

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Practical Emergency Resuscitation and Critical Care

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Practical Emergency Resuscitation and Critical Care

Edited by

Kaushal Shah, MD

Residency Director for the Emergency Medicine residency at Mount Sinai in New York City,
Chair of the SAEM Trauma Interest Group,
and Chair of the Education Committee for the New York chapter of ACEP

Jarone Lee, MD, MPH

Critical Care Attending
Quality Director, Surgical Critical Care
Division of Trauma, Emergency Surgery, Surgical Critical Care,
Massachusetts General Hospital
Harvard Medical School
Boston, MA, USA

Kamal Medlej, MD

Assistant Professor of Clinical Emergency Medicine,
Department of Emergency Medicine,
American University of Beirut Medical Center, Beirut, Lebanon

Scott D. Weingart, MD

Department of Emergency Medicine at the
Elmhurst Hospital Center; and Associate Professor and the
Director of ED Critical Care at the Mount Sinai School of Medicine, NY, USA



CAMBRIDGE
UNIVERSITY PRESS

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

CAMBRIDGE
UNIVERSITY PRESS

University Printing House, Cambridge CB2 8BS, United Kingdom

Published in the United States of America by Cambridge University Press, New York

Cambridge University Press is part of the University of Cambridge.

It furthers the University's mission by disseminating knowledge in the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org

Information on this title: www.cambridge.org/9781107626850

© Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart 2013

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing agreements, no reproduction of any part may take place without the written permission of Cambridge University Press.

First published 2013

Printed in the United Kingdom by TJ International Ltd. Padstow Cornwall

A catalogue record for this publication is available from the British Library

Library of Congress Cataloguing in Publication data

Practical emergency resuscitation and critical care / [edited by] Kaushal Shah, Jarone Lee, Kamal Medlej, Scott D. Weingart.

p. ; cm.

Includes bibliographical references and index.

ISBN 978-1-107-62685-0 (pbk.)

I. Shah, Kaushal, editor of compilation. II. Lee, Jarone, editor of compilation.

III. Medlej, Kamal, editor of compilation. IV. Weingart, Scott, editor of compilation.

[DNLM: 1. Critical Care—Handbooks. 2. Emergency Medical Services—Handbooks.

3. Resuscitation—Handbooks. WX 39]

RC86.7

616.02'5—dc23

2013022964

ISBN 978-1-107-62685-0 Paperback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

Every effort has been made in preparing this book to provide accurate and up-to-date information which is in accord with accepted standards and practice at the time of publication. Although case histories are drawn from actual cases, every effort has been made to disguise the identities of the individuals involved. Nevertheless, the authors, editors and publishers can make no warranties that the information contained herein is totally free from error, not least because clinical standards are constantly changing through research and regulation. The authors, editors and publishers therefore disclaim all liability for direct or consequential damages resulting from the use of material contained in this book. Readers are strongly advised to pay careful attention to information provided by the manufacturer of any drugs or equipment that they plan to use.

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Contents

<i>List of contributors</i>	<i>page xi</i>
<i>Preface</i>	<i>xxi</i>
<i>List of abbreviations</i>	<i>xxii</i>

Section 1: General critical care

Section editor: Raghu Seethala

1. Shock	1
Kenneth R. L. Bernard	
2. Monitoring	10
Brandy Ferguson	
3. Airway management	17
N. Seth Trueger	
4. Mechanical ventilation	28
Nelson Wong	
5. The boarding ICU patient in the emergency department	35
Robert L. Sherwin and Bram Dolcourt	

Section 2: Trauma

Section editor: Julie Mayglothling

6. General trauma principles	41
Benjamin Schnapp	
7. Severe traumatic brain injury	47
Jacob D. Isserman	
8. Spinal cord trauma	56
Ani Aydin	

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)**vi Contents**

- | | | |
|-----|---|-----|
| 9. | Neck trauma
Vishal Demla | 64 |
| 10. | Thoracic trauma
Samantha Wood | 71 |
| 11. | Solid organ abdominal trauma
Jayaram Chelluri | 82 |
| 12. | Severe pelvic trauma
Jeffrey Pepin | 90 |
| 13. | Compartment syndrome
Katrina L. Harper and Kaushal Shah | 96 |
| 14. | Soft tissue injury: crush injury, arterial injury, and open fractures
Katrina L. Harper and Kaushal Shah | 100 |
| 15. | Burns
Jonathan Friedstat, Jeremy Goverman, and Shawn Fagan | 108 |

Section 3: Neurological emergencies**Section editor: Michael N. Cocchi**

- | | | |
|-----|--|-----|
| 16. | Ischemic strokes
Joshua W. Joseph and Ashley L. Greiner | 115 |
| 17. | Intracranial hemorrhage
Jonathan C. Roberts and Timothy C. Peck | 123 |
| 18. | Status epilepticus
Matthew L. Wong and John W. Hardin | 130 |
| 19. | Acute spinal cord compression
Cristal Cristia and Timothy C. Peck | 134 |

Section 4: Cardiovascular emergencies**Section editor: Todd A. Seigel**

- | | | |
|-----|---|-----|
| 20. | Acute coronary syndrome
Steven C. Rougas | 139 |
| 21. | Tachyarrhythmias
Joshua Jauregui | 146 |

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

22.	Bradyarrhythmias Chad Van Ginkel	153
23.	Post-cardiac arrest care Stephen Hendriksen	158
24.	Acute decompensated heart failure Brandon Maughan	164
25.	Aortic dissection Gregory Hayward	171
26.	Pericarditis and myocarditis Jennifer L. Carey	177
27.	Hypertensive emergencies Nadine Himelfarb	185
28.	Valvular diseases Elena Kapilevich	191

Section 5: Respiratory emergencies**Section editor: Susan Wilcox**

29.	Upper airway emergencies Brian C. Geyer and Susan Wilcox	197
30.	Asthma Andrew Eyre	203
31.	Chronic obstructive pulmonary disease Andrew Eyre	208
32.	Acute respiratory distress syndrome Elisabeth Lessenich	213
33.	Massive hemoptysis Karen A. Kinnaman and Susan Wilcox	218
34.	Pulmonary embolism Liza Gonen Smith	223

Section 6: Gastrointestinal emergencies**Section editor: Ruth Lamm**

35.	Gastrointestinal bleeding Bina Vasantharam and Joel Moll	229
-----	--	-----

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)**viii Contents**

- | | | |
|-----|--|-----|
| 36. | Abdominal aortic aneurysms
Marie Carmelle Tabuteau, Payal Modi, and Ted Stettner | 237 |
| 37. | Acute pancreatitis
John Woodruff and Abigail Hankin | 245 |
| 38. | Fulminant hepatic failure
Heather Meissen and Matthew Nicholls | 253 |
| 39. | Acute mesenteric ischemia
Carolyn Maher Overman and Jeffrey N. Siegelman | 261 |
| 40. | The surgical abdomen
Sarah Fisher and Carla Haack | 268 |
| 41. | Abdominal compartment syndrome
Sarah Fisher and Carla Haack | 274 |
| 42. | Esophageal perforation and mediastinitis
Kathryn A. Seal and Sarvotham Kini | 278 |
| 43. | Small bowel obstruction
Byron Pitts, John Lemos, and Kevin McConnell | 284 |

Section 7: Renal emergencies**Section editor: John E. Arbo**

- | | | |
|-----|---|-----|
| 44. | Acid–base interpretation
Chanu Rhee | 289 |
| 45. | Common electrolyte disorders (sodium, potassium, calcium, magnesium)
John E. Arbo | 299 |
| 46. | Acute kidney injury and emergent dialysis
Feras H. Khan | 314 |
| 47. | Rhabdomyolysis
Jeremy Gonda | 320 |

Section 8: Hematology–oncology emergencies**Section editor: Graham Walker**

- | | | |
|-----|---|-----|
| 48. | Reversal of anticoagulation
Calvin E. Hwang | 325 |
|-----|---|-----|

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

- | | | |
|-----|---|-----|
| 49. | Disseminated intravascular coagulation and thrombotic thrombocytopenic purpura/hemolytic uremic syndrome
Joseph E. Tonna | 330 |
| 50. | Neutropenic fever
Nolan Caldwell | 337 |
| 51. | Tumor lysis syndrome
Casey Grover | 343 |
| 52. | Sickle cell emergencies
Charles Lei | 348 |

Section 9: Infectious disease emergencies**Section editor: Syed S. Ali**

- | | | |
|-----|---|-----|
| 53. | Severe sepsis and septic shock
Syed S. Ali and Laura Medford-Davis | 357 |
| 54. | Pneumonia
Navdeep Sekhon and Calvin Lee | 362 |
| 55. | Meningitis and encephalitis
Nathan Allen and Elizabeth Arrington | 367 |
| 56. | Infective endocarditis
Sandra J. Williams | 371 |
| 57. | Necrotizing soft tissue and skin infections
Jennifer Carnell and Lindsay Oelze | 375 |
| 58. | Complications of human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS)
Zubaid Rafique and Candace Pettigrew | 381 |

Section 10: Endocrine emergencies**Section editor: Brandon Godbout**

- | | | |
|-----|--|-----|
| 59. | Diabetic ketoacidosis and hyperglycemic hyperosmolar state
Benjamin Zabar | 389 |
| 60. | Thyroid storm
Kirill Shishlov | 397 |

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)**x Contents**

61. Adrenal crisis 403
Daniel Rolston
62. Pheochromocytoma 408
Jolene H. Nakao

Section 11: Environmental emergencies**Section editors: Jarone Lee and Kamal Medlej**

63. Anaphylaxis 413
Sebastian Siadecki
64. Hyperthermia 418
Amy Caggiula and Daniel Herbert-Cohen
65. Hypothermia 427
Viral Patel
66. Overdoses 431
Daniel Herbert-Cohen and Daniel J. Lepp

Section 12: End of life**Section editor: Ashley Shreves**

67. Care of the dying patient 451
Ashley Shreves
- Index* 457

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Contributors

Syed S. Ali, MD

Assistant Professor of Medicine, Section of Emergency Medicine, Department of Medicine, and Director of Emergency Critical Care, Ben Taub General Hospital, Baylor College of Medicine, Houston, TX, USA

Nathan Allen, MD, FAAEM

Assistant Professor of Medicine and Medical Ethics, Assistant Residency Program Director, Section of Emergency Medicine, Department of Medicine, Baylor College of Medicine, Houston, TX, USA

John E. Arbo, MD

Assistant Professor of Medicine, Division of Emergency Medicine and Pulmonary Critical Care Medicine, Weill Cornell Medical College, New York Presbyterian Hospital, New York, NY, USA

Elizabeth Arrington, MD

Emergency Medicine Resident, Baylor College of Medicine, Houston, TX, USA

Ani Aydin, MD

Clinical Instructor, Department of Emergency Medicine, Yale-New Haven School of Medicine, New Haven, CT, USA

Kenneth R. L. Bernard, MD, MBA

Emergency Medicine Resident, Massachusetts General Hospital & Brigham and Women's Hospital, Boston, MA, USA

Amy Caggiula, MD

Resident Physician, Department of Emergency Medicine, St Luke's-Roosevelt Hospital Center, New York, NY, USA

Nolan Caldwell, MD

Chief Resident, Stanford/Kaiser Emergency Medicine Residency, Stanford, CA, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

xii Contributors

Jennifer L. Carey, MD

Toxicology Fellow, Department of Emergency Medicine, University of Massachusetts Medical School, Worcester, MA, USA

Jennifer Carnell, MD

Ultrasound Director, Section of Emergency Medicine, Department of Medicine, Baylor College of Medicine, Houston, TX, USA

Jayaram Chelluri, MD

Resident Physician, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, USA

Michael N. Cocchi, MD

Director of Critical Care Quality, Assistant Professor of Medicine, Harvard Medical School, Beth Israel Deaconess Medical Center, Boston, MA, USA

Cristal Cristia, MD

Attending Physician, Department of Emergency Medicine, Beth Israel Deaconess Hospital-Milton, Milton, MA, USA

Vishal Demla, MD

Department of Emergency Medicine, Mount Sinai Medical Center, New York, NY, USA

Bram Dolcourt, MD

Assistant Professor of Emergency Medicine, Wayne State University School of Medicine, Detroit, MI, USA

Andrew Eyre, MD

Resident, Harvard Affiliated Emergency Medicine Residency, Brigham and Women's Hospital & Massachusetts General Hospital, Boston, MA, USA

Shawn Fagan, MD

Medical Director, Division of Burns, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

Brandy Ferguson, MD

Resident Physician, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, USA

Sarah Fisher, MD

Resident, Department of General Surgery, Emory University, Atlanta, GA, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Jonathan Friedstat, MD

Resident Physician, Plastic and Reconstructive Surgery, University of North Carolina, Chapel Hill, NC, USA

Brian C. Geyer, MD, PhD, MPH

Emergency Medicine Resident, Harvard Affiliated Emergency Medicine Residency, Massachusetts General Hospital & Brigham and Women's Hospital, Boston, MA, USA

Brandon Godbout, MD

Attending Physician, Department of Emergency Medicine, Director of Simulation Medicine, Lenox Hill Hospital, New York, NY, USA

Jeremy Gonda, MD

Critical Care Fellow, Department of Critical Care Medicine, Stanford University School of Medicine, Stanford, CA, USA

Jeremy Goverman, MD

Attending Surgeon, Division of Burns, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

Ashley L. Greiner, MD, MPH

Resident Physician, Beth Israel Deaconess Medical Center, Boston, MA, USA

Casey Grover, MD

Chief Resident, Stanford/Kaiser Emergency Medicine Residency, Stanford, CA, USA

Carla Haack, MD

Assistant Professor of General and GI Surgery, Emory University, Atlanta, GA, USA

Abigail Hankin, MD

Clinical Instructor of Emergency Medicine, Tufts University School of Medicine, Attending Physician, Maine Medical Center, Portland, ME, USA

John W. Hardin, MD

Resident Physician, Harvard Affiliated Emergency Medicine Residency, Beth Israel Deaconess Medical Center, Boston, MA, USA

Katrina L. Harper, MD

Mount Sinai School of Medicine, New York, NY, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

xiv Contributors

Gregory Hayward, MD

Department of Emergency Medicine, Rhode Island Hospital, Providence, RI, USA

Stephen Hendriksen, MD

Resident Physician, Department of Emergency Medicine, Alpert Medical School of Brown University, Providence, RI, USA

Daniel Herbert-Cohen, MD

Resident Physician, Department of Emergency Medicine, St Luke's-Roosevelt Hospital Center, New York, NY, USA

Nadine Himelfarb, MD

Memorial Hospital of Rhode Island, Pawtucket, RI, USA

Calvin E. Hwang, MD

Resident Physician, Stanford/Kaiser Emergency Medicine Residency, Stanford, CA, USA

Jacob D. Isserman, MD

Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, USA

Joshua Jauregui, MD

University of Washington School of Medicine, Division of Emergency Medicine, Seattle, WA, USA

Joshua W. Joseph, MD

Resident in Emergency Medicine, Beth-Israel Deaconess – Harvard Affiliated Emergency Medicine Residency, Boston, MA, USA

Elena Kapilevich, MD

Resident Physician, Department of Emergency Medicine, Alpert Medical School of Brown University, Providence, RI, USA

Feras H. Khan, MD

Assistant Professor, Department of Internal Medicine, Division of Pulmonary and Critical Care Medicine, Department of Emergency Medicine, University of Maryland, Baltimore, MD, USA

Sarvotham Kini, MD, FACEP, FACS

Staff Physician, Atlanta VA Medical Center, Decatur, GA, USA

Karen A. Kinnaman, MD

Resident, Harvard Affiliated Emergency Medicine Program, Partners Healthcare, Boston, MA, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Ruth Lamm, MD, FACEP

Assistant Professor of Emergency Medicine, Assistant Professor of Surgery, Emory University School of Medicine, Department of Emergency Medicine, Atlanta, GA, USA

Calvin Lee, MD

Resident Physician, Harvard Affiliated Emergency Medicine Residency, Massachusetts General Hospital & Brigham and Women's Hospital, Boston, MA, USA

Jarone Lee, MD, MPH

Critical Care Attending, Quality Director, Surgical Critical Care, Division of Trauma, Emergency Surgery, Surgical Critical Care, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

Charles Lei, MD

Chief Resident, Stanford/Kaiser Emergency Medicine Residency, Stanford, CA, USA

John Lemos, MD

Attending Physician, Department of Emergency Medicine, Emory University, Atlanta, GA, USA

Daniel J. Lepp, MD

Resident in Emergency Medicine, St. Luke's-Roosevelt Hospital Center, New York, NY, USA

Elisabeth Lessenich, MD, MPH

Emergency Medicine Resident, Massachusetts General Hospital & Brigham and Women's Hospital, Boston, MA, USA

Brandon Maughan, MD, MHS

Emergency Medicine Resident, Alpert Medical School of Brown University, Providence, RI, USA

Julie Mayglothling, MD, FACEP

Associate Professor, Department of Emergency Medicine, Department of Surgery, Division of Trauma/Critical Care, Virginia Commonwealth University, Richmond, VA, USA

Kevin McConnell, MD

Assistant Professor of Surgery, Acute and Critical Care Surgery, Emory University School of Medicine, Atlanta, GA, USA

Laura Medford-Davis, MD

Emergency Medicine Resident, Baylor College of Medicine, Houston, TX, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

xvi Contributors

Kamal Medlej, MD

Assistant Professor of Clinical Emergency Medicine, Department of Emergency Medicine, American University of Beirut Medical Center, Beirut, Lebanon

Heather Meissen, ACNP-BC

Director of NP/PA Critical Care Residency, Surgical Intensive Care Unit, Emory University Hospital, Emory Healthcare, Atlanta, GA, USA

Payal Modi, MD

Resident Physician, Department of Emergency Medicine, Alpert Medical School of Brown University, Providence, RI, USA

Joel Moll, MD, FACEP

Assistant Professor of Emergency Medicine, Director of Emergency Medicine Administration Fellowship, Director of Academic and Clinical Integration and Assistant Residency Director, Department of Emergency Medicine, Emory University School of Medicine, Atlanta, GA, USA

Jolene H. Nakao, MD, MPH

Resident Physician, Department of Emergency Medicine, St. Luke's-Roosevelt Hospital Center, New York, NY, USA

Matthew Nicholls, ACNP

Surgical Intensive Care Unit, Emory University Hospital, Atlanta, GA, USA

Lindsay Oelze, MD

Resident Physician, Baylor College of Medicine, Section of Emergency Medicine, Department of Medicine, Houston, TX, USA

Carolyn Maher Overman, MD

Emergency Medicine Resident, Emory University School of Medicine, Atlanta, GA, USA

Viral Patel, MD

Emergency Medicine Resident, St. Luke's-Roosevelt Hospital Center, New York, NY, USA

Timothy C. Peck, MD

Chief Resident, Harvard Affiliated Emergency Medicine Residency, Beth Israel Deaconess Medical Center, Boston, MA, USA

Jeffrey Pepin, MD

Resident Director of Medical Student/Intern Academic Affairs, Department of Emergency Medicine, Lincoln Medical and Mental Health Medical Center, Bronx, NY, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Candace Pettigrew, MD

Resident Physician, Baylor College of Medicine, Section of Emergency Medicine,
Department of Medicine, Houston, TX, USA

Byron Pitts, MD

Resident Physician, Department of Emergency Medicine, Emory University,
Atlanta, GA, USA

Zubaid Rafique, MD

Assistant Professor of Medicine, Section of Emergency Medicine, Department of
Medicine, Baylor College of Medicine, Houston, TX, USA

Chanu Rhee, MD

Infectious Disease Fellow, Massachusetts General Hospital & Brigham and
Women's Hospital, Boston, MA, USA

Jonathan C. Roberts, MD

Attending Physician, Department of Emergency Medicine, Beth Israel Deaconess
Hospital-Milton, Milton, MA, USA

Daniel Rolston, MD, MS

Chief Resident, St. Luke's-Roosevelt Hospital Center, New York, NY, USA

Steven C. Rougas, MD

Department of Emergency Medicine, Warren Alpert Medical School of Brown
University, Providence, RI, USA

Benjamin Schnapp, MD

Resident Physician, Department of Emergency Medicine, Mount Sinai Medical
Center, New York, NY, USA

Kathryn A. Seal, MD

Resident Physician, Emory University, Atlanta, GA, USA

Raghu Seethala, MD

Emergency Medicine and Critical Care Attending, Brigham and Women's Hospital,
Harvard Medical School, Boston, MA, USA

Todd A. Seigel, MD

Assistant Professor of Emergency Medicine, Warren Alpert Medical School of
Brown University, Providence, RI, USA

Navdeep Sekhon, MD

Assistant Professor, Baylor College of Medicine, Houston, TX, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

xviii Contributors

Kaushal Shah, MD

Residency Program Director, Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, USA

Robert L. Sherwin, MD

Assistant Professor of Emergency Medicine, Wayne State University School of Medicine, Detroit, MI, USA

Kirill Shishlov, MD, MPH

Resident Physician, Department of Emergency Medicine, St Luke's-Roosevelt Hospital Center, New York, NY, USA

Ashley Shreves, MD

Assistant Professor, Department of Emergency Medicine, Brookdale Department of Geriatrics and Palliative Medicine, Mount Sinai School of Medicine, New York, NY, USA

Sebastian Siadecki, MD

Resident Physician, Department of Emergency Medicine, St Luke's-Roosevelt Hospital Center, New York, NY, USA

Jeffrey N. Siegelman, MD

Assistant Professor of Emergency Medicine, Emory University, Atlanta, GA, USA

Liza Gonen Smith, MD

Assistant Professor of Emergency Medicine, Tufts University School of Medicine, Attending Physician, Baystate Medical Center, Springfield, MA, USA

Ted Stettner, MD

Assistant Professor of Emergency Medicine, Emory University, Atlanta, GA, USA

Marie Carmelle Tabuteau, DO, MBA

Emergency Medicine Resident, Emory University, Atlanta, GA, USA

Joseph E. Tonna, MD

Resident Physician, Stanford/Kaiser Emergency Medicine Residency, Stanford, CA, USA

N. Seth Trueger, MD

Health Policy Fellow and Adjunct Instructor in Emergency Medicine, George Washington University Hospital, Washington, DC, USA

Chad Van Ginkel, MD, MPH

Resident Physician, Department of Emergency Medicine, Alpert Medical School of Brown University, Providence, RI, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Bina Vasantharam, MD

Resident Physician, Emergency Medicine, Emory University, Atlanta, GA, USA

Graham Walker, MD

Staff Physician, Stanford/Kaiser Emergency Medicine Residency, Massachusetts General Hospital & Brigham and Women's Hospital, Boston, MA, USA

Susan Wilcox, MD

Attending Physician, Department of Emergency Medicine, Department of Anesthesia, Critical Care, and Pain Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

Sandra J. Williams, DO, MPH

Assistant Professor of Emergency Medicine, Baylor College of Medicine, Houston, TX, USA

Matthew L. Wong, MD, MPH

Resident, Beth Israel Deaconess Medical Center, Boston, MA, USA

Nelson Wong, MD

Resident Physician, Department of Emergency Medicine, Mount Sinai Medical Center, New York, NY, USA

Samantha Wood, MD

Assistant Professor of Emergency Medicine, Tufts University School of Medicine and Attending Physician, Maine Medical Center, Portland, ME, USA

John Woodruff, MD

Resident Physician, Department of Emergency Medicine, Emory University, Atlanta, GA, USA

Benjamin Zabar, MD

Resident Physician, Department of Emergency Medicine, St Luke's-Roosevelt Hospital Center, New York, NY, USA

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Preface

Every day more and more critically ill patients arrive at the emergency department (ED) requiring both rapid stabilization and the full spectrum of treatments that are normally delivered in intensive care units (ICU). This book's content is unique in that it was written, researched, and edited by physicians with training in both emergency medicine and critical care from leading medical institutions throughout the world. It describes the initial steps in the stabilization of acutely ill patients, and also details the management if they continue to further decompensate. This book fills an important niche by providing concise, evidence-based summaries of key material and concepts. Although it was designed with the medical student and junior resident in mind, it will surely help practitioners at all levels of experience better manage their critically ill patients. Not only does it provide key points and details of well-established and evidence-based interventions in bullet point format, it is easy to read and portable – ideal for the busy clinician at the bedside.

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

Abbreviations

AA	aortic stenosis
AAA	abdominal aortic aneurysm
ABG	arterial blood gases
ABI	ankle-brachial index
AC	assist control (assist volume control)
ACE	angiotensin-converting enzyme
ACLS	advanced cardiac life support
ACS	abdominal compartment syndrome
ACS	acute coronary syndrome
ACTH	corticotropin (adrenocorticotrophic hormone)
ADH	antidiuretic hormone
ADHF	acute decompensated heart failure
AEF	aortoenteric fistula
AG	anion gap
AGA	American Gastroenterological Association
AIP	intra-abdominal pressure
AKI	acute kidney injury
ALI	acute lung injury
ALT	alanine aminotransferase
AMI	acute myocardial infarction
AMS	altered mental status
ANC	absolute neutrophil count
ANT	acute tubular necrosis
AP	anteroposterior
APRV	airway pressure release ventilation
AR	aortic regurgitation
ARDS	acute respiratory distress syndrome
AST	aspartate aminotransferase (same as SGOT)
ATLS	advanced trauma life support
ATP	adenosine triphosphate
AV	atrioventricular
AVM	arteriovenous malformation
AVNRT	atrioventricular nodal reentrant tachycardia

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)**List of abbreviations** xxiii

Bi-PAP	bi-level positive airway pressure
BISAP	bedside index of severity in acute pancreatitis
BMV	bag-mask ventilation
BNP	brain (or B-type) natriuretic peptide
BP	blood pressure
bpm	beats per minute
BRBPR	bright red blood per rectum
CAP	community-acquired pneumonia
CBC	complete blood count
CDC	Centers for Disease Control
CHF	congestive heart failure
CI	cardiac index
CMV	controlled mandatory ventilation
CMV	cytomegalovirus
CNS	central nervous system
CO	cardiac output
COPD	chronic obstructive pulmonary disease
CPAP	constant positive airway pressure
CPK	creatine phosphokinase
CPP	cerebral perfusion pressure
CPR	cardiopulmonary resuscitation
CRP	C-reactive protein
CRT	cardiac resynchronization therapy
CSF	cerebral spinal fluid (CSF)
c-spine	cervical spine
CT	computed tomography
CTA	CT-angiography
CVA	cerebrovascular accident
CVC	central venous catheter
CVP	central venous pressure
CVVH	continuous veno-venous hemofiltration
CVVHD	continuous venous-venous hemodiafiltration
CXR	chest radiograph/chest radiography
DI	diabetes insipidus
DIC	disseminated intravascular coagulation
DKA	diabetic ketoacidosis
DNI	do not intubate
DNR	do not resuscitate
DO ₂	oxygen delivery
DOL	diagnostic peritoneal lavage
DSI	delayed sequence intubation
DVT	deep vein thrombosis
EAST	Eastern Association for the Surgery of Trauma
ECG	electrocardiogram

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)**xxiv List of abbreviations**

ECMO	extracorporeal membrane oxygenation
ED	emergency department
EDT	emergency department thoracotomy
EEG	electroencephalogram/electroencephalography
EGA	extraglottic airways
EGDT	early goal-directed therapy
ELM	external laryngeal manipulation
EMG	electromyography
EMS	emergency medical services
EOR	endpoint of resuscitation
ERCP	endoscopic retrograde cholangiopancreatography
ESR	erythrocyte sedimentation rate
ET	endotracheal tube
EtCO ₂	end-tidal carbon dioxide
ETT	endotracheal tube
EUS	emergency ultrasonography
EVD	external ventricular drain
FAST	Focused Assessment with Sonography in Trauma
FEV ₁	forced expiratory volume in 1 second
FFP	fresh frozen plasma
FiO ₂	fraction of inspired oxygen
FSP	fibrin split products
FVC	forced vital capacity
FVCA	four-vessel cerebrovascular angiography
GCS	Glasgow Coma Score
GCSE	generalized convulsive status epilepticus
GFR	glomerular filtration rate
GI	gastrointestinal
GOLD	Global Initiative for Chronic Obstructive Lung Disease
GSW	gunshot wounds
HbA	hemoglobin A
HBO	hyperbaric oxygen
HCAP	healthcare-associated pneumonia
hCG	human chorionic gonadotropin
Hct	hematocrit
HELLP	hemolysis, elevated liver enzymes, and low platelet count
HFOV	high-frequency oscillatory ventilation
Hgb	hemoglobin
HSV	herpes simplex virus
I/E ratio	ratio of inspiratory time to expiratory time
ICH	intracerebral hemorrhage
ICP	intracranial pressure
ICU	intensive care unit
IFR	inspiratory flow rate

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)**List of abbreviations** xxv

iHD	intermittent hemodialysis
INR	international normalized ratio
IRIS	immune reconstitution inflammatory syndrome
IV	intravenous
IVC	inferior vena cava
IVDA	intravenous drug abuse
IVDU	intravenous drug use
IVF	intravenous fluid
IVIg	intravenous immunoglobulin
IVP	intravenous push
JVD	jugular venous distension
KDIGO	Kidney Disease Improving Global Outcomes
L	liter
LAD	left anterior descending artery
LCX	left circumflex artery
LDH	lactate dehydrogenase
LFT	liver function tests
LOS	length of stay
lpm	liters per minute
LRINEC	laboratory risk indicator for necrotizing fasciitis
LVAD	left ventricular assist device
LVEDV	LV end-diastolic volume
MAE	mesenteric arterial embolism
MAHA	microangiopathic hemolytic anemia
MAP	mean arterial pressure
MASCC	Multinational Association for Supportive Care in Cancer
MAST	military anti-shock trousers
MAT	mesenteric arterial thrombosis
MDI	metered-dose inhaler
MEN-2	multiple endocrine endpoint neoplasia type 2
MESS	mangled extremity severity score
MH	malignant hyperthermia
mL	milliliter
MOCHA	markers of coagulation hemostatic activation
MODS	multi-organ dysfunction syndrome
MR	mitral regurgitation
MRA	magnetic resonance angiography
MRI	magnetic resonance imaging
MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
MS	mitral stenosis
MVT	mesenteric venous thrombosis
NCSE	nonconvulsive status epilepticus
NF-1	neurofibromatosis type 1
NIV	noninvasive ventilation

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)**xxvi List of abbreviations**

NMS	neuroleptic malignant syndrome
NNT	number needed to treat
NOMI	nonocclusive mesenteric ischemia
NPO	nothing by mouth
NPPV	noninvasive positive-pressure ventilation
NRB	non-rebreather mask
NS	normal saline
NSTI	necrotizing soft tissue skin infection
OG	osmolal gap
OR	operating room
PA	posteroanterior
PAC	pulmonary artery catheter
PaCO ₂	partial pressure of carbon dioxide
PAP	proximal airway pressure
PC	pressure control
PCC	prothrombin complex concentrate
PCI	percutaneous coronary intervention
PCP	<i>Pneumocystis jirovecii</i> pneumonia
PCWP	pulmonary capillary wedge pressure
PE	pulmonary embolism
PEA	pulseless electrical activity
PEEP	positive end-expiratory pressure
PIP	peak inspiratory pressure
PMH	past medical history
PPI	proton pump inhibitor
PPV	pulse pressure variation
PRBC	packed red blood cells
PS	pressure support
PT	prothrombin time
PTT	partial thromboplastin time
PVC	premature ventricular contraction
RBC	red blood cell
RCA	right coronary artery
ROSC	return of spontaneous circulation
RR	respiratory rate
RRT	renal replacement therapy
RSI	rapid sequence intubation
RTA	renal tubular acidosis
RV	right ventricle
SA	sinoatrial
SAH	subarachnoid hemorrhage
SaO ₂	arterial oxygen saturation
SBP	systolic blood pressure
SCD	sickle cell disease

ScvO ₂	central venous oxygen saturation
SDH	subdural hemorrhage
SGOT	serum glutamic oxalo-acetic transaminase (same as AST)
SIADH	syndrome of inappropriate antidiuretic hormone secretion
SIMV	synchronized intermittent mandatory ventilation
SIRS	severe/systemic inflammatory response syndrome
SLED	sustained low-efficiency dialysis
SMA	superior mesenteric artery
SpO ₂	pulse oximeter saturation estimate
SPV	systolic pressure variation
ST	sinus tachycardia
STEMI	ST-segment elevation myocardial infarction
SVC	superior vena cava
SvO ₂	mixed venous oxygen saturation
SVR	systemic vascular resistance
SVT	supraventricular tachycardia
TB	tuberculosis
TBI	traumatic brain injury
TBSA	total body surface area
TCA	tricyclic antidepressant
T _i	inspiratory time
TIPS	transjugular intrahepatic portosystemic shunt
TLS	tumor lysis syndrome
tPA	tissue plasminogen activator
TSCI	traumatic spinal cord injury
TSH	thyroid-stimulating hormone
TTKG	transtubular potassium gradient
TTP/HUS	thrombotic thrombocytopenic purpura/hemolytic uremic syndrome
TXA	tranexamic acid
UA	unstable angina
Uk	urine potassium
UOP	urine output
Uosm	urine osmolality
US	ultrasonography, ultrasound
VAP	ventilator-associated pneumonia
VATS	video assisted thoracic surgery
VBG	venous blood gases
VF	ventricular fibrillation
VHL	von Hippel-Lindau disease
VILI	ventilator-induced lung injury
VL	video laryngoscope/laryngoscopy
VO ₂	oxygen consumption
VOC	vaso-occlusive crisis

Cambridge University Press

978-1-107-62685-0 - Practical Emergency Resuscitation and Critical Care

Edited by Kaushal Shah, Jarone Lee, Kamal Medlej and Scott D. Weingart

Frontmatter

[More information](#)

xxviii List of abbreviations

V_t	tidal volume
VT	ventricular tachycardia
VTE	venous thromboembolic events
vWF	von Willebrand factor
WBC	white blood cell