The SAGES Manual of Acute Care Surgery

David Renton Robert Lim Alberto S. Gallo Prashant Sinha Editors





The SAGES Manual of Acute Care Surgery

The SAGES University Masters Program Series Editor-in-Chief: Brian Jacob

David Renton • Robert Lim Alberto S. Gallo • Prashant Sinha Editors

The SAGES Manual of Acute Care Surgery





Editors

David Renton Division of General Surgery The Ohio State University Columbus, OH USA

Alberto S. Gallo Baptist Health Louisville Louisville, KY USA Robert Lim Tripler Army Medical Center Surgery Honolulu, HI USA

Prashant Sinha NYU Langone Hospital – Brooklyn NYU Langone Health New York, NY USA

ISBN 978-3-030-21958-1 ISBN 978-3-030-21959-8 (eBook) https://doi.org/10.1007/978-3-030-21959-8

© Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) 2020 This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG

The registered company address is: Gewerbestrasse 11,6330 Cham, Switzerland

Preface

Acute care surgery has changed a great deal in the past decade. While the nature of surgical emergencies is not different, the approaches taken by the surgeon to correct them has evolved to include different treatment options, including minimally invasive techniques, endoscopic options, and new medical therapies. The experts at SAGES have pooled their knowledge and have created this manual to describe the most up-to-date treatment options for the emergent surgical patient. This manual will cover subjects such as minimally invasive surgery in the trauma setting, surgical emergencies in the bariatric patient, and treatment of emergencies in pregnant, cirrhotic, and anticoagulated patients. We hope that our collective knowledge will help educate surgeons to bring the optimum care to the patients that they are called to see in their emergency rooms.

Columbus, OH, USA Honolulu, HI, USA Louisville, KY, USA New York, NY, USA David Renton Robert Lim Alberto S. Gallo Prashant Sinha

Contents

| 1 | Acute Care Pathway |
|----|---|
| | Daniel B. Jones, Linda Schultz, and Brian P. Jacob |
| 2 | Appendicitis 15 Joshua J. Weis and Elizabeth C. Hamilton |
| 3 | Cholecystectomy |
| 4 | Foregut and Hindgut Perforations 57 Prashant Sinha and Michael Timoney |
| 5 | Small Bowel Obstruction |
| 6 | Colon Emergencies |
| 7 | Acute Gastrointestinal Bleeding |
| 8 | Emergency Hernia Surgery: What to Know When Evaluating a Patient with an Incarcerated Hernia 185 Brent D. Matthews and Caroline E. Reinke |
| 9 | Bariatrics |
| 10 | Paraesophageal Hernia |

| 11 | Necrotizing Pancreatitis |
|-------|---|
| 12 | Acute Complications of Inflammatory Bowel Disease 247 Kenneth Bogenberger, Robert Conrad, and Suzanne Gillern |
| 13 | Minimally Invasive Techniques in Trauma: Above and Below the Diaphragm |
| 14 | The Difficult Patient |
| 15 | Incorporating ACS into Your Practice |
| 16 | The Future of Acute Care Surgery: From Divergence to Emergence and Convergence |
| Index | |

Contributors

Nawar A. Alkhamesi, MD, PhD, FRCS Department of Surgery, Schulich School of Medicine and Dentistry, Western University and University Hospital, London Health Sciences Centre, London, ON, Canada

Alexi Bloom, MD Department of Surgery, Houston Methodist Hospital, Houston, TX, USA

Matthew Bloom, MD, MSEE, FACS Department of Surgery, Division of Trauma and Acute Care Surgery, Cedars-Sinai Medical Center, Los Angeles, CA, USA

Kenneth Bogenberger, MD General Surgery, Tripler Army Medical Center, Honolulu, HI, USA

Daniel J. Bonville, DO Acute Care Surgery & Surgical Critical Care, Houston Methodist Hospital, Houston, TX, USA

Department of Surgery, Houston Methodist Specialty Physician Group, Houston, TX, USA

Elliott Brill, MD Stanford University School of Medicine, Stanford, CA, USA

Department of Surgery, Boston University School of Medicine, Boston, MA, USA

Department of General Surgery, Kaiser Permanente, Santa Clara, CA, USA

Courtney Collins, MD Department of Surgery, The Ohio State University Wexler Medical Center, Columbus, OH, USA

Christos Colovos, MD, PhD Department of Surgery, Division of Acute Care Surgery, University of Vermont Larner College of Medicine, Burlington, VT, USA

Robert Conrad, MD General Surgery, Tripler Army Medical Center, Honolulu, HI, USA

Michael W. Cripps, MD Department of Surgery, University of Texas Southwestern Medical Center, Dallas, TX, USA

Paul Deramo, MD Department of Surgery, Methodist Dallas Medical Center, Dallas, TX, USA

Alberto S. Gallo, MD, FACS Baptist Surgical Associates, Baptist Health Louisville, Louisville, KY, USA

Suzanne Gillern, MD Department of Surgery, Tripler Army Medical Center, Honolulu, HI, USA

Weidun Alan Guo, MD Department of Surgery, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, NY, USA

Elizabeth C. Hamilton, MD Department of Surgery, University of Texas Southwestern Medical Center, Dallas, TX, USA

Sara A. Hennessy, MD, FACS Department of Surgery, University of Texas Southwestern Medical Center, Dallas, TX, USA

Brian P. Jacob, MD, FACS Department of Surgery, Mount Sinai Health System, New York, NY, USA

Daniel B. Jones, MD, MS, FACS Office of Technology and Innovation, Minimally Invasive Surgical Services, Bariatric Program, Beth Israel Deaconess Medical Center, Boston, MA, USA

Harvard Medical School, Boston, MA, USA

Brent D. Matthews, MD Department of Surgery, Carolinas Medical Center, Atrium Health, Charlotte, NC, USA

Laura Mazer, MD, MS Department of General Surgery, Stanford University Hospital and Clinics, Stanford, CA, USA

Jennifer A. Minneman, MD Department of Surgery, University of Washington, Seattle, WA, USA

Bradley J. Needleman, MD Center for Minimally Invasive Surgery, The Ohio State University, Wexner Medical Center, Columbus, OH, USA

Brant K. Oelschlager, MD Division of General Surgery, University of Washington, Seattle, WA, USA

Jin Sol Oh, MD Department of Surgery, University of Washington, Seattle, WA, USA

Christopher Pearcy, MD Department of Surgery, Methodist Dallas Medical Center, Dallas, TX, USA

Caroline E. Reinke, MD, MSHP Department of Surgery, Carolinas Medical Center, Atrium Health, Charlotte, NC, USA

H. Alejandro Rodriguez, MD Department of Surgery, University of Washington, Seattle, WA, USA

Jarrett R. Santorelli, MD Department of Surgery, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo, Buffalo, NY, USA

Linda Schultz Society of Gastrointestinal and Endoscopic Surgeons, Boston, MA, USA

Steven D. Schwaitzberg, MD, FACS Department of Surgery, University of Buffalo, Jacobs School of Medicine, Buffalo, NY, USA

Biomedical Sciences, The State University of New York, Buffalo, NY, USA

Nathalie Sela, MD, MSc Department of Surgery, Schulich School of Medicine and Dentistry, Western University and University Hospital, London Health Sciences Centre, London, ON, Canada

Prashant Sinha, MD NYU Langone Hospital – Brooklyn, NYU Langone Health, New York, NY, USA

David P. Sonntag, MD Department of Interventional Radiology, St. Luke's Health System, Boise, ID, USA

Motokazu Sugimoto, MD Department of Hepatobiliary and Pancreatic Surgery, National Cancer Center Hospital East, Kashiwa, Chiba, Japan

Luis R. Taveras, MD Department of Surgery, University of Texas Southwestern Medical Center, Dallas, TX, USA

Michael Timoney, MD NYU Langone Hospital – Brooklyn, NYU Langone Health, New York, NY, USA

L. William Traverso, MD Center for Pancreatic and Liver Disease, St. Luke's Health System, Boise, ID, USA

Michael S. Truitt, MD, FACS Department of Surgery, Methodist Dallas Medical Center, Dallas, TX, USA

Holly B. Weis, MD Department of Surgery, University of Texas Southwestern Medical Center, Dallas, TX, USA

Joshua J. Weis, MD Department of Surgery, University of Texas Southwestern Medical Center, Dallas, TX, USA



Chapter 1 SAGES University MASTERS Program: Acute Care Pathway

Daniel B. Jones, Linda Schultz, and Brian P. Jacob

The Masters Program organizes educational materials along clinical pathways into discrete blocks of content which could be accessed by a surgeon attending the SAGES annual meeting or by logging into the online SAGES University (Fig. 1.1) [1]. The SAGES Masters Program currently has eight pathways including acute care, biliary, bariatrics, colon, foregut, hernia, flexible endoscopy, and robotic surgery (Fig. 1.2). Each path-

Adopted from Jones DB, Stefanidis D, Korndorffer JR, Dimick JB, Jacob BP, Schultz L, Scott DJ. SAGES University Masters Program: a structured curriculum for deliberate, lifelong learning. Surg Endosc. 2017;31(8):3061–71.

D. B. Jones (\boxtimes)

Office of Technology and Innovation, Minimally Invasive Surgical Services, Bariatric Program, Beth Israel Deaconess Medical Center, Boston, MA, USA

Harvard Medical School, Boston, MA, USA e-mail: djones@bidmc.harvard.edu

L. Schultz

Society of Gastrointestinal and Endoscopic Surgeons, Boston, MA, USA

B. P. Jacob

Department of Surgery, Mount Sinai Health System, New York, NY, USA

© Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) 2020

D. Boston et al. (eds.). The SACES Manual of Acute Care

1



FIGURE 1.1 MASTERS Program logo



FIGURE 1.2 MASTER Program Clinical Pathways

way is divided into three levels of targeted performance: competency, proficiency, and mastery (Fig. 1.3). The levels originate from the Dreyfus model of skill acquisition [2], which has five stages: novice, advanced beginner, competency, proficiency, and expertise. The SAGES MASTERS Program is based on the three more advanced stages of skill acquisition: compe-



FIGURE 1.3 MASTERS Program Progression

tency, proficiency, and expertise. Competency is defined as what a graduating general surgery chief resident or Minimally Invasive Surgery (MIS) fellow should be able to achieve; proficiency is what a surgeon approximately 3 years out from training should be able to accomplish; and mastery is what more experienced surgeons should be able to accomplish after several years in practice. Mastery is applicable to SAGES surgeons seeking an in-depth knowledge in a pathway, including the following areas of controversy, outcomes, best practice, and ability to mentor colleagues. Over time, with the utilization of coaching and participation in SAGES courses, this level should be obtainable by the majority of SAGES members. This edition of the *SAGES Manual of Acute Care Surgery* aligns with the current version of the new SAGES University MASTERS Program Acute Care Surgery pathway (Table 1.1).

Acute Care Surgery Curriculum

The key elements of the Acute Care Surgery curriculum include core lectures for the pathway, which provide a 45-minute general overview including basic anatomy, physiology, diagnostic work-up, and surgical management. As of 2018, all lecture content of the annual SAGES meetings are labeled as follows: basic (100), intermediate (200), and advanced (300). This allows attendees to choose lectures that best fit their educational needs. Coding the content additionally facilitates online retrieval of specific educational material, with varying degrees of surgical complexity, ranging from introductory to revisional surgery.