

EIGHTH
EDITION


Available in
**DIGITAL
VERSION**
with
eBooks
and
Videos


Available in
**DIGITAL
VERSION**
with
eBooks
and
Videos

Shackelford's
SURGERY *of the*
ALIMENTARY
TRACT



Volume
1

CHARLES J. YEO

Steven R. DeMeester | David W. McFadden | Jeffrey D. Matthews | James W. Fleshman

ELSEVIER

of the
ALIMENTARY



Volume
2

CHARLES J. YEO

Steven R. DeMeester | David W. McFadden | Jeffrey D. Matthews | James W. Fleshman

ELSEVIER

2-Volume Set

Shackelford's

SURGERY *of the*
ALIMENTARY
TRACT

SECTION
EDITORS

Volume
1

Steven R. DeMeester, MD, FACS

Division of Foregut and Minimally Invasive Surgery
The Oregon Clinic
Portland, Oregon

Section I Esophagus and Hernia

David W. McFadden, MD, MBA, FACS

Chairman, Department of Surgery
University of Connecticut
Surgeon-in-Chief
University of Connecticut Health
Farmington, Connecticut

Section II Stomach and Small Intestine

Volume
2

Jeffrey B. Matthews, MD, FACS

Dallas B. Phemister Professor and Chairman of Surgery
The University of Chicago
Chicago, Illinois

Section III Pancreas, Biliary Tract, Liver, and Spleen

James W. Fleshman, MD, FACS

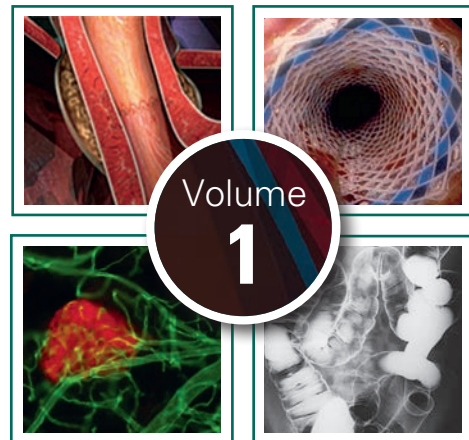
Seeger Professor and Chairman of Surgery
Baylor University Medical Center
Professor of Surgery
Texas A&M Health Science Center
Dallas, Texas

Section IV Colon, Rectum, and Anus

EIGHTH
EDITION

Shackelford's

SURGERY *of the*
ALIMENTARY
TRACT



Volume

1

Charles J. Yeo, MD, FACS

Samuel D. Gross Professor and Chair

Department of Surgery

Sidney Kimmel Medical College at
Thomas Jefferson University

Philadelphia, Pennsylvania

ELSEVIER

ELSEVIER

1600 John F. Kennedy Blvd.
Ste 1800
Philadelphia, PA 19103-2899

SHACKELFORD'S SURGERY OF THE ALIMENTARY
TRACT, EIGHTH EDITION

ISBN: 978-0-323-40232-3
Volume 1 part number: 9996118169
Volume 2 part number: 9996118223

Copyright © 2019 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

Knowledge and best practice in this field are constantly changing. As new research and experience broaden our understanding, changes in research methods, professional practices, or medical treatment may become necessary.

Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds, or experiments described herein. In using such information or methods they should be mindful of their own safety and the safety of others, including parties for whom they have a professional responsibility.

With respect to any drug or pharmaceutical products identified, readers are advised to check the most current information provided (i) on procedures featured or (ii) by the manufacturer of each product to be administered, to verify the recommended dose or formula, the method and duration of administration, and contraindications. It is the responsibility of practitioners, relying on their own experience and knowledge of their patients, to make diagnoses, to determine dosages and the best treatment for each individual patient, and to take all appropriate safety precautions.

To the fullest extent of the law, neither the Publisher nor the authors, contributors, or editors, assume any liability 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 2013, 2007, 2002, 1996, 1991, 1986, 1983, 1982, 1981, 1978, 1955.
Mayo Foundation retains copyright to their original artwork.

Library of Congress Cataloging-in-Publication Data

Names: Yeo, Charles J., editor.

Title: Shackelford's surgery of the alimentary tract / [edited by] Charles J. Yeo.

Other titles: Surgery of the alimentary tract

Description: Eighth edition. | Philadelphia, PA : Elsevier, [2019] | Includes bibliographical references and index.

Identifiers: LCCN 2017042680 | ISBN 9780323402323 (hardcover : alk. paper)

Subjects: | MESH: Digestive System Surgical Procedures—methods | Digestive System Diseases—surgery

Classification: LCC RD540 | NLM WI 900 | DDC 617.4/3—dc23 LC record available at

<https://lcn.loc.gov/2017042680>

Executive Content Strategist: Russell Gabbedy

Content Development Specialist: Mary Hegeler

Publishing Services Manager: Patricia Tannian

Senior Project Manager: Amanda Mincher

Design Direction: Patrick Ferguson

Printed in China

Last digit is the print number: 9 8 7 6 5 4 3 2 1



Working together
to grow libraries in
developing countries

www.elsevier.com • www.bookaid.org

To my wife, Theresa, and my children, William and Scott; to my many mentors (some now deceased, many still alive) who have contributed to the science of surgery and to my education; to the many colleagues and friends whose contributions have made this eighth edition possible; and to those young alimentary tract surgeons and other health care professionals who will learn from these pages, move the field forward, and continue to improve our understanding of alimentary tract diseases.

CHARLES J. YEO

To my father, Tom DeMeester, whose passion for understanding the pathophysiology of esophageal and foregut disorders and applying this knowledge to better the lives of patients has been and remains an inspiration for me; to my many mentors who have helped me learn the craft of surgery and encouraged me to constantly strive for perfection; to my colleagues who give up many hours of their evenings, weekends, and vacations to contribute to abstracts, papers, and book chapters; to my fellows and residents who diligently train to be the next generation of expert surgeons; and to my family and friends who support me and graciously accept my long hours away at work caring for people in need of help.

STEVEN R. DEMEESTER

I would like to dedicate this book to all the past residents and fellows with whom I have worked and to thank them for making education such a wonderful part of my life; I hope this will help us to remember the times we've spent together taking care of complex patients and will encourage you to continue to pass on your knowledge to those whom you mentor.

JAMES W. FLESHMAN

To Dr. William Silen and my late grandfather, Dr. Benjamin M. Banks, for their wisdom; to the surgical residents and students, for their thirst for knowledge; and to my wife, Joan, and our boys, Jonathan, David, and Adam, for their love and support.

JEFFREY B. MATTHEWS

To my wife, Nancy, and my children, William, Hunter, and Nora; and to all of my mentors, colleagues, and patients who challenge and inspire me every day.

DAVID W. McFADDEN

Shackelford's Surgery of the Alimentary Tract, Eighth Edition

Table of Contents

<u>Front Matter</u>	<u>in the United States of America and Worldwide</u>	34. <u>Ablation for Patients With Barrett Dysplasia</u>
<u>Copyright</u>	16. <u>Etiology and Natural History of Gastroesophageal Reflux Disease and Predictors of Progressive Disease</u>	35. <u>Epidemiology, Risk Factors, and Clinical Manifestations of Esophageal Cancer</u>
<u>Dedication</u>	17. <u>Respiratory Complications of Gastroesophageal Reflux Disease</u>	36. <u>Esophageal Cancer Diagnosis and Staging</u>
<u>Contributors</u>	18. <u>Acid-Suppression Therapy for Gastroesophageal Reflux Disease and the Therapeutic Gap</u>	37. <u>Endoscopic Management of High-Grade Dysplasia and Superficial Esophageal Carcinoma</u>
<u>Preface</u>	19. <u>Fundoplication for Gastroesophageal Reflux Disease</u>	38. <u>Multimodality Therapy in the Management of Locally Advanced Esophageal Cancer</u>
<u>Acknowledgments</u>	20. <u>Magnetic Sphincter Augmentation for Gastroesophageal Reflux Disease</u>	39. <u>Surgical Approaches to Remove the Esophagus : Open</u>
1. <u>Esophageal Sphincters in Health and Disease</u>	21. <u>Endoscopic Management of Gastroesophageal Reflux Disease</u>	39. <u>Surgical Approaches to Remove the Esophagus : Minimally Invasive</u>
2. <u>Esophageal Body in Health and Disease</u>	22. <u>Options to Address Delayed Gastric Emptying in Gastroesophageal Reflux Disease</u>	39. <u>Surgical Approaches to Remove the Esophagus : Vagal-Sparing</u>
3. <u>Esophageal Mucosa in Health and Disease</u>	23. <u>Management of Failed Fundoplications, End-Stage Gastroesophageal Reflux Disease, and Scleroderma</u>	39. <u>Surgical Approaches to Remove the Esophagus : Robotic</u>
4. <u>Relevant Anatomic Relations of the Esophagus</u>	24. <u>Esophageal Complications of Bariatric Procedures</u>	40. <u>Extent of Lymphadenectomy for Esophageal Cancer</u>
5. <u>Esophageal Symptoms and Selection of Diagnostic Tests</u>	25. <u>Paraesophageal Hernia : Etiology, Presentation, and Indications for Repair</u>	41. <u>Options for Esophageal Replacement</u>
6. <u>Radiology of the Esophagus : Barium, Computed Tomography Scan, Positron Emission Tomography Scan, Magnetic Resonance Imaging</u>	26. <u>Laparoscopic Paraesophageal Hernia Repair : Technique, Outcomes, and Management of Complications</u>	42. <u>Palliative Therapy for Esophageal Cancer</u>
7. <u>Endoscopic Evaluation of the Esophagus and Endoscopic Ultrasonography of the Esophagus</u>	27. <u>Open Paraesophageal Hernia Repair</u>	43. <u>Anastomotic Complications After Esophagectomy : Frequency, Prevention, and Management</u>
8. <u>High-Resolution Esophageal Manometry : Techniques and Use in the Diagnosis of Esophageal Motility Disorders and for Surgical Decision Making</u>	28. <u>Diaphragmatic Relaxing Incisions for Crural Tension During Hiatal Hernia Repair</u>	44. <u>Nonreflux Esophagitis</u>
9. <u>pH and Impedance Evaluation of the Esophagus</u>	29. <u>Collis Gastroplasty for a Foreshortened Esophagus</u>	45. <u>Esophageal Duplication Cyst</u>
10. <u>Novel Diagnostic Technologies : Mucosal Impedance, Optical Coherence Tomography, Endomicroscopy</u>	30. <u>Mesh at the Hiatus</u>	46. <u>Submucosal Tumors of the Esophagus and Gastroesophageal Junction</u>
11. <u>Cricopharyngeal Dysfunction and Zenker Diverticulum</u>	31. <u>Controversies in the Definition of Barrett Esophagus</u>	47. <u>Caustic Esophageal Injury</u>
12. <u>Surgical Management of Mid- and Distal Esophageal Diverticula</u>	32. <u>Epidemiology of Barrett Esophagus and Risk Factors for Progression</u>	48. <u>Etiology and Management of Esophageal Perforation</u>
13. <u>Epidemiology, Diagnosis, and Medical Management of Achalasia</u>	33. <u>Medical and Surgical Therapy for Gastroesophageal Reflux Disease and Barrett Esophagus</u>	49. <u>Management of Esophageal Perforations and Leaks</u>
14. <u>Endoscopic and Surgical Therapies for Achalasia</u>		50. <u>Basic Concepts and Factors Associated With Ventral Hernia Recurrence</u>
15. <u>Gastroesophageal Reflux Disease : Definition and Scope of the Problem</u>		51. <u>Congenital Diaphragmatic Hernia</u>
		52. <u>Ventral Hernia and Abdominal Release Procedures</u>
		53. <u>Inguinal Hernia Repair : Laparoscopic</u>

53. Inguinal Hernia Repair : Open
54. Lumbar, Pelvic, and Uncommon Hernias
55. Mesh : Material Science of Hernia Repair
56. Anatomy and Physiology of the Stomach
57. Diagnostic and Therapeutic Endoscopy of the Stomach and Small Bowel
58. Access and Intubation of the Stomach and Small Intestine
59. Surgery for Peptic Ulcer Disease
60. Zollinger-Ellison Syndrome
61. Gastric Adenocarcinoma
62. Postgastrectomy Syndromes
63. Operations for Morbid Obesity
64. Foreign Bodies and Bezoars of the Stomach and Small Intestine
65. Motility Disorders of the Stomach and Small Intestine
66. Miscellaneous Benign Lesions and Conditions of the Stomach, Duodenum, and Small Intestine
67. Surgical Disease of the Stomach and Duodenum in Infants and Children
68. Anatomy and Physiology of the Duodenum
69. Adenocarcinoma of the Small Intestine
70. Reoperations on the Stomach and Duodenum
71. Anatomy and Physiology of the Small Intestine
72. Small Bowel Obstruction
73. Volvulus of the Stomach and Small Bowel
74. Internal Hernias : Congenital and Acquired
75. Crohn Disease and Its Surgical Management
76. Gastric, Duodenal, and Small Intestinal Fistulas
77. Small Bowel Diverticula
78. Radiation Enteritis
79. Short Bowel Syndrome
80. Gastrointestinal Carcinoid Tumors
81. Gastrointestinal Stromal Tumors
82. Gastrointestinal Lymphomas
83. Surgical Conditions of the Small Intestine in Infants and Children
84. Ileostomy
85. Suturing, Stapling, and Tissue Adhesion
86. Anatomy and Physiology of the Mesenteric Circulation
87. Mesenteric Ischemia
88. Aortoenteric Fistula and Visceral Artery Aneurysms
89. Mesenteric Arterial Trauma
90. Anatomy, Physiology, and Embryology of the Pancreas
91. Acute Pancreatitis
92. Chronic Pancreatitis
93. Pseudocysts and Other Complications of Pancreatitis
94. Endoscopic and Minimally Invasive Therapy for Complications of Pancreatitis
95. Imaging and Radiologic Intervention in the Pancreas
96. Pancreatic and Periampullary Cancer
97. Neuroendocrine Tumors of the Pancreas
98. Primary Pancreatic Cystic Neoplasms
99. Unusual Pancreatic Tumors
100. Techniques of Pancreatic Resection for Cancer
101. Minimally Invasive Pancreas Surgery
102. Pancreatic Trauma
103. Pancreatic Problems in Infants and Children
104. Pancreas and Islet Allograft Transplantation
105. Prevention and Management of Complications of Pancreatic Surgery
106. Anatomy, Embryology, Anomalies, and Physiology of the Biliary Tract
107. Imaging and Radiologic Intervention in the Biliary Tract
108. Operative Management of Cholecystitis and Cholelithiasis
109. Management of Common Bile Duct Stones
110. Biliary Dyskinesia and Sphincter of Oddi Dysfunction
111. Endoscopic Evaluation and Management of Pancreaticobiliary Disease
112. Biliary Tract Tumors
113. Prevention and Management of Bile Duct Injury
114. Operative Management of Bile Duct Strictures
115. Biliary Atresia and Biliary Hypoplasia
116. Cystic Disorders of the Bile Ducts
117. Surgical Treatment of Primary Sclerosing Cholangitis
118. Anatomy and Physiology of the Liver
119. Laboratory Measurement of Hepatic Function
120. Perioperative Management and Nutritional Support in Patients With Liver and Biliary Tract Disease
121. Hepatic Cysts
122. Liver Abscess
123. Management of Hepatobiliary Trauma
124. Diagnostic Operation of the Liver Techniques of Hepatic Resection
125. Minimally Invasive Techniques of Hepatic Resection
126. Ablative Therapies for Hepatic Neoplasms
127. Hepatic Transplantation
128. Acute Liver Failure and Bioartificial Liver Support
129. Vascular Diseases of the Liver
130. Drug-Induced Liver Injury
131. Benign Hepatic Neoplasms
132. Hepatocellular Carcinoma
133. Management of Primary Malignant Hepatic Neoplasms Other Than Hepatocellular Cancer
134. Management of Secondary Hepatic Neoplasms
135. Management of Portal Hypertension
136. Anatomy and Physiology of the Spleen
137. Technique of Splenectomy
138. Minimally Invasive Surgical and Image-Guided Interventional Approaches to the Spleen
139. Management of Splenic Trauma in Adults
140. Splenic Trauma in Children
141. Splenectomy for Conditions Other Than Trauma
142. Cysts and Tumors of the Spleen
143. Operative Anatomy of the Colon, Rectum, and Anus

144. [Physiology of the Colon and Its Measurement](#)
145. [Diagnostic and Therapeutic Colonoscopy](#)
146. [Magnetic Resonance Imaging Staging of Rectal Cancer](#)
147. [Ultrasonographic Diagnosis of Anorectal Disease](#)
148. [Diagnosis and Management of Fecal Incontinence](#)
149. [Surgical Treatment of Dysmotility Disorders of the Colon](#)
150. [Pelvic Floor Dysfunction](#)
151. [Rectovaginal and Rectourethral Fistulas](#)
152. [Current Approaches to Complete Rectal Prolapse and Internal Intussusception](#)
153. [Pilonidal Disease and Perianal Hidradenitis](#)
154. [Emergent Care of the Victim of Colorectal Trauma](#)
155. [Colonic Intussusception and Volvulus](#)
156. [Colonic Bleeding and Ischemia](#)
157. [Diverticular Disease Management](#)
158. [Hemorrhoids and Rectoceles](#)
159. [Fissure-in-Ano](#)
160. [Anal Fistula Management](#)
161. [Concepts in Inflammatory Bowel Disease Management](#)
162. [Operative Therapy for Ulcerative Colitis : A Minimally Invasive Approach](#)
163. [Surgery for Crohn Disease : Personalizing the Operation](#)
164. [Appendix](#)
165. [Inherited Colorectal Cancer and the Genetics of Colorectal Cancer](#)
166. [Basic Principles of the Operative Treatment of Colorectal Cancer](#)
167. [Transanal Approaches to Early Rectal Cancers : Transanal Minimally Invasive Surgery](#)
167. [Transanal Approaches to Early Rectal Cancer : Transanal Endoscopic Microsurgery and Conventional Transanal Excision](#)
168. [Operations for Rectal Cancer : Low Anterior Resection—Open, Laparoscopic or Robotic, taTME, Coloanal Anastomosis](#)
169. [Abdominoperineal Resection for Rectal Cancer](#)
170. [Minimally Invasive Approaches to Colon Cancer](#)
171. [Recurrent and Metastatic Colorectal Cancer](#)
172. [Management of Metastatic Colorectal Cancer to the Liver](#)
173. [Neoplasms of the Anus : High-Grade Squamous Intraepithelial Lesions Cancer](#)
174. [Retrorectal Tumors](#)
175. [Rare Colorectal Malignancies](#)
176. [Adjuvant and Neoadjuvant Therapy for Colorectal Cancer : Molecular-Based Therapy](#)
177. [Prevention, Diagnosis, and Management of Anastomotic Leak](#)
178. [Ostomy Construction and Management : Personalizing the Stoma for the Patient](#)
179. [Reducing the Risk of Infection in Elective and Emergent Colectomy Patient](#)
180. [Reoperative Pelvic Surgery](#)
181. [Evidence-Based Decision Making. Colon and Rectal Surgery](#)

Contributors

Abbas E. Abbas, MD, MS, FACS

Professor and Chief, Division of Thoracic Surgery, Department of Thoracic Medicine and Surgery; Director, Thoracic and Foregut Surgery, Temple University School of Medicine, Philadelphia, Pennsylvania

David B. Adams, MD

Professor of Surgery, Medical University of South Carolina, Charleston, South Carolina

Piyush Aggarwal, MBBS

Fellow, Division of Colorectal Surgery, Mayo Clinic, Phoenix, Arizona

Bestoun H. Ahmed, MD, FRCS, FACS, FASMBS

Associate Professor of Surgery, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania

Craig Albanese, MD, MBA

Division of Pediatric Surgery, Department of Surgery, Stanford University School of Medicine, Stanford, California

Matthew R. Albert, MD, FACS, FASCRS

Program Director, Florida Hospital Colorectal Fellowship, Department of Colon and Rectal Surgery, Center for Colon and Rectal Surgery, Florida Hospital, Orlando, Florida

Abubaker Ali, MD

Assistant Professor of Surgery, Wayne State University, Detroit, Michigan

Evan Alicuben, MD

General Surgery Resident, Keck School of Medicine of the University of Southern California, Los Angeles, California

Marco E. Allaix, MD, PhD

Department of Surgical Sciences, University of Torino, Torino, Italy

Ashley Altman, MD

Department of Radiology, The University of Chicago Medicine, Chicago, Illinois

Hisami Ando, MD

President, Aichi Prefectural Colony; Emeritus Professor, Department of Pediatric Surgery, Nagoya University Graduate School of Medicine, Nagoya-city, Aichi, Japan

Ciro Andolfi, MD

Department of Surgery, The University of Chicago Pritzker School of Medicine, Chicago, Illinois

Alagappan Annamalai, MD

Surgery, Cedars-Sinai Medical Center, Los Angeles, California

Elliot A. Asare, MD, MS

Chief Resident, General Surgery, Department of Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin

Emanuele Asti, MD, FACS

Assistant Professor, General and Emergency Surgery, IRCCS Policlinico San Donato, University of Milano, Milan, Italy

Hugh G. Auchincloss, MD, MPH

Cardiothoracic Fellow, Massachusetts General Hospital, Boston, Massachusetts

Benjamin Babic, MD

Department of Surgery, Agaplesion Markus Hospital, Frankfurt, Germany

Talia B. Baker, MD

Associate Professor of Surgery, Transplantation Institute, The University of Chicago Medicine, Chicago, Illinois

Chad G. Ball, MD, MSC, FRCSC, FACS

Associate Professor of Surgery, University of Calgary, Foothills Medical Center, Calgary, Alberta, Canada

Arianna Barbetta, MD

Research Fellow, General Surgery Department, Thoracic Surgery Service, Memorial Sloan Kettering Cancer Center, New York, New York

John M. Barlow, MD

Assistant Professor, Department of Radiology, Mayo Clinic College of Medicine, Rochester, Minnesota

Justin Barr, MD, PhD

Department of Surgery, Duke University Medical Center, Durham, North Carolina

Juan Camilo Barreto, MD

Assistant Professor of Surgery, Division of Surgical Oncology, University of Arkansas for Medical Sciences, Little Rock, Arkansas

Linda Barry, MD, FACS

Associate Professor of Surgery, University of Connecticut School of Medicine; Chief Operating Officer, Connecticut Institute for Clinical and Translational Science, Farmington, Connecticut

Eliza W. Beal, MD

Department of Surgery, The Ohio State University Wexner Medical Center, Columbus, Ohio

Kristin Wilson Beard, MD

Baylor Scott and White Medical Center, Round Rock, Texas

David E. Beck, MD, FACS, FASCRS

Professor and Chair, Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, Louisiana; Professor of Surgery, Ochsner Clinical School, University of Queensland, Brisbane, Queensland, Australia

Kevin E. Behrns, MD

Dean, School of Medicine, VP for Medical Affairs, St. Louis University, St. Louis, Missouri

Oliver C. Bellevue, MD

General Surgery Resident, Department of Surgery, Swedish Medical Center, Seattle, Washington

Omar E. Bellorin-Marin, MD

Chief Resident, General Surgery, NewYork-Presbyterian/Queens, Flushing, New York

Jacques Bergman, MD, PhD

Professor of Gastrointestinal Endoscopy, Department of Gastroenterology and Hepatology, Academic Medical Center, Amsterdam, The Netherlands

James Berry, MD

Department of Surgery, University of Connecticut Health Center, Farmington, Connecticut

Marc G.H. Besselink, MD, MSc, PhD

Department of Surgery, Academic Medical Center, Amsterdam, The Netherlands

Adil E. Bharucha, MBBS, MD

Professor of Medicine, Division of Gastroenterology and Hepatology, Mayo Clinic, Rochester, Minnesota

Anton J. Bilchik, MD, PhD

Professor of Surgery, Chief of Medicine, Chief of Gastrointestinal Research, Gastrointestinal Oncology, John Wayne Cancer Institute at Providence Saint John's Health Center, Santa Monica, California

Nikolai A. Bildzukewicz, MD, FACS

Assistant Professor of Clinical Surgery, Division of Upper GI and General Surgery, Associate Program Director, General Surgery Residency and Advanced GI/MIS Fellowship, Keck School of Medicine of the University of Southern California, Los Angeles, California

Jason Bingham, MD

Department of General Surgery, Madigan Army Medical Center, Tacoma, Washington

Elisa Birnbaum, MD

Professor of Surgery, Section of Colon and Rectal Surgery, Washington University School of Medicine, St. Louis, Missouri

Sylvester M. Black, MD, PhD

Assistant Professor of Surgery, Division of Transplant, The Ohio State University Wexner Medical Center, Columbus, Ohio

Shanda H. Blackmon, MD, MPH

Associate Professor of Surgery, Division of Thoracic Surgery, Mayo Clinic, Rochester, Minnesota

Joshua I.S. Bleier, MD

Associate Professor of Surgery, University of Pennsylvania, Philadelphia, Pennsylvania

Adam S. Bodzin, MD

Assistant Professor, Department of Surgery, Section of Transplantation, The University of Chicago, Chicago, Illinois

C. Richard Boland, MD

Chief, Division of Gastroenterology, Internal Medicine, Baylor Scott and White, La Jolla, California

John Bolton, MD

Chairman Emeritus, Department of Surgery, Ochsner Health Systems, New Orleans, Louisiana

Nathan Bolton, MD

Resident, General Surgery, Ochsner Medical Center, New Orleans, Louisiana

Luigi Bonavina, MD, PhD

Professor and Chief of General Surgery, Department of Biomedical Sciences for Health, IRCCS Policlinico San Donato, University of Milano, Milan, Italy

Morgan Bonds, MD

Surgical Resident, University of Oklahoma Health Science Center, Oklahoma City, Oklahoma

Stefan A.W. Bouwense, MD, PhD

Department of Surgery, Radboud University Medical Center, Nijmegen, The Netherlands

Joshua A. Boys, MD

Thoracic Surgery Research Fellow, Department of Surgery, University of Southern California, Los Angeles, California

Raquel Bravo-Infante, MD

Gastrointestinal Surgery Department, Hospital Clinic of Barcelona, Barcelona, Spain

Ross M. Bremner, MD, PhD

Executive Director, Norton Thoracic Institute, St. Joseph's Hospital and Medical Center, Phoenix, Arizona

Bruce M. Brenner, MD

Associate Professor of Surgery, University of Connecticut, Farmington, Connecticut

Shaun R. Brown, DO, FACS

Clinical Fellow, Department of Colon and Rectal Surgery, Ochsner Medical Center, New Orleans, Louisiana

Mark P. Callery, MD

Professor of Surgery, Harvard Medical School; Chief, Division of General Surgery, Beth Israel Deaconess Medical Center, Boston, Massachusetts

John L. Cameron, MD

Alfred Blalock Distinguished Service Professor of Surgery, Professor of Surgery, The Johns Hopkins Hospital, Baltimore, Maryland

Michael Camilleri, MD

Atherton and Winifred W. Bean Professor, Professor of Medicine, Pharmacology, and Physiology, Consultant, Division of Gastroenterology and Hepatology, Department of Medicine, Mayo Clinic, Rochester, Minnesota

Jacob Campbell, DO, MPH

Department of Surgery, University of Connecticut Health Center, Farmington, Connecticut

Riaz Cassim, MD, FACS, FASCRS

Associate Professor, Department of Surgery, West Virginia University, Morgantown, West Virginia; Chief of Surgery, Louis A. Johnson VA Medical Center, Clarksburg, West Virginia

Manuel Castillo-Angeles, MD, MPH

Research Fellow, Department of Surgery, Beth Israel Deaconess Medical Center, Boston, Massachusetts

Christy Cauley, MD, MPH

Resident, Department of Surgery, Massachusetts General Hospital, Boston, Massachusetts

Keith M. Cavaness, DO, FACS

Surgery, Baylor Scott and White Health, Dallas, Texas

Robert J. Cerfolio, MD, MBA, FACS, FACCP

Professor of Surgery, Chief of Clinical Division Thoracic Surgery, Director of the Lung Cancer Service Line, New York University; Senior Advisor, Robotic Committee, New York, New York

Bradley J. Champagne, MD, FACS, FASCRS

Chairman of Surgery, Fairview Hospital; Director of Services, DDSI West Region; Professor of Surgery, Cleveland Clinic Lerner School of Medicine; Medical Director, Fairview Ambulatory Surgery Center, Cleveland, Ohio

Parakrama Chandrasoma, MD, MRCP

Chief, Surgical and Anatomic Pathology, Los Angeles County + University of Southern California Medical Center; Emeritus Professor of Pathology, Keck School of Medicine of the University of Southern California, Los Angeles, California

Alex L. Chang, MD

Department of General Surgery, University of Cincinnati, Cincinnati, Ohio

Christopher G. Chapman, MD

Assistant Professor of Medicine, Director, Bariatric and Metabolic Endoscopy, Center for Endoscopic Research and Therapeutics, The University of Chicago Medicine and Biological Sciences, Chicago, Illinois

William C. Chapman, MD, FACS

Surgery, Washington University, St. Louis, Missouri

Susannah Cheek, MD

Clinical Instructor in Surgery, University of Pittsburgh, Pittsburgh, Pennsylvania

Harvey S. Chen, MD

Department of Surgery, Mayo Clinic, Rochester, Minnesota

Clifford S. Cho, MD

Department of Surgery, University of Michigan, Ann Arbor, Michigan

Eric T. Choi, MD

Chief, Vascular and Endovascular Surgery, Professor of Surgery, Professor, Center for Metabolic Disease Research, Temple University Lewis Katz School of Medicine, Philadelphia, Pennsylvania

Eugene A. Choi, MD

Associate Professor of Surgery, Baylor College of Medicine, Houston, Texas

Karen A. Chojnacki, MD, FACS

Associate Professor of Surgery, Thomas Jefferson University, Philadelphia, Pennsylvania

Michael A. Choti, MD, MBA

Professor, Department of Surgery, University of Texas Southwestern Medical Center, Dallas, Texas

Ian Christie

Research Assistant, Department of Cardiothoracic Surgery, University of Pittsburgh, Pittsburgh, Pennsylvania

Heidi Chua, MD

Consultant, Department of Colon and Rectal Surgery, Mayo Clinic, Rochester, Minnesota

James M. Church, MBChB, MMedSci, FRACS

Staff Surgeon, Colorectal Surgery, Digestive Disease and Surgery Institute, Cleveland Clinic, Cleveland, Ohio

Jessica L. Cioffi, MD

Assistant Professor of Surgery, University of Florida, Gainesville, Florida

Susannah Clark, MS, MPAS

Boston, Massachusetts

Pierre-Alain Clavien, MD, PhD

Professor and Chairman, Department of Surgery, Division of Visceral and Transplant Surgery, University Hospital Zurich, Zurich, Switzerland

Adam Cloud, MD

Assistant Professor of Surgery, University of Connecticut, Farmington, Connecticut

Paul D. Colavita, MD

Gastrointestinal and Minimally Invasive Surgery, Carolinas Medical Center, Charlotte, North Carolina

Steven D. Colquhoun, MD

Professor of Surgery, Chief, Section of Hepatobiliary Surgery, Director of Liver Transplantation, Department of Surgery, University of California, Davis, Davis, California

William Conway, MD

Surgical Oncology, Ochsner Medical Center, New Orleans, Louisiana

Jonathan Cools-Lartigue, MD, PhD

Assistant Professor of Surgery, McGill University, Montreal, Quebec, Canada

Willy Coosemans, MD, PhD

Professor in Surgery, Clinical Head, Department of Thoracic Surgery, University Hospital Leuven, Leuven, Belgium

Edward E. Cornwell III, MD, FACS, FCCM, FWACS

The LaSalle D. Leffal Jr., Professor and Chairman of Surgery, Howard University Hospital, Washington, D.C.

Mario Costantini, MD

Department of Surgical, Oncological, and Gastroenterological Sciences, University and Azienda Ospedaliera of Padua, Padua, Italy

Yvonne Coyle, MD

Medical Director, Oncology Outpatient Services at the Baylor T. Boone Pickens Cancer Hospital; Texas Oncology and the Baylor Charles A. Sammons Cancer Center at the Baylor University Medical Center; Clinical Associate Professor, Texas A&M Health Science Center, College of Medicine, Dallas, Texas

Daniel A. Craig, MD

Assistant Professor of Radiology, Mayo Clinic, Rochester, Minnesota

Kristopher P. Croome, MD, MS

Assistant Professor of Transplant Surgery, Mayo Clinic, Jacksonville, Florida

Joseph J. Cullen, MD

Professor of Surgery, University of Iowa College of Medicine; Chief Surgical Services, Iowa City VA Medical Center, Iowa City, Iowa

Anthony P. D'Andrea, MD, MPH

Department of Surgery, Division of Colon and Rectal Surgery, Icahn School of Medicine at Mount Sinai, New York, New York

Themistocles Dassopoulos, MD

Adjunct Professor of Medicine, Texas A&M University; Director, Baylor Scott and White Center for Inflammatory Bowel Diseases, Dallas, Texas

Marta L. Davila, MD

Professor, Department of Gastroenterology, Hepatology, and Nutrition, The University of Texas MD Anderson Cancer Center, Houston, Texas

Raquel E. Davila, MD

Associate Professor, Department of Gastroenterology, Hepatology, and Nutrition, The University of Texas MD Anderson Cancer Center, Houston, Texas

Steven R. DeMeester, MD, FACS

Division of Foregut and Minimally Invasive Surgery, The Oregon Clinic, Portland, Oregon

Tom R. DeMeester, MD

Professor and Chairman Emeritus, Department of Surgery, University of Southern California, Los Angeles, California

Daniel T. Dempsey, MD, MBA

Professor of Surgery, University of Pennsylvania; Assistant Director, Perioperative Services, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania

Gregory dePrisco, MD

Diagnostic Radiologist, Baylor University Medical Center, Dallas, Texas

Lieven Depypere, MD

Joint Clinical Head, Department of Thoracic Surgery, University Hospital Leuven, Leuven, Belgium

David W. Dietz, MD, FACS, FASCRS

Chief, Division of Colorectal Surgery, Vice Chair, Clinical Operations and Quality, Vice President, System Surgery Quality and Experience, University Hospitals, Cleveland, Ohio

Mary E. Dillhoff, MD, MS

Assistant Professor of Surgery, The Ohio State University College of Medicine, Columbus, Ohio

Joseph DiNorcia, MD

Assistant Professor of Surgery, David Geffen School of Medicine, University of California, Los Angeles, Los Angeles, California

Stephen M. Doane, MD

Advanced Gastrointestinal Surgery Fellow, Department of Surgery, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania

Epameinondas Dogeas, MD

Resident, Department of Surgery, University of Texas Southwestern Medical Center, Dallas, Texas

Eric J. Dozois, MD, FACS, FASCRS

Colon and Rectal Surgery, Mayo Clinic, Rochester, Minnesota

Kristoffel Dumon, MD

Associate Professor of Surgery, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania

Stephen P. Dunn, MD

Chairman, Department of Surgery, Nemours/Alfred I. Dupont Hospital for Children, Wilmington, Delaware; Professor of Surgery, Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia, Pennsylvania

Christy M. Dunst, MD

Co-Program Director, Advanced GI-Foregut Fellowship, Cancer Center, Providence Portland Medical Center; Foregut Surgeon, Gastrointestinal and Minimally Invasive Surgery, The Oregon Clinic, Portland, Oregon

John N. Dussel, MD

Fellow in Vascular Surgery, University of Connecticut, Farmington, Connecticut

Matthew Dyer, BA

Case Western Reserve University School of Medicine, Cleveland, Ohio

Jonathan Efron, MD

Associate Professor of Surgery and Urology, Johns Hopkins University, Baltimore, Maryland

Yousef El-Gohary, MD

Department of General Surgery, Stony Brook University School of Medicine, New York, New York

Mustapha El Lakis, MD

Thoraco-Esophageal Postdoctoral Research Fellow, General, Vascular, and Thoracic Surgery, Virginia Mason Medical Center, Seattle, Washington

E. Christopher Ellison, MD

Robert M. Zollinger and College of Medicine Distinguished Professor of Surgery, The Ohio State University College of Medicine, Columbus, Ohio

James Ellsmere, MD, MSc, FRCSC

Division of General Surgery, Dalhousie University, Halifax, Nova Scotia, Canada

Rahila Essani, MD, FACS

Department of Surgery, Baylor Scott and White Healthcare, Texas A&M University College of Medicine, Temple, Texas

Douglas B. Evans, MD

Professor and Chair of Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin

Sandy H. Fang, MD

Assistant Professor, Department of Surgery, Johns Hopkins Medical Institutions, Baltimore, Maryland

Geoffrey Fasen, MD, MS

Clinical Instructor in General Surgery, University of Virginia, Charlottesville, Virginia

Hiran C. Fernando, MBBS, FRCS, FRCSEd

Department of Surgery, Inova Fairfax Medical Campus, Falls Church, Virginia

Lorenzo Ferri, MD, PhD

Professor of Surgery, McGill University, Montreal, Quebec, Canada

Alessandro Fichera, MD, FACS, FASCRS

Professor and Section Chief, Gastrointestinal Surgery, University of Washington Medical Center, Seattle, Washington

Christine Finck, MD

Chief, Division of Pediatric Surgery, Donald Hight Endowed Chair, Surgery, Connecticut Children's Medical Center, Hartford, Connecticut; Associate Professor of Pediatrics and Surgery, University of Connecticut Health Center, Farmington, Connecticut

Oliver M. Fisher, MD

Gastroesophageal Cancer Program, St. Vincent's Centre for Applied Medical Research, Department of Surgery, University of Notre Dame School of Medicine, Sydney, Australia

James W. Fleshman, MD, FACS

Seeger Professor and Chairman of Surgery, Baylor University Medical Center; Professor of Surgery, Texas A&M Health Science Center, Dallas, Texas

Yuman Fong, MD

Chairman, Department of Surgery, City of Hope National Medical Center, Duarte, California

Michael L. Foreman, MS, MD

Chief, Division of Trauma, Critical Care, and Acute Care Surgery, Department of Surgery, Baylor University Medical Center; Professor of Surgery, Texas A&M Health Science Center, College of Medicine, Dallas, Texas

Todd D. Francone, MD, MPH, FACS, FASCRS

Chief, Division of Colon and Rectal Surgery, Newton-Wellesley Hospital; Director, Robotic Surgery, Newton-Wellesley Hospital; Associate Chair, Department of Surgery, Newton-Wellesley Hospital; Staff Surgeon, Massachusetts General Hospital; Assistant Professor of Surgery, Tufts Medical School, Boston, Massachusetts

Edward R. Franko, MD, FACS

Assistant Professor of Surgery, Texas A&M University College of Medicine, Dallas, Texas

Daniel French, MD, MASC, FRCSC

Assistant Professor, Division of Thoracic Surgery, Dalhousie University, Halifax, Nova Scotia, Canada

Hans Friedrich Fuchs, MD

Department of Surgery, University Hospital Cologne, Cologne, Germany

Karl Hermann Fuchs, MD

Professor, Department of Surgery, Agaplesion Markus Hospital, Frankfurt, Germany

Brian Funaki, MD

Professor of Radiology, The University of Chicago Pritzker School of Medicine; Section Chief, Division of Vascular and Interventional Radiology, The University of Chicago Medicine, Chicago, Illinois

Geoffrey A. Funk, MD, FACS

Trauma and General Surgery, Surgical Critical Care, Assistant Professor of Surgery, Texas A&M University College of Medicine, Dallas, Texas

Joseph Fusco, MD

Children's Hospital of Pittsburgh, University of Pittsburgh, Pittsburgh, Pennsylvania

Shrawan G. Gaitonde, MD

Fellow, Surgical Oncology, John Wayne Cancer Institute at Providence Saint John's Health Center, Santa Monica, California

Julio Garcia-Aguilar, MD, PhD

Chief, Colorectal Service, Department of Surgery, Benno C. Schmidt Chair in Surgical Oncology, Memorial Sloan Kettering Cancer Center; Professor of Surgery, Weill Cornell Medical College, New York, New York

Susan Gearhart, MD

Associate Professor of Surgery, Johns Hopkins Medical Institutions, Baltimore, Maryland

David A. Geller, MD, FACS

Richard L. Simmons Professor of Surgery, Chief, Division of Hepatobiliary and Pancreatic Surgery, University of Pittsburgh, Pittsburgh, Pennsylvania

Comeron Ghobadi, MD

Department of Radiology, The University of Chicago Medicine, Chicago, Illinois

Sebastien Gilbert, MD

Associate Professor of Surgery, University of Ottawa; Chief, Division of Thoracic Surgery, Department of Surgery, Clinician Investigator, The Ottawa Hospital Research Institute, The Ottawa Hospital, Ottawa, Ontario, Canada

David Giles, MD

Associate Clinical Professor of Surgery, University of Connecticut School of Medicine, Farmington, Connecticut

Erin Gillaspie, MD

Assistant Professor, Department of Thoracic Surgery, Vanderbilt University Medical Center, Nashville, Tennessee

Micah Girotti, MD

Division of Vascular Surgery, Northwestern University Feinberg School of Medicine, Chicago, Illinois

George K. Gittes, MD

Professor of Surgery, Surgeon-in-Chief, Children's Hospital of Pittsburgh, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania

Michael D. Goodman, MD

Assistant Professor of Surgery, University of Cincinnati, Cincinnati, Ohio

Hein G. Gooszen, MD, PhD

Professor, Department of Operating Room/Evidence Based Surgery, Radboud University Medical Center, Nijmegen, The Netherlands

Gregory J. Gores, MD

Executive Dean for Research, Professor of Medicine, Division of Gastroenterology and Hepatology, Mayo Clinic, Rochester, Minnesota

James F. Griffin, MD

Surgical Resident, Department of Surgery, The Johns Hopkins Hospital, Baltimore, Maryland

S. Michael Griffin, OBE, MD, FRCSEd

Professor, Consultant Oesophagogastric Surgeon, Northern Oesophagogastric Cancer Unit, Royal Victoria Infirmary, Newcastle-upon-Tyne, United Kingdom

Leander Grimm Jr., MD, FACS, FASCRS

Assistant Professor of Surgery, Division of Colon and Rectal Surgery, University of South Alabama, Mobile, Alabama

L.F. Grochola, MD, PhD

Department of Visceral and Transplant Surgery, University Hospital Zurich, Zurich, Switzerland

Fahim Habib, MD, MPH, FACS

Esophageal and Lung Institute, Allegheny Health Network, Pittsburgh, Pennsylvania

John B. Hanks, MD

C. Bruce Morton Professor and Chief, Division of General Surgery, Department of Surgery, University of Virginia Health System, Charlottesville, Virginia

James E. Harris Jr., MD

Assistant Professor of Surgery, The Johns Hopkins Hospital, Baltimore, Maryland

Matthew G. Hartwig, MD

Associate Professor of Surgery, Division of Thoracic and Cardiovascular Surgery, Department of Surgery, Duke University Hospital, Durham, North Carolina

Imran Hassan, MD, FACS

Clinical Associate Professor of Surgery, Carver College of Medicine, University of Iowa Health Care, Iowa City, Iowa

Traci L. Hedrick, MD, MS

Associate Professor of Surgery, University of Virginia Health System, Charlottesville, Virginia

Terry C. Hicks, MD, FACS, FASCRS

Colorectal Surgeon, Department of Colon and Rectal Surgery, Ochsner Medical Center, New Orleans, Louisiana

Richard Hodin, MD

Department of Surgery, Massachusetts General Hospital, Boston, Massachusetts

Wayne L. Hofstetter, MD

Professor of Surgery and Deputy Chair, Department of Thoracic and Cardiovascular Surgery, The University of Texas MD Anderson Cancer Center, Houston, Texas

Melissa Hogg, MD, MS

Assistant Professor of Surgery, Division of Surgical Oncology, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Yue-Yung Hu, MD, MPH

Pediatric Surgery Fellow, Connecticut Children's Medical Center, Hartford, Connecticut

Eric S. Hungness, MD

S. David Stulberg, MD Research Professor, Associate Professor in Gastrointestinal and Endocrine Surgery and Medical Education, Northwestern University Feinberg School of Medicine; Attending Surgeon, Northwestern Memorial Hospital, Chicago, Illinois

Steven R. Hunt, MD

Associate Professor of Surgery, Division of General Surgery, Section of Colon and Rectal Surgery, Washington University School of Medicine, St. Louis, Missouri

Khumara Huseynova, MD

Assistant Professor of Vascular and Endovascular Surgery, West Virginia University, Morgantown, West Virginia

Neil H. Hyman, MD

Chief, Section of Colon and Rectal Surgery, Co-Director, Digestive Disease Center, Department of Surgery, The University of Chicago Medicine, Chicago, Illinois

David A. Iannitti, MD

Chief, Division of Hepatobiliary and Pancreatic Surgery, Department of Surgery, Carolinas HealthCare System, Charlotte, North Carolina

Jeffrey Indes, MD

Associate Professor of Surgery, Section of Vascular Surgery, University of Connecticut, Farmington, Connecticut

Megan Jenkins, MD

Department of Surgery, New York University Langone Medical Center, New York, New York

Todd Jensen, MSc

Research Associate, University of Connecticut, Farmington, Connecticut

Paul M. Jeziorczak, MD

Senior Fellow, Division of Pediatric Surgery, St. Louis Children's Hospital, St. Louis, Missouri

Danial Jilani, MD

Department of Radiology, The University of Chicago Medicine, Chicago, Illinois

Marta Jiménez-Toscano, MD, PhD

Gastrointestinal Surgery Department, Hospital Clinic of Barcelona, Barcelona, Spain

Blair A. Jobe, MD, FACS

Director, Esophageal and Lung Institute, Allegheny Health Network; Clinical Professor of Surgery, Temple University School of Medicine, Pittsburgh, Pennsylvania

Lily E. Johnston, MD, MPH

Resident, Department of Surgery, University of Virginia Health System, Charlottesville, Virginia

Peter J. Kahrilas, MD

Gilbert H. Marquardt Professor of Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois

Matthew F. Kalady, MD

Professor of Surgery, Colorectal Surgery, Co-Director, Comprehensive Colorectal Cancer Program, Digestive Disease and Surgery Institute, Cleveland Clinic, Cleveland, Ohio

Noor Kassira, MD

Assistant Professor of Surgery, Division of Pediatric Surgery, University of South Florida, Morsani College of Medicine, Tampa, Florida

Namir Katkhouda, MD, FACS

Professor of Surgery, Division of Upper Gastrointestinal and General Surgery, Keck School of Medicine of the University of Southern California, Los Angeles, California

Philip O. Katz, MD, FACC

Director of Motility Laboratories, Jay Monahan Center for Gastrointestinal Health, Weill Cornell Medicine, New York, New York

Deborah S. Keller, MS, MD

Department of Surgery, Baylor University Medical Center, Dallas, Texas

Matthew P. Kelley, MD

General Surgery Resident, Johns Hopkins Medical Institutions, Baltimore, Maryland

Gregory D. Kennedy, MD, PhD

Professor of Surgery, University of Alabama Birmingham, Birmingham, Alabama

Tara Sotsky Kent, MD, MS

Assistant Professor of Surgery, Harvard Medical School, Beth Israel Deaconess Medical Center, Boston, Massachusetts

Leila Kia, MD

Department of Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois

Melina R. Kibbe, MD

Chair, Department of Surgery, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina

John Kim, DO, MPH, FACS

Clinical Assistant Professor of Surgery, Clerkship Director, Surgery, University of Illinois College of Medicine, Champaign-Urbana, Illinois; Attending Surgeon, Acute Care Surgery and Trauma, Carle Foundation Hospital, Urbana, Illinois

Alice King, MD

Junior Fellow, Division of Pediatric Surgery, St. Louis Children's Hospital, St. Louis, Missouri

Ravi P. Kiran, MBBS, MS, FRCS (Eng), FRCS (Glas), FACS, MSc EBM (Oxford)

Kenneth A. Forde Professor of Surgery in Epidemiology, Division Chief and Program Director, Director, Center for Innovation and Outcomes Research, Division of Colorectal Surgery, NewYork-Presbyterian Hospital/Columbia University Medical Center, New York, New York

Orlando C. Kirton, MD, FACS, MCCM, FCCP, MBA

Surgeon-in-Chief, Chairman of Surgery, Abington-Jefferson Health; Professor of Surgery, Sidney Kimmel Medical College of Thomas Jefferson University, Abington, Pennsylvania

Andrew Klein, MD, MBA, FACS

Professor and Vice Chairman, Department of Surgery, Director, Comprehensive Transplant Center, Cedars-Sinai Medical Center, Los Angeles, California

Eric N. Klein, MD

Acute Care Surgeon, North Shore University Hospital, Manhasset, New York

Geoffrey P. Kohn, MBBS(Hons), MSurg, FRACS, FACS

Senior Lecturer, Department of Surgery, Monash University, Melbourne, Australia; Upper Gastrointestinal Surgeon, Melbourne Upper Gastrointestinal Surgical Group, Melbourne, Victoria, Australia

Robert Caleb Kovell, MD

Assistant Professor of Clinical Urology in Surgery,
Department of Urology Surgery, Perelman School of
Medicine, University of Pennsylvania, Philadelphia,
Pennsylvania

Robert Kozol, MD

General Surgery, JFK Medical Center, Atlantis, Florida

Antonio M. Lacy, MD, PhD

Chief, Gastrointestinal Surgery, Hospital Clinic of Barcelona,
Barcelona, Spain

Daniela P. Ladner, MD, MPH, FACS

Associate Professor of Transplant Surgery, Division of Organ
Transplantation, Feinberg School of Medicine, Northwestern
University; Director, Northwestern University Transplant
Outcomes Research Collaborative, Northwestern University,
Chicago, Illinois

S.M. Lagarde, MD, PhD

Department of Surgery, Erasmus MC–University Medical
Center Rotterdam, Rotterdam, The Netherlands

Carrie A. Laituri, MD

Assistant Professor of Surgery, Division of Pediatric Surgery,
University of South Florida, Morsani College of Medicine,
Tampa, Florida

Alessandra Landmann, MD

Resident Physician, Department of Surgery, University of
Oklahoma, Oklahoma City, Oklahoma

Janet T. Lee, MD, MS

Clinical Assistant Professor of Surgery, University of
Minnesota, St. Paul, Minnesota

Lawrence L. Lee, MD, PhD, FRCS

Department of Colon and Rectal Surgery, Center for Colon &
Rectal Surgery, Florida Hospital, Orlando, Florida

Jennifer A. Leinicke, MD, MPHS

Department of Surgery, Washington University School of
Medicine, St. Louis, Missouri

Toni Lerut, MD, PhD

Emeritus Professor of Surgery, Clinical Head, Department of
Thoracic Surgery, University Hospital Leuven, Leuven,
Belgium

David M. Levi, MD

Transplant Surgeon, Carolinas Medical Center, Charlotte,
North Carolina

Chao Li, MD, MSc, FRCS

Division of General Surgery, Dalhousie University, Halifax,
Nova Scotia, Canada

Yu Liang, MD

Department of Surgery, University of Connecticut Health
Center, Farmington, Connecticut

Andrew H. Lichliter, MD

Diagnostic Radiology Resident, Baylor University Medical
Center, Dallas, Texas

Warren E. Lichliter, MD

Chief, Colon and Rectal Surgery, Baylor Scott and White
Health, Dallas, Texas

Amy L. Lightner, MD

Senior Associate Consultant, Department of Colon and Rectal
Surgery, Mayo Clinic, Rochester, Minnesota

Deacon J. Lile, MD

Department of General Surgery, Temple University Hospital,
Philadelphia, Pennsylvania

Keith D. Lillemoe, MD, FACS

W. Gerald Austen Professor of Surgery, Harvard Medical
School; Surgeon-in-Chief, The Massachusetts General
Hospital, Boston, Massachusetts;

Jules Lin, MD, FACS

Associate Professor, Mark B. Orringer Professor, Section of
Thoracic Surgery, University of Michigan, Ann Arbor,
Michigan

Shu S. Lin, MD, PhD

Associate Professor of Surgery, Pathology, and Immunology,
Duke University Medical Center, Durham, North Carolina

John C. Lipham, MD, FACS

Chief, Division of Upper Gastrointestinal and General
Surgery, Associate Professor of Surgery, Keck School of
Medicine of the University of Southern California, Los
Angeles, California

Virginia R. Litle, MD

Professor of Surgery, Division of Thoracic Surgery, Boston
University, Boston, Massachusetts

Nayna A. Lodhia, MD

Resident, Department of Internal Medicine, The University of
Chicago Medicine, Chicago, Illinois

Walter E. Longo, MD, MBA

Colon and Rectal Surgery, Yale University School of
Medicine, New Haven, Connecticut

Reginald V.N. Lord, MBBS, MD, FRACS

Director, Gastroesophageal Cancer Program, St. Vincent's
Centre for Applied Medical Research; Professor and Head of
Surgery, University of Notre Dame School of Medicine,
Sydney, Australia

Brian E. Louie, MD, MPH, MHA

Director, Thoracic Research and Education, Division of
Thoracic Surgery, Swedish Cancer Institute and Medical
Center, Seattle, Washington

Donald E. Low, MD, FACS, FRCS(C)

Head of Thoracic Surgery and Thoracic Oncology, General,
Vascular, and Thoracic Surgery, Virginia Mason Medical
Center, Seattle, Washington

Val J. Lowe, MD

Professor of Radiology/Nuclear Medicine, Mayo Clinic,
Rochester, Minnesota

Jessica G.Y. Luc, MD

Faculty of Medicine and Dentistry, University of Alberta, Alberta, Canada

James D. Luketich, MD

Henry T. Bahnson Professor and Chairman, Department of Cardiothoracic Surgery, Chief, Division of Thoracic and Foregut Surgery, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania

Yanling Ma, MD

Pathologist, Department of Surgical Pathology, Los Angeles County + University of Southern California Medical Center; Associate Professor of Pathology, Keck School of Medicine of the University of Southern California, Los Angeles, Los Angeles, California

Robert L. MacCarty, MD

Professor of Diagnostic Radiology, Emeritus, Mayo Clinic College of Medicine, Rochester, Minnesota

Blair MacDonald, MD, FRCPC

Associate Professor of Medical Imaging, University of Ottawa; Clinical Investigator, The Ottawa Hospital Research Institute; Gastrointestinal Radiologist, The Ottawa Hospital, Ottawa, Ontario, Canada

Robert D. Madoff, MD

Professor of Surgery, University of Minnesota, Minneapolis, Minnesota

Deepa Magge, MD

Fellow in Surgical Oncology, Division of Surgical Oncology, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Anurag Maheshwari, MD

Clinical Assistant Professor of Medicine, Division of Gastroenterology and Hepatology, University of Maryland School of Medicine; Consultant Transplant Hepatologist, Institute for Digestive Health and Liver Diseases, Mercy Medical Center, Baltimore, Maryland

Najjia N. Mahmoud, MD

Professor of Surgery, Division of Colon and Rectal Surgery, University of Pennsylvania, Philadelphia, Pennsylvania

David A. Mahvi, MD

Brigham and Women's Hospital, Boston, Massachusetts

David M. Mahvi, MD

Professor of Surgery, Northwestern University School of Medicine, Chicago, Illinois

Grace Z. Mak, MD

Associate Professor, Section of Pediatric Surgery, Department of Surgery, The University of Chicago Medicine and Biological Sciences, Chicago, Illinois

Sara A. Mansfield, MD, MS

Clinical Housestaff, Department of Surgery, The Ohio State University Wexner Medical Center, Columbus, Ohio

Maricarmen Manzano, MD

Division of Gastroenterology, National Cancer Institute of Mexico, Mexico City, Mexico

David J. Maron, MD, MBA

Vice Chair, Department of Colorectal Surgery, Director, Colorectal Surgery Residency Program, Cleveland Clinic Florida, Weston, Florida

Melvy S. Mathew, MD

Assistant Professor of Radiology, The University of Chicago Pritzker School of Medicine; Division of Body Imaging, The University of Chicago Medicine, Chicago, Illinois

Kellie L. Mathis, MD

Surgery, Mayo Clinic, Rochester, Minnesota

Jeffrey B. Matthews, MD, FACS

Dallas B. Phemister Professor and Chairman of Surgery, The University of Chicago, Chicago, Illinois

David W. McFadden, MD, MBA, FACS

Chairman, Department of Surgery, University of Connecticut; Surgeon-in-Chief, University of Connecticut Health, Farmington, Connecticut

Amit Merchea, MD, FACS, FASCRS

Assistant Professor of Surgery, Colon and Rectal Surgery, Mayo Clinic, Jacksonville, Florida

Evangelos Messaris, MD, PhD

Associate Professor of Surgery, Pennsylvania State University, College of Medicine, Hershey, Pennsylvania

Daniel L. Miller, MD

Clinical Professor of Surgery, Medical College of Georgia, Augusta University, Augusta, Georgia; Chief, General Thoracic Surgery, Program Director, General Surgery Residency Program, Kennestone Regional Medical Center, WellStar Health System/Mayo Clinic Care Network, Marietta, Georgia

Heidi J. Miller, MD, MPH

Assistant Professor of Surgery, University of New Mexico, Sandoval Regional Medical Center, Albuquerque, New Mexico

J. Michael Millis, MD, MBA

Professor of Surgery, Transplant Surgery, The University of Chicago, Chicago, Illinois

Sumeet K. Mittal, MD, FACS, MBA

Surgical Director, Esophageal and Foregut Program, Norton Thoracic Institute, St. Joseph's Hospital and Medical Center, Phoenix, Arizona

Daniela Molena, MD

Surgical Director, Esophageal Cancer Surgery Program, General Surgery Department, Thoracic Surgery Service, Memorial Sloan Kettering Cancer Center, New York, New York

Stephanie C. Montgomery, MD, FACS

Director of Surgery Education, Saint Francis Hospital and Medical Center; Assistant Professor, University of Connecticut School of Medicine, Hartford, Connecticut

Ryan Moore, MD

Department of General Surgery, Temple University Hospital, Philadelphia, Pennsylvania

Katherine A. Morgan, MD, FACS

Professor of Surgery, Chief, Division of Gastrointestinal and Laparoscopic Surgery, Medical University of South Carolina, Charleston, South Carolina

Melinda M. Mortenson, MD

Department of Surgery, Permanente Medical Group, Sacramento, California

Michael W. Mulholland, MD, PhD

Department of Surgery, University of Michigan, Ann Arbor, Michigan

Michael S. Mulvihill, MD

Resident Surgeon, Department of Surgery, Duke University, Durham, North Carolina

Matthew Mutch, MD

Chief, Section of Colon and Rectal Surgery, Associate Professor of Surgery, Washington University, St. Louis, Missouri

Philippe Robert Nafteux, MD, PhD

Assistant Professor in Surgery, Clinical Head, Department of Thoracic Surgery, University Hospital Leuven, Leuven, Belgium

Arun Nagaraju, MD

Department of Radiology, The University of Chicago Medicine, Chicago, Illinois

David M. Nagorney, MD, FACS

Professor of Surgery, Mayo Clinic, Rochester, Minnesota

Hari Nathan, MD, PhD

Department of Surgery, University of Michigan, Ann Arbor, Michigan

Karen R. Natoli, MD

Department of Surgery, Community Hospital, Indianapolis, Indiana

Rakesh Navuluri, MD

Department of Radiology, The University of Chicago Medicine, Chicago, Illinois

Nicholas N. Nissen, MD

Director, Liver Transplant and Hepatopancreatobiliary Surgery, Cedars-Sinai Medical Center, Los Angeles, California

Tamar B. Nobel, MD

Department of Surgery, Mount Sinai Hospital, New York, New York

B.J. Noordman, MD

Department of Surgery, Erasmus MC–University Medical Center Rotterdam, Rotterdam, The Netherlands

Jeffrey A. Norton, MD

Professor of Surgery, Stanford University School of Medicine, Stanford, California

Yuri W. Novitsky, MD

Director, Cleveland Comprehensive Hernia Center, University Hospitals Cleveland Medical Center; Professor of Surgery, Case Western Reserve School of Medicine, Cleveland, Ohio

Michael S. Nussbaum, MD, FACS

Professor and Chair, Department of Surgery, Virginia Tech Carilion School of Medicine, Roanoke, Virginia

Scott L. Nyberg, MD, PhD

Professor of Biomedical Engineering and Surgery, Department of Transplantation Surgery, Mayo Clinic, Rochester, Minnesota

Brant K. Oelschlager, MD

Byers Endowed Professor of Esophageal Research, Chief, Division of General Surgery, University of Washington Medical Center; Vice Chair, Department of Surgery, University of Washington, Seattle, Washington

Daniel S. Oh, MD

Assistant Professor of Surgery, Thoracic Surgery, University of Southern California, Los Angeles, California

Ana Otero-Piñeiro, MD

Gastrointestinal Surgery Department, Hospital Clinic of Barcelona, Barcelona, Spain

Aytekın Oto, MD

Professor of Radiology, The University of Chicago Pritzker School of Medicine; Section Chief, Division of Body Imaging, The University of Chicago Medicine, Chicago, Illinois

H. Leon Pachter, MD

Chairman, Department of Surgery, New York University Langone Medical Center, New York, New York

Charles N. Pavidas, MD, MBA

Professor of Surgery and Pediatrics, Chief, Pediatric Surgery, Vice Dean for Graduate Medical Education, University of South Florida, Morsani College of Medicine, Tampa, Florida

Francesco Palazzo, MD

Associate Professor of Surgery, Thomas Jefferson University, Philadelphia, Pennsylvania

Alessandro Panizza, MD

General Surgery Resident, University of Colorado School of Medicine, Aurora, Colorado

Harry T. Papaconstantinou, MD, FACS, FACRS

Department of Surgery, Baylor Scott and White Healthcare, Texas A&M University College of Medicine, Temple, Texas

Theodore N. Pappas, MD, FACS

Distinguished Professor of Surgical Innovation, Chief of Advanced Oncologic and Gastrointestinal Surgery, Duke University School of Medicine, Durham, North Carolina

Emmanouil P. Pappou, MD, PhD

Assistant Professor of Colorectal Surgery, Columbia University Medical Center, New York, New York

Manish Parikh, MD

Associate Professor of Surgery, New York University Langone Medical Center/Bellevue Hospital, New York, New York

Jennifer L. Paruch, MD, MS

Lahey Hospital and Medical Center, Burlington, Massachusetts

Asish D. Patel, MD

Chief Resident, Department of Surgery, University of Nebraska Medical Center, Omaha, Nebraska

Mikin Patel, MD

Department of Radiology, The University of Chicago Medicine, Chicago, Illinois

Marco G. Patti, MD

Center for Esophageal Diseases and Swallowing, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina

Emily Carter Paulson, MD, MSCE

Assistant Professor of Surgery, University of Pennsylvania; Assistant Professor of Surgery, Corporal Michael Crescenz VA Medical Center, Philadelphia, Pennsylvania

Timothy M. Pawlik, MD, MPH, PhD

Professor of Surgery and Oncology, The Urban Meyer III and Shelley Meyer Chair for Cancer Research, Ohio State University; Chair, Department of Surgery, Wexner Medical Center, Columbus, Ohio; Division of Surgical Oncology, Department of Surgery, The Johns Hopkins School of Medicine, Baltimore, Maryland

Isaac Payne, DO

Surgical Resident, University of South Alabama, Mobile, Alabama

John H. Pemberton, MD

Professor of Surgery, College of Medicine, Consultant, Department of Colon and Rectal Surgery, Mayo Clinic, Rochester, Minnesota

Michael Pendola, MD

Staff Colorectal Surgeon, Department of Surgery, Baylor University Medical Center, Dallas, Texas

Alexander Perez, MD, FACS

Chief of Pancreatic Surgery, Duke University Medical Center, Durham, North Carolina; Associate Professor of Surgery, Duke University School of Medicine, Durham, North Carolina

Luise I.M. Pernar, MD

Assistant Professor of Surgery, Boston University School of Medicine; Minimally Invasive and Weight Loss Surgery, Boston Medical Center, Boston, Massachusetts

Walter R. Peters Jr., MD, MBA

Chief, Division of Colon and Rectal Surgery, Baylor University Medical Center, Dallas, Texas

Henrik Petrowsky, MD

Professor of Surgery, Vice Chairman, Department of Visceral and Transplant Surgery, University Hospital Zurich, Zurich, Switzerland

Christian G. Peyre, MD

Division of Thoracic and Foregut Surgery, Department of Surgery, University of Rochester School of Medicine and Dentistry, Rochester, New York

Alexander W. Phillips, MA, FRCSEd, FFSTEd

Consultant Oesophagogastric Surgeon, Northern Oesophagogastric Cancer Unit, Royal Victoria Infirmary, Newcastle-upon-Tyne, United Kingdom

Lashmikumar Pillai, MD

Associate Professor of Vascular and Endovascular Surgery, West Virginia University Medical Center, Morgantown, West Virginia

Joseph M. Plummer, MBBS, DM

Department of Surgery, Radiology, and Intensive Care, University of the West Indies, Mona, Jamaica

David T. Pointer Jr., MD

Surgery, Tulane University School of Medicine, New Orleans, Louisiana

Katherine E. Poruk, MD

Surgical Resident, Department of Surgery, The Johns Hopkins Hospital, Baltimore, Maryland

Mitchell C. Posner, MD, FACS

Thomas D. Jones Professor of Surgery and Vice-Chairman, Chief, Section of General Surgery and Surgical Oncology, Physician-in-Chief, The University of Chicago Medicine Comprehensive Cancer Center, The University of Chicago Medicine, Chicago, Illinois

Russell Postier, MD

Chairman, Department of Surgery, University of Oklahoma, Oklahoma City, Oklahoma

Vivek N. Prachand, MD

Associate Professor, Director of Minimally Invasive Surgery, Chief Quality Officer, Executive Medical Director, Procedural Quality and Safety, Section of General Surgery, Department of Surgery, The University of Chicago Medicine and Biological Sciences, Chicago, Illinois

Timothy A. Pritts, MD, PhD

Professor of Surgery, University of Cincinnati, Cincinnati, Ohio

Gregory Quatrino, MD

Surgical Resident, University of South Alabama, Mobile, Alabama

Sagar Ranka, MD

Resident, Department of Internal Medicine, John H. Stroger Hospital of Cook County, Chicago, Illinois

David W. Rattner, MD

Chief, Division of General and Gastrointestinal Surgery, Massachusetts General Hospital; Professor of Surgery, Harvard Medical School, Boston, Massachusetts

Kevin M. Reavis, MD

Division of Gastrointestinal and Minimally Invasive Surgery, The Oregon Clinic, Portland, Oregon

Vikram B. Reddy, MD, PhD

Colon and Rectal Surgery, Yale University School of Medicine, New Haven, Connecticut

Feza H. Remzi, MD, FACS, FTSS (Hon)

Director, Inflammatory Bowel Disease Center, New York University Langone Medical Center; Professor of Surgery, New York University School of Medicine, New York, New York

Rocco Ricciardi, MD, MPH

Chief, Section of Colon and Rectal Surgery, Massachusetts General Hospital, Boston, Massachusetts

Thomas W. Rice, MD

Professor of Surgery, Cleveland Clinic Lerner College of Medicine; Emeritus Staff, Department of Thoracic Cardiovascular Surgery, Cleveland Clinic, Cleveland, Ohio

Aaron Richman, MD

Department of Surgery, Boston Medical Center, Boston, Massachusetts

Paul Rider, MD, FACS, FASCRS

Associate Professor of Surgery, Division of Colon and Rectal Surgery, University of South Alabama, Mobile, Alabama

John Paul Roberts, MD, FACS

Professor and Chief, Division of Transplant Surgery, University of California, San Francisco, San Francisco, California

Patricia L. Roberts, MD

Chair, Department of Surgery, Senior Staff Surgeon, Division of Colon and Rectal Surgery, Lahey Hospital and Medical Center, Burlington, Massachusetts; Professor of Surgery, Tufts University School of Medicine, Boston, Massachusetts

Kevin K. Roggin, MD

Professor of Surgery and Cancer Research, Program Director, General Surgery Residency Program, Associate Program Director, Surgical Oncology Fellowship, The University of Chicago Medicine, Chicago, Illinois

Garrett Richard Roll, MD, FACS

Assistant Professor of Surgery, Department of Surgery, Division of Transplant, University of California, San Francisco, San Francisco, California

Kais Rona, MD

Chief Resident in General Surgery, Keck School of Medicine of the University of Southern California, Los Angeles, California

Charles B. Rosen, MD

Chair, Division of Transplantation Surgery, Mayo Clinic, Rochester, Minnesota

Samuel Wade Ross, MD, MPH

Chief Resident, Department of Surgery, Carolinas Medical Center, Charlotte, North Carolina

J. Scott Roth, MD

Professor of Surgery, Chief, Gastrointestinal Surgery, Department of Surgery, University of Kentucky, Lexington, Kentucky

Amy P. Rushing, MD, FACS

Assistant Professor, Division of Trauma, Critical Care, and Burn, The Ohio State University Wexner Medical Center, Columbus, Ohio

Bashar Safar, MBBS

Assistant Professor of Surgery, Johns Hopkins Medicine, Baltimore, Maryland

Pierre F. Saldinger, MD

Chairman, Surgery, NewYork-Presbyterian/Queens, Flushing, New York

Kamran Samakar, MD, MA

Assistant Professor of Surgery, Division of Upper Gastrointestinal and General Surgery, Keck School of Medicine of the University of Southern California, Los Angeles, California

Kulmeet K. Sandhu, MD, FACS, MS

Assistant Professor of Clinical Surgery, Division of Upper Gastrointestinal and General Surgery, Keck School of Medicine of the University of Southern California, Los Angeles, California

Lara W. Schaheen, MD

Cardiothoracic Surgery Resident, Department of Cardiothoracic Surgery, University of Pittsburgh, Pittsburgh, Philadelphia

Bruce Schirmer, MD

Stephen H. Watts Professor of Surgery, University of Virginia Health System, Charlottesville, Virginia

Andrew Schneider, MD

General Surgery Resident, The University of Chicago Medicine, Chicago, Illinois

Richard D. Schulick, MD, MBA

Professor and Chair, Department of Surgery, University of Colorado School of Medicine, Aurora, Colorado

Ben Schwab, MD, DC

General Surgery Resident, Northwestern University Feinberg School of Medicine, Chicago, Illinois

Stephanie Scurci, MD

Resident, University of Miami Miller School of Medicine, Palm Beach Regional Campus, Palm Beach, Florida

Anthony Senagore, MD, MS, MBA

Professor, Chief of Gastrointestinal Surgery, Surgery, University of Texas—Medical Branch, Galveston, Texas

Adil A. Shah, MD

Resident, Department of Surgery, Howard University Hospital and College of Medicine, Washington, D.C.

Shimul A. Shah, MD

Director, Liver Transplantation and Hepatobiliary Surgery, Associate Professor of Surgery, University of Cincinnati, Cincinnati, Ohio

Brian Shames, MD

Chief, Division of General Surgery, General Surgery Residency Program Director, University of Connecticut Health Center, Farmington, Connecticut

Skandan Shanmugan, MD

Assistant Professor of Surgery, Division of Colon and Rectal Surgery, University of Pennsylvania, Perelman School of Medicine, Philadelphia, Pennsylvania

David S. Shapiro, MD, FACS, FCCM

Chairman, Department of Surgery, Saint Francis Hospital and Medical Center—Trinity Health New England, Hartford, Connecticut; Assistant Professor of Surgery, University of Connecticut School of Medicine, Farmington, Connecticut

Matthew Silveira, MD

Washington University, St. Louis, Missouri

Douglas P. Slakey, MD, MPH, FACS

Professor, Surgery, Tulane University, New Orleans, Louisiana

Joshua Sloan, DO

Division of Gastroenterology, Einstein Healthcare Network, Philadelphia, Pennsylvania

Nathan Smallwood, MD

Division of Colon and Rectal Surgery, Baylor University Medical Center, Dallas, Texas

Shane P. Smith, MD

General Surgery Resident, Department of Surgery, Swedish Medical Center, Seattle, Washington

B. Mark Smithers, MBBS, FRACS, FRCSEng, FRCSEd

Professor of Surgery, University of Queensland; Director, Upper Gastrointestinal and Soft Tissue Unit, Princess Alexandra Hospital, Brisbane, Queensland, Australia

Rory L. Smoot, MD, FACS

Assistant Professor, Mayo Clinic, Rochester, Minnesota

Kevin C. Soares, MD

Resident, General Surgery, Department of Surgery, Johns Hopkins Medical Institutions, Baltimore, Maryland

Edy Soffer, MD

Professor of Clinical Medicine, Director, GI Motility Program, Keck School of Medicine of the University of Southern California, Los Angeles, California

Julia Solomina, MD

Department of Surgery, The University of Chicago, Chicago, Illinois

Nathaniel J. Soper, MD

Loyal and Edith Davis Professor of Surgery, Northwestern University Feinberg School of Medicine; Chair, Department of Surgery, Northwestern Memorial Hospital, Chicago, Illinois

Stuart Jon Spechler, MD

Chief, Division of Gastroenterology, Co-Director, Center for Esophageal Research, Baylor University Medical Center at Dallas; Co-Director, Center for Esophageal Research, Baylor Scott and White Research Institute, Dallas, Texas

Praveen Sridhar, MD

Department of Surgery, Boston Medical Center, Boston, Massachusetts

Scott R. Steele, MD, FACS, FASCRS

Chairman, Department of Colorectal Surgery, Cleveland Clinic; Professor of Surgery, Case Western Reserve University School of Medicine, Cleveland, Ohio

Joel M. Sternbach, MD, MBA

Bechily-Hodes Fellow in Esophagology, Department of Surgery, Northwestern University Feinberg School of Medicine, Chicago, Illinois

Christina E. Stevenson, MD

Assistant Professor of Surgery, Department of Surgery and Neag Comprehensive Cancer Center, University of Connecticut, Farmington, Connecticut

Scott A. Strong, MD

James R. Hines Professor of Surgery, Northwestern University Feinberg School of Medicine, Chicago, Illinois

Iswanto Sucandy, MD

Clinical Instructor, Department of Surgery, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania

Magesh Sundaram, MD, MBA, FACS

Senior Associate Medical Director, Carle Cancer Center, Carle Foundation Hospital, Urbana, Illinois

Sudhir Sundaesan, MD, FRCSC, FACS

Surgeon-in-Chief, The Ottawa Hospital; Wilbert J. Keon Professor and Chairman, Department of Surgery, University of Ottawa, Ottawa, Ontario, Canada

Lee L. Swanstrom, MD

The Institute of Image-Guided Surgery of Strasbourg, University of Strasbourg, Strasbourg, Alsace, France; Director, Division of Gastrointestinal and Minimally Invasive Surgery, The Oregon Clinic, Portland, Oregon

Patricia Sylla, MD

Associate Professor of Surgery, Division of Colorectal Surgery, Icahn School of Medicine at Mount Sinai Hospital, New York, New York

Tadahiro Takada, MD, FACS, FRCSEd

Emeritus Professor, Department of Surgery, Teikyo University School of Medicine, Tokyo, Japan

Ethan Talbot, MD

Resident, General Surgery, Bassett Medical Center, Cooperstown, New York

Vernissia Tam, MD

Resident in General Surgery, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Eric P. Tamm, MD

Professor, Diagnostic Imaging, The University of Texas MD Anderson Cancer Center, Houston, Texas

Talar Tatarian, MD

Department of Surgery, Jefferson Gastroesophageal Center, Sidney Kimmel Medical College at Jefferson University, Philadelphia, Pennsylvania

Ali Tavakkoli, MD, FACS, FRCS

Associate Professor of Surgery, Director, Minimally Invasive and Weight Loss Surgery Fellowship, Co-director, Center for Weight Management and Metabolic Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts

Helen S. Te, MD

Associate Professor of Medicine, Department of Medicine, Center for Liver Diseases, The University of Chicago Medicine, Chicago, Illinois

Ezra N. Teitelbaum, MD, MEd

Foregut Surgery Fellow, Providence Portland Medical Center, Portland, Oregon

Charles A. Ternent, MD, FACS

Section of Colon and Rectal Surgery, Creighton University School of Medicine, University of Nebraska College of Medicine, Omaha, Nebraska

Jon S. Thompson, MD

Professor of Surgery, University of Nebraska Medical Center, Omaha, Nebraska

Iain Thomson, MBBS, FRACS

Senior Lecturer, University of Queensland; Upper Gastrointestinal and Soft Tissue Unit, Princess Alexandra Hospital, Brisbane, Queensland, Australia

Alan G. Thorson, MD, FACS

Clinical Professor of Surgery, Creighton University School of Medicine, University of Nebraska College of Medicine, Omaha, Nebraska

Chad M. Thorson, MD, MSPH

Pediatric Surgery Fellow, Stanford University, Palo Alto, California

Crystal F. Totten, MD

Department of Surgery, University of Kentucky College of Medicine, Lexington, Kentucky

Mark J. Truty, MD, MsC, FACS

Assistant Professor, Mayo Clinic, Rochester, Minnesota

Susan Tsai, MD, MHS

Associate Professor of Surgical Oncology, Department of Surgery, Medical College of Wisconsin, Milwaukee, Wisconsin

Jennifer Tseng, MD

Surgical Oncology Fellow, The University of Chicago, Chicago, Illinois

Tom Tullius, MD

Department of Radiology, The University of Chicago Medicine, Chicago, Illinois

Andreas G. Tzakis, MD, PhD

Director, Transplant Center, Cleveland Clinic Florida, Weston, Florida

J.J.B. van Lanschot, MD, PhD

Professor, Department of Surgery, Erasmus MC–University Medical Center Rotterdam, Rotterdam, The Netherlands

Hjalmar C. van Santvoort, MD, PhD

Department of Surgery, St. Antonius Hospital, Nieuwegein, The Netherlands

Hans Van Veer, MD

Joint Clinical Head, Department of Thoracic Surgery, University Hospital Leuven, Leuven, Belgium

Jorge A. Vega Jr., MD

Department of Surgery, University of South Florida Morsani College of Medicine, Tampa, Florida

Vic Velanovich, MD

Professor, Department of Surgery, University of South Florida Morsani College of Medicine, Tampa, Florida

Sarah A. Vogler, MD, MBA

Clinical Assistant Professor of Surgery, University of Minnesota, Minneapolis, Minnesota

Huamin Wang, MD, PhD

Professor of Pathology, The University of Texas MD Anderson Cancer Center, Houston, Texas

Mark A. Ward, MD

Minimally Invasive Surgery Fellow, Gastrointestinal and Minimally Invasive Surgery, The Oregon Clinic, Portland, Oregon

Brad W. Warner, MD

Division of Pediatric Surgery, St. Louis Children's Hospital, St. Louis, Missouri

Susanne G. Warner, MD

Assistant Professor of Surgery, City of Hope National Medical Center, Duarte, California

Thomas J. Watson, MD, FACS

Professor of Surgery, Georgetown University School of Medicine; Regional Chief of Surgery, MedStar Washington, Washington, D.C.

Irving Waxman, MD

Sara and Harold Lincoln Thompson Professor of Medicine, Director of the Center for Endoscopic Research and Therapeutics, The University of Chicago Medicine and Biological Sciences, Chicago, Illinois

Carissa Webster-Lake, MD

University of Connecticut, Farmington, Connecticut

Benjamin Wei, MD

Assistant Professor, Division of Cardiothoracic Surgery, University of Alabama-Birmingham Medical Center, Birmingham, Alabama

Martin R. Weiser, MD

Stuart H.Q. Quan Chair in Colorectal Surgery, Department of Surgery, Memorial Sloan Kettering Cancer Center; Professor of Surgery, Weill Cornell Medical College, New York, New York

Dennis Wells, MD

Resident in Thoracic Surgery, Department of Surgery, University of Cincinnati College of Medicine, Cincinnati, Ohio

Katerina Wells, MD, MPH

Director of Colorectal Research, Baylor University Medical Center; Adjunct Assistant Professor, Texas A&M Health Science Center, Dallas, Texas

Mark Lane Welton, MD, MHCM

Chief Medical Officer, Fairview Health Services, Minneapolis, Minnesota

Yuxiang Wen, MD

General Surgery, Cleveland Clinic Florida, Weston, Florida

Mark R. Wendling, MD

Acting Instructor and Senior Fellow, Advanced Minimally Invasive Surgery, CVES, Division of General Surgery, University of Washington, Seattle, Washington

Hadley K.H. Wesson, MD

Assistant Professor of Surgery, The Johns Hopkins Hospital, Baltimore, Maryland

Steven D. Wexner, MD, PhD(Hon)

Director, Digestive Disease Center, Chair, Department of Colorectal Surgery, Cleveland Clinic Florida, Weston, Florida

Rebekah R. White, MD

Associate Professor of Surgery, University of California, San Diego, La Jolla, California

Charles B. Whitlow, MD, FACS, FASCRS

Chairman, Department of Colon and Rectal Surgery, Ochsner Clinic Foundation, New Orleans, Louisiana

B.P.L. Wijnhoven, MD, PhD

Department of Surgery, The Erasmus University Medical Center, Rotterdam, The Netherlands

Justin Wilkes, MD

Department of Surgery, Maine Medical Center, Portland, Maine; Research Fellow, Department of Surgery, University of Iowa, Iowa City, Iowa

Rickesha L. Wilson, MD

General Surgical Resident, Department of Surgery, University of Connecticut, Farmington, Connecticut

Piotr Witkowski, MD, PhD

Associate Professor of Surgery, Department of Surgery, The University of Chicago, Chicago, Illinois

Christopher L. Wolfgang, MD, PhD

Chief, Hepatobiliary and Pancreatic Surgery, Professor of Surgery, Pathology, and Oncology, The Johns Hopkins Hospital, Baltimore, Maryland

Stephanie G. Worrell, MD

Surgery, Keck School of Medicine of the University of Southern California, Los Angeles, California

Jian Yang, MD

Department of Liver Transplantation Center, West China Hospital of Sichuan University, Chengdu, Sichuan Province, China

Charles J. Yeo, MD, FACS

Samuel D. Gross Professor and Chair, Department of Surgery, Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, Pennsylvania

Ching Yeung, MD

Thoracic Surgery Fellow, University of Ottawa, The Ottawa Hospital—General Campus, Ottawa, Canada

Evan E. Yung, MD

Fellow in Surgical Pathology, Los Angeles County + University of Southern California Medical Center, Los Angeles, California

Syed Nabeel Zafar, MD MPH

Chief Resident, Department of Surgery, Howard University Hospital, Washington, D.C.

Giovanni Zaninotto, MD

Professor, Department of Surgery and Cancer, Imperial College, London, United Kingdom

Herbert Zeh III, MD

Professor of Surgery, Division of Surgical Oncology, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania

Joerg Zehetner, MD, MMM, FACS

Adjunct Associate Professor of Surgery, Klinik Beau-Site Hirslanden, Berne, Switzerland

Michael E. Zenilman, MD

Professor of Surgery, Weill Cornell Medicine; Chair, Department of Surgery, NewYork-Presbyterian Brooklyn Methodist Hospital, Brooklyn, New York

Pamela Zimmerman, MD

Associate Professor of Vascular and Endovascular Surgery, West Virginia University, Morgantown, West Virginia

Gregory Zuccaro Jr., MD

Department of Gastroenterology and Hepatology, Cleveland Clinic, Cleveland, Ohio

Preface

The time has come to release the eighth edition of the classic textbook *Shackelford's Surgery of the Alimentary Tract*. This publication has served as an important resource for surgeons, internists, gastroenterologists, residents, medical students, and other medical professionals over the past 61 years. I hope that you will find the eighth edition brimming with new information, beautifully illustrated, up to date, and educationally fulfilling.

BRIEF HISTORY

The first edition of *Surgery of the Alimentary Tract* was written solely by Dr. Richard T. Shackelford, a Baltimore surgeon, and was published in 1955. Following the success of the first edition, the book's publisher, W.B. Saunders Company, urged Dr. Shackelford to produce a second edition. Considerable time passed. A second edition was released, as separate five-volume tomes, between 1978 and 1986, with Dr. Shackelford enlisting the assistance of Dr. George D. Zuidema, the Chairman of the Department of Surgery at Johns Hopkins, as co-editor. It was the second edition that served as my "bible" for alimentary tract diseases during my surgical residency and early faculty appointment.

The third edition, edited by Dr. Zuidema, was published as a five-volume set in 1991 and proved to be a major tour de force. The field of alimentary tract surgery had advanced, new research findings were included in the edition, and emerging techniques were illustrated. For the third edition, Dr. Zuidema enlisted the help of a guest editor for each of the five volumes.

The fourth edition, again headed by Dr. Zuidema, was published in 1996 and remained encyclopedic in scope, breadth, and depth of coverage. The textbook had become a classic reference source for surgeons, internists, gastroenterologists, and other health care professionals involved in the care of patients with alimentary tract diseases.

The fifth edition was published in 2002. At that time, Dr. Zuidema asked me to join him as a co-editor. The fifth edition remained a five-volume set, and it was filled with new operative techniques, advances in molecular biology, and noninvasive therapies. It marked progress in the co-management of patients by open surgical, laparoscopic surgical, and endoscopic techniques.

In 2007, the sixth edition of *Shackelford's Surgery of the Alimentary Tract* was published. The look of the sixth edition was changed. The book went from five volumes to two volumes with the deletion of outdated material, and it included a four-color production scheme, emphasized new procedures, and focused on advances in technology. In 2012, the seventh edition was published.

THE EIGHTH EDITION

The eighth edition maintains the exterior changes and look of the sixth and seventh editions. However, the

eighth edition has been carefully planned by me and the four expert section editors to represent the current state of alimentary tract surgery as practiced throughout the world. This edition has been completed with an enormous amount of assistance from my four colleagues, who have served as editors for the four major sections of the book. These section editors have worked tirelessly, planning, organizing, and developing this massive textbook. They have incorporated numerous changes in surgical practice, operative techniques, and noninvasive therapies within the text. Although each area does retain sections on anatomy and physiology, the numerous advances in genomics, proteomics, laparoscopic techniques, and robotics are included. The eighth edition includes the contributions of two new and two retained section editors from the seventh edition, providing both innovation and stability.

Section I, Esophagus and Hernia, is now edited by Dr. Steven R. DeMeester, a Professor of Surgery at the University of Southern California, in Los Angeles. Dr. DeMeester is a nationally and internationally known expert who brings his detailed knowledge of the esophagus and esophageal diseases to the textbook. Dr. DeMeester is the son of Dr. Tom DeMeester, a legendary individual who has made numerous contributions to the field. Steve has enlisted new authors for his chapters and has put together a spectacular section on esophageal diseases, including pathology and ambulatory diagnostics, extensive sections on gastroesophageal reflux disease, esophageal motility disorders, and esophageal neoplasia.

Dr. David W. McFadden remains as the editor for Section II, Stomach and Small Intestine. Dr. McFadden works at the University of Connecticut in Farmington, Connecticut, serving as the Professor and Chairman of the Department of Surgery and the Surgeon in Chief of their health system. Dr. McFadden is an expert in alimentary tract diseases, surgical research, and education. He served for many years as the co-editor-in-chief of the *Journal of Surgical Research*, and he has served as the president of the Society for Surgery of the Alimentary Tract. He has done a superb job of enlisting many new chapter authors so as to present an updated section regarding the luminal structures of the upper gastrointestinal system. Dr. McFadden's section is an outstanding contribution to this area.

For Section III, Pancreas, Biliary Tract, Liver, and Spleen, we have retained our section editor, Dr. Jeffrey B. Matthews, the Dallas B. Phemister Professor and Chairman of the Department of Surgery at the University of Chicago, in Chicago, Illinois. Dr. Matthews' surgical career has focused on diseases of the nonluminal structures of the alimentary tract, and he has done a superb job in enlisting new contributors and reorganizing this section. Dr. Matthews' credentials include serving as the editor-in-chief of the *Journal of Gastrointestinal Surgery*, and he is also a recent past president of the Society for Surgery of the Alimentary Tract. This section serves as an outstanding contribution to the field.

Finally, Section IV, Colon, Rectum, and Anus, has been designed and reorganized by Dr. James W. Fleshman, the Seeger Professor and Chairman of the Department of Surgery at Baylor University Medical Center. Dr. Fleshman is an internationally known figure in his field, and his section has been totally reorganized. Included are various new developments in the field, updates on pelvic floor anatomy and physiology, new therapies for inflammatory bowel disease, increased emphasis on laparoscopic interventions, and new chapters dealing with the topics not previously presented.

ACKNOWLEDGMENTS

The eighth edition would have been impossible to complete without the expertise, dedication, and hard work of each of these four expert section editors. They have been helped immensely by their colleagues, staff, and all the chapter contributors. I would like to thank each of these section editors for their vision, dedication, expertise, and incredible hard work in bringing this project to fruition.

As is often the case with printed works of this size, hundreds of individuals have contributed chapters to this edition. In fact, hundreds of contributors are listed

in the contributors section. We understand how difficult it is to produce superb chapters, and I wish to recognize these individuals and thank them for their dedication and commitment. Most of these contributors are nationally and internationally known leaders in their fields. I am deeply indebted to them for sharing their knowledge and enthusiasm about their topic, culminating in an outstanding overall product.

I would also like to thank the publishing team at Elsevier, who again have been instrumental in making this edition a reality. My thanks go out to Michael Houston, Mary Hegeler, Amanda Mincher, and many others who have been involved in overseeing this project. This edition represents an enormous amount of new work, and thousands of hours have been spent on its production. These professionals have made it a labor of love to work on this project.

Finally, I must thank individuals who have helped me during this new edition process over the past three years. Here in my office at Thomas Jefferson University, accolades go out to Claire Reinke, Dominique Viccharelli, and Laura Mateer who have been outstanding assistants in bringing this work to fruition.

Charles J. Yeo, MD

Anatomy and Physiology of the Esophagus

CHAPTER

1

Esophageal Sphincters in Health and Disease

Karl Hermann Fuchs

Benjamin Babic

Hans Friedrich Fuchs

The esophagus is a muscular tube connecting the mouth with the stomach. The main function of the esophagus is transport of fluids and food to ensure regular nutrition of the body. At the proximal and distal end of the tube, special boundaries are necessary to fulfill complex functional tasks such as swallowing, belching, and vomiting and allowing breathing and coughing, while preventing substantial reflux of gastric contents into the esophagus. The proximal part of the esophagus and its upper esophageal sphincter (UES) comprise mainly striated musculature.¹ In the esophageal corpus, a few centimeters below the UES, the structure switches through a zone of mixed striated-smooth muscle to the distal esophagus including the lower esophageal sphincter (LES) with complete smooth muscle structures. The complex function of the two sphincters is regulated and influenced by neural innervations, pressure systems, hormonal and chemical influences, and external and possible psychological factors.

UPPER ESOPHAGEAL SPHINCTER IN HEALTH

SWALLOWING PROCESS

The UES is involved in the swallowing process. This process is complex and requires a number of important features to temporarily change the pathway of breathing air between the mouth, nose, pharynx, and the trachea into the channel for passing liquid and food farther into the esophagus.

The main anatomic structures of the upper boundary of the esophagus are the cricopharyngeal muscle connected to the cricoid cartilage. Because there is no circular symmetric muscle structure, but instead a ventral cartilage with lateral and dorsal muscular parts, the resulting pressure profile of the UES is not symmetric. It is important to note that the anatomic relations functionally change during swallowing. The UES moves upward approximately 1 cm because of the laryngeal upward swing. The innervation of the UES is mainly achieved by the vagus nerve and, to a lesser extent, by cranial nerves IX and XII.¹

Swallowing is a complex process and the UES is involved in the pharyngeal phase, which occurs later in the swallowing process. Depending on the respective author,

swallowing can be described in three to six different phases.²⁻⁶ Three main phases are often differentiated: the oral, pharyngeal, and esophageal phase.

In the oral phase, the tongue and the surrounding structures of the pharynx, the soft and hard palate, and the closed glossopalatal area form a bolus (Fig. 1.1). This process is started by will of the individual. The first step of bolus formation is performed by the soft palate and the posterior aspect of the tongue. The second component of the oral phase is the upward movement of the soft palate toward the hard palate, closing the nasopharynx, and the upward swing of the hyoid bone more ventrally.

When the tongue creates more pressure on the bolus toward the soft and hard palates, the bolus is propelled through the glossopalatal opening and enters the pharyngeal area, thus representing the transition to the pharyngeal phase (Fig. 1.2). The sequences of the pharyngeal phase happen involuntarily. In health, the most important part of the process is the well-coordinated closure of the airway during the passage of the bolus. The nasopharyngeal area is closed by the soft palate and the posterior pharyngeal wall. The muscles of the floor of the mouth pull the hyoid bone, and subsequently the larynx and cricoid, anteriorly and upward, thus allowing the epiglottis to flip downward and close off the airways.

The constrictor pharyngeal muscle contracts, and the UES is opened by approximately 1 second of relaxation. The bolus leaves the pharyngeal area, moves through the hypopharynx, and into the esophagus. The esophageal phase begins as the bolus enters the proximal esophagus through the opened cricopharyngeal sphincter (Fig. 1.3). The peristaltic contractions take over propulsion of the bolus and assist gravity in transporting the bolus through the esophageal corpus. Finally, all structures return to their resting positions, and the airway is opened again as the UES closes.

ASSESSMENT OF THE UPPER ESOPHAGEAL SPHINCTER

The UES comprises cricoid cartilage at the ventral border and cricopharyngeal muscle toward its lateral and posterior borders.¹ This structure creates the asymmetric pressure

ABSTRACT

Introduction: The esophagus is a muscular tube connecting the mouth with the stomach. The main function of the esophagus is the transport of fluids and food to ensure regular nutrition of the body. At the proximal and distal end of the tube, special boundaries are necessary to fulfill complex functional tasks such as swallowing, belching, and vomiting and allowing breathing and coughing, while preventing substantial reflux of gastric contents into the esophagus.

Structures and Function in Health and Disease: This chapter focuses on the upper esophageal sphincter (UES) and the lower esophageal sphincter (LES). The complex functions of the two sphincters are regulated and influenced by neural innervations, pressure systems, hormonal and chemical influences, and external and possible psychological factors. The functional assessment is usually performed by radiographic studies and manometric techniques. There are many disorders that can cause cervical or oropharyngeal dysphagia. This includes myogenic, neurogenic, iatrogenic, mechanical, and psychogenic causes, as well as idiopathic dysfunctions of the UES.

The LES structure is incorporated in the distal esophagus. The major function is the proximal closure of the gastric reservoir to prevent reflux of substantial amounts of gastric contents back into the esophagus. This is important because gastric juice can be toxic for the esophageal mucosa. The major functional finding at the distal esophagus is a high-pressure zone. The most frequent failure of the LES is a weakening causing increased gastroesophageal reflux.

KEYWORDS

Esophagus, upper esophageal sphincter, lower esophageal sphincter, dysphagia, myotomy, achalasia, gastroesophageal reflux disease.

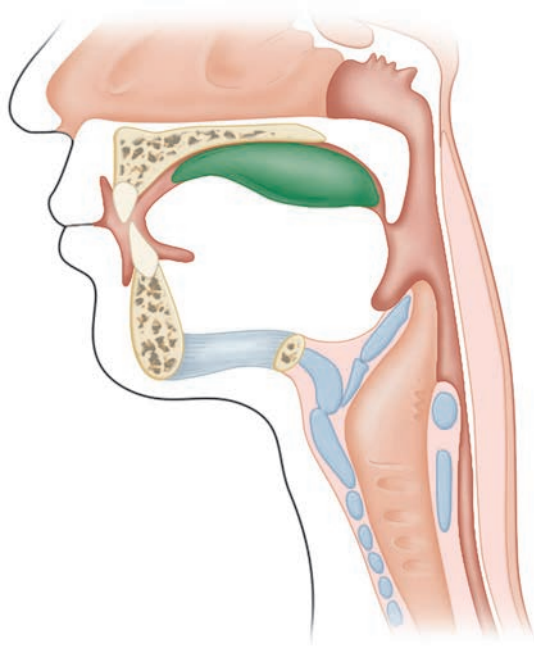


FIGURE 1.1 The swallowing process: The tongue has formed a bolus between the ventral part of the tongue and its posterior part against the soft palate.

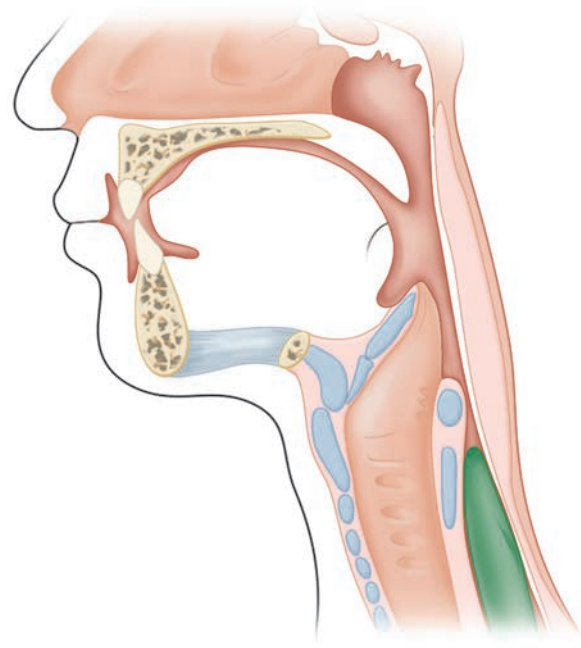


FIGURE 1.3 The swallowing process: The upper esophageal sphincter is fully relaxed for a short time in which the bolus passes into the proximal esophagus, where it is pushed farther by gravity and esophageal peristalsis. The larynx and epiglottis then resume their resting positions.

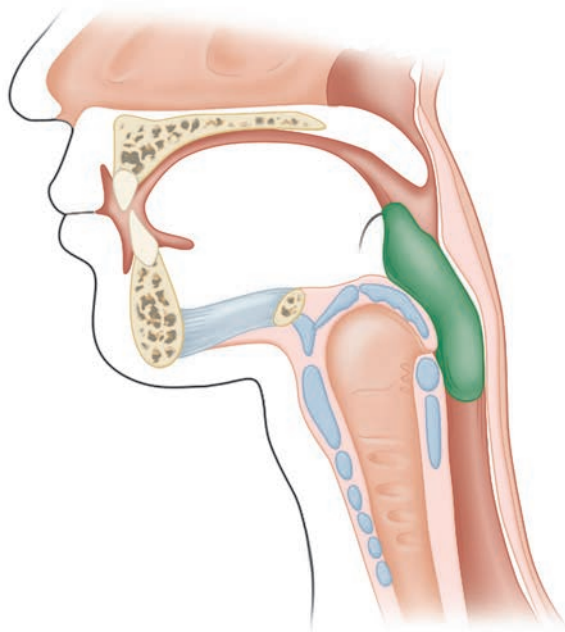


FIGURE 1.2 The swallowing process: The soft palate is lifted upward toward the hard palate, thus closing off the nasopharynx. The tongue pushes the bolus backward into the pharynx. The hyoid bone and the larynx are pulled upward, thus causing the epiglottis to flip down and close off the trachea. The upper esophageal sphincter relaxes to prepare the passage of the bolus.

profile of the sphincter. Functional assessment of the UES is usually performed by radiographic studies or manometric techniques.²⁻⁵ Routine radiographic investigations by barium swallow provide insight into the swallowing process and demonstrate pathologic anatomic alterations such as a Zenker diverticulum. However, a subtle functional failure of the regular swallowing process—for example, as a result of a discrete neurologic defect causing cervical dysphagia—might be missed. High-speed photography using a specialized kinematographic analysis may be necessary to describe dysfunctions in detail.⁴ Video documentation allows for repetitive visualization and analysis of the findings.

Clinical assessment of symptoms is necessary to clearly determine the underlying functional problem and the impact of the disorder on the patient's quality of life. Endoscopy is important in detecting or excluding malignant disease and obstruction.

Pharyngoesophageal manometric studies can demonstrate the physiologic swallowing function through the UES and possibly its pathologic changes.^{5,7-10} The UES is asymmetric and changes its pressure profile in milliseconds during swallowing. Consequently, traditional perfusion manometry with a few recorded openings and manometry probes with only a few solid-state pressure transducers cannot demonstrate subtle pressure increases or relaxations or coordination features along the vertical axis. Manometry systems with multiple recording sites along the probe and circumferentially on the probe are necessary to record sufficient data to fully describe the complex process of