Adam I. Levine
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Editors
Adam I. Levine, MD
Departments of Anesthesiology
Otolaryngology, and Structural
& Chemical Biology
Icahn School of Medicine at Mount Sinai
New York, NY, USA

Samuel DeMaria, Jr., MD
Department of Anesthesiology
Icahn School of Medicine at Mount Sinai
New York, NY, USA

Satish Govindaraj, MD
Department of Otolaryngology
Head and Neck Surgery
Icahn School of Medicine at Mount Sinai
New York, NY, USA

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Dedication

To my best friend and wife, Robin, whose commitment, support and sacrifice made this book possible.
To my daughter, Sam, whose enthusiasm was always welcome.
To my dad, Howie, in loving memory.

Adam I. Levine

To my parents, who taught me the importance of hard work and perseverance; to my wife and best friend, Jocelyn, for her support, patience, and love over the years; and to my children, Maya, Neelam, and Devan, who make me realize each day what is truly important in life.

Satish Govindaraj

To my wife, Tara, for her unwavering support and enthusiasm.

Samuel DeMaria, Jr.

Foreword

A View on Sharing the Airway

It still is debated as to who deserves credit for administering the first general anesthetic. Many credit Dr. William Morton, a dentist, for first demonstrating ether anesthesia on October 16, 1846, in the "Ether Dome" of the Massachusetts General Hospital, since the case was published in the Boston Medical and Surgical Journal in November 1846. The patient had a vascular tumor of the neck removed in the sitting position by the surgeon, John Collins Warren, without crying out in pain. However, it is well known that Dr. Crawford W. Long, a country physician practicing in rural Georgia, used ether anesthesia in 1842 to remove another tumor of the neck. The patient felt no pain and had a good outcome. This case is documented in the Crawford W. Long Museum in Jefferson, Georgia, which is open today and supported by the Georgia Society of Anesthesiologists. These are the first documented cases utilizing the combined skills of both a clinician administering a general anesthetic and a surgeon performing head and neck surgery.

Spontaneous ventilation during anesthesia was managed by mask without specialized airway devices for almost 50 years after the discovery of the inhaled anesthetic agents. With increasing complexity and duration of more extensive surgical procedures near the neck, nose, and mouth, the need arose for devices to isolate and control the airway. In 1878, Sir William Macewen was the first physician to intubate the trachea orally by a blind technique for the sole purpose of administering general anesthesia for an extensive operation on the tongue. Robert Miller and Robert Macintosh designed laryngoscopes in the early 1940s for anesthesiologists to visualize the larynx and intubate the patient's trachea under direct vision. The modern techniques to deal with the difficult airway came later with the introduction of special laryngoscope blades, the laryngeal mask airway, and fiberoptic laryngoscopes and bronchoscopes in recent decades.

It took almost 100 years after the first use of ether anesthesia for the specialty of anesthesiology to become well established during World War II. The new discipline had the usual problems of achieving recognition, but by 1935 leaders in the field were forming the early Departments of Anesthesiology at Bellevue Hospital in New York City, the University of Wisconsin, and the University of Iowa. Specialization in medicine depends primarily on advances in medical science and technology, professional preferences, and economic considerations. Some physicians are drawn to specialties because they offer defined responsibilities, more control over their practices, prestige, and potential income. This is true of both anesthesiology and otolaryngology.

As research in the medical sciences has continued to grow and new clinical applications of these findings are introduced, our medical knowledge base has expanded, creating new specialties and new subspecialties within established medical disciplines. Within anesthesiology, some of the earliest subspecialties were critical care medicine, pediatric anesthesia, neuroanesthesia, cardiac anesthesia, and thoracic anesthesia. In each of these subspecialties, like thoracic anesthesia, the medical knowledge of the fields of pulmonary medicine and thoracic surgery must be combined and coordinated with the knowledge and the special techniques of

the anesthesiologist in order to provide safe care of the patient undergoing highly complex chest surgery. Certainly, this is also true of one of the newest subspecialties highlighted in this excellent textbook, *Anesthesiology and Otolaryngology*. This book takes it even one step further with its combined authorship of the chapters by both surgeons and anesthesiologists, who point out the key clinical material for their own and the other subspecialists who are often sharing the patient's airway during complex head and neck surgery. Both specialties emphasize the key coordination and communication that are needed for successful outcomes. In 2002, Pronovost and the Johns Hopkins group showed that clinical outcomes in critically ill patients were improved by having intensive care units staffed by well-trained intensivists, and I am certain that outcomes have been and will be improved with the growing role of subspecialists like those described in this text.

My successful career as a subspecialist in cardiac, thoracic, and vascular anesthesia is due to the excellent mentors I had during medical school, residency, and fellowship training, and early on as an attending anesthesiologist. These mentors served me as "wise and trusted counselors" as first described by Homer in *The Odyssey* about the character, Mentor. They were motivated to help me, to share knowledge and experience, and to demonstrate their commitment to caring for the patients. They showed me the benefits of subspecialization and helped me apply my knowledge of cardiovascular medicine to the cardiac surgical operating room, leading to the development of cardiac anesthesia and improved care for the patients with heart disease undergoing new cardiac operations. I hope that my example, in some small way, led the editors of this outstanding book to share their experiences with their students and mentees.

During my 15 years as chairman of the Department of Anesthesiology at the Mount Sinai Hospital and School of Medicine, I was able to introduce the subspecialties of anesthesiology in order to improve our clinical, educational, and research missions in coordination with the various surgical departments. Thus, today, it is my great pleasure to see this new book edited by Levine, Govindaraj and Demaria, Jr., and authored by authorities at Mount Sinai, that highlights the further developments in coordinated perioperative care for otolaryngology surgery. The highly specialized area of anesthesia for head and neck surgery around and in the airway provides extensive information for all anesthesiologists caring for patients undergoing all types of surgical procedures. This book brings together a segment of anesthetic and surgical practice not readily available from other sources. It should become the standard textbook for teaching in these subspecialties, lead to improved care, and, hopefully, even save lives by its demonstration of best practices for complex surgical procedures.

San Diego, CA, USA Joel A. Kaplan

Foreword

The major theme of this important textbook is stated very clearly in the first chapter namely, "… the importance of teamwork … with a special emphasis on effective communication." Both anesthesiologists and otolaryngologists share a common goal, which is to achieve the best possible outcome for the patient, and that outcome is very dependent on teamwork and communication. As a young otolaryngology resident at Boston University School of Medicine, I will never forget my encounter with a senior anesthesiologist at a major Boston teaching hospital. I was assisting my attending in a composite cancer resection of the head and neck and happened to notice that the blood in the field appeared somewhat dark and possibly not well oxygenated. The year was 1974, when routine use of blood gas monitoring was not available and the operating field was separated from the anesthesia delivery equipment by an "ether screen." I leaned over to speak to the anesthesiologist with some trepidation and expressed my concern. The answer was rather straightforward, "Don't tell me how to give anesthesia, and I won't tell you how to do surgery!" A few other choice words were expressed by my senior attending, but they are not appropriate for this Foreword. Fortunately, for me, the rest of my encounters with my anesthesia colleagues during and after residency have been exemplary. My mentors during residency taught me by example that respect, collegiality, and good communication are essential to ensure good surgical outcomes for my patients.

John C. Snow, MD, former Chair of the Department of Anesthesiology at Boston University, states in the first edition of *Anesthesia in Otolaryngology and Ophthalmology* (1972), "… there is the problem of a strong competition between the anesthesiologist and the surgeon in a small area of the body. In particular, surgery of the mouth and throat involves the airway itself, with the added risk of respiratory obstruction by secretions, blood, loose tissue, or instruments." Since the 1970s, the challenge of sharing the airway of course has become much more complicated with the advent of lasers and the emergence of new endoscopic technology, ventilating, and imaging systems. Given the incredible importance of teamwork, it is the responsibility of the anesthesiologist and otolaryngologist as the proverbial "Captains of the Ship" to collaboratively provide leadership and education for members of the entire perioperative team. Communication therefore must start well before the induction of anesthesia in all cases, but particularly in difficult airway situations. Preoperative photographs of the pathologic condition and status of the airway should always be present to share with the team before the patient arrives in the operating room. Important comorbidities such as gastroesophageal reflux, chronically infected secretions, reactive airway conditions, and sleep apnea need to be discussed preoperatively. A detailed written checklist of preparations for the surgical procedure should be part of the planning process. My typical checklist for laser endoscopy in the airway will include choosing and checking the functionality of the equipment, preoperative medications, position of the patient, endotracheal tube type and size or Venturi jet system, and of course, safety precautions for the patient and the operating team.

When the patient signs the permission for surgery, the team of otolaryngologists and anesthesiologists assume the role of guardian. I am not a particularly religious man; however, I do believe we have just made a sacred contract with the patient to provide the best possible

surgical outcome. An understanding and insight into the entire anesthesia experience is an extremely important part of the surgeon's responsibility to the patient. Each individual patient has some unique requirements demanding careful planning and consideration prior to surgery. Attention to details and adhering to a checklist make the physicians better guardians for the patient. I am happy to tell the patient in the preoperative area, particularly in a difficult airway situation, that fortunately we have an experienced, talented anesthesia and nursing team specially trained to deal with the particular problem of the patient and that we work as a team. This statement has a very calming influence on the patient.

It is customary in a Foreword to tell the readers what is unique about the text and the contribution the book makes to the existing literature on the subject. The authors have succeeded in putting together for the first time an outstanding reference for both otolaryngologists and anesthesiologists practicing in the modern era with the state-of-the-art technology. The basic science chapters on anatomy, physiology, and pharmacology set the stage for the clinical chapters coauthored by both specialists, with unique considerations for both surgery and anesthesia management. "Insights" and "Pearls" are pointers provided by and for each other as would be expected in a truly team approach to care. This very comprehensive textbook in addition discusses acute and chronic pain management and postoperative care as well as the often not discussed topic of medical-legal concerns and patient safety. *Anesthesiology and Otolaryngology*, written and edited by Doctors Levine, Govindaraj, and DeMaria, Jr. who are leaders in their fields, is a landmark textbook that is essential reading for otolaryngologists and anesthesiologists dealing with patients requiring surgery of the upper aerodigestive system and head and neck. It will certainly be a most valuable addition to my medical library.

Albany, NY, USA Stanley M. Shapshay

Preface

The book *Anesthesiology and Otolaryngology* is a novel and innovative collaboration of otolaryngologists and anesthesiologists predominately from their respective departments at the Icahn School of Medicine at Mount Sinai, one of the busiest otolaryngology services in the United States. Expert teams of anesthesiologists and otolaryngologists have been brought together to coauthor most of this text.

The book is divided into three main sections. The introductory chapters cover essential material for both specialties, including gross and radiographic anatomy, basic physiology, pharmacology of anesthetic and adjunctive medications, and preoperative assessment, optimization, and monitoring. In this section of the book we also include a chapter regarding oxygen delivery systems. This chapter serves as a comprehensive review for the anesthesiologists and an overview for the otolaryngologist of the basics of the anesthesia machine, oxygen delivery systems, and jet and other ventilator modalities.

The chapters in the main body of the text are collaboratively authored by experts in both specialties to provide a unique perspective on the management of patients presenting for a full range of otolaryngologic procedures. In each of these chapters information is presented and organized in the order in which it would occur; namely preoperative, intraoperative, and postoperative considerations. The otolaryngologist's perspective is presented first, followed by the anesthesiologist's perspective. Special consideration has been given to difficult airway management and pediatric otolaryngologic procedures because these topics represent some of the most challenging situations encountered by both specialists. The chapter on airway emergencies and the difficult airway, for example, serves as a key reference for the practicing clinician on the details and considerations in acute airway management. In no other setting is it as critical for both the anesthesiologist and otolaryngologist to work as an efficient team. This chapter discusses airway devices and techniques germane to both specialists, including awake intubation techniques, extubation protocols, fiberoptic bronchoscopy, and video and rigid laryngoscopy.

Each chapter in the main body of the book concludes with *Pearls* and *Insights*, special bulleted sections where key "take home" points are emphasized. *Clinical Insights* are written by each specialist for readers of the other specialty. *Insights* highlight salient concepts that are critical for a complete understanding of the topic from the other specialist's perspective. *Clinical Pearls,* on the other hand, are written by each specialist for readers from their own specialty. *Pearls* serve as a list of "tricks of the trade" and best practices from experts in the field.

The book concludes with special chapters regarding postoperative care, acute and chronic pain management, and medico-legal issues. Considering the prevalence of otolaryngologic procedures that are performed in the office setting, there is also a chapter regarding the logistics of managing an office-based surgical practice.

Anesthesiology and Otolaryngology represents the first text to bring together collaborative teams of anesthesiologists and otolaryngologists coediting and coauthoring the same topics

from their own point of view. In total, this text is meant to serve as a reference for each specialist, including practicing physicians, trainees, and allied health providers. It is our intent that this collaborative approach will provide you with the knowledge and perspectives necessary to improve your care for the operative otolaryngologic patient.

New York, NY, USA

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Contents