Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

HARVARD MEDICAL SCHOOL

Department of Anesthesia, Critical Care and Pain Medicine

2025–2026 Report



CONTENTS

CHAIRMAN'S WELCOME 3

ENDOWED CHAIRS 5

FACULTY LIST 8

Harvard Medical School Faculty | HMFP CRNA Division

Longwood Specialty Physicians | LSP CRNA Team

CLINICAL ACTIVITIES 12

CLINICAL DIVISIONS

Cardiac Anesthesia

Obstetric Anesthesia

Multi-Specialty Anesthesia

-Neuroanesthesia

-Orthopedic Anesthesia

-Regional Anesthesia and Acute Pain Service

-Thoracic Anesthesia

-Transplant Anesthesia

-Non-Operating Room Anesthesia (NORA)

-Vascular Anesthesia

CRITICAL CARE 31

PAIN MEDICINE 37

Nurse Anesthesia 39

COMMUNITY ANESTHESIA 41

Anna Jaques Hospital

BID–Milton

BID–Needham

BID–Plymouth

Mount Auburn Hospital

New England Baptist Hospital

HOSPITAL SERVICES & OTHER CLINICAL PROGRAMS 45

Pre-Admission Testing

Other Clinical Services

Perioperative Advanced Practice Providers

GLOBAL HEALTH 48

RESEARCH 51

Research Centers

Center for Inflammation Research

Center for Lung Injury Research (CLIR)

Sadhguru Center for a Conscious Planet

Center for Education Research, Technology, and Innovation

Headache Research

Research Highlights and Impact

EDUCATION 61

Residency Program

Fellowship Programs

Simulation Center

Skills Lab

Loring Scholar Program

Educational Leadership and Program Directors

ADMINISTRATION 74

QUALITY, SAFETY & INNOVATION 75

CENTER FOR MEDICAL SIMULATION 81

PROFESSIONAL AFFAIRS 83

COMMUNITY ENGAGEMENT 87

SELECTED PUBLICATIONS June 2024 – June 2026 89





Alan Lisbon, MD

Executive Vice Chair, Emeritus
Anesthesia, Critical Care and Pain Medicine

Chair, Committee on Clinical Investigation

Associate Professor of Anaesthesia, Harvard Medical School

Editor's Note

This biennial report of the Department of Anesthesia, Critical Care and Pain Medicine highlights the extraordinary work and achievements of our department members for the academic years 2025—2026.

Our department is a united community dedicated to a vision of excellent clinical care, ground-breaking research, and innovative medical education, where all are welcome.

I hope you find the report interesting and informative. —Alan

Editorial & Production

Alan Lisbon, MD
Executive Vice Chair Emeritus

Heather Derocher
Director of Communications and Special Projects

Ann Plasso
Communications Specialist, Writer

Isabel Thornton
Communications Specialist, Social Media Manager

Min Jeon
Data Analyst

James Derek Dwyer
Photographer

To Learn More and Join Our Community:

INSTAGRAM

@BIDMC_Anesthesia
Residency | Culture | Department Life

@BIDMC_InterventionalPainMed
Pain Fellowship/Pain Center

@BIDMC_CriticalCare
Critical Care Fellowship

@HMFP_Anesthesia_CRNA
CRNA Division

@BIDMC_Anesthesia_Education
CERTAIN: Education Research

@CenterForMedicalSimulation
Simulation and Training

LINKEDIN

BIDMC Department of Anesthesia, Critical Care and Pain Medicine



Daniel S. Talmor, MD, MPH

Chairman, Department of Anesthesia, Critical Care and Pain Medicine

Edward Lowenstein Professor of Anaesthesia, Harvard Medical School

Welcome

Welcome to the Department of Anesthesia, Critical Care and Pain Medicine at Harvard Medical Faculty Physicians and Beth Israel Deaconess Medical Center.

This report highlights the remarkable accomplishments of our department over the past two years and reflects the extraordinary commitment of our physicians, CRNAs, advanced practice providers, nurses, researchers, educators, and administrative staff. Together, we have advanced exceptional patient care, innovative research, and outstanding educational programs while continuing to expand our impact across the Beth Israel Lahey Health system.

As Chair and a longtime member of this department, I remain inspired by the talent, professionalism, and dedication of our teams as they care for some of the most complex patients in New England. Our educators train future leaders in anesthesiology, critical care, and pain medicine. Our investigators generate new knowledge that is transforming clinical practice nationally and internationally. The achievements described in this report are a direct reflection of the people who make this department exceptional.

Our department now serves as one of the largest and most integrated anesthesia and critical care programs in New England. In addition to our academic mission at Beth Israel Deaconess Medical Center, we provide anesthesia, critical care, and pain medicine services throughout the Beth Israel Lahey Health network, including BID–Milton, BID–Needham, BID–Plymouth, Mount Auburn Hospital, New England Baptist Hospital, and Anna Jaques Hospital.

Across this network, our commitment remains: to provide safe, compassionate, evidence-based care while fostering innovation and continuous improvement. Our faculty support some of the region's most advanced surgical, critical care, and pain management programs. Through a culture of collaboration, accountability, and excellence, we have achieved outstanding clinical outcomes and established ourselves as world leaders in patient safety, quality improvement, and perioperative medicine.

While we take great pride in our accomplishments, we remain focused on the future. Healthcare is undergoing profound transformation, creating both opportunities and challenges for academic medical centers. Our department is uniquely positioned to lead this transformation through innovation, research, education, and operational excellence across an increasingly integrated health system.

Mission, Vision, and Values

Our **MISSION** is clear:

- Improve the lives of our patients through compassionate, equitable, and state-of-the-art care.
- Educate and develop future leaders in anesthesia, critical care, and pain medicine.
- Advance medicine through the discovery, translation, and dissemination of new knowledge.
- Support the personal and professional growth of every member of our department.
- Foster a diverse and inclusive environment that serves all patients and communities.
- Promote innovation, improvement, and responsible stewardship of healthcare resources.

(*continued on p. 4*)



Our **VALUES** guide every aspect of our work:

Patients First – We are committed to providing safe, equitable, high-quality care and an exceptional patient experience.

Trust and Respect – We embrace diversity, inclusion, professionalism, and mutual respect throughout our healthcare community.

Innovation – We continually seek new ways to improve patient outcomes, advance knowledge, and transform healthcare delivery.

Excellence – We strive for the highest standards in clinical care, education, research, and leadership.

Our **VISION** is ambitious: to be the preeminent Department of Anesthesia, Critical Care and Pain Medicine in the United States.

Looking Ahead

The Department of Anesthesia, Critical Care and Pain Medicine has a proud history rooted in clinical excellence, innovation, academic achievement, and service to our patients and communities. The coming years present extraordinary opportunities. Having successfully expanded our clinical network across Beth Israel Lahey Health, our focus is increasingly directed toward integration, standardization, and excellence across all practice sites. We are leveraging the expertise of our Quality, Safety, and Innovation Division to implement evidence-based clinical pathways, enhance patient outcomes, and ensure that best practices are consistently delivered throughout our network.

Our educational programs continue to grow in scope and national influence. Through the Center for Education Research, Technology and Innovation, we are developing and studying novel educational approaches that prepare future clinicians for an increasingly complex healthcare environment. We are also expanding collaborations with leading institutions nationwide to advance medical education and simulation-based learning.

Research remains a defining strength of our department. Over the past decade, we have built one of the nation's leading academic programs of research in perioperative medicine. Our investigators lead major multicenter clinical trials, secure substantial federal and foundation funding, and collaborate with colleagues across the country and around the world. These efforts are generating discoveries that improve outcomes for patients undergoing surgery and those suffering from critical illness.

Equally important is our commitment to our people. Through the Professional Affairs Division, we continue to develop initiatives focused on career development, mentorship, community engagment, wellness, and professional fulfillment. The long-term success of our department depends upon creating an environment where every member of our team can thrive professionally and personally.

Strengthening Our Partnership with the Dana-Farber Cancer Institute

The continued growth of our partnership with the Dana-Farber Cancer Institute represents both the greatest opportunity and one of the most significant challenges facing our department. As oncology services expand, our department will play a central role in supporting increasingly complex surgical, critical care, and perioperative needs for cancer patients.

This partnership will create exciting opportunities for innovation in oncology, critical care, operative anesthesia, pain management, research, and education. Through close collaboration with Dana-Farber and our surgical colleagues, we will continue to develop new approaches to improving outcomes for patients undergoing cancer treatment.

To support this growth, substantial expansion of surgical capacity will be required. Increasing the number of operating rooms and procedural spaces will be essential to accommodate higher surgical volumes while maintaining timely access to care. This expansion will also require thoughtful planning around anesthesia staffing, ICU capacity, perioperative services, and educational resources.

Our department is committed to working closely with Dana-Farber, BIDMC, Harvard Medical Faculty Physicians, and Beth Israel Lahey Health leadership to ensure that this growth strengthens our ability to provide world-class cancer care while maintaining the highest standards of quality, safety, and patient experience.

As we look toward the future, we remain committed to building upon our legacy while embracing new opportunities to improve patient care, advance science, educate future leaders, and strengthen the healthcare systems we serve.

I invite you to explore the accomplishments highlighted in this report and to join us as we continue to shape the future of anesthesia, critical care, and pain medicine.

Daniel Talmor, MD, MPH
Edward Lowenstein Professor of Anaesthesia at Harvard Medical School
Chairman, Department of Anesthesia, Critical Care and Pain Medicine,
Beth Israel Deaconess Medical Center and Harvard Medical School





Dr. Todd Sarge and critical care colleagues at presentation of endowed chair: Alan Lisbon Chair in Critical Care at BIDMC

Endowed Chairs in the department:

Leonard Bushnell Chair of Anaesthesia at BIDMC
Robina Matyal, FS, MBBS

Ellison "Jeep" Pierce Chair of Anaesthesia at BIDMC
Balachundhar Subramaniam, MBBS, MD, MPH

Mark E. Comunale Chair in Cardiac Anaesthesia at BIDMC
Feroze Mahmood, MBBS, MA

Nancy E. Oriol Chair in Obstetric Anaesthesia at BIDMC
Yunping Li, MD, MSc

Alan Lisbon Chair in Critical Care at BIDMC
Todd Sarge, MD

Edward Lowenstein Professor of Anaesthesia at HMS
Daniel S. Talmor, MD, MPH

John Hedley-Whyte Professor of Anaesthesia at HMS
Rami Burstein, PhD

Charlotte F. & Irving W. Rabb Distinguished Professor of Medicine at BIDMC
Simon C. Robson, MBChB, PhD

Joseph J. and Josephine A. Gazzola Family Chair in the Field of Inflammation Research at BIDMC
Simon C. Robson, MBChB, PhD

Our **Code of Conduct** is the moral compass that guides how we show up and interact with one another. We're proud to share these values as a reflection of the community we aspire to be—supportive, respectful, and welcoming to all.

W	E	L	C	O	M	E
Workplace	**Equity**	**Listening**	**Communication**	**Opportunities**	**Mindful**	**Educate**
Create a collegial and safe workplace	Equitable and fair treatment for all	Listen respectfully	Communicate frequently in a transparent, courteous and caring manner	Create and pursue opportunities for growth and development	Be mindful, observe your-self and treat others the way they want to be treated	Empower others and model welcoming behavior







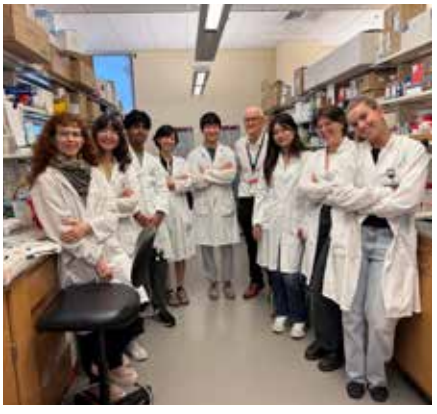













Welcome to Boston




John Hedley-Whyte
Daniel Talmor
Beth Israel Deaconess Medical Center

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center



The Future of Cancer Care

The partnership between Dana-Farber Cancer Institute and Beth Israel Deaconess Medical Center, announced in September 2023, marks a transformative expansion of adult cancer care. Construction of a new 300-bed, 450,000-square-foot Dana-Farber cancer hospital on BIDMC's West Campus began in March 2026, with completion expected by the end of 2030 and the first patients anticipated in 2031. Dana-Farber will own and operate the new hospital, which is being jointly funded by Dana-Farber and BIDMC. The facility will connect directly with BIDMC, strengthening collaboration across cancer care, surgery, critical care, and other clinical services.

For the Department of Anesthesia, Critical Care and Pain Medicine, this growth will create important opportunities to expand our role in complex oncology care. Increasing surgical and procedural volumes will require additional operating room capacity, anesthesia staffing, ICU resources, and perioperative services. As outlined in the Chair's letter, our department is committed to working closely with Dana-Farber, BIDMC, HMFP, and BILH leadership to support this growth while advancing innovation in oncology anesthesia, critical care, pain medicine, research, and education. This partnership positions our department to play a central role in delivering world-class cancer care while maintaining our commitment to safety, quality, and exceptional patient outcomes.



Harvard Medical School Faculty

HARVARD MEDICAL SCHOOL

DEPARTMENT CHAIR

Daniel S. Talmor, MD, MPH
Edward Lowenstein Professor of Anaesthesia

EXECUTIVE VICE CHAIRS

Philip E. Hess, MD
Program Director, Obstetric Anesthesia Fellowship
Associate Professor of Anaesthesia

Alan Lisbon, MD
Executive Vice Chair Emeritus
Associate Professor of Anaesthesia

Chief Administrative Officer

Dawn M. Ferrazza, MA

VICE CHAIRS

Vice Chair, Neuroscience

Rami Burstein, PhD
John Hedley-Whyte Professor of Anaesthesia

Vice Chair, Clinical Affairs

J. Michael Haering, MD
Assistant Professor of Anaesthesia

Vice Chair, Community Engagement

Josephine M. Hernández, MD
Lecturer on Anaesthesia

Vice Chair, Education

Robina Matyal, FS, MBBS
Director, Vascular Anesthesia
Director, Center for Education Research, Technology and Innovation (CERTAIN)
Program Director, Advanced Perioperative Clinical Fellowship
Leonard Bushnell Chair of Anaesthesia at BIDMC
Professor of Anaesthesia

Vice Chair, Professional Affairs

Sara Neves, MD
Assistant Professor of Anaesthesia

Vice Chair, Quality, Safety, and Innovation

Richard J. Pollard, MD
Director, Neuroanesthesia Fellowship
Co-Director, Executive Scholar Program in Quality and Safety
Assistant Professor of Anaesthesia

Vice Chair, Research

Simon C. Robson, MBChB, PhD
Director, Center for Inflammation Research
Professor of Anaesthesia
Professor of Medicine
Charlotte F. & Irving W. Rabb Distinguished Professor of Medicine
Joseph J. and Josephine A. Gazzola Family Chair in the Field of Inflammation Research at BIDMC

Vice Chair, Critical Care Medicine

Todd W. Sarge, MD
Alan Lisbon Chair in Critical Care at BIDMC
Assistant Professor of Anaesthesia

Vice Chair, Network Anesthesia

Aileen G. Starnbach, MD
Site Chief of Anesthesia, Mount Auburn Hospital
Instructor in Anaesthesia

Vimal K. Akhouri, MD, MBBS, ISc
Assistant Professor of Anaesthesia

Rae M. Allain, MD
Lecturer on Anaesthesia

Rabia Amir, MD
Instructor in Anesthesia

Benjamin Aronow, MD
Instructor in Anesthesia

Sait Ashina, MD
Director, Comprehensive Headache Center
Assistant Professor of Anaesthesia
Associate Professor of Neurology

Alfredo Barcenas Gonzalez, MD
Instructor in Anaesthesia

Douglas Barnes, MD
Instructor in Anesthesia

Katherine Barnes, MD
Instructor in Anaesthesia

Ariel S. Berkowitz, MD, MA
Instructor in Anaesthesia

Maria C. Borrelli, DO
Director, Medical Student Education
Instructor in Anaesthesia

Ruma R. Bose, MBBS, MD
Administrative Director, Fellowship Programs
Assistant Professor of Anaesthesia

Somnath Bose, MBBS, MD, MPH
Site Director for Critical Care, BID–Needham
Assistant Professor of Anaesthesia

Maurizio Bottiroli, MD
Director, Venovenous (VV) Extracorporeal Membrane Oxygenation (ECMO) Program
Assistant Professor of Anaesthesia

Yitzhak Brzezinski Sinai, MD, MBA
CMS Medical Director and Faculty Leader
Instructor in Anaesthesia

Viet L. Cai, MD
Acting Division Director, Pain Medicine
Instructor in Anaesthesia

Jessica M. Cassavaugh, MD, PhD
Program Director, Anesthesia Critical Care Medicine Fellowship
Instructor in Anaesthesia

Philip Chan, MD
Instructor in Anaesthesia

Guanqing Chen, MD, PhD
Instructor in Anaesthesia

Sarah Christensen, DVM, PhD
Instructor in Anaesthesia

Hyun Kee Chung, MD
Instructor in Anaesthesia

Erin J. Ciampa, MD, PhD
Assistant Professor of Anaesthesia

Edward Clune, MS, MD
Director of Global Health
Instructor in Anaesthesia

Michael N. Cocchi, MD
Associate Professor of Anaesthesia

Meredith I. Colella, MD
Director, Categorical Internship
Instructor in Anaesthesia

Francesca Colombo Pavini, MD
Instructor in Anaesthesia

Farah Dadabhoy, MD
Instructor in Anaesthesia

Victoria M. Derevianko, MD
Site Chief, BID-Milton
Instructor in Anaesthesia

Survandita Dhawan, MD
Instructor in Anesthesia

Noor Dirni, MD
Master In Education Fellow

Inna Epstein, MD
Master In Education Fellow

Moreno Favarato, MD
Instructor in Anaesthesia

Theresa G. Feng, MD
Instructor in Anaesthesia

Claudia Friedrich, MD
Instructor in Anaesthesia

Diana Marie Fidrocki, MD
Instructor in Anaesthesia

Joji Fujisaki, MD, PhD
Deputy Director, Center for Inflammation Research
Associate Professor of Anaesthesia

Matthew H. Gao, DO
Associate Program Director, Anesthesia Residency
Instructor in Anaesthesia

Jatinder S. Gill, MBBS
Associate Professor of Anaesthesia

Ionita Ghiran, MD, PhD
Deputy Director, Center for Inflammation Research
Associate Professor of Anaesthesia

Zachary S. Glicksman, MD
Director, Cardiac Anesthesia, Mount Auburn Hospital
Instructor in Anaesthesia

Gustavo Gonzalez, MD
Instructor in Anaesthesia

Sapna Govindan, MBBS, MD
Section Head for ECT
Instructor in Anaesthesia, Part-time

Aviva Green, MD
Master's in Education Fellow

Nathaniel R. Greenbaum, MD
Director, Clinical Informatics
Instructor in Anaesthesia

Vandana Gupta, MBBS, MD
Instructor in Anaesthesia

Sepideh Hariri, MS, PhD
Program Manager, Sadhguru Center for a Conscious Planet
Instructor in Anaesthesia

Mona Hedayat, MD
Associate Program Director, Anesthesia Residency
Instructor in Anaesthesia

Matthew Heron, MD
Lecturer on Anaesthesia

Jeffrey K. Jankun, MD
Assistant Professor of Anaesthesia, Part-time

Lee-Wei Kao, MD
Instructor in Anaesthesia

Anastasia Katsiampoura, MD, PhD
Assistant Professor of Anaesthesia

Samir M. Kendale, MD
Division Director, Neuroanesthesia
Assistant Professor of Anaesthesia

Mitra Khany, MD, MHQS
Instructor in Anaesthesia

Vahid Kiarad, MD, MPH
Program Director, Adult Cardio-Thoracic Anesthesia Fellowship
Instructor in Anaesthesia

Christopher Kim, MD
Instructor in Anaesthesia

Andrew J. Koropey, MD
Associate Site Chief, BID-Milton
Instructor in Anaesthesia

Megan L. Krajewski, MD
Instructor in Anaesthesia

Lisa J. Kunze, MD, PhD
Assistant Professor of Anaesthesia

Mahmoud Labib, MD
Instructor in Anaesthesia

Angela Lang, MD, MS
Instructor in Anaesthesia

Anthony C. Lee, MD
Instructor in Anaesthesia

Akiva Leibowitz, MD
Director, Multi-Specialty Anesthesia
Assistant Professor of Anaesthesia

Dan Levy, MS, PhD
Associate Professor of Anaesthesia

Lior A. Levy, MD
Director, Resident Anesthesia Simulation
Instructor in Anaesthesia, Part-time

Nadav Levy, MD, MHQS
Director, Non-Operating Room Anesthesia (NORA)
Director, Medical Simulation for Anesthesiology at BIDMC
Assistant Professor of Anaesthesia

Michael Hua-Gen Li, MBBS, MPHTM, GCCT
Director of Residency Ultrasound Education
Instructor in Anaesthesia

Yunping Li, MD, MS
Division Director, Obstetric Anesthesia
Nancy E. Oriol Chair in Obstetric Anaesthesia at BIDMC
Associate Professor of Anaesthesia

Maria Serena Longhi, MD, PhD
Deputy Director, Center for Inflammation Research
Associate Professor of Anaesthesia

J. Mark Lunderberg, MD, PhD
Instructor in Anaesthesia

Amanda Macone, MD
Instructor in Anaesthesia

Soumya Mahapatra, MBBS
Site Chief, BID-Needham
Instructor in Anaesthesia

Feroze Mahmood, MBBS, MA
Director, Cardiac Anesthesia
Director, Perioperative Echocardiography
System Director, Cardiac Anesthesia
Mark E. Comunale Chair in Cardiac Anaesthesia at BIDMC
Professor of Anaesthesia

Christopher A. Mallard, MS, MD
Instructor in Anaesthesia

Federico Puerta Martinez, MD
Instructor in Anaesthesia

Juan Puerta Martinez, MD
Instructor in Anesthesia

Agustin Melo Carrillo, MD, PhD
Assistant Professor of Anaesthesia

David W. Melton, MD, PhD
Instructor in Anaesthesia

Jyotsna V. Nagda, HSC, MBBS, MD
Program Director, Pain Medicine Fellowship
Assistant Professor of Anaesthesia

Brian P. O'Gara, MD, MPH
Section Head, Trauma Anesthesia
Director, Resident Research
Assistant Professor of Anaesthesia

Florian Goek Chen Ong, MD
Lecturer on Anaesthesia

Achikam Oren-Grinberg, MD, MS
Director of Critical Care Ultrasound
Assistant Professor of Anaesthesia

Nancy E. Oriol, MD
Faculty Associate Dean for Community Engagement in Medical Education, HMS
Associate Professor of Anaesthesia

Ameeka Pannu, MD
Director, Cardiac Critical Care
Instructor in Anaesthesia

Riccardo Pinciroli, MD
Division Director, Transplant Anesthesia
Assistant Professor of Anaesthesia

Victor Polshin, MD
Division Director, Orthopedic Anesthesia
Instructor in Anaesthesia

Stephen D. Pratt, MD
Assistant Professor of Anaesthesia

Andrey Rakalin, MD
Director, Regional Anesthesia
Program Director, Regional Anesthesia and Acute Pain Medicine Fellowship
Instructor in Anaesthesia

Satya Krishna Ramachandran, MD, MBA
Co-Director, Executive Scholar Program in Quality and Safety
Associate Professor of Anaesthesia

Valluvan Rangasamy, MBBS, MD
Assistant Professor of Anaesthesia

Sylvia Ranjeva, MD
Instructor in Anaesthesia

Preeti Upadhyay Reed, MBBS, MPH
Instructor in Anaesthesia

Jeannette Rkaiby, MD
Section Head for GYN Anesthesia
Instructor in Anaesthesia

Mark J. Robitaille, MD, MA
Instructor in Anaesthesia

Christopher J. Roussin, PhD
Senior Director of Clinical Programs at CMS
Lecturer on Anaesthesia, Part-time

Lindsay A. Rubenstein, MD, MA
Director of Recruitment & Retention, Professional Affairs
Instructor in Anaesthesia

Jenny Rudolph, PhD
Senior Director, Innovation , CMS
Lecturer on Anaesthesia, Part-time

Peter Santer, MD
Instructor in Anaesthesia

Maximilian S. Schaefer, MD
Division Director, Thoracic Anesthesia
Director, Center for Anesthesia Research Excellence (CARE)
Associate Professor of Anaesthesia

Aaron J. Schain, PhD
Instructor in Anaesthesia

Aidan M. Sharkey, MD
Program Director, Anesthesia Residency
Assistant Professor of Anaesthesia

Sukhman Shergill, MD
Associate Program Director, Pain Medicine Fellowship
Instructor in Anaesthesia

Kyle Chin Shue, MD
Instructor in Anesthesia

Shahla Siddiqui, MBBS, MSc
Associate Professor of Anaesthesia

Thomas T. Simopoulos, MD, MA
Associate Professor of Anaesthesia

Joan E. Spiegel, MD
Director, Pre-Admission Testing
Assistant Professor of Anaesthesia

Andrew M. Strassman, PhD
Associate Professor of Anaesthesia

Catriona L. Stewart, MBChB, FRCA
Director of Anesthesia, Scottish Livingston Hospital, Botswana, Africa
Instructor in Anaesthesia

Balachundhar Subramaniam, MBBS, MD, MPH
Director, Sadhguru Center for a Conscious Planet
Ellison "Jeep" Pierce Chair of Anesthesia at BIDMC
Professor of Anaesthesia

Eswar Sundar, MBBS
Director, Clinical Operations - East
Assistant Professor of Anaesthesia

Sugantha Sundar, MBBS
Director for Professional Affairs, BIDMC
Director for Center on Professional and Peer Support, BIDMC
Assistant Professor of Anaesthesia

Edina Szabo, PhD
Instructor in Anaesthesia

M. Leo Tsay, MD
Site Chief, New England Baptist Surgicare at Brookline
Assistant Professor of Anaesthesia

Michael Verile, PhD
Instructor in Anaesthesia

Jason S. Wakakuwa, MD
Director, Clinical Operations - West
Assistant Professor of Anaesthesia

Daniel P. Walsh, MD
Associate Program Director, Anesthesia Residency
Medical Director, CERTAIN
Assistant Professor of Anaesthesia

Emily Li-Wen Wang, MD
Instructor in Anaesthesia

Stephanie Wahab, MD
Instructor in Anesthesia

Carol A. Warfield, MD
Edward Lowenstein Distinguished Professor of Anaesthesia

Dario Winterton, MD
Instructor in Anaesthesia

Shweta Yemul-Golhar, MBBS, MD
Section Head for Electrophysiology
Instructor in Anaesthesia

Cyrus A. Yazdi, MD
Site Director, Community Pain, BID-Milton
Assistant Professor of Anaesthesia
Part-time

Haohai Zhang, MD, PhD
Instructor in Anaesthesia

Scott D. Zimmer, MD
Director, Wellness
Instructor in Anaesthesia

Liana V. Zucco, MS, MBBS, MHQS
Director, Quality and Safety
Instructor in Anaesthesia

CRNA Division

System Chief CRNA
Patricia O'Connor, CRNA

Associate Chief CRNA, BIDMC
Naira Qazi, MSN, CRNA

Education Coordinator
Olivia Bergquist, CRNA

Ramy Al-Taweel, CRNA
Juan Carlos Barranco, CRNA
Alfredo Bell, CRNA
Katherine Bellanti, CRNA
Darin Bellissimo, CRNA
Alina Benoit, CRNA
Susan Bourgeois, CRNA
Jessica Braveman, CRNA
Scott Breitenstein, CRNA
Jennifer Brown, CRNA
Ziporah Brown, CRNA
Nathaniel Camillo, CRNA
Andrea Castro, CRNA
Megan Clancy, CRNA
Nicole Collins, CRNA
Brigid Cazzetta, CRNA
Benjamin Dalton, CRNA
Timothy deGuzman, CRNA
Jillian Dempsey, CRNA
Katelyn Desimone, CRNA
Erin Droomgoole, CRNA
Lauren Frost, CRNA
Gregory Gardner, CRNA
Emily Glaner, CRNA
Kristine Grady, CRNA
Donna Greene, CRNA
Amelia Haney, CRNA
Sarah Hayden, CRNA
James Hogan, CRNA
Anne Horrigan, CRNA
So-min Huang, CRNA
Lauren Jewell, CRNA
Seon Hee Kang CRNA
Jennifer Kim, CRNA
Emily Kucher, CRNA
Eileen Lyons, CRNA
Carli McCrossen, CRNA
Fotini Mitsis, CRNA
Sarah Mooradian, CRNA
Timothy Morrison, CRNA
Audra Murphy, CRNA
Erick Nuestro, CRNA
Emily O'Connor, CRNA
Laura Parisi, CRNA
Diana Park, CRNA
Julia Peters, CRNA
Caroline Putnam, CRNA
Samantha Robbins, CRNA
Jared Rose,CRNA
Meghan Saund, CRNA
Andrea Simoes, CRNA
Nadia Sladkey, CRNA
Marva Somerville, CRNA
Ashlyn Swintek, CRNA
Bettina Tassone, CRNA
Tamaya Tompoe, CRNA
Alyssa Tromer, CRNA
Samantha Tyson, CRNA
Ashley Vaughn, CRNA
Nora Wood, CRNA

Harvard Medical Faculty Physicians at Beth Israel Deaconess Medical Center

Our Harvard Medical School faculty and certified registered nurse anesthetists (CRNAs) who provide care at Beth Israel Deaconess Medical Center are employed by the physician group, Harvard Medical Faculty Physicians at Beth Israel Deaconess Medical Center, Inc.

Longwood Specialty Physicians

Longwood Specialty Physicians
World-class care in your community.

Leadership at our community hospitals includes physicians from both HMFP and LSP.

NETWORK ANESTHESIA

Aileen G. Starnbach, MD
Vice Chair, Network Anesthesia
Instructor in Anaesthesia

MOUNT AUBURN HOSPITAL

Site Chief of Anesthesia
Aileen G. Starnbach, MD
Instructor in Anaesthesia

Associate Site chief of Anesthesia; Director, Cardiac Anesthesia
Zachary S. Glicksman, MD
Instructor in Anaesthesia

ANNA JAQUES HOSPITAL

Site Chief of Anesthesia
Katherine Bourne, MD

Associate Site Chief of Anesthesia
Mark Kats, MD

NEW ENGLAND BAPTIST HOSPITAL

Site Chief of Anesthesia
Samir Patel, MD

BID-PLYMOUTH

Site Chief of Anesthesia
Erin Burns, MD

Associate Site Chief of Anesthesia
Neil Oliwa, MD

Site Director, Community Pain Medicine
Fadi Farah, MD

Community Pain Medicine
Mark Wechsler, MD

BID-MILTON

Site Chief of Anesthesia
Victoria M. Derevianko, MD
Instructor in Anaesthesia

BID-NEEDHAM

Site Chief of Anesthesia
Soumya Mahapatra, MBBS
Instructor in Anaesthesia

Patrick Alvarado, MD
Caroline Andrew, MD
Bahinah Callahan, MD
Ashley Chin, MD
Claire Eichinger, MD
Jonathan Erdman, MD
Jen Evansmith, MD
Diana Fidrocki, MD
Lawrence Gibbons, DO
Jessica Heath, MD
Sharon Herman-Berreby, MD
Mihaela Ionita, MD
Igrar Ismail-Zade, MD
Lee-Wei Kao, MD
Sonia Kapoor, MD
Vladimir Kazakin, MD
Andrew Koropey, MD
Angela Lang, MD
Helen Leung, MD
Juan Li, MD
Brian Lo, MD
Kai Matthes, MD, PhD
Thomas Mayo, MD
Andrew McQuide, MD
Lindsay Moore, MD
Michael Natale, MD
Derek Nie, MD
Beth Ren, MD
Omkar Vaidya, MD
Thomas Walsh, MD
Christopher Walters, MD
Jason Wang, MD
Svetla Yordanov, MD
Dana Zalkind, MD
Shannon Zikovich, MD

PER DIEM

Michael Antonell, MD
Arkadi Beloiartsev, MD
Satrait Bose, MD
Sean Collins, DO
Vladimir Eisenberg, MD
James English, MD
Russell Flatto, MD
Frank Gu, MD
Kara Joseph, MD
Michael Kaufman, MD
Marissa Lazor, MD
Michael Lubrano, MD
Anna Margulian, MD
Taylor Mayberry, CRNA
Ryan Nazemian, MD
James O'Rourke, MD
John Patrick Python, MD
Indu Reddy, MD
Maitriyi Shah, MD
Balram Sharma, MD
Jeffrey Swanson, MD
Arun Uthayashankar, MD
Elizabeth Welch Marsh, MD
Lisa Wollman, MD
Rowland Wu, MD
Sana Zaidi, MD





Longwood Specialty Physicians

Certified Registered Nurse Anesthetist Division

Leadership at our community hospitals includes CRNAs from both HMFP and LSP.

MOUNT AUBURN HOSPITAL

Co-CRNA Site Leads
Christine Maggs, CRNA
Marissa O'Connor, CRNA

ANNA JAQUES HOSPITAL

CRNA Site Lead
Robert Martin, CRNA

NEW ENGLAND BAPTIST HOSPITAL

Co-CRNA Site Leads
Matthew Ascione, CRNA
Kheyla Matthews, CRNA

BID-PLYMOUTH

CRNA Site Lead
Randy Barnhard, CRNA

BID-MILTON

CRNA Site Lead at Milton
Erin Herrmann, CRNA

BID-NEEDHAM

CRNA Site Lead
Rebecca Peyev, CRNA

BOSTON COLLEGE,
William F. Connell School of Nursing

Director, Nurse Anesthesia Program
Susan Emery, CRNA, PhD

Associate Program Director, Nurse Anesthesia Program
Caitlin Vitale, CRNA

Claudia Ambrus, CRNA
Hilary Bloom, CRNA
Amy Bogosian, CRNA
Richard Burns, CRNA
Shelby Butler, CRNA
Katherine Canina, CRNA
Elizabeth Cardone, CRNA
Katelyn Caron, CRNA
Dayna Cary, CRNA
Joseph Casassa, CRNA
Lori Cetrino, CRNA
Brittney Chmielinski, CRNA
John Cona, CRNA
Matthew Daube, CRNA
Steven Demartini, CRNA
Kevin Doherty, CRNA
Camie Doyle, CRNA
Christine Dundon, CRNA
Debra Espinosa, CRNA
Kate Evangelista, CRNA
Stacey Gargulio, CRNA
Lynn Gilbody, CRNA
Paula Griesaker, CRNA
James Howard, CRNA
Beth Hughes, CRNA
Patrick Johnson, CRNA
Michelle Keane, CRNA
Dorothy Kushmerek, CRNA
Seth Long, CRNA
Hope Mangili, CRNA
Jennifer Manning, CRNA
Brad Manuel, PA

Lauren McGrath, CRNA
Ryan Messier, CRNA
Katelyn Mullaney, CRNA
Leah Murnane, CRNA
Shannon Oliver, CRNA
Kathleen Oppenheim, CRNA
Elizabeth Pescosolido, CRNA
John Photos, CRNA
Alexandra Post, CRNA
Taylor Pribaz, CRNA
Timothy Putney, CRNA
Shahdokhy Reeder, CRNA
Lee Reeves-Blurton, CRNA
Susan Roessle, CRNA
Julianne Ryan, CRNA
Erin Sanchez, CRNA
Sachiko Sato, CRNA
Valerie Sioras, CRNA
Brianna Smalanskas, CRNA
Elizabeth Stansberry, CRNA
Elizabeth Staunton, CRNA
Christina Tenedios, CRNA
Amalia Thomson, CRNA
Amy Townsend, CRNA
Peter Tsinzo, CRNA
Victoria Turaman, CRNA

PER DIEM

Lisa Barnhouse, CRNA
Joan Botelho, CRNA
Giovanna Burns, CRNA
Gregory Cain, CRNA
Travis Caron, CRNA
Minwook Chong, CRNA
Jessica Clough, CRNA
Chelsea D'Ascanio, CRNA
Emily Cronin, CRNA
Elizabeth Demartini, CRNA
Beatrice DeRaco, CRNA
Erin Donohue, CRNA
Patrick Donohue, CRNA
Mary Foley, CRNA
Penne Greer, CRNA
Shannon Griffin, CRNA
Sasha Griffith, CRNA
Richard Guillaume, CRNA
Rachel Hammerschmidt, CRNA
Theresa Hoopis, CRNA
Svetlana Ivanov, CRNA
Jeffrey Joyce, CRNA
Daryl Kinney, CRNA
Elizabeth Kittredge, CRNA
Kimberly Kleinsorge, CRNA
Joshua Lea, CRNA
Matthew Leblanc, CRNA
Vivien Li, CRNA
Carolyn Bruce Long, CRNA
Kara MacLean, CRNA
Michael Maguire, CRNA
Lorreen Mattson, CRNA
Letitia Mazzaferro, CRNA
Keegan McDonnell, CRNA
Elizabeth McGinnis, CRNA
Karl Mitchell, CRNA
Daniel Nichol, CRNA
Martina O'Connell, CRNA
Melanie Omojoloa, CRNA
Casey Owens, CRNA
Marybethe Sabeti, CRNA
Heather Saitta, CRNA
Michael Schinis, CRNA
Gregory Sheedy, CRNA
Elizabeth Stocksdale, CRNA
Jennifer Sullivan, CRNA
Wendi Sylvia, CRNA
Tony Tang, CRNA
Dylan Van Lith, CRNA
Maria Clara Vaz, CRNA
Sten Willander, CRNA

Longwood Specialty Physicians
World-class care in your community.

Longwood Specialty Physicians is our team of anesthesiologists and certified registered nurse anesthetists (CRNAs) who who provide care at our community hospitals. They are employed by the physician group, Harvard Medical Faculty Physicians at Beth Israel Deaconess Medical Center, Inc.







Clinical Activities

Overview and Organization



J. Michael Haering, MD
Vice Chair, Clinical Affairs
Assistant Professor of Anaesthesia



Jason S. Wakakuwa, MD
Director, Clinical Operations, West Campus
Assistant Professor of Anaesthesia



Eswar Sundar, MBBS
Director, Clinical Operations, East Campus
Assistant Professor of Anaesthesia

The Clinical Anesthesia Division in the Department of Anesthesia, Critical Care and Pain Medicine provides anesthesia services for all operating rooms, the labor and delivery suite, and non–operating room procedural areas at Beth Israel Deaconess Medical Center (BIDMC) and the community sites.

At BIDMC, the department staffs 67 operating rooms (ORs) between Boston's East and West Campuses, including catheterization labs; the Feldberg and Shapiro Ambulatory Suites; labor and delivery ORs; and remote non-OR procedural areas that include gastrointestinal (GI) endoscopy suites, electrophysiology (EP) suites, angiography suites, an endovascular procedure suite, and CT, MRI, and ECT suites. Clinical anesthesia divisions include cardiac, obstetrics, multidisciplinary anesthesia (encompasses vascular, thoracic, orthopedic, neurosurgical, transplant, and regional anesthesia), as well as pre-admission testing. Twenty-one of our anesthetizing locations are remote, which prompted the appointment of a Director of Non-Operating Room Anesthesia (NORA). This new position is held by Dr. Nadav Levy.

The Klarman Building, BIDMC's newest inpatient medical tower on the West Campus, opened in April 2023 and is connected to our current OR space, doubling the square footage of the OR footprint on the West Campus. Additionally, New England Baptist Surgicare at Brookline is scheduled to reopen this year and will be staffed by BIDMC anesthesia faculty and led by Dr. Leo Tsay as Site Chief of Anesthesia. This outpatient facility will serve patients undergoing orthopedic, colorectal, gynecological, oncologic, podiatric, and plastic surgery procedures.

The department is expanding to support additional space and growing volume at our Boston campus and community hospitals. We have 105 attendings, 68 certified registered nurse anesthetists (CRNAs), and a house staff of 66 residents, 16 interns, and 19 fellows.

In 2023, Beth Israel Lahey Health (BILH) expanded its cardiovascular services to include adult cardiac transplant surgery. BILH is the leading provider of cardiovascular services in Eastern Massachusetts by market share. Cardiac transplantation at BIDMC has enhanced resident and fellow recruitment and education efforts, as many potential trainees are interested in cardiovascular anesthesia and critical care. We completed 33 cardiac transplant procedures in 2025 with no mortality.

The department's presence in the community has significantly increased with the addition of anesthesia, ICU, and Pain coverage at BID-Plymouth, BID-Needham, BID-Milton, Anna Jaques Hospital, New England Baptist Hospital, and Mount Auburn Hospital. Beth Israel Deaconess Medical Center and Dana-Farber Cancer Institute announced a new affiliation that will dramatically increase surgical volume for BIDMC and will culminate in the building of a new cancer hospital on the former site of the Joslin Diabetes Center. The movement of surgeons and surgeries has already begun, and as of this writing, fifteen new cancer surgeons have performed over 800 cases at our medical center. With the addition of New England Baptist Surgicare at Brookline, our department will cover 71 locations by the end of the 2026 calendar year. ❑

CLINICAL ANESTHESIA DIVISIONS

Cardiac Anesthesia



Feroze Mahmood, MD, FASA

Director, Cardiac Anesthesia and Perioperative Echocardiography

System Director, Cardiac Anesthesia

Professor of Anaesthesia

Mark E. Comunale Chair in Cardiac Anaesthesia at BIDMC

The Division of Cardiac Anesthesia, directed by Dr. Feroze Mahmood, cares for patients undergoing a wide variety of cardiac surgical, electrophysiological, and structural heart disease procedures. Our faculty members provide clinical services to a diverse group of challenging patients at the medical center and across the network. Division members participate in a wide array of administrative responsibilities at the department and hospital level. The cardiac surgical program has consistently performed more than a thousand open cardiac surgeries, including coronary revascularization, complex valvular and aortic arch procedures. In collaboration with interventional cardiology, BIDMC is also one of the busiest "structural heart disease" centers in the country, with a case mix that includes percutaneous aortic valve replacement (TAVR), transcatheter mitral edge-to-edge repair (TEER), percutaneous atrial and ventricular septal defect closures, and valve-in-valve therapy. We also participate in multicenter trials of percutaneous valve replacement therapy for mitral and tricuspid valves.

Areas of Excellence

BIDMC participates in the Society of Thoracic Surgeons (STS) database and shares our quality assurance and outcomes data. Some key metrics are compliance with perioperative antibiotics, beta-adrenergic blocking drug administration, allogenic blood product use, length of stay, re-admission rates, and 30-day mortality. We have consistently exceeded all national quality benchmarks established by the Centers for Medicare and Medicaid Services and are rated among the top medical centers in the country. Of note, our cardiac surgeons perform 150 to 200 mitral valve procedures annually, and BIDMC has established a reputation as a "mitral surgery center" with a broad and growing referral base. This expertise is now being extended to aortic and tricuspid valve repairs, and hypertrophic cardiomyopathy surgery. This success and excellence would not be possible without the procedural guidance provided by intraoperative transesophageal echocardiography, a service exclusively provided by our division. Division members are also involved in providing procedural guidance for complex structural heart disease interventions.



Clinical Procedure Areas

Traditionally, a case was considered "cardiac" when it involved use of cardiopulmonary bypass or high risk of going to bypass, but developments in the field have significantly broadened our specialty. The division now handles many cases that were previously not considered exclusively cardiac, particularly with the evolution of percutaneous structural heart disease interventions, ventricular assist devices, and complex electrophysiological procedures. Our expanding heart failure service and ventricular assist device (VAD) program also provide state-of-the-art care and give staff and trainees exposure to the types of complex cases that require a deep understanding of the nuances of device operation and their perioperative management. Division members regularly lead and participate in multidisciplinary conferences related to scheduling of structural heart and electrophysiological procedures and heart failure service. As a result, the scope of our clinical practice has significantly expanded.

Our Structural Heart Disease Program is growing and thriving under the expert leadership of our interventional cardiology team. **In the last fiscal year, we performed 224 transcatheter aortic valve replacements; 80 edge-to-edge percutaneous mitral valve repairs; 20 percutaneous tricuspid valve repairs; and 50 cases of paravalvular leak closures, left atrial appendage occlusion, atrial and ventricular septal defect closures, and valve-in-valve therapies.** These procedures are entirely driven and guided by three-dimensional transesophageal echocardiograms (3D TEE), exclusively provided by the members of our division. With the incorporation of the medical center into the Beth Israel Lahey Health network, the activities of the cardiac division have expanded, and we now participate in cardiac cases at Mount Auburn Hospital and collaborate with the cardiac division at Lahey Hospital & Medical Center.

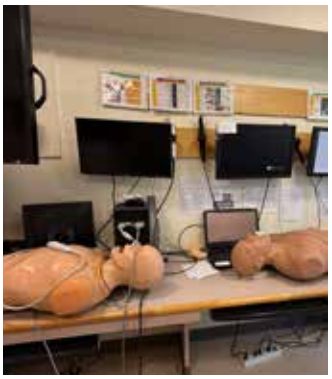
Service Trends

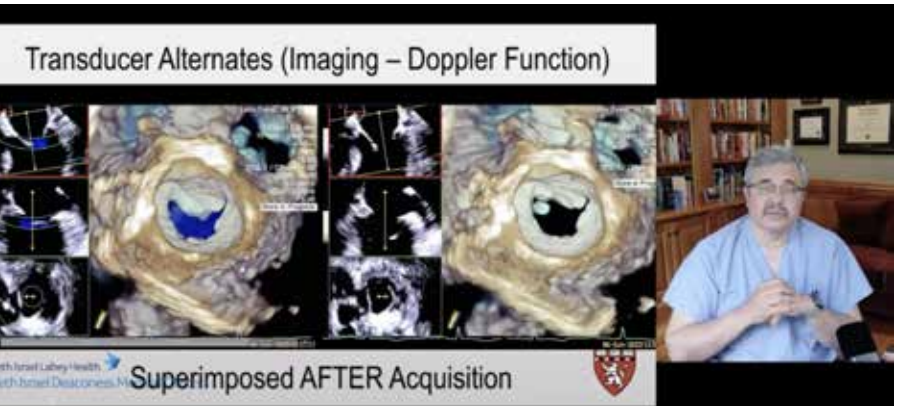
	FY24	FY25	FY26 Projected
Total Procedures	5,358	6,252	6,445

New Programs

- Cardiac transplant: BIDMC has launched a cardiac transplant program. Thirty-three transplants were performed in 2025 with zero mortality.
- Hypertrophic obstructive cardiomyopathy (HOCM) surgery: Over the past year, we have established a HOCM surgery center, and our medical center is now an official referral center for HOCM surgery. Today, BIDMC surgeons routinely perform septal myomectomies for HOCM patients.
- Percutaneous valve therapy: BIDMC is also part of multiple clinical trials that relate to percutaneous valve therapies for tricuspid and mitral valves. ❑









Obstetric Anesthesia



Yunping Li, MD, MSc

Director, Obstetric Anesthesia

Associate Professor of Anaesthesia

Nancy E. Oriol Chair in Obstetric Anaesthesia at BIDMC

Beth Israel Deaconess Medical Center (BIDMC) is a Level IV Maternal Care Center and tertiary referral center providing the most comprehensive care for both healthy and medically complex obstetric patients and newborns. As a major referral hub within the BILH system and across New England, BIDMC is among the largest delivery centers in Massachusetts.

The Division of Obstetric Anesthesia, directed by Dr. Yunping Li, is an integral component of this system, comprising specialized obstetric anesthesiologists, fellows, and residents. Our faculty are nationally recognized leaders in clinical care, research, and innovation. We deliver personalized, high-quality anesthesia care to all parturients, with particular expertise in the management of high-risk pregnancies through consultative services and longitudinal peripartum care.

Our mission is to ensure safe, effective labor analgesia, provide optimal anesthesia for operative deliveries, and contribute to multidisciplinary care for critically ill obstetric patients throughout the peripartum period.

Clinical Metrics and Benchmarking

- Approximately 90% of laboring parturients received neuraxial labor analgesia
- 350–400 anesthesia consults provided annually
- Low rate of general anesthesia for Cesarean delivery: 1–2.2% (national benchmark: 5–6%)
- Low incidence of post-dural puncture headache: 0.063% (SOAP Center of Excellence criterion: ≤2%)

Areas of Excellence

The division's commitment to high-quality, evidence-based care has been recognized by designation as a Society for Obstetric Anesthesia and Perinatology (SOAP) Center of Excellence, first awarded in 2019 and successfully recertified in 2023.

BIDMC is also home to the New England Center for Placental Disorders, a highly specialized multidisciplinary program for the management of placenta accreta spectrum (PAS). This program attracts referrals regionally, nationally, and ➪➪



internationally. Its success is driven by tightly coordinated, protocol-driven care involving obstetrics, anesthesia, surgery, interventional radiology, and critical care. Obstetric anesthesia plays a critical role in this program through:

- Standardized PAS preparation and management protocols
- Advanced perioperative planning and hemodynamic management
- Team-based simulation and workflow optimization
- These efforts ensure consistent practice, efficient coordination, and improved maternal outcomes.

Caring for Pregnant Women with Cardiac Disease: BIDMC has established a dedicated Cardio-Obstetric Center to provide coordinated, individualized care for pregnant patients with congenital and acquired cardiovascular disease. This program brings together Maternal-Fetal Medicine, Cardiology, and Obstetric Anesthesia in a structured, multidisciplinary model. A monthly joint conference is held to review complex cases, allowing for detailed prenatal risk stratification and comprehensive peripartum planning. This proactive, team-based approach ensures optimized care and improved maternal and fetal outcomes in this high-risk population.

Obstetric anesthesia plays a pivotal role within the program, including the development and implementation of tailored anesthetic plans. This includes the use of cardiac-optimized labor epidural analgesia to maintain hemodynamic stability, as well as specialized anesthetic management for Cesarean delivery in patients with significant cardiac disease.

Protocolized, Evidence-Based Patient Care: The Division of Obstetric Anesthesia is a recognized leader in protocol-driven, evidence-based care for obstetric patients. Using knowledge gained through more than 30 years of clinical experience, the division has developed a comprehensive set of protocols and guidelines that standardize care, enhance patient safety, and optimize outcomes across a wide range of clinical scenarios.

Clinical Service Scope

The division provides the full spectrum of obstetric anesthesia services expected of a high-volume academic center:

- Prenatal anesthesia consultation and patient education
- Pre-delivery medical evaluation and risk stratification
- Pioneering use of low-concentration (“walking”) epidural techniques
- Analgesia and anesthesia for vaginal and operative vaginal delivery and Cesarean deliveries
- Anesthesia for non-obstetric surgery during pregnancy
- Post-fetal intervention analgesia
- Individualized care for high-risk patients, including those with cardiac, pulmonary, neurologic, and hematologic comorbidities, and opioid use disorder
- Specialized multidisciplinary and personalized care for patients with placenta accreta spectrum
- Consultative and collaborative services for postpartum complications (e.g., hemorrhage, cardiopulmonary instability, and neurologic injuries)
- Postpartum follow-up visits for all patients to ensure continuity of care and quality improvement

Service Trends

	FY24	FY25	FY26 Projected
Total Procedures	4,615	4,839	4,356

Education

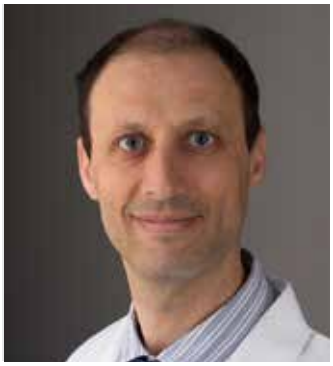
The division provides a full spectrum of education to all levels of learners, including medical students from around the world through the HMS clerkship, residency training in obstetric anesthesia, the ACGME obstetric anesthesia fellowship, and ongoing staff education.

We have published a textbook titled Obstetric Anesthesia: Quick References and Practical Guides (McGraw-Hill Education, 2023). This text reflects our institutional traditions and achievements as well as significant contributions from our junior faculty. It provides standard instructions that can be integrated into everyday practice and serves as a valuable resource for clinicians and trainees in the field. ❑





Multi-Specialty Anesthesia



Akiva Leibowitz, MD

Director, Multi-Specialty Anesthesia

Assistant Professor of Anaesthesia

Multi-Specialty Anesthesia

Neuroanesthesia

Orthopedic Anesthesia

Regional Anesthesia and Acute Pain Service

Thoracic Anesthesia

Transplant Anesthesia

Non-Operating Room Anesthesia (NORA)

Vascular Anesthesia

The Department of Anesthesia established the Division of Multi-Specialty Anesthesia in 2023. As the largest division within the department, it encompasses all anesthesia services with the exception of cardiac anesthesia, obstetric anesthesia, pain medicine, and critical care anesthesia medicine. Under the leadership of Director Akiva Leibowitz, MD, the division's faculty provide comprehensive perioperative care for a wide spectrum of surgical specialties, including general, vascular, neurosurgical, thoracic, orthopedic, gynecologic, ENT (otolaryngology, head and neck), and transplant surgery. While individual specialty divisions remain active and their directors maintain responsibility for professional excellence in their respective fields, the Multi-Specialty Division aims to enhance clinical opportunities to manage complex and challenging cases, pursue professional development and subspecialty training, and participate in education and research. Following the inception of the Multi-Specialty Anesthesia Division, a fundamental transition has occurred that positions generalists as authorities within their designated clinical domains. Most faculty within this division participate in multiple subspecialty groups, fostering their advancement as skilled clinicians and educators while spearheading various investigative research initiatives, concomitantly establishing robust professional partnerships with their counterparts across the various surgical disciplines.

Key Objectives and Core Responsibilities:

Patient-Centered Care: Deliver patient-centered, compassionate, and high-quality care in a cost-effective and efficient manner across all surgical specialties.

Quality Assurance & Clinical Operations: Establish, moderate, and monitor quality standards and quality assurance programs to reduce inefficiencies, coverage problems, and response times.

Research & Innovation: Advance medical knowledge through pioneering basic, translational, and clinical research initiatives.

Education & Mentorship: Educate the next generation in the science and practice of anesthesia through resident and medical student teaching. Oversee clinical training to ensure the development of strong clinical knowledge and skills.

Faculty Growth & Mentorship: Support and foster the professional growth, career development, mentoring, and academic advancement of faculty.

Interdisciplinary Collaboration: Serve as an operational resource for subspecialty division directors while acting as an active liaison between nursing staff, surgical partners, and hospital administration.



Samir M. Kendale, MD
Director, Neuroanesthesia
Assistant Professor of Anaesthesia

Neuroanesthesia

Anesthesiologists from the Division of Neuroanesthesia, directed by Dr. Samir Kendale, provide comprehensive perioperative care for patients undergoing a wide array of complex intracranial, endovascular, and spine procedures at BIDMC. The medical center performs approximately 2,500 intracranial and spine surgeries annually and has an international reputation for the surgical treatment of movement disorders, epilepsy, brain tumors, and cerebral aneurysms. A multidisciplinary team of specialists is crucial to the overall success of this program.

Areas of Excellence

The Division of Neuroanesthesia delivers anesthesia services for the full range of spine surgery—from minimally invasive procedures to complex functional neurosurgery, neuromodulation, and epilepsy surgery; intracranial tumors (various types and locations, using awake and asleep anesthetic approaches); and open and endovascular cerebrovascular procedures. The dramatic increase in intraoperative neurophysiologic monitoring has led our division to engage with the department in developing best practices for management, as these complex cases have unique anesthetic requirements.

Members from the division serve as attending faculty in our high-acuity Neurosciences Intensive Care Unit (NICU). As a tertiary-care regional referral center, the NICU treats patients with a wide variety of neurologic diseases.

Clinical Procedure Areas

The division provides specialized anesthesia care for the high volume of patients undergoing cerebrovascular procedures in the operating room and the interventional neuroradiology suite.

With the arrival of new neurosurgeons focusing on various types of brain tumors, we have also seen an increase in complex tumor surgeries, from gliomas to meningiomas. Skull base surgeries, such as transsphenoidal pituitary surgery and resections of acoustic neuromas, are commonly performed in conjunction with ENT surgeons and require an understanding of the impact of tumor location on physiology and careful attention to timely and smooth emergence.

Surgery for tumors in the speech areas is now frequently performed while a patient is awake, necessitating a unique anesthetic technique, careful positioning, and constant open communication between the anesthesiologist, neuromonitoring teams, and the patient.

We have increasingly incorporated EEG monitoring during many neurosurgical cases to limit anesthetic exposure, optimize neuromonitoring signals, and provide safe emergence and extubation, allowing for rapid neurologic assessment. We have also held educational sessions for several divisions, including workshops on electroencephalography in the perioperative setting.

New Programs

The division has developed several quality-improvement projects, with several more currently underway. We have formalized handoffs for craniotomies, enhanced the anesthesia team's visualization of the surgical field during open cerebrovascular surgery, developed care pathways for spine surgery and adult spine deformity surgery, and engaged in multidisciplinary programs for improving various perioperative workflows.

As part of the division's commitment to enhancing care and evaluating changing medical practices, we regularly engage in a neuroanesthesia journal club. We are

Service Trends

	FY24	FY25	FY26 Projected
Total Procedures	1,410	1,202	1,097



currently creating an educational program for PACU nurses on postoperative care of neurosurgical patients, with instruction on case-management strategies for anesthesiologists and evaluation of the pain management protocol for patients undergoing craniotomy to reduce overall opioid use and maintain stable postoperative neurologic examinations.

In addition, team members are involved in Beth Israel Lahey Health system committees for the establishment of the Neurosciences service lines, which includes workgroups for both neuro-oncology and epilepsy. We have also recently integrated the Neuroanesthesia Division into several of the institution's stroke care committees. This gives the division the ability to interface with the various groups involved in the care of stroke patients, including nursing, emergency medicine, neurology, and neurosurgery through education, hands-on training, and radiology-based learning. Division members are also heavily involved in the Society for Neuroscience in Anesthesia and Critical Care.

The neuroanesthesia rotations are popular with trainees, and a "longitudinal oral board exam" is conducted individually with each resident on the rotation through an online message board. A testament to the rotation's success is the increasing number of residents interested in pursuing neuroanesthesia projects or a neuroanesthesia fellowship after graduating. Current and former residents have developed podcasts for the Society for Neuroscience in Anesthesiology and Critical Care (SNACC) and Anesthesia Toolbox and have worked on the neuroanesthesia classroom project with the Trainee Engagement Committee at SNACC.

Fellowship Programs

The Neuroanesthesia Fellowship is a one-year non-ACGME-accredited program that has existed since 2017. The fellowship provides advanced clinical training in anesthesia for both the surgical and endovascular management of complex intracranial disease and the surgical treatment of complex acute and chronic spine disorders.

For anesthesiologists who have completed a fellowship in critical care medicine, the department offers an additional one-year fellowship in neurocritical care. This fellowship, accredited by the United Council for Neurologic Subspecialties (UCNS), leads to board eligibility for the subspecialty of neurocritical care. ❑



Victor Polshin, MD
Director, Orthopedic Anesthesia
Instructor in Anaesthesia

Orthopedic Anesthesia

The Orthopedic Anesthesia Division, directed by Dr. Victor Polshin, became a separate division at BIDMC in 2012 and encompasses all non-spine orthopedic anesthesia. All providers at BIDMC care for orthopedic oncology and orthopedic trauma patients. Orthopedic sports medicine and total joint arthroplasty surgeries are now transitioning to New England Baptist Hospital, as well as community and ambulatory surgery centers. During this transition, we are working to ensure that our patients continue to receive the same high level of care they have received at BIDMC and that our anesthesia residents and fellows continue to receive the same level of exposure to these surgeries.

Areas of Excellence

The Orthopedic Anesthesia Division was one of the first divisions to develop clinical pathways and has demonstrated their benefits in improving patient care. Elements of the pathways, such as the use of tranexamic acid to reduce bleeding and the need for transfusions, have been adapted for other surgical populations. The application of the total joint arthroplasty pathway reduced patients' length of stay, which was of critical importance during the COVID -19 peaks. The reduction in length of stay made the transition to outpatient total joint replacement surgery possible. The pathways are updated annually to reflect new evidence and evolving trends. At this point, most total joint surgery has been transitioned to New England Baptist Hospital, which uses the same clinical pathways as BIDMC.

There have been improvements in our care of geriatric hip fracture patients over the past three years. In conjunction with the orthopedic trauma surgeons and ➪➪



geriatricians, patients with geriatric hip fractures now benefit from more efficient, standardized perioperative care, which improves the patient experience and may provide economic benefits to the hospital. The needs of geriatric hip fracture patients can be particularly complex, so the addition of geriatricians to the care team was key to improving patient workup, expediting time to surgery, and improving postoperative care. Currently, we are evaluating outcomes that can be monitored longitudinally to identify opportunities for further improvement.

Orthopedic procedures are among the most painful procedures. In collaboration with the Regional Anesthesia Division, we have worked to optimize analgesia through the use of epidural analgesia, peripheral nerve blocks, peripheral nerve catheters, and multimodal analgesia. The Orthopedic

Anesthesia Division is committed to further reduce pain and opioid use through quality improvement and research projects.

The elective knee and hip arthroplasty patients are commonly the population of choice for various research projects, and members of the division have been actively involved in various research projects. The multiyear SAGES I and II projects required collection of spinal fluid and blood from patients during spinal placement, and division members expertly and efficiently assisted with these efforts. The ongoing virtual reality study by Dr. Brian O'Gara requires significant involvement from members of the division and could result in meaningful benefits to patients.

Clinical Procedure Areas

Many patients who present for elective total knee or hip arthroplasty have severe cardiac, pulmonary, and other comorbidities such as cirrhosis. These medically complex patients undergoing elective orthopedic procedures are managed with multidisciplinary discussions among surgeons, anesthesiologists, nursing teams, medical specialists, and sometimes members of the Division of Cardiac Anesthesia.

The use of spinal anesthesia for elective arthroplasty and hip fracture surgery has provided educational opportunities for anesthesia residents and SRNAs. This older patient population offers both anatomic complexity and clinical challenges. The physicians in the Division of Orthopedic Anesthesia have the expertise to achieve successful spinal anesthesia in over 95% of cases in which spinal anesthesia is planned.

Orthopedic Anesthesia Service Trends

	FY24	FY25	FY26 Projected
Knee arthroplasty	276	253	240
Hip arthroplasty	190	142	101
Shoulder procedures	294	319	273
Foot and ankle procedures	322	359	133
Oncology	150	189	148
Hand	196	569	497
Total	**1427**	**1831**	**1392**

New Programs

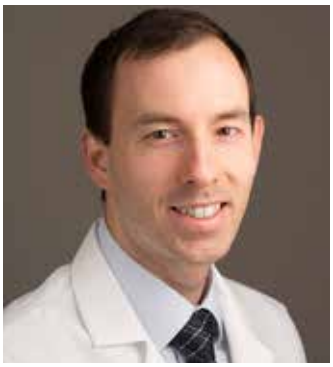
We instituted the use of intraoperative tranexamic acid (TXA) and routine use of fascia iliaca blocks in hip fracture patients. Our Emergency Department colleagues have been performing these blocks for patients as well. Early performance of the block may help reduce morbidity and improve the patient experience.

The Orthopedic and Regional Anesthesia Divisions created a new order set to reduce the risk associated with the use of anticoagulant and antiplatelet medications after neuraxial anesthesia. The goal is to reduce the risk of epidural hematoma after neuraxial anesthesia.

Education

Clinical education in orthopedic anesthesia is excellent because the attending physicians and CRNAs in the division are exceptional teachers. We are creating a formal curriculum for orthopedic anesthesia to further develop our educational program. ❑

Regional Anesthesia and Acute Pain Service



Andrey Rakalin, MD

Director, Regional Anesthesia and Acute Pain Service

Instructor in Anaesthesia

Program Director, Regional Anesthesia and Acute Pain Medicine Fellowship

The Division of Regional Anesthesia and Acute Pain Service, directed by Dr. Andrey Rakalin, was established in 2008 to improve patient care, safety, and comfort through pharmacologic interventions, neuraxial anesthesia, and peripheral nerve blocks. The division provides high-quality care to patients across all surgical subspecialties. The goals of the division are to expand the use of regional anesthesia, provide high-quality patient care, develop residents and fellows as experts in a wide range of regional anesthetics and acute pain management, help anesthesia faculty maintain their proficiency with regional anesthesia techniques, and serve as consultants to our surgical and medical colleagues in managing acute pain.

The division currently consists of 15 faculty members and two nurse practitioners. We perform nerve blocks for surgical procedures and manage patients with acute postoperative pain. One faculty member is assigned with a resident or a fellow each day as a regional team for this purpose. Subsequent anesthetic care is performed by an intraoperative anesthesia team. This dedicated nerve block service is present on both the East and West Campuses. This model has greatly increased the volume and quality of regional anesthesia performed at BIDMC. The development of the regional anesthesia team has increased patient and surgeon satisfaction and demand for regional anesthetics.

The volume of regional anesthetic cases has gradually increased over the past few years. We have expanded regional blocks for vascular, spine, and thoracic patients to improve analgesia and support patients' surgical recovery according to several enhanced recovery after surgery (ERAS) protocols.

Areas of Excellence

The Regional Division cares for simple and complex pain patients, working to improve their care while decreasing opioid use. Together with the Chronic Pain Service, we developed guidelines on management of perioperative patients on buprenorphine and chronic opioid therapy.

We offer regional analgesia to thoracic, spine, and vascular surgery patients and have incorporated regional anesthetics into the ERAS protocols for complex spine surgery and limb amputations. We have also extended our services to our community hospitals, ensuring standardized, high-quality patient care.

Clinical Procedure Areas

This division performs about 4,000 regional anesthetics every year. We perform nerve blocks for acute pain, place nerve catheters with continuous infusion of local anesthetic for inpatients, and place all non-obstetric anesthesia epidurals. We offer consultation services for our surgical and medical colleagues—from curbside consultations regarding patient-controlled analgesia (PCA) to comprehensive patient evaluations and follow-up.

New Developments

Our most significant achievement in the last year is receiving approval for the Regional Anesthesia and Acute Pain Medicine Fellowship Program from the Accreditation Council for Graduate Medical Education (ACGME). Although this training program has existed for many years, accreditation provides external validation to the rigorous training that fellows undergo and brings national and international recognition to the program. Fellows rotate through regional anesthesia, inpatient pain services, obstetric

regional anesthesia, pediatric regional anesthesia, point-of-care ultrasound, and various electives. This transition to an accredited program also allowed us to direct more of the fellows' focus on research and QI projects, with both current fellows presenting at local and national meetings. We are also incorporating innovative educational methods, including virtual reality and AI-assisted learning.

We are currently collaborating with our gynecologic surgery and transplant surgery colleagues to incorporate the latest pharmacologic therapies and further reduce opioid use.

Lastly, we are excited about our upcoming collaboration with Dana-Farber and look forward to providing not only acute pain services but also comprehensive pain services for patients with cancer, in collaboration with the Chronic Pain Service and our palliative care colleagues.

Service Trends

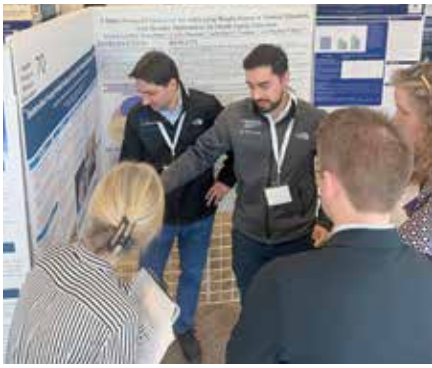
	FY24	FY25	FY26 Projected
Total Procedures	3,894	4,252	4,147

New Programs

- We developed a comprehensive hip fracture pathway that covers all phases of care surrounding this surgery, an effort led by Dr. Lisa Kunze, former director of Orthopedic Anesthesia. Through regional interventions, we can help reduce morbidity and mortality among geriatric patients presenting for corrective surgery after falls. This process involves collaboration with surgeons, geriatricians, anesthesiologists, and emergency department physicians and staff.
- We developed a comprehensive workflow for our vascular patients. This routinely involves placing sciatic and femoral nerve catheters for above- and below-knee amputations, and this has improved pain management and patient satisfaction for patients undergoing this life-changing surgery.
- We are evaluating various regional nerve block strategies to further optimize pain management for our thoracic surgery patients. We have performed epidurals, erector spinae plane blocks, and paravertebral blocks for these patients.
- We perform various chest wall plane blocks for our cardiac patients. ❑






Thoracic Anesthesia



Maximilian S. Schaefer, MD
Director, Thoracic Anesthesia
Associate Professor of Anaesthesia
Director, Center for Anesthesia Research Excellence (CARE)

The Division of Thoracic Anesthesia, directed by Dr. Maximilian Schaefer, provides anesthesia services to thoracic surgery and interventional pulmonology (IP) patients in a variety of BIDMC locations and affiliated community sites. The combined volume of cases from January 2024 to Present is 6,293 thoracic surgeries and interventional pulmonology procedures. During this time, we adopted high-frequency jet ventilation as our usual mode of ventilation during rigid bronchoscopy cases.
Over the past five years, we have recruited talented new anesthesiologists to handle increased case volume, particularly in robotic surgery. Of the current 15 members of our division, 10 have joined over the past five years. The new clinicians and continued assistance from the block team allow us to perform regional procedures via a multimodal approach to pain management. The division works closely with the Department of Thoracic Surgery and the Division for Interventional Pulmonology to constantly improve patient care, which results in the development and implementation of protocols to enhance post-procedural recovery and increase the efficiency and safety of the procedures.

Areas of Excellence

Patients undergoing thoracic surgery or interventional pulmonary procedures are often complex, requiring close collaboration between the anesthesia and surgical team. Our services include general and regional anesthetics; state-of-the-art, individualized conventional mechanical ventilation, high-frequency jet ventilation, advanced airway management, including intraoperative lung isolation and single-lung ventilation; and intraoperative bronchoscopy and the management of complex airways and advanced lung disease.

Collaborating closely with the Regional Anesthesia Division, we supplement general anesthesia with neuraxial and peripheral anesthesia techniques such as thoracic epidural anesthesia, ultrasound-guided erector spinae block, or intercostal nerve block. A recent retrospective analysis has shown that success for thoracic epidural anesthesia in our institution is 80%, 10% higher than the success rate provided in the literature. Nonetheless, along with the Regional Anesthesia Division, we continually strive to further enhance the effectiveness of our blocks and neuraxial anesthesia through ongoing training of residents and attendings. We further leverage research findings from the Center for Lung Injury Research for clinical care and implement clinically relevant research findings into patient care. One example is individualized mechanical ventilation—our patients now receive individualization of tidal volume and positive end-expiratory pressure during one-lung ventilation.

Clinical Procedure Areas

The division provides anesthesia care, including flexible and rigid bronchoscopy involving stent placement, cryoablation and laser ablation, and surgical lung resection due to cancer, including open and video-assisted (VATS) procedures.
As the Chest Disease Center at BIDMC has become a leading institution in treating tracheobronchomalacia, drawing patients from across the country to BIDMC, the Thoracic Anesthesia Division is challenged with providing anesthesia care during bronchoscopic evaluation, stent placement, and robotic or open tracheobronchoplasty for these patients. We are one of a few centers in the country that do tracheobronchoplasty. In addition, tracheal resections for patients with chronic tracheal stenosis are challenging procedures that require comprehensive intraoperative airway management. Finally, the minimally invasive thoracic surgery

program has greatly advanced over the last two years. An increasing number of endoscopic procedures, such as minimally invasive esophagectomy, pose specific and interesting challenges for anesthesia management.

Seventy-four percent (74%) of thoracotomies receive thoracic epidural catheters, and over 90% of video-assisted thoracic surgery (VATS) procedures receive either erector spinae plane or paravertebral blocks. These regional techniques are either applied by the team from the Thoracic Anesthesia Division or the regional team in close collaboration. The total amount of opioid medication used in thoracic surgery and interventional pulmonology has dropped dramatically with the advent of multimodal pain therapy.[1]

Two percent of VATS patients receive epidurals, usually when either pleural decortication or pleurodesis is planned. The pathway for video-assisted thoracic surgery provides multimodal pre-medications and intraoperative intercostal blocks to relieve pain in these patients. In addition, paravertebral and erector spinae blocks have been employed to reduce pain and lower the requirements for opioid medications in the postoperative period. The total amount of opioid medication used in thoracic surgery and IP has dropped dramatically with the advent of multimodal pain therapy. In 2018, 79 erector spinae blocks were performed.

Service Trends

	FY24	FY25	FY26 Projected
Total Procedures	2,001	2,095	2,197

New Programs

The Robotic Surgery Program became fully functional in 2023, and has become part of the standard portfolio for thoracic surgeries involving lobectomies or segmentectomies of the lung.

In collaboration with the Division of Thoracic Surgery, we developed and implemented a comprehensive protocol to enhance recovery after thoracic surgery (ERATS). This protocol implements state-of-the-art treatment and prevention procedures, including preoperative nutrition, multi-modal pain prophylaxis and treatment, best practice management of mechanical ventilation and neuromuscular blockade and postoperative mobilization and physiotherapy. We are evaluating this protocol's clinical impact, specifically in terms of rescue pain medication requirement, pulmonary complications, and hospitalization duration.

In addition, the division has several ongoing quality improvement projects, including an initiative to increase comfort with one-lung ventilation in non-thoracic anesthesia faculty. This initiative assesses the skillset and comfort level of attendings who are not members of the thoracic anesthesia group but care for patients who require lung isolation and one-lung ventilation (e.g., during on-call hours). We have initiated a training program to enhance skill and confidence when initiating one-lung ventilation. We will evaluate the overall comfort level after participants have completed the initiative to evaluate success.

Education

The Thoracic Anesthesia Division is integrally involved in the department's educational mission through the teaching of medical students, residents, staff and allied health professionals. Local instruction occurs with anesthesia resident lectures, simulations and virtual bronchoscopy sessions. All interventional pulmonology (IP) fellows in New England come to BIDMC for a one-day orientation and demonstration session. This includes lectures on anesthesia and the practice of airway skills—both taught by anesthesiologists. A regular monthly session in virtual bronchoscopy, airway anatomy and double-lumen tube and bronchial blocker placement is now required before any of the residents rotate in thoracic anesthesia. Local CME courses on bronchoscopy, anesthesia practices, and airway workshops include anesthesiologists from BIDMC. ❑



Transplant Anesthesia



Riccardo Pinciroli, MD

Director, Transplant Anesthesia

Assistant Professor of Anaesthesia

The Division of Transplant Anesthesia, directed by Riccardo Pinciroli, MD, primarily cares for living donor liver transplants, with separate dedicated teams for the donor and recipient. Depending on scheduling needs, the team may also be involved in elective hepatic resections and major hepatobiliary surgeries. For patients undergoing kidney transplants (deceased- and living-donor), pancreas transplants, donor nephrectomies and dialysis access procedures, anesthesia is provided by members of the department according to clinical and scheduling needs. However, the division oversees the clinical, academic, quality, and safety aspects of these transplant-related cases, constituting an overall institutional point of reference for the perioperative care of patients undergoing transplant surgery.

Providing anesthesia care for organ transplant surgery requires a high level of expertise, skill, and close collaboration with the surgical team and other healthcare professionals involved in patient care. The Division of Transplant Anesthesia at BIDMC comprises eight senior attending anesthesiologists responsible for the intraoperative care of patients undergoing liver transplantation and related complex hepatobiliary procedures and provides 24/7 availability as an integral part of the institutional transplant team.

The division director oversees the division's clinical, educational, and research activities and ensures that the team provides safe and effective anesthesia care for patients undergoing organ transplant surgery. The director is a liaison between the Departments of Surgery and Anesthesia, communicating regularly with the surgical team. The director participates in weekly Liver Transplant Selection Committee and quarterly Transfusion Committee meetings to ensure the department is actively involved in the center's clinical activity.

Areas of Excellence

The transplant anesthesia program provides specialized perioperative care for patients undergoing complex liver transplantation and other transplant-related procedures. The division works closely with transplant surgery, critical care, transfusion medicine, and other multidisciplinary teams to optimize perioperative management and patient outcomes.

The Division of Transplant Anesthesia provides exceptional care to patients undergoing organ transplantation. The division strives to achieve optimal outcomes with a team of highly skilled anesthesiologists, state-of-the-art monitoring, and a collaborative approach to patient care. Examples of the division's clinical and quality-improvement efforts include the following:

- Successful implementation of thromboelastography (TEG) as the standard of care for intraoperative monitoring of hemostasis in liver transplant surgery. TEG provides real-time assessment of coagulation function and guides the administration of blood products, helping to optimize transfusion management and reduce unnecessary blood product utilization.
- Development of comprehensive and standardized guidelines for kidney transplant anesthesia to optimize clinical outcomes, minimize complications associated with anesthesia administration, and ensure patient safety.
- Regular internal auditing and review of clinical cases to identify areas for improvement, with findings incorporated into department-wide morbidity and mortality meetings.

The division is committed to improving outcomes and enhancing patient safety through innovative techniques and evidence-based practices.

Clinical Procedure Areas

Working alongside the department scheduling office, the division guarantees reliable year-round call coverage while remaining flexible. BIDMC's transplant anesthesiologists are skilled clinicians with vast experience managing patients undergoing high-acuity surgery. The division consists of attendings with diverse subspecialty backgrounds, including critical care and anesthesia for major procedures such as neurosurgery and thoracic and cardiac surgery. Consequently, all division members have knowledge of a variety of specialized monitoring techniques and advanced technologies, including pulmonary artery catheterization, transesophageal echocardiography (TEE), thromboelastography (TEG), and renal replacement therapy.

Service Trends

BIDMC Transplant Institute	FY24	FY25	FY26 Projected
Organs Transplanted			
Liver	148	138	109
Kidney	28	48	60
Heart	34	36	31
Pancreas	1	4	7
Total	**211**	**226**	**207**

Donor Care Center

In 2024, BIDMC opened a Donor Care Center (DCC) in collaboration with New England Donor Services (NEDS), creating a specialized setting for the care and optimization of patients who have been declared deceased by neurologic criteria and are designated organ donors. The center is the only facility of its kind in the New England/Boston region and is designed to support optimal donor management and organ recovery while reducing the impact of donor care on the hospital's ICUs.

The Department of Anesthesia, Critical Care and Pain Medicine was integral to the development of the center, with Dr. Todd Sarge serving as Medical Director. The Critical Care Division provides 24/7 physician staffing, working closely with NEDS and the multidisciplinary transplant team. The center also creates opportunities for education, quality improvement, and research in organ donation and donor management.



Education

The Transplant Division is a prime example of our department's commitment to teaching. Our senior residents have valuable educational opportunities and are involved in all aspects of perioperative care, with a particular interest in the care of liver transplant patients, given their extreme complexity and unique challenges. Senior residents actively participate in every phase of the operation, from perioperative preparation to airway management, induction and emergence, intraoperative monitoring, pain control strategy selection, and potential complication management. Our liver transplant cases are staffed with a 1:1 attending-resident ratio, thereby allowing for dedicated bedside teaching opportunities.

Moreover, we organize regular resident lectures focused on transplant anesthesia, covering topics such as pathophysiology, intraoperative management, surgical considerations, and case presentations.

Since 2017, we have established a joint Anesthesia Transplant Fellowship Program with Lahey Hospital and Medical Center in Burlington, Massachusetts. Trainees from this program have become a more active presence in our operating room over time. The program provides fellows with exposure to complex transplant anesthesia and multidisciplinary perioperative care. ❑

Non-Operating Room Anesthesia (NORA)



Nadav Levy, MD, MHQS

Director, Non-Operating Room Anesthesia (NORA)

Assistant Professor of Anaesthesia

Director, Medical Simulation for Anesthesiology at BIDMC

The Division of Non-Operating Room Anesthesia (NORA), directed by Dr. Nadav Levy, was established in 2025 to support the continued growth in procedural volume and the increasing complexity of patients receiving anesthesia care outside the operating room. The division The division coordinates anesthesia services across procedural areas including gastroenterology, radiology, the ECT clinic, advanced imaging, interventional pulmonology, and other locations where sedation or anesthesia care is delivered.

Growth and Opportunities

As minimally invasive procedures become increasingly complex and are performed outside the traditional operating room, anesthesiologists play an essential role in patient selection, pre-procedure assessment, airway and hemodynamic management, procedural sedation, general anesthesia, and rescue of critically ill patients.

NORA environments frequently involve patients with significant medical comorbidities, limited physical space, specialized equipment, and more limited immediate access to resources than in a conventional operating room. The division therefore focuses on efficient clinical operations, standardized workflows, emergency preparedness, appropriate patient selection, multidisciplinary communication, and consistent monitoring and anesthesia practices across procedural locations.

The continued growth of these services creates an opportunity for NORA to support the expansion of BIDMC's advanced procedural programs while maintaining consistent standards of safety, quality, and peri-procedural care.

Areas of Clinical Practice

The NORA team provides anesthesia services across a broad range of procedural areas, including:

Gastroenterology/Endoscopy: Advanced endoscopic procedures including, ERCP, EUS, complex therapeutic endoscopy, and procedures requiring deep sedation or general anesthesia.

Interventional Radiology: Complex image-guided interventions, including embolization, TIPS, tumor-directed therapies, biopsies, drainage procedures, and other interventional procedures.

MRI and CT: Anesthesia and sedation for patients undergoing advanced diagnostic and interventional imaging, particularly those who cannot safely tolerate procedures while awake.

Electroconvulsive Therapy (ECT): Repeated anesthetic care for patients undergoing ECT, with emphasis on efficient, safe, and consistent peri-procedural management.

Interventional Pulmonology and Bronchoscopy: Anesthesia support for advanced diagnostic and therapeutic airway procedures, including complex bronchoscopy.

Other Procedural Services: Depending on institutional needs, NORA may also support procedures in radiation oncology, pain medicine, outpatient procedural suites, and other specialized environments.

Overall, the NORA division provides a framework for delivering safe, efficient, and consistent anesthesia care across BIDMC's expanding procedural environments outside the operating room. ❑

Boston, beautifully multifaceted.

Academia, nature, culture, ocean air, mountain escapes, and endless things to discover.





















Vascular Anesthesia



Robina Matyal, FS, MBBS

Vice Chair, Education

Director, Vascular Anesthesia

Director, Center for Education Research, Technology and Innovation (CERTAIN)

Program Director, Advanced Perioperative Clinical Fellowship

Professor of Anaesthesia

Leonard Bushnell Chair in Anaesthesia at BIDMC

The Division of Vascular Anesthesia, directed by Dr. Robina Matyal, Professor of Anesthesia at Harvard Medical School; Vice Chair for Education; and Leonard S. Bushnell, MD, Chair in Anesthesia at BIDMC, is a dedicated team of anesthesiologists who care for a challenging patient population and bring extensive experience, motivation, enthusiasm, and compassion to their clinical work.

Perioperative management of patients undergoing vascular surgery presents unique clinical challenges and requires specialized skills. Vascular anesthesiologists are expected to have expertise in transesophageal echocardiography (TEE) and transthoracic echocardiography (TTE), perform ultrasound-guided regional anesthesia, and, when required, safely transition from sedation to general anesthesia with advanced invasive monitoring.

The division continues to provide perioperative care for patients undergoing open, endovascular, and robotic vascular surgery. Alongside their clinical responsibilities, division members participate in research, education, and quality improvement initiatives. Clinical volume has shown sustained growth, and the vascular surgery service remains one of the busiest clinical services in the city. BIDMC's Aortic Center is a national leader in the treatment of complex aortic disease, and the breadth and complexity of this practice support the division's clinical, educational, and academic missions.

Areas of Excellence

Our division continuously develops innovative educational tools, streamlines operating room workflows, and works to improve perioperative outcomes through multidisciplinary quality improvement initiatives.

Robotic Vascular Surgery: We are developing a best-practice protocol for the perioperative management of robotic vascular procedures, including AAA repair, aortobifemoral bypass, median arcuate ligament release, and first-rib resection, with the goal of standardizing institutional practice in this expanding area of vascular surgery.

Fenestrated Endovascular Aortic Repair (FEVAR) With Physician-Modified Endograft (PMEG): The Division of Vascular and Endovascular Surgery actively evaluates and utilizes PMEGs through clinical trials and specialized surgical care. In collaboration with vascular surgery, we have developed a multidisciplinary, standardized perioperative approach for FEVAR with PMEG to streamline implementation of the institutional protocol, with the goal of reducing complications and improving outcomes.

Peripheral Nerve Catheters: A standardized practice pathway was developed for the use of peripheral nerve catheters to optimize analgesia in patients with critical limb ischemia undergoing emergency surgery, with the goal of improving clinical outcomes.

Preoperative Consult Service: We launched a pilot preoperative consultation service for high-risk patients referred by the vascular surgery team. The service provides detailed perioperative evaluation, preoperative TTE and POCUS, and individualized recommendations to improve surgical readiness, efficiency, and multidisciplinary coordination of care. Based on our experience with this pilot, there are plans to expand the service to other surgical specialties.

Research and Scholarship: The division maintained a strong scholarly output, with 21 publications in peer-reviewed journals over the past year. A major area of focus has

been multidisciplinary cardiovascular and perioperative outcomes research using the AHRQ Nationwide Readmissions Database (NRD). These studies leverage large national cohorts to evaluate readmissions, perioperative complications, risk factors, disparities, and longer-term outcomes, in collaboration with colleagues across anesthesia, cardiovascular medicine, surgery, and outcomes research.

Clinical Procedure Areas

The division's broad clinical experience provides a state-of-the-art teaching environment for residents and fellows. Endovascular procedures are performed in hybrid operating rooms equipped to support both fluoroscopic interventions and open surgical procedures. Our practice is also expanding into robotic surgical suites, which present distinct anesthetic challenges. These complex procedures require a high degree of vigilance, advanced monitoring, and readiness for resuscitation, providing faculty and trainees with a unique clinical experience.

Service Trends

	FY24	FY25	FY26 Projected
Total Procedures	1,137	1,279	2,000

The vascular anesthesia service provides 24/7 coverage. We routinely care for elective and emergency patients classified as ASA Physical Status III–V. The division provides anesthesia care for open and endovascular abdominal and thoracoabdominal aortic aneurysm repair, robotic vascular surgery, open peripheral vascular surgery, open and endovascular carotid surgery, amputation surgery, and procedures for median arcuate ligament syndrome (MALS), including celiac ganglion release. Our clinical strengths include high-quality care for complex patients, an efficient and experienced team, close collaboration between anesthesia and vascular surgery, and 24/7 availability of vascular anesthesia consultation and support.

Programs and Initiatives

Advanced Perioperative Clinical Anesthesiology Fellowship (formerly the Advanced Vascular and Ultrasound Fellowship)

The fellowship continues to provide broad clinical and academic training for current fellows Mansi Arora, MD, and Meghana Badari Narayan, MD. Fellows participate in high-risk vascular and other complex procedures in the OR and non-operating-room settings, gaining experience in open and endovascular aortic surgery, advanced invasive monitoring, perioperative TTE/TEE and POCUS, spinal drains, pacemakers, ventricular assist devices, and hybrid-OR workflows.

Fellows also serve as an educational resource within the department. They teach and supervise residents, contribute to ultrasound and simulation-based education, and participate in teaching sessions that support continued skill development for both residents and faculty. They also contribute to multidisciplinary conferences, standard-of-practice pathways, quality improvement initiatives, and scholarly projects.

The fellowship has supported successful career advancement. Graduate Sumeeta Kapoor, MD, joined the BIDMC Department of Anesthesia as an attending anesthesiologist, while graduate Sadique Ali, MD, matched to an advanced position in the BIDMC Anesthesiology Residency and is currently completing his preliminary general surgery year before beginning anesthesiology residency training.

Quality Improvement Projects

Division members continue to participate in quality improvement initiatives focused on operating room efficiency, resource utilization, and consistency of care. An ongoing department-wide project to improve first case on-time starts includes the vascular operating rooms, with efforts directed toward identifying and reducing avoidable delays.

On two high-volume vascular days each week, workflow redesign has allowed three rooms to be staffed from the start of the day, rather than routinely beginning with two rooms and opening an additional room later. Case scheduling is also staggered across rooms to optimize turnover, reduce competing demands on personnel and equipment, and improve resource utilization. A dedicated anesthesia technician assigned to the vascular operating rooms supports room preparation, equipment readiness, and efficient turnover, while the vascular service also provides structured teaching for anesthesia technician students.

The division has expanded its vascular anesthesia faculty pool to approximately 25 anesthesiologists, supporting reliable 24/7 coverage for complex and emergent vascular cases and greater flexibility in staffing multiple vascular locations. Additional quality improvement efforts include ongoing review and standardization of vascular anesthesia protocols, with multidisciplinary discussions used to incorporate emerging evidence and identify opportunities for continued improvement.

Education Initiatives

Under the leadership of Christopher Mallard, MD, Residency Rotation Director, the vascular anesthesia rotation incorporates problem-based learning, simulation, faculty-led educational sessions, and hands-on TTE training. The division also holds regular faculty workshops and multidisciplinary conferences with vascular surgery to review complex cases, evolving evidence, and clinical protocols. Recent educational and quality-improvement efforts have focused on spinal drain and spinal cord protection protocols, physician-modified endograft procedures, and activated clotting time (ACT) training and certification. ❑

CRITICAL CARE MEDICINE



Todd W. Sarge, MD

Vice Chair, Critical Care Medicine

Assistant Professor of Anaesthesia

Alan Lisbon Chair in Critical Care at BIDMC

The Division of Critical Care Medicine, led by Dr. Todd Sarge, is a major clinical division in the Department of Anesthesia, Critical Care and Pain Medicine that provides critical care services in six intensive care units (ICUs) at BIDMC: Trauma Surgical Intensive Care Unit (TSICU); Surgical Intensive Care Unit (SICU); Cardiovascular Intensive Care Unit (CVICU); Neurosciences Intensive Care Units (Neurosciences ICUs A and B); and the Coronary Care Unit (CCU). It also provides coverage of the Post Anesthesia Care Unit (PACU) and the Donation Care Center (DCC) on the West Campus of BIDMC.

The first ICU at Beth Israel Hospital was the Respiratory-Surgical ICU with seven ICU beds, formed jointly by Dr. Leonard Bushnell of anesthesia and Dr. John Skillman of surgery in 1967. Dr. Alan Lisbon started the Critical Care Fellowship in 1990. A year later, in 1991, Dr. Lisbon formed the Division of Critical Care. This division now includes 21 division members who work with nine intensivists from the Department of Surgery, one intensivist from the Department of Emergency Medicine, and three intensivists from the Department of Neurology to provide 24/7 multidisciplinary coverage of the six physical ICUs, encompassing 54 beds, as well as three beds in the Donor Care Center. The division also covers the ICUs in three community hospitals in the BILH network (BID–Plymouth, BID–Milton and BID–Needham) and provides site directorship for the ICU at BID–Needham. In addition to patient care, the division provides education for medical trainees at all levels and conducts extensive, innovative research on a variety of subjects, ranging from diseases such as acute respiratory distress syndrome (ARDS), sepsis, sedation, organ dysfunction, and medical ethics in the ICU.

Mission Statement

Our division's mission is to provide exceptional compassionate care to critically ill patients supported by high-impact research while providing comprehensive learning experiences for medical trainees in our specialty so they can do the same throughout their careers.

Critical Care Medicine Leadership

Led by the Vice Chair for Critical Care Medicine, Dr. Todd Sarge, the Division of Critical Care Medicine comprises several leadership roles, listed below.

Leader	Department	Position
Michael Cocchi, MD	Emergency Medicine	Associate Chief Medical Officer
Somnath Bose, MD, MPH	Anesthesia, Critical Care and Pain Medicine	Intensive Care Unit (ICU) Site Director, BID–Needham
Jessica Cassavaugh, MD, PhD	Anesthesia, Critical Care and Pain Medicine	Program Director, Anesthesia Critical Care Medicine Fellowship
Maurizio Bottiroli, MD	Anesthesia, Critical Care and Pain Medicine	Director, Venovenous (VV) Extracorporeal Membrane Oxygenation (ECMO) Program
Ameeka Pannu, MD	Anesthesia, Critical Care and Pain Medicine	Director, Cardiac Critical Care Director, Extracorporeal Cardiopulmonary Resuscitation (E-CPR)
Akiva Leibowitz, MD	Anesthesia, Critical Care and Pain Medicine	Director, Post Anesthesia Care Unit (PACU) Director, Multi-Specialty Anesthesia
Achikam Oren-Grinberg, MD, MS	Anesthesia, Critical Care and Pain Medicine	Director, Critical Care Ultrasound
Melissa Bowman, PA-C, MS	Anesthesia, Critical Care and Pain Medicine	APP Clinical Manager Critical Care



Areas of Excellence

The Anesthesia Critical Care Division provides state-of-the-art care for the hospital's surgical critical care patients and is a recognized leader in the field for point-of-care critical care echocardiography and ultrasound, as well as clinical research in acute lung injury and acute respiratory distress syndrome (ARDS).

Critical Care Echocardiography and Ultrasound

Members of the division, and in particular Drs. Achikam Oren-Grinberg and Akiva Leibowitz, are very active in the field of education in critical care echocardiography and ultrasound. Division members founded the highly successful Fundamentals of Critical Care Ultrasound course at the Society of Critical Care Medicine and have been active internationally with the World Interactive Network Focused on Critical Ultrasound, as well as courses sponsored by the American Thoracic Society. Division members previously directed a Harvard Medical School Continuing Medical Education (CME) course, "Ultrasonography for Intensivists and Emergency Medicine Clinicians," which sold out for 10 years leading up to the COVID-19 pandemic. Division members are also active in teaching point-of-care ultrasound to faculty within the department at quarterly hands-on ultrasound training sessions during Grand Rounds. They also teach bedside ultrasound to the division's anesthesia and surgical critical care fellows at their weekly echocardiography conferences. Division members, specifically Drs. Achikam Oren-Grinberg, Akiva Leibowitz, and Somnath Bose, have also been involved in research for point-of-care ultrasound in critically ill patients.

Research in Acute Lung Injury and ARDS

While the division is active in many areas of research (see Research section), they are leaders in research in acute lung injury and acute respiratory distress syndrome (ARDS). The division was part of the National Heart, Lung, and Blood Institute's (NHLBI) Prevention and Early Treatment of Acute Lung Injury (PETAL) Network at the National Institutes of Health (NIH), a large multicenter collaborative examining interventions for patients at risk for ARDS that successfully completed five large multicentered randomized controlled trials that have positively impacted the care of ARDS patients world-wide. Drs. Daniel Talmor, Somnath Bose and Brian O'Gara help lead the Boston Clinical Center within this network. The division also investigates the use of respiratory mechanics (Drs. Daniel Talmor and Brian O'Gara) in treating ARDS patients, as well as the use of inhaled anesthetics to prevent lung injury (Drs. Brian O'Gara and Daniel Talmor). Results of the division's research not only add knowledge to the healthcare community but also inform and improve how the division cares for its critically ill patients. The division is also participating in PREVENT VILI (PREcision VENTilation to attenuate Ventilation-Induced Lung Injury), a multicenter randomized controlled trial investigating strategies to reduce ventilator-induced lung injury in critically ill patients.

ECMO

Due to the COVID-19 pandemic, there was an increasing need for extracorporeal membrane oxygenation (ECMO) for patients. Dr. Maurizio Bottiroli, Director of the VV ECMO Service, is active in researching the efficacy of veno-venous ECMO (VV-ECMO) and is also involved with research on the efficacy of extracorporeal cardiopulmonary resuscitation (ECPR), led by Dr. Ameeka Pannu. The Critical Care Division, along with the Division of Pulmonary Critical Care Medicine, currently provides a 24/7 ECMO consult service for the medical center. As the director of the ECPR service, Dr. Ameeka Pannu has been working to ensure that BIDMC participates in the Boston city-wide ECPR program which coordinates the transfer and cannulation of patients in cardiac arrest among participating medical centers in the city. Both the

Critical Care Service Trends

Critical Care	FY24	FY25	FY26 Projected
Encounters	6,651	7,567	7,336
Total Admissions	1,875	2,109	2,743
Procedures	686	884	688

VV-ECMO and ECPR services focus on developing protocols to facilitate efficient and appropriate use of these procedures.

Airway Team

Before the COVID-19 pandemic, the division had already been providing airway management and support for all the ICUs. When the pandemic first started, its members were designated as the intubating team for COVID-19 patients. As the pandemic progressed, "airway teams" consisting of certified registered nurse anesthetists (CRNAs) were formed to help manage intubations. Although the pandemic has now ended, the department continues to provide the critical service of emergent airway response for the hospital as well as back-up for the emergency department for difficult airways.

New Programs

CCU Coverage: The Division of Critical Care Medicine has provided intensivist coverage for heart failure patients in the Coronary Care Unit (CCU) for several years but has recently expanded this coverage to general cardiology patients in the CCU as well, in a joint effort with the Division of Pulmonary Critical Care Medicine.

Donor Care Center: In 2024, BIDMC opened a new Donor Care Center (DCC) on the West Campus in collaboration with New England Donor Services (NEDS). The three-bed DCC provides a dedicated environment for the care and optimization of patients who have been declared deceased by neurologic criteria and are potential organ donors. The center supports high-quality donor management and organ recovery while helping to alleviate capacity constraints in the hospital's ICUs. BIDMC's DCC is currently the only center of its kind in the New England/Boston region. The Anesthesia Department was integral to the successful development of the center, with Dr. Todd Sarge serving as Medical Director. The Critical Care Division provides 24/7 physician staffing for this specialized patient population and works closely with NEDS to optimize donor management and streamline the organ donation process.

Clinical Activities

The Critical Care Division provides care for critically ill patients in the following six physical ICUs at BIDMC:

Trauma Surgical Intensive Care Unit (TSICU): The TSICU is a nine-bed unit caring for trauma, thoracic, and acute-care surgery patients admitted largely through the emergency room. Intensivist coverage of this unit is shared 50% with the Division of Surgical Critical Care.

Surgical Intensive Care Unit (SICU): The SICU is an eight-bed unit caring for a variety of surgical patients, including transplant, hepato-biliary and general surgery. Similar to the TSICU, intensivist coverage of this unit is shared 50% with the Division of Surgical Critical Care.

Cardiovascular Intensive Care Unit (CVICU): The CVICU is a 15-bed unit caring for patients undergoing cardiac and vascular surgery. Additionally, post-cardiotomy patients supported via veno-arterial extracorporeal membrane oxygenation (VA-ECMO) as well as patients with severe respiratory failure supported by veno-venous ECMO are admitted to this unit. Intensivist coverage of this unit is solely provided by the Division of Anesthesia Critical Care.

Neurosciences Intensive Care Unit (Neurosciences ICU) A and B: The Neurosciences ICU recently expanded into two adjacent 8-bed units, with current staffing allowing for the care of 12 critically ill neurology patients and neurosurgical patients with plans for further expansion to full use of all 16 beds in the next year. These units are dedicated to the care of neuroscience patients. Intensivist coverage of this unit is shared with the Departments of Neurology and Surgery.

Coronary Care Unit (CCU): The CCU is a 10-bed unit caring for critically ill patients with a primary cardiac problem including heart attacks, heart failure and malignant arrhythmias. This unit includes



patients requiring mechanical circulatory support, including VA-ECMO (non-sternotomy), LVAD, Impella, and IABP. Intensivist coverage of this unit is shared with the Department of Medicine's Pulmonary Critical Care Medicine Division and employs a multi-disciplinary co-rounding model with the General Cardiology and Heart Failure services.

Other Clinical Services

Besides covering the six ICUs, the division provides an "ICU Float" service based on the West Campus of BIDMC. One anesthesia critical care attending is assigned to this service per weekday during the day. This service serves several important roles, including critical care response to airway emergencies, cardiac arrest and peri-arrest situations outside of the ICU, triage and optimization of workflow, surgical ICU bed allocation within the hospital, and critical care services to ICU-level patients admitted to the post-anesthesia care unit (PACU) during their perioperative course.

Additional clinical services provided by the division include:

- Airway management and support for all ICUs and floors on the West Campus
- Code coverage of the West Campus
- Anesthesia for tracheostomies in all ICUs
- Focused echocardiography support for in-hospital cardiac arrests using handheld ultrasound devices
- Coverage of the West Campus Post-Anesthesia Care Unit
- ECMO consults for respiratory failure (shared with the Division of Pulmonary Critical Care Medicine)

All surgical ICUs are semi-closed, and patients are cared for by multidisciplinary critical care teams. Below is our staffing model for the units at BIDMC.

Staffing Model for Surgical Intensive Care Units at BIDMC

Unit	Weekday Day	Weekday Night and Weekend*	
SICU	Attending critical care physician (anesthesia, emergency medicine, or surgery) Critical Care fellow (anesthesia or surgery) Dedicated house officers (anesthesia and surgery)	Attending critical care physician (anesthesia or emergency medicine) Critical care fellow (anesthesia or surgery)	Resident (anesthesia or surgery)
TSICU	Attending critical care physician (anesthesia, emergency medicine or surgery) Critical care fellow (anesthesia or surgery) Dedicated house officers (anesthesia and surgery)		Resident (anesthesia or surgery)
CVICU	Attending critical care physician (anesthesia or emergency medicine) Critical Care fellow (anesthesia or surgery) Nurse practitioner/physician assistant Attending cardiac surgeon		Nurse practitioner/ physician assistant
Neuro-sciences ICUs	Attending critical care physician (anesthesia, neurology or surgery) Critical care fellow (anesthesia, surgery or neurology) Resident (neurology) Nurse practitioner/physician Assistant		Nurse practitioner/ physician assistant
CCU	Attending critical care physician (anesthesia, or pulmonary critical care medicine) Critical care fellow (anesthesia) Dedicated house officers (internal medicine)	Attending critical care physician (anesthesia or pulmonary critical care medicine)	Resident (internal medicine)

*On weekends during the day:
- An additional surgery attending critical care physician covers the TSICU or SICU.
- An additional anesthesia attending critical care physician covers the CVICU and CCU.
- An additional anesthesia, surgery, or neurology attending critical care physician covers the Neurosciences ICUs.



- ECPR consults for emergent ECMO cannulation for cardiac arrests within the medical center

The division is also actively involved in the ICU coverage of our affiliate hospitals in the network. Since October 2012, the division has provided coverage for the critical care unit at BID–Plymouth. Since February 2016, the division has provided coverage for the critical care unit at BID–Milton. Since November 2020, the division has provided coverage and medical directorship for the critical care unit at BID–Needham. All three hospitals contain mixed medical-surgical ICUs and care for the wide variety of intensive care patients seen at a community hospital via different staffing models.

The ICU at BID–Plymouth is a closed 14-bed unit staffed 24/7 by an intensivist and a team of advanced practice providers. The ICU at BID–Milton is a closed eight-bed unit staffed 24/7 by an intensivist with overnight help from the hospitalist service at BID–Milton.

The ICU at BID–Needham is a closed seven-bed unit staffed 24/7 by an intensivist and a team of advanced practice providers. Dr. Somnath Bose serves as the medical director.

Education

The Division of Critical Care Medicine prioritizes education at all levels of undergraduate and graduate medical training with learners that include medical students, residents and fellows. Our Critical Care Anesthesia Medicine Fellowship program, directed by Dr. Jessica Cassavaugh, is highly competitive and accepts four fellows per year. In addition to trainee teaching accomplished through daily rounds and at bedside, the division also hosts robust multidisciplinary didactic programs. The division also actively participates in postgraduate education for division faculty and other physicians.

Leadership and Innovation

Over the past two years, the division has been involved in numerous faculty development and quality-improvement projects, including improvement and updates to the care of patients consented for Donation after Circulatory Death, improvement in Anesthesia to ICU handoffs, reduction/prevention of postoperative re-intubations, training for critical care advanced practice providers, faculty ultrasound education, and ICU volume and throughput initiatives. The division is also active in working with the MICU's and hospital leadership to reduce hospital acquired infections (HAIs), specifically CAUTIs and CLABSIs, to ensure the hospital is performing commensurate with national standards and metrics.

Our division faculty are also very active in hospital committee service and leadership roles. Dr. Ameeka Pannu is the Chair of the Hospital





Melissa Bowman, PA

Clinical Manager, Critical Care Advanced Practice Providers

Advanced Practice Providers

Dedicated nurse practitioners and other advanced practice providers (APP) are an integral part of the multidisciplinary critical care teams across the division's ICUs. They provide continuity of bedside care, participate in daily rounds and clinical decision-making, perform procedures, assist with care coordination and transitions, and contribute to quality improvement and education. Our APPs led by Melissa Bowman have dedicated roles in several of the ICUs, working closely with critical care attending physicians, fellows, residents, nurses, pharmacists, respiratory therapists, and other members of the multidisciplinary team. The division also supports the education and professional development of its advanced practice providers, including specialized training in critical care practice.

Critical Care Advanced Practice Providers

Katie Alwin, PA
Amanda Ariola, PA
Padmapriya Badri, NP
Gregory Brostke, NP
Hoai Croce, NP
Brianna DiTullio, NP
John Kenna, NP
Emma Louise Locke, NP
Margaret Lewerk, PA
Madeline Maline, PA
Curtis Monier, NP
Katherine Palmer, PA
Hannah Schwartzstein, NP
Sophia Singleton, PA
Patricia Wells, NP

Per Diem

Danielle Conroy, NP
Kevin Cornett, NP
Klarita Doci, PA
Emily Everett, NP
Rachel Harris,
Tory Larsen, NP
Sophia Mirageas, NP
Carmen Viudes, NP
Jena Wise, PA

Code Committee which is charged with providing excellent care of patients in cardiac arrest to ensure the hospital remains in compliance with the national AHA guidelines and metrics for patients suffering in-hospital cardiac arrest. Dr. Todd Sarge is a standing member of the Hospital Code Committee. Dr. Todd Sarge completed a six-year-term limit as chair of the Critical Care Executive Committee, which oversees all matters regarding the provision of intensive care across the medical center. Dr. Todd Sarge, Dr. Shahla Siddiqui and Melissa Bowman PA-C remain standing members of this committee. This committee reports directly to the Medical Executive Committee. Dr. Michael Cocchi from the Department of Emergency Medicine is the co-chair of the Quality Improvement Oversight Committee, a committee to assess and seek improvement for quality and safety in the hospital. Dr. Todd Sarge is also the chair for the Organ Donation Advisory Committee that works with our regional organ procurement organization, New England Donor Services (NEDS), to collaborate and ensure best practices are followed for critically ill patients near end of life with potential for organ or tissue donation. Additionally, Dr. Todd Sarge is a member of the steering committee and associate medical director for the Donor Care Center, developed and built in collaboration with NEDS to ensure optimal care and recovery of organs from potential organ donors in the New England region. Dr. Shahla Siddiqui is the co-chair of the hospital Ethics Advisory Committee which reviews consultative and educational activities across the hospital, and addresses any policy and systems issues identified through its activities. The Committee also oversees the activities and involvement of the BIDMC-wide network of Ethics Liaisons. Dr. Alan Lisbon is the chair of the Committee on Clinical Investigations (IRB) at BIDMC. Dr. Somnath Bose is the co-director of the Center for Humanizing the ICU at BIDMC and an Antimicrobial Stewardship Committee member.

See the research section of this report for critical care research projects, including several large multi-centered randomized controlled trials such as PREVENT VILI (PREcision VENTilation to attenuate Ventilation-Induced Lung Injury) and the Inhaled sedation versus propofol in respiratory failure in the ICU (INSPiRE-ICU2) trials.

Future Goals

In the spring of 2023, BIDMC opened its new inpatient building, the Klarman Building, where the hospital moved its Cardiovascular Intensive Care Unit (CVICU) and Coronary Care Unit (CCU) from the Rosenberg Building. The movement of Cardiology and Cardiac Surgery services out of the Rosenberg and Farr buildings opened space for the expansion of other critical care service lines including a new Medical ICU (2023) and additional Neurosciences ICU space (2026). The continued development of these critical care spaces will allow the division to expand capacity and support the evolving needs of critically ill patients across the medical center.

Building on the success and expansion of the Klarman Building, the medical center entered into an agreement with the Dana-Farber Cancer Institute to merge and develop a collaborative partnership that will include all aspects of adult cancer care, building on each organization's legacy of excellence with compassion, innovative research, and world-class patient care. The collaboration will involve coordination among many stakeholders throughout the medical center and network, including Anesthesia Critical Care services.



Pain Medicine



Viet L. Cai, MD

Acting Division Director, Pain Medicine

Instructor in Anaesthesia



Brus Guerrier, BSN, MBA, MASc

Director of Clinical Operations, Arnold Warfield Pain Management Center

Nursing Staff

Brad Manuel, PA
Katie Boyle, RN
Katie Campbell, NP
Joanne Cullen, RN
Susan Dwyer, RN
Patti Smith, RN
Katrina Robertson, NP
Mimi Sogoba, NP
Amanda Wright, NP
Linda York, BSN, MSN, NP, RN

We thank Dr. Sanjeet Narang for his two years of service as Vice Chair for Pain Medicine. His leadership and contributions have supported the continued development of the department's pain medicine program.

The William Arnold – Carol A. Warfield Pain Mangement Center (AWPC) offers compassionate, comprehensive, state-of-the-art care for patients with complex chronic pain. The center is also at the forefront of pain medicine research and has a highly regarded pain medicine fellowship, promoting intellectual curiosity and a passion for pain medicine among our clinicians. Our guiding principle is to do our best to help our patients while training leaders in the field of pain medicine.

Pain medicine at BIDMC and across our community hospitals is directed by Acting Division Director for Pain Medicine, Dr. Viet Cai. Our clinical staff includes anesthesiologists, neurologists, physiatrists, nurse practitioners, pain fellows, anesthesia residents, and a dedicated team of nurses. Our multidisciplinary care team works closely with primary care physicians to provide evidence-based, safe, patient-centered care, including opioid consultation and counseling. We coordinate care among radiology, physical therapy, and surgical teams to ensure comprehensive, high-quality care. We treat challenging patients with multiple comorbidities and a wide spectrum of pain disorders, including musculoskeletal pain, cancer pain, visceral pain, headaches, neuropathic pain syndromes, and other complex chronic pain conditions.

Our center conducts ongoing quality assurance efforts to ensure that our care and training meet the highest standards based on current evidence in the field. Over the past several years, we have developed screening protocols and treatment pathways for pain procedures. Our faculty serve on key BIDMC committees addressing clinical and ethical issues in pain medicine, including the Interventional Procedure Committee, Radiation Safety Committee, Opioid Care Committee, and Perioperative Substance Abuse Committee. Faculty also participate in the annual GME Pain Fellowship Program Committee.

Our center has continued to grow in patient volume, number of sites, and services offered. This growth has included re-establishing the Comprehensive Headache Center under the direction of Dr. Sait Ashina and expanding to the sixth floor at One Brookline Place. Our physician staff has grown alongside the expansion of BIDMC clinical services into the community. We added four new pain specialists, and together our providers offer comprehensive, individualized care, totaling more than 28,000 visits in the past year. We now see patients at BIDMC locations throughout the greater Boston area, including the Spine Center, Chestnut Hill, Chelsea, BID–Milton, BID–Needham, and BID–Plymouth.

Areas of Excellence

Our fellowship program, directed by Dr. Jyotsna Nagda, is highly competitive and focuses on comprehensive, interdisciplinary, collaborative training in the treatment of acute, chronic, and cancer pain. Our faculty collaborate with numerous disciplines, including the Spine Center, neurology, orthopedics, oncology and palliative care, gynecology, urology, and gastroenterology. Dr. Nagda is a member of the Beth Israel Endometriosis and Complex Pelvic Pain team as well as the Intimate Health and Wellness team, working closely with these programs to provide multidisciplinary care for patients with challenging abdominal and pelvic pain.

Clinical and basic science research in chronic pain and headache medicine continues to receive support from federal and corporate sources.



Clinical Procedure Areas

Many of our patients have seen multiple physicians before reaching our clinic. We approach these patients with advanced treatment options while recognizing and addressing the complex physical and emotional challenges of living with chronic pain.

We treat patients with multiple comorbidities, including neck and back pain, cancer-related pain, osteoporosis, abdominal and pelvic pain, and many other chronic painful medical conditions. Our Comprehensive Headache Center provides diagnosis and treatment, basic science research, clinical trials, and educational resources for a wide spectrum of headache disorders. We use traditional and integrated treatment options, including Botox injections, nerve blocks, implantable therapies, medication management, and other complementary modalities.

Treatment modalities at the Arnold – Warfield Pain Management Center include:

- Nerve injections, blocks, and ablation therapy
- Comprehensive headache care, including Botox
- Implantable therapies, including spinal cord stimulators, peripheral nerve stimulators, and intrathecal drug delivery systems
- Advanced spine treatments, including vertebral augmentation and minimally invasive spine procedures
- Psychological counseling, meditation, and biofeedback

Service Trends

Following the creation of Beth Israel Lahey Health, we focused on establishing a pain network across multiple hospitals and stand-alone clinics in the greater Boston area. Pain services in the community have grown and been integrated onto a common platform, particularly at BID–Needham, BID–Milton, and BID–Plymouth. In the coming year, BID–Needham will expand to offer five-day physician coverage, including expanded implantable pain therapies.

Increased utilization of telehealth has expanded our reach to patients across Massachusetts, allowing patients to be evaluated and managed remotely and increasing access to care in underserved locations.

New Programs

We plan to expand collaboration with oncology and palliative care to provide interdisciplinary care for patients with cancer-related pain, including through our partnership with Dana-Farber Cancer Institute. We have also started offering interventional cancer pain management options at Mt. Auburn hospital and plan to continue increasing the collaboration there in the future.

Research

Pain medicine research is a vital component of our enterprise, particularly through the groundbreaking contributions of Drs. Jatinder Gill and Thomas Simopoulos. Their work on fluoroscopic techniques for visualizing the spine has influenced the specialty and contributed to techniques now widely used in clinical practice. Drs. Gill and Simopoulos also continue to explore novel therapeutic approaches, including chemical and electrical therapies, spinal cord stimulation, and approaches to better understand pain pathways. They are also involved in developing new tools for the treatment of spinal conditions and studying outcomes of current therapies.

The Headache Center Research

Group, under the direction of Dr. Rami Burstein, is deeply involved in studying the pathophysiology of chronic headache and developing novel strategies to treat migraine and other headache syndromes. ❑



Nurse Anesthesia



Patricia O'Connor, CRNA
System Chief CRNA







The Division of Nurse Anesthesia, directed by System Chief CRNA Trish O'Connor, comprises 130 skilled and compassionate certified registered nurse anesthetists (CRNAs) who demonstrate unwavering dedication to patient care. Over the past several years, the division has grown along with the expansion of our department. Working within a care team model, our nurse anesthetists provide perioperative anesthesia care for patients undergoing procedures across many subspecialties throughout the medical center and community settings.

In addition to their clinical roles, our CRNAs are committed to education and training. They serve as clinical instructors for student nurse anesthetists training throughout our network and actively contribute to nursing and medical student education, as well as MedFlight airway training. CRNAs also participate in a wide variety of hospital and department committees, including the Clinical Affairs Committee, Quality and Safety Improvement (QSI), Community Engagement, the Perioperative Education Committee, and the Advanced Practice Nursing Committee.

Areas of Excellence

The Boston College Nurse Anesthesia Program is a collaboration between the Boston College Connell School of Nursing and Harvard Medical Faculty Physicians (HMFP). Under the guidance of Program Director Susan Emery, PhD, CRNA, and Assistant Program Director Caitlin Vitale, PhD, CRNA, the program has continued to thrive and expand. The recent addition of clinical faculty members and CRNAs Sarah Hayden, Megan Clancy, Kate Evangelista, and Laura Parisi has further strengthened this collaboration. CRNA faculty members teach in both the classroom and operating room. This integration creates a cohesive program and strengthens the bridge between the School of Nursing and our CRNA clinical preceptors.

Clinical Procedure Areas

We have grown to 60 CRNAs at BIDMC and 70 CRNAs practicing in our community settings, including BID–Needham, BID–Milton, BID–Plymouth, Anna Jaques Hospital, Mount Auburn Hospital, and New England Baptist Hospital. We anticipate further growth in the coming years as we recruit CRNAs to join our team.

Our CRNAs function primarily in a clinical role within the department, supporting our mission by providing efficient, high-quality care for patients undergoing a wide range of procedures. They work within a team care model that has proven highly effective in providing perioperative care for patients at all acuity levels and across many subspecialties. Over the past two years, our work has focused on streamlining communication among care teams and other clinical staff, standardizing clinical practice protocols across sites, and creating a more integrated CRNA group within the department. The result is a clinically excellent and cohesive team that works together to provide reliable coverage for a high-volume practice caring for many critically ill patients undergoing complex procedures.

Global Health Education

Our CRNA division continues to support our partnership with the Boston-Africa Anesthesia Collaborative (BAAC). This important global health initiative works with partners in Liberia to build an in-country, Liberian-led nurse anesthesia school and increase the capacity for trained anesthesia professionals to provide safe anesthesia care. Our CRNAs actively participate in online continuing education programs and monthly transnational virtual grand rounds. The program also sponsors visits by Liberian CRNA faculty to Boston for training, as well as visits by our department CRNAs to Liberia for teaching and collaboration. BAAC is described in further detail in the Global Health section of our Education Division. ❑

Longwood Specialty Physicians: Strong Teams, Lasting Connections.

Great people, genuine camaraderie, and exceptional care across our community hospitals.

















Aileen Starnbach, MD
Vice Chair, Network Anesthesia
Site Chief, Mount Auburn Hospital
Instructor in Anaesthesia

Community Anesthesia

Since 2014, the Department of Anesthesia has expanded beyond BIDMC to provide anesthesia services across six community hospitals: Anna Jaques Hospital, Beth Israel Deaconess Hospital–Milton, Beth Israel Deaconess Hospital–Needham, Beth Israel Deaconess Hospital–Plymouth, Mount Auburn Hospital, and New England Baptist Hospital. Together, these hospitals extend the department's clinical, educational, and perioperative expertise across the Beth Israel Lahey Health network and the communities we serve.

Anna Jaques Hospital



Katherine Bourne, MD
Site Chief, Anna Jaques Hospital

Anna Jaques Hospital is a 120-bed community hospital located 40 miles north of Boston. The Department of Anesthesia provides care across five operating rooms, interventional radiology and cardiology, four endoscopy suites, and the Comprehensive Pain Center, with 24/7 in-house anesthesia coverage for more than 700 deliveries annually. Our volume has grown year-over-year, and this year our anesthesia clinicians provided care for over 10,000 cases across a broad range of surgical specialties, including orthopedics, general surgery, OB/GYN, urology, plastic surgery, breast surgery, podiatry, and ENT.



Orthopedics remains an important area of growth, with a large volume of total and partial joint replacements, many performed using the Mako robotic system. Most surgical procedures at Anna Jaques are performed on an outpatient basis, including most total joint replacements and most hysterectomies. The department continues to support enhanced recovery through preoperative nutrition and hydration, multimodal analgesia, and balanced anesthetic techniques.

Anna Jaques received an "A" Hospital Safety Grade from The Leapfrog Group in its spring 2026 review, and the Birth Center is certified Baby-Friendly, reflecting the hospital's continued commitment to safe, high-quality care for the community.

Beth Israel Deaconess Hospital–Milton



Victoria Derevianko, MD
Site Chief, BID–Milton
Instructor in Anaesthesia

Beth Israel Deaconess Hospital–Milton (BID–Milton) is a 100-bed community hospital located eight miles south of Boston, with eight operating rooms, four endoscopy suites, an eight-bed intensive care unit, and 24-hour emergency and surgical services. The Department of Anesthesia brings together anesthesiologists, intensivists, nurse anesthetists, pain medicine specialists, and nurse practitioners to provide patient-centered, team-based care throughout the hospital, including the operating rooms, endoscopy suites, ICU, Pain Clinic, and Pre-Admission Testing Clinic.



Orthopedic surgery is a particular area of strength, accounting for approximately 40% of operating room volume and ranging from sports medicine procedures and primary total joint replacements to complex joint revisions. The department has developed an expansive regional anesthesia program, including peripheral nerve blocks for orthopedic procedures, to improve the patient experience, facilitate recovery, and reduce length of hospital stay. The department also provides anesthesia for general surgery, gynecology, spine surgery, otolaryngology, plastic surgery, podiatry, and urology.

BID–Milton's team-based model brings anesthesiologists and nurse anesthetists

together in the operating rooms and endoscopy suites, with physicians regularly working alongside nurse anesthetists. Both anesthesiologists and nurse anesthetists participate in hospital-wide perioperative initiatives, including the Surgical Steering Committee, Robotic Steering Committee, and Orthopedic Steering Committee. The endoscopy service remains a major component of the hospital's procedural volume, averaging approximately 6,000 procedures annually.



Soumya Mahapatra, MD
Site Chief, BID–Needham
Assistant Professor
(Part Time) in Anaesthesia

Beth Israel Deaconess Hospital–Needham

Beth Israel Deaconess Hospital–Needham (BID–Needham) is a 73-bed community hospital in the Beth Israel Lahey Health (BILH) network located 11 miles south of BIDMC. The surgical pavilion features a state-of-the-art, open-concept pre-anesthesia holding area and post-anesthesia care unit (PACU), along with six operating rooms. In addition, the recently built outpatient clinical center houses four endoscopy suites with pre-procedure and recovery bays.

Our operating rooms handled 2,861 cases in 2025, and we are on track to surpass that volume in 2026. During 2025, we dramatically expanded our group of gynecologic surgeons and more than tripled our volume of gynecologic surgeries, including urogynecology. The addition of a full-time orthopedic trauma surgeon allows us to treat more of these patients in the community where they live rather than transferring them to BIDMC.

Our student registered nurse anesthetist (SRNA) training program at BID–Needham began in 2022. We serve as an introductory training site for up to three SRNAs during the first few months of their training and welcome them back later in their training to develop regional anesthesia skills. All three trainees in our inaugural class joined our CRNA team at BIDMC and BID–Needham after graduation. This is a testament to the strength of our program, as most of our SRNAs choose to remain within the BILH system after graduation. BID–Needham has continued its tradition of training SRNAs from both Boston College and Northeastern University, and we are proud that Needham remains one of the most popular training sites for our SRNAs.



At BID–Needham, we are proud of our experienced and highly qualified anesthesia providers. Our staff also practice at the main BIDMC campus and regularly care for critically ill patients undergoing complex surgeries, as well as those having routine elective procedures. Needham anesthesiologists participate in leadership throughout the HMFP anesthesia group, including as site chiefs, division directors, and clinical administrators. We are also privileged to have CRNAs who serve as leaders in departmental administration and education. Our staff includes clinicians with postgraduate doctoral degrees and fellowship training in anesthesia subspecialties, as well as a culturally diverse group with international clinical experience. Our dedicated and caring staff is our greatest strength at Needham.

Over the past year, BID–Needham has continued to expand its surgical and procedural capabilities. The addition of orthopedic trauma services has allowed the hospital to care for increasingly complex, long-duration, and unscheduled orthopedic cases locally, reducing the need for transfers to BIDMC while increasing late-call and pager-call demands on the anesthesia team. We also introduced the da Vinci 5 robotic surgery system. The opening of a new endoscopy procedure room in fall 2025 expanded our capacity to meet the community's growing need for colonoscopy and other endoscopic procedures. The Dana-Farber Cancer Institute collaboration with BIDMC has further strengthened cancer care across the BILH network, including at BID–Needham, and has expanded access to breast cancer surgical expertise in the community.

Our collegial relationships with surgeons, perioperative nurses, and other clinicians and staff remain central to the culture of anesthesia at Needham. Patient safety guides our discussions, decisions, and perioperative planning, with open communication and a shared commitment to ensuring that every member of the care team can raise concerns and contribute to improving care. Across the department, our common goal remains the same: to provide safe, high-quality, efficient care to every patient we serve.



Erin Burns, MD
Site Chief, BID–Plymouth

Beth Israel Deaconess Hospital–Plymouth

Beth Israel Deaconess Hospital–Plymouth (BID–Plymouth) is a 175-bed community hospital located 43 miles south of Boston in historic Plymouth, Massachusetts. The BID–Plymouth Department of Anesthesia works closely with BIDMC, our tertiary-care partner hospital in Boston, to provide comprehensive anesthetic and pain management care. The department comprises seven physicians, 21 CRNAs, and several nurse practitioners who provide care in pre-admission testing and chronic pain management.

Anesthesia care is provided throughout the hospital, including the operating rooms, Birthing Center, Pain Management Center, cardiovascular laboratory, endoscopy suites, interventional radiology, critical care unit, and emergency department. Anesthesiologists are available in the hospital 24 hours a day to meet the urgent and emergent needs of the growing South Shore community.



BID–Plymouth continues to expand its surgical and procedural capabilities. In 2025, the hospital performed more than 700 deliveries and continued to provide a broad range of orthopedic and sports medicine services, including joint replacements and complex spine surgery. Two Mako robotic systems are used for joint replacement surgery, and the hospital recently added a da Vinci robotic surgery system. BID–Plymouth also received recertification as a Joint Commission Center for Excellence in Orthopedics. More than 80% of joint replacements are performed on an outpatient basis, making BID–Plymouth a network leader in outpatient joint replacement care. Many of these procedures will transition to the new BILH outpatient orthopedic ambulatory surgery center, a four-room facility scheduled to open in the second half of 2026.

Regional anesthesia and multimodal pain management remain important components of the department's clinical practice. The team routinely uses ultrasound-guided nerve blocks, including adductor canal and genicular blocks for total knee arthroplasty and pericapsular nerve group blocks for hip arthroplasty. Regional and multimodal, opioid-sparing techniques are also used for abdominal, breast, and orthopedic procedures when appropriate. These approaches support excellent postoperative pain control while minimizing opioid requirements

The department also oversees the Pre-Admission Testing Center and has adopted evidence-based guidelines for preoperative testing. A multidisciplinary preoperative risk-stratification program for joint arthroplasty patients is being developed to improve the care of patients with more complex medical needs. BID–Plymouth has also collaborated with the Commonwealth of Massachusetts on an early-intervention program for patients presenting to the emergency department after a drug overdose, extending support beyond discharge and reinforcing the importance of thoughtful opioid prescribing and pain management.

The department's strong team-based approach is central to its success. Anesthesiologists, CRNAs, nurse practitioners, and colleagues across the hospital work collaboratively to provide safe, efficient, and compassionate care. As BID–Plymouth continues to grow, including the expansion of emergency services and the addition of new surgical and robotic capabilities, the Department of Anesthesia remains committed to teamwork, inclusion, respect, and excellent patient care.

Community Anesthesia

Service Trends	FY22	FY23	FY24	FY25	FY26
Anna Jaques	8,884	9,313	9,544	9,918	10,064
BIDMC - Milton	10,766	11,164	12,716	12,828	13,797
BIDMC - Needham	12,488	13,763	11,623	13,219	14,384
BIDMC - Plymouth	20,299	23,394	20,868	20,432	21,399
Mount Auburn	12,889	15,022	16,284	18,208	18,597
New England Baptist	8,977	8,940	9,015	8,833	8,036



Aileen Starnbach, MD
Vice Chair, Network Anesthesia
Site Chief, Mount Auburn Hospital
Instructor in Anaesthesia



Mount Auburn Hospital

Founded in 1886 as the first hospital in Cambridge, Massachusetts, Mount Auburn Hospital is a 217-bed teaching hospital affiliated with Harvard Medical School and a tertiary hub within the Beth Israel Lahey Health system. Located four miles from BIDMC, Mount Auburn provides comprehensive inpatient and outpatient care across a broad range of medical and surgical specialties. Our anesthesia team provided care for approximately 18,208 cases in 2025, an increase from 16,284 cases in 2024.

Mount Auburn is also an important clinical training site. We host five to six student registered nurse anesthetists each month from the Boston College Nurse Anesthesia Training Program and typically host a senior BIDMC anesthesia resident each month.

Our anesthesia team is distinguished by a strong culture of teamwork, inclusiveness, and mutual respect. Physicians and CRNAs work closely with our surgical, nursing, and administrative colleagues to provide excellent patient care, develop new care pathways, and advance pain management strategies. This collaborative approach also helps our operating rooms and procedural areas run efficiently and smoothly. We are proud of the expertise and dedication our clinicians bring to Mount Auburn and of the relationships we have built across the hospital community.



Samir Patel, MD
Site Chief, New England Baptist Hospital



New England Baptist Hospital

New England Baptist Hospital (NEBH), located a half mile from BIDMC in Boston, is a nationally recognized orthopedic subspecialty hospital dedicated to restoring function and improving the lives of patients with musculoskeletal conditions. With 80 staffed beds and 16 operating rooms, NEBH performs approximately 13,500 cases annually, including 6,500 total joint replacements, 2,000 spine surgeries, and more than 5,000 sports medicine and outpatient procedures. The Anesthesiology Department provides comprehensive perioperative care with an emphasis on evidence-based anesthetic techniques, optimal pain management, and rapid recovery.

The department has made significant progress in expanding neuraxial and regional anesthesia. Regional anesthesia is now used in more than 90% of hip surgeries. Our preoperative nerve block service is supported by an extensive database that allows us to evaluate outcomes and continually refine our practice.

Quality improvement remains a central focus of the department. Recent initiatives include standardizing perioperative anticoagulation management according to American Society of Regional Anesthesia (ASRA) guidelines; developing a cardiac implantable electronic device (CIED) management pathway spanning the operating room, PACU, and inpatient units; implementing lidocaine and ketamine infusion protocols to support opioid-sparing pain management in major spine surgery; evaluating low-dose spinal anesthesia techniques and their effects on syncope and time to ambulation; integrating high-flow nasal cannula oxygen therapy into every operating room; and implementing the Belmont Rapid Infusion device for massive transfusion management.

NEBH is also an important clinical education site. The department works closely with the Boston College Nurse Anesthesia Training Program and typically hosts two student registered nurse anesthetists at a time. We also provide an anesthesia clerkship for Tufts University medical students and serve as a clinical site for BIDMC regional anesthesia residents and fellows, who rotate through our busy preoperative nerve block service.

Our strength comes from a talented team of physicians and CRNAs who provide expert, compassionate care in a welcoming, inclusive, and respectful environment. Through collaboration, education, and continuous quality improvement, we remain committed to advancing perioperative care and improving outcomes for our patients. ❑

Hospital Services and Organization



Joan Spiegel, MD
Director of Pre-Admission Testing
Assistant Professor of Anaesthesia

PAT NP Team

Joelle Chateauneuf, NP
Joyce Larson, NP
Ginny Sheppard, NP
Eileen Stuart-Shor, NP, PhD
Jennifer Webster, NP

Pre-Admission Testing

The BIDMC Pre-Admission Testing (PAT) unit, directed by Dr. Joan Spiegel, MD, provides comprehensive perioperative evaluation and preparation for patients undergoing surgery and procedures at BIDMC. The multidisciplinary team includes anesthesiologists, perioperative advanced practice providers, nurses, case managers, physical therapists, medical assistants, and administrative staff. Services include medical evaluation, laboratory testing, electrocardiography, medication management, patient education, and targeted physical therapy assessments.

The PAT team's mission is to ensure that patients are appropriately prepared for anesthesia and surgery while identifying and addressing medical issues that could affect perioperative care. The team reviews patients' medical histories, coordinates necessary testing and consultations, provides individualized recommendations, and helps patients understand what to expect before and after their procedure. This comprehensive approach promotes patient safety, efficient surgical scheduling, and a patient-centered perioperative experience.

Dr. Spiegel works closely with surgical and medical teams to advance the quality, efficiency, and coordination of preoperative care.

Areas of Excellence

The PAT clinic brings an evidence-based approach to perioperative evaluation and optimization. The team works closely with surgical services and other clinical partners to develop and implement standardized pathways that improve patient safety, readiness for surgery, and the overall patient experience.

PAT clinicians contribute to Enhanced Recovery After Surgery (ERAS) initiatives and have developed and refined clinical pathways addressing conditions and medications that can significantly affect perioperative management, including diabetes, cardiac implantable electronic devices, opioid use disorders, anticoagulation, and postoperative nausea and vomiting (PONV).

Service Trends

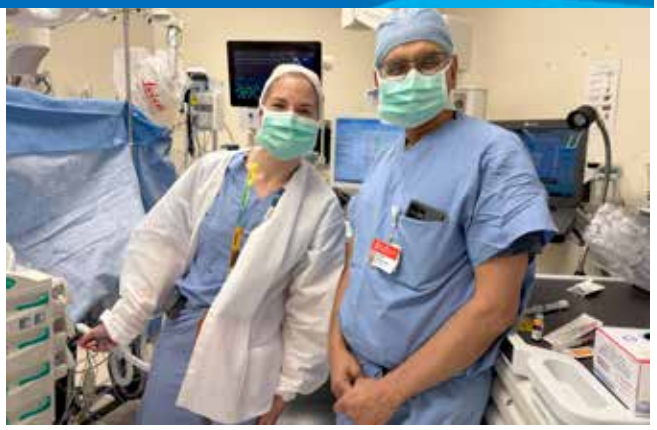
BIDMC's Pre-Admission Testing service continues to support a high-volume, complex surgical practice through a combination of in-person and remote evaluation. The service continues to refine workflows to match patient needs and surgical volume while maintaining timely completion of required evaluations and testing.



The PAT team continues to adapt its model to support the increasing complexity and volume of BIDMC's surgical services while maintaining a focus on safety, efficiency, and patient experience.

New Programs

The PAT group has updated practice-management guidelines for patients with diabetes, cardiac implantable electronic devices, and opioid use disorders. The team also coordinates perioperative anticoagulation



management for surgical patients across the institution, extending this expertise beyond patients who are seen directly in PAT.

Additional work has focused on ERAS pathways and the refinement of clinical protocols for perioperative anticoagulation and PONV. Pre-anesthesia orders have also been revised to incorporate current evidence and evolving clinical guidelines.

Education

Resident education is an important component of the PAT mission. Clinicians work with residents and other trainees on preoperative evaluation and risk assessment, including the perioperative management of cardiovascular and pulmonary disease, cardiac implantable devices, diabetes and other endocrine disorders, opioid and substance use disorders, psychiatric conditions, and anticoagulation.

PAT clinicians also contribute to departmental education and assist with recruitment of patients for clinical research studies. The service remains committed to using the preoperative encounter as an opportunity for clinical teaching while ensuring that patients are appropriately optimized and prepared for surgery.

PACU

The Post-Anesthesia Care Units (PACUs) at BIDMC provide high-acuity care for patients recovering from anesthesia and procedural interventions. The transition from anesthesia to wakefulness is a critical period during which patients may require close monitoring and management of airway and respiratory function, hemodynamics, neurologic status, pain, nausea, and other postoperative complications. Highly trained PACU nurses, supported by the Department of Anesthesia, Critical Care and Pain Medicine, provide comprehensive care during this transition and facilitate safe discharge to home, transfer to inpatient units, or escalation to higher levels of care when needed.

The PACU also supports patients throughout the perioperative period, including pre-procedure preparation and the placement of invasive lines, neuraxial and regional anesthesia techniques, and other interventions when appropriate. PACU clinicians work closely with anesthesiologists, surgeons, nurses, and other members of the perioperative team to ensure continuity of care.

BIDMC has two PACUs on the East Campus and one PACU on the West Campus. Additional procedural areas provide post-anesthetic recovery for patients undergoing anesthesia and monitored anesthesia care, including gastrointestinal procedures, interventional cardiology and electrophysiology procedures, transesophageal echocardiography (TEE), and electroconvulsive therapy (ECT).

The Department of Anesthesia, Critical Care and Pain Medicine plays a central role in the clinical management of the PACUs. Attendings and trainees routinely evaluate and treat postoperative conditions and complications and participate in the development of multidisciplinary policies and guidelines that promote safe and effective recovery care.

The PACUs also serve as important educational environments for medical students, residents, fellows, and other trainees. In contrast to the operating room, where trainees often focus on intraoperative physiologic signs, the recovery environment provides opportunities to develop skills in the assessment and management of postoperative symptoms and complications. PACU faculty and staff also participate in quality improvement and research initiatives focused on perioperative care.

Anesthesia Skills Laboratory

The Anesthesia Skills Laboratory is led by **Robina Matyal, MD**, Vice Chair for Education and Director of the Center for Education Research, Technology, and Innovation (CERTAIN), with
Aiden Sharkey, MD, Associate Director (Clinical), CERTAIN. The laboratory provides a dedicated environment for individual and group skills training for residents, fellows, faculty, and other members of the perioperative team.

Located on BIDMC's East Campus, the laboratory supports hands-on procedural training, simulation, independent study, small- and large-group instruction, videoconferencing, and live-streamed educational activities. The space includes networked computer workstations, part-task trainers, mannequin-based simulation equipment, and flexible areas for small-group teaching and skills practice.

The laboratory has also incorporated emerging technologies into anesthesia education, including virtual and augmented reality platforms. These resources provide trainees and faculty with access to novel simulation and mixed-reality learning environments that complement traditional hands-on training.

Code Teams

The Department provides 24/7 coverage for airway management and resuscitation throughout the medical center.

On the West Campus, the Critical Care Division provides primary coverage for urgent and emergent airway management, including patients in the intensive care units, inpatient areas, and procedural locations. The Critical Care Division also triages and manages patients with cardiac arrest who may require extracorporeal support.

Dr. Ameeka Pannu has served as Chair of the Medical Center's Code Blue (Resuscitation) Committee since January 2024. . ❑



Ashley A. Lowery, RN, AGNP-BC

Clinical Manager, Anesthesia Advanced Practice Providers

Periop Team

Alexandra Alioto, NP
Elisabeth Baker, NP
Bidisha Bhattacharya, NP
Gianna Bozzetti, NP
Erin Brashear, NP
Corine Buurman, BSN, MSN
Ashley Cakridas, NP
Jennifer Crane, NP
Kimberly Drucker, NP
Gretchen Grossheim, MSN, NP
Julie Harris, NP
Ina Harten, NP
Bryar Hasenjaeger, NP
Emily Keegan, NP
Laura Kenney, NP
Jake Laghetto, NP
Sheila McNaught, BSN, MSN, NP
Yun Park, NP
Janet Pelerossi, NP
Teresa Rogers, NP
Ann Thomas, NP
Peguy Philemon, RN

Per Diem

Ceara Conley, NP
Jean Donovan, MSN, NP

GI Team

Emily Diezeman, NP
Emilia Evans, NP
Josie Mattsson, NP
Laura Ricercato, NP
Alison Rogg, NP

PAT Team

Joelle Chateauneuf, NP
Joyce Larson, NP
Ginny Sheppard, NP
Eileen Stuart-Shor, NP, PhD
Jennifer Webster, NP

Perioperative Advanced Practice Providers

The Division of Perioperative Anesthesia Advanced Practice Providers (APPs), directed by Clinical Manager **Ashley A. Lowery, RN, AGNP-BC**, comprises 33 nurse practitioners and one registered nurse. Perioperative APPs collaborate with multidisciplinary teams throughout the medical center to provide safe, efficient, and high-quality pre- and post-anesthesia care.

In addition to their clinical responsibilities, Perioperative APPs are deeply committed to education, both as learners and educators. Many serve as preceptors for students and hold adjunct faculty appointments at universities throughout the Boston area. The team also participates in a broad range of hospital and departmental initiatives, including the Clinical Affairs Committee, Quality and Safety Improvement (QSI), Community Engagement, Resident Education, the Boston-Africa Anesthesia and Critical Care Collaborative, Perioperative Excellence Committees, and the Advanced Practice Nursing Committee.

Clinical Procedure Areas

Over the past two decades, the Perioperative APP team has grown from a single registered nurse assisting in the holding areas to a team of more than 30 nurse practitioners. Collectively, the team provides coverage across nine clinical areas, including Pre-Admission Testing, GI3, GI4, the West Procedural Center, Cardiovascular, ECT, the Regional and Acute Pain Service, and East Campus holding areas and PACUs.

APPs provide cross-coverage across multiple practice areas, fostering collaboration, operational flexibility, and a broad departmental perspective. As clinical services continue to expand, including through the Department's collaboration with Dana-Farber Cancer Institute, the team anticipates continued growth in both clinical responsibilities and staffing.

New Programs

In response to increasing patient volume, higher acuity, and prolonged recovery times, the APP team identified a need for extended evening coverage. A pilot program was developed in which nurse practitioners extended patient care coverage into the evening hours on the East Campus. Based on results, the extended evening coverage model has been permanently implemented. ❑



Global Health



Edward Clune, MD

Director of Global Health

Instructor in Anaesthesia



Shweta Yemul Golhar, MBBS, MD, FASE, FACC

Director of Global Health Education

Cardiac and Critical Care Anesthesiologist

Instructor in Anaesthesia

Strategic Impact

The Division of Global Health extends the Department's mission beyond institutional and national boundaries. Through enduring partnerships and innovative educational models, the program:

- Expands access to safe perioperative and critical care.
- Builds sustainable local training capacity.
- Creates meaningful global health experiences for faculty and trainees.
- Promotes collaborative research and scholarly exchange.
- Advances health equity and systems improvement worldwide.

The Department of Anesthesia, Critical Care and Pain Medicine is committed to advancing global health equity through education, clinical training, research, and strategic partnerships that strengthen perioperative and critical care systems in resource-limited settings. Through sustainable collaborations with institutions and clinicians around the world, the Division of Global Health works to expand access to safe anesthesia, surgery, and critical care while fostering bidirectional learning and innovation.

Leadership

Dr. Edward Clune founded the Department's Botswana Global Health Program and leads the Division of Global Health. He has developed a comprehensive strategy to advance global health equity through education, research, and sustainable international partnerships. Under his leadership, the Division has expanded its work across Africa, Asia, and Latin America, with a focus on workforce development, systems strengthening, and innovative approaches to improving access to safe perioperative and critical care.

Dr. Clune joined the Department in 2017 and subsequently spent six years working in Botswana through the Botswana-Harvard Partnership, dedicating most of his time to building local anesthesia and critical care capacity and helping establish the country's first anesthesia residency training program.

Dr. Shweta Yemul Golhar leads the educational initiatives of the Division of Global Health, with a focus on developing innovative and scalable training programs for clinicians in resource-limited settings. Her work includes the Virtual Distance Learning Point-of-Care Ultrasound (POCUS) Curriculum in India, which provides structured remote instruction and mentorship to anesthesia providers. She also supports the development of new educational partnerships and expansion of the Department's global health portfolio through curriculum design, faculty engagement, and international collaboration.

Mission

Advance universal access to safe perioperative and critical care through education, research, and policy collaboration.

Vision

To contribute to the equitable provision of high-quality perioperative and critical care for patients worldwide, particularly in low-resource and limited-capacity settings.

Core Values

Access to perioperative and critical care is a universal human right. Strong partnerships require humility, mutual respect, and reciprocity. Healthcare is a moral undertaking that embodies dignity, justice, compassion, and equitable access.

Geographic Areas of Engagement

The Division of Global Health currently supports educational, clinical, and research collaborations in Botswana, Liberia, India, China, Pakistan, Bolivia, and Kenya. Additional partnerships are under development as the program continues to expand its global reach. ❑



Catriona L. Stewart, MbChB, FRCA

Director of Anesthesia, Scottish Livingston Hospital, Botswana, Africa

Instructor in Anaesthesia



Eileen Stuart-Shor, PhD, ANP, FAAN

Director, Boston–Africa Anesthesia and Critical Care Collaborative (BAAC)

2026 ANAMASS Living Legend in Massachusetts Nursing

Nurse Practitioner, PAT



Signature Programs

Botswana Global Health Program:



Founded in 2017 by Dr. Edward Clune, the Botswana Global Health Program partners with the Botswana Ministry of Health, and the Botswana-Harvard Partnership. The program provides educational opportunities for BIDMC residents and fellows while strengthening local capacity in anesthesia and critical care.

A major milestone was the co-founding of Botswana's first anesthesia residency program in 2020, which graduated its inaugural class of locally trained anesthesiologists in 2024. This program represents a transformative investment in workforce development and long-term healthcare sustainability.

The program also supports structured elective rotations for senior anesthesia residents and critical care fellows, offering immersive four-week global health experiences in resource-limited clinical environments. These rotations emphasize clinical adaptability, systems-based thinking, and teaching skills.

Dr. Catriona Stewart serves as Program Director for anesthesia and critical care resident and fellow rotations. Based in Botswana, Dr. Stewart plays a central role in coordinating clinical training, supporting the University of Botswana School of Medicine, and advancing national capacity-building efforts. She also contributes to broader surgical outreach initiatives aimed at improving access to pediatric and elective surgical care across the country.

Boston–Africa Anesthesia and Critical Care Collaborative (BAAC):

The Boston–Africa Anesthesia and Critical Care Collaborative (BAAC) is a longstanding partnership focused on strengthening nurse anesthesia education and critical care capacity in Liberia. Founded in 2015 by **Eileen Stuart-Shor, PhD, ANP, FAAN, BAAC** brings together collaborators from Lutheran University of Liberia Phebe-Esther Bacon College of Health Sciences, Beth Israel Deaconess Medical Center, Harvard Medical School, Northeastern University, and the Liberian Association of Nurse Anesthetists.

BAAC has successfully transitioned from a visiting-faculty model to a Liberian-led partnership. In 2024, the Phebe Nurse Anesthesia Program celebrated the graduation of the first cohort of students to earn bachelor's degrees in nurse anesthesia, a significant milestone in building a sustainable, Liberia-owned anesthesia workforce.

Since its inception, BAAC has collaborated with Liberian education and government partners to strengthen the training curriculum, contribute to the graduation of more than 120 nurse anesthesia providers, establish monthly virtual Grand Rounds connecting anesthesia providers across Liberia, create a national educational platform for continuous learning and collaboration, and host the first continuing education unit (CEU) programs for nurse anesthetists in Liberia. These educational activities contribute to locally relevant workforce strengthening and improved access to lifesaving, high-quality, safe anesthesia care when and where it is needed.

On World Anesthesia Day, Mrs. Lorba Tulay, a nurse anesthesia faculty colleague at Phebe and now the Director of Nursing and Midwifery at the Liberian Ministry of Health, posted the following on Facebook: ➪➪

Global Health *continued*

"On World Anesthesia Day, we extend our deepest gratitude to our global supporters, IFNA, BAAC, and Our Heart Your Hands. Your strategic investment in training and faculty development is deeply appreciated. You don't just fund training; you fund survival, dignity, and safe passage through the scariest moments of a patient's life. Thank you for investing in the minds and hands of the teachers who train the providers. When you support faculty development, you multiply your impact a thousandfold.

Every student who learns with confidence, every educator who gains better tools, and every patient who wakes up safely in an operating theater around the world is a testament to your vision.

Education is the most powerful tool to change healthcare. Thank you for making sure no anesthesia provider stands unsupported. Happy World Anesthesia Day."

Virtual Distance Learning POCUS Curriculum – India:

Led by **Shweta Yemul Golhar, MBBS, MD, FASE, FACC**, in collaboration with Dr. Ruma Bose, this innovative program provides structured remote education and mentorship in point-of-care ultrasound (POCUS) for anesthesia providers in India. The curriculum integrates virtual learning, live instruction, hands-on workshops, and longitudinal mentorship to build durable ultrasound competency and expand access to advanced perioperative education.

Emerging Initiatives

The Division is actively exploring and developing additional collaborations in **Pakistan**, and **Bolivia**. These initiatives include educational partnerships, ultrasound and simulation-based training, collaborative research, and health systems-strengthening projects designed to meet locally identified needs. The Division of Global Health continues to grow as an important pillar of the Department's academic mission and a powerful platform for international partnership, education, and impact. ❑

Access to Headache Care in Kenya:



Rami Burstein, PhD
Vice Chair, Neuroscience
Founder, Global Migraine Aid
John Hedley-Whyte Professor of Anaesthesia

The Department is also supporting innovative global health efforts aimed at improving access to headache and migraine care in low-resource settings. Over a four-year period (2023–2026), **Dr. Rami Burstein** and faculty collaborators worked extensively in Kenya to identify and address major barriers to headache care, including workforce shortages, limited clinician training, poor medication availability and affordability, and low public awareness.

This work resulted in a practical, scalable implementation strategy tailored to the Kenyan healthcare system, where patients most commonly receive care from nurses, clinical officers, and community health promoters working in district and community facilities. A key strength of the program has been the development of strong local partnerships, including collaboration with the Kenya Conference of Catholic Bishops (KCCB) and the Mission for Essential Drugs and Supplies (MEDS). These organizations provide trusted infrastructure for medication distribution, public outreach, and community-based education. The program also established Global Migraine Aid, a U.S.-based charitable organization dedicated to improving access to affordable migraine medications.

Through these partnerships, the initiative has launched a comprehensive awareness campaign reaching thousands of churches and boarding schools throughout Kenya. Educational materials and structured teaching sessions are designed to improve understanding of migraine as a treatable condition and encourage individuals to seek care. In parallel, negotiations have secured access to migraine medications at approximately 95% lower cost than previously available, reducing prices from nearly $2.00 per tablet to approximately $0.15 per tablet.



This initiative represents a powerful example of systems-based global health innovation, integrating workforce training, medication access, public awareness, and policy advocacy to create sustainable improvements in care. Similar programs are now being explored in the Philippines and Mexico, expanding the Department's efforts to address neurological and chronic disease disparities worldwide.

To learn more about our global health initiatives and our impact:

BAAC: research.bidmc.org/anesthesia-gme/boston-africa-anesthesia-and-critical-care-collaborative. To donate: http://bit.ly/LiberianCRNAProgram

Global Migraine Aid: globalmigraineaid.org/
https://research.bidmc.org/anesthesia-gme/global-health

Botswana and other programs: research.bidmc.org/anesthesia-gme/global-health

Research



Simon C. Robson, MB, ChB, PhD

Vice Chair, Research

Director, Center for Inflammation Research

Professor of Anaesthesia
Charlotte F. & Irving W. Rabb

Distinguished Professor of
Gastro-enterology and Hepatology

Joseph J. and Josephine A. Gazzola
Family Chair in the Field of
Inflammation Research at BIDMC



Alexander Shtifman, PhD

Director of Research & Graduate Medical Education Programs

Overview and Organization

Research in the Department of Anesthesia, Critical Care and Pain Medicine at BIDMC includes a wide spectrum of investigation, ranging from basic mechanistic studies to translational research and innovative clinical and data-driven studies. There are multiple clinical trials incorporated across all divisions in the department with long-standing collaborations forged locally, nationally, and internationally.

Over the last several years, the Research Program has continued to expand through our strategic development of internal pipelines of young clinical scientists and basic science investigators. These include early-career clinical faculty members as well as fellows and residents. Research activities are supported by a well-organized administrative structure, including the Vice Chair for Research (Simon C. Robson, MD, PhD) and the Administrative Director for Research (Alexander Shtifman, PhD), with support from the Chief Administrative Officer (Dawn Ferrazza).

The Department employs over 80 research staff, which includes MD, PhD, and MD/PhD investigators; approximately 30 postdoctoral fellows; residents who are participants in the research-track Loring Scholar residency program, as well as biostatisticians, project managers, research assistants, students, and other research support staff. Research activities have been supported by grants from the National Institutes of Health (NIH), Department of Defense, Foundations, Industry, Philanthropy, Harvard Medical School, as well as Institutional and Departmental funding.

Annually, faculty members and staff publish over 200 peer-reviewed journal articles. See Publications updates.

Vision and Opportunities

As outlined in its Strategic Plan, the department's primary goal is to become one of the world's preeminent departments, with world-class hospital-based research centers of excellence and innovative programs in anesthesiology and perioperative medicine, critical care, pain medicine, inflammation, and headache research.

The research divisions contribute to this goal through studies focused on clinical outcomes in critical care and perioperative medicine; translational and clinical investigations that advance patient care; and research addressing pain, headache, and inflammatory conditions.

Departmental leadership supports investigators throughout the research process, from initial idea development and hypothesis generation through study completion, publication, dissemination, and translation into clinical practice. Consistent with this strategy, faculty members and trainees participate in a wide range of laboratory-based, clinical, and translational research projects.

RESEARCH PRIORITIES

Growth and Recruitment

The department's long-term goals include continued programmatic growth and an increase in the number of faculty members engaged in research, whether as members of collaborative teams or as independently funded investigators. Recruitment efforts seek outstanding talent in clinical, basic, and translational research and aim to broaden the department's research portfolio.

These goals have been pursued through several approaches: recruiting experienced investigators at all academic levels; establishing new centers of excellence; helping clinical faculty develop research programs; and building a pipeline of new investigators through the residency program.

In conjunction with faculty recruitment over the past five years, the department has established and supported four centers of excellence:

- Center for Inflammation Research
- Center for Education Research, Technology and Innovation (CERTAIN)
- The Sadhguru Center for a Conscious Planet
- Center for Lung Injury Research (CLIR)

The department continues to invest in developing research faculty. Over the past five years, multiple clinical faculty members have received NIH T32 or K-series career development funding, mentored training grants, or equivalent awards. Several faculty members are also participating in the Foundation for Anesthesia Education and Research (FAER) mentored training program and submitting grant applications to the NIH and other funding agencies and foundations.

To support these investigators, departmental leadership has provided research space, protected nonclinical time, and supplemental funding to conduct studies and hire research staff. The department has also established internal grant mechanisms to assist junior and midcareer clinical faculty members in developing and executing research projects.



The department is committed to supporting clinical trainee research through the Anesthesia Resident Research Program. The program aims to provide meaningful, productive research experiences that help residents develop foundational research skills and pursue their career interests.

Through protected time and departmental resources, residents learn the fundamentals of clinical or laboratory-based research and participate in or lead projects aligned with their professional goals. These experiences may culminate in scholarly work that advances knowledge in anesthesiology and related fields.

Residents who participate are matched with departmental mentors who help them develop their research skills. They also benefit from informal mentorship by departmental research leadership, which provides guidance and helps them navigate challenges throughout the research process.

Loring Scholar Program

Applicants to the Anesthesia Residency Research Program may apply for the Loring Scholar/Clinical Scientist Research Track.

The program aims to train future clinical scientists and research leaders by providing a foundation in research methodology, supporting the development of productive research careers during residency, and preparing trainees to become outstanding clinical scientists of the highest caliber.

To date, most Loring Scholar graduates have remained on the department's faculty and continue to develop their research portfolios.

The department also supports the training of postdoctoral research fellows, undergraduate students, and high school scholars. During the 2025–2026 academic year, approximately 30 research fellows received postdoctoral training in the department's basic, clinical, and translational laboratories.

Faculty Mentoring Program

The department has established a mentoring program to support junior faculty members pursuing research careers. Each participating faculty member is offered a mentoring committee consisting of a primary mentor and at least two additional faculty members.

These committees advise on career development, research project design and implementation, grant opportunities, and manuscript preparation and publication.

Research Operations and Communication

The Center for Anesthesia Research Excellence (CARE), described in greater detail below, serves as the department's central resource for clinical research. Its staff includes a senior program manager, project managers, PhD- and MS-level biostatisticians, a regulatory specialist, research assistants, research fellows, and research coordinators.

Resources

Center for Anesthesia Research Excellence (CARE)





The Center for Anesthesia Research Excellence (CARE) is a key departmental resource established to facilitate all aspects of clinical research within the Department of Anesthesia, Critical Care and Pain Medicine. It is led by Medical Director Maximilian Schaefer, MD, and Program Director Valerie Goodspeed, MPH.

CARE brings together expertise across the clinical research lifecycle, from study initiation and execution through closeout and publication. This centralized resource is available to faculty members and trainees. Since its inception, CARE has supported more than 130 researchers, including departmental faculty and trainees and investigators from other departments at BIDMC. Many investigators use multiple services, including study design, statistical consultation, database development, and data collection.

CARE facilitates research from initial planning through completion. Its services include idea development; Institutional Review Board (IRB) submission support; participant recruitment and data capture; statistical consultation; and assistance with funding applications to departmental, industry, foundation, and federal sources. CARE also assigns project managers and research staff to help oversee projects. Statistical analysis, data management, and writing support for grant applications and publications are available as well.

CARE collaborates closely with the Committee on Clinical Investigations, the Office of Sponsored Programs, the Clinical Trials Office, and Harvard Catalyst's Clinical Research Center at BIDMC.

Prospective Research

The prospective research arm of CARE supports investigators conducting clinical studies across critical care, perioperative medicine, and pain medicine. Its teams include project managers, regulatory specialists, research coordinators, and research fellows. During the reporting period, these teams supported investigators seeking a broad range of research services.

Retrospective research

The Perioperative Outcomes Lab within CARE supports faculty members and residents conducting large-scale retrospective studies. This research group uses large datasets and advanced statistical methods to investigate timely questions concerning patient outcomes following anesthesia and surgery.

CARE also oversees the department's anesthesia and intensive care research data repository, which contains records for more than 700,000 patients who received anesthesia or intensive care at BIDMC. This resource, along with analytical support, is available to departmental faculty and staff.

Training and onboarding

CARE works across departmental divisions to provide research and compliance education, foster collaboration, and support mentorship. By simplifying and streamlining research processes, CARE helps faculty members and trainees advance their projects while incorporating education into each supported research experience.

The center places particular emphasis on supporting early-career investigators who lack the resources to conduct projects independently. Through this approach, CARE helps researchers build skills early in their careers and progress toward research independence, strengthening the department's community of clinician-scientists.

Departmental Grant Programs

The department has established three internal grant programs to help early- and midcareer research faculty develop their research programs:

- Seed Grants: $48,000 for one year.
- Career Development Grants: $60,000 per year for up to three years.
- John Hedley-Whyte/Eleanor and Miles Shore Faculty Development Awards: $50,000 for one year.

These opportunities are open to all departmental faculty members, and all research topics and methodologies are eligible.



Faculty Recruitment and Retention

The department continues to expand its research program through recruitment and the development of promising investigators. Research leadership seeks faculty members in clinical, basic, and translational research, both through recruitment from other institutions and through internal development pipelines, including the Resident Research Program and Loring Scholar Program.

For investigators arriving with established research programs, the department offers competitive startup packages and appropriate laboratory space.

Junior faculty members and recent residency graduates also receive substantial departmental support for their research. The department has established basic science laboratories led by investigators who were either active members of the clinical faculty or recent graduates of the BIDMC anesthesiology residency program. These investigators have received laboratory and office space, equipment, supplies, and financial support to sustain their research while pursuing external funding.

Areas of Excellence

The research program has expanded significantly over the last several years by recruiting new faculty, as well as developing outstanding new investigators. This has resulted in significant advances in the fields of inflammation, lung injury, perioperative outcomes, obstetric anesthesia, medical education and mindfulness/consciousness research, and pain and headache research.

DESCRIPTION OF RESEARCH EFFORTS

Centers of Excellence

Center for Inflammation Research





In 2018, the department established the Center for Inflammation Research, which has grown under the joint leadership of **Dr. Daniel Talmor** and **Dr. Simon C. Robson**. The center supports collaborative, multidisciplinary research into acute and chronic inflammatory diseases. Its goals include integrating advances in innate and adaptive immunology across diverse areas of inflammation and immunobiology and translating these discoveries into clinical care.

As life expectancy increases, inflammatory diseases are expected to account for a substantial proportion of healthcare costs. The center addresses these challenges through basic, translational, and clinical research aimed at improving prevention, treatment, and patient outcomes.

The center comprises basic scientists, immunologists, translational researchers, and clinicians working to advance biomedical knowledge and improve patient care. Its growth has included the recruitment of three midcareer, independently funded principal investigators who also serve as deputy directors: **Dr. Maria Serena Longhi**, **Dr. Joji Fujisaki**, and **Dr. Ionita Ghiran**. Additional clinical faculty collaborators include **Drs. Melton**, **Lunderberg**, **Cassavaugh**, **Katsiampoura**, and **Robitaille**, who contribute to translational research studies.

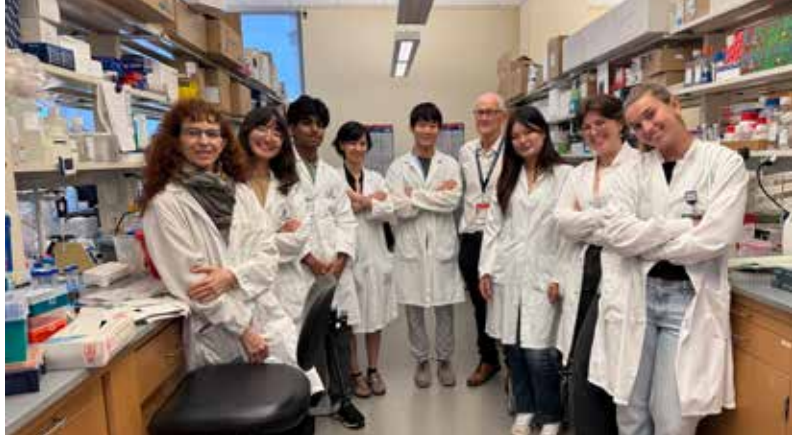
A major focus is the study of mammalian ectonucleotidases, including enzymes expressed by vascular cells, myeloid cells, and regulatory lymphocytes. These enzymes hydrolyze extracellular nucleotides, such as ATP and ADP, into adenosine and related products. CD39 and other members of this enzyme family are expressed on vascular and immune cells and contribute to vascular homeostasis and the regulation of inflammation and immune responses in transplanted and native organs, including the heart, lungs, and liver.

The center investigates inflammatory diseases affecting the cardiovascular system, lungs, liver, and gastrointestinal tract, advancing discoveries from initial mechanistic studies and preclinical development through translational evaluation.

Achievements

In collaboration with international experts, the Center for Inflammation Research has published more than 100 manuscripts and maintains active studies supported by NIH funding, biopharmaceutical industry partners, foundations, and development funds.

Research spans hyperoxic lung injury and acute respiratory distress syndrome (ARDS), including lung injury associated with COVID-19; perioperative and post-traumatic inflammation; the consequences of immunosuppression; transplantation biology; inflammatory bowel disease (IBD); autoimmune hepatitis (AIH); atherosclerosis; vascular calcification; metabolic syndrome; and immunotherapeutic approaches to cancer and immune exhaustion.



Simon C. Robson, MB, ChB, PhD, directs the Center for Inflammation Research. He has contributed to the development of purinergic signaling research, which examines how extracellular nucleotides and their derivatives regulate inflammatory responses. He is known for his work on the function of CD39 in vascular and immune cells. His clinical research has also addressed inflammatory and vascular liver diseases, including autoimmune hepatitis, liver transplantation, metabolic syndrome, inflammatory bowel disease, and gastrointestinal and liver cancers.

Current research aims to advance understanding of purinergic signaling and innate regulation of vascular responses and immune cell activity, including their roles in inflammatory pain. Translational studies include the use of CD39-neutralizing antibodies in cancer and soluble CD39 in ischemia-reperfusion, normothermic machine perfusion, and transplantation.



Joji Fujisaki, MD, PhD, serves as a deputy director of the Center for Inflammation Research. His laboratory studies stem immunology, at the intersection of stem cell biology and immunology. His research has identified regulatory mechanisms governing immune responses to normal and malignant stem cells, with implications for tumor immunotherapy and stem cell transplantation.

Dr. Fujisaki's group has demonstrated that the hematopoietic stem cell (HSC) microenvironment, or niche, in the bone marrow can function as an immunological sanctuary for stem cells, a phenomenon described as an immune-privileged site.

Current studies seek to advance understanding of stem immunology and develop new research tools. These investigations include regulatory T cells (Tregs) expressing ectonucleotidases, which contribute to immune protection of normal, transplanted, and malignant stem cells. The findings may inform strategies to improve bone marrow transplant engraftment and tolerance.

The group has also identified mechanisms underlying immune privilege involving stem cells and niche-resident Tregs in the bone marrow, lungs, liver, and intestine. These findings may reveal immunotherapeutic targets for organ-specific inflammation, transplantation-related injury, metabolic dysfunction, and cancer.



Ionita Ghiran, MD, PhD, is a deputy director of the Center for Inflammation Research. His laboratory investigates the formation and tissue targeting of extracellular vesicles (EVs), or exosomes, and the cargoes of circulating small noncoding RNAs, with an emphasis on red blood cell-derived EVs. Current research examines post-translational modifications, particularly m6A and A-to-I editing, in circulating small RNAs associated with cancer and neurodegenerative conditions.



Maria Serena Longhi, MD, PhD, is a deputy director of the Center for Inflammation Research. Her laboratory investigates the mechanisms underlying the breakdown of immune tolerance in chronic inflammatory and autoimmune conditions, including IBD and AIH.

Her group has found that an imbalance between regulatory T cells (Tregs) and effector T cells (Teffs) in AIH is associated with alterations in aryl hydrocarbon receptor (AhR) signaling, including changes involving noncanonical AhR-binding partners and inhibitors. In IBD, her research has identified a natural antisense RNA targeting human CD39 that may contribute to inflammation through changes in Treg and Th17 cell metabolism. These findings have provided a foundation for further preclinical research, including the development of potential therapeutic approaches for IBD and AIH.

Research Faculty Pipeline Development

Departmental resources, including Loring Scholar awards, federal NIH T32 and KL2 funding, and other training opportunities, support students, residents, fellows, trainees, and faculty members pursuing biomedical research relevant to the Center for Inflammation Research.

Over the past several years, research has emphasized preclinical and experimental models of human inflammatory disease and the translation of new discoveries into clinical studies. Investigators also draw on resources across BIDMC and other departments, interinstitutional T32 programs, and Harvard Catalyst, which brings together research expertise, technologies, and clinical capabilities across Harvard University and its affiliates.

This coordinated research portfolio supports interdisciplinary training focused on innovation, discovery, and translation, helping prepare future generations of academic physicians and scientists.

Center for Lung Injury Research (CLIR)









The Center for Lung Injury Research (CLIR) is a multidisciplinary group of anesthesiologists, intensivists, and pulmonologists specializing in lung-protective mechanical ventilation in the operating room and intensive care unit. The center is led by **Drs. Daniel Talmor**, **Elias Baedorf-Kassis**, and **Maximilian Schaefer**.

The center uses a range of research methods to investigate lung-protective ventilation strategies. Its studies incorporate esophageal manometry, electrical impedance tomography, and measures of ventilation intensity to better understand mechanical ventilation and develop approaches to reduce postoperative pulmonary complications.

The center also uses detailed real-world clinical data to investigate how variations in clinical practice affect pulmonary complications and patient survival. Future work aims to translate these findings into routine clinical practice through improved ventilator functions and implementation strategies.

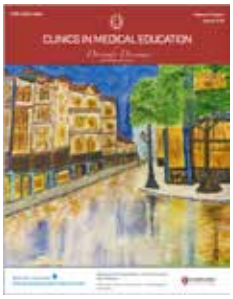
Center for Education Research, Technology and Innovation (CERTAIN)

The Center for Education Research, Technology and Innovation (CERTAIN) was established in late 2019 to promote educational excellence through continuous learning, assessment, and feedback. Its faculty conduct educational research and use their findings to improve training programs, evaluate teaching methods, and enhance learner satisfaction and performance.

The center uses educational technology to develop innovative teaching and assessment methods tailored to trainees' individual learning needs. CERTAIN has managed more than 10 projects involving more than 25 departmental faculty members.

CERTAIN is led by **Dr. Robina Matyal**, Vice Chair for Education, who brings extensive experience in medical education research and teaching, together with the center's associate directors. Dr. Jacqueline Hannan leads research applying cognitive science, human factors, and engineering methods to challenges in the perioperative setting.

An additional objective is to develop future educational leaders by supporting meaningful educational research. Mentorship is central to this effort, with affiliated faculty members mentoring colleagues and residents in project development and career advancement.



To learn more, visit: MedicalEducationClinic.com

Headache Research



Headache research is one of the key research priorities in the department. Currently, there are multiple research groups engaged in bench, clinical and translational research that focuses on a better understanding of the physiology of migraine, the pathophysiology of migraine, mechanisms of action of novel migraine abortive and prophylactic drugs, identification of biomarkers of response to selective migraine drugs, and interaction between neuronal, vascular, and the immune cells in the meninges.

In clinical research, the impact of any published article can only be judged years later when the published work is accepted and confirmed by others and when it has changed disease understanding, diagnosis, and treatment. Taking this caveat into consideration, the highest and most immediate impact of the Burstein translational research lab, directed by **Dr. Rami Burstein**, the John Hedley-Whyte Professor of Anesthesia, is attributed to a series of papers that collectively led to (1) improved understanding of migraine pathophysiology, (2) implementation of combination therapy for the prophylactic treatment of migraine in patients whose response to monotherapy is not satisfactory, (3) invention and distribution of devices that provide phototherapy for migraine, insomnia, and generalized anxiety disorders, (4) invention of a novel method for identification of treatment responders and treatment non-responders to anti-CGRP monoclonal antibodies using a simple and affordable test that can easily be implemented in non-academic headache clinics, and most recently, (5) attracting attention to macrophages role in migraine and the therapeutic potential they hold in the treatment of migraine.

The major accomplishments and high impact of



the Levy lab, led by **Dr. Dan Levy,** Associate Professor of Anesthesia, relate to preclinical published and ongoing work demonstrating: 1) key cellular and molecular mechanisms that drive pain in migraine via the activation and sensitization of meningeal afferents that involve cortical astrocytes, 2) development of innovative two-photon imaging tools and algorithms to study the activity of dozens of meningeal in the intact meninges of awake-behaving mice, 3) collaborative work with Dr. Isaac Chiu at HMS to investigate peripheral neuroimmune mechanism of migraine pain triggering and chronification, 4) Development of two-photon imaging tools to study calcium activity of meningeal macrophages at steady state and migraine-like conditions. 5) Development of non-invasive optogenetic tools to study the consequences of meningeal nociceptor stimulation.

Sadhguru Center for a Conscious Planet



Founded in 2020 and directed by **Dr. Balachundhar Subramaniam**, the Sadhguru Center for a Conscious Planet is a multidisciplinary research center that integrates scientific investigation with yoga and meditation practices to develop interventions that promote health and well-being. The center conducts research, encourages dialogue and exploration, and raises awareness through education and community outreach. Its work seeks to expand understanding of human consciousness, cognition, and compassion while advancing rigorous research in contemplative sciences.

In collaboration with more than 80 experts, the center's faculty conduct cross-disciplinary research on mental and physical health outcomes. The center has published more than 55 peer-reviewed journal articles and leads 21 active studies supported by the NIH, foundations, and philanthropic partners.



Research areas include perioperative delirium, cognitive decline, opioid-sparing strategies, and the effects of mind–body interventions on brain health, stress resilience, immune function, mental health, sleep, and physiological biomarkers in healthy and clinical populations. Investigators examine physiological and psychological correlates of contemplative practices and explore clinical applications, including multimodal approaches to general anesthesia and opioid-sparing pain management, with particular interest in reducing cognitive decline and delirium in older patients.

The center's research has also attracted media attention. A study published in Mindfulness reporting differences between estimated brain age and chronological age among experienced meditation practitioners was featured by outlets including HuffPost, Psychology Today, CNN News18, The Times of India, and Financial Express. Dr. Subramaniam also presented the center's work at TEDxBoston.

Beyond research, the center brings together scientists, healthcare practitioners, contemplative scholars, neuroscientists, and other experts through conferences, speaker series, workshops, and panel discussions. Its in-person events have engaged more than 4,000 people, while its online content has generated more than 10 million views on platforms such as YouTube.

The center also supports the next generation of researchers through an internship program that has served more than 50 high school and college students from across the country. Participants gain experience in research, clinical programs, and community outreach. In addition, the center's clinical wellness programs have reached more than 1,000 patients in populations including people with long COVID, Parkinson's disease, and cancer.

Division Research Highlights

Critical Care

The Division of Critical Care includes intensivists and researchers focused on improving outcomes for patients with critical illness. Its research spans basic mechanistic investigations, translational studies, interventional clinical trials, and epidemiologic research. The division also conducts qualitative research on ICU survivorship, provider moral distress, and ethics and humanities in critical care. Other research areas include novel medications and mechanical ventilation strategies. Common disease targets include acute respiratory distress syndrome (ARDS), sepsis, and other forms of organ failure.

The division collaborates extensively with investigators in other departments and with critical care researchers across the United States and Canada. These partnerships support the development and testing of new hypotheses through multicenter studies.

Notable and High-Impact Critical Care Research:

PREVENT VILI Trial: The Center for Lung Injury Research and CARE coordinate the PREcision VENTilation to attenuate Ventilation-Induced Lung Injury (PREVENT VILI) trial, a 40-center, randomized controlled clinical trial evaluating an individualized, lung-stress-guided mechanical ventilation strategy in critically ill patients with moderate-to-severe acute respiratory distress syndrome (ARDS). The study compares this approach with guided usual-care ventilation to determine whether optimizing ventilator settings to reduce ventilator-induced lung injury can improve clinical outcomes, including 60-day survival.

Drs. Daniel Talmor and Brian O'Gara lead research examining the potential of inhaled anesthetics to prevent lung injury, including the lung-protective effects of volatile anesthetics in critically ill patients at risk of ventilator-induced lung injury.

Dr. Brian O'Gara also investigates volatile anesthetics for ICU sedation and serves as a consultant to Sedana Medical in Danderyd, Sweden, which developed the AnaConDa device for administering inhaled anesthetics to mechanically ventilated patients.

Drs. Todd Sarge, Achikam Oren-Grinberg, and Akiva Leibowitz conduct studies on echocardiography in critically ill patients during cardiac arrest. Together with Drs. Somnath Bose and Ameeka Pannu, they also investigate the use of point-of-care ultrasound during cardiac arrest.

Cardiac Anesthesia

The Division of Cardiac Anesthesia conducts basic science, clinical, educational, and outcomes research. Its basic science laboratory investigates ischemia-reperfusion injury, neoangiogenesis, nanoparticle-based targeted drug delivery, and myocardial ischemia associated with metabolic syndrome. The division has also conducted an NIH-funded trial examining perimenopausal ischemia-related myocardial injury during cardiac surgery.

Outcomes research includes studies of sex-based differences in outcomes following cardiac and noncardiac surgery, perioperative blood transfusion, and enhanced recovery after cardiac surgery.

The division has an echocardiography simulation center equipped with multiple advanced echocardiography simulators. Faculty members conduct educational research, have received educational grants, and have pioneered the use of motion metrics to track proficiency during complex clinical tasks and inform training.

Clinical research includes three-dimensional echocardiographic imaging for ventricular and valvular assessment, evaluation of valve repair techniques and their durability, and three-dimensional printing to improve understanding of valve structure and function. Division members also participate in national and international multicenter trials involving percutaneous structural heart interventions.

Other areas of investigation include acute kidney injury, postoperative delirium following cardiac surgery, regional anesthesia techniques for cardiac surgery, and enhanced recovery after surgery. Quality improvement research addresses early extubation, opioid-free cardiac surgery, and perioperative transfusion management.

Vascular Anesthesia

The Division of Vascular Anesthesia is led by Robina Matyal, MD. Faculty members conduct clinical, basic science, outcomes, and educational research and have published more than 50 original research papers, in addition to case reports and book chapters.

Clinical research ranges from database analyses and ultrasound-based cardiac and pulmonary assessment to three-dimensional printing of patient-specific thoracic aortic aneurysms for preoperative planning of complex vascular procedures. The division investigates optimal anesthetic techniques for patients undergoing lower-extremity amputation. Analyses of national databases have identified improved outcomes associated with





regional anesthesia. Additional studies have found that preemptive continuous peripheral nerve blocks may support recovery by reducing pulmonary complications and opioid consumption while providing adequate pain control.

Basic science research includes nanoparticle-based delivery of angiogenic molecules to promote microvascular growth, the pathophysiology of postoperative atrial fibrillation, and sex-based differences in diabetic cardiomyopathy. Investigators are also examining sex-based differences in heart failure and altered adenosinergic responses associated with postmenopausal estrogen deficiency, including the potential translational applications of pharmacologic Adora2AR agonists.

Division members have presented their research at scientific meetings of the American Society of Anesthesiologists, Society of Cardiovascular Anesthesiologists, American Heart Association, and Harvard Medical School.

Faculty members have received grants from the NIH, National Institute of General Medical Sciences, and National Institute of Diabetes and Digestive and Kidney Diseases to investigate permissive hypoxia in sepsis, deferoxamine for the prevention of acute kidney injury, and sex-based differences in heart failure and adenosinergic responses associated with postmenopausal estrogen deficiency.

Pain Medicine Research

Advancing pain medicine through research is a central priority of the Division of Pain Medicine. Faculty members design and conduct research focused on pain management and mentor interested residents through the research process, including Institutional Review Board (IRB) applications, study conduct, analysis, and publication.

The division has helped refine fluoroscopic techniques in interventional pain medicine, including standardization of the contralateral oblique view, which is increasingly used for epidural access. Ongoing projects evaluate the utility of different imaging views. Faculty members also lead a multisociety initiative to develop standardized nomenclature for reporting interventional spine procedures.

Another research focus is the assessment of spinal cord stimulator complications and outcomes. The division has published research on technical and clinical aspects of spinal cord stimulation, including variation in clinical practice and treatment parameters.

Over the past five years, the division has conducted multiple industry-funded studies and participated in an international registry of spinal cord stimulator outcomes. Current investigations include a comparison of pulse dosing with continuous spinal cord stimulation and an NIH-funded study examining the mechanisms underlying spinal cord stimulation.

Neuroanesthesia

The Division of Neuroanesthesia investigates anesthesia for neurosurgical procedures, perioperative brain health, and perioperative brain monitoring.

Investigators examine perioperative risk factors associated with adverse outcomes following neurosurgery and collaborate across specialties to investigate the relationships between anesthetic management and neurosurgical outcomes, including the effects of hemodynamic management and anesthetic choice. The division also has conducted a randomized controlled trial examining perioperative dantrolene use in spine surgery.

Perioperative Brain Health: The division conducts large-database outcomes research in collaboration with other specialties, focusing on risk assessment for postoperative delirium and stroke. Investigators are particularly interested in the effects of intraoperative hemodynamic and ventilatory management on postoperative outcomes.

Previous work with the BIDMC Outcomes Lab examined associations between arterial hypotension, hypocapnia, and outcomes across a broad surgical population. The division plans to continue investigating factors that affect perioperative brain health.

Perioperative Brain Monitoring: The division investigates perioperative brain monitoring techniques, including electroencephalography (EEG), cerebral oximetry, and cerebral autoregulation. Research includes multicenter EEG data acquisition and repository development, training in EEG interpretation, and the identification of EEG signatures associated with clinical outcomes. With advances in cerebral oximetry technology, investigators are also examining relationships between cerebral autoregulation, postoperative delirium, and anesthetic exposure.

Obstetric Anesthesia

The Division of Obstetric Anesthesia conducts clinical, basic, and translational research to improve maternal and neonatal outcomes and strengthen evidence-based obstetric anesthetic care. Major research areas include placental aging and metabolism, gastric emptying during labor, general anesthesia for cesarean delivery, antiemetic strategies, labor epidural techniques, maternal cognitive outcomes, and neurological complications of preeclampsia.

Placental Aging and Metabolism: Erin Ciampa, MD, PhD, leads research investigating mitochondrial and metabolic mechanisms of placental aging and their effects on pregnancy outcomes. Studies have identified age-related changes in healthy placental tissue, including alterations in hypoxia-inducible factor-1 (HIF-1) signaling, metabolism, inflammation, and cellular senescence. Experimental findings also suggest that changes in placental NAD metabolism and prostaglandin PGE2 secretion may influence the timing of labor. The research aims to identify potential strategies for optimizing labor induction and treating preterm labor.

Gastric Emptying During Labor: Philip Hess, MD, leads a randomized controlled trial examining gastric emptying in laboring patients. The study compares carbohydrate-based and protein-based sports drinks and uses ultrasound to assess gastric emptying, addressing questions about oral intake during labor and the evidence underlying current fasting practices.

General Anesthesia for Cesarean Delivery: BIDMC participates in the Society for Obstetric Anesthesia and Perinatology (SOAP) Research Network registry, a prospective multicenter study investigating indications, airway management, risk factors, and maternal and anesthetic outcomes associated with general anesthesia for cesarean delivery. Philip Hess, MD, is the principal investigator at BIDMC.

Prevention of Postoperative Nausea and Vomiting: Philip Hess, MD, leads a randomized, double-blind study comparing dexamethasone with ondansetron as first-line prophylaxis for postoperative nausea and vomiting following cesarean delivery.

Labor Epidural Analgesia: Yunping Li, MD, leads an international collaborative study comparing high- and low-concentration local anesthetic regimens for labor epidural analgesia. The research evaluates the effectiveness of these approaches and their potential effects on pain control, motor blockade, labor progression, and delivery outcomes.

Maternal Brain Health Initiative: The Maternal Brain Health Initiative investigates cognitive outcomes during pregnancy and following delivery. The Perioperative Maternal Cognitive Outcomes Study (MCOS) is a prospective longitudinal cohort study designed to characterize the incidence, trajectory, and risk factors for cognitive dysfunction over 12 months.

The CEREBRAL-MOM study examines whether individual cerebral autoregulatory capacity is associated with cognitive vulnerability during pregnancy, with a focus on the relationship between impaired autoregulation and cognitive decline.

Neurological Complications of Preeclampsia and Eclampsia: An ongoing study investigates extracellular vesicle-associated microRNAs (EV-miRNAs) in cerebrospinal fluid to assess their potential diagnostic value and role in the cerebrovascular dysfunction associated with severe preeclampsia and eclampsia. The research aims to identify molecular markers of neurological complications and potential therapeutic targets.

Thoracic Anesthesia

Research in the Division of Thoracic Anesthesia focuses on perioperative care in the operating room and intensive care unit, with particular emphasis on preventing postoperative respiratory complications. Lung-protective ventilation is a central research area, including studies of mechanical ventilation physiology during one-lung ventilation. Investigators have also examined neuromuscular blockade management as a factor in reducing postoperative respiratory complications.

Additional studies address recovery after surgery and the prevention of adverse events, including postoperative delirium. Research from division members has identified intraoperative hypoxemia and impaired cerebral perfusion as potential contributors to postoperative delirium, particularly in older patients. Investigators also study postoperative nausea and vomiting and its effects on recovery and patient satisfaction.

Finally, division researchers have reported increasing cannabis use among surgical patients and are investigating its implications for perioperative care. ❑



Education

Overview and Organization

The Education Division in the Department of Anesthesia, Critical Care and Pain Medicine is committed to training the next generation of anesthesiologists, critical care physicians, and pain physicians. Our residency and fellowship programs attract outstanding trainees from leading national and international medical schools and training programs. The division also maintains a strong medical student program and provides continuing medical education that draws on the clinical, teaching, and technical expertise of our faculty.

The division's educational mission is supported by the Center for Education Research, Technology and Innovation (CERTAIN), which conducts education research and develops innovative approaches to improve teaching, assessment, simulation, and learning.

The division is led by Vice Chair for Education Robina Matyal, MD, Professor of Anesthesia. Aidan Sharkey, MD, became Residency Program Director in 2026, succeeding Sara Neves, MD, who was appointed Vice Chair of Professional Affairs. Working closely with the associate program directors and rotation directors, Dr. Sharkey leads the continued development of a comprehensive residency program that emphasizes clinical excellence, innovative education, mentorship, and academic growth.

The Residency Program Director and associate program directors oversee curriculum development and coordination, resident feedback and mentorship, ACGME compliance, and collaboration with rotation directors to optimize clinical learning experiences. The leadership team also works to expand opportunities for residents to pursue academic careers, research, and fellowship training.

Associate Program Director **Matt Gao, DO**, spearheads Tuesday Education Day (TED), providing residents with protected time for structured education. Associate Program Director **Daniel Walsh, MD**, leads resident rotations and board examination preparation and provides mentorship related to professionalism. Associate Program Director **Mona Hedayat, MD** has strengthened the residency feedback process, substantially increasing the frequency of feedback provided to residents and establishing an individualized faculty mentorship program that engages a broader group of faculty in resident education.

Meredith Colella, MD, directs the categorical internship and has guided more than 50 residents through the intern year while developing strong collaborative relationships with other departments. **Maria Borrelli, DO**, directs medical student education. Under her leadership, anesthesia rotations at BIDMC have become highly sought-after experiences for Harvard Medical School and visiting medical students. She also established a funded visiting medical student scholarship to support students interested in anesthesiology who do not have a home anesthesia program.

The department currently has 99 residents, 22 clinical fellows, and approximately 130 faculty anesthesiologists with appointments at Harvard Medical School and Beth Israel Deaconess Medical Center.

NOTE: We thank Dr. Sara Neves for her six years of service as Residency Program Director. In 2026, she was appointed Vice Chair of Professional Affairs. Her contributions to resident education, mentorship, and the development of the residency program have been significant.



Robina Matyal, FS, MBBS

Vice Chair, Education

Director, Vascular Anesthesia

Director, Center for Education Research, Technology and Innovation (CERTAIN)

Program Director, Advanced Perioperative Clinical Fellowship

Professor of Anaesthesia

Leonard Bushnell Chair in Anaesthesia at BIDMC



Aidan Sharkey, MD

Program Director, Anesthesia Residency

Instructor in Anaesthesia



Alexander Shtifman, PhD

Director of Research & Graduate Medical Education Programs




Center of Education Research, Technology, and Innovation















Leader	Position
Aidan Sharkey, MD	Program Director, Anesthesia Residency, ACGME
Daniel Walsh, MD	Associate Program Director, Anesthesia Residency Associate Director, CERTAIN
Matthew Gao, DO	Associate Program Director, Anesthesia Residency
Mona Hedeyat, MD	Associate Program Director, Anesthesia Residency
Federico Puerta-Martinez, MD	Associate Program Director, Anesthesia Residency
Lior Levy, MD	Director, Resident Simulation
Brian O'Gara, MD, MPH	Director, Resident Research
Simon C. Robson MD, PhD	Director, Loring Scholar Program
Ruma Bose, MD	Director, Fellowship Programs
Vahid Kiarid, MD, MPH	Program Director, Adult Cardiothoracic Anesthesia Fellowship, ACGME-accredited Program Director, Adult Structural Heart Anesthesia Fellowship, non-ACGME
Ameeka Pannu, MD	Program Director, Advanced Critical Care and Ultrasound Fellowship, non-ACGME accredited
Jessica Cassavaugh, MD	Program Director, Anesthesia Critical Care Medicine Fellowship
Philip Hess, MD	Program Director, Obstetric Anesthesia Fellowship, ACGME accredited
Robina Matyal, MD	Master's in Education Fellowship, non-ACGME Advanced Perioperative Clinical Fellowship, non-ACGME
Jyotsna Nagda, MD	Program Director, Pain Medicine Fellowship, ACGME accredited
Richard Pollard, MD	Program Director, Neuroanesthesia Fellowship, non-ACGME accredited Co-Director, Executive Scholar Program in Quality and Safety
Andrey Rakalin, MD	Program Director, Regional Anesthesia and Acute Pain Medicine Fellowship, ACGME accredited
Satya Krishna Ramachandran, MD, MBA	Director, Executive Scholar Program in Quality and Safety
Eswar Sundar, MBBS	Program Director, Anesthesia for Outpatient Surgery/Clinical Anesthesia Fellowship, non-ACGME accredited
Shahla Siddiqui, MD	Course Director, Harvard Medical School Advanced Clinical Elective: Respiratory-Surgical Intensive Care
Meredith Colella, MD	Director, Categorical Internship
Maria Borrelli, DO	Director, Medical Student Education
Federico Puerta Martinez, MD	Director, NeuroAnesthesia Roatation; Direcdtor, Anesthesia Rotators
Dario Winterton, MD	Co-Director, Anesthesia Internship; Director, Thoracic Anesthesia Rotation
Katherine Barnes, MD	Director, Cardiac Anesthesia Rotation
Christopher Mallard, MD	Director, Vascular Anesthesia Rotation
Theresa Feng, MD	Director, ICU Rotation
Stephen Woloszynek, MD, PhD	Director, Loring Scholar Program

Clinical Training Environment

Training takes place across a broad range of clinical environments, including operating rooms; non-operating-room anesthetizing locations; surgical intensive care units; obstetric operating rooms and labor and delivery suites; the New England Center for Placental Disorders; the Pre-Admission Testing Clinic; Post-Anesthesia Care Units; the Arnold–Warfield Pain Center; and the Postoperative Pain Management Service.

Residents also rotate through New England Baptist Hospital, Boston Children's Hospital, the Boston VA Healthcare System, and other affiliated clinical sites.

The expansion of the department's community hospital network provides trainees with a broad and varied clinical experience. The rotation at New England Baptist Hospital offers high-volume exposure to regional and orthopedic anesthesia, and an orthopedic anesthesia rotation was added in 2026 to further expand this experience. The integration of Dana-Farber Cancer Institute into the Beth Israel Lahey Health system also provides additional opportunities for exposure to oncologic care and multidisciplinary collaboration.

Mission

The department's educational mission is to develop leaders in anesthesiology and related disciplines through excellent clinical experience, strong mentorship, innovative curricula, and a flexible program that can be adapted to the needs of individual learners. This mission is supported by a continuous pursuit of excellence through creativity, educational innovation, and quality improvement grounded in sound educational theory and evidence.

The quality of the training program is assessed through multiple measures, including resident and fellow academic productivity, learner satisfaction, fellowship and career placement, board examination performance, and accreditation outcomes.

Inclusion and Mentorship

The department remains committed to fostering a diverse, inclusive, and supportive anesthesia community. The residency application review process incorporates education regarding implicit bias, and the department continues outreach to students interested in careers in medicine and anesthesiology.

The department maintains relationships with programs that introduce students from the Boston area to careers in medicine and simulation-based learning. Faculty mentorship remains an important component of trainee development, with both longitudinal faculty advising and individualized mentorship opportunities available to residents.

The department also supports visiting medical students through funded opportunities designed to reduce financial barriers for students interested in anesthesiology who do not have a home anesthesia program.

Accomplishments and Educational Innovation

During 2024–2026, the Education Division continued to strengthen its national presence, advance educational scholarship, and develop innovative approaches to clinical training, simulation, and assessment.

- Robina Matyal, MBBS, serves as Vice Chair for Education and continues to contribute to national anesthesiology education and examination development, including service with the American Board of Anesthesiology.
- The division continued its *Clinics in Medical Education* initiative, providing an interactive journal and forum for educational scholarship, case-based discussion, and dissemination of innovative teaching practices.
- In 2026, Sara Neves, MD, transitioned from Residency Program Director to Vice Chair of Professional Affairs. During her tenure as Residency Program Director, she helped guide the residency program's educational development and supported initiatives in resident mentorship, feedback, and curriculum innovation. Aidan Sharkey, MD, succeeded her as Residency Program Director in 2026.
- Sugantha Sundar, MD, continues to serve as an American Board of Anesthesiology examiner and directs the annual Harvard Anesthesiology Update continuing medical education program.



- The department continued developing open courseware through the Docebo learning management system, with faculty and trainees contributing educational modules. Ameeka Pannu, MD, and Feroze Mahmood, MD, continue to contribute to UpToDate in anesthesiology.
- Department faculty maintain a strong presence at national meetings, including those of the Society for Education in Anesthesia, the American Society of Anesthesiologists, and the Society of Cardiovascular Anesthesiologists.
- Jacqueline Hannan, PhD, continues education research examining automaticity, workload, and performance during ultrasound-guided procedures, incorporating motion tracking, eye tracking, and clinical performance measures.
- Nadav Levy, MD, leads an ongoing in situ simulation program incorporating self-reflection, audio analysis, and evaluation of simulation performance in relation to clinical training.
- The department continues to expand virtual reality–based training for central venous catheter placement and other procedural skills.
- Ruma Bose, MD, leads development of a Rescue Ultrasound curriculum incorporating high-fidelity simulation and augmented reality.
- The department continues to use simulation and educational technology to support quality improvement, communication, procedural training, and patient safety.
- Shweta Yemul Golhar, MD, leads a virtual clinical ultrasound curriculum for international trainees in India, combining remote instruction with clinical education and mentorship.







Education Research

The division continues to support education research across simulation, procedural skills, technology-enhanced learning, and assessment.

Grant	PI	Title	Status
T32	Jacqueline Hannan, PhD	Objective Evaluation of Automaticity in Ultrasound-Guided Procedures	Funded
SSH Early Career Award	Jacqueline Hannan, PhD	Quantifying mental workload with various training strategies for central venous catheter placement	Funded
Rabkin	Maria Borrelli, DO	Evaluating a Simulation Training Program for Medical Students	Funded

Education Programs

The department values continuous learning and provides multiple opportunities for residents, fellows, faculty, and other healthcare professionals. Educational activities include protected academic time, interdisciplinary Grand Rounds, morbidity and mortality conferences, simulation, skills workshops, journal clubs, board preparation, and specialty-specific curricula.

The residency program begins with a dedicated internship followed by a structured three-year anesthesiology curriculum. Didactic and experiential education are integrated throughout training.

Current resident educational activities include:

- Grand Rounds
- Morbidity and Mortality Conferences
- Tuesday Education Day
- Monthly Resident Grand Rounds
- Mock Oral Boards
- Journal Club
- In situ simulation
- Procedural and skills workshops
- Division-specific lectures and curricula
- Global health experiences
- Protected academic time

Residency Internship

Meredith Colella, MD, directs the categorical internship program. The categorical internship provides a broad clinical foundation in medicine and surgery while introducing residents to the hospital, operating environment, and multidisciplinary teams with whom they will work throughout residency.

Interns rotate through BIDMC and affiliated clinical sites and gain experience in medicine, surgery, cardiology, oncology, critical care, anesthesia, emergency medicine, neurology, and other disciplines relevant to perioperative care.

Residency Program: PGY-2–PGY-4

The residency curriculum is organized around progressive clinical responsibility, structured didactics, simulation, procedural training, mentorship, and scholarly development.

The department currently accepts 24 residents per year. The Loring Scholar/Clinical Scientist Research Track provides an individualized pathway for residents interested in developing careers as physician-scientists. The program connects residents with departmental mentors and resources through Harvard Catalyst, MIT, and other research programs.

Selected Rotation Programs

Critical Care

The critical care curriculum provides residents with a strong foundation in the management of critically ill surgical and trauma patients. Residents care for patients with complex trauma and thoracic, transplant, vascular, and general surgical conditions while developing expertise in mechanical ventilation, severe respiratory failure, invasive monitoring, hemodynamic management, organ support, resuscitation, and multidisciplinary critical care.

Categorical interns who become residents receive longitudinal ICU experience while senior (PGY-4) residents have additional elective opportunities in the cardiothoracic and neuroscience intensive care units.

Critical care education includes structured lectures and case-based teaching on topics including shock, sepsis, respiratory failure, pharmacology, transfusion medicine, hemodynamic monitoring, nutrition, resuscitation, mechanical ventilation, end-of-life care, ethics, ECMO, acute kidney injury, gastrointestinal bleeding, acid-base physiology, and sedation.

Regional Anesthesia

Regional anesthesia is a major component of the residency curriculum. Residents are introduced to regional techniques early in training and develop increasing proficiency through dedicated regional anesthesia rotations and supervised clinical experience.

The Education Lab provides computer-assisted peripheral nerve block models, thoracic and lumbar epidural models with adjustable difficulty, ultrasound training, and procedural tutorials. Quarterly education sessions provide residents with additional opportunities to practice ultrasound-guided procedures and reinforce technical skills.

Graduates leave residency with experience in neuraxial anesthesia and ultrasound-guided regional anesthesia for a broad range of surgical procedures.

Thoracic Anesthesia

The thoracic anesthesia curriculum incorporates interactive online learning through the department's learning management system, followed by simulation and supervised clinical training.

The curriculum includes:

- Interactive online introductory education
- Hands-on simulator training
- Supervised teaching and clinical training in the operating room

Ongoing lectures and journal clubs reinforce important concepts and current evidence in thoracic anesthesia.

The division also supervises the thoracic anesthesia rotation for cardiothoracic anesthesia fellows. A "mini-attending" experience allows fellows, under attending supervision, to teach and supervise residents while developing skills in clinical education and trainee supervision.

Vascular Anesthesia

The vascular anesthesia curriculum incorporates pre-learning, interactive online modules, simulation, and clinical teaching to maximize learning from each patient encounter. Residents begin the rotation by identifying expected knowledge and procedural skills, completing self-assessment activities, and working through problem-based scenarios.

Clinical teaching includes bedside instruction, formal lectures, simulation-based learning, and participation in relevant national and international educational activities.

Loring Scholar/Clinical Scientist Research Track

The Loring Scholar/Clinical Scientist Research Track is individualized through the residency program and the Center for Anesthesia Research Excellence (CARE). The program is designed to develop future clinical scientists and academic leaders.

The program provides:

- Identification of a research focus and departmental mentor
- Access to Harvard Catalyst, MIT, and other research resources
- Intensive research mentorship
- Training in research methodology
- Opportunities for scholarly presentation and publication
- Protected research time during advanced residency

Residency Educational Resources

Simulation Center

The Carl J. Shapiro Simulation and Skills Center at Beth Israel Deaconess Medical Center provides multidisciplinary simulation-based education for physicians, nurses, medical students, and other healthcare professionals. The center occupies approximately 5,000 square feet on the BIDMC East Campus and supports both individual procedural training and team-based simulation.

Learners participate in simulations involving minimally invasive and robotic surgery, airway management, invasive procedures, acute trauma, obstetric emergencies, cardiac and pulmonary arrest, ultrasound-guided procedures, and surgical complications.

The department also owns and operates the Center for Medical Simulation (CMS) in Charlestown, a nationally and internationally recognized center for healthcare simulation and team training.

Anesthesia Skills Laboratory

The Anesthesia Skills Laboratory is led by Robina Matyal, MD, Vice Chair for Education and Director of CERTAIN. The approximately 200-square-foot facility on the BIDMC East Campus supports individual and group skills training for residents, fellows, and faculty.

The laboratory supports self-directed learning, small- and large-group instruction, video conferencing, and live streaming. It includes networked computer workstations, computer-based part-task trainers, mannequin-based procedural trainers, ultrasound equipment, and space for small-group instruction.

The laboratory also includes virtual and augmented reality technology, including Meta Quest and Microsoft HoloLens systems, as well as Aurora, a high-fidelity simulator used for respiratory management and ventilator training.

Loring Scholar/Clinical Scientist Research Track			
Year	Research Time	Course(s)	Conference(s)
PGY-1	1 month	BIDMC Intro to Research	Consultation with Harvard librarian
PGY-2*-3	BIDMC Intro to Research (if not taken in PGY-1)	ASA, FAER Scholars, or equivalent One research presentation at conferences covered	
PGY-4	6 months	Successful Grant Writing Strategies (Harvard Catalyst workshop) Case-Based Stats for Clinical and Biological Scientists (Harvard Catalyst online course)	Two research presentations at conferences covered
*Mentors will be identified in the PGY-2 year			

Unique Skills Training Programs

Perioperative Ultrasound Training

The perioperative ultrasound program provides multimodal training in point-of-care ultrasound, rescue TEE, cardiac imaging, and perioperative ultrasound. Faculty members with expertise in perioperative TEE and critical care ultrasound provide instruction to residents, fellows, and faculty.

The program incorporates hands-on scanning, simulation, image review, and longitudinal feedback. Portable ultrasound technology has also expanded opportunities for bedside teaching and remote image review across the Beth Israel Lahey Health network.

Faculty members participate in national and international educational programs, professional committees, editorial activities, and educational symposia. The division also contributes to courses in two- and three-dimensional TEE and perioperative ultrasound for anesthesia, cardiology, and surgical learners.

In Situ Simulation Training

The department uses in situ simulation to improve clinical readiness, communication, teamwork, and operating room efficiency. Simulation scenarios are conducted in the clinical environment and are used to identify system vulnerabilities, improve workflows, and reinforce crisis-management skills.

Current quality improvement initiatives include attention to on-time starts, communication and pre-planning among team members, workflow optimization, and team performance during high-acuity events.

ICU BASIC Course

Since 2011, critical care faculty and fellows have led the ICU BASIC Course, an introductory program completed by residents before beginning their surgical ICU rotations. The course is offered three times each year at the Shapiro Skills and Simulation Center.

The curriculum combines didactic teaching with hands-on simulation and covers fundamental concepts in surgical critical care, including shock, respiratory failure, neurologic emergencies, ventilator management, cardiac arrest, and invasive procedures.

The course is currently led by **Theresa Feng, MD and Jessica Cassavaugh, MD, PhD** and includes instruction from critical care fellows and respiratory therapists. The program has expanded to include advanced practice providers and trainees from multiple surgical and procedural specialties.

Continuing Medical Education

The department contributes to continuing medical education through courses offered through Harvard Medical School and other educational programs.

Anesthesiology Update — May 4–8, 2026
Course Directors: Sugantha Sundar, MD, and Brian O'Gara, MD, MPH

Anesthesiology Update provides practicing anesthesiologists, nurse anesthetists, and other healthcare professionals with an intensive review of advances in anesthesiology, risk mitigation, clinical guidelines, and emerging practice. The interactive format combines lectures from national and international experts with practical recommendations and resources for clinical practice.

Boston 3D Echo Workshop — June 12–14, 2026
Course Directors: Feroze Mahmood, MD, and Shweta Yemul Golhar, MD

This interactive workshop provides advanced education in three-dimensional echocardiography for cardiac anesthesiologists, echocardiographers, and interventionalists. Topics include acquisition and optimization of three-dimensional datasets, multiplanar reconstruction, valve assessment, ventricular volumes, and measurement of cardiac structures relevant to structural and interventional procedures.

Evaluating and Treating Pain — June 29–July 2, 2026
Course Directors: Carol A. Warfield, MD; Sanjeet Narang, MD; and Thomas T. Simopoulos, MD, MA

This multidisciplinary CME course provides an update on the diagnosis and treatment of acute, chronic, and cancer-related pain. Faculty from anesthesiology, neurology, psychiatry, psychology, internal medicine, physical medicine and rehabilitation, orthopedic surgery, interventional radiology, and neurosurgery address pharmacologic, behavioral, and interventional approaches to pain management, including the appropriate use of opioids.

Consciousness, Cognition, and Compassion
Course Directors: Balachundhar Subramaniam, MD, MPH, and Sepideh Hariri, PhD

This interdisciplinary conference examines consciousness from the perspectives of anesthesiology, neuroscience, psychology, physics, and related fields, with additional discussion of leadership, compassion, environmental responsibility, and the broader human dimensions of healthcare.

New CME Programs

The department has developed additional CME opportunities focused on educational practice and crisis management, including:

Education Scholarly Program — a faculty CME program focused on mentorship, clinical teaching, and perioperative education.

Maintenance of Skills and Crisis Management for Anesthesia Providers Using Simulation-Based Training — a hands-on faculty CME program focused on crisis resource management and maintenance of procedural and clinical skills.

Postgraduate Education for Faculty

Faculty members participate in formal postgraduate education through Harvard Medical School, Harvard T.H. Chan School of Public Health, BIDMC, and other institutions.

Faculty in the Critical Care Division have participated in the Program in Clinical Effectiveness at Harvard T.H. Chan School of Public Health, which provides training in clinical epidemiology and biostatistics.

The Silverman Institute for Health Care Quality and Safety at BIDMC offers leadership development opportunities for physicians, including programs focused on leadership skills, reflection, communication, and implementation of organizational change.

Departmental Conferences and M&M

Weekly Grand Rounds provide a forum for education across the Department of Anesthesia, Critical Care and Pain Medicine. Speakers include national and international experts as well as members of the department presenting updates on clinical practice, research, education, quality improvement, and topics aligned with the department's mission.

The department also conducts morbidity and mortality conferences and participates in interdisciplinary safety conferences. Faculty and trainees contribute clinical lectures, case discussions, and hands-on educational sessions throughout the academic year.

Hands-on ultrasound and procedural education is incorporated periodically into the departmental educational calendar.



Fellowships

Between 30% and 70% of our residents choose to pursue fellowship training, with many choosing to remain at BIDMC. Fellowship programs are individually led by their program directors and overseen by Dr. Ruma Bose, Director of Fellowships. Under her leadership, the department has expanded its fellowship offerings, including the addition of Advanced Perioperative and Clinical Anesthesia and Neuroanesthesia, brought nonstandard fellowships into alignment with ACGME standards, and transitioned the Regional Anesthesia and Acute Pain Medicine Fellowship to an ACGME-accredited program.

The department currently offers nine fellowship and advanced training programs, including both ACGME-accredited and non-ACGME-accredited programs:

- Adult Cardiothoracic Anesthesia*
- Anesthesia Critical Care Medicine*
- Obstetric Anesthesiology*
- Pain Medicine*
- Regional Anesthesia and Acute Pain Medicine*
- Perioperative Quality and Safety
- Medical Education
- Advanced Perioperative and Clinical Anesthesia
- Neuroanesthesia

*ACGME-accredited

Adult Cardiothoracic Anesthesia Fellowship

The Cardiothoracic Anesthesia Fellowship is designed to prepare experts and leaders in cardiothoracic anesthesia. The program provides a strong academic and clinical foundation for a career in cardiothoracic anesthesiology, with emphasis on cardiopulmonary pathophysiology, pharmacology, and advanced clinical management of patients undergoing cardiothoracic procedures. Fellows also develop the knowledge and skills necessary to pursue certification in perioperative transesophageal echocardiography through the National Board of Echocardiography.

Advanced Perioperative and Clinical Anesthesia Fellowship

The Advanced Perioperative and Clinical Anesthesia Fellowship provides advanced training in the management of high-risk surgical patients. Fellows participate in complex vascular and other high-acuity procedures and gain experience with advanced monitoring and technologies, including ventricular assist devices, spinal drains, pacemakers, perioperative ultrasound, and hybrid operating rooms.

Fellows contribute to the development of educational tools and standardized practice pathways for complex procedures, including equipment setup for TEVAR and EVAR and cerebrospinal fluid drain placement for ruptured abdominal aortic aneurysms. They also participate in multidisciplinary conferences and supervise residents in invasive monitoring and perioperative ultrasound. The fellowship is designed to develop advanced perioperative clinicians who can provide complex clinical care while helping educate the next generation of anesthesiologists.

Anesthesia Critical Care Medicine Fellowship (ACGME)

Our Anesthesia Critical Care Medicine Fellowship has been ACGME-accredited since 1990 and has trained more than 83 fellows in advanced critical care medicine. The 12-month program includes nine months of rotations through the TSICU, SICU, CVICU, Neuro ICU, CCU, and combined medical/surgical ICU, with three months of elective and research time.

Fellows participate in overnight and weekend call and complete six weeks of weekday in-house overnight call during the year. The program has expanded its clinical experience to include the CCU, mechanical circulatory support, and the Neuro ICU.

Dr. Ameeka Pannu led the program through this period of expansion before transitioning to her role as Director of Cardiac Critical Care. The current Anesthesia Critical Care Medicine Fellowship Program Director is Dr. Jessica Cassavaugh.

The program accepts four fellows annually through the San Francisco Match. The division also offers two-year training pathways. One is the dual Adult Cardiothoracic Anesthesia/Anesthesia Critical Care Medicine pathway, which allows physicians to complete one year of Adult Cardiothoracic Anesthesia training and one year of Anesthesia Critical Care Medicine training within the department. The other is a 24-month Anesthesia Critical Care Medicine pathway for physicians who have completed an Emergency Medicine residency, which was approved by the American Board of Anesthesiology in 2018.

The goal of the fellowship is to prepare graduates to provide comprehensive care for critically ill patients, lead multidisciplinary teams, manage critical care operations, critically appraise the medical literature, and develop foundational research skills. Fellows also participate in a structured didactic curriculum throughout the year.

Neuroanesthesia Fellowship

The Neuroanesthesia Fellowship is a one-year, non-ACGME-accredited program established in 2017.

The fellowship provides advanced clinical training in anesthesia for complex intracranial disease, including both surgical and endovascular procedures, as well as complex acute and chronic spine surgery. Graduates have gone on to academic positions at institutions including BIDMC, Dartmouth-Hitchcock, Yale, and the University of Florida.

For anesthesiologists who have completed fellowship training in critical care medicine, the department also offers a one-year fellowship in neurocritical care. This program is accredited by the United Council for Neurologic Subspecialties and leads to board eligibility in neurocritical care.

Obstetric Anesthesiology Fellowship (ACGME)

We offer two positions annually in our one-year ACGME-accredited Obstetric Anesthesiology Fellowship. The program combines advanced clinical training with opportunities for clinical research and resident education.

Fellows work with dedicated obstetric anesthesiologists and collaborate closely with intensivists, cardiologists, obstetricians, maternal-fetal medicine specialists, neonatologists, and pathologists. Training includes:

- Transthoracic echocardiography
- Point-of-care ultrasound
- Transfusion medicine and blood bank
- Maternal-fetal medicine
- Neonatal intensive care
- Clinical research
- Elective global health experience

The program prepares physicians to educate colleagues across disciplines and contribute to the continued advancement of obstetric anesthesia through clinical practice, scholarship, and research.

Pain Medicine Fellowship (ACGME)

Our Pain Medicine Fellowship is nationally recognized for its comprehensive, multidisciplinary approach to pain medicine education. The program prepares fellows to provide state-of-the-art care for patients with complex pain conditions while developing skills in leadership, research, and clinical education.

Fellows train in the outpatient Arnold–Warfield Pain Center, inpatient Acute/Chronic Pain Services, and satellite pain clinics throughout the greater Boston area. The multidisciplinary faculty includes specialists in anesthesiology, neurology, physiatry, internal medicine, psychology, nursing, physical therapy, and complementary medicine. Fellows participate in departmental Grand Rounds, seminars, clinical case

conferences, and a broad range of interventional and noninterventional pain care.

Fellows also participate in the Comprehensive Headache Center, pain psychology evaluations, pediatric pain care at Boston Children's Hospital, and palliative care rotations focused on cancer-related pain. Faculty from pain psychology, neurology, spine surgery, and physiatry provide additional expertise in multidisciplinary and multimodal approaches to pain treatment.

Regional Anesthesia and Acute Pain Medicine Fellowship (ACGME)

The Regional Anesthesia and Acute Pain Medicine Fellowship prepares fellows to serve as consultants in regional anesthesia and acute pain management and to provide optimal perioperative pain care.

Fellows rotate between adult regional anesthesia and the acute pain service while also practicing as attending anesthesiologists within the Department of Anesthesia, Critical Care and Pain Medicine at BIDMC. Fellows have opportunities for regional anesthesia experience at community hospitals throughout the Beth Israel Lahey Health system and receive extensive exposure to orthopedic regional anesthesia at New England Baptist Hospital. A short rotation at Boston Children's Hospital is also available.

Training includes peripheral nerve single-shot blocks and catheters, multimodal analgesia, and regional techniques for adolescents and adults, including head and neck, upper and lower extremity, and truncal blocks.

Fellows attend weekly departmental Grand Rounds, teach residents, participate in monthly Journal Club, and complete at least one quality and safety or research project during the fellowship year.

Special Programs

Advanced Structural Heart Program

The Cardiac Anesthesia Division offers advanced training in structural heart disease imaging. Fellows develop expertise in three-dimensional cardiac imaging for assessment of cardiac and valvular structure and function and learn to use advanced imaging to guide interventional cardiology procedures.

The program was among the first in the country to offer a dedicated six-month Structural Heart Disease fellowship focused on the perioperative management of patients undergoing structural heart interventions.

Several graduates have remained on the BIDMC faculty and contributed to the continued development of the institution's structural heart program.

Clinical Ultrasound and Vascular Fellowship

This one-year advanced training program is designed for anesthesiologists who have completed their anesthesia board requirements and seek additional expertise in invasive monitoring and perioperative ultrasound for diagnosis and clinical management.

Executive Education

Executive Scholar Program in Quality and Safety

The Executive Scholar Program in Quality and Safety is designed to develop the next generation of leaders in healthcare quality and safety. More than 50% of program alumni are currently serving as directors within their institutions.

This two-year program combines training through Harvard Medical School, culminating in a Master of Healthcare Quality and Safety, with clinical practice in anesthesia and critical care at BIDMC, engagement with hospital operations, and access to a robust research environment.

The program prepares scholars to lead improvements in patient safety and quality within an increasingly complex healthcare environment. Scholars are exposed to organizational aspects of healthcare quality and safety and work with mentors who are recognized leaders in the field. They also participate in the department's Quality and Safety Outcomes Research Lab, using institutional data resources to conduct operationally relevant research and receive simulation training through the Center for Medical Simulation.

Program activities and projects have included neuromuscular blocking agent safety, work intensity and clinical outcomes, safety outcomes following airway device implementation, cost-effectiveness of clinical change, root cause analysis and action, implementation science, Quality Week programming, systems-focused event reviews, team training, and other interventions



designed to improve safety culture and communication.

Program objectives include:

- Drive strategic change and foster a culture of quality and safety.
- Generate data-driven solutions to operational challenges.
- Use data to support evidence-based improvements.
- Measure, interpret, and communicate meaningful healthcare outcomes.
- Identify quality and safety gaps and develop strategies to address them.
- Develop and implement quality improvement initiatives within resource constraints.
- Assess and improve healthcare processes through evidence-based practices.
- Identify, design, and implement malpractice prevention and intervention strategies.

Fellowship in Medical Education

The Medical Education Fellowship is a fully funded, two-year integrated program culminating in a Master of Medical Sciences in Medical Education degree from Harvard Medical School.

The program develops clinician-educators into independent leaders in academic medicine through advanced training in education theory, curriculum design, innovation, assessment, and research.

Fellows learn to:

- Apply foundational learning theories and adult learning principles to educational program design.
- Design, implement, and evaluate curricula across undergraduate, graduate, and continuing medical education.
- Identify educational gaps and develop evidence-based interventions.
- Develop and use assessment tools, including OSCEs, simulation, and written evaluations.
- Conduct rigorous qualitative and quantitative medical education research.
- Integrate simulation, virtual reality, and other emerging technologies into teaching and assessment.
- Deliver high-quality instruction to interprofessional and multidisciplinary learners.
- Develop leadership, mentorship, and communication skills.
- Participate in education administration, curriculum planning, program evaluation, and accreditation.
- Lead innovation in medical education at institutional, national, and global levels.

Growth and Recruitment

Medical Student Program

The department offers medical students a broad range of clinical experiences in anesthesia, critical care, and pain medicine. The core anesthesiology clerkship provides students with direct experience in the BIDMC operating rooms, with progressively more complex clinical exposure as the rotation advances.

Additional opportunities include rotations in obstetric anesthesia and pain relief in childbirth; respiratory and surgical intensive care; preclinical anesthesiology; perioperative medicine; and a post-PCE curriculum providing an in-depth introduction to anesthesiology. Together, these experiences provide students with exposure to the breadth of anesthesiology and a comprehensive understanding of the specialty as a career.

To Learn More and join Our Community:

INSTAGRAM

@BIDMC_Anesthesia
Residency | Culture | Department Life

@BIDMC_Anesthesia_Education
CERTAIN: Education Research

@BIDMC_InterventionalPainMed
Pain Fellowship/Pain Center

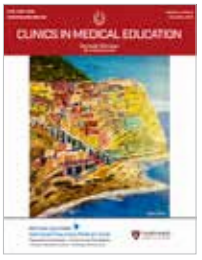
@CenterForMedicalSimulation
Simulation and Training

@BIDMC_CriticalCare
Critical Care Fellowship

@HMFP_Anesthesia_CRNA
CRNA Division

LINKEDIN

BIDMC Department of Anesthesia, Critical Care and Pain Medicine



CLINICS IN MEDICAL EDUCATION
A journal for education in anesthesthesia

WEBSITE: medicaleducationclinic.com

An online, interactive medical education journal produced by CERTAIN (Center for Education Research and Innovation) and published by the Department of Anesthesia, Critical Care and Pain Medicine, featuring the latest developments, educational insights, and clinical learning resources in anesthesia.

SRNA Program

BIDMC serves as a major clinical training site for student registered nurse anesthetists from Boston College and Northeastern University. Students receive hands-on clinical experience within the department and across the BIDMC and Beth Israel Lahey Health network.

.Postgraduate Education for Faculty

Faculty members participate in advanced educational opportunities designed to strengthen clinical research, leadership, and quality improvement skills. Several members of the Critical Care Division have completed the Program in Clinical Effectiveness at the Harvard T.H. Chan School of Public Health, a summer program providing training in clinical epidemiology and biostatistics.

The Silverman Institute for Health Care Quality and Safety at BIDMC also offers a Physician Leadership Development Program designed to strengthen leadership skills through customized training emphasizing reflection, organizational leadership, and action.

Departmental Conferences and M&M

Weekly Wednesday morning Grand Rounds feature speakers addressing topics related to the department's clinical practice, academic mission, values, and priorities. Faculty include national and international experts as well as members of the department who present updates on clinical practice, research, education, and quality improvement.

In addition to Grand Rounds and morbidity and mortality (M&M) conferences, the department participates in quarterly interdisciplinary safety Grand Rounds. Faculty also participate in clinical lectures, hands-on educational sessions, and periodic ultrasound training throughout the academic year.

Faculty are expected to participate in departmental Grand Rounds and M&M conferences, with a target of attending at least 75% of sessions, with appropriate exceptions for post-call responsibilities, leave, and other excused absences. The department also offers periodic hands-on ultrasound education to support continued development of procedural and imaging skills. ❑





Administration



Dawn Ferrazza, MA

Chief Administrative Officer

Overview and Organization

The administrative group, led by Chief Administrative Officer (CAO) Dawn Ferrazza, provides foundational support for all functions of the Department of Anesthesia, Critical Care and Pain Medicine. Two administrative directors report to the CAO and provide operational leadership for Harvard Medical Faculty Physicians (HMFP) and Longwood Specialty Physicians (LSP).

The administrative group provides oversight for nine functional areas supporting the department's clinical, academic, research, and operational missions. Each administrative director partners with department leadership and vice chairs to support the needs of both HMFP and LSP. The functional areas and their respective leadership are listed below.

Vision and Opportunities

Administration's vision is to provide exceptional results that advance the department's missions by cultivating strategic partnerships, leading operational initiatives, and driving process innovation. Opportunities to achieve this vision include close alignment between administrative leaders and the department's vice chairs, as well as ongoing refinement and standardization of administrative processes.

Recent efforts have included consolidation to a single scheduling platform across locations, implementation of tracking systems for provider credentialing and other professional affairs processes, and development of team-based systems for financial management. By embracing modern tools, technology, and processes, the administrative team continues to improve efficiency and responsiveness while supporting the department's growing clinical, academic, and research activities. ❑

Specialty	Administrative Director	Vice Chair (Clinical Partner)
Administration Group	**Dawn Ferrazza, MA** CAO	Department Chair Executive Vice Chair
HMFP Clinical, Critical Care, and Pain Medicine	**Brian Duckman, MBA/MHA** Director, HMFP	VC Clinical Operations VC Critical Care VC Pain Medicine
LSP Clinical and Pain Medicine	**Krystyna Prokopiuk** Executive Director, LSP	VC Network Anesthesia
Communications	**Heather Derocher, MA**	Executive Vice Chair Emeritus
Community Engagement	**Jana Penders, PhD**	VC Community Engagement
Finance	**Patricia Stevens, MBA**	Department Chair
Professional Affairs	**Susan Kilbride**	VC Professional Affairs
QSI	**Krystyna Prokopiuk** Executive Director, LSP	VC QSI
Research, Education	**Alex Shtifman, PhD**	VC Research VC Education
Scheduling	**Krystyna Prokopiuk** Executive Director, LSP	VC Clinical Operations

Quality, Safety, and Innovation



Richard J. Pollard, MD

Vice Chair, Quality, Safety, Innovation and Informatics

Director, Neuroanesthesia Fellowship

Assistant Professor of Anaesthesia



Liana Zucco, MD

Director, Quality, and Safety

Instructor in Anaesthesia



Nathaniel Greenbaum, MD

Director, Informatics

Instructor in Anaesthesia

Overview and Organization

The Division of Quality, Safety, Innovation and Informatics (QSII) was created in 2009 with the goals of centralizing and coordinating quality and safety activities in the department, ensuring representation at important hospital meetings, expanding the number of faculty involved in these activities and developing department safety initiatives, education programs and research. The division, led by Vice Chair of QSII Dr. Richard Pollard, Director of Quality and Safety Dr. Liana Zucco, and Director of Informatics Dr. Nathaniel Greenbaum, supports the delivery of safe and efficient patient care through processes directed at the site, division, and individual level. The division's foundational arms aim to create more effective ways to modify both human and system drivers of quality and safety. The QSII team is also responsible for overseeing and assisting quality, safety and innovation efforts at the hospitals that make up the Beth Israel Lahey Health (BILH) system.

Clinical Quality

The QSII leadership group comprises site directors, quality leaders, IT experts, project managers, and support staff who are actively engaged in developing quality and safety programs, as well as research and data visualizations for both process and outcome metrics relevant to our constituencies. This data-visualization engine combines data from multiple local and organizational databases that allow us to link processes of care with outcomes that matter to our patients, department, and organization. Specific cross-departmental issues identified through threshold indicators are explored in depth through the Faculty Hour mechanism using multidisciplinary project teams. It is estimated that the combined efforts of these projects reduce hospital costs by several million dollars a year while enhancing patient safety. Our highly successful project management team supports clinical leadership in executing key interventions.





Clinical Safety

During the past several years, we have continued to use system-based Quality Assurance (QA) methods to enhance the quality and safety of clinical care. Striving to foster a Just Culture, we have focused on promoting a model of shared accountability and a deeper understanding of human factors. This philosophy is evident in our Morbidity and Mortality (M&M) structure, which provides a standardized set of support tools to improve both individual and organizational learning from adverse events or near misses. Peer review is performed by our Professional Standards Committee and Departmental Safey Committee, which is designed to evaluate systems vulnerabilities and identify contributing factors when analyzing adverse events. A select number of major adverse events are presented at the twice-monthly multidisciplinary hospital Quality Improvement Directors Meeting for further review and potential reporting to state agencies.

Over the last 2 years, we have further refined our adverse event reporting system and have seen an incredible 5-fold increase in reporting from within the department. This has resulted in dozens of quality improvement initiatives, guideline development, project generation, and safety measures.

Future goals of the division will be to implement automated methods for tracking of adverse events, as well as national safety indicators

Education and Team Training Projects

The division provides ongoing, robust quality and safety educational programs for faculty, CRNAs and residents at all stages of training. Programs such as Intern Quality Improvement Week, the Resident Root Cause Analysis and Action (RCAA) program, and the Combined Safety Grand Rounds Conference, focus on enabling and training providers to perform standardized patient safety exercises. A new educational platform, introduced over the last 2 years in concert with our colleagues from the Education Division, is the hands-on Quality and Safety Workshop for faculty, which delivers focused hands-on training on topics identified through adverse event reporting. The program allows for an opportunity to consolidate learning and promote a culture of safety.

Vision and Opportunities

Our innovation efforts aim to discover improvements that will positively impact healthcare delivery in the perioperative environment. This work involves both quality-improvement initiatives and rigorous research projects. The results influence areas such as team and organization design, communication pathways and transitions of care, information management systems and training and education. By virtue of being part of the Department of Anesthesia, Critical Care and Pain Medicine, we work across all phases of the perioperative environment (pre-, intra-, and post-operative). We also strive to work across departments, including Surgery, Orthopedics, Obstetrics/Gynecology, Perioperative Nursing, Pharmacy, as well as Healthcare Quality and Safety, to ensure our improvement and research efforts encompass the interdisciplinary nature of our perioperative work.

Areas of Excellence

The QSII division focuses on excellence in clinical care, education and research to further its goal of improving anesthesia care both at BIDMC and the allied hospitals of the Beth Israel Lahey Health (BILH) system. The unique postgraduate Executive Scholars Program in Perioperative Quality and Safety allows the department to focus more fully on practices to improve quality and safety both within the department and across the hospital system. This scholars program leads the drive to refine the QSII process through education and research.

• The activities of the Informatics Division allow a fuller visualization of quality and safety metrics to be analyzed for areas targeted for improvement. This allows the department to focus on excellence in clinical care.

• The creation of the Network Anesthesia Patient Safety Committee allows for a shared operational and mental model to improve quality and safety across the healthcare network. This will allow the BILH system to become a national leader in quality and safety.

QSII Education Activities

The division successfully integrated an expanded quality and safety training program for postgraduate residents, fellows, and faculty over the last two years. The intern QA week is now a fully mature, immersive program with lectures from nationally renowned experts in quality, safety, informatics, operations, and human factors. Under the course directorship of Dr. Krish Ramachandran along with Dr. Sara Neves and the QSI executive scholars, the division has completed seven full years of RCA2 training for the third postgraduate year (PGY-3) class. Our residents have completed over 20 RCA2s over the last 6 years. Through this program, residents and faculty

trainers are employing industry-standard techniques endorsed by the Institute for Healthcare Improvement and the National Patient Safety Foundation. We also defined the Implementation Science Training Curriculum for the PGY-4 (CA-3) residents. The goal is to train our residents in the approach and methodology for influencing and implementing changes in healthcare environments. The program was developed through collaboration with Dr. James Bagian and Joseph Derosier, PE, CSP, two pre-eminent leaders in patient safety, internationally renowned for their work in the National Center for Patient Safety and their authorship of the RCA2 methodology.

Fellowship

A two-year PGY-5 Executive Scholar Program in Quality and Safety was approved as a Non-Accreditation Council for Graduate Medical Education (ACGME) program by the BIDMC Graduate Medical Education Committee and endorsed by the ABA in 2018. This program sponsors two exceptional international post-residency scholars each year. Scholars receive a Master of Science in Healthcare Quality and Safety from Harvard Medical School. A collaboration was finalized with the Royal College of Anaesthetists, the UK Association of Anaesthetists of Great Britain and Ireland, and the UK National Health Service (NHS) through the Safe Anesthesia Liaison Group, to host scholars at BIDMC through this mechanism. This provides a tremendous opportunity for us to develop internationally recognized leaders in healthcare quality. Visit https://www.salg.ac.uk/get-involved/salg-bidmc-fellowship.

QSII Research Activities

The QSII research efforts focus on epidemiology, root causes, human factors, resilience, interventions, implementation, and outcomes as they relate to the quality, safety and innovation of healthcare. Research topics examine both retrospective and prospective data to develop innovative solutions to healthcare quality and safety. Over the past several years, we have engaged in human factors and cognitive systems engineering research to understand and mitigate safety and quality vulnerabilities for our individual providers, teams, and systems. Currently, our research focuses on individual performance assessment and augmentation, simulation-based training and education, as well as system-level collaboration and resilience. Our latest efforts are aimed at understanding provider reporting of near-miss or no-harm events.

Funded Research

Dr. Krish Ramachandran has received several research grants from industry sponsors and the Controlled Risk Insurance Company (CRICO). These grants are being used to improve quality, safety, and innovation at BIDMC.

Clinical Trials

Dr. Pollard has completed a triple-blinded, placebo-controlled, randomized clinical trial on the effects of Dantrolene on patients after posterior lumbar spine surgery. The manuscript is in process of being completed.

Clinical Safety Initiatives

QSI Alerts and Minutes

QSI minutes are brief communications to highlight a quality and safety issue for the department. Initiated in 2023, we have now issued over 20 communications. Topics include medication safety, blood product mismatch risks, ventilation equipment, product changes, and so on. These alerts have now been consolidated into a single resource for providers to review easily on our C8 and anesthesia portal platforms.

Medication Safety

Medication safety continues to be an ongoing challenge in anesthesia practice, as anesthesiologists are solely responsible for obtaining, preparing, and administering potent medications in the operating room. In 2025, we established an Anesthesia-Pharmacy Quality and Safety Program, to streamline quality and safety efforts across these two departments and increase collaboration between the two departments to find additional systems-level interventions to reduce medication errors. This has already resulted in over 12 significant improvements to workflow and medication safety in the operating rooms. Initial targets included expansion of pre-mixed, pre-filled syringes and IV infusions, pharmacy verification of epidural infusions, and Omnicell drawer reconfiguration. More recently, a dedicated OR-Anesthesia Drug library on all large volume infusion pumps was implemented to promote safety when using specific high-risk medications.

Nursing M&M

Our framework for M&M meetings has now been adopted by our nursing colleagues in the Post Anesthesia Care Unit. With the support of Dr. Liana Zucco, an M&M structure was created to help PACU nursing teams learn from adverse events. This has been ongoing for the last two years, with several educational and safety initiatives being implemented. The response from nursing colleagues to this initiative was overwhelmingly positive, with over 90% agreeing it would positively impact their practice and the unit's overall practice, including communication with physician colleagues. 93% stated they received new information and 100% felt it was a safe environment to voice concerns. This work was presented at the American Society for PeriAnethesia Nurses.

SRNA Collaboration

Under the direction of Megan Clancy, CRNA and Dr Liana Zucco, a collaboration was developed to support SRNAs during their DNP program, focusing on a quality and safety topic relevant to the department. This pilot collaboration resulted in a clinical and economic assessment of IV fluid shortages in the endoscopy unit. The completed project was selected by Boston College for presentation at the Eastern Nursing Research Society Conference and received the 1st place DNP Poster Award. The success of this program has set the path for upcoming SRNAs, and three new projects focusing on MRI safety, allergy alert fatigue, and difficult airway algorithms.

OR Anesthesia Emergency Manual Creation

In 2020, the QSI team published the BIDMC Emergency Manual, a compendium of cognitive aids to support crisis management in the operating room (OR). This program is intended to focus on team training around events directly relevant to anesthesia care and enhance in-situ performance of teams during actual crises. This manual was implemented across every anesthetizing location organization-wide and has also been incorporated into local in-situ simulation training for completeness. It is currently being modified and introduced to the affiliated hospitals of the Beth Israel Lahey Health medical system.

Concise In Situ Training Drills

The QSII team further advanced just-in-time (JIT) training delivered through in situ simulation to facilitate the rapid implementation of new crisis management techniques throughout the operating rooms of both BIDMC and affiliated hospitals. These techniques are used to implement crisis resource strategies and best practices with multidisciplinary groups. JIT training is an educational strategy that aims to refresh knowledge and skills for infrequently performed high-risk activities. Previously, in the healthcare setting, JIT training had been used to address a decline in procedural skills over time and to correct gaps in knowledge. It has also been proven to promote provider confidence in performing specific tasks and facilitate urgent training when required and is usually delivered in close temporal and spatial proximity to the clinical encounter for which the skill is required. The QSII team took these processes and introduced a series of in situ exercises to improve patient care in challenging situations. These simulations are delivered within providers' actual work environment and can facilitate interprofessional training. It provides a means to implement change, error-proof a process, reveal site-specific latent hazards, and identify opportunities for improvement.

Handoff Tools (ICU, PACU and Intra-operative)

Ineffective communication among healthcare providers frequently occurs during handoffs, defined by the Joint Commission as the "real-time process of passing patient-specific information from one caregiver to another, or from one team of caregivers to another, for the purpose of ensuring the continuity and safety of the patient's care." For all accreditation programs, National Patient Safety Goal 2E, stated that organizations should implement standardized and structured processes for handoff communications that include the opportunity for face-to-face questions and clarification. The Joint Commission's requirement for a standardized approach to handoff communications is now Element of Performance 2 ("The hospital's process for hand-off communications provides for the opportunity for discussion between the giver and receiver of patient information.") for Standard PC.02.02.01. In accordance with these mandates, the QSII team developed and introduced an ICU handoff tool to facilitate communication amongst providers and facilitate clear communication between providers at the transfer of care from the operating room to the intensive care units. In conjunction with the above clinical intervention, an intraoperative handoff tool was implemented to maximize the continuity and safety of the patient's care during the transfer of responsibility from one provider to another. Furthermore, in collaboration with our PACU nursing colleagues, the QSI division assisted in the implementation of a PACU Handoff Tool (PACU Pause).

CRICO Training

The Controlled Risk Insurance Company (CRICO) is the Harvard malpractice insurance provider for our department's attendings, residents and fellows. The CRICO Premium Reduction Program has been credited with significant improvements in anesthesia safety, resulting in a four-fold reduction in premiums over the past few decades. Our premiums today are among the lowest in the United States. Although our certified registered nurse anesthetists (CRNAs), currently insured through a hospital nursing coverage mechanism, are technically outside the CRICO coverage, we intend to expand this program to include our CRNAs in the four-hour simulation activities going forward. CRICO's Premium Reduction Program provides guidelines for specific trainings that clinicians are expected to complete over a three-year period to realize a cost-savings on their malpractice insurance, and to learn teamwork best practices that enhance patient outcomes. To maximize these premium reductions and improve perioperative care, our QSII team designs and runs training programs for the department, including short drills and 4-hour simulation-based courses, in collaboration with our surgical and nursing colleagues.

Network Anesthesia Patient Safety

With the merger of Beth Israel Deaconess Medical Center and Lahey Health, new opportunities presented themselves to the QSII team. The quality and safety procedures for disparate hospitals could now be unified and improved. The QSII division has taken the lead in instituting the Network Anesthesia Patient Safety Committee, where we are able to improve the RCA and implementation of processes across the system to improve patient care.

Combined Safety Grand Rounds

Each year the hospital conducts four combined safety grand rounds (CSGR) presentations. These are chosen to highlight specific patient safety concerns that BIDMC has identified. The division is actively involved in these presentations. The fall event each year is produced by the Anesthesia QSII team. This process involves a multidisciplinary group of anesthesiologists, surgeons, and operating room staff who perform a root cause analysis of a selected case. This case is chosen to highlight a patient safety concern that needs to be approached in a multidisciplinary manner.

Informatics Initiatives

Innovation

Our innovation efforts are directed toward improvements that will positively impact perioperative healthcare delivery. This work involves both quality-improvement initiatives and rigorous research projects. The results influence areas such as team and organization design communication pathways and transitions of care, information management systems, and training and education. By virtue of being part of the Anesthesia Department, we work across all phases of the perioperative environment (pre-, intra-, and post-operative). We strive to work across departments—Surgery, Orthopedics, Obstetrics/Gynecology, Perioperative Nursing, Pharmacy, and Healthcare Quality and Safety—to ensure our improvement and research efforts encompass the interdisciplinary nature of our perioperative work.

Electronic Medical Records

As of June 1, 2024, BILH migrated to the Epic platform.

Dashboards

In collaboration with BIDMC administration, the Informatics Division has created multiple surveillance dashboards looking at multiple data streams. These dashboards allow for departmental and hospital monitoring of metrics that can improve efficiency and patient safety. One of the dashboards focuses on anesthesia operations. This dashboard allows real-time analysis of operating room metrics, including on-time starts, delayed cases, block time usage, and case durations. These and other metrics allow the department to improve operating room efficiency. Using metrics from the anesthesia information management systems, QSI dashboards were created for the anesthetizing locations and labor and delivery. This dashboard allows for the monitoring of anesthesia-specific quality and safety issues identified by the department. This data is then collated and reviewed by the QSI division to improve patient outcomes.

In collaboration with the hospital, the division created a controlled substance dashboard. This dashboard allows for the monitoring of opioid prescriptions and usage throughout the hospital. This can identify areas where protocols can be utilized to decrease use of narcotics.

C8Health

C8Health is an integrated informatics application that supports the department's work across its clinical, operational, educational, and research pillars. Its incorporation into departmental workflows helps connect information and processes across these areas, supporting collaboration, data accessibility, and continuous improvement in perioperative care.

Training Portal

The Department of Anesthesia Training Portal is a centralized platform designed to track and manage all departmental training, certifications, compliance requirements, and education activities. It provides real-time visibility into individual progress, streamlines documentation, and supports ongoing professional development while ensuring departmental readiness and accountability. ❑








mindray





Center for Medical Simulation



Yitzhak (Isaac) Brzezinksi Sinai, MD, MBA

Director, Center for Medical Simulation

Assistant Professor of Anaesthesia



Dawn Ferrazza, MA

Administrative Director, Center for Medical Simulation

Chief Administrative Officer, Department of Anesthesia, Critical Care and Pain Medicine

Follow Us!

Instagram
@CenterForMedicalSimulation

LinkedIn
Center for Medical Simulation

YouTube
youtube.com/medicalsimulation

Overview and Organization

The Center for Medical Simulation (CMS) is an internationally recognized nonprofit organization and global leader in simulation-based healthcare education, founded in Boston in 1993. CMS partners with hospitals, health systems, universities, and professional organizations worldwide to improve patient safety, healthcare quality, and clinical education through experiential learning that never puts a patient at risk.

In September 2023, CMS merged with the Beth Israel Anesthesia Foundation (BIAF), the research and education arm of the Harvard Medical Faculty Physicians (HMFP) Department of Anesthesia, Critical Care and Pain Medicine at Beth Israel Deaconess Medical Center. CMS continues to operate as an independent 501(c)(3) organization within the BIAF/HMFP structure and remains headquartered in the Charlestown Navy Yard in Boston.

This integration significantly expands the Department's academic and educational portfolio and reinforces its longstanding leadership in simulation-based education, research, and innovation. CMS delivers world-renowned faculty development programs, team training, simulation-based consulting, systems testing, and safety initiatives to organizations across the United States and internationally.

Leadership and Organizational Structure

CMS is now led through a dyad leadership model:

Isaac Brzezinski Sinai, MD, MBA – Medical Director

An anesthesiologist, educator, and internationally recognized leader in simulation-based medical education, Dr. Brzezinski Sinai provides strategic and academic leadership. His focus includes strengthening core educational programs, expanding consulting services, advancing research, and growing CMS's global reach.

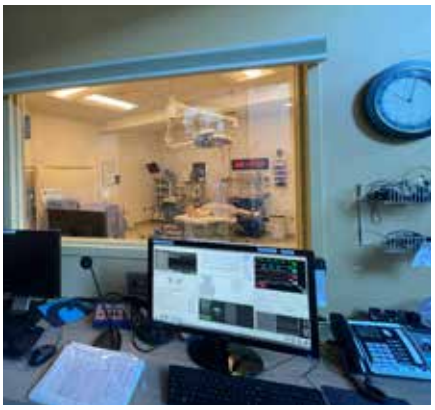
Dawn Ferrazza, MA – Administrative Director

As Chief Administrative Officer for the Department of Anesthesia, Critical Care and Pain Medicine, Ms. Ferrazza oversees CMS's operational, financial, and administrative strategy. Her work includes modernizing infrastructure, implementing robust financial systems, and creating scalable processes to support long-term sustainability and growth.

Current Focus and Strategic Development

CMS is in an active phase of transformation and growth. Current priorities include:

- Strengthening financial and operational infrastructure
- Modernizing reporting, budgeting, and business processes
- Expanding consulting and simulation-based services
- Developing new educational offerings and institutional partnerships
- Enhancing faculty development and leadership training
- Building research collaborations and grant opportunities
- Increasing opportunities for anesthesia residents and fellows
- Broadening global engagement and market reach











Core Programs and Services

CMS offers a broad portfolio of educational and consulting services, including:

- Simulation instructor and debriefing training
- Crisis resource management and team communication
- Healthcare leadership and organizational development
- Systems integration and safety testing
- Obstetric, perioperative, and multidisciplinary simulation
- International consulting and faculty development
- Fellowship training in simulation and healthcare education

Strategic Value to the Department

The acquisition of CMS positions the Department of Anesthesia, Critical Care and Pain Medicine as one of the leading academic departmentws in the world integrating simulation, education, research, and systems improvement. CMS enhances the Department's ability to:

- Deliver world-class simulation education
- Expand research and external funding opportunities
- Support recruitment of top faculty and trainees
- Strengthen institutional and international partnerships
- Generate diversified revenue through educational and consulting services
- Advance innovation in patient safety and healthcare quality

As CMS continues to evolve, it represents a major strategic asset for the Department and a platform for future growth, academic distinction, and global impact.

Leadership Transition and Legacy

A key component of CMS's successful integration has been the thoughtful leadership transition led by Roxane Gardner, MD, MPH, MSHPED, DSc, who served as Executive Director of CMS for many years. Dr. Gardner played a pivotal role in expanding CMS's educational programs, including its nationally recognized obstetric simulation initiatives, and guided the organization through significant challenges, including the COVID-19 pandemic and a period of financial uncertainty. Her leadership helped stabilize CMS and positioned it for its merger with BIAF and integration into the Department of Anesthesia, Critical Care and Pain Medicine. Dr. Gardner now focuses on advancing the obstetric simulation and fellowship programs and continues to serve as a valued advisor to CMS leadership.

Professional Affairs



Sara Neves, MD

Vice Chair, Professional Affairs

Assistant Professor of Anaesthesia



Lindsay A. Rubenstein, MD

Director, Faculty Recruitment and Retention

Instructor in Anaesthesia

Overview and Organization

The Division of Professional Affairs plays a central role in supporting the Department's clinical, educational, and research missions. Its work spans the professional lifecycle of faculty and clinical providers, including physicians, certified registered nurse anesthetists (CRNAs), and advanced practice providers (APPs). Through specialized administrative expertise, individualized guidance, and coordinated support across Beth Israel Lahey Health (BILH) including BIDMC and our affiliated community sites, the division helps providers navigate complex institutional and regulatory processes while advancing their careers.

The division's work encompasses recruitment and retention, credentialing, licensure, onboarding, and professional development through academic appointments and promotions, mentorship and sponsorship, leadership development, performance management, academic programming, and wellness. By coordinating these functions, the division helps ensure that providers are supported from recruitment through every stage of their professional careers. The scope of responsibilities include:

Faculty and CRNA Recruitment: Identify, recruit, and hire physicians and CRNAs across Beth Israel Deaconess Medical Center (BIDMC) and affiliated community sites, including candidate sourcing, evaluation, selection, and competetive offer development.

Hiring, Onboarding, and Integration: Coordinate hiring and onboarding processes and provide structured orientation to help new providers integrate into the Department and their clinical practice environments.

Credentialing and Re-credentialing: Coordinate initial and ongoing credentialing for clinical providers across the BILH network, working with medical staff offices and relevant regulatory bodies to facilitate timely completion of requirements. This encompasses the thorough evaluation of provider qualifications and the ongoing monitoring of their credentials to maintain compliance with regulatory standards.

Licensure and Regulatory Compliance: Assist providers with medical licensure, documentation, and regulatory requirements, including coordination with the Massachusetts Board of Registration in Medicine and institutional offices.

Immigration and Visa Support: Guide physicians and faculty through immigration and visa-related processes in coordination with appropriate institutional resources.

Provider Records and Administrative Support: Coordinate provider documentation and ongoing requirements related to credentials, licensing, and institutional compliance.

Academic Appointments and Promotions: Coordinate Harvard Medical School (HMS) appointments, reappointments, and promotions for eligible faculty, including support for academic advancement and promotion review processes.

Mentorship and Sponsorship: Facilitate opportunities for mentorship, sponsorship, career development, and professional visibility at local, regional, national, and international levels.

Faculty and Provider Development: Coordinate annual performance reviews for faculty and CRNAs, supporting accountability, performance management, and the achievement of established performance standards. The division also facilitates professional development, leadership training, and career advancement opportunities. Support faculty development initiatives, such as the Physicians Leadership Program at HMFP, to enhance the capabilities and leadership potential of academic faculty members.

Academic Programming: Coordinate Grand Rounds, visiting professors, and other academic conferences that promote education, collaboration, and scholarly exchange.

Wellness and Peer Support: Coordinate wellness initiatives and events that promote professional well-being and a healthy, supportive departmental culture. Provide access to peer support for faculty and clinical providers experiencing challenging or critical situations, helping connect colleagues with timely assistance and appropriate resources.

Leadership

In 2026, Sara Neves, MD, assumed the role of Vice Chair for Professional Affairs, building on the strong foundation established by her predecessor, Shazhad Shaefi, MD, MPH. Dr. Neves, a respected clinician, educator, and leader who previously served as Program Director of the Anesthesiology Residency Program, brings extensive experience in medical education, mentorship, and academic leadership to her new role. She will lead the division into its next chapter, continuing to advance recruitment, retention, professional development, wellness, and academic advancement across the Department and the broader BILH network.

The division's progress reflects years of strategic investment in faculty success. Under Dr. Shaefi's leadership, the Division of Professional Affairs strengthened the infrastructure and programs that support faculty recruitment, onboarding, promotion, mentorship, and well-being. His contributions helped establish the systems and culture needed to support the Department's extraordinary growth while maintaining a strong commitment to faculty engagement and professional fulfillment.

Throughout 2024–2025, the division continued to develop a more comprehensive and coordinated approach to faculty development and retention. The Department expanded recruitment efforts across the BILH network, strengthened orientation and onboarding processes, formalized sponsorship and mentorship programs, and enhanced support for academic promotion and leadership development. Initiatives focused on faculty well-being, peer support, and professional growth further fostered a culture of collaboration, inclusion, and academic excellence.

In 2024, Lindsay Rubenstein joined the division as Director of Faculty Recruitment and Retention. Under her guidance, the Department enhanced its recruitment strategy and developed a comprehensive orientation program designed to help new faculty feel welcomed, supported, and connected to the Department community. These efforts have strengthened the Department's ability to attract and retain talented clinicians and academics in an increasingly competitive market.

As Dr. Neves assumes leadership in 2026, she inherits a strong foundation on which to build. The division remains committed to supporting faculty and clinical providers at every stage of their careers, strengthening professional pathways, and ensuring that the Department's continued growth is matched by an equally strong investment in its people who make its success possible.

Areas of Excellence

Faculty and CRNA Recruitment and Workforce Growth

Over the past decade, the Department has grown substantially in both size and clinical capacity. Its workforce has expanded from approximately 55 physicians and 49 CRNAs to more than 200 physicians and 160 CRNAs. This growth has increased the complexity of recruitment, onboarding, and retention across the Department and its affiliated clinical sites.

The Division of Professional Affairs has helped meet these challenges by strengthening recruitment processes, coordinating hiring across the network, and supporting the integration of new providers. These efforts are essential to maintaining clinical staffing, attracting top talent, and supporting the Department's continued expansion.

Faculty Orientation and Integration

Recognizing the importance of a successful transition into a new academic and clinical environment, the division has expanded its faculty orientation program. The program includes carefully curated introductions and experiences in each of our clinical practice areas, teaching and supervision expectations, mentorship opportunities, and a welcome reception that connects new faculty with key departmental and clinical leaders.

By providing structured guidance and opportunities to build relationships, the program helps new faculty navigate the Department, understand its academic and clinical missions, and establish a sense of connection and belonging.

Credentialing, Licensure, and Provider Onboarding

Credentialing is a critical and often complex component of bringing physicians and other clinical providers into practice. The division coordinates initial credentialing and re-credentialing across BIDMC and affiliated community sites, working closely with medical staff offices and relevant regulatory bodies to manage documentation, licensing requirements, and institutional processes.

Under the leadership of Susan Kilbride, Director of Professional Affairs, the division's credentialing team provides specialized administrative support throughout these processes. Its work helps providers navigate multiple requirements and facilitates their transition into practice and continued eligibility to provide clinical care across the network.

The division also assists providers with related administrative needs, including immigration and visa processes where applicable. This coordinated support helps reduce administrative barriers for incoming and current providers while allowing them to focus on their clinical, educational, and research responsibilities.

Faculty Mentorship and Sponsorship

The division supports faculty development through structured mentorship and sponsorship opportunities. Through the sponsorship program, senior departmental members are encouraged to identify opportunities for colleagues to expand their professional networks, increase academic visibility, and participate in local, regional, national, and international activities.

These relationships complement formal faculty development programs by helping faculty build connections, pursue professional opportunities, and advance their academic careers.

Protected Time for Teaching and Research

The Department recognizes protected academic time as an important investment in faculty development, scholarship, and academic excellence. By preserving time for teaching and research alongside clinical responsibilities, the Department enables faculty to pursue scholarly interests, develop educational programs, and contribute to advances in anesthesiology, critical care, and pain medicine.

Protected time also plays a pivotal role in mentorship and the development of early-career faculty as they establish research programs, develop new ideas, and build academic careers. Combined with mentorship and institutional support, these opportunities help cultivate the next generation of investigators and educators, explore novel ideas, embark on educational journeys, and carve out their own research trajectories and contribute to scholarly productivity, including research supported by the National Institutes of Health (NIH).

Academic Programming and Visiting Professors

Academic Programming and Visiting Professors: Grand Rounds and Visiting Professors: The division supports the Department's educational mission by coordinating weekly Grand Rounds and facilitating visits from distinguished international speakers and academic leaders. These programs foster a diverse and enriching learning environment, allowing faculty, division directors, residents, and other departmental members to invite colleagues from around the world to share expertise, present emerging research, and promote scholarly exchange.



Faculty Hour: A distinctive feature of the Department's academic environment, Faculty Hour is a dedicated period on Tuesday mornings made possible by staggered operating room start times. This protected time enables faculty, surgeons, perioperative nurses, anesthesiologists, and other stakeholders to participate in essential meetings, address high-priority projects, and collaborate on initiatives to improve clinical practice and departmental operations.

Joint Grand Rounds and Community Engagement: In collaboration with the Community Engagement Division, the Division of Professional Affairs has developed joint Grand Rounds sessions with colleagues in surgery and other perioperative specialties. These sessions provide opportunities for interdisciplinary education and open dialogue on issues affecting the clinical workforce and the communities it serves.

By bringing colleagues together to explore shared challenges and priorities, these programs strengthen collaboration, foster professional relationships, and advance efforts to create a more inclusive and supportive healthcare environment.



Faculty Development and Leadership

The division supports faculty and clinical providers in developing the skills, experience, and professional relationships needed to advance throughout their careers. In addition to mentorship and sponsorship, the Department invests in identifying emerging leaders and preparing them for the complex demands of academic medicine.

Leadership in this environment requires more than clinical, research, or educational expertise. It also requires skills in communication, organizational management, strategic planning, and team development. The Department's approach combines formal education, structured leadership pathways, coaching, and opportunities to assume increasing responsibility.

Leadership Development Pathways: The Department supports pathways to leadership across education, research, clinical practice, and administration. These pathways provide faculty with opportunities to build the knowledge and practical skills needed to lead teams, programs, and departmental initiatives.

Opportunities have included academic leadership certificates through Harvard Business School and the Harvard T.H. Chan School of Public Health, participation in national conferences and practice management courses, and support for advanced management education, including business administration degrees. Faculty are also encouraged to pursue leadership education at local, regional, and national levels.

Physician Leadership Program: The Department participates in a network-wide Physician Leadership Program (PLP), a competitive, 12-month development opportunity for early- to mid-career physicians in leadership roles. The program provides structured leadership education and practical experience to help participants strengthen their management capabilities, lead organizational initiatives, and contribute to the Department and broader network.

Academic Appointments and Promotions: The division plays an important role in supporting faculty advancement through Harvard Medical School. The Department has strengthened its academic promotion processes, including restructuring the Anesthesia Academic Promotion Committee to better align its work with the mission of Professional Affairs.

These efforts help faculty navigate appointment and promotion requirements and provide a more coordinated framework for recognizing academic contributions and supporting career progression.

Alternate Entry Pathway: The Department has supported selected faculty in pursuing American Board of Anesthesiology (ABA) certification through the Alternate Entry Pathway (AEP). This pathway offers an alternative route to board certification for eligible anesthesiologists who have established records of achievement in areas such as clinical care, education, and research.

Supporting eligible faculty through this process helps the Department recruit and retain talented anesthesiologists from diverse professional and international backgrounds while advancing their long-term academic careers.

Faculty and Staff Wellness

The Department recognizes that the well-being of its faculty, CRNAs, APPs, and staff is essential to a healthy and sustainable clinical and academic environment. In response to the professional and personal challenges of healthcare, the Department supports wellness initiatives that foster social connection, provide peer support, and connect colleagues with confidential resources.



Under the guidance of Scott Zimmer, MD, Director of Wellness, these efforts emphasize the importance of early support, collegial relationships, and a culture in which individuals feel comfortable seeking assistance when needed.

Expanding the Wellness Mission: The heightened need for expanded support and a more encompassing wellness mission led to the inception of innovative programs aimed at bolstering employee well-being. These initiatives include the HEALS Pager, and the formulation of a Department Code of Conduct.

Wellness Initiatives and the Wellness Fund: The Department's Wellness Fund supports initiatives designed to strengthen morale, foster connection, and promote well-being. Activities have included professionally led virtual exercise classes, department-wide social events, and support for the HEALS Pager. Together, these resources reinforce the Department's commitment to a supportive workplace and recognize the importance of community in professional life.

Departmental Peer Support Program: Under the leadership of Dr. Zimmer, the Wellness Committee continues to support the Departmental Peer Support Program, which assists clinicians and staff navigating challenging clinical and nonclinical experiences. Historically, colleagues have sought peer support following serious adverse clinical events and other emotionally taxing circumstances.

Recognizing the potential psychological impact of these experiences, the program aims to identify colleagues who may be affected by potentially traumatic events and connect them promptly with trained peers. These peers offer empathetic, confidential, and nonintrusive support, helping colleagues navigate difficult experiences and access additional resources when needed.

HEALS Pager: Hearing Each Other and Lending Support: Under the leadership of Dr. Lindsay Rubenstein, the HEALS Pager (Hearing Each Other and Lending Support) complements the Peer Support Program by providing a way for clinical and nonclinical staff to connect with a supportive colleague for a confidential conversation.

Available 24 hours a day, seven days a week, the HEALS Pager offers an accessible resource for colleagues experiencing difficult situations. It can also serve as a gateway to additional support services when appropriate.

Professional Conduct and a Supportive Culture: The Department is committed to maintaining a professional environment characterized by respect, accountability, inclusion, and ethical patient care. Its Code of Conduct supports expectations for how colleagues interact and work together, complementing broader efforts to foster a culture of professionalism and mutual respect. ❑

Community Engagement



Josephine M. Hernández, MD

Vice Chair, Community Engagement

Instructor in Anaesthesia

Overview and Organization

Community Engagement (CE) was established in 2022 as a foundational element within the Department of Anesthesia, Critical Care and Pain Medicine to promote fairness in access, opportunity, and advancement for all members of the department while supporting equitable, patient-centered care. In 2025, the department intentionally shifted from a Diversity, Equity, and Inclusion (DEI) framework to Community Engagement, emphasizing a broader commitment to inclusion, belonging, and support for all members of our community: patients, staff, trainees, and faculty alike.

Under the leadership of Dr. Josephine Hernández, Vice Chair of Community Engagement, and Jana Penders, Senior Project Manager, CE has developed an integrated, department-wide approach grounded in collaboration, visibility, and action. The CE Committee is open to all members of the department and includes representation across roles and network hospitals. This structure ensures that initiatives reflect the collective voice of the department and support a truly welcoming and responsive environment. The committee meets quarterly to guide priorities and advance project planning.



Jana Penders, PhD

Senior Project Manager, Community Engagement

Vision and Opportunities

Community Engagement is the department's foundational element that:

- Is dedicated to the recruitment and mentorship of faculty and medical staff.
- Strives to provide a welcoming environment robust with kindness and empathy for both our patients and colleagues.
- Upholds an environment in which our patients see their own values and concerns reflected in our community of caregivers who treat them first as humans.
- Supports a culture of fairness, tolerance, respect, accountability and impartiality for our patients and each other.
- Works to achieve a world that is welcoming, where equal opportunities and balanced outcomes exist for all.

Guided by findings from the 2024 Community Engagement Survey, stakeholder interviews, and focus groups, CE developed a three-year strategic plan centered on strengthening community, expanding access, and deepening engagement across the department and beyond. This work has focused on building sustainable infrastructure through communication, mentorship, education, and partnerships, while advancing innovative patient-centered initiatives that directly impact care delivery. Together, these efforts position Community Engagement as both an operational partner within the department and a catalyst for broader cultural and systems-level change.

Education and Outreach

Community Engagement's education and outreach efforts represent the core of its work, spanning internal education, workforce development, and outreach programming that builds pathways into medicine while strengthening patient understanding and trust.

A central focus is the development of a longitudinal pipeline model, engaging learners from middle school through medical training. CE has significantly expanded its participation in the Summer Youth Jobs Program (SYJP), supporting

high school students through structured weekly programming, mentorship, and exposure to clinical and research environments. This work has grown to include independent high school scholars and the creation of a mentored research internship in clinical anesthesia. At the college level, CE has expanded internships to include placements throughout the year, with some students receiving academic credit at their home institution. Further, CE has continued to mentor medical students through outreach events and institutional partnerships, including engagement with Harvard Medical School and Howard University College of Medicine.

In parallel, CE has strengthened community-based outreach, most notably through its partnership with the James W. Hennigan School. Department members conducted multiple visits, including a career exploration session and a hands-on anesthesia workshop designed to introduce students to clinical concepts in an engaging and accessible way. Recognizing the linguistic needs of the student population, CE intentionally brought Haitian Creole- and Spanish-speaking clinicians to facilitate meaningful communication and connection. This approach reflects CE's commitment to meeting communities where they are and ensuring that engagement is both embracing and impactful.

Within the department, CE has contributed to resident and faculty education through Grand Rounds, curriculum development, and collaborative programming. Educational offerings have addressed critical topics such as culturally informed care for Haitian immigrant populations and global initiatives on surgical access. Thematic Grand Rounds have focused on social determinants of health, solutions-oriented practice, and community engagement. These efforts are complemented by department-wide events, including book clubs, cultural celebrations, and community gatherings, that foster dialogue, visibility, and shared understanding across roles and backgrounds.

A defining advancement within CE's strategy is the Patient Access Initiative, a leading effort that integrates education, clinical care, and communication to improve the patient experience. Building on earlier work to translate anesthesia consent forms into multiple languages, CE is launching a suite of patient-facing video resources designed to increase understanding and reduce anxiety prior to procedures. The Patient Access Video Project introduces patients to anesthesia care through clear, provider-led explanations, helping establish a baseline understanding before clinical encounters. Complementing this effort, the Patient Consent Project provides concise, accessible summaries of key consent information, enabling patients to review and discuss important concepts with family members in advance of their procedures.

Both projects are being developed in multiple languages, including American Sign Language, Spanish, Haitian Creole, Mandarin, Cantonese, and Portuguese, to reflect the linguistic diversity of the populations we serve. Together, these initiatives represent a shift toward proactive, comprehensive patient communication, allowing for more meaningful, informed interactions on the day of care.

The Patient Access Initiative exemplifies CE's broader approach: leveraging collaboration across Clinical Affairs, Quality and Safety, Patient Advocacy, and institutional partners to address real-world barriers and improve both patient understanding and satisfaction.

Departmental Investment

Department leadership has demonstrated a strong and sustained commitment to Community Engagement by positioning it as a foundational element integrated across recruitment, education, clinical care, research, and administration. This investment has supported the development of a comprehensive CE infrastructure and function.

CE leadership is actively embedded in departmental operations, including participation in recruitment and hiring processes, faculty leadership committees, and resident interviews. These roles ensure that CE principles are consistently reflected in decision-making and strategic planning.

As Community Engagement continues to evolve, it has become a visible and impactful presence within the department. Its integration across multiple domains positions it as a model for broader adoption, demonstrating how intentional investment in community, access, and engagement can drive meaningful and sustainable change in academic medicine. ❑





Selected Publications

June 30, 2024 – June 30, 2026

Abrate C, Brunotto V, Bossio SN, Boccardo S, Tosello Boari J, Caudana P, Hernandez L, Gimenez C, Theumer MG, Sedlik C, Amezcua-Vesely MC, Robson SC, Gruppi A, Piaggio E, Acosta Rodríguez EV, Montes CL. Targeting CD39 in combination with IL-2/anti-IL-2 complexes enhances cytotoxic immunity and limits tumor progression. Front Immunol. 2026. PMID: 41668741

Abu Fraiha Y, Devanney J, McNichol M, Cummiskey T, Kumaresan A, Bose S. Non clinic-Based Interventions to Mitigate Post-Intensive Care Syndrome: A Scoping Review. Crit Care Explor. 2026. PMID: 42302310

Ahluwalia M, Sehgal S, Lee G, Agu E, Kpodonu J. Disparities in Artificial Intelligence-Based Tools Among Diverse Minority Populations: Biases, Barriers, and Solutions. JACC Adv. 2025. PMID: 40286381

Ahmed U, Kim C, Sharkey A, Laham R, Mahmood F, Liu DC . Urgent Transcatheter Edge-To-Edge Mitral Valve Repair in Cardiogenic Shock: A Case Series. A A Pract. 2026. PMID: 41818469

Ahmed U, Mahmood F, Nicoara A, Kiarad V. Right Ventricular Function and Echocardiographic Pressure-Volume Loops: Overview and Perioperative Clinical Implications. J Cardiothorac Vasc Anesth. 2025. PMID: 40483247

Ahmed U, Noor F, Ahmad S, Sharkey A, Robitaille M, Mahmood F. The Rotated Aortic Root: A Hidden Anatomical Variant Revealed by Three-dimensional Echocardiography. Cardiothorac Vasc Anesth. 2025. PMID: 40987638

Ahmed U, Sohail M, Hussain HS, Valencia J, Manji AA, Khabbaz K, Schaefer MS, Mahmood F, Sharkey A, Matyal R. Beyond the 30-day metric: National trends and predictors of 90-day readmission after coronary artery bypass grafting. Am Heart J Plus. 2026. PMID: 41868437

Ahrens E, Ratajczak N, Schaefer MS. Acetaminophen 5-HT 3 Antagonist Interaction: Reply. Anesthesiology. 2026. PMID: 41212517

Ahrens E, Riesemann S, Tenge T, Totwani M, de Oliveira S, Penders JEC, Yemul-Golhar S, Hedayat M, Hernandez J, Talmor D, Oriol NE, Schaefer MS, Wachtendorf LJ. Primary language other than English and the risk of delirium after surgery in an English-speaking hospital: a retrospective cohort study. Br J Anaesth. 2026. PMID: 42191527

Ahrens E, Schaefer MS, Wachtendorf LJ. Race, Ethnicity, and Antiemetic Management: Comment. Anesthesiology. 2025. PMID: 40923837

Ahrens E, von Wedel D, Redaelli S, Tenge T, Wachtendorf LJ, Munoz-Acuna R, Chen G, Schaefer MS, Shay D. Comparison of established comorbidity scores using administrative data of patients undergoing surgery or interventional procedures in Massachusetts. J Clin Epidemiol. 2025. PMID: 40532893

Ahrens E, Wachtendorf LJ, Hill KP, Schaefer MS. Considerations for Anesthesia in Older Adults with Cannabis Use. Drugs Aging. 2024 . PMID: 39617807

Ahrens E, Wachtendorf LJ, Shay D, Tenge T, Paschold BS, Rudolph MI, Redaelli S, Kaiser L, Suleiman A, Ma H, Fassbender PJ, Schaefer MS. Association Between Neuromuscular Blockade and Its Reversal with Postoperative Delirium in Older Patients: A Hospital Registry Study. Anesth Analg. 2025. PMID: 40251137

Ahrens E, Wachtendorf LJ, Tenge T, Riesemann S, Kaiser L, Chen G, Neves SE, Robitaille MJ, Xu X, Allain RM, Ma H, Schaefer MS. Dose-dependent relationship between intra-operative dexmedetomidine and delirium after non-cardiac surgery: a retrospective cohort study. Anaesthesia. 2026. PMID: 41717663

Alape Moya MA, O'Gara B. Inhalational Agents as Intensive Care Unit Sedatives.Crit Care Clin. 2025. PMID: 41101834

Albilali AS, Bahammam RAS, Albadrani WF, Alharbi MK, Alfaadhel TA, Ashina S, Sampaio Rocha-Filho PA. Dialysis Headache in Hemodialysis Patients: Is a History of Recurrent Headaches Prior to Hemodialysis a Risk Factor? J Pain Res. 2026. PMID: 42046799

Al-Khazali HM, Al-Sayegh Z, Younis S, Christensen RH, Ashina M, Schytz W, Ashina S.Systematic review and meta-analysis of Neck Disability Index and Numeric Pain Rating Scale in patients with migraine and tension-type headache. Cephalalgia. 2024. PMID: 39205428

Almada L, Gazzoni YN, Beccaria CG, Fiocca Vernengo F, Boccardo S, Gorosito Serrán M, Trivedi A, Vinuesa CG, Robson SC, Acosta Rodríguez EV, Gaya M, Montes CL, Gruppi A. CD39 is an antibody-secreting B-cell marker that modulates germinal center and antibody responses during infection. Front Immunol. 2025. PMID: 41190065

Almeida-Santos G, Santiago-Carvalho I, Almeida FM, Barbosa Bomfim CC, Santos E Silva JC, Cantarini DG, Silva CR, Ribeiro MS, do Nascimento RS, de Gois Macedo B, Lisboa Raeder PH, Teixeira-Xavier Junior J, Alvarez JM, Hirata MH, Coutinho-Silva R, Robson SC, Amaral EP, Lasunskaia E, D'Império Lima MR. CD39 regulates P2RX7-mediated lung necrotic lesions in severe experimental tuberculosis. Mucosal Immunol. 2026. PMID: 41839294

Antonioli L, Valdiserra G, Pacher P, Robson SC, Haskó G. Metabolic reprogramming and intracellular ATP homeostasis in immunity. Pharmacol Ther. 2026. PMID: 41747828

Armstrong SL, Berger AA, Zec S, Douek M, Li K, Borrelli MC, Li Y, Hess PE. Maternal hemodynamic effects associated with intravenous and neuraxial dexmedetomidine during labor and cesarean delivery: a single center retrospective study (2021-2024). Int J Obstet Anesth. 2025. PMID: 41289955

Armstrong SL, Li Y, Hess PE, Ciampa EJ. Stability of the pH of local anesthetics after bicarbonation: an electrochemical assay of clinical mixtures. Int J Obstet Anesth. 2026.PMID: 41794005

Ashina S. Pituitary adenylate cyclase-activating polypeptide blockade in migraine and the transformation of clinical practice. Headache. 2026. PMID: 42289907

Ashina S, Ashina M, Holle-Lee D, Tassorelli C, Cho SJ, He MY, De Abreu Ferreira R, Gandhi P, Smith JH, Pfleeger K, Trugman JM. Long-term safety, efficacy and functional outcomes of atogepant for the preventive treatment of migraine. Cephalalgia. 2025. PMID: 40831083

Ashina S, Johnston E, Muenzel EJ, Kim G, Buse DC, Reed ML, Shapiro RE, Hutchinson S, Zagar AJ, Nicholson RA, Lipton RB. Opioid Use among People with Migraine: Results of the OVERCOME (US) Study. Pain Ther. 2025. PMID: 40971111

Ashina S, Kim G, Muenzel EJ, Buse DC, Zagar AJ, Zakharyan A, Shapiro RE, Nicholson RA, Pearlman EM, Lipton RB. Patterns of calcitonin gene-related peptide monoclonal antibody use in people with migraine: Results of the OVERCOME (US) study. Cephalalgia. 2025. PMID: 40501125

Ashina S, Muenzel EJ, Nicholson RA, Zagar AJ, Buse DC, Reed ML, Shapiro RE, Hutchinson S, Pearlman EM, Lipton RB. Machine learning identifies factors most associated with seeking medical care for migraine: Results of the OVERCOME (US) study. Headache. 2024. PMID: 38785227

Ashina S, Robertson CE, Srikiatkhachorn A, Di Stefano G, Donnet A, Hodaie M, Obermann M, Romero-Reyes M, Park YS, Cruccu G, Bendtsen L. Trigeminal neuralgia. Nat Rev Dis Primers. 2024. PMID: 38816415

Ashrafian S, Ahrens E, Wachtendorf LJ, Munoz-Acuna R, Shay D, Suleiman A, Redaelli S, von Wedel D, Chen G, Wolff G, Hill KP, Schaefer MS. Association of cannabis use with major cardiovascular and cerebrovascular events after surgery or interventional procedures. Am J Addict. 2025. PMID: 40204668

Azimaraghi O, Rudolph MI, Wongtangman K, Borngaesser F, Doehne M, Ng PY, von Wedel D, Eyth A, Zou F, Tam C, Sauer WJ, Kiyatkin ME, Houle TT, Karaye IM, Zhang L, Schaefer MS, Schaefer ST, Himes CP, Grimm AM, Nafiu OO, Mpody C, Suleiman A, Stiles BM, Di Biase L, Garcia MJ; Boston-NYC Afib after non-cardiac surgery collaborators Consortium; Bhatt DL, Eikermann M. Role of anticoagulation therapy in modifying stroke risk associated with new-onset atrial fibrillation after non-cardiac surgery. Nat Med. 2024. PMID: 39179854

Bald A, Grimm AM, Rudolph MI, Schaefer MS, Jones S, Choi J, Bellemare S, Borngaesser F, Suleiman A, Karaye IM, Eikermann M, Wongtangman K. Association of Surgeons' Male or Female Gender and Urgent/Emergent Add-on Cases Wait Time: A Multicentric Hospital Registry Trial. Ann Surg. 2025. PMID: 40853636

Banks JC, Hariri S, Kveraga K, Ouyang A, Gallagher K, Quadri SA, Tesh RA, Reed PU, Thomas RJ, Westover MB, Sun H, Subramaniam B. Sleep-Based Brain Age Is Reduced in Advanced Inner Engineering Meditators. Mindfulness (N Y). 2025. PMID: 40535579

Baribeau V, Sane MP, Sharkey A, Murugappan KR, Walsh DP, Wong VT, Mitchell JD. Objective Assessment of Skill Retention 7 Months Post-Training: Motion Analysis of Central Venous Catheter Placement. J Educ Perioper Med. 2025. PMID: 40248587

Berger AA, Armstrong SL, Li Y, Hess PE. Association Between Injected Volume and Epidural Blood Patch Success on Obstetric Post-Dural-Puncture Headache: A Retrospective Cohort Study. Anesth Analg. 2026 Feb. PMID: 41666403

Berger AA, Armstrong SL, Fischer A, Jordan J, Gupta M, Li Y, Hess PE, Kowalczyk JJ. Peripartum antihypertensive use and the risk of neonatal hypoglycemia and postpartum uterine atony: a retrospective cohort study. Pregnancy Hypertens. 2025. PMID: 40570616

Berger-Estilita J, Burlacu CL, Østergaard D, Sinai YB, Preckel B, Crişan I, Diaz-Navarro C, Camilleri Podesta AM, Langenecker S, Guasch E, Sabelnikovs O, Ringvold EM, Buhre W, Mato I. The Østergaard Declaration: A European Society of Anaesthesiology and Intensive Care statement on advancing simulation-based education and training. Eur J Anaesthesiol. 2026. PMID: 42204928

Bergero G, Mazzocco YL, Del Rosso S, Liu R, Cejas Gallardo ZM, Robson SC, Rottenberg M, Aoki MP. Purinergic signaling modulates CD4+ T cells with cytotoxic potential during Trypanosoma cruzi infection. J Clin Invest. 2025. PMID: 40590226

Bidd H, Wong DJN, Colville G, Banugo P, Baldwin M, Waring H, Zucco L, Radcliife G, Zayed H, El-Boghdadly K. Mentored multimodal prehabilitation for aortic aneurysm surgery: a pilot randomised controlled trial. Perioper Med (Lond). 2025. PMID: 41275253

Bose S, Binda DD, Ramachandran SK, Nafiu OO. Pulse Oximetry, Intraoperative Occult Hypoxemia, and Remote Post-Surgical Mortality: Guilty or Not Guilty?
Anesth Analg. 2025. PMID: 40279287

Bose S, Groat D, Stollings JL, Barney P, Dinglas VD, Goodspeed VM, Carmichael H, Mir-Kasimov M, Jackson JC, Needham DM, Brown SM, Sevin CM; APICS-01 Study Team. Prescription of potentially inappropriate medications after an intensive care unit stay for acute respiratory failure. Aust Crit Care. 2024. PMID: 38688808

Bose S, Novack L, Harrison S, Goodspeed V, Capers K, Hayes MM, Dinglas VD, Needham DM, Brown SM. Hierarchy of Preferred Patient Outcomes Among Survivors of Acute Respiratory Failure. Respir Care. 2025. PMID: 40643959

Bose S, Paschold BS, Shamsi T, Kaiser L, Pensier J, Chen G, Nguyen V, Janga SR, Behera A, Talmor D, Subramaniam B, Schaefer MS. Role of Acetaminophen in Intensive Care Unit Delirium Prevention: A Retrospective Cohort Study. Ann Am Thorac Soc. 2025. PMID: 40758474

Botrel T, Myles PS, Futier E, Garrigue D, Bell M, Egan T, Malbouisson LM, Wijeysundera DN, O'Gara B, Raux M, Constantin JM; GRO2M-1 study group. A Delphi process to define medical reporting outcomes for urgent surgical pathways. Anaesth Crit Care Pain Med. 2025. PMID: 40288749

Bouhassira DC, Dinglas VD, Lee EM, Beesley S, Carmichael H, Jackson JC, Mir-Kasimov M, Sevin CM, Bose S, Goodspeed V, Hopkins RO, Brown SM, Needham DM, Turnbull AE; Addressing Post-Intensive Care Syndrome (APICS) Study Team.The COVID-19 Pandemic and Patient Expectations About Recovery From Acute Respiratory Failure. JAMA Netw Open. 2024. PMID: 39514230

Breitkopf M, Ahrens E, Herrmann ML, Heinemann S, Kuester O, Ma H, Walther A, Thomas C, Eschweiler GW, von Arnim CAF, Wagner S. Preoperative hypoxic biomarkers and postoperative delirium in patients with obstructive sleep apnea. Anesth. 2024. PMID: 39495288

Brown A, Parmar J, Ganji-Angirekula S, Robinson CL, Al-Jumah R, Gill J, Hasoon J. Practice Patterns of Physicians who Perform Caudal Epidural Steroid Injections. Orthop Rev (Pavia). 2024. PMID: 39286465

Bu Y, Savir S, Saeed S, Sharkey A, Robitaille M, Mahmood F, Matyal R, Khabbaz K. Comparative efficacy of chest wall fascial plane blocks for cardiac surgery via median sternotomy: a network meta-analysis. BMC Anesthesiol. 2025. PMID: 41350608

Bu Y, Sharkey A, Neves S, Zhong Q, Wong V, Saeed S, Gbagornah P, Mahmood F, Matyal R.Opening the "Black Box" in Transesophageal Echocardiography Teaching: Implementation of 3D-Printed Omniplane Simulator and Heart Models. J Educ Perioper Med. 2026. PMID: 41509882

Burlacu CL, Brzezinski Sinai Y, Norte G, Buleon C, Stourac P, Savoldelli GL, Berger-Estilita J, Camilleri Podesta AM, Ostergaard D. European simulation-based education and training in anaesthesiology and intensive care: evidence, value and inevitable evolution. Eur J Anaesthesiol. 2026;43(9):749–761. PMID: 42338341.

Buse DC, Muenzel EJ, Zagar AJ, Mehrabadi AS, Shapiro RE, Kim G, Ashina S, Nicholson RA, Lipton RB. Rates and risk factors for migraine progression using multiple definitions of progression: Results of the longitudinal OVERCOME (US) study. Headache. 2025. PMID: 40084740

Carmichael HL, Groat D, Dinglas VD, Bose S, Kasimov MM, Jackson JC, Kadiri NP, Trejo-Zambrano MI, Sevin CM, Green T, Needham DM, Brown SM; APICS-COVID Study Team Effect of the COVID-19 pandemic on unmet healthcare needs after hospital discharge in acute respiratory failure survivors: A multicenter prospective cohort study. J Hosp Med. 2024. PMID: 39702942

Carneiro-Nascimento S, Wei C, Gutterman A, Levy D Intravital calcium imaging of meningeal macrophages reveals niche-specific dynamics and aberrant responses to brain hyperexcitability. Elife. 2026. PMID: 42126091

Cassavaugh J, Longhi MS, Robson SC. Impact of Estrogen on Purinergic Signaling in Microvascular Disease. Int J Mol Sci. 2025. PMID: 40076726

Cerda IH, Zhang E, Dominguez M, Ahmed M, Lang M, Ashina S, Schatman ME, Yong RJ, Fonseca ACG. Artificial Intelligence and Virtual Reality in Headache Disorder Diagnosis, Classification, and Management. Curr Pain Headache Rep. 2024. PMID: 38836996

Chaudhry BA, Robinson CL, Caronna E, Dodd-Glover F, Virk AS, Prieto Peres MF, O'Brien HL, Romero-Reyes M, Ashina S. Central and Peripheral Sensitization in Temporomandibular Disorders: Proposed Mechanisms of Botulinum Toxin Therapy. Toxins (Basel). 2026. PMID: 41591174

Christensen SL, Levy D. Meningeal brain borders and migraine headache genesis. Trends Neurosci. 2024. PMID: 39304416

Christensen RH, Strassman AM, Ashina M, Ashina H, Burstein R. Opening of ATP-sensitive potassium channels activates meningeal nociceptors: Implications for the origin of migraine headache. Cephalalgia. 2025. PMID: 40785517

Christensen RH, Strassman A, Ashina M, Ashina H, Burstein R. Activation and sensitization of meningeal nociceptors by PACAP-38: implications for migraine headache. Brain. 2025. PMID: 40795030

Ciampa EJ, Machado LM, Lee KJ, Clark AJ, Vu KQ, Khan NA, Kispert S, Armstrong S, Li Y, Milne GL, Solmonson A, Karumanchi SA, Parikh SM. Placental nicotinamide adenine dinucleotide modulates the timing of labor. Science. 2026. PMID: 42275500

Clift CL, Blaser MC, Bartoli-Leonard F, Schlotter F, Higashi H, Kuraoka S, Kasai T, Turner ME, Pham T, Perez KA, Robson SC, Body SC, Muehlschlegel JD, Aikawa M, Singh SA, Aikawa E. Sexual Dimorphism of Plasma and Tissue Proteomes in Human Calcific Aortic Valve Stenosis Pathogenesis. Arterioscler Thromb Vasc Biol. 2025. PMID: 40808650

de Freitas Dias B, Robinson CL, Villar-Martinez MD, Ashina S, Goadsby PJ. Current and Novel Therapies for Cluster Headache: A Narrative Review. Pain Ther. 2024. PMID: 39489854

Dehghani A, Melo-Carrillo A, Strassman AM, Broide RS, Adams AM, Dabruzzo B, Brin MF, Burstein R. Mapping Dural and Periosteal SV2C, a Botulinum Toxin A Receptor, in the Mouse. Toxins (Basel). 2025. PMID: 41150209

Dhawan R, von Wedel D, Redaelli S, Schaefer MS, Shay D. Analysis of venture capital investments in anaesthesiology companies from 2000 to 2024. Anaesthesia. 2025. PMID: 40058884

Dhawan R, Choi JJ, von Wedel D, Schaefer MS, Shay D. Private equity consolidation in anaesthesiology: trends and sector-specific investment patterns from 2006 to 2024. Anaesthesia. 2025. PMID: 40296841

Dong L, Luo W, Maksym S, Robson SC, Zavialov AV. Adenosine deaminase 2 regulates the activation of the toll-like receptor 9 in response to nucleic acids. Front Med. 2024. PMID: 39078537

Elmadhoun O, Esmaeilzadeh S, Teixeira MT, Huang J, Ramanujan K, Shaefi S, Ramakrishna H.J. Hyperoxia in Cardiac Surgery: Where Do We Stand? Cardiothorac Vasc Anesth. 2025. PMID: 40803905

Espinosa-Leon JP, Alvarez GG, Azocar RJ. Optimizing ergonomics in the operating room: A vital factor for anesthesia care. J Clin Anesth. 2024. PMID: 39002403

Espinosa-Leon JP, Mathura R, Chen G, Joseph M, Sadhwani T, Beydoun N, Hernandez ER, Riley T, Kunze LJ, Goodspeed V, O'Gara BP. Intraoperative virtual reality for older patients undergoing total knee arthroplasty: study protocol for a randomized clinical trial. Trials. 2024. PMID: 39695824

Eyth A, Borngaesser F, Rudolph MI, Paschold BS, Ramishvili T, Kaiser L, Tam CW, Wongtangman K, Eikermann G, Garg S, Karasick MH, Kiyatkin ME, Kinkhabwala MM, Forest SJ, Leff J, Zhang L, Fassbender P, Karaye I, Steinbicker AU, Schaefer MS, Eikermann M, Kim SC. Development and Validation of a Risk Model to Predict Intraoperative Blood Transfusion. JAMA Netw Open. 2025. PMID: 40244584

Falzoni S, Giuliani AL, Adinolfi E, Coutinho-Silva R, Illes P, Robson SC, Tang Y, Ulrich H, Kennedy C. In tribute to Francesco Di Virgilio, a great scientist and a wonderful friend. Purinergic Signal. 2026. PMID: 41677956

Feng L, Zhang H, Mao C, De Andrade Mello P, Stroopinsky D, Csizmadia E, Zhou J, Avigan D, Yu J, Gao W, Robson SC. Cd39 and P2rx7-Wnt signaling enhance blast pathogenicity in an experimental model of acute myeloid leukemia. Haematologica. 2024. PMID: 39157874

Fligor SC, Polanco-Santana JC, Lanys A, Kasakewitch JPG, Schaefer MS, Sarpel U, Kent TS. Intraoperative high dose dexamethasone is associated with clinically relevant postoperative pancreatic fistula: a retrospective cohort study. HPB (Oxford). 2025. PMID: 41062381

Fosset M, von Wedel D, Redaelli S, Talmor D, Molinari N, Josse J, Baedorf-Kassis EN, Schaefer MS, Jung B. Subphenotyping prone position responders with machine learning. Crit Care. 2025. PMID: 40087660.

Fu Z, Ganesana M, Hwang P, Tan X, Kinkaid MM, Sun YY, Bian E, Weybright A, Sol-Church K, Eyo UB, Pridans C, Quintana FJ, Robson SC, Kumar P, Venton BJ, Schaefer A, Kuan CY. Microglia modulate cerebral blood flow and neurovascular coupling through ectonucleotidase CD39. bioRxiv [Preprint]. 2024. PMID: 39574618

Gbagornah PF, Tran C, Hannan J, Saeed S, Levy N, Kim C, Winterton D, Sharkey A, Neves S, Mitchell J, Hussain HS, Mahmood FU, Matyal R, Jackson CD, Bose R. Augmented Reality-aided Rescue Ultrasound Curriculum for Perioperative Crisis Management. Cardiothorac Vasc Anesth. 2025. PMID: 40685293

Gill JS, Simopoulos T. On the cervical epidural needle tip position and contrast spread: Is the anteroposterior view superior to the lateral view for determining target access and as a marker for efficacy? Pain Pract. 2025. PMID: 40170240.

Gill JS, Stippler M, Ruan Q, Hussain N, White AP, Oruhurhu V, Malik O, Simopoulos T, Urits I, D'Souza RS, Narang S, Hirsch JA. Validation of thoracolumbar injury classification and Severity Score in the management of acute and subacute Osteoporotic vertebral compression fractures - A pilot study and a suggested modification. Interv Pain Med. 2024. PMID: 39309034

Goadsby PJ, Friedman DI, Holle-Lee D, Demarquay G, Ashina S, Sakai F, Neel B, Gandhi P, Dabruzzo B, Smith JH, Liu Y, Trugman JM. Efficacy of Atogepant in Chronic Migraine With and Without Acute Medication Overuse in the Randomized, Double-Blind, Phase 3 PROGRESS Trial. Neurology. 2024. PMID: 38924724

Gonçalves MCB, Khera T, Otu HH, Narayanan S, Dillon ST, Shanker A, Gu X, Jung Y, Ngo LH, Marcantonio ER, Libermann TA, Subramaniam B. Multivariable Predictive Model of Postoperative Delirium in Cardiac Surgery Patients: Proteomic and Demographic Contributions. Anesth Analg. 2025. PMID: 39774401

Gorecki DC, Adinolfi E, Adriouch S, Coutinho-Silva R, Engel T, Gölöncsér F, Haag F, Illes P, Jacobson KA, Koch-Nolte F, Mansoor SE, Matute C, Melino G, Novak I, Pegoraro A, Pelegrin P, Piacentini M, Robson SC, Rumney RMH, Seman M, Sluyter R, Sperlagh B, Tang Y, Tarantini M, Ulrich H, Vouret-Craviari V, Ye Q, Yegutkin GG, Verkhratsky A. Methodological guidelines for P2X receptor assays and data interpretation. Cell Death Dis. 2026. PMID: 42010307

Gromova B, Kupcova V, Longhi MS, Gardlík R. Neutrophil-T cell crosstalk in non-infectious liver diseases. Am J Physiol Gastrointest Liver Physiol. 2025. PMID: 41324991.

Guérin E, Roland J, Sourieau I, Arame A, Didier J, Prieu A, Hermann B, Bréchot N, Talmor D, Diehl JL. Extracorporeal Membrane Oxygenation Combined With Esophageal Pressure-Guided Mechanical Ventilation as Salvage Therapies in Postpneumonectomy Acute Respiratory Distress Syndrome. Crit Care Explor. 2026. PMID: 42084216

Hanidziar D, Dwyer LJ, Ranjeva SL, Csizmadia E, Maheshwari S, Valencia JD, Aspden JW, Farhat N, Otterbein LE, Robson SC, Sîrbulescu RF, Poznansky MC. Protective and Immunomodulatory Functions of Exogenous B Cells in Experimental Hyperoxic Lung Injury. Anesth Analg. 2025. PMID: 40549576

Harrison S, Capers K, Chen G, Liu JT, Pannu A, Goodspeed V, Leibowitz A, Bose S. New initiation of opioids, benzodiazepines and antipsychotics following hospitalization for COVID-19. J Hosp Med. 2024. PMID: 38742528

Hasoon J, Chung M, Yazdi C, Robinson CL. Evaluation of Landmark-Based and Fluoroscopic-Guided Sacroiliac Joint Injections-A Pilot Series. Orthop Rev (Pavia). 2025. PMID: 40860249

Hasoon J, Ezenekwe E, Orhurhu VJ, Yazdi C, Abd-Elsayed A. Increasing Denials of Genicular Nerve Procedures Threaten Post-TKA Pain Management and May Drive Opioid Utilization. Orthop Rev (Pavia). 2026. PMID: 41694410

Hasoon J, Gill J, Yazdi C, Abd-Elsayed A. Enhanced Pain Relief with Catheter-Guided Caudal Epidural Steroid Injections: A Case Series of Patients with Unilateral Lumbar Radicular Pain. Orthop Rev (Pavia). 2025. PMID: 40134813

Hasoon J, Orhurhu VJ, Yazdi C. Genicular Nerve Blocks for the Management of Chronic Knee Pain Related to Osteoarthritis - A Case Series. Orthop Rev (Pavia). 2024. PMID: 39640541

Hasoon J, Robinson CL, Mahmood S, Yazdi C. Post Dural Puncture Headache After Spinal Cord Stimulator Lead Insertion Successfully Treated with Occipital Nerve Blocks. Orthop Rev (Pavia). 2024. PMID: 39624473

Hasoon J, Spatz M, Garcia RA, Ho JS, Gill J, Simopoulos TT, Gutierrez G, Caylor J, Mouch T, Yong RJ, Robinson CL. Practice Patterns of Physicians Who Perform Lumbar Transforaminal Epidural Steroid Injections. Curr Pain Headache Rep. 2025. PMID: 41307623

Hasoon J, Viswanath O, Simopoulos TT, Gill J. Cylindrical Lead Spinal Cord Stimulators: Common Device-Related Issues. Orthop Rev (Pavia). 2025. PMID: 41163706

Hasoon J, Vu PD, Mousa B, Markaryan AR, Sarwary ZB, Pinkhasova D, Chen GH, Gul F, Robinson CL, Simopoulos TT, Gill J, Viswanath O. Device-Related Complications Associated with Cylindrical Lead Spinal Cord Stimulator Implants: A Comprehensive Review. Curr Pain Headache Rep. 2024. PMID: 38850491

Hastie MJ, Mittel A, Raman V, Szokol J, Whittington R, Bustillo M, Siddiqui S, Straker T, Sakai T, Armstead V, Wiener-Kronish J, Jewitt C, Mashour GA. Sexual Harassment in Academic Anesthesiology: A Survey of Prevalence, Sources, Impact, and Recommendations. Anesth Analg. 2025. PMID: 39745880

He R, Mao X, Chen W, Zhang L, Xu Y, Zhao H, Zhang S, Tao X, Pan Q, Talmor D, Heunks L, Xu L, Shi Z, Ge H. Diaphragm physiological similarity index (DPSI): a de Novo speckle-tracking ultrasound metric for HFNC adjustment in acute respiratory failure. Crit Care. 2026. PMID: 41749337

Hene ON, Reddy R, Labib M, Siddiqui. Epinephrine-Induced Tako Tsubo Cardiomyopathy: Point of Care Ultrasound Findings in Postoperative Care. 2025. Open Journal of Anesthesiology. 15; 59-64. (DOI): 10.4236/ojanes.2025.153005

Hess PE, Li Y. Anesthetic Considerations and Blood Utilization for Placenta Accreta Spectrum. Clin Obstet Gynecol. 2025. PMID: 39660904

Hess PE, Smiley R. Intrathecal morphine for cesarean delivery: a little goes a long way. Int J Obstet Anesth. 2025. PMID: 40199615

Hill JL Jr, Conroy JM, Azocar RJ. From the Bedside to the Boardroom: Developing Physician Leaders to Manage Tomorrow's Healthcare Challenges. Front Health Serv Manage. 2024. PMID: 39565023

Ho JS, Glicksman M, Kang K, Zhang EX, Phung AT, Thérond A, Fonseca AC, Bulat E, Schatman ME, Kaye AD, Hasoon J, Yazdi C, Gill J, Ruan Q, Robinson CL, Simopoulos T. Spinal Cord Stimulator Complication Rates: A Single-Institution, 22-Year Study (1999-2021). Pain Physician. 2024. PMID: 39621991

Hua M, Billings FT 4th, Aziz MF, Dutton R, Kheterpal S, Legrand M, Leslie K, Mathew JP, McCann ME, Subramaniam B, Treggiari MM, Wijeysundera DN, Gropper MA. Anesthesiology Clinical Trial Networks in the United States: A Report from the Anesthesia Research Council. Anesthesiology. 2025. PMID: 40793804

Huang Y, Sharma P, Palepu A, Greenbaum N, Beam A, Beam K.NeoCLIP: a self-supervised foundation model for the interpretation of neonatal radiographs. NPJ Digit Med. 2025. PMID: 40993183

Hussain R, Pickle E, Lonjin T, Then J, Rivosecchi R, Cassavaugh J, Fichman M, Kaynar AM. Disruption of normal saline supply chain due to a disaster: an analysis of the impact of normal saline shortage on anesthesia practice in a large hospital system and models toward resiliency. Front Med (Lausanne). 2026. PMID: 41625742

Janga SR, Li MH, Kveraga K, Ramachandran RV, Sharkey A, Bose R, Sehgal S, Brown EN, Subramaniam B. Perioperative Multimodal General Anesthesia Focusing on Specific Central Nervous System Targets Does Not Reduce Postoperative Interleukin-6 and Neurofilament Light Levels in Patients Undergoing Cardiac Surgeries: A Randomized Controlled Trial. J Cardiothorac Vasc Anesth. 2025. PMID: 41365755

Jin H, Li M, Wang X, Yang L, Zhong X, Zhang Z, Han X, Zhu J, Li M, Wang S, Robson SC, Sun G, Zhang D. Purinergic signaling by TCRαβ+ double-negative T regulatory cells ameliorates liver ischemia-reperfusion injury. Sci Bull (Beijing). 2024. PMID: 39658411

Jotwani ML, Szabo E, Comptdaer G, Kim A, Lunde CE, Pierce M, Missmer SA, Laufer MR, Anchan R, Burstein R, Borsook D, Sieberg CB, Holmes S. A cross-sectional analysis of brain structure, pain behaviors, and mental health in persons with surgically confirmed endometriosis. Commun Biol. 2025. PMID: 41266551

Kaiser L, Paschold BS, Wachtendorf LJ, Ahrens E, Tenge T, Redaelli S, Hentges M, Sahli SD, Chen G, Novack V, Eikermann M, Ma H, Schaefer MS. Dose-dependent relationship between intra-operative ketamine administration and postoperative delirium: a retrospective cohort study. Anaesthesia. 2025. PMID: 40619168

Kang K, Glicksman M, Ho J, Hoang K, Phung A, Madabhushi S, Hasoon J, Yazdi C, Fonseca AC, Kaye AD, Schatman ME, Gill J, Simopoulos T, Robinson CL. Single Institutional Cross-Sectional Phone Survey Study: Evaluation of Causes for Loss to Follow-up After Spinal Cord Stimulator Implantation. Pain Physician. 2024. PMID: 39353115

Karan SB, Karelsky S, Kadura S, Ramachandran SK. Sleep medicine for anesthesia trainees: building the value proposition. Anesth Analg. 2025;140(3):577–580. doi:10.1213/ANE.0000000000007109. PMID: 39976621.

Kaur MN, Hazewinkel MHJ, Mönnink GLE, Tsangaris E, Pattanaik R, O'Gorman J, Ashina S, Austen WG, Klassen A, Pusic A, Gfrerer L. A conceptual framework to assess health-related quality of life and treatment effectiveness in headache disorders from the patient perspective. J Plast Reconstr Aesthet Surg. 2026. PMID: 42155414

Kasotakis G, Kuriyama A, Smalls N, Connor KA, Dempsey T, Miller AG, Bittner EA, Jaehne AK, Temsah MH, Siddiqui S, Bell CM, Khanna AK, Biswas S, Slain K, Akuamoah-Boateng K, Owusu KA, Sakhuja A, Boomer L, Setliff EL, Neyra JA, Rincon T, Bose S, Barwise A, Alexander P, Dugar S, Cantrell S, Shein SL; Society of Critical Care Medicine (SCCM) U.S. ICU Registry Working Group. Assessing Critical Care Delivery Using National-Level ICU Registry Data. Crit Care Med. 2025. PMID: 41139471

Kelestemur T, Robson SC, Németh ZH, Pacher P, Arif M, Aydin MS, Suzek BE, Pelletier J, Lunsford KE, Schwabe RF, Geng Y, Sévigny J, Haskó G. NTPDase8 Protects Against Liver Ischemia-Reperfusion Injury in Mice. FASEB. 2025. PMID: 40600918

Kesecioglu J, Rusinova K, Alampi D, Arabi YM, Benbenishty J, Benoit D, Boulanger C, Cecconi M, Cox C, van Dam M, van Dijk D, Downar J, Efstathiou N, Endacott R, Galazzi A, van Gelder F, Gerritsen RT, Girbes A, Hawyrluck L, Herridge M, Hudec J, Kentish-Barnes N, Kerckhoffs M, Latour JM, Malaska J, Marra A, Meddick-Dyson S, Mentzelopoulos S, Mer M, Metaxa V, Michalsen A, Mishra R, Mistraletti G, van Mol M, Moreno R, Nelson J, Suñer AO, Pattison N, Prokopova T, Puntillo K, Puxty K, Qahtani SA, Radbruch L, Rodriguez-Ruiz E, Sabar R, Schaller SJ, Siddiqui S, Sprung CL, Umbrello M, Vergano M, Zambon M, Zegers M, Darmon M, Azoulay E. European Society of Intensive Care Medicine guidelines on end of life and palliative care in the intensive care unit. Intensive Care Med. 2024. PMID: 39361081

Khan AA, Yunus R, Sohail M, Rehman TA, Saeed S, Bu Y, Jackson CD, Sharkey A, Mahmood F, Matyal R. Artificial Intelligence for Anesthesiology Board-Style Examination Questions: Role of Large Language Models. J Cardiothorac Vasc Anesth. 2024;38(5):1251–1259. PMID: 38423884.

Kolev M, Kremer AE, Sokollik C, Gershwin ME, Terziroli Beretta-Piccoli B; speakers of 4th Swiss Autoimmune Liver Disease Meeting. Unmet needs in autoimmune liver diseases. Curr Opin Immunol. 2025. PMID: 40414140

Kollenburg L, Kurt E, Mulleners W, Arnts H, Robinson CL, Poelen J, Meier K, Dominguez M, Ashina S, Vissers K.Brain. Bridging the gap: molecular mechanisms, regional activity, and connectivity in headache disorders. Brain. 2025 PMID: 40995873

Kollenburg L, Kurt E, Mulleners W, Abd-Elsayed A, Yazdi C, Schatman ME, Yong RJ, Cerda IH, Pappy A 2nd, Ashina S, Robinson CL, Dominguez M. Four Decades of Occipital Nerve Stimulation for Headache Disorders: A Systematic Review. Curr Pain Headache Rep. 2024. PMID: 38907793

Kutryb-Zając B, Robson SC, Caiazzo E. Editorial: Adenosine metabolism in cardiovascular and smooth muscle. Front Pharmacol. 2026. PMID: 41953195

Lanspa MJ, Khan A, Lyons PG, Gong MN, Naqvi AA, Dugar S, Duggal A, Johnson NJ, Schoeneck JH, Smith L, Bose S, Shapiro NI, Shvilkina T, Groat D, Jacobs JR, Olsen TD, Cannavina S, Knox DB, Hirshberg EL, Self WH, Brown SM. Crystalloid Liberal or Vasopressors Early Resuscitation in Sepsis-Study of Treatment's Echocardiographic Mechanisms (CLOVERS-STEM). Crit Care Explor. 2024. PMID: 39652431

Lee NT, Savvidou I, Selan C, Wright DK, Brkljaca R, Chia JSJ, Calvello I, Craenmehr DDD, Larsson P, Tarlac V, Vuong A, Carmichael I, Wang X, Peter K, Robson SC, Nandurkar HH, Sashindranath M. Endothelial -targeted CD39 is protective in a mouse model of global forebrain ischaemia. J Neuroinflammation. 2025. PMID: 40259346

Levy N, Saeed S, Gbagornah PF, Benavides-Zora D, Winterton D, Jackson CD, Sharkey A, Levy L, Neves S, Walsh DP, Matyal R.J Implementation of Routine In Situ Simulation in Residency Curriculum Targeting Competency in Technical and Decision-Making Skills. Cardiothorac Vasc Anesth. 2024. PMID: 38955619

Li K, Li Y, Hess PE, Berger AA. Neuraxial labor analgesia in type 2N von Willebrand disease: a case report. Int J Obstet Anesth. 2025. PMID: 41330092

Li MH-G, Chen G, Harrison S, Capers K, Subramaniam B. Anesthesiologists' intraoperative analgesic practices for patients undergoing cardiac surgery. J Cardiothorac Vasc Anesth. 2025;39(12):3299–3305. doi:10.1053/j.jvca.2025.08.018. PMID: 40973511.

Li MH-G, McGrail D, Mahmood F, Bose R. Preoperative cardiac assessment for coronary artery disease: from symptoms to angiography. J Cardiothorac Vasc Anesth. 2025;39(4):889–896. doi:10.1053/j.jvca.2024.12.036. PMID: 39864981.

Liao G, Nakayama T, Zhu B, Lee IT, Yeung J, Yeo YY, Chang Y, Wang C, Liao SC, Nkosi D, Renteria A, Bravo DT, Overdevest JB, Yan CH, Zarabanda D, Gall PA, Dholakia SS, Borchard NA, Yang A, Kim D, Patel ZM, Hwang PH, Wagh D, Coller J, Phillips KM, Chang MT, Lechner M, Li Z, Yeh TH, Nolan G, Longhi MS, Boussiotis V, Barouch DH, Ma Q, Nayak JV, Jiang S. Multi-scaled transcriptomics of chronically inflamed nasal epithelium reveals immune-epithelial dynamics and tissue remodeling in nasal polyp formation. Immunity. 2025. PMID: 40945518

Liebich K, Riesemann S, Tenge T, Ahrens E, Paschold BS, Marcus C, Sahli SD, Chen G, Braeuer BLP, O'Gara B, Zucco LV, Sundar E, Xu X, Pensier J, Wachtendorf LJ, Schaefer MS. Advanced healthcare utilisation after monitored anaesthesia care versus general anaesthesia: A real-world data analysis. Anaesth Crit Care Pain Med. 2026. PMID: 41796862

Lim AH, Ali FS, Ciampa EJ, Berzin TM. Performing Endoscopy Safely in Pregnant Patients: Best Practices for the Gastroenterology Team. Am J Gastroenterol. 2026. PMID: 40569352

Lipton RB, Martinez B, Buse DC, Mehrabadi AS, Zagar AJ, Cohen F, Shapiro RE, Hoyt M, Ashina S, Nicholson RA, Muenzel EJ. The Role of Income and Health Insurance on Migraine Care: Results of the OVERCOME (US) Study. Adv Ther. 2026. PMID: 41525045

Longhi MS, Zhang L, Mieli-Vergani G, Vergani D. Can we cure autoimmune hepatitis? Curr Opin Immunol. 2025. PMID: 40663808

Luo Z, Chen H, Wu A, Mao W, Barge S, Alper SL, Robson SC, Yu W. Dysregulation of CD39/Ectonucleoside Triphosphate Diphosphohydrolase 1 Causes Urinary Bladder Dysfunction with Abnormal Smooth Muscle Contractility. FASEB J. 2026. PMID: 41891871

Lunderberg JM, Spicer AJ, Cassavaugh J, Jalkanen J, Haskó G, Robson SC. Targeting CD73 and correcting adenosinergic signaling in critically ill patients. Front Pharmacol. 2026. PMID: 41601962

Lynch N, De Luca R, Spinieli RL, Rillosi E, Thomas RC, Sailesh S, Gangeddula N, Lima JD, Bandaru SS, Arrigoni E, Melo-Carrillo A, Burstein R, Thankachan S, Kaur S. Calcitonin Gene-Related Peptide (CGRP)-Expressing Neurons in the External Lateral Parabrachial Area Regulate Pain-Induced Sleep Disturbances. Adv Sci (Weinh). 2025. PMID: 40583282

Ma H, Ahrens E, Wachtendorf LJ, Chen G, Rhee J, Schaefer MS. Intraoperative Vasopressors and Delirium: Reply. Anesthesiology. 2024. PMID: 39392782

Ma KS, Chan SY, Van Dyke TE, Wang SI, Wei JC, Ashina S. Tooth Loss and Chronic Pain: A Population-based Analysis of the National Health and Nutrition Examination Survey. J Pain. 2024. PMID: 38588761

Mahmood E, Robitaille M, Bu Y, Khan A, Poulin MF, Mahmood F, Bose R, Khabbaz KR, Robson SC, Matyal R. Targeting the CD39/CD73 pathway: New insights into cardiac fibrosis and inflammation in female cardiac surgery patients. J Mol Cell Cardiol Plus. 2025. PMID: 40230374

Manji AA, Puerta-Martinez F, Hannan J, Dirini N, Rkaiby J, Brzezinski-Sinai Y, Matyal R, Levy N, Winterton D. Integrating Virtual Reality into Cricothyrotomy Training: A Pilot Evaluation of Learner Confidence and Perceived Skills Transfer. J Cardiothorac Vasc Anesth. 2026. PMID: 41997815

Martinelli D, De Icco R, Al-Khazali HM, Ashina S, Diener HC, Dodd-Glover F, Goicochea MT, Jenkins B, MaassenVanDenBrink A, Lee MJ, Özge A, Peres MFP, Pozo-Rosich P, Puledda F, Sacco S, Schwedt T, Terwindt GM, Tassorelli C. Advances in migraine prevention. Lancet Neurol. 2026. PMID: 41722594

Martinelli D, Leone M, Burstein R, Charway-Felli A, Tassorelli C. Globally advancing neurological education in headache. Lancet Neurol. 2024. PMID: 39152027

Mazzinari G, Zampieri FG, Ball L, Campos NS, Bluth T, Hemmes SNT, Ferrando C, Librero J, Soro M, Pelosi P, Gama de Abreu M, Schultz MJ, Serpa Neto A; for REPEAT on behalf of the PROVHILO, iPROVE, and PROBESE investigators and the PROVE Network investigators High Positive End-expiratory Pressure (PEEP) with Recruitment Maneuvers versus Low PEEP during General Anesthesia for Surgery: A Bayesian Individual Patient Data Meta-analysis of Three Randomized Clinical Trials. Anesthesiology. 2025. PMID: 39042027

McGrail D, Li M, Short C, Saeed S, Grinberg AO, Sharkey A, Mahmood F, Matyal R. Leveraging Digital Technologies to Establish a Perioperative Ultrasound Program. J Cardiothorac Vasc Anesth. 2026. PMID: 42014219 Review.

Melo-Carrillo A. Is there a role of calcitonin gene-related peptide in cortical spreading depression mechanisms? – argument con J Headache Pain. 2025. PMID: 40295929

Melo-Carrillo A, Strassman AM, Broide R, Adams A, Dabruzzo B, Brin M, Burstein R. Novel insight into atogepant mechanisms of action in migraine prevention. Brain. 2024 PMID: 38411458

Melo-Carrillo A, Strassman A, Burstein R. Elucidating the nociceptive role of CGRP in migraine headache. Brain. 2026. PMID: 41503630.

Melo-Carrillo A, Strassman AM, Malcolm KJ, Adams AM, Dabruzzo B, Broide RS, Brin MF, Burstein R. Exploring the effects of extracranial injections of botulinum toxin type A on activation and sensitization of central trigeminovascular neurons by cortical spreading depression in male and female rats. Cephalalgia. 2024. PMID: 39252510

Meng C, Sato T, Ueda R, Kim J, Longhi MS, Fujisaki J. Transfer of bone marrow niche-residential regulatory T cells ameliorates experimental colitis. Cell Immunol. 2025. PMID: 40306133

Mohamed E, Katz A, Jafari N, Rayapuraju A, Reed PU, Hariri S, Subramaniam B. The effect of the inner engineering program on interpersonal relationships: a qualitative study of emotional regulation and relational transformation. Front Psychol. 2025. PMID: 41245337

Moreau S, Thérond A, Cerda IH, Studer K, Pan A, Tharpe J, Crowther JE, Abd-Elsayed A, Gilligan C, Tolba R, Ashina S, Schatman ME, Kaye AD, Yong RJ, Robinson CL. Virtual Reality in Acute and Chronic Pain Medicine: An Updated Review. Curr Pain Headache Rep. 2024. PMID: 38587725

Moya MAA, Chen L, Otaluka N, Gulluoglu A, Talmor D, O'Gara B. Lung protective characteristics of volatile anesthetic sedation. Crit Care. 2026. PMID: 41998735

Müller-Wirtz LM, O'Gara B, Gama de Abreu M, Schultz MJ, Beitler JR, Jerath A, Meiser A. Volatile anesthetics for lung- and diaphragm-protective sedation. Crit Care. 2024. PMID: 39217380

Müller-Wirtz LM, Lilien TA, Patterson WM, Ott S, Francis RCE, Gama de Abreu M, Serpa Neto A, Bem RA, van Meenen DMP, Schultz MJ; REPEAT investigators. Individual and combined effects of chemical and mechanical power on postoperative pulmonary complications: a secondary analysis of the REPEAT study. Anaesthesia. 2025. PMID: 40827607

Munoz-Acuna R, Ahrens E, Suleiman A, Wachtendorf LJ, Azizi BA, Redaelli S, Tartler TM, Chen G, Baedorf-Kassis EN, Schaefer MS, Siddiqui S. Impact of the COVID-19 pandemic on lung-protective ventilation practice in critically ill patients with respiratory failure: a retrospective cohort study from a New England healthcare network. Crit Care. 2024. PMID: 38965629

Nagrebetsky A, Zhu M, Deng H, Gaissert HA, Gama de Abreu M, Frendl G, Schaefer MS, Vidal Melo MF. Impaired oxygenation after lung resection: Incidence and perioperative risk factors. J Clin Anesth. 2024. PMID: 38718685

Nasa P, van Meenen DMP, Paulus F, Ferrando C, Bluth T, Gama de Abreu M, Ball L, Bossers SM, Schober P, Schultz MJ, Serpa Neto A, Hemmes SNT; REPEAT; PROVHILO; PROBESE; investigators of the PROVE network; ESAIC CTN.Association of intraoperative end-tidal CO2 levels with postoperative outcomes: a patient-level analysis of two randomised clinical trials. Br J Anaesth. 2025. PMID: 40930872

Naushad W, Okeoma BC, Gartner C, Santos-Ortega Y, Vary CPH, Premadasa LS, Noghero A, Stapleton JT, Ghiran IC, Mohan M, Okeoma CM. Non-Vesicular Extracellular Particle (NVEP) Proteomes from Diverse Biological Sources Reveal Specific Marker Composition with Varying Enrichment Levels. Biomolecules. 2025. PMID: 41301405

Neuburger PJ, Mahmood F. Con: Perioperative Echocardiography Accreditation Is Costly, Time Consuming, and Unnecessary. Cardiothorac Vasc Anesth. 2024. PMID: 38987102

Obeidat SS, Suleiman A, Ahrens E, Needham MJ, Stewart C, Khany M, Tartler TM, Zucco L, Pandit JJ, Schaefer MS, Ramachandran SK. Real-World Evaluation of i-gel Introduction on Intraoperative Airway-Related Safety Events: A Retrospective Cohort Study From a New England Hospital Network. Anesth Analg. 2025. PMID: 39804591

O'Gara B, Boncyk C, Meiser A, Jerath A, Bellgardt M, Jabaudon M, Beitler JR, Hughes CG. Volatile Anesthetic Sedation for Critically Ill Patients. Anesthesiology. 2024. PMID: 38860793

O'Gara B, Serra AL, Englert JA, Sachdev A, Owens RL, Chang SY, Park PK, Talmor D, Sverud I, Sackey P, Beitler JR. Inhaled sedation versus propofol in respiratory failure in the ICU (INSPiRE-ICU2): study protocol for a multicenter randomized controlled trial. Trials. 2025. PMID: 40165305 Okeoma CM, Premadasa LS, Tan CS, Ghiran IC, Mohan M. Cannabinoids shift the basal ganglia microRNA m6A methylation profile towards an anti-inflammatory phenotype in SIV-infected rhesus macaques. Commun Biol. 2025. PMID: 41286161

Oliveira WS, Dos Santos ERR, Peixoto PM, Grassi V, Pedrosa MVS, Burstein R, Peres MFP. Migraine as a primary care-sensitive condition: Building pathways to accessible care. Cephalalgia. 2026. PMID: 41773569

Ornello R, Caponnetto V, Ahmed F, Al-Khazali HM, Ambrosini A, Ashina S, Baraldi C, Bellotti A, Brighina F, Calabresi P, Casillo F, Cevoli S, Cheng S, Chiang CC, Chiarugi A, Christensen RH, Chu MK, Coppola G, Corbelli I, Crema S, De Icco R, de Tommaso M, Di Lorenzo C, Di Stefano V, Diener HC, Ekizoğlu E, Fallacara A, Favoni V, Garces KN, Geppetti P, Goicochea MT, Granato A, Granella F, Guerzoni S, Ha WS, Hassan A, Hirata K, Hoffmann J, Hüssler EM, Hussein M, Iannone LF, Jenkins B, Labastida-Ramirez A, Laporta A, Levin M, Lupica A, Mampreso E, Martinelli D, Monteith TS, Orologio I, Özge A, Pan LH, Panneerchelvam LL, Peres MFP, Souza MNP, Pozo-Rosich P, Prudenzano MP, Quattrocchi S, Rainero I, Romanenko V, Romozzi M, Russo A, Sances G, Sarchielli P, Schwedt TJ, Silvestro M, Swerts DB, Tassorelli C, Tessitore A, Togha M, Vaghi G, Wang SJ, Ashina M, Sacco S. Evidence-based guidelines for the pharmacological treatment of migraine. Cephalalgia. 2025. PMID: 40277319

Owegie OC, Hancco Zirena I, Penubothu T, Ghiran IC, Yang M. Isoquercetin treatment of mouse sickled red blood cells shows a discernible deformability and sickling phenotype. bioRxiv [Preprint]. 2026. PMID: 42094342

Özge A, Peres MFP, Burstein R. Pediatric migraine care: bridging gaps, overcoming barriers, and advancing solutions. Eur J Pediatr. 2025. PMID: 40411625

Padilla A, Stockinger J, Zanolli NC, Hurwitz R, Ende HB, Butwick AJ, Warrick CM, Hess PE, Mathis M, Fuller M, Habib AS; Multicenter Perioperative Outcomes Group Investigators. Mode of anesthesia for patients with placenta accreta spectrum undergoing cesarean hysterectomy: a report from the Multicenter Perioperative Outcomes Group Database. Anesthesiology. 2026 Mar;144(3):535–545. doi:10.1097/ALN.0000000000005788. Epub 2025 Oct 6. PMID: 41051360.

Padrao EMH, Nguyen AT, Nguyen K, Sopuch IA, Gulluoglu A, Alape MA, Harrison S, Wong A, Sadrolashrafi M, Cozzi G, Pais K, Furfaro D, Hayes M, Goodspeed V, Talmor DS, Baedorf-Kassis EN. Automated data extraction from electronic medical records for pragmatic clinical trials. J Med Syst. 2026. PMID: 42062587

Paschold BS, Braeuer BLP, Santer P, Wichelhaus LM, Alcala G, Robitaille MJ, Woloszynek S, Pinciroli R, Sahli S, Wachtendorf LJ, Karimitar A, Goodspeed V, Pensier J, Jungwirth B, Baedorf-Kassis E, Amato MBP, Talmor D, Schaefer MS. Impact of high versus low fraction of inspired oxygen for anaesthetic washout and extubation on postoperative pulmonary atelectasis formation and oxygenation: a randomised controlled trial. Br J Anaesth. 2026. PMID: 42297665

Pensier J, Fosset M, Paschold BS, von Wedel D, Redaelli S, Braeuer BLP, Novack V, Balzer F, Jung B, Amato MBP, Jaber S, Talmor D, Baedorf-Kassis E, Schaefer MS. Temporal stability of phenotypes of acute respiratory distress syndrome: clinical implications for early corticosteroid therapy and mortality. Intensive Care Med. 2025 Oct;51(10):1784-1796. doi: 10.1007/s00134-025-08089-4. PMID: 40839098.

Pensier J, Fosset M, Paschold BS, von Wedel D, Sharif M, Braeuer BLP, Sahli SD, Novack V, Goodspeed V, Sarge T, Jung B, Amato MBP, Sinha P, Talmor D, Schaefer MS, Baedorf-Kassis E. Effects of inflammatory phenotypes in acute respiratory distress syndrome on mortality and partitioning of lung and chest wall mechanics in patients in the USA and Canada: a retrospective cohort study. Lancet Respir Med. 2026 Jul;14(7):609-619. doi: 10.1016/S2213-2600(26)00045-7. PMID: 42155495.

Pensier J, Schaefer MS, Seitz KP. Rapid sequence induction and intubation: Can we predict and prevent hypotension? Anaesth Crit Care Pain Med. 2025 May;44(3):101536. doi: 10.1016/j.accpm.2025.101536. PMID: 40318851.

Pensier J, Talmor D, Jaber S. Postoperative ARDS: distinct etiologies, distinct priorities. Intensive Care Med. 2026 Sep;52(9):2006-2009. doi: 10.1007/s00134-026-08353-1. PMID: 41774108.

Pensier J, Triché LR, Fosset M, Jabaudon M, Schaefer MS. Clarifying the technical and conceptual foundations of ARDS inflammatory phenotypes. Author's reply. Anaesth Crit Care Pain Med. 2026;45(5):101806. doi: 10.1016/j.accpm.2026.101806. PMID: 41765095.

Peres MFP, Lucchetti G, Vallada H, Riso IL, Westenhofen GK, Valença MM, de Andrade JR, Brennan KC, Levin M, Takizawa T, Dong Z, Wang Y, Rattanawong W, Sofyan HR, Leone M, Dodd-Glover F, Yuan H, Albilali A, Alsaadi T, Caixeta L, Andreou AP, Goadsby PJ, MaassenVanDenBrink A, Ashina S, Burstein R, Pozo-Rosich P, Ahmed F, Wang SJ. Transcultural headache medicine: A framework for integrating cultural contexts into headache science and care - a call to action from the International Headache Society. Cephalalgia. 2026. PMID: 41914792

Peres MFP, Ozge A, Burstein R. Headache burden among schoolchildren in Sub-Saharan Africa on the map for targeted solutions. Cephalalgia. 2024. PMID: 39376027

Peres MFP, Sacco S, Pozo-Rosich P, Tassorelli C, Ahmed F, Burstein R, Ashina S, Uluduz D, Husøy AK, Steiner TJ. Migraine is the most disabling neurological disease among children and adolescents, and second after stroke among adults: A call to action. Cephalalgia. 2024. PMID: 39197864

Pozo-Rosich P, Alpuente A, Silberstein SD, Burstein R. Insights from 25 years of onabotulinumtoxinA in migraine - mechanisms and management. Nat Rev Neurol. 2024. PMID: 39160284

Pozo-Rosich P, Caronna E, Sacco S, Peres MFP, Ashina S, Özge A, Ahmed F, Velez-Jimenez MK, Jenkins B, Wang SJ, Schwedt TJ, Sakai F, Levin M, Burstein R, Terwindt GM, Tassorelli C. Early treatment in migraine - A call to shift prevention from attacks to disease progression: A position statement from the International Headache Society. Cephalalgia. 2025. PMID: 41134822

Puerta-Martinez F, Benavides-Zora D, Manji AA, Winterton D, Friedrich C, Matyal R. A Novel Simulation-Based Approach to Enhance Anesthesiologists' Electroencephalography Training and Education. J Cardiothorac Vasc Anesth. 2025. PMID: 41027798

Puledda F, Sacco S, Diener HC, Ashina M, Al-Khazali HM, Ashina S, Burstein R, Liebler E, Cipriani A, Chu MK, Cocores A, Dodd-Glover F, Ekizoğlu E, Garcia-Azorin D, Göbel C, Goicochea MT, Hassan A, Hirata K, Hoffmann J, Jenkins B, Kamm K, Lee MJ, Ling YH, Lisicki M, Martinelli D, Monteith TS, Ornello R, Ozge A, Peres M, Pozo-Rosich P, Romanenko V, Schwedt TJ, Souza MNP, Takizawa T, Terwindt GM, Thuraiaiyah J, Togha M, Vandenbussche N, Wang SJ, Yu S, Tassorelli C. International Headache Society global practice recommendations for the acute pharmacological treatment of migraine. Cephalalgia. 2024. PMID: 39133176

Puledda F, Sacco S, Diener HC, Ashina M, Al-Khazali HM, Ashina S, Burstein R, Liebler E, Cipriani A, Chu MK, Cocores A, Dodd-Glover F, Ekizoğlu E, Garcia-Azorin D, Göbel CH, Goicochea MT, Hassan A, Hirata K, Hoffmann J, Jenkins B, Kamm K, Lee MJ, Ling YH, Lisicki M, Martinelli D, Monteith TS, Ornello R, Özge A, Peres MFP, Pozo-Rosich P, Romanenko V, Schwedt TJ, Souza MNP, Takizawa T, Terwindt GM, Thuraiaiyah J, Togha M, Vandenbussche N, Wang SJ, Yu S, Tassorelli C. International Headache Society Global Practice Recommendations for Preventive Pharmacological Treatment of Migraine. Cephalalgia. 2024. PMID: 39262214

Qi Y, Li X, Song X, Wei W, Ghiran I, Robson SC. Purinergic signal transduction and metabolic regulation by ENTPD5 and ENTPD6. Front Endocrinol (Lausanne). 2026. PMID: 41685236

Ramachandran RV, Behera A, Hussain Z, Peck J, Ananthakrishanan A, Mathur P, Banner-Goodspeed V, Muehlschlegel JD, Pittet JF, Bardia A, Schonberger R, Marcantonio ER, Kveraga K, Subramaniam B. Incidence of Concurrent Cerebral Desaturation and Electroencephalographic Burst Suppression in Cardiac Surgery Patients. Anesth Analg. 2024. PMID: 39446661

Ramachandran SK. Postoperative Ataxic Breathing: A New Tool for Early Diagnosis of Opioid-Induced Respiratory Depression? Anesth Analg. 2024. PMID: 39661045

Rangasamy V, Subramaniam B, Pandit JJ. Evolving Clinical Trial Structures: Raising the Bar for Anesthesiology Research and Creating New Challenges for Journals. Anesth Analg. 2025. PMID: 40911479

Ratajczak N, Ahrens E, Wachtendorf LJ, Schaefer MS. Acetaminophen 5-HT3 Antagonist Interaction: Reply. Anesthesiology. 2025. PMID: 40197456

Ratajczak N, Munoz-Acuna R, Redaelli S, Suleiman A, Seibold EL, von Wedel D, Shay D, Ashrafian S, Chen G, Sundar E, Ahrens E, Wachtendorf LJ, Schaefer MS. Increased Postoperative Opioid Consumption in the Presence of Coadministration of 5-Hydroxytryptamine Type 3 Antagonists with Acetaminophen: A Hospital Registry Study. Anesthesiology. 2024. PMID: 38700445

Riesemann S, Tenge T, Ahrens E, Wachtendorf LJ, Paschold BS, Shay D, von Wedel D, Liebich K, Student JP, Fligor SC, Kaiser L, Xu X, Katsiampoura A, Valeri L, Novack V, Kent TS, Ma H, Schaefer MS. Association of intraoperative dexamethasone administration with postoperative delirium and the role of hyperglycaemia: a retrospective cohort study. EClinicalMedicine. 2026. PMID: 41660365

Riesemann S, Wachtendorf LJ, Braeuer BLP, Sahli SD, Paschold BS, Tenge T, Marcus C, Santer P, Matyal R, Schaefer MS, Robitaille MJ. Intraoperative respiratory exchange ratio to predict complications after cardiopulmonary bypass surgery: a retrospective cohort study. J Clin Monit Comput. 2026. PMID: 41984141

Renard Triché L, Fosset M, Jabaudon M, Futier E, Lucas B, Latroche C, Paschold BS, Baedorf-Kassis E, Sharshar T, Schaefer MS, Jung B, Mazeraud A, Pensier J. Temporal stability of inflammatory subphenotypes of acute respiratory distress syndrome: 28-day insights from the ICAR trial. Anaesth Crit Care Pain Med. 2025. PMID: 40436270

Robinson CL, Christensen RH, Al-Khazali HM, Amin FM, Yang A, Lipton RB, Ashina S. Prevalence and relative frequency of cervicogenic headache in population- and clinic-based studies: A systematic review and meta-analysis. Cephalalgia. 2025. PMID: 40094720

Robinson CL, Schatman ME, Hasoon J, Chung M, Emerick T, Lo Bianco G, Ashina S, Yong RJ. Suzetrigine: Is This What We Have Been Waiting for or Just the Beginning? J Pain Res. 2025. PMID: 40255364

Robitaille M, Ahmed U, Valencia J, Khan A, Manji AAK, Russ E, Chu L, Khabbaz K, Mahmood F, Matyal R. Impaired PGC-1α-pAMPK signaling in postmenopausal women undergoing cardiac surgery and the role of nicotinamide in its reversal: Insights from a murine model. J Mol Cell Cardiol Plus. 2025 Dec;14:100831. doi: 10.1016/j.jmccpl.2025.100831. PMID: 41377471.

Roth S, Tenge T, M'Pembele R, Wachtendorf LJ, Kindgen-Milles D, Schaefer MS, Lurati Buse G; MET-REPAIR Investigators. Chronic kidney disease is associated with major adverse events on the ward after noncardiac surgery: A secondary analysis of an international cohort study. Eur J Anaesthesiol. 2025. PMID: 40371540

Rothrock J, Najib U, Ailani J, Ashina S, Bao J, Smith JH, Adams AM, Dabruzzo B, Pfleeger K, Blumenfeld A. Safety, tolerability, and efficacy of atogepant added to onabotulinumtoxinA for the preventive treatment of chronic migraine: A phase 3, multicenter, 24-week, open-label study. Cephalalgia. 2026. PMID: 41944477

Ruan QZ, Pak DJ, Gulati A, Dominguez M, Diwan S, Hasoon J, Deer TR, Yong RJ, Albilali A, Macone A, Ashina S, Robinson CL. Scoping Review: The Effects of Interrupted Onabotulinumtoxin A Treatment for Chronic Migraine Prevention During the COVID-19 Pandemic. J Pain Res. 2024. PMID: 39679430

Ruan QZ, Pak DJ, Reece DE, Jotwani R, Li S, Dominguez M, Kaye AD, Yong RJ, Albilali A, Bhayani S, Hasoon J, Schatman ME, Ku JB, Simopoulos TT, Ashina S, Robinson CL. The Efficacy of Botulinum Toxin Use in Service Members and Veterans with Migraine and Post-Traumatic Headache Disorders: A Scoping Review. J Pain Res. 2024. PMID: 39679425

Rudolph MI, Borngaesser F, Zmily OM, Mpody C, Wongtangman K, Wachtendorf LJ, Khandaker R, Suleiman A, Binda DD, Ramishvili T, Schaefer MS, Di Biase L, Garcia MJ, Nafiu OO, Devereaux PJ, Bhatt DL, Eikermann M, Karaye IM; Health Outcomes and; Perioperative Equity (HOPE) Group Investigators Writing Committee.Preoperative beta blocker use and postoperative ischaemic stroke risk in noncardiac surgery: a multicentre retrospective cohort study. Br J Anaesth. 2026. PMID: 41506973

Saeed S, Robitaille M, Ahmed U, Yunus RA, Sohail M, Levy N, Neves S, Schermerhorn ML, Matyal R, Mahmood FJ. Sex-Based Differences in Ruptured Abdominal Aortic Aneurysm Management and Outcomes: An Update. Cardiothorac Vasc Anesth. 2025.PMID: 39794195

Sagir A, Simopoulos TT, Nagda JV, Fonseca ACG, Cai VL, Hussain N, Liang C, Gill JS. Standalone anteroposterior contrast spread pattern is insufficient to distinguish lumbar epidural from extradural spread: A prospective study. Interv Pain Med. 2025. PMID: 40896551

Salzmann RJS, Mocan T, Willms AG, Klein A, Schwab R, Mois E, Grapa C, Mocan LP, Craciun R, Sparchez Z, Schmidt-Wolf IGH, Best J, Schmidt HH, Krawczyk M, Robson SC, Lukacs-Kornek V, Kornek MT. AI-guided additive scoring model for differential diagnosis of primary liver cancer.JHEP Rep. 2026. PMID: 41895662

Sampaio Rocha-Filho PA, Dominguez M, Robinson CL, Ashina S. Uses of Botulinum Toxin in Headache and Facial Pain Disorders: An Update. Toxins (Basel). 2025. PMID: 40711126

Santarisi A, Suleiman A, Redaelli S, von Wedel D, Beitler JR, Talmor D, Goodspeed V, Jung B, Schaefer MS, Baedorf Kassis E. Transpulmonary Pressure as a Predictor of Successful Lung Recruitment: Reanalysis of a Multicenter International Randomized Clinical Trial. Respir Care. 2025. PMID: 39964867

Sarullo K, Samad M, Kendale S, Baldi P, Swamidass SJ. Domain Knowledge Inclusive Monotonic Neural Network Guides Patient-Specific Induction of General Anesthesia Dosing. A A Pract. 2025.PMID: 40792650

Savir S, Hannan J, Saeed S, Tran C, Kapoor S, Winterton D, Sinai YB, Mitchell J, Mahmood F, Matyal R, Neves S. Virtual Reality (VR) Training for Anesthesiologist in Invasive Procedures (VR TAIP) - a Single Center Randomized Controlled Trial.
Cardiothorac Vasc Anesth. 2025. PMID: 41224598

Savir S, Khan AA, Yunus RA, Gbagornah P, Levy N, Rehman TA, Saeed S, Sharkey A, Jackson CD, Mahmood F, Mitchell J, Matyal R. Virtual Reality Training for Central Venous Catheter Placement: An Interventional Feasibility Study Incorporating Virtual Reality Into a Standard Training Curriculum of Novice Trainees. J Cardiothorac Vasc Anesth. 2024. PMID: 39048413

Schaefer MS, et al. Does low-dose ketamine really protect against delirium? A reply. Anaesthesia. 2026;81(2):304–305. doi:10.1111/anae.70004. PMID: 41016841.

Schaefer MS, Tenge T, Futier E. How to set the ventilator during surgery? Key principles to guide intraoperative mechanical ventilation. Intensive Care Med. 2026. PMID: 41557000

Schain AJ, Delgado Fajardo D, Strassman AM, Kulkarni S, Broide RS, Brideau-Andersen AD, Adams AM, Brin MF, Burstein R. OnabotulinumtoxinA alters pro- and anti-inflammatory dural macrophage response to CSD in female mice.
Cephalalgia. 2025. PMID: 41004644

Schreiber AF, Subirà C, Sklar M, Santos M, Ko M, Panelli A, Schaller SJ, Theodore D, Rowley DD, Watson D, Bonde P, Baedorf Kassis EN, Talmor DS, Ranieri M, Goligher EC, Slutsky A, Brochard LJ. Multi-center randomized superiority clinical trial in the early phase of mechanically ventilated patients to preserve diaphragm thickness using non-invasive magnetic phrenic nerve stimulation: STIMIT ACTIVATOR 1 pivotal trial. Trials. 2025. PMID: 40500715

Schwedt TJ, Pradhan AA, Oshinsky ML, Brin MF, Rosen H, Lalvani N, Charles A, Ashina M, Do TP, Burstein R, Gelfand AA, Dodick DW, Pozo-Rosich P, Lipton RB, Ailani J, Szperka CL, Charleston L 4th, Digre KB, Russo AF, Buse DC, Powers SW, Tassorelli C, Goadsby PJ; Headache Research Priorities Working Group Members. The headache research priorities: Research goals from the American Headache Society and an international multistakeholder expert group. Headache. 2024. PMID: 39149968

Sehgal S, Liu S, Mahmood F, Maslow A, Ahmed AA, Knio ZO, Matyal R, Chu L, Liu DC, Senthilnathan V, Khabbaz KR. Comprehensive Dynamic 3-Dimensional Analysis of the Tricuspid Valve in Functional Tricuspid Regurgitation: Implications for Prophylactic Tricuspid Valve Intervention. J Cardiothorac Vasc Anesth. 2024. PMID: 39489663

Seibold EL, Paschold BS, Schaefer MS, Wachtendorf LJ. Impact of desflurane removal from the operating room on carbon dioxide emissions at a tertiary academic medical centre: potential impact on anaesthesia time. Response to Br J Anaesth 2026; 136: 1036-7. J.Br J Anaesth. 2026. PMID: 42034558

Seibold EL, Wachtendorf LJ, Needham MJ, Munoz-Acuna R, Redaelli S, Suleiman A, von Wedel D, Ratajczak N, Remotti EJ, Paschold BS, Chen G, Palardy A, Pierce T, Kienbaum P, Ramachandran SK, Schaefer MS. Impact of desflurane removal from the operating room on carbon dioxide emissions at a tertiary academic medical centre: a retrospective analysis. J. Br J Anaesth. 2025. PMID: 40675839

Seng EK, Muenzel EJ, Shapiro RE, Buse DC, Reed ML, Zagar AJ, Ashina S, Hutchinson S, Nicholson RA, Lipton RB. Development of the Migraine-Related Stigma (MiRS) Questionnaire: Results of the OVERCOME (US) Study. Headache. 2025. PMID: 39844595

Seshadri AJ, Alves P, Kim HI, Singh A, Harbison J, Hancco I, Nikolaus-Liberum J, Voltarelli V, Meehan WP, Qiu J, Guilhaume-Correa F, Warren K, Nosek N, Sodemann RL, Nedder A, Stippler M, Hauser C, Mannix R, Ghiran I, Otterbein LE. Traumatic Brain Injury Enhances Susceptibility to Lung Bacterial Infection in Mice and Pigs by Modulating the Innate Immune Response. Crit Care Med. 2026. PMID: 42262353

Shamsi T, Janga SR, Baskaran NU, Rangasamy V, Ramachandran RV, Chen M, Ganesh S, Novack V, Subramaniam B. Temporal Trends and Severity of Postoperative Delirium in Cardiac Surgery: Insights from a Systematic Review and Meta-analysis. J Cardiothorac Vasc Anesth. 2025. PMID: 40537396

Shapiro RE, Muenzel EJ, Nicholson RA, Zagar AJ, L Reed M, Buse DC, Hutchinson S, Ashina S, Pearlman EM, Lipton RB. Factors and Reasons Associated with Hesitating to Seek Care for Migraine: Results of the OVERCOME (US) Study. Neurol Ther. 2024. PMID: 39487945

Shapiro RE, Viktrup L, Muenzel EJ, Buse DC, Zagar AJ, Ashina S, Hutchinson S, Nicholson RA, Lipton RB. Stigmatizing attitudes toward people with migraine by people without active migraine: results of the OVERCOME (US) study. BMC Neurol. 2025. PMID: 40075330

Sharkey A, Ahmed U, Manji AA, Mahmood F, Saeed S, Valencia J, Fatima H, Matyal R, Rastegar H, Khabbaz KR. Peak Gradients and Left Ventricular Outflow Tract Area in Hypertrophic Obstructive Cardiomyopathy:A 3-Dimensional Echocardiography Study. J Cardiothorac Vasc Anesth. 2026. PMID: 41680053

Sharkey A, Khan AA, Saeed S, Yunus RA, Ahmed U, Manji AA, Bose R, Khabbaz K, Mahmood F, Matyal R. Peripheral Nerve Blocks for Enhanced Recovery in Cardiac Surgery: A Retrospective Observational Study. Ann Card Anaesth. 2025. PMID: 40762637

Sharkey A, Khan AA, Yunus R, Rehman T, Bu Y, Saeed S, Matyal R, Mahmood F. Advancing Precision in 3D Echocardiography: Incorporating 3D Markers to Aid Spatial Orientation. .J Cardiothorac Vasc Anesth. 2024. PMID: 38918095

Shepherd AI, James TJ, Gould AAM, Mayes H, Neal R, Shute J, Tipton MJ, Massey H, Saynor ZL, Perissiou M, Montgomery H, Sturgess C, Makaronidis J, Murray AJ, Grocott MPW, Cummings M, Young-Min S, Rennell-Smyth J, McNarry MA, Mackintosh KA, Dent H, Robson SC, Corbett J. Impact of nocturnal hypoxia on glycaemic control, appetite, gut microbiota and inflammation in adults with type 2 diabetes mellitus: A single-blind cross-over trial. J Physiol. 2024. PMID: 38769692

Shipman WD, Fonseca R, Dominguez M, Bhayani S, Gilligan C, Diwan S, Rosenblum D, Ashina S, Tolba R, Abd-Elsayed A, Kaye AD, Hasoon J, Schatman ME, Deer T, Yong J, Robinson CL. An Update on Emerging Regenerative Medicine Applications: The Use of Extracellular Vesicles and Exosomes for the Management of Chronic Pain. Curr Pain Headache Rep. 2024. PMID: 39495409

Siddiqui S. Ethics of consenting the 'unconsentable'. Curr Opin Anaesthesiol. 2025;38(3):294–296. doi:10.1097/ACO.0000000000001480. PMID: 40071967.

Siddiqui S. It depends on whom you ask: perceptions of dignity-related distress among critically ill patients and families. Anesth Analg. 2024;139(6):1229–1231. doi:10.1213/ANE.0000000000007077. PMID: 39715514.

Siddiqui S. Training with integrity: designing an ethics curriculum for anesthesiology residents. A&A Pract. 2025;19(12):e02128. doi:10.1213/XAA.0000000000002128. PMID: 41427788.

Siddiqui S, de la Noue VV, Hamzaoui O, Bakker J. Practice and ethical considerations surrounding donation after cardiac death from US and Europe. J Crit Care. 2025;88:155092. doi:10.1016/j.jcrc.2025.155092. PMID: 40253758.

Siddiqui S, Gali B, Cotter E, Short M, McNichol M, Mulaikal TA, Cassavaugh J, Chow J, Russell C, Golhar SY, Ben-Jacob TK. Women physicians in leadership roles in critical care medicine or academic medicine—a systematic literature review. Crit Care Explor. 2025;7(4):e1249. doi:10.1097/CCE.0000000000001249. PMID: 40153554.

Siddiqui S, Khanna A, Tung A, Duranteau O, Pearl R, Nagrebetsky A, O'Connor M, Chow J, Deshpande R, Hicks M, Krause M, Moll V, Verdiner RE, Karamchandani K, Tawil J, Njoku D, Frendl G. The changing landscape of academic anesthesiology research funding: preliminary insights from a national survey. Cureus. 2026;18(2):e103599. doi:10.7759/cureus.103599. PMID: 41846642.

Siddiqui S, Metaxa V. Cultivating cultural competence in ICU communication. Intensive Care Med. 2025;51(3):599–602. doi:10.1007/s00134-025-07829-w. PMID: 39961853.

Siddiqui S, Tanios M, Lopes M, Viglianti E. Regret in the ICU—when care takes a personal toll. J Crit Care. 2025;89:155160. doi:10.1016/j.jcrc.2025.155160. PMID: 40582131.

Sidhwa F, Abu Fraiha Y, Leibowitz A, Kaminski N. Standing by Our Colleagues in Gaza - A Plea to the U.S. Medical Community. N Engl J Med. 2025. PMID: 41042199

Simon MV, Rutkove SB, Ngo L, Fehnel CR, Das AS, Sarge T, Bose S, Selim M, Kumar S. Understanding the variability of the electrophysiologic laryngeal adductor reflex. Clin Neurophysiol. 2024. PMID: 38631074

Splith K, Berndt N, Haber PK, Wabitsch S, Feldbrügge L, Herber A, Franke A, Schmiedeknecht A, Mengwasser J, Bruns T, Reuken PA, Goeser T, Berg C, Wedemeyer H, Chang J, Mueller T, Aehling N, Lammert F, Galle PR, Jiang ZG, Robson SC, Engelmann C, Berg T, Schmelzle M. Immune biomarkers predicting response to G-CSF in acute-on-chronic liver failure: results from a GRAFT trial sub-study. Hepatol Int. 2026. PMID: 41793651

Su X, Júnior GPO, Marie AL, Gregus M, Figueroa-Navedo A, Ghiran IC, Ivanov AR. Enhanced proteomic profiling of human plasma-derived extracellular vesicles through charge-based fractionation to advance biomarker discovery potential. J Extracell Vesicles. 2024. PMID: 39641316

Suleiman A, Munoz-Acuna R, Redaelli S, Ahrens E, Tartler TM, Ashrafian S, Hashish MM, Santarisi A, Chen G, Riedel S, Talmor D, Baedorf Kassis EN, Schaefer MS, Goodspeed V. Previous Coronavirus Disease-2019 Infection and Lung Mechanics in Surgical Patients: A Hospital Registry Study. Anesth Analg. 2024. PMID: 39058628

Suleiman A, von Wedel D, Munoz-Acuna R, Redaelli S, Santarisi A, Seibold EL, Ratajczak N, Kato S, Said N, Sundar E, Goodspeed V, Schaefer MS. Assessing ChatGPT's ability to emulate human reviewers in scientific research: A descriptive and qualitative approach. Comput Methods Programs Biomed. 2024. PMID: 38954915

Swaminathan A, DeSchryver B, Rayapuraju A, Barbaro J, Orui H, Subramaniam B, Reed PU. From strain to strength: a yearlong study on the transformative influence of inner engineering online program on mental well-being. Front Psychol. 2025. PMID: 39968198

Szabo E, Bolo NR, Borsook D, Burstein R, Ashina S. Peripherally acting anti-CGRP monoclonal antibodies attenuate cortical resting-state connectivity in migraine patients. Cephalalgia. 2025. PMID: 39995155

Tenge T, Hadler R, Mahal E, Ahrens E, Wachtendorf LJ, Redaelli S, Riesemann S, Paschold BS, Chen G, Khan S, Schwartz J, Schallenburger M, Allain RM, Lee K, Neukirchen M, Schaefer MS. Development and validation of a prediction score for early identification of palliative care needs for patients in the intensive care unit: a multicentre retrospective cohort study. EClinicalMedicine. 2025. PMID: 41048666

Tenge T, Reekers S, Maier O, Schallenburger M, Batzler YN, Stefaniak M, Schwartz J, Stroda A, M Pembele R, Roth S, Bahners BH, Chen G, Schaefer MS, Jung C, Neukirchen M. Wireless patches for continuous vital sign monitoring, symptoms and medication at the end-of-life in the palliative care unit: A prospective observational study. J Clin Monit Comput. 2025. PMID: 40828438

Tenge T, Roth S, Ahrens E, Wachtendorf LJ, Paschold BS, Chen G, M'Pembele R, Kindgen-Milles D, Katsiampoura A, Kienbaum P, Buse GL, Schaefer MS. Preoperative SGLT-2 inhibitor use and risk of adverse postoperative events: a single-centre retrospective observational study. Br J Anaesth. 2025. PMID: 39863469

Tisherman SA, Spevetz A, Farmer JC, Kashyap R, Michener E, Leichtle SW, Sreedharan R, Strickler SS, Chang CWJ, Yataco AC, Cuschieri J, Dudzinski D, Ellender T, Emlet LL, Fahy BG, Geller BJ, Hennessey E, Kaups KL, Keegan MT, Lee MM, Malaiyandi D, Michetti CP, Mohr NM, Moitra VK, O'Neil K, Palmieri TL, Park PK, Pathak A, Raksin PB, Shapshak AH, Siddiqui S, Stein DM, Timmons SD, Vespa PM, Wessman BT, Wittwer ED; Adult Critical Care Physician Core Knowledge and Skills Task Force of the Society of Critical Care Medicine. Determination of adult critical care physician core knowledge and skills: results of a multidisciplinary, modified Delphi process. Crit Care Med. 2026;54(2):224–233. doi:10.1097/CCM.0000000000006978. Epub 2025 Dec 9. PMID: 41363909.

Tonelli R, Protti A, Spinelli E, Grieco DL, Yoshida T, Jonkman AH, Akoumianaki E, Telias I, Docci M, Rodrigues A, Perez J, Piquilloud L, Beitler J, Liu L, Roca O, Pisani L, Goligher E, Carteaux G, Bellani G, Clini E, Zhou JX, Grasselli G, Jaber S, Demoule A, Talmor D, Heunks L, Brochard L, Mauri T. Assessing inspiratory drive and effort in critically ill patients at the bedside. Crit Care. 2025. PMID: 40745324

Tran V, de Oliveira-Jr GP, Chidester S, Lu S, Pleet ML, Ivanov AR, Tigges J, Yang M, Jacobson S, Gonçalves MCB, Schmaier AA, Jones J, Ghiran IC. Choice of blood collection methods influences extracellular vesicles counts and miRNA profiling. J Extracell Biol. 2024. PMID: 39440167

von Wedel D, Redaelli S, Fosset M, Pensier J, Shay D, Ahrens E, Wachtendorf LJ, Seibold EL, Suleiman A, Wu PW, Berkowitz SJ, Milá T, Balzer F, Costa EV, Jung B, Baedorf Kassis EN, Amato MB, Talmor D, Schaefer MS The predicted body weight equation overestimates lung sizes of female, critically ill patients: an analysis of randomized, controlled trials and real-world clinical data. Intensive Care Med. 2026. PMID: 42096093

von Wedel D, Redaelli S, Jung B, Baedorf-Kassis EN, Schaefer MS; Lung Injury Group. Higher mortality in female versus male critically ill patients at comparable thresholds of mechanical power: necessity of normalization to functional lung size. Intensive Care Med. 2025. PMID: 39849156

von Wedel D, Redaelli S, Wachtendorf LJ, Ahrens E, Rudolph MI, Shay D, Chiarella LS, Suleiman A, Munoz-Acuna R, Ashrafian S, Seibold EL, Woloszynek S, Chen G, Talmor D, Banner-Goodspeed V, Eikermann M, Oriol NE, Schaefer MS. Association of anaesthesia provider sex with perioperative complications: a two-centre retrospective cohort study. Br J Anaesth. 2024. PMID: 38926028

Vuerich M, Nguyen DH, Ferrari D, Longhi MS. Adenosine-mediated immune responses in inflammatory bowel disease. Front Cell Dev Biol. 2024. PMID: 39188525

Wachtendorf LJ, Ahrens E, Suleiman A, von Wedel D, Tartler TM, Rudolph MI, Redaelli S, Santer P, Munoz-Acuna R, Santarisi A, Calderon HN, Kiyatkin ME, Novack L, Talmor D, Eikermann M, Schaefer MS. The association between intraoperative low driving pressure ventilation and perioperative healthcare-associated costs: A retrospective multicenter cohort study. J Clin Anesth. 2024. PMID: 39191081

Wachtendorf LJ, Kaiser L, Ahrens E, Tenge T, Riesemann S, Xu X, Shay D, von Wedel D, Paschold BS, Chen G, Kiziltug H, Ramachandran SK, Fassbender PJ, Kienbaum P, Eikermann M, Schaefer MS. Changes in Intraoperative Rocuronium Dosing after the Introduction of Sugammadex and Association with Postoperative Respiratory Complications: A Retrospective Cohort Study. Anesthesiology. 2026. PMID: 41343719

Wachtendorf LJ, Tsay ML, Witt AS, Ferrazza DM, Hess PE, Schaefer MS, Eikermann M, Fassbender P. Impact of changes in anaesthesia staff assignments on billing compliance, financial margins, and costs of anaesthesia services: development and application of a margin-cost estimation tool. Br J Anaesth. 2024. PMID: 38987036

Wang KY, Xu K, Liu Y, Alshanniek S, Newmeyer N, Mesnik L, Prudhivi V, Chase T, Rangasamy V, Sison SM, Shi SM, Travison TG, Subramaniam B, Kim DH. Multi-Component Prehabilitation Program for Older Adults Undergoing Major Elective Surgery: A Pilot and Feasibility Study. J Am Geriatr Soc. 2025;73(11):3387–3395. doi:10.1111/jgs.70095. PMID: 40916355.

Wang P, Yuksel M, Gabeta S, Graham J, Hussain M, Blackmore LJ, Huang X, Hadzic D, Samyn M, Grammatikopoulos T, Heneghan M, Liberal R, Longhi MS, Mieli-Vergani G, Vergani D, Ma Y. HLA alleles predisposing to autoimmunity are linked to impaired immunoregulation in patients with juvenile autoimmune liver disease and in their first-degree relatives. J Autoimmun. 2025;154:103436. PMID: 40334621.

Weinstein J, Ali H, Metrouh O, Sarwar A, Mitchell JD, Baribeau V, Wong VT, Matyal R, Palmer MR, MacLellan C, Ahmed M. Hand Motion Analysis of Different Segments of a Procedure: Is One Segment Enough? J Med Syst. 2025. PMID: 40407939

Weinstein JL, Ali H, Mitchell JD, Sarwar A, Palmer MR, MacLellan C, Matyal R, Ahmed M. Analyzing the Evolution of Needle and Ultrasound Probe Manipulation Skills of Interventional Radiology Trainees With Time and Experience. Simul Healthc. 2024. PMID: 38922448

Willms AG, Wöhler A, Schwab R, Schaaf S, Slomka A, Ghiran I, Robson SC, Kornek MT. Editorial: Unveiling immune biomarkers: advancing trauma care through cellular and vesicular insights. Front Immunol. 2025. PMID: 41181135

Xu X, Wachtendorf LJ, Paschold BS, Riesemann S, Ahrens E, Tenge T, Chen G, Mohammed M, Ma H, O'Brien K, Talmor D, Schaefer MS. Intraoperative allogeneic packed red blood cell transfusions and postoperative delirium: a retrospective cohort study in the USA. EClinicalMedicine. 2026. PMID: 42005920

Yang M, Hancco Zirena I, Kennedy QP, Patel A, Merrill-Skoloff G, Sack KD, Fulcidor E, Scartelli C, Guo S, Bekendam RH, Owegie OC, Xie H, Ghiran IC, Levy O, Lin L, Flaumenhaft R. Galloylated polyphenols represent a new class of antithrombotic agents with broad activity against thiol isomerases. J Thromb Haemost. 2025. PMID: 39952360

Yu B, Safaee Fakhr B, Bry L, Shih A, Wanderley HV, Dai Y, Carroll RW, Winterton D, Buehl T, Okda M, Bruno G, Marutani E, Cenci S, Medeiros KJ, Villalobos R, Spina S, Mietto C, Bittner EA, Cereda M, Delaney ML, Cadringher P, LaVita C, Stuehr DJ, Arora P, Ichinose F, Berra L. Inhaled nitric oxide at 300 ppm treats multidrug-resistant Pseudomonas pneumonia in swine and is safe in humans. Sci Transl Med. 2026. PMID: 41564156

Zhang L, Cagle C, Nguyen DH, Gomes GS, Gromova B, Csizmadia E, Karimitar A, Lee GR, Chen G, Kokkotou E, Grossberg L, Jiang S, Cheifetz AS, Kota SK, Longhi MS. Antisense to human CD39 dysregulates immune metabolism in inflammatory bowel disease. Cell Mol Immunol. 2025. PMID: 40415115

Zhang S, Yuan S, Baedorf Kassis E, Talmor D, Gulluoglu A, Chi Y, Cai F, Ma Y, Song Z, Liu W, Huang H, Yang Y, He H, Su L, Long Y. Reverse Triggering With and Without Breath Stacking During Pressure-Controlled Ventilation: Exposure Burden and Associations With Ventilation Outcomes. Respir Care. 2026. PMID: 42200607

Zhong Q, Ahmed U, Yunus RA, Saeed S, Sohail M, Manji A, Robitaille M, Schermerhorn ML, Mahmood F, Matyal R. Sex Disparities in Medical Management: Influence on Morbidity in Peripheral Arterial Disease. Ann Vasc Surg. 2025. PMID: 40287128

Zhong Q, Yunus RA, Sohail M, Saeed S, Rehman TA, Khan AA, Russ E, Schermerhorn M, Mahmood F, Matyal R. Association of Body Surface Area versus Body Mass Index on Outcomes in Peripheral Arterial Disease. Ann Vasc Surg. 2024. .PMID: 39098723

Beth Israel Lahey Health

Beth Israel Deaconess Medical Center

2025–2026 Report

Department of Anesthesia, Critical Care and Pain Medicine

330 Brookline Avenue, Boston, MA 02215

Harvard Medical Faculty Physicians
at Beth Israel Deaconess Medical Center

Contact us:

BIDMC-AnesthesiaRecruitment@bidmc.harvard.edu

HARVARD MEDICAL SCHOOL



To Learn More and Join Our Community:

INSTAGRAM

@BIDMC_Anesthesia
Residency | Culture | Department Life

@BIDMC_InterventionalPainMed
Pain Fellowship/Pain Center

@BIDMC_CriticalCare
Critical Care Fellowship

@HMFP_Anesthesia_CRNA
CRNA Division

@BIDMC_Anesthesia_Education
CERTAIN: Education Research

@CenterForMedicalSimulation
Simulation and Training



CLINICS IN MEDICAL EDUCATION
A journal for education in anesthesthesia

WEBSITE: medicaleducationclinic.com

LINKEDIN

BIDMC Department of Anesthesia, Critical Care and Pain Medicine

bidmc.org/anesthesia