Handbook of Evidence-Based Critical Care
Paul Ellis Marik, MD
Division of Pulmonary and Critical Care Medicine
Eastern Virginia Medical School
Norfolk, VA, USA
marikpe@evms.edu

DOI 10.1007/978-1-4419-5923-2
Springer New York Dordrecht Heidelberg London

Library of Congress Control Number: 2010921986

All rights reserved. This work may not be translated or copied in whole or in part without the written permission of the publisher (Springer Science+Business Media, LLC, 233 Spring Street, New York, NY 10013, USA), except for brief excerpts in connection with reviews or scholarly analysis. Use in connection with any form of information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed is forbidden. The use in this publication of trade names, trademarks, service marks, and similar terms, even if they are not identified as such, is not to be taken as an expression of opinion as to whether or not they are subject to proprietary rights. While the advice and information in this book are believed to be true and accurate at the date of going to press, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)
To Susan, Ernie and Molly,  
who have enriched my life.
Acknowledgments

This book is dedicated to my mentors and students who have taught me everything I know and inspired me to learn even more.
Learning without thinking is useless. Thinking without learning is dangerous

– Confucius

Since the publication of the first edition of The Handbook of Evidence-Based Critical Care in 2001, the landscape of critical care medicine has changed enormously. Numerous randomized controlled studies (RCTs) that have changed the daily practice of critical care medicine have been published. Furthermore, our understanding of the complex pathophysiology of the critically ill and injured has advanced, new therapies have emerged (and some have fallen by the wayside), and we have refined how we monitor and manage our patients. We have also recognized our limitations and improved end-of-life care. In all, we are wiser and more attuned to the challenges of providing care to the sickest of the sick. However, the basic guiding principles of critical care medicine have not changed; compassionate, dedicated and thoughtful clinicians, who evaluate the functioning of the “whole” patient, ponder their disease processes and pathophysiology and provide the highest level of evidence-based interventions with the goal of restoring the patient to a quality of life which he/she values. The second edition of The Handbook of Evidence-Based Critical Care chronicles the remarkable progress made in the last decade and sets the stage for what is yet to come!

The focus of this handbook is on issues that pertain specifically to the ICU. As such the reader is referred to standard medical and surgical texts as well as online resources for more complete information on the wide spectrum of conditions and diseases from which ICU patients may suffer.

Paul Ellis Marik
Norfolk, Virginia
Contents

Part I. Introduction to Critical Care Medicine
1. Evidence-Based Critical Care 3
2. Classic Critical Care Papers 7
3. Critical Care Medicine 101 13
4. House Officers’ Guideline 1: Housekeeping 17
5. Admission–Discharge Criteria 23
7. Chronic Critical Illness 43
8. Fluid Resuscitation and Volume Assessment 55
9. Sedation and Analgesia 79
10. Sepsis 95
11. Catheter-Related Bloodstream Infection 117
12. Antibiotics 123
13. Fever 133

Part II. Respiratory
14. Mechanical Ventilation 101 153
15. Non-invasive Positive-Pressure Ventilation 175
16. Weaning (Liberation) 183
17. Ventilator-Associated Pneumonia 193
18. Community-Acquired Pneumonia 205
19. ARDS 215

xi
20. Aspiration Pneumonia and Pneumonitis 233
21. Deep Venous Thrombosis–Pulmonary Embolism 245
22. COPD Exacerbation 253
23. Acute Severe Asthma 261
24. Pleural Effusions and Atelectasis 271

Part III. Cardiac
25. Hypertensive Crises 281
26. Acute Coronary Syndromes 295
27. ST Segment Elevation Myocardial Infarction 301
28. Arrhythmias 311
29. Acute Decompensated Cardiac Failure 323
30. Takotsubo Cardiomyopathy 343

Part IV. Gastrointestinal
31. Nutrition 351
32. Stress Ulcer Prophylaxis 361
33. Chronic Liver Failure 371
34. Alcoholic Hepatitis 381
35. Fulminant Hepatic Failure 385
36. GI Bleeding 393
37. Pancreatitis 403
38. Diarrhea and Constipation 411

Part V. Metabolic
39. Stress Hyperglycemia and Glycemic Control 421
40. Adrenal Insufficiency and CIRCI 427
41. Hypo- and Hypercalcemia 435
42. Electrolyte Disturbances 443
43. Acid–Base Disturbances 453
44. Acute Renal Failure 461
45. Rhabdomyolysis 469
Part VI. Central Nervous System
46. Ischemic Strokes and Intracerebral Hemorrhage 479
47. Delirium 495
48. Seizures and Status Epilepticus 503
49. Management of Raised ICP 517
50. Subarachnoid Hemorrhage 525

Part VII. Miscellaneous ICU Topics
51. Anemia and RBC Transfusion 535
52. Coagulopathy and FFP Transfusions 543
53. Thrombocytopenia and Platelet Transfusion 553
54. Eclampsia 565
55. Management Issues in the Elderly 575
56. Management Issues in the Obese Patient 587
57. Multi-organ Dysfunction Syndrome 593
58. Therapeutic Hypothermia 599
59. Toxicology 603
60. Alcohol Withdrawal Syndromes 625
61. Serotonin Syndrome 631
62. Radiology 637
63. PRES 645
64. End-of-Life Issues 651
65. What Defines an Intensive Care Unit? Implications for Organizational Structure 657
66. Intrahospital Transport 665
67. Limiting Errors and Avoiding Litigation 671
68. Avoiding Therapeutic Misadventures in the ICU 677
69. The “Devil’s” Medicine Bag 679
70. Words of Wisdom 681
Subject Index 683