Tracheotomy Management

A Multidisciplinary Approach
Tracheotomy Management
A Multidisciplinary Approach

Edited by

Peggy A. Seidman MD FAAP
Clinical Associate Professor,
Departments of Anesthesiology and Pediatrics
Division Chief Pediatric Anesthesiology
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA

David Goldenberg MD FACS
Professor of Surgery and Oncology
Director of Head and Neck Surgery
Pennsylvania State University College of Medicine
Hershey, PA USA

Elizabeth H. Sinz MD
Professor of Anesthesiology, Critical Care Medicine and Neurosurgery and
Associate Dean of Clinical Simulation
Pennsylvania State University College of Medicine
Hershey, PA USA
# Contents

Preface page vii  
List of contributors viii  
Acknowledgements xii  

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Anatomy of the anterior and lateral neck</td>
<td>Elliot Regenbogen</td>
</tr>
<tr>
<td>2</td>
<td>Elective surgical tracheotomy in the adult</td>
<td>Yvonne Tsui, Michael Ondik, and David Goldenberg</td>
</tr>
<tr>
<td>3</td>
<td>Percutaneous tracheotomy</td>
<td>Garret Choby, Dmitri Bezinover, and David Goldenberg</td>
</tr>
<tr>
<td>4</td>
<td>Emergency surgical airways</td>
<td>Leonard Pott and Scott Goldstein</td>
</tr>
<tr>
<td>5</td>
<td>Congenital, embryological, and anatomic variations, and their association with pediatric tracheotomy</td>
<td>Elliot Regenbogen</td>
</tr>
<tr>
<td>6</td>
<td>Pediatric tracheotomy</td>
<td>Robert Yellon, Raymond Maguire, and Jay B. Tuchman</td>
</tr>
<tr>
<td>7</td>
<td>Laryngotracheal reconstruction: surgical management of pediatric airway stenosis</td>
<td>Diego Preciado, Sophie R. Pestieau, and Ira Todd Cohen</td>
</tr>
<tr>
<td>8</td>
<td>Timing of tracheotomy for intubated patients</td>
<td>Alison Wilson, Elias B. Rizk, Kimberly E. Fenton, Thomas K. Lee, and Elizabeth H. Sinz</td>
</tr>
<tr>
<td>9</td>
<td>Intensive care unit tracheotomy care</td>
<td>Shaji Poovathoor, Eric Posner, James Vosswinkel, and Peggy A. Seidman</td>
</tr>
<tr>
<td>10</td>
<td>Complications of tracheotomy</td>
<td>Steven L. Orebaugh</td>
</tr>
<tr>
<td>11</td>
<td>Airway manipulation with tracheotomy</td>
<td>Daryn H. Moller, Slawomir Oleszak, and Ghassan J. Samara</td>
</tr>
<tr>
<td>12</td>
<td>Tracheotomy equipment</td>
<td>Dana Stauffer, John Stene, and Joanne Stene</td>
</tr>
<tr>
<td>13</td>
<td>Care of the patient with a tracheotomy</td>
<td>Margaret Wojnar and Jonathan D. McGinn</td>
</tr>
<tr>
<td>14</td>
<td>Tracheotomy education for home care</td>
<td>Jodie E. Landis, Michael K. Hurst, and Brian W. Grose</td>
</tr>
</tbody>
</table>

Index 195
Preface

When confronted with a challenging clinical problem, help can frequently be found in textbooks or a search of the literature. Unfortunately, for questions about tracheotomies, the resources were either parceled in multiple diverse sources or buried in the lore of different subspecialties. A wide range of healthcare providers treat patients with a surgical airway and a mix of different providers must be ready to obtain or manage a surgical airway in an emergency. With the increasing prevalence of patients with tracheotomies, a book written from a consensus approach by the different healthcare providers encountering them was needed. The result is this text, useful when caring for anyone with a surgical airway.

This book provides a concise but comprehensive summary of current treatments and techniques. In each chapter, the authors are drawn from different specialties to provide a comprehensive view of each topic covered. Sample clinical cases are described to provide context. While each chapter can be used independently for specific topics, the book also serves as a complete resource for anyone confronted with uncommon clinical situations that can arise in people with surgical airways.

The history of tracheotomy has been steeped in controversy since its inception; however, the past century has seen many advances. Although evidence-based recommendations are given when possible, there is still more to learn. It is our hope that this text will improve healthcare providers’ understanding and ability to take care of the tracheotomized patient.

The Editors:
Peggy Seidman
David Goldenberg
Elizabeth Sinz
Contributors

Dmitri Bezinover MD, PhD
Assistant Professor of Anesthesiology
Department of Anesthesiology
Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Ira Todd Cohen MD, MEd, FAAP
Professor of Anesthesiology and Pediatrics
Division of Anesthesiology and Pain Medicine
The George Washington University
Children’s National Medical Center
Washington, DC, USA

Garret Choby MD
Division of Otolaryngology-Head and Neck Surgery
Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Kimberly E. Fenton MD, FAAP
Associate Professor of Pediatrics
Division of Critical Care Medicine
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA

David Goldenberg MD, FACS
Professor of Surgery and Oncology
Director of Head and Neck Surgery
Division of Otolaryngology-Head and Neck Surgery
Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Scott Goldstein DO
Assistant Professor of Emergency Medicine
Department of Emergency Medicine
Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Brian W. Grose MD
Assistant Professor of Anesthesia
Vice Chair for Clinical Operations
West Virginia University School of Medicine
Morgantown, WV USA

Michael K. Hurst DDS, MD
Associate Professor of Otolaryngology
Department of Otolaryngology – Head and Neck Surgery
West Virginia University School of Medicine
Morgantown, WV USA

Zara Karpvar MD
Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Jodie E. Landis MS, CCC-SLP
Speech Language Pathologist
Morgantown, WV USA

Thomas K. Lee MD
Associate Professor of Surgery and Pediatrics
Chief, Pediatric Surgery
Department of Pediatric Surgery
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA
List of contributors

Jonathan D. McGinn MD
Associate Professor of Surgery Division of Otolaryngology – Head and Neck Surgery Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Raymond Maguire DO
Assistant Professor of Otolaryngology Division of Pediatric Otolaryngology Children’s Hospital of Pittsburgh of UPMC
University of Pittsburgh School of Medicine
Pittsburgh, PA USA

Daryn H. Moller MD
Associate Professor of Anesthesiology Department of Anesthesiology Division Chief, General/Vascular/Trauma Anesthesia
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA

Slawomir Oleszak MD
Assistant Professor of Anesthesiology Department of Anesthesiology
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA

Michael Ondik MD
Division of Otolaryngology–Head and Neck Surgery Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Steven L. Orebaugh MD
Associate Professor of Anesthesiology and Critical Care Medicine Department of Anesthesiology
University of Pittsburgh School of Medicine
UPMC-Southside/Mercy
Pittsburgh, PA USA

Sophie R. Pestieau MD
Assistant Professor of Anesthesiology and Pediatrics Division of Anesthesiology and Pain Medicine
The George Washington University
Children’s National Medical Center
Washington, DC, USA

Shaji Poovathoor MD
Assistant Professor of Clinical Anesthesiology and Critical Care Medicine Department of Anesthesiology
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA

Eric Posner MD
Clinical Assistant Professor of Anesthesiology,
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA

Leonard Pott MBBCh FCA(SA)
Associate Professor of Anesthesiology and Emergency Medicine Department of Anesthesiology
Pennsylvania State University College of Medicine
The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Diego Preciado MD, PhD
Assistant Professor of Surgery and Pediatrics Division Pediatric Otolaryngology – Head and Neck Surgery
The George Washington University
Children’s National Medical Center
Washington, DC, USA

Elliot Regenbogen MD
Assistant Professor of Surgery Division Otolaryngology, Head and Neck Surgery
SUNY at Stony Brook School of Medicine
Stony Brook, NY USA
Elias B. Rizk MD  
Chief Resident Department of Neurosurgery  
Pennsylvania State University College of Medicine  
The Penn State Milton S. Hershey Medical Center  
Hershey, PA USA

Ghassan J. Samara MD, FACS  
Associate Professor of Surgery Director of Rhinology, Research  
Division of Otolaryngology, Head and Neck Surgery  
SUNY at Stony Brook School of Medicine  
Stony Brook, NY USA

Peggy A. Seidman MD, FAAP  
Clinical Associate Professor, Departments of Anesthesiology and Pediatrics  
Division Chief Pediatric Anesthesiology  
SUNY at Stony Brook School of Medicine  
Stony Brook, NY USA

Elizabeth H. Sinz MD  
Professor of Anesthesiology, Critical Care Medicine and Neurosurgery and Associate Dean of Clinical Simulation Departments of Anesthesiology and Neurosurgery  
Pennsylvania State University College of Medicine  
The Penn State Milton S. Hershey Medical Center  
Hershey, PA USA

John Steene MD, PhD  
Professor of Anesthesiology and Neurosurgery Departments of Anesthesiology and Neurosurgery  
Pennsylvania State University College of Medicine  
The Penn State Milton S. Hershey Medical Center  
Hershey, PA USA

Jay B. Tuchman MD, FAAP  
Assistant Professor of Anesthesiology  
Department of Anesthesiology  
Children’s Hospital of Pittsburgh  
University of Pittsburgh School of Medicine  
Pittsburgh, PA USA

Yvonne Tsui MD  
Division of Otolaryngology-Head and Neck Surgery  
Pennsylvania State University College of Medicine  
The Penn State Milton S. Hershey Medical Center  
Hershey, PA USA

James Vosswinkel MD  
Assistant Professor  
Department of Surgery  
Director of Surgical Intensive Care Unit  
SUNY at Stony Brook School of Medicine  
Stony Brook, NY USA

Alison Wilson MD  
Associate Professor of Surgery Director, Jon Michael Moore Trauma Center  
Chief, Trauma, Emergency Surgery and Surgical Critical Care  
Department of Surgery West Virginia University School of Medicine  
Morgantown, WV USA

Margaret Wojnar MD  
Professor of Medicine Division Pulmonary, Allergy and Critical Care Medicine  
Pennsylvania State University College of Medicine
List of contributors

The Penn State Milton S. Hershey Medical Center
Hershey, PA USA

Robert Yellon MD
Professor of Otolaryngology Division of Pediatric Otolaryngology

Children’s Hospital of Pittsburgh
of UPMC
University of Pittsburgh School of Medicine
Pittsburgh, PA USA
Acknowledgements

We can only reach for the stars by standing on shoulders of those before us. I am only where I am with the help of many teachers and colleagues who gave me time, advice and support. To my children Eli and Samuel, you will always be the most important work I ever produced.

Peggy Seidman

My deepest gratitude to my parents for their support, to my wife, Renee, who is an invaluable partner in my life, and to my beloved children Michael, Ellie, and Dana.

David Goldenberg

I have been fortunate to have many good teachers and a few great mentors. All have given me their time, patience, and what little wisdom I possess. Thanks to my husband, David, for giving me uninterrupted time to complete this book, and to my daughters, Claire, Caroline, and Kate who distracted me enough to stop working and digest the material.

Lisa Sinz