Shotwell, PhD

BH Robbins Scholar Program

The Benjamin Howard Robbins Scholar Program was initiated in 2007 to support the professional development of department early-stage physician-scientists. The program builds critical research skills under direct mentorship of established scientists with the goal that all Robbins Scholars establish vigorous, independently funded research programs. The program is named in honor of the department's first chairman, a renowned physician-scientist. The BH Robbins Scholar Program is multidisciplinary, encouraging and supporting mentorships and collaborations that extend well beyond traditional boundaries of anesthesia. Scholars apply and are rewarded on a competitive basis.

Department Chair Warren Sandberg, MD, PhD, notes, "The BH Robbins Scholar Program provides a unique mentored research experience for early-stage investigators that includes a two-year multidisciplinary fellowship devoted to research. Our Robbins Scholars benefit from one-on-one mentorship, a wealth of research and educational resources, protected research time and a stipend during their residency and fellowship. The program, with a more than 15-year track record of excellence, is material evidence of our staunch commitment to identifying and developing future generations of anesthesiologist clinician-scientists."



The BH Robbins Scholar Program is led by F. T. (Josh) Billings IV, MD, MSCI, and Associate Director Carrie Grueter, PhD. Dr. Billings states, "We strive to mentor, develop and support physician-scientists so that they make discoveries that advance the care of perioperative and critically ill patients. This is a critical goal of academic anesthesiology and our department."

Three scholars completed the program June 2023, Drs. Rohini Chakravarthy, Eric Mace and Amanda Stone. Congratulations to these Scholars for their ongoing success and commitment!

Rohini Chakravarthy, MD, is a pediatric hematology/oncology fellow investigating late health outcomes following pediatric stem cell transplantation. Her research focuses on using the Pediatric Health Information System (PHIS) database to understand readmission rates and indications for readmission to the hospital following pediatric allogeneic stem cell transplantation. The initial results of her work have been presented at the annual American Society of Pediatric Hematology/Oncology (ASPHO) meeting. She recently completed a Master of Public Health degree through Vanderbilt University. She is the current Lily's Garden Fellow through the Division of Pediatric Hematology/Oncology. Dr. Chakravarthy is mentored by Deb Friedman, MD, MS, Carrie Kitko, MD, and Justin Godown, MD. She will be completing additional clinical and research training at University of Colorado in Denver next year.

Eric Mace, MD, is a general surgery resident and T32 research fellow working in the PROTECT Laboratory. His research focuses on the effects of excess oxygen on vascular reactivity in murine ischemia and reperfusion injury, as well as potential treatments for these effects in perioperative and critically ill patients. His recent work was presented at the 2023 Shock Society Annual Conference. He recently published a primary research manuscript in *Shock* and a review on targeting soluble guanylate cyclase during ischemia and reperfusion in *Cells*. Dr. Mace is mentored by Josh Billings IV, MD, MSCI, and Marcos Lopez, MD.

Amanda Stone, PhD, is an assistant professor in the Division of Research and a clinical psychologist with primary interests in pediatric pain and intergenerational factors affecting children's health outcomes. After completing the T32 training period, Stone received a K23 from NICHD to evaluate biopsychosocial predictors of opioid use for pediatric postsurgical pain. She has also received the Early Career Research Grant from the International Association for the Study of Pain to further her work on the intergenerational transmission of risk for chronic pain. Dr. Stone aims to optimize pediatric pain management and prevent adverse outcomes. She is mentored by Stephen Bruehl, PhD.

Matthew Barajas, MD, is a cardiothoracic anesthesiologist investigating post conditioning in a diabetic rat model of cardiac arrest. One such method of conditioning is ischemic post conditioning instituted through short pauses in compressions after the initiation of CPR. In addition, he continues to evaluate peripheral intravenous waveform analysis (PIVA) and its utility across several types of shock, including hemorrhage, respiratory arrest, and acute obstructive shock. He will remain on faculty as assistant professor as he transitions off the T32. He looks forward to continuing his success under the mentorship of Matthias Riess, MD, PhD, and Susan Eagle, MD.

Brandon Farmer, MD, PhD, is a CA-1 resident in the Department of Anesthesiology. He is interested in how intracellular fatty acid accumulation in the brain impacts patient response to anesthesia. He was recently nominated for the FAER Resident Scholar Program, and he plans to attend and present at the 2023 ASA Annual Meeting. Brandon continues to build his mentorship team, which includes BH Robbins leadership and Brad Grueter, PhD.

Gloria Han, PhD, is an assistant professor in the Division of Pain Medicine in the Department of Anesthesiology. She is a clinical psychologist with primary interests in quantitative methods, co-occurring psychiatric and medical conditions in autism, and pediatric chronic pain. She is currently

BH Robbins Scholar Program

a research fellow supported by the Training in Perioperative Science Fellowship T32 grant and is preparing a K23 award examining the prevalence, assessment, and mechanisms underlying chronic pain in children with autism. She is mentored by Stephen Bruehl, PhD.

Daniel Larach, MD, MSTR, is an assistant professor in the Department of Anesthesiology. A clinical anesthesiologist and pain physician, his research focuses on the assessment and optimization of risks related to perioperative opioid prescribing. He recently received a K23 award from the National Institute on Drug Abuse to study the abuse potential and analgesic efficacy of low-dose buccal buprenorphine in the laboratory and perioperative settings. He is interested in whether buprenorphine may be a potential alternative to traditional full mu-agonist opioid prescribing following surgery. Dr. Larach is mentored by Stephen Bruehl, PhD, within the Anesthesiology Department.

Kimberly Rengel, MD, MSCI, is an assistant professor in the Division of Anesthesiology Critical Care Medicine interested in improving long-term recovery for patients after major surgery or critical illness. Her research program is currently focused on the role of skeletal muscle health in recovery after critical illness and the use of ultrasound to examine skeletal muscle health throughout critical illness. Further,

working with her mentors, she plans to translate this research into the perioperative space, identifying patients at risk for acquired disability and using interventions like prehabilitation to prevent physical decline after major surgery. She is supported by a Vanderbilt Faculty Research Scholar mentored research training grant and recently completed her Master of Science in Clinical Investigation. Dr. Rengel is mentored by Christopher Hughes, MD, and Pratik Pandharipande, MD, MSCI.

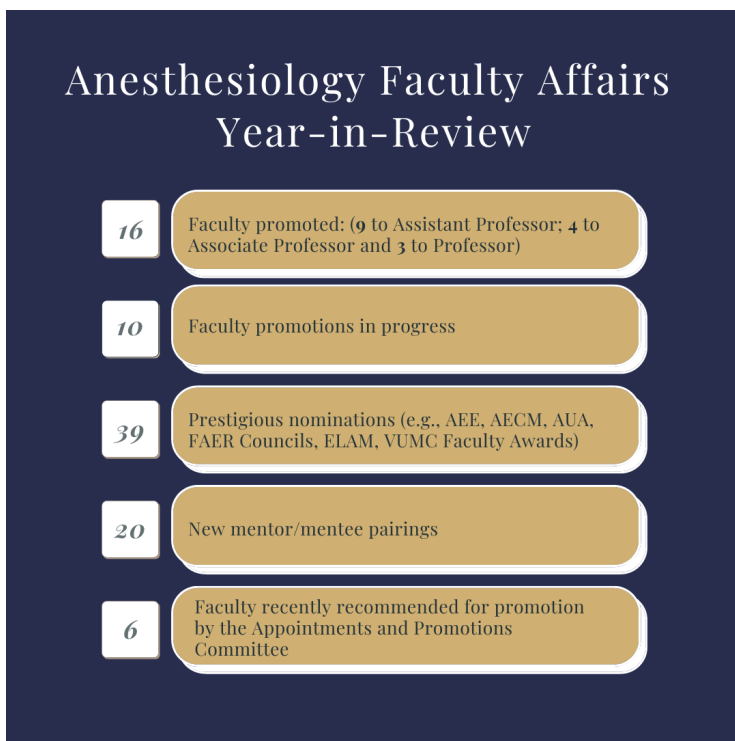
Matthew Zapf, MD, is an assistant professor in the Divisions of Multispecialty Anesthesiology and Informatics Research investigating machine learning approaches to clinical decision support. He is currently developing an algorithm to predict intraoperative transfusion to guide type and screen ordering. He is also currently earning a Master of Science in Clinical Investigation through Vanderbilt University with the hope of using this knowledge to rigorously test the clinical application of machine learning based tools. Dr. Zapf is mentored by Robert Freundlich, MD, MS, MSCI.

2023 Research Symposium



Anesthesiology Faculty Affairs

The Anesthesiology Faculty Affairs (AFA) Office in the Department of Anesthesiology seeks to facilitate the professional and academic development of its faculty, improve career satisfaction, and instill a sense of meaning in our faculty from the practice of their vocation.



The major pillars of AFA are faculty development, engagement, and well-being, which are strengthened through programming, as shown in the timeline on page 39.

Appointments and Promotions

This critical function is executed by the department's Appointments and Promotions Committee (APC), which annually assesses each faculty member's academic and career progress. The APC recommends faculty to the Anesthesiology Department Chair for promotion. Once approved by the department chair, the promotion packet is constructed and submitted to the School of Medicine for consideration. All faculty in the Professor rank are eligible to serve on the APC. The APC generally has 12 to 14 members, who are selected by the AFA Vice Chair to serve staggered three-year terms to ensure fair representation across divisions and tracks. The AFA Office also processes faculty track changes to better align faculty career goals with the academic tracks available.

Career Development Award (CDA) Program

The CDA Program aims to provide clinical faculty with academic and administrative days, allowing dedicated time to advance their careers, achieve success in administrative roles and contribute to the missions of the department and institution beyond direct patient care. Each year, faculty submit CDA applications based on their planned administrative, educational, scholarship and academic service goals. Academic Year 2023-2024 marked a milestone in our attempts to automate the CDA application, with a goal of increasing efficiency for both the faculty and the CDA Review Committee. This CDA Committee, consisting of APC members and the department's division chiefs, uses an NIH-style grant review process to evaluate the applications. After an initial review, the CDA Committee meets to discuss all applications via a transparent process based on published

guidelines, considering prior success of faculty and alignment with departmental missions. The resulting CDA allocation recommendations are reviewed and approved by the department chair.

Academic Achievement Award (AAA) Program

The AAA Program provides annual merit-based financial incentives to encourage professional development and academic achievement. It recognizes faculty contributions to the department's numerous missions beyond direct patient care, especially in the areas of education, scholarship and professional service. Development of a faculty database that will populate contributions into an automated report are ongoing.

Continuous Professional Development (CPD)

Continuous professional development (CPD) of clinicians is a core mission of the Department of Anesthesiology. This includes a broad range of educational and professional development activities for faculty and healthcare professionals. The core mission of this program is to identify, develop, implement and evaluate educational opportunities that enable healthcare professionals to provide the best possible care to their patients and perform optimally in their other professional activities. CPD partners with the Office of Educational Affairs, the Perioperative Optimization and Quality, Safety and Outcomes leadership teams, and Advance Practice Anesthesiology. Initial programming for Academic Year 2023-2024 consists of implementing Point-of-Care Ultrasonography (POCUS) certification and establishing training modules for select perioperative ultrasound-guided regional anesthesia techniques for interested faculty.

Annual Faculty Reviews

The AFA Office coordinates annual faculty reviews, a time to celebrate faculty successes, identify challenges and provide faculty an opportunity to discuss career goals with senior departmental leadership. An individual letter is generated based on the meeting that includes summative feedback and specific recommendations. The objective is to create individualized career development plans aligned with each faculty member's unique career goals and to maximize support for the well-being of faculty.

Mentorship Program

The Mentorship Program was introduced to pair faculty with mentors aligned with their desired career development path. The Mentorship Program is based on approximately 50 scholarly hubs within the department, which are arranged thematically into affinity groups that cover broad areas of basic science, education, quality improvement, clinical research, systems engineering, informatics, clinical operations, genomics and clinical and administrative service. A tiered approach, through which hub mentors are assigned senior mentors, serves to boost the efficacy of the program.

Professional Development

Faculty professional development fosters valuable post-medical training skill sets for a successful and balanced career. In the past fiscal year, through interactive workshops and simulation exercises, AFA launched an innovative faculty professional development program that highlights key topics such as communication, conflict resolution, strategies to avoid burnout, and advocating for career goals. Professional development programs are tailored to be relevant across faculty ranks and applicable throughout an academic medical career.

Honorific Nominations

The AFA Office works with divisional and departmental leaders to solicit and nominate faculty for honorific nominations as a means of recognizing faculty who are pursuing novel and impactful clinical, educational, research, scholarship and service activities.

Anesthesiology Faculty Affairs

Wellness and Support Initiatives

Faculty in an academic medical center have extremely demanding jobs with associated stressors that can degrade well-being and disrupt work-life integration. To address these pressures, our office is supported by Amanda Stone, PhD, and Gloria Han, PhD, clinical psychologists, who serve, respectively, as our director and assistant director of Faculty Professional Well-Being. AFA works to identify and address issues related to the professional well-being of faculty and has designed initiatives that include a comprehensive faculty survey, consultation with faculty and department leadership regarding well-being, and collaboration on programming to help build skills to support workplace engagement and interprofessional collaboration.

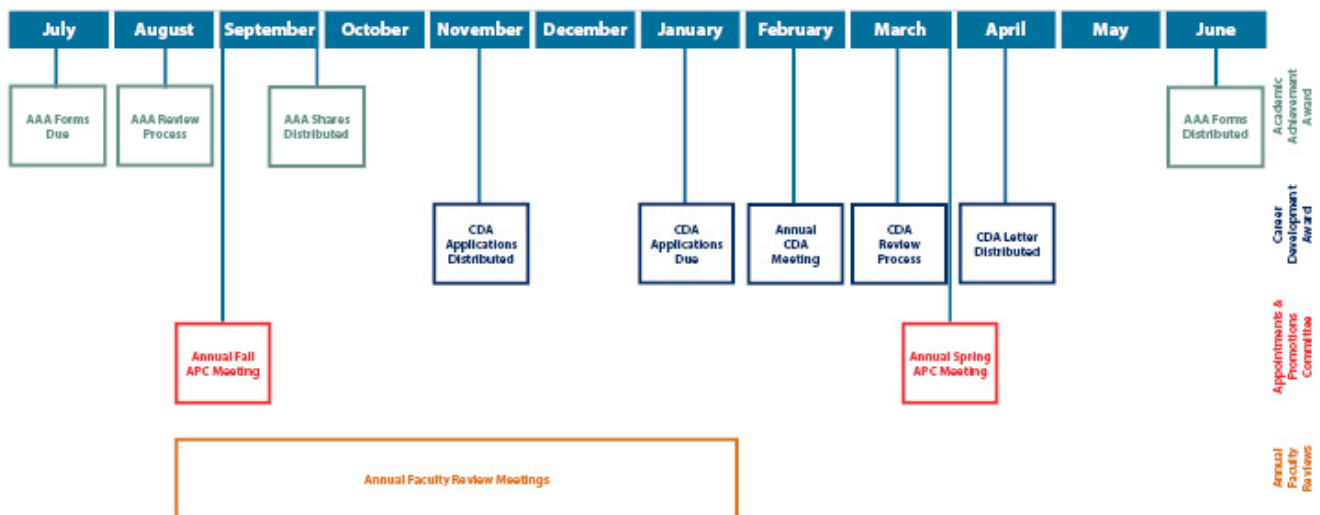
CLARITY

CLARITY is a departmental program designed to enhance the written and oral academic communication skills of clinicians, researchers and staff—from faculty and fellows to managers and administrative staff. The program has three components: training to improve written and oral academic communication, structured editorial support (primarily for manuscripts and grants), and resources and support for publication and other scholarly processes.

CLARITY
FY 2023

THE YEAR IN
NUMBERS

45	EDITORIAL SUPPORT REQUESTS
97	EDITING ENCOUNTERS
77	AUTHORS IN THE DEPARTMENT ASSISTED
44	JOURNALS REPRESENTED
ALL	DIVISIONS REPRESENTED



PEER-REVIEWED PUBLICATIONS

202
peer-reviewed
publications

121
original research
publications

26
reviews

14
infographics

20
editorials/
commentaries

13
letters to the editor

AUTHORS

94
faculty

6
trainees

10
research staff

4
advanced practice nurse
practitioners/CRNAs

2022-2023 Selected Publications

The Department of Anesthesiology places a strong emphasis on faculty, trainee and staff career development in academic anesthesiology. Active mentoring programs pair junior and mid-level investigators with experienced mentors in broad categories of scholarship, including basic and clinical research, education, global health, health services, patient safety, informatics and the humanities. Research productivity, determined by publication in peer-reviewed journals, grant dollars and ongoing research studies, continues to be strong. Selected publications, highlighting the breadth of research conducted, publication type and contributing authors, are provided on the next few pages. A complete list of department publications can be found at: vumc.org/anesthesiology/communications or by scanning the QR code provided here.



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Achieving Balance



Cooking class at Pain Division retreat (May 2023)



Resident team building at Adventureworks, Nashville West (June 2022)



Vanderbilt International Anesthesia Fundraiser, Nashville Zoo at Grassmere (May 2022)



OB Anesthesiology bridal shower celebrating two brides (August 2023)



Family-friendly faculty picnic (October 2022)



CRNAs and guests at Phythyon Memorial Lectureship dinner reception (April 2023)



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