LEE A. FLEISHER • STANLEY H. ROSENBAUM

# COMPLICATIONS IN ANESTHESIA

THIRD EDITION

# COMPLICATIONS IN ANESTHESIA

# THIRD EDITION

# LEE A. FLEISHER, MD

Robert D. Dripps Professor and Chair of Anesthesiology and Critical Care Professor of Medicine Perelman School of Medicine at the University of Pennsylvania Philadelphia, Pennsylvania

# STANLEY H. ROSENBAUM, MA, MD

Professor of Anesthesiology, Internal Medicine, and Surgery Yale School of Medicine New Haven, Connecticut

# **ELSEVIER**

1600 John F. Kennedy Blvd. Philadelphia, Pennsylvania 19103-2899

#### COMPLICATIONS IN ANESTHESIA, THIRD EDITION

ISBN: 978-1-4557-0411-8

# Copyright © 2018 by Elsevier Inc. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher. Details on how to seek permission, further information about the Publisher's permissions policies, and our arrangements with organizations such as the Copyright Clearance Center and the Copyright Licensing Agency can be found at our website: www.elsevier.com/permissions.

This book and the individual contributions contained in it are protected under copyright by the Publisher (other than as may be noted herein).

#### **Notices**

Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds or experiments described herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made. To the fullest extent of the law, no responsibility is assumed by Elsevier, authors, editors or contributors for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions, or ideas contained in the material herein.

Previous editions copyrighted 2007 and 1999.

#### Library of Congress Cataloging-in-Publication Data

Names: Fleisher, Lee A., editor. | Rosenbaum, Stanley H., editor. Title: Complications in anesthesia / [edited by] Lee A. Fleisher, Stanley H.

Rosenbaum.

Other titles: Complications in anesthesia (Atlee)

Description: Edition 3. | Philadelphia, Pennsylvania: Elsevier, [2018] |

Includes bibliographical references and index.

Identifiers: LCCN 2017039267 | ISBN 9781455704118 (hardcover)

Subjects: | MESH: Anesthesia--adverse effects | Anesthetics--adverse effects

| Intraoperative Complications | Perioperative Period | Preoperative Period

Classification: LCC RD81 | NLM WO 245 | DDC 617.9/6--dc23 LC record available at

https://lccn.loc.gov/2017039267

Executive Content Strategist: Dolores Meloni Senior Content Development Specialist: Rae Robertson Publishing Services Manager: Julie Eddy Book Production Specialist: Clay S. Broeker Design Direction: Ashley Miner





# Contributors

#### Devon Aganga, MD

Instructor in Anesthesiology and Pediatrics Department of Anesthesiology Mayo Clinic Rochester, Minnesota Anterior Mediastinal Mass

### Bryan S. Ahlgren, MD

Assistant Professor
Department of Anesthesiology
University of Colorado, Anschutz Medical Campus
Aurora, Colorado
Hemodilution and Blood Conservation

#### Lourdes Al Ghofaily, MD

Assistant Professor of Clinical Anesthesiology Department of Anesthesiology and Critical Care University of Pennsylvania Philadelphia, Pennsylvania Postobstruction Pulmonary Edema in Pediatric Patients

# Maurice S. Albin, MD (deceased)

Professor of Anesthesiology Department of Anesthesiology and Perioperative Medicine University of Alabama at Birmingham Birmingham, Alabama Venous Air Embolism

#### Laura J. Alexander, MD

Obstetric Anesthesiology Fellow
Department of Anesthesiology, Perioperative and Pain
Medicine
Brigham and Women's Hospital
Boston, Massachusetts
Pulmonary Aspiration in the Parturient

# Nicolas N. Algarra, MD

Assistant Professor
Department of Anesthesiology
University of Florida College of Medicine
Gainesville, Florida
Barbiturates: Porphyrias

# Maged Argalious, MD, MSc, MBA, MEd

Professor of Anesthesiology
Cleveland Clinic Lerner College of Medicine
Director, Center for Anesthesiology Education
Residency Program Director, Anesthesiology Institute
Cleveland Clinic
Cleveland, Ohio
Complications of Trauma Surgery

#### Lori A. Aronson, MD

Associate Professor of Clinical Anesthesia and Pediatrics Director of Liver Transplant Anesthesia Department of Anesthesia University of Cincinnati College of Medicine Cincinnati Children's Hospital Medical Center Cincinnati, Ohio Hypoxemia in the Pediatric Patient

#### Michael A. Ashburn, MD, MPH, MBA

Professor
Department of Anesthesiology and Critical Care
Director, Pain Medicine
Co-Director, Palliative Care
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania
Chronic Opioid Use

#### Joshua H. Atkins, MD, PhD

Associate Professor of Anesthesiology and Critical Care
Associate Professor of Otorhinolaryngology: Head and Neck
Surgery (Secondary)
Perelman School of Medicine at the University of Pennsylvania
Philadelphia, Pennsylvania
Laryngoscopy and Microlaryngoscopy

#### Michael S. Avidan, MB BCh, FCASA

Professor of Anesthesiology and Surgery Department of Anesthesiology Washington University School of Medicine St. Louis, Missouri *HIV Infection and AIDS* 

#### Hamdy Awad, MD

Associate Professor Department of Anesthesiology The Ohio State University Wexner Medical Center Columbus, Ohio Porphyrias

# Diana Ayubcha, MS, DO

Clinical Instructor
Department of Anesthesiology and Critical Care
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania
Complications of Spinal Surgery
Perioperative Hypoxia
Posterior Fossa Surgery

# Ignacio Badiola, MD

Assistant Professor of Anesthesiology and Critical Care Perelman School of Medicine at the University of Pennsylvania Philadelphia, Pennsylvania

Celiac Plexus Block: Side Effects and Complications

Fat Embolism Syndrome

Persistent Paresthesia

#### Mark Bain, MD

Staff Neurosurgeon Cerebrovascular Center Cleveland Clinic Cleveland, Ohio

Intracranial Aneurysms: Vasospasm and Other Issues

#### Kate E. Balbi, DO

Resident

New York Presbyterian, Columbia Campus New York, New York

Pediatric Hyperthermia

#### Jennifer M. Banayan, MD

Assistant Professor

Department of Anesthesia and Critical Care

University of Chicago

Chicago, Illinois

Perioperative Myocardial Ischemia and Infarction

# Dimitry Y. Baranov, MD

Assistant Professor of Clinical Anesthesiology and Critical Care

Department of Anesthesiology and Critical Care Perelman School of Medicine at the University of Pennsylvania Philadelphia, Pennsylvania

Posterior Fossa Surgery

# Catherine B. Barden, MD

Associate Professor of Anesthesiology and Pain Management University of Texas Southwestern

Dallas,Texas

Autonomic Dysreflexia

#### Juliana Barr, MD

Associate Professor Department of Anesthesiology Stanford University School of Medicine Stanford, California

Reversal Agents: Naloxone, Flumazenil, and Sugammadex

# James N. Bates, PhD, MD

Associate Professor Department of Anesthesia University of Iowa, Carver College of Medicine Iowa City, Iowa Fetal Distress

# Curtis L. Baysinger, MD

Professor of Anesthesiology Department of Anesthesiology Vanderbilt University School of Medicine Nashville, Tennessee Hypertensive Disorders of Pregnancy

#### Joan Benca, MD

Associate Professor

Department of Anesthesiology

University of Wisconsin School of Medicine and Public Health

Madison, Wisconsin

Bronchospasm

# Martin L. Birch, MD

Assistant Professor

Department of Anesthesiology

University of Minnesota School of Medicine

Minneapolis, Minnesota

Hyperthyroidism: Thyroid Storm

# Alain Borgeat, MD

Senior Clinical and Research Consultant, Anesthesiology Balgrist University Hospital

Zurich, Switzerland

Interscalene Nerve Block: Potential Severe Complications

#### Gwendolyn L. Boyd, MD

Professor of Anesthesiology and Perioperative Medicine University of Alabama at Birmingham

Birmingham, Alabama

Venous Air Embolism

#### John Bracken, MD

Assistant Professor and Associate Program Director of Resident

Education

Department of Anesthesiology

University of Kansas School of Medicine

Kansas City, Kansas

Hyperglycemia and Diabetic Ketoacidosis

# Lois L. Bready, MD

Professor and Vice Chair

Department of Anesthesiology

Vice Dean for Graduate Medical Education and Designated

Institutional Official

University of Texas Health Science Center at San Antonio

San Antonio, Texas

Corneal Injury

# James Bromilow, BM, MRCP, FRCA, FFICM

Consultant in Intensive Care Medicine and Anaesthesia

Poole Hospital NHS Foundation Trust

Poole, United Kingdom

Perioperative Tachyarrhythmias

# Yuriy S. Bronshteyn, MD

Assistant Professor

Department of Anesthesiology

Duke University School of Medicine

Durham, North Carolina

Pulmonary Artery Pressure Monitoring

# Benjamin B. Bruins, MD

**Assistant Professor** 

Department of Anesthesia and Critical Care Medicine

Children's Hospital of Philadelphia

Philadelphia, Pennsylvania

Postoperative Apnea in Infants

# Casey D. Bryant, MD

Critical Care Fellow Department of Anesthesia Critical Care Wake Forest University Baptist Medical Center Winston-Salem, North Carolina *Toxic Ingestion* 

#### W. Michael Bullock, MD, PhD

Assistant Professor
Department of Anesthesiology
Duke University Hospital
Durham, North Carolina

Continuous Nerve Blocks: Perineural Local Anesthetic Infusion

#### Kristen Burton, MD

Resident Physician Anesthesiology and Critical Care University of Pennsylvania Philadelphia, Pennsylvania Nonbarbiturate Anesthetics

#### Lu Fan Cai, MD

Assistant Professor Department of Anesthesiology and Critical Care Hospital of the University of Pennsylvania Philadelphia, Pennsylvania Infectious Complications of Central Neuraxial Block

# William R. Camann, MD

Director of Obstetric Anesthesiology
Department of Anesthesiology, Perioperative and Pain
Medicine
Brigham & Women's Hospital
Associate Professor of Anaesthesia
Harvard Medical School
Boston, Massachusetts
Pulmonary Aspiration in the Parturient

#### Michelle Capdeville, MD

Associate Professor
Department of Cardiothoracic Anesthesia
Cleveland Clinic
Cleveland, Ohio
Mechanical Assist Devices

#### Maurizio Cereda, MD

Assistant Professor
Department of Anesthesiology and Critical Care
Perelman School of Medicine at the University of Pennsylvania
Philadelphia, Pennsylvania
Postoperative Respiratory Failure

Mark A. Chaney, MD
Professor
Director, Cardiac Anesthesia
Program Director, Adult Cardiothoracic Fellowship
Department of Anesthesia and Critical Care
University of Chicago
Chicago, Illinois
Adverse Neurologic Sequelae: Central Neurologic Impairment
Hypercoagulable States: Thrombosis and Embolism

Perioperative Myocardial Ischemia and Infarction

#### Michael I. Chen, MD

Clinical Associate Professor Department of Pediatric Anesthesia Stanford University School of Medicine Stanford, California *Air Emboli* 

#### S. Devi Chiravuri, MD

Assistant Professor Department of Anesthesiology University of Michigan Ann Arbor, Michigan Rapid Fluid and Blood Delivery Systems

#### Lois A. Connolly, MD

Professor
Department of Anesthesiology
Medical College of Wisconsin
Milwaukee, Wisconsin
Intracranial Aneurysms: Rebleeding
Unstable Cervical Spine: Atlantoaxial Subluxation

#### Scott D. Cook-Sather, MD

Assistant Professor of Anesthesia
Department of Anesthesiology and Critical Care Medicine
University of Pennsylvania School of Medicine
Associate Anesthesiologist
Children's Hospital of Philadelphia
Philadelphia, Pennsylvania
Ophthalmic Problems and Complications

#### John R. Cooper, Jr., MD

Clinical Professor of Anesthesiology
Department of Anesthesiology
Baylor College of Medicine
Attending Anesthesiologist
Division of Cardiovascular Anesthesia
Texas Heart Institute/Baylor St. Luke's Medical Center
Houston, Texas
Troubleshooting Common Problems During Cardiopulmonary Bypass

#### Douglas B. Coursin, MD

Professor
Departments of Anesthesiology and Medicine
University of Wisconsin
Madison, Wisconsin
Adrenal Insufficiency

#### Chad D. Courtemanche, MD

Assistant Professor of Anesthesiology Section on Neuroanesthesiology Wake Forest School of Medicine Winston-Salem, North Carolina Pituitary Tumors: Diabetes Insipidus

#### Joseph P. Cravero, MD

Senior Associate in Perioperative Anesthesia
Department of Anesthesiology, Perioperative and Pain Medicine
Boston Children's Hospital
Associate Professor of Anaesthesiology
Harvard Medical School
Boston, Massachusetts
Sedation of Pediatric Patients

#### Craig E. Cummings, MD

Assistant Professor
Department of Anesthesiology
Medical College of Wisconsin
Clement J. Zablocki Veterans Affairs Medical Center
Milwaukee, Wisconsin
Local Anesthetic Systemic Toxicity

#### Christopher J. Curatolo, MD, MEM

Fellow, Division of Pain Management
Department of Anesthesiology, Perioperative and Pain
Medicine
The Mount Sinai Hospital
Icahn School of Medicine at Mount Sinai
New York, New York
Vaporizers

### Armagan Dagal, MD, FRCA

Associate Professor Department of Anesthesiology and Pain Medicine Harborview Medical Center, University of Washington Seattle, Washington *Head Injury* 

# Joanna David, MBBS, FCAI

Consultant Anaesthetist
North West Anglia NHS Foundation Trust
Peterborough, United Kingdom
Complications of Massive Transfusion
Postpartum Hemorrhage
Respiratory Depression After Spinal Anesthesia

# Andrew Davidson, MBBS, FRCA, FICM

Consultant Anaesthetist
Department of Anaesthesia
Sheffield Teaching Hospitals NHS Foundation Trust
Sheffield, United Kingdom
Pulmonary Aspiration

#### Anthony de la Cruz, MD

Assistant Professor Department of Anesthesiology Rush University Medical Center Chicago, Illinois Abdominal Aortic Aneurysm Repair

#### Martin L. De Ruyter, MD

Associate Professor of Anesthesiology Department of Anesthesiology Kansas University School of Medicine Kansas City, Kansas Hyperglycemia and Diabetic Ketoacidosis Sarcoidosis

#### Ronak Desai, DO

Assistant Professor of Anesthesiology Department of Anesthesiology Cooper Medical School of Rowan University Camden, New Jersey Peripheral Vascular Surgery

#### Somi R. Desikan, MD, FRCA, FFICM

John Hammond Department of Anaesthesia East Surrey Hospital Redhill, United Kingdom Delayed Emergence

# Barbara M. Dilos, DO

Assistant Clinical Professor
Department of Anesthesiology
Icahn School of Medicine at Mount Sinai
New York, New York
Hypothermia in the Pediatric Patient
Postintubation Croup

#### Andrew Disque, MD, MS

Assistant Clinical Professor
Department of Anesthesiology and Perioperative Medicine
David Geffen School of Medicine at UCLA
Los Angeles, California
Hypercoagulable States: Thrombosis and Embolism

#### Sylvia Y. Dolinski, MD, FCCP

Professor of Anesthesiology and Critical Care Director, Critical Care Fellowship Medical College of Wisconsin Milwaukee, Wisconsin Anaphylaxis and Anaphylactoid Reactions

#### Catherine Drexler, MD

Assistant Professor Department of Anesthesiology Medical College of Wisconsin Milwaukee, Wisconsin Angioedema and Urticaria

# Michael P. Eaton, MD

Denham S. Ward Professor and Chair Department of Anesthesiology University of Rochester School of Medicine Rochester, New York Patient Warming Systems

#### Roderic G. Eckenhoff, MD

Austin Lamont Professor Department of Anesthesiology and Critical Care University of Pennsylvania Perelman School of Medicine Philadelphia, Pennsylvania Alzheimer's Disease

# Jan Ehrenwerth, MD

Professor Department of Anesthesiology Yale School of Medicine New Haven, Connecticut Electrical Safety Surgical Electrocautery

# James B. Eisenkraft, MD

Professor

Department of Anesthesiology, Perioperative and Pain

Medicine

Icahn School of Medicine at Mount Sinai

New York, New York

Carbon Dioxide Absorbers

Scavenging Systems

Vaporizers

#### Nabil M. Elkassabany, MD, MSCE

Assistant Professor

Department of Anesthesiology and Critical Care

University of Pennsylvania

Philadelphia, Pennsylvania

Methylmethacrylate

#### Herodotos Ellinas, MD

**Associate Professor** 

Department of Anesthesiology

Medical College of Wisconsin

Milwaukee, Wisconsin

Difficult Pediatric Airway

Fires in the Operating Room

Magnetic Resonance Imaging

Malignant Hyperthermia

#### Jason A. Ellis, MD

Chief Resident

Department of Neurological Surgery

Columbia University Medical Center

New York, New York

Arteriovenous Malformation: Normal Perfusion Pressure Breakthrough

# Mohammad El-Orbany, MD

Professor

Department of Anesthesiology

Medical College of Wisconsin

Milwaukee, Wisconsin

Difficult Airway and Failed Extubation

Nondepolarizing Neuromuscular Block

#### Brenda G. Fahy, MD

Professor of Anesthesiology

Department of Anesthesiology

University of Florida

Gainesville, Florida

Disorders of Water Homeostasis: Hyponatremia and Hypernatremia

# Scott A. Falk, MD

**Assistant Professor** 

Department of Anesthesiology and Critical Care

University of Pennsylvania

Philadelphia, Pennsylvania

Adverse Events and Unanticipated Outcomes: Comprehensive Disclosure

#### **Zhuang T. Fang, MD, MSPH**

Clinical Professor

Department of Anesthesiology and Perioperative Medicine

David Geffen School of Medicine at UCLA

Los Angeles, California

Unanticipated Hospital Admission and Readmission

#### Ehab Farag, MD, FRCA

Professor of Anesthesiology

Cleveland Clinic Lerner College of Medicine

Case Western University

Director of Clinical Research

Department of General Anesthesia

Cleveland Clinic

Cleveland, Ohio

Intracranial Aneurysms: Vasospasm and Other Issues

#### Michael Feduska, MD

Assistant Professor of Clinical Anesthesiology and Critical

Care

Department of Anesthesiology & Critical Care

Hospital of the University of Pennsylvania

Philadelphia, Pennsylvania

Antihistamines: H<sub>1</sub>- and H<sub>2</sub>-Blockers

# Lynne R. Ferrari, MD

Chief of Perioperative Anesthesia

Boston Children's Hospital

Associate Professor of Anaesthesia

Harvard Medical School

Boston, Massachusetts

Adenotonsillectomy

## Paul G. Firth, MBChB

Attending Anesthesiologist

Department of Anesthesia, Critical Care and Pain Medicine

Massachusetts General Hospital

Assistant Professor

Harvard Medical School

Boston, Massachusetts

Foreign Body Aspiration

#### Lee A. Fleisher, MD

Robert D. Dripps Professor and Chair of Anesthesiology and

Critical Care

Professor of Medicine

Perelman School of Medicine at the University of

Pennsylvania

Philadelphia, Pennsylvania

Preoperative Cardiac Intervention

# Randall P. Flick, MD, MPH

Associate Professor

Department of Anesthesiology and Pediatrics

Mayo Clinic Children's Center

Rochester, Minnesota

Anterior Mediastinal Mass

# Keith M. Franklin, MD

**Assistant Professor** 

Department of Anesthesiology

University of Rochester

Rochester, New York

Proportioning Systems

#### Eugene B. Freid, MD

Anesthesiologist

JLR Medical Group, US Anesthesia Partners

Affiliated Professor

University of Central Florida College of Medicine

Clinical Professor

Florida State University College of Medicine

Maitland, Florida

Succinylcholine

#### Andrea Gabrielli, MD, MBA

Professor

Department of Anesthesiology and Critical Care

Hospital of the University of Pennsylvania

Philadelphia, Pennsylvania

Postoperative Hemodynamic Instability

#### Elizabeth Mahanna Gabrielli, MD

Clinical Associate, Anesthesiology and Critical Care Medicine Perelman School of Medicine at the University of Pennsylvania

Philadelphia, Pennsylvania

Postoperative Hemodynamic Instability

#### Ariunan Ganesh, MBBS, FRCS

Associate Professor

Department of Anesthesiology and Critical Care

Perelman School of Medicine at the University of Pennsylvania

Philadelphia, Pennsylvania

Upper Respiratory Tract Infection

#### Jeremy M. Geiduschek, MD

Professor

Pediatric Anesthesiology Division Chief

Department of Anesthesiology and Pain Medicine

University of Washington School of Medicine

Seattle, Washington

Intraoperative Cardiac Arrest: Pediatric

# J.C. Gerancher, MD

Professor of Anesthesiology

Section Head, Regional Anesthesia and Acute Pain Management

Department of Anesthesiology

Wake Forest University School of Medicine

Winston-Salem, North Carolina

Epidural Anesthesia: Unintended Intrathecal Injection

# Rebecca M. Gerlach, MD, FRCPC

Assistant Professor

Director, Anesthesia Perioperative Medicine Clinic

Department of Anesthesia and Critical Care

University of Chicago

Chicago, Illinois

Adverse Neurologic Sequelae: Central Neurologic Impairment

Mediastinal Masses

# David B. Glick, MD, MBA

Professor

Medical Director, Post-Anesthesia Care Unit

Department of Anesthesiology and Critical Care

University of Chicago

Chicago, Illinois

Hyperthermia (Perioperative)

#### Mark S. Gold, MD

Chairman, Scientific Advisory Boards

RiverMend Health

Adjunct Professor

Department of Psychiatry

Washington University in St. Louis School of Medicine

St. Louis, Missouri

Chemical Dependency: Nonopioids

Chemical Dependency: Opioids

# Suneeta Gollapudy, MD

Associate Professor

Department of Anesthesiology

Director, Division of Neuroanesthesia

Director, Division of PACU Rotation (FMLH)

Medical College of Wisconsin

Milwaukee, Wisconsin

Intracranial Aneurysms: Rebleeding

Unstable Cervical Spine: Atlantoaxial Subluxation

#### Stuart A. Grant, MD

Assistant Professor

Department of Anesthesiology

Duke University School of Medicine

Durham, North Carolina

Continuous Nerve Blocks: Perineural Local Anesthetic Infusion

#### Glenn P. Gravlee, MD

Professor

Department of Anesthesiology

University of Colorado, Anschutz Medical Campus

Aurora, Colorado

Hemodilution and Blood Conservation

#### Philip E. Greilich, MD, FAHA

Professor

University of Texas Southwestern Medical Center

Dallas, Texas

Steroids

#### Nancy B. Greilich, MD

**Associate Professor** 

University of Texas Southwestern Medical School

Dallas, Texas

Steroids

# Taras Grosh, MD

Instructor

Department of Anesthesiology, Critical Care and Pain

Management

Hospital of the University of Pennsylvania

Philadelphia, Pennsylvania

Chronic Opioid Use

Perioperative Hypoxia

# Harleena Gulati, BComm, MD, FRCPC

Anesthesiologist

Department of Anesthesia and Perioperative Medicine

University of Manitoba

Winnipeg, Canada

Complications After Pneumonectomy

#### Harshad Gurnaney, MBBS, MPH

**Assistant Professor** 

Department of Anesthesiology and Critical Care

Hospital of the University of Pennsylvania

Children's Hospital of Philadelphia

Philadelphia, Pennsylvania

Upper Respiratory Tract Infection

#### Jacob T. Gutsche, MD

**Assistant Professor** 

Department of Anesthesiology and Critical Care

University of Pennsylvania

Philadelphia, Pennsylvania

Sepsis, Systemic Inflammatory Response Syndrome, and Multiple Organ

Dysfunction Syndrome

#### Michael A. Hall, MD

Instructor of Anesthesiology

Department of Anesthesiology and Critical Care

Hospital of the University of Pennsylvania

Philadelphia, Pennsylvania

Laryngeal and Tracheal Injury

#### Charles B. Hantler, MD

**Professor** 

Department of Anesthesiology and Cardiothoracic Surgery

Washington University in St. Louis School of Medicine

St. Louis, Missouri

Bradyarrhythmias

### Mohammed E. Haque, MBBS, BSc, FRCA

Specialist Registrar

Central London School of Anaesthesia

London, United Kingdom

Long QT Syndromes and Torsades de Pointes

#### H. David Hardman, MD, MBA

Professor of Anesthesiology

Vice-Chair for Professional Affairs

University of North Carolina

Chapel Hill, North Carolina

Extremity Tourniquets

#### Barry A. Harrison, MB, BS

Assistant Professor of Anesthesiology

Department of Anesthesiology

Mayo Clinic College of Medicine

Jacksonville, Florida

Hyperglycemia and Diabetic Ketoacidosis

Sarcoidosis

# Elizabeth Healy, MD

Cardiac Anesthesia and Critical Care Fellow

Department of Anesthesia and Critical Care

University of Chicago

Chicago, Illinois

Adverse Neurologic Sequelae: Peripheral Nerve Injury

# Daryl S. Henshaw, MD

Associate Professor of Anesthesiology

Wake Forest School of Medicine

Winston-Salem, North Carolina

Psoas Compartment Block: Potential Complications

#### Rosemary Hickey, MD

Clinical Professor of Anesthesiology and Neurosurgery University of Texas Health Science Center at San Antonio San Antonio, Texas

Intracranial Hypertension

# Natalie F. Holt, MD, MPH

**Assistant Professor** 

Department of Anesthesiology

Yale School of Medicine

New Haven, Connecticut

Staff Anesthesiologist and Medical Director, Ambulatory

**Procedures Unit** 

VA Connecticut Healthcare System, West Haven Campus

West Haven, Connecticut

Hypothermia

#### Jiri Horak, MD

Assistant Professor of Clinical Anesthesiology and Critical Care

Department of Anesthesiology and Critical Care

Hospital of the University of Pennsylvania

Philadelphia, Pennsylvania

Postoperative Pulmonary Hypertension

## Nathaniel Hsu, MD

Instructor/OB Anesthesia Fellow

Department of Anesthesiology and Critical Care

Hospital of the University of Pennsylvania

Philadelphia, Pennsylvania

Peripartum Neurologic Complications

#### Stephanie Huang, MD

Resident Physician

Department of Anesthesiology and Critical Care

University of Pennsylvania

Philadelphia, Pennsylvania

Infectious Complications of Central Neuraxial Block

#### William S. Jacobs, MD

**Associate Professor** 

Departments of Psychiatry and Health Behavior

Director, Addiction Medicine

Medical College of Georgia

Augusta, Georgia

Chemical Dependency: Nonopioids

Chemical Dependency: Opioids

## Eric Jacobsohn, MD

Professor and Head

Department of Anesthesia

University of Manitoba

Winnipeg, Manitoba, Canada

Complications After Pneumonectomy

# Arul Prakash Pandian James, MBBS, MD, MRCA

Anaesthetics

Queen's Medical Centre, Nottingham University Hospitals NHS

Nottingham, United Kingdom

Laser Complications

#### Shailendra Joshi, MD

Assistant Professor

Department of Anesthesiology

Columbia University Medical Center

New York, New York

Arteriovenous Malformation: Normal Perfusion Pressure Breakthrough

## Zeev N. Kain, MD

Professor of Anesthesiology Department of Anesthesiology Yale University School of Medicine New Haven, Connecticut

Perioperative Psychological Trauma

#### Wendy B. Kang, MD, JD

Clinical Professor of Anesthesiology Department of Anesthesiology University of Texas Health Science Center at San Antonio San Antonio, Texas Retrobulbar Block

#### Ravish Kapoor, MD

**Assistant Professor** 

Department of Anesthesiology and Perioperative Medicine University of Texas MD Anderson Cancer Center Houston, Texas Postoperative Nausea and Vomiting: Pediatric

# Amanpreet Kaur, MD

High Risk Obstetric Anesthesiologist Gateway Anesthesia Association, PLLC Gilbert, Arizona Preterm Labor

# Jeffrey S. Kelly, MD

Associate Professor
Department of Anesthesiology, Critical Care Section
Wake Forest School of Medicine
Winston-Salem, North Carolina
Toxic Ingestion

# Kevin J. Kelly, MD

Professor and Chair
Department of Pediatrics
Associate Dean, School of Medicine
Children's Mercy Hospital and Clinics
University of Missouri
Kansas City, Missouri
Latex Reactions in Health Care Personnel

### Johnny J. Kenth, MBBS, FRCA

Department of Anaesthesia Royal Manchester Children's Hospital Manchester, United Kingdom Cardioversion

#### Michael L. Kentor, MD

Associate Professor

Department of Anesthesiology

University of Pittsburgh School of Medicine

Pittsburgh, Pennsylvania

Chief Anesthesiologist

**UPMC East** 

Monroeville, Pennsylvania

Medical Director

**UPMC Mercy South Side** 

Pittsburgh, Pennsylvania

Inadequate Pain Relief

#### Robert E. Kettler, MD

**Associate Professor** 

Department of Anesthesiology

Medical College of Wisconsin

Froedtert Memorial Lutheran Hospital East

Milwaukee, Wisconsin

Latex Reactions in Health Care Personnel

#### Jonathan T. Ketzler, MD

**Associate Professor** 

Department of Anesthesia and Critical Care

University of Wisconsin

Madison, Wisconsin

Adrenal Insufficiency

#### Evan D. Kharasch, MD, PhD

Assistant Dean for Clinical Research
Professor and Research Director
Department of Anesthesiology
University of Washington School of Medicine
Seattle, Washington
Volatile Anesthetics: Organ Toxicity

#### Arthur Kitt, MD, MPH

Pain Management Fellow
Department of Anesthesiology and Critical Care
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania
Chronic Nonsteroidal Antiinflammatory Drug Use

#### Koffi M. Kla, MD

Assistant Professor, Department of Anesthesiology Professor, Department of Anesthesiology and Neurological Surgery Vanderbilt University School of Medicine Nashville, Tennessee Autonomic Hyperreflexia

# Jerome M. Klafta, MD

Professor Vice-Chair for Education and Academic Affairs Department of Anesthesia and Critical Care University of Chicago Chicago, Illinois

Mediastinal Masses

# Antoun Koht, MD

Professor of Anesthesiology, Neurological Surgery, and Neurology Northwestern University Feinberg School of Medicine Chicago, Illinois

Spinal Cord Injury

# Sandra L. Kopp, MD

Consultant

Department of Anesthesiology and Perioperative Medicine Mayo Clinic

Associate Professor of Anesthesiology

Mayo Clinic College of Medicine

Rochester, Minnesota

Supraclavicular and Infraclavicular Block: Pneumothorax

#### Kenneth Kuchta, MD

Clinical Professor

Department of Anesthesiology and Perioperative Medicine

David Geffen School of Medicine at UCLA

Los Angeles, California

Misidentification of a Patient

#### Kavitha Kuntumalla, MBBS, DA, FRCA

Registrar

Department of Anaesthesia

**Ipswich Hospital** 

Ipswich, Great Britain

Complications of Thyroid Surgery

#### Madhuri S. Kurdi, MBBS, MD

Professor

Department of Anaesthesiology

Karnataka Institute of Medical Sciences

Hubli, India

Ketamine

## C. Dean Kurth, MD

Professor of Anesthesia and Pediatrics

University of Cincinnati College of Medicine

Anesthesiologist-in-Chief and Chair

Institute for Pediatric Research

Cincinnati Children's Hospital Medical Center

Cincinnati, Ohio

Postoperative Apnea in Infants

#### Arthur M. Lam, MD, FRCPC, FNCS

Professor of Anesthesiology and Neurological Surgery and

Anesthesiologist-In-Chief

Department of Anesthesiology

Co-Director, Cerebrovascular Laboratory

Harborview Medical Center

Seattle, Washington

Head Injury

#### Jennifer E. Lam, DO

Associate Professor of Clinical Anesthesia and Pediatrics

Pediatric Cardiac Anesthesia Fellowship Director

Department of Anesthesia

University of Cincinnati College of Medicine

Cincinnati Children's Hospital Medical Center

Cincinnati, Ohio

Hypoxemia in the Pediatric Patient

#### Mary Landrigan-Ossar, MD, PhD

Senior Associate in Perioperative Anesthesia

Department of Anesthesiology, Perioperative and Pain

Medicine

Boston Children's Hospital

Assistant Professor of Anaesthesiology

Harvard Medical School

Boston, Massachusetts

Sedation of Pediatric Patients

#### Elizabeth M.S. Lange, MD

Assistant Professor

Department of Anesthesiology

Northwestern University Feinberg School of Medicine

Chicago, Illinois

Antepartum Hemorrhage

#### Dale W. Lanks, MSN, RN

Director of Risk Management

Office of the General Counsel

University of Pennsylvania Health System

Philadelphia, Pennsylvania

Adverse Events and Unanticipated Outcomes: Comprehensive Disclosure

#### Krzysztof Laudanski, MD, PhD, MA, FCCM

**Assistant Professor** 

Department of Anesthesiology and Critical Care

University of Pennsylvania

Philadelphia, Pennsylvania

The Hostile-Combative Patient

#### Melissa A. Laxton, MD

Associate Professor of Anesthesiology

Section on Neuroanesthesiology

Wake Forest School of Medicine

Winston-Salem, North Carolina

Pituitary Tumors: Diabetes Insipidus

#### Huong Le, MD

**Assistant Professor** 

Division of Cardiothoracic Anesthesiology, Department of

Anesthesiology

University of Florida College of Medicine

Gainesville, Florida

Antibiotics

# Jeffrey W. Lee, MD, MS

Assistant Professor

Section Head of Ambulatory Anesthesia

Department of Anesthesiology

University of Wisconsin Hospital and Clinics

Madison, Wisconsin

Preanesthetic Evaluation: False-Positive Tests

Preanesthetic Evaluation: Inadequate or Missing Test Result

#### Lorri A. Lee, MD

Professor

Chief, Division of Neuroanesthesiology

Department of Anesthesiology and Neurosurgery

Vanderbilt University Medical Center

Nashville, Tennessee

Autonomic Hyperreflexia

#### xvi

#### John T. Lemm, MD

Assistant Professor of Anesthesiology Department of Anesthesiology Duke University Medical Center Durham, North Carolina Central Venous Pressure Monitoring

#### Adam J. Lemmon, MD

Associate Professor Department of Anesthesia Indiana University School of Medicine Indianapolis, Indiana Postoperative Peripheral Neuropathy

# Philip R. Levin, MD

Clinical Professor
Department of Anesthesiology and Perioperative Medicine
David Geffen School of Medicine at UCLA
Los Angeles, California
Postoperative Delirium

#### Jerrold H. Levy, MD, FAHA, FCCM

Professor of Anesthesiology and Associate Professor of Surgery Co-Director, Cardiothoracic ICU Duke University Hospital Durham, North Carolina Perioperative Hypertension

#### Charles J. Lin, MD

Assistant Professor Department of Anesthesiology University of Pittsburgh Medical Center Pittsburgh, Pennsylvania Inadequate Pain Relief

# Regina E. Linganna, MD

Resident Physician
Department of Anesthesiology and Critical Care
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania
Postoperative Pulmonary Hypertension

# Ronald S. Litman, DO

Professor and Attending Anesthesiologist Department of Anesthesiology and Critical Care Children's Hospital of Philadelphia Philadelphia, Pennsylvania Pediatric Hyperthermia

#### Jaibin Liu, MD, PhD

Assistant Professor Department of Anesthesiology and Critical Care Perelman School of Medicine at the University of Pennsylvania Philadelphia, Pennsylvania Fat Embolism Syndrome

#### Luis L. Llamas, MD

Assistant Professor
Departments of Anesthesiology and Neurosurgery
Director of Neuroanesthesia
University of Texas Health Science Center at San Antonio
San Antonio, Texas
Corneal Injury

#### Robert G. Loeb, MD

Clinical Professor of Anesthesiology University of Florida School of Medicine Gainesville, Florida Flowmeters

# Celeste M. Lombardi, MD

Physician Advisor, Office of Quality, Safety and Improvement Director, Outpatient Interventional Pain Service Department of Neurology/Pain Management Baltimore VA Medical Center, VA Maryland Health Care System Baltimore, Maryland

Chronic Nonsteroidal Antiinflammatory Drug Use

# Katarzyna Luba, MD, MS

Assistant Professor
Department of Anesthesiology
Medical College of Wisconsin
Milwaukee, Wisconsin
Complications of Laparoscopic Surgery
Perioperative Management of Patients with Muscular Dystrophy
Postobstruction Pulmonary Edema
Thermally Injured Patients

#### Monica I. Lupei, MD

Assistant Professor Department of Anesthesiology University of Minnesota Minneapolis, Minnesota Hypothyroidism: Myxedema Coma

# Stewart J. Lustik, MD, MBA

Professor of Anesthesiology
Department of Anesthesiology
University of Rochester Medical Center
Rochester, New York
Proportioning Systems

# Daqing Ma, MD, PhD, FRCA

Professor of Anaesthesia
Department of Surgery and Cancer
Anaesthetics, Pain Medicine and Intensive Care
Imperial College London, Chelsea and Westminster Hospital
London, United Kingdom
Nitrous Oxide: Neurotoxicity

#### **Alvaro Andres Macias, MD**

Instructor in Anesthesia
Department of Anesthesiology, Perioperative and Pain
Medicine
Brigham and Women's Hospital
Department of Anesthesia
Massachusetts Eye and Ear
Boston, Massachusetts
Open Globe Injury

#### Ross MacPherson, BPharm, MSc, PhD, FANZCA

Clinical Professor Department of Anaesthesia and Pain Management Royal North Shore Hospital Sydney, Australia Anesthesia for Electroconvulsive Therapy

# Anuj Malhotra, MD

Assistant Professor

Department of Anesthesiology

Icahn School of Medicine at Mount Sinai

New York, New York

Complications of Transurethral Surgery

# Gaurav Malhotra, MD

**Assistant Professor** 

Department of Anesthesiology and Critical Care

University of Pennsylvania

Philadelphia, Pennsylvania

Blood and Blood Products: Infections

Nonbarbiturate Anesthetics

#### Vinod Malhotra, MD

Professor

Departments of Anesthesiology and Urology

Weill Cornell Medical College

New York, New York

Complications of Transurethral Surgery

#### Gerard R. Manecke, MD

Professor and Chair

Department of Anesthesiology

University of California San Diego Health Sciences

San Diego, California

Thromboembolic Complications

#### Jonathan B. Mark, MD

Professor of Anesthesiology

**Duke University Medical Center** 

Chief, Anesthesiology Service

Veterans Affairs Medical Center

Durham, North Carolina

Central Venous Pressure Monitoring

Pulmonary Artery Pressure Monitoring

# Klaus Martin, MD

Deputy Director

Department of Anesthesiology

German Heart Center Munich

Munich, Germany

Bleeding After Cardiac Surgery

#### Lizabeth D. Martin, MD

Assistant Professor

Department of Anesthesiology and Pain Medicine

University of Washington School of Medicine

Seattle, Washington

Intraoperative Cardiac Arrest: Pediatric

#### Michael R. Mathis, MD

Clinical Lecturer and Research Fellow

Department of Anesthesiology, Cardiothoracic Division

University of Michigan

Ann Arbor, Michigan

Anesthesia Circuit

#### Jagroop Mavi, MD

Assistant Professor

Department of Anesthesiology and Pain Management

Cincinnati Children's Hospital Medical Center

Cincinnati, Ohio

Anesthetic Complications of Fetal Surgery: EXIT Procedures

#### Elizabeth W. Mburu, MD

Fellow, Cardiothoracic Anesthesiology

Department of Cardiothoracic Anesthesiology

Cleveland Clinic

Cleveland, Ohio

Peripheral Vascular Surgery

#### Victoria L. McCormack, BScMedSci, MBChB, FRCA, FFICM

Specialist Trainee

Department of Anaesthesia and Intensive Care Medicine

North West Deanery

Manchester, United Kingdom

Complications of Radical Urologic Surgery

#### Thomas McCutchen, MD

Assistant Professor of Anesthesiology

Department of Anesthesiology

Wake Forest University School of Medicine

Winston-Salem, North Carolina

Epidural Anesthesia: Unintended Intrathecal Injection

#### David L. McDonagh, MD

Professor of Anesthesiology and Pain Management,

Neurological Surgery, and Neurology

University of Texas Southwestern

Dallas, Texas

Autonomic Dysreflexia

# Nolan McDonnell, FANZCA

Clinical Associate Professor

University of Western Australia

Crawley, Western Australia

Embolic Events of Pregnancy

#### Marc Mecoli, MD

**Assistant Professor** 

Department of Pediatric Anesthesiology and Pain Management

Cincinnati Children's Hospital Medical Center

Cincinnati, Ohio

Perioperative Aspiration Pneumonitis

#### Mohammed M. Minhaj, MD, MBA

Associate Professor

Vice Chair for Finance and Operations

Associate Chair for Faculty Development

Department of Anesthesia and Critical Care

University of Chicago Medicine

Chicago, Illinois

Adverse Neurologic Sequelae: Peripheral Nerve Injury

#### Constance L. Monitto, MD

**Assistant Professor** 

Department of Anesthesiology and Critical Care Medicine The Johns Hopkins University School of Medicine

Baltimore, Maryland

Muscle Relaxants

#### Richard C. Month, MD

Assistant Professor of Clinical Anesthesiology Department of Anesthesiology and Critical Care University of Pennsylvania Health System Philadelphia, Pennsylvania Magnesium

#### Timothy E. Morey, MD

Professor and Chair Department of Anesthesiology University of Florida College of Medicine Gainesville, Florida Antibiotics

#### Senthil Nadarajan, MBBS, FRCA

Department of Anaesthesia Ipswich Hospital Ipswich, Great Britain Complications of Thyroid Surgery

#### Carsten Nadjat-Haiem, MD

Associate Clinical Professor
Department of Anesthesiology and Perioperative Medicine
David Geffen School of Medicine at UCLA
Los Angeles, California
Syringe Swaps

# Mohamed Naguib, MB, BCh, MSc, FCARCSI, MD

Professor
Department of Anesthesiology
Cleveland Clinic
Cleveland, Ohio
Myasthenic Disorders

#### Bhiken I. Naik, MBBCh

Associate Professor of Anesthesiology and Neurosurgery University of Virginia Health System Charlottesville, Virginia Intrathecal Opioids

#### David A. Nakata, MD, MBA

Program Director
Department of Anesthesia
Indiana University Medical Center
Indianapolis, Indiana
Intractable Nausea and Vomiting
Postoperative Peripheral Neuropathy

# Patrick J. Neligan, MA, MB, FCARCSI

Department of Anaesthesia and Intensive Care University Hospital Galway Galway, Ireland Metabolic Acidosis and Alkalosis

# Mary Ellen Nepps, JD

Senior Counsel University of Pennsylvania Philadelphia, Pennsylvania Alleged Malpractice

#### Myrna C. Newland, MD

Professor Emeritus Department of Anesthesiology Nebraska Medical Center Omaha, Nebraska Dental Injuries

#### Richard J. Novak, MD

Adjunct Clinical Associate Professor
Department of Anesthesiology, Perioperative and Pain Medicine
Stanford University
Associated Anesthesiologists Medical Group
Stanford, California
Disorders of Potassium Balance

# Andrew E. Ochroch, MD

Professor
Department of Anesthesiology and Critical Care
Hospital of the University of Pennsylvania
Director, Thoracic Anesthesiology
Department of Anesthesiology and Critical Care
University of Pennsylvania
Philadelphia, Pennsylvania
Laryngeal and Tracheal Injury

#### Jason A. Ochroch, MD

Anesthesiology Resident
Department of Anesthesiology and Critical Care
Hospital of the University of Pennsylvania
Philadelphia, Pennsylvania
Blood and Blood Products: Infections

# Christopher J. O'Connor, MD

Professor Department of Anesthesiology Rush University Medical Center Chicago, Illinois Abdominal Aortic Aneurysm Repair

#### Jerome F. O'Hara, Jr., MD

Professor
Department of Anesthesiology
Case Western Reserve University School of Medicine
Departments of General Anesthesiology, Urology, and
Outcomes Research
Cleveland Clinic Foundation
Cleveland, Ohio
Complications of Lithotripsy

#### Tyson Olds, MD

Anesthesiology Resident Physician Department of Anesthesiology University of Missouri Columbia, Missouri Emergence Agitation and Emergence Delirium

#### David A. Olsen, MD

Senior Associate Consultant
Department of Anesthesiology and Perioperative Medicine
Mayo Clinic
Instructor of Anesthesiology
Mayo Clinic College of Medicine
Rochester, Minnesota

Supraclavicular and Infraclavicular Block: Pneumothorax

#### Paul S. Pagel, MD, PhD

Staff Physician, Anesthesia Service

Clement J. Zablocki Veterans Affairs Medical Center

Milwaukee, Wisconsin

Major Organ System Dysfunction After Cardiopulmonary Bypass

#### Eric Pan. MD

**Acting Assistant Professor** 

Department of Anesthesiology and Pain Medicine

University of Washington

Seattle, Washington

Postoperative Urinary Retention

# Jaideep J. Pandit, MA, BM, DPhil, FRCA, FFPMRCA, DM

Consultant Anaesthetist

**Nuffield Department of Anaesthetics** 

Oxford University Hospitals NHS Foundation Trust

Professorial Fellow

St. John's College

Oxford, United Kingdom

Awareness Under Anesthesia

#### Komal Patel, MD

Associate Professor of Anesthesiology

Department of Anesthesiology and Perioperative Medicine

David Geffen School of Medicine at UCLA

Los Angeles, California

Hypercoagulable States: Thrombosis and Embolism

#### Vijal N. Patel, MD

Resident and Fellow

Department of Anesthesiology and Critical Care

University of Chicago

Chicago, Illinois

Hyperthermia (Perioperative)

# D. Janet Pavlin, MD

**Professor** 

Department of Anesthesiology

University of Washington

Seattle, Washington

Postoperative Urinary Retention

#### Seth Perelman, MD

Clinical Assistant Professor

Department of Anesthesiology, Perioperative Care, and Pain

Medicine

New York University Langone Medical Center

New York University School of Medicine

New York, New York

Blood and Blood Products: Transfusion Reactions and Complications

# Adam Pichel, MBChB, FRCA

Department of Anaesthesia

Manchester Royal Infirmary

Manchester, United Kingdom

Complications of Radical Urologic Surgery

#### Adrian Pichurko, MD

Fellow and Clinical Lecturer

Department of Anesthesiology

University of Michigan Health System

Ann Arbor, Michigan

Intracranial Pressure Monitoring

#### L. Kareen Porter, MD

Pediatric Anesthesiologist

Valley Anesthesiology Consultants

Phoenix, Arizona

Rapid Fluid and Blood Delivery Systems

# Joseph Previte, MD, FAAP

Associate Professor of Pediatric Anesthesiology

Cincinnati Children's Hospital Medical Center

Cincinnati, Ohio

Complications of Fetal Surgery: EXIT Procedures

Perioperative Aspiration Pneumonitis

# Richard C. Prielipp, MD, MBA, FCCM

Professor

Department of Anesthesiology

University of Minnesota

Minneapolis, Minnesota

Hyperthyroidism: Thyroid Storm

Hypothyroidism: Myxedema Coma

# Donald S. Prough, MD

Professor and Chair

Department of Anesthesiology

University of Texas Medical Branch

Galveston, Texas

Perioperative Fluid Management

#### **Bridget Perrin Pulos, MD**

Consultant

Department of Anesthesiology and Perioperative Medicine

Mayo Clinic

Rochester, Minnesota

Methylmethacrylate

# Jesse M. Raiten, MD

**Assistant Professor** 

Department of Anesthesiology and Critical Care

University of Pennsylvania

Philadelphia, Pennsylvania

Sepsis, Systemic Inflammatory Response Syndrome, and Multiple Organ

Dysfunction Syndrome

# Satya Krishna Ramachandran, MD, FRCA

**Assistant Professor** 

Department of Anesthesiology

University of Michigan

Ann Arbor, Michigan

Anesthesia Circuit

# Mohamed Ehab Ramadan, MBBCh

Research Fellow

Department of Anesthesiology

The Ohio State University, Wexner Medical Center

Columbus, Ohio

Research Assistant

Department of Anesthesiology

Theodor Bilharz Research Institute

Giza, Egypt

Porphyrias

#### Mallikarjun G. Reddy, MD, MPH

Clinical Instructor of Anesthesiology Department of Anesthesiology Weill Cornell Medical College Assistant Attending Anesthesiologist New York Presbyterian Hospital New York, New York Cardiomyopathies

# Clare H. Ridley, MD

Assistant Professor Washington University in St. Louis St. Louis, Missouri Bradyarrhythmias

#### David Roberts, MD

Resident Physician
Department of Anesthesiology
Vanderbilt University
Nashville, Tennessee
Postoperative Acute Kidney Injury

## Michael Robinson, MBChB, FRCA

Consultant Anaesthetist
Department of Anaesthetics
Sheffield Teaching Hospitals NHS Foundation Trust
Sheffield, United Kingdom
Pulmonary Aspiration

#### Andrew Roscoe, MBChB

Consultant in Anaesthesia and Intensive Care Papworth Hospital Cambridge, United Kingdom Pulmonary Hypertension

#### John B. Rose, MD

Professor
Department of Anesthesia and Pediatrics
University of Cincinnati, College of Medicine
Department of Anesthesia, Division of Pain Management
Cincinnati Children's Hospital Medical Center
Cincinnati, Ohio
Delayed Emergence in Pediatric Patients

#### Cody Rowan, MD

Assistant Professor Department of Anesthesiology University of North Carolina Chapel Hill, North Carolina Extremity Tourniquets

#### Marc A. Rozner, PhD, MD (deceased)

Professor of Anesthesiology and Perioperative Medicine Professor of Cardiology University of Texas MD Anderson Cancer Center Houston, Texas Patients with a Cardiovascular Implantable Electronic Device Undergoing Surgery

#### Mashhood Salahuddin, BS

Medical Student Atlantic University School of Medicine Rodney Bay, St. Lucia Department of Anesthesiology The Ohio State University, Wexner Medical Center Columbus, Ohio Porphyrias

#### Reza Salajegheh, MD

Assistant Professor of Anesthesiology and Pain Medicine. University of Virginia Medical Center Charlottesville, Virginia Intrathecal Opioids

# Nancy B. Samol, MD

Assistant Professor of Anesthesiology University of Cincinnati College of Medicine Cincinnati Children's Hospital Cincinnati, Ohio Pediatric Laryngospasm

## William J. Sauer, MD

Critical Care Fellow
Department of Anesthesia and Critical Care
Stanford University
Stanford, California
Reversal Agents: Naloxone, Flumazenil, and Sugammadex

#### R. Alexander Schlichter, MD

Assistant Professor of Clinical Anesthesiology and Critical Care Department of Anesthesiology and Critical Care Perelman School of Medicine at the University of Pennsylvania Philadelphia, Pennsylvania Patients With Seizure Disorders

#### Jay Schoenherr, MD

Assistant Professor Department of Anesthesiology University of North Carolina Chapel Hill, North Carolina Extremity Tourniquets

#### Peter M. Schulman, MD

Associate Professor
Department of Anesthesiology and Perioperative Medicine
Oregon Health and Science University
Portland, Oregon
Patients With a Cardiovascular Implantable Electronic Device
Undergoing Surgery

#### Jeffrey J. Schwartz, MD

Associate Professor Department of Anesthesiology Yale University School of Medicine New Haven, Connecticut Electrical Safety Surgical Electrocautery