Department of Anesthesiology

Anesthesiology is a medical specialty encompassing a broad range of medical and scientific activities. The clinical practice of anesthesiology includes the following:

1. Assessment of, consultation for and preparation of patients for anesthesia and surgery;
2. Provision of insensibility to pain during surgical, obstetric, therapeutic and diagnostic procedures;
3. Monitoring and restoration of physiologic homeostasis during the perioperative period as well as homeostasis in the critically ill or seriously injured patient;
4. Diagnosis and treatment of painful syndromes; and
5. Clinical management and teaching of cardiopulmonary resuscitation (CPR).

The realm of scientific investigation in anesthesiology also spans a broad range. Scientific efforts at the cellular and molecular levels are directed toward understanding the molecular mechanisms of anesthesia and analgesia. Clinical research in anesthesiology includes broad epidemiological approaches to identifying indicators of outcome as well as prospective clinical studies examining new technologies, anesthetic agents and methods.

The Department of Anesthesiology (http://anest.wustl.edu) presents the student with the opportunity to do the following:

1. Acquire and apply pharmacologic knowledge related to anesthetic, narcotic, paralytic and sedative drugs and to drugs affecting the autonomic nervous system;
2. Understand and apply the basic principles of airway management and mechanical ventilation;
3. Understand and apply the principles of cardiopulmonary resuscitation;
4. Understand and apply the technical skills and anatomic and pharmacologic knowledge used in performing regional nerve blocks;
5. Learn and apply the fundamental principles of acute and chronic pain management; and
6. Learn and apply the basic principles of critical care medicine.

Anesthesiology bridges the gap between basic science and clinical medicine. It provides experience with the clinical evaluation and management of patients as well as with applied physiology and pharmacology. The Department of Anesthesiology offers student experiences in the operating room, the intensive care unit, the pain clinic and the laboratory.

Website: http://anest.wustl.edu

Degrees & Requirements

While the Department of Anesthesiology does not offer its own degree, some of the department's courses are open to students in the MD and MSTP (MD/PhD) programs. Further information about the MD and MSTP degrees can be found in the Degrees & Programs Offered (http://bulletin.wustl.edu/medicine/degrees) section of this Bulletin.

Research

Research Electives in Anesthesiology

Special electives in basic science research as it applies to anesthesiology can be arranged with the principal investigators in the Department of Anesthesiology (http://anest.wustl.edu); in the Anesthesiology Research Unit and the Washington University Pain Center under the direction of Rob Gereau, PhD; and in the Division of Clinical and Translational Research under the direction of Michael Avidan, MBBC.

These laboratories focus on various aspects of molecular neurobiology, including ion channel structure and function; G-protein molecular biology; molecular mechanisms of anesthetic action; genetics of anesthetic responsiveness; and the molecular, cellular and genetic basis of acute and chronic pain and itch. Arrangements for these special electives are made through the specific investigators: Walter A. Boyle III, MD; Zhou-Feng Chen, PhD; Alex S. Evers, MD; Narasimhan Gautam, PhD; Richard S. Hotchkiss, MD; Christopher J. Lingle, PhD; Gustav Akk, PhD; Michael Bruchas, PhD; Yu-Qing Cao, PhD; Robert W. Gereau, PhD; DP Mohapatra, PhD; or Jose Moron-Concepcion, PhD. In addition, opportunities exist for clinical research under the direction of Michael Avidan, MBBC, or Ben Palanca, MD, PhD.

Faculty

Department Chair

Michael Avidan, MBBC, FCA SA

Department Vice Chair

Ellen M. Lockhart, MD

Department Associate Vice Chair

Courtney Hardy, MD

Visit our website for more information about our faculty (http://anest.wustl.edu/about/faculty) and their appointments.

A

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MD University of Pittsburgh 2007
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MD Hubel Medical University 1985  
PHD Beijing Medical University 1991

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Professor of Neuroscience  
BS University of Oregon 1972  
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PHD Saint Louis University 1997  
MD Nanjing Medical University 1983

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Associate Professor of Neuroscience  
Associate Professor of Ophthalmology and Visual Sciences  
BS Wuhan University 1998  
PHD Chinese Academy of Sciences 2004

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Vice Chairman of Anesthesiology  
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MD Saint Louis University 1984  
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Assistant Professor of Emergency Medicine in Medicine  
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MBA John Hopkins University 2010
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MA Meharry Med College 1980

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MD University of Michigan 2012
BS University of Wisconsin 2018

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BS Lindenwood University 1969

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MD Christian Medical College 1994

Robert A Swarm, MD
Professor of Anesthesiology (primary appointment)
BA Oberlin College 1978
MD Washington Univ in St. Louis 1983

Rene Tempelhoff, MD
Professor of Anesthesiology (primary appointment)
Professor of Neurological Surgery
MD University of Lyon 1974

Raghu P Terkonda, MD
Assistant Professor of Anesthesiology (primary appointment)
BS University of MO Columbia 1983
MD University of MO Columbia 1987

Christina Sarah Thomas, MD
Assistant Professor of Anesthesiology (Pending Executive Faculty Approval) (primary appointment)
BS University of CA Irvine 2008
MD WESTERN U OF HEALTH SCIENCES 2014

Douglas Royce Thompson, MD
Associate Professor of Anesthesiology (primary appointment)
BS University of CA San Diego 1998
MD University of CA San Diego 2003

Marko Slobodan Todorovic, MD
Instructor in Anesthesiology (Pending Dean's Approval) (primary appointment)
MD University of Virginia 2015

Swarup Varaday, MBBS
Associate Professor of Anesthesiology (primary appointment)
MBBS Andhra University 1989

Anandhalakshmi Varadharajan, MBBS, MD
Instructor in Clinical Anesthesiology (primary appointment)
MBBS Srimachandra Medical College 2000
MD St. Lukes 2007

Gershon Ram Volotzky, MD
Associate Professor of Anesthesiology (primary appointment)
MD Tel-Aviv University 1979

Coridalia Wald Chen, MD
Instructor in Anesthesiology (primary appointment)
MD University of Panama 2006

Ashley Brooke Weinhold, MD
Assistant Professor of Anesthesiology (primary appointment)  
MD University of Arkansas 2011  
Brian T Wessman, MD  
Associate Professor of Anesthesiology (primary appointment)  
Associate Professor of Emergency Medicine in Medicine  
BS College of William and Mary 2000  
MD Commonwealth College 2005  
Troy S Wildes, MD  
Associate Professor of Anesthesiology (primary appointment)  
MD Washington Univ in St. Louis 2002  
BS Illinois Wesleyan University 1998  
Sidney Beth Williams, MS, PHD  
Instructor in Anesthesiology (primary appointment)  
BS Furman University 2007  
MS Florida Atlantic University 2009  
PHD University of Alabama 2014  
Mark D. Willingham, MD, MS  
Instructor in Anesthesiology (primary appointment)  
MD Indiana University Bloomington 1985  
BA Indiana University Bloomington 1981  
Xiaoming Xia, PHD, MS  
Assistant Professor of Anesthesiology (primary appointment)  
PHD Vollum Institute OHSU 1998  
BS Fudan University 1984  
MS Shanghai Jiao Tong University 1987  
Branden Edward Yee, MD  
Assistant Professor of Anesthesiology (primary appointment)  
BS Tufts University 2004  
MD Tufts University 2008  
Xiaobin Yi, MD  
Associate Professor of Anesthesiology (primary appointment)  
MD Hunan Medical University 1985  
Alexander H Young, MD  
Assistant Professor of Anesthesiology (primary appointment)  
BA University of Mississippi 1986  
MD University of Arkansas 1990  
Anna Rebecca Young, MD  
Assistant Professor of Anesthesiology (primary appointment)  
BS Asbury College 2004  
MD University of Kentucky 2008  

Z  
Yu Zhou, MS, PHD  
Instructor in Anesthesiology (primary appointment)  
BS Wuhan University 1996  
MS Zhejiang Medical University 1999  
PHD State Univ of NY Buffalo 2005  
Jonathan Kramer Zoller, MD  
Assistant Professor of Anesthesiology (primary appointment)  
MD Tulane University 2009  

Courses  

M10 Anesth 805 Anesthesiology  
This clinical elective is designed to familiarize the student with basic aspects of anesthesiology practice. The primary teaching method is patient care in a clinical setting (one-on-one). The student will learn the basics of the preoperative evaluation of surgical patients, the use of intraoperative monitoring in patient management, and postoperative care. In addition to perioperative care, the student will be exposed to other clinical areas, which include our pain management clinic, regional anesthesia/acute pain management, cardiothoracic intensive care unit, labor and delivery, pediatric anesthesia, and the Center for Preoperative Assessment and Planning. During the four-week rotation, the student will learn airway management skills, practical perioperative fluid, and electrolyte therapy, along with general and regional anesthetic techniques. As an integral part of the anesthesia care team, the student will participate actively in the anesthetic management of surgical patients. The student's specific requests to be assigned to certain types of cases will be honored as time and availability dictate. The rotation will include three clinical simulator sessions using a simulator mannequin for the practical management of airway problems, resuscitation, and trauma emergencies. By the end of the rotation, the student should be able to independently (under supervision) provide anesthesia for uncomplicated surgical procedures.  

M10 Anesth 811 Cardiothoracic Anesthesiology  
Subinternship  
This clinical elective offers practical experience in the perioperative assessment and management of surgical patients undergoing cardiothoracic procedures. The student, as an integral part of the cardiothoracic anesthesia team that is composed of faculty members, fellows and residents, will learn basic principles of airway management and lung ventilation, essential aspects of pharmacologic treatment of hemodynamic abnormalities and cardiac dysrhythmias, and management of intraoperative coagulation disturbances. Emphasis will be placed on the interpretation of intraoperative hemodynamic data, echocardiographic finding (TEE), and laboratory results. During this rotation, the student will also gain practical experience in endotracheal intubation as well as the placement of intravenous lines and invasive monitoring lines, including radial artery and pulmonary artery catheters. Students will learn how to use these parameters in clinical decision making during anesthesia. At the conclusion of the rotation, the student will have a better understanding of invasive monitoring and data interpretation, as
well as a more systematic approach to the management of intra-
and postoperative hemodynamic, pulmonary and coagulation
abnormalities. The students are expected to attend the didactic
sessions of CTA and the Department of Anesthesiology. A
presentation will be assigned.

M10 Anesth 812 Pediatric Anesthesiology
This clinical elective is designed to teach the theory and practice
of pediatric anesthesiology and pain management. It features
individualized instruction with faculty who specialize in the
perioperative care of pediatric patients. The elective consists
of active participation with pediatric anesthesiologists at St.
Louis Children's Hospital and St. Louis Shriners Hospital
learning pre-anesthetic assessment, the performance of routine
anesthetics (which includes instruction and practice in pediatric
airway skills), learning other technical skills such as intravenous
line placement and the management of post-anesthesia care
and pain therapies. The final week may be tailored to meet
the student’s individual interests, needs and career goals.
Possibilities include exposure to sedation and anesthesia for
procedures outside of the operating rooms, and to subspecialties
including cardiovascular anesthesia, neurosurgical anesthesia,
and acute and chronic pediatric pain management. Students
will have opportunities to learn the management of some
common medical emergencies in the Clinical Simulation Center.

M10 Anesth 819 Cardiothoracic Critical Care Subinternship
This clinical elective offers practical experience in the
postoperative management of cardiothoracic patients. The
student will be fully integrated into one of the intensive care
teams and have the opportunity to contribute to the management
of critically ill patients. Students will have the opportunity to
follow specific patients over the course of their stay in the
ICU, during which time they will gain insight into the holistic
management of patients with multi-organ dysfunction. The
CTICU environment is both challenging and exciting. Students
will gain unique insight into cardiorespiratory physiology and
pharmacology, which will be demonstrated at the patients’
bedside, an invaluable and unforgettable learning experience.
Students will have opportunities to learn and sometimes
assist with procedures, such as central lines, chest tubes,
bronchoscopy, and pulmonary artery catheter insertion as well
as bedside ultrasound, including TTE and TEE. Principles of
management and resuscitation of hemodynamically unstable
patients following surgery will be emphasized, as will ventilator
management. Students will also see and help manage patients
with unique physiology, such as patients on ventilator assist
devices and patients on ECMO. We also have a very busy and
heart and lung transplantation program at the hospital, and all
of these patients are cared for in the CTICU. At the conclusion
of the rotation, the student will have a better understanding
of shock, sepsis, multi-organ failure, organ system support,
and the compassionate withdrawal of life support. In addition
to bedside teaching, there will be informal teaching sessions
on a wide variety of topics as well as teaching on interpreting
hemodynamic data and waveforms and cardiac echo exams.
Students will be encouraged to present on their patient at
morning rounds, during which constructive feedback and
interactive teaching will occur. Medical students will be asked to
present a short discussion on a topic of their choice. This should
be a 20- to 30-minute presentation followed by a discussion of
the topic, which will be moderated by the attending. The time and
topic of choice will be discussed with the attending of service.

M10 Anesth 820 Critical Care Subinternship
Students on this rotation are integral members of the
multidisciplinary intensivist-led critical care team in the Surgical
Intensive Care Unit (SICU). Students learn an organ systems-
based approach for evaluation and management of critically ill
and injured patients, and application of evidence-based
principles in delivery of state-of-the-art critical care. Emphasis
is placed on critical care knowledge and techniques used at the
bedside in the clinical management of serious traumatic and
surgical conditions. Students become familiar with resuscitation
and cardiopulmonary support, including methods for non-
invasive and invasive hemodynamic monitoring, and techniques
for airway management and pulmonary support in respiratory
failure. Basic knowledge and skills in the management of blunt
and penetrating trauma, neurologic injuries, multi-system organ
failure, and life-threatening infections in the surgical patient
are also taught, as is the importance of treatments to alleviate
anxiety and pain, maintain fluid and electrolyte balance, and
providing adequate nutrition. Practical experience is gained
in placement of vascular access devices, airway equipment,
ultrasonography and its applications, interpretation of imaging
and laboratory data, and use of guidelines, protocols and quality
assurance tools in the management of critically ill patients.

M10 Anesth 821 Pain Management
Acute pain is the most common symptom of medical illness and
is ubiquitous after major surgery. Chronic pain is the leading
cause of worker disability. Severe pain afflicts most people with
advanced cancer. Learning the fundamentals of pharmacologic,
interventional, and multidisciplinary pain management is
important for all areas of clinical medicine. Rotation is based at
Barnes-Jewish Hospital with focus adjusted to meet student’s
interest and career plans.

M10 Anesth 822 Anesthesiology for Neurosurgery
Subinternship
Students will help care for patients having challenging
neurosurgical procedures. Students will become familiar with
complex procedures, brain monitoring, cardiovascular support
and airway management and will be exposed to all kinds of
neurosurgical pathology. Student must be prepared to participate
in the intricate anesthetic management of patients undergoing
surgery in our novel intraoperative MRI rooms. For those
interested, clinical research projects are ongoing and student
participation is encouraged.

M10 Anesth 823 Obstetrical Anesthesiology Subinternship
The medical students will learn the different analgesia/anesthetic
options for the labor patient. They will also learn how the
physiological adaptations of pregnancy influence anesthetic
management. They will be actively involved in the parturient’s
management, i.e., starting an IV, placement of spinal, epidural
or CSE (combined spinal epidural) anesthetics. They will also
attend the OB anesthesia conferences and interview patients in
labor (with an OB anesthesia attending).

M10 Anesth 900 Research Elective — Anesthesiology
Research opportunities may be available. If interested, please
contact the Department of Anesthesiology.