

# Contents

## SECTION 1 General

- 1 General Considerations in Pediatric Otolaryngology, 1**  
*Alan T.L. Cheng*
- 2 Anesthesia in Pediatric Otolaryngology, 15**  
*Michael P. Puglia II, Ashlee E. Holman, Anila B. Elliott, Catherine A. Gruffi*
- 3 Evaluation and Management of Pediatric Obstructive Sleep Apnea, 46**  
*Nira A. Goldstein*
- 4 Nonobstructive Pediatric Sleep Disorders, 59**  
*Bailey Pierce, Scott E. Brietzke*
- 5 Congenital and Acquired Malformations of the Nose and Nasopharynx, 64**  
*Ravindhra G. Elluru*

## SECTION 2 Craniofacial

- 6 Craniofacial Surgery for Congenital and Acquired Deformities, 77**  
*Joshua C. Demke, Sherard A. Tatum III*
- 7 Pediatric Facial Fractures, 105**  
*Lauren A. Bohm, Brianne B. Roby*
- 8 Pediatric Speech Disorders, 118**  
*Lynn E. Driver, Marc E. Nelson*
- 9 Cleft Lip and Palate, 124**  
*Tom D. Wang, Henry A. Milczuk*
- 10 Velopharyngeal Dysfunction, 143**  
*Harlan R. Muntz, Cara L. Sauder, Jeremy D. Meier, Jonathan R. Skirko*
- 11 22q11.2 Deletion Syndrome, 154**  
*Brianne B. Roby, Michael Broderick, Lauren A. Bohm*

## SECTION 3 Hearing Loss and Pediatric Otology

- 12 Early Detection and Diagnosis of Infant Hearing Impairment, 164**  
*M. Elise Graham, Kavita Dedhia, Albert H. Park*
- 13 Congenital Malformations of the Inner Ear, 177**  
*Taha A. Jan, Alan G. Cheng, Robert K. Jackler*
- 14 Enlarged Vestibular Aqueduct, 201**  
*Andrew J. Griffith, Keiji Honda*
- 15 Acute Otitis Media and Otitis Media With Effusion, 210**  
*Anne G. M. Schilder, Richard M. Rosenfeld, Roderick P. Venekamp*

- 16 Pediatric Otologic Surgery, 228**  
*Simon D. Carr, Adrian L. James, Sharon L. Cushing, Blake C. Papsin*
- 17 Pediatric Cochlear Implantation, 236**  
*Howard W. Francis, Carlton J. Zdanski, Ivette Cejas, Laurie Eisenberg*
- 18 Microtia Reconstruction, 249**  
*David A. Zopf, Elizabeth Knecht, Jennifer Kim*
- 19 Evaluation and Management of Congenital Aural Atresia, 259**  
*Bradley W. Kesser, Kay W. Chang*
- 20 Evaluation and Management of Pediatric Vestibular Disorders, 276**  
*Sharon L. Cushing, Blake C. Papsin*

## SECTION 4 Infections and Inflammation

- 21 Pediatric Chronic Rhinosinusitis, 284**  
*Fuad M. Baroody*
- 22 Pediatric Infectious Disease, 295**  
*Yi Cai, Anna Meyer*

## SECTION 5 Head and Neck

- 23 Congenital and Inflammatory Neck Masses in Children, 308**  
*Aaron L. Thatcher*
- 24 Salivary Gland Disease in Children, 322**  
*Sam J. Daniel, Yehuda Schwarz*
- 25 Vascular Anomalies of the Head and Neck, 344**  
*M. Elise Graham, Jonathan A. Perkins, J. Fredrik Grimmer*
- 26 Pediatric Head and Neck Neoplasms, 364**  
*Jennifer V. Brinkmeier, Aaron L. Thatcher*

## SECTION 6 Pharynx, Larynx, Trachea, and Esophagus

- 27 Evaluation and Management of the Pediatric Airway, 382**  
*Douglas R. Sidell, Anna H. Messner*
- 28 Glottic and Subglottic Stenosis and Related Voice Disorders, 402**  
*Claire M. Lawlor, Reza Rahbar, Sukgi S. Choi*
- 29 Recurrent Respiratory Papillomatosis, 421**  
*Craig S. Derkay, Paolo Campisi*
- 30 Diagnosis and Management of Tracheal Anomalies and Tracheal Stenosis, 441**  
*Glenn E. Green, Richard G. Ohye*

- 31 Laryngotracheal Clefts, 456**  
*Jad Jabbour, Sukgi S. Choi, Reza Rahbar*
- 32 Pediatric Tracheotomy and Decannulation, 465**  
*Nathan J. Gonik*
- 33 Ankyloglossia and Tight Maxillary Frenula, 473**  
*Anna H. Messner, Jennifer E. Ha*
- 34 Aerodigestive Foreign Bodies and Caustic Ingestions, 483**  
*Scott R. Schoem, Kristina W. Rosbe, Edward R. Lee*

- 35 Pediatric Swallowing, Laryngopharyngeal and Gastroesophageal Reflux Disease, Eosinophilic Esophagitis, and Aspiration, 497**  
*Robert H. Chun, Richard J. Noel, Joan C. Arvedson*
- APPENDIX Supplemental Material, 507**

pediatric institutions throughout the world. With these institutions, the emergence of pediatric otitis media with effusion, pediatric critical care medicine, and a subspecialty of pediatric otolaryngology has necessitated the development of subspecialty fellowships to train the next generation of otolaryngologists. These fellowships are designed to provide the next generation of otolaryngologists with the necessary technical and clinical skills to care for children of various ages. Institutions that house multiple subspecialties allow pediatric surgical specialties with other skilled colleagues to manage children, including the youngest children and those with critical and complex life-threatening illnesses, in a safe medical environment. The experience of these institutions is then disseminated to the rest of the community in other health care facilities, academic medical centers, training programs, and the general public.

This chapter highlights a variety of topics that are covered comprehensively elsewhere in this volume, and it provides an overview of the multidisciplinary aspects of pediatric care and its influence in the field of otolaryngology.

### History of Pediatric Otolaryngology

The evolution of pediatric otolaryngology, like that of most subspecialties, began when a group of like-minded colleagues decided to share their experiences with the challenges, scenarios each had faced. The Society for Ear, Nose and Throat Advances in Children (SENTAC) was founded in 1973 as an interdisciplinary professional organization. Similar groups were established in Poland (1947), Hungary (1948), Japan (1979), South America (1979), and Australia/New Zealand (1985).<sup>1-5</sup> These groups helped to define subspecialty training to include an in-depth knowledge of developmental physiology, growth mechanisms, and pediatric pharmacotherapy. The pediatric otolaryngologist must also have a dominant contribution to caring for young patients and their parents. It is generally accepted that pediatric otolaryngology is based on shared decision-making with an emphasis on the best outcomes for the children and their guardians.<sup>6,7</sup>

Hirschberg and colleagues described the rise of the specialty in Hungary from the 1890s onward. It arose because of the need for nascentomy in children. Infections were the major killers of children in the late 1800s, and diphtheria was responsible for significant mortality from death by suffocation. Literature on acute purulent otitis media was published as early as the late 1890s and early 1900s and the first successful retrieval of an aerodigestive foreign body occurred in 1906. Eye ingestion in the 1930s was common, and individuals such as Chercher Jackson, in the United States, were instrumental in campaigning for the labeling of all preparations of corrosive substances to prevent accidental ingestion.<sup>8</sup> The high mortality from otitis media and foreign body aspirations led to the development of the "airway foreign body service" in the late 1940s in Hungary.<sup>9</sup> Similar courses on pediatric airway management such as the Polish "Days of Pediatric Laryngology" began<sup>10</sup> and continued to this day (see [endodays2017.org](http://endodays2017.org)). The management of acute airway emergencies continues to be the sine qua non of pediatric otolaryngology.

### INTRODUCTION

Pediatric otolaryngologists often care for children with complex issues, often in a pediatric institution capable of providing multidisciplinary care. As with other pediatric subspecialties, the mission of pediatric otolaryngology is to develop best practices for the care of children to improve outcomes for illnesses faced by children and their families, as stated by Robin L. Cotton, MD, in delivering the 2014 Willbain Lecture to the Canadian Otolaryngology Society. The aim of pediatric otolaryngology "is to set a standard and end the era of a monopoly" (Fig. 1.1). Through high-quality training and meaningful research, the subspecialty of pediatric otolaryngology is focused on a small number of difficult problems not often encountered in general otolaryngologic practice, with the goal of continuous improvement in providing excellent care for children.

Pediatric otolaryngology as a surgical specialty has matured and is continuing to evolve, given the continued growth of the pediatric population and the resources devoted to establishing