

EMERGENCY

MEDICINE

A Comprehensive Review

T H I R D E D I T I O N

Editors

Thomas Clarke Kravis

Carmen Germaine Warner

Lenworth M. Jacobs, Jr.

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EMERGENCY MEDICINE

A Comprehensive Review

Third Edition

Editors

Thomas Clarke Kravis, MD

*Medical Director
Continental Rehabilitation Hospital
San Diego, California
Associate Medical Director
Emergency Services
CompHealth
Salt Lake City, Utah*

Carmen Germaine Warner,

MSN, RN, FAAN
*Consultant, Community Health Systems,
Emergency Care, and Publishing
Coordinating Editor, Topics in Emergency Medicine
Leucadia, California*

Lenworth M. Jacobs, Jr., MD, MPH, FACS

*Director, Emergency Medicine
Trauma and LIFE STAR Program
Hartford Hospital
Hartford, Connecticut
Professor of Surgery
University of Connecticut School of Medicine
Farmington, Connecticut*

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*To
Mavourneen*

T.C.K.

*To
Dorothy Loreen Warner (1913–1992), my mother,
who taught me the value of completing any task,
not as others would desire it,
but as I would believe in it.*

C.G.W.

*To
Jennifer, a superb human being,
a wonderful flight nurse
who really cared for the patients
and was an inspiration to all of us.*

L.M.J.

Contributing Authors

Kouros B. Afshar, MD

*Department of Neurosurgery
Georgetown University Medical Center
3800 Reservoir Road Northwest
Washington, DC 20007*

James B. Alexander, MD

*Assistant Professor of Surgery
University of Medicine and Dentistry
of New Jersey
Robert Wood Johnson Medical School
at Camden
Department of Surgery
Cooper Hospital/University Medical Center
3 Cooper Plaza
Camden, New Jersey 08103*

C. Gresham Bayne, MD

*Associate Professor
University of California, San Diego
San Diego, California 92106*

Daniel R. Benson, MD

*Professor
Department of Orthopaedic Surgery
University of California, Davis
2230 Stockton Boulevard
Sacramento, California 95817*

Howard A. Bessen, MD, FACEP

*Associate Clinical Professor of Medicine
University of California, Los Angeles
Los Angeles, California
Department of Emergency Medicine
Harbor-UCLA Medical Center
1000 West Carson Street
Torrance, California 90509*

Janice L. Birney, MD

*Swedish Health Park Southwest
6169 South Balsam Way
Littleton, Colorado 80123*

Tina M.H. Blair, MD, FACEP

*Addison Gilbert Hospital
298 Washington Street
Gloucester, Maine 01930*

Marc Borenstein, MD, FACEP

*940 High Road
Kensington, Connecticut 06037*

Alan H. Brader, MD

*Clinical Assistant Professor of Surgery
University of North Carolina
Wake Medical Center
3000 New Bern Avenue
Raleigh, North Carolina 27610*

G. Richard Braen, MD, FACEP

*Professor and Chairman
Department of Emergency Medicine
Buffalo General Hospital
100 High Street
Buffalo, New York 14203*

Timothy J. Bray, MD

*Associate
Reno Orthopaedic Clinic
555 North Arlington Avenue
Reno, Nevada 89520
Assistant Clinical Professor
Department of Orthopaedic Surgery
University of California, Davis
Medical Center
Sacramento, California 95817
Assistant Clinical Professor
Orthopaedic Surgery
University of Nevada, Reno
School of Medicine
Reno, Nevada*

Barry E. Brenner, MD, PhD

*Assistant Clinical Professor of Medicine
University of California, Los Angeles
School of Medicine
Cedars-Sinai Medical Center
8700 Beverly Boulevard
Los Angeles, California 90048*

Brent E. Burton, MD

*Oregon Poison Center
Oregon Health Sciences University
3181 Southwest Sam Jackson Park Road
Portland, Oregon 97201*

James Cabral, MD
Vitreo-Retinal Surgeon
 4060 Fourth Avenue
 San Diego, California 92103

Richard M. Cantor, MD, FAAP, FACEP
Assistant Professor
Department of Emergency Medicine and
Pediatrics
State University of New York Health Science
Center
 750 East Adams Street
 Syracuse, New York 13210

Stephen V. Cantrill, MD, FACEP
Emergency Medical Services
Denver General Hospital
 777 Bannock Street
 Denver, Colorado 80204

Anthony J. Caputy, MD
Department of Neurosurgery
Georgetown University Medical Center
 3800 Reservoir Road Northwest
 Washington, DC 20007
Department of Neurosurgery
Fairfax Hospital
 Fairfax, Virginia

Brian W. Carlin, MD, FCCP
Assistant Professor of Medicine and
Anesthesiology
Medical College of Pennsylvania, Allegheny
Campus
 Pittsburgh, Pennsylvania
Division of Emergency Medicine
Allegheny General Hospital
 320 East North Avenue
 Pittsburgh, Pennsylvania 15212

Jonathan H. Cilley, Jr., MD
Assistant Professor of Surgery
University of Medicine and Dentistry
of New Jersey
Robert Wood Johnson Medical School
at Camden
Division of Cardiothoracic Surgery
Cooper Hospital/University Medical Center
 3 Cooper Plaza
 Camden, New Jersey 08103

William D. Clark, MD
Bath Memorial Hospital
 1356 Washington Street
 Bath, Maine 04530

Arthur Cooper, MD, FACS, FAAP, FCCM
Associate Professor and Chief
Pediatric Surgical Critical Care
Division of Pediatric Surgery
College of Physicians and Surgeons of
Columbia University
Harlem Hospital Center
 506 Lenox Avenue
 New York, New York 10037

Davis Cracraft, MD, FACEP
Mercy Hospital
 4077 Fifth Avenue
 San Diego, California 92103

Raphael J. DeHoratius, MD
Professor of Medicine
Division of Rheumatology
Thomas Jefferson Medical College
 1015 Walnut Street
 Philadelphia, Pennsylvania 19107

Anthony J. DelRossi, MD
Associate Professor of Surgery
University of Medicine and Dentistry
of New Jersey
Robert Wood Johnson Medical School
at Camden
Cooper Hospital/University Medical Center
 3 Cooper Plaza
 Camden, New Jersey 08103

David J. Dula, MD, FACEP
Department of Emergency Medicine
Geisinger Medical Center
 Academy Avenue
 Danville, Pennsylvania 17822

Richard T. Ellison III, MD
Associate Professor of Medicine
University of Massachusetts School of
Medicine
Clinical Director of Infectious Disease
University of Massachusetts Medical Center
 55 Lake North Avenue
 Worcester, Massachusetts 01655

Frederick B. Epstein, MD, FACEP
Director, Emergency Medical Services
Bay Medical Center
 615 North Bonita Avenue
 Panama City, Florida 32401

George L. Foltin, MD

*Assistant Professor of Clinical Pediatrics
New York University School of Medicine
New York, New York
Director, Pediatric Emergency Services
Bellevue Hospital Center
First Avenue and 27th Street
New York, New York 10016*

Jacek B. Franaszek, MD, FACEP

*P.O. Box 9766
Rancho Santa Fe, California 92067*

Richard G. Friedman, MD, FACC

*Associate Clinical Professor of Medicine
University of California, San Diego
School of Medicine
San Diego, California
Assistant Director
Cardiac Catheterization Laboratory
Mercy Hospital and Medical Center
4033 Third Avenue
San Diego, California 92103*

Joel Geiderman, MD, FACEP

*Associate Director
Department of Emergency Medicine
Cedars-Sinai Medical Center
8700 Beverly Boulevard
Los Angeles, California 90048*

Gordon Genta, MD

*Private Practice
Boise, Idaho*

Leonard G. Gomella, MD

*Assistant Professor of Urology
Thomas Jefferson University
Philadelphia, Pennsylvania 19107*

Edgar R. Gonzalez, PharmD

*Associate Professor of Pharmacy and
Medicine
Department of Pharmacy and Pharmaceutics
Virginia Commonwealth University
Medical College of Virginia
Richmond, Virginia 23298*

Emanuel K. Gordon, MD, FACEP

*Clinical Assistant Professor of Medicine
University of California, Los Angeles
School of Medicine
Los Angeles, California 90025*

Shirley A. Graves, MD

*Professor
Departments of Anesthesiology and Pediatrics
Chief, Division of Pediatric Anesthesia
University of Florida College of Medicine
Gainesville, Florida 32610*

Joseph A. Grillo, BS Pharm

*PharmD Candidate
Department of Pharmacy and Pharmaceutics
Virginia Commonwealth University
Medical College of Virginia
Richmond, Virginia 23298*

James Santiago Grisolia, MD

*4033 Third Avenue
San Diego, California 92103*

Alan D. Guerci, MD

*Department of Cardiology
St. Francis Hospital
100 Port Washington Boulevard
Roslyn, New York 11576*

Peter H. Hackett, MD

*Director, Denali Medical Research Project
Staff Emergency Physician and Air Ambulance
Director
Humana Hospital, Alaska
2801 Debarr Avenue
Anchorage, Alaska 99508
Affiliate Associate Professor
University of Washington
School of Medicine
Seattle, Washington 98195*

Stephen Hamburger, MD, FACP

*Associate Professor of Medicine
Department of Medicine
University of Missouri, Kansas City
School of Medicine
Kansas City, Missouri*

Fred Harchelroad, MD, FACEP, ABMT

*Associate Professor
Department of Emergency Medicine
Medical College of Pennsylvania, Allegheny
Campus
Pittsburgh, Pennsylvania
Director, Medical Toxicology Treatment
Center
Allegheny General Hospital
320 East North Avenue
Pittsburgh, Pennsylvania 15212*

Robert Harrison, MD, MPH

*Associate Clinical Professor of Medicine
Division of Occupational and Environmental
Medicine
University of California, San Francisco
350 Parnassus Avenue
San Francisco, California 94143*

Roland Heidenhofer, MD, FACEP

*2440 East Tudor Road
Anchorage, Alaska 99507*

Robert W. Heilig, RN, MPA, Esq

*Private Practice
4939 Shady Leaf Way
Sacramento, California 95838*

George L. Higgins III, MD, FACEP

*Clinical Associate Professor of Surgery
University of Vermont
Burlington, Vermont 05401
Chief, Department of Emergency Medicine
Medical Director, Maine Poison Control
Center
Maine Medical Center
22 Bramhall Street
Portland, Maine 04102*

K. Sue Hoyt, RN, MSN, CEN

*2040 Capri Court
El Cajon, California 92020*

Gregg Husk, MD

*Emergency Department
Roosevelt Hospital
428 West 59th Street
New York, New York 10019*

Barbara Bennett Jacobs, RN, BSN, MPH

*Educational Consultant
Department of Education
Hartford Hospital
Hartford, Connecticut*

**Lenworth M. Jacobs, Jr., MD, MPH,
FACS**

*Director, EMS/Trauma/LIFESTAR Program
Hartford Hospital
Hartford, Connecticut
Professor of Surgery
University of Connecticut
Farmington, Connecticut*

Lester B. Jacobson, MD, FACC, FACP

*Cardiovascular Diseases
California Pacific Medical Center
2340 Clay Street
San Francisco, California 94115*

Dietrich Jehle, MD, FACEP

*Director of Emergency Services
Erie County Medical Center
462 Grider Street
Buffalo, New York 14215
Associate Professor
Department of Emergency Medicine
State University of New York
at Buffalo
Buffalo, New York 14222*

Robert C. Jorden, MD, FACEP

*Chairman, Department of Emergency
Medicine
Maricopa Medical Center
Phoenix, Arizona 85016*

William Kantor, MD

*Associate Director
Trauma Program and Critical Care
St. Vincent's Hospital
Worcester, Massachusetts*

John P. Kelly, DMD, MD

*Department of Oral and Maxillofacial Surgery
Ambulatory Care Center
Massachusetts General Hospital
5 Fruit Street
Boston, Massachusetts 02114*

Carl Klingelberger, MD

*Chairman, Emergency Medicine Department
Naval Hospital San Diego
San Diego, California 92134*

Thomas Clarke Kravis, MD

*Medical Director
Continental Rehabilitation Hospital
555 Washington Avenue
San Diego, California 92103
Associate Medical Director
Emergency Services
CompHealth
Salt Lake City, Utah*

Kenneth Kulig, MD

*University of Colorado Medical School
Rocky Mountain Poison Center
Denver General Hospital
Denver, Colorado*

Joel M. Lamon, MD, FACP

*Southwest Cancer Care
15524 Pomerado Road
Poway, California 92064*

A. Joseph Layon, MD

*Associate Professor
Departments of Anesthesiology and Medicine
University of Florida
College of Medicine
Gainesville, Florida 32610*

Gerald S. Levey, MD

*Senior Vice President
Medical and Scientific Affairs
Merck and Co., Inc.
One Merck Drive
Whitehouse Station, New Jersey 08889*

William Linnik, MD

*2050 Pacific Beach Drive
San Diego, California 92109*

Emily J. Lucid, MD, FACEP

*Associate Professor and Chairman of
Emergency Medicine
Medical College of Pennsylvania, Allegheny
Campus
Pittsburgh, Pennsylvania
Director, Division of Emergency Medicine
Allegheny General Hospital
320 East North Avenue
Pittsburgh, Pennsylvania 15212*

Celeste M. Madden, MD, FAAP, FACEP

*Maternal and Child Health Center
516 Prospect Avenue
Syracuse, New York 13208*

Marcus L. Martin, MD

*Associate Professor
Residency Program Director
Department of Emergency Medicine
Medical College of Pennsylvania, Allegheny
Campus
Pittsburgh, Pennsylvania
Allegheny General Hospital
320 East North Avenue
Pittsburgh, Pennsylvania 15212*

Barbara M. Matteucci, MD

*Assistant Professor of Medicine
Division of Rheumatology
Albert Einstein Medical Center
5501 Old York Road
Philadelphia, Pennsylvania 19141*

Thomas F. McGee, PhD

*Associate Provost and Director
Psychological Services Center
California School of Professional Psychology
6215 Ferris Square
San Diego, California 92121*

Jon W. Miller, Jr., MD, FACEP, FACURP

*St. Claire Medical Center
222 Medical Circle
Morehead, Kentucky 40351*

John A. Mitas II, MD, FACP

*Department of Urology
Thomas Jefferson University
1020 Walnut Street
Philadelphia, Pennsylvania 19107*

Glenn W. Mitchell, MD, MPH, FACEP

*Adjunct Associate Professor of Clinical
Military and Emergency Medicine
Uniformed Services University of the Health
Sciences
Bethesda, Maryland
Aeromedical Teaching Faculty
U.S. Air Force School of Aerospace Medicine
Brooks Air Force Base, Texas
Department of Emergency Medicine
Brooks Army Medical Center
San Antonio, Texas 78250*

Linda Nordeman, MD

*Assistant Professor of Medicine
Medical College of Pennsylvania, Allegheny
Campus
Pittsburgh, Pennsylvania
Attending Staff
Division of Emergency Medicine
Allegheny General Hospital
320 East North Avenue
Pittsburgh, Pennsylvania 15212*

Paul M. Paris, MD, FACEP

*Associate Professor and Chief
Division of Emergency Medicine
University of Pittsburgh
School of Medicine
Pittsburgh, Pennsylvania 15213*

James E. Pierog, MD, FACEP

*Medical Director, Emergency Department
Children's Hospital of Orange County
St. Joseph Hospital, Orange
1100 West Stewart Drive
Orange, California 92668*

Charles V. Pollack, Jr., MD
*Attending Physician/Associate Research
 Director
 Department of Emergency Medicine
 Maricopa Medical Center
 Phoenix, Arizona 85016*

Ronald N. Rothenberg, MD, FACEP
*Associate Clinical Professor
 Community and Family Medicine
 University of California, San Diego
 San Diego, California
 Attending Physician
 Department of Emergency Medicine
 Scripps Memorial Hospital
 Encinitas, California*

David Rush, PharmD
*Professor of Medicine and Clinical
 Pharmacology
 University of Missouri
 Truman Medical Center East
 7900 Lee's Summit Road
 Kansas City, Missouri 64139*

Dennis E. Sandler, MD, FACOG
*Staff Physician
 Division of Obstetrics and Gynecology
 Scripps Clinic and Foundation
 10666 North Torrey Pines Road
 La Jolla, California 92037
 Clinical Instructor
 University of California, San Diego
 225 Dickinson Street
 San Diego, California 92103*

Michael R. Sayre, MD, FACEP
*Assistant Professor
 Department of Emergency Medicine
 Center for Emergency Care
 University of Cincinnati Hospital
 231 Bethesda Avenue
 Cincinnati, Ohio 45267*

Ann R. Schreier, MSN, RN
*City of Hope Medical Center
 1500 East Duarte Road
 Duarte, California 91010*

Kenneth E. Schultz, MD
*Corporate Medical Director
 Risk Management Division
 EMSA
 1200 South Pine Island Road
 Fort Lauderdale, Florida 33324*

Rebecca Seip, MD
*Assistant Professor
 Medical College of Pennsylvania, Allegheny
 Campus
 Pittsburgh, Pennsylvania
 Department of Emergency Medicine
 Allegheny General Hospital
 320 East North Avenue
 Pittsburgh, Pennsylvania 15212*

Mark A. Selland, MD
*Cardiovascular Pulmonary Research
 Laboratory
 University of Colorado Health Sciences Center
 781 South High Street
 Denver, Colorado 80209*

Mark Allen Shaffer, MD, FACEP
*Medical Director/President
 Centro Medico Latino
 San Marcos, California
 Attending Physician
 Sharp Murrieta Hospital
 Murrieta, California 92362
 Attending Physician
 Sharp Community Hospital
 Chula Vista, California*

Daniel Shine, MD
*Mount Sinai School of Medicine
 Beth Israel Hospital
 New York, New York*

Charles M. Shufflebarger, MD
*Department of Emergency Medicine
 Methodist Hospital of Indiana
 1701 North Senate Boulevard
 Indianapolis, Indiana 46206*

Mark Smith, MD
*Chairman, Department of Emergency
 Medicine
 George Washington University Medical Center
 2140 Pennsylvania Avenue Northwest
 Washington, DC 20037*

Gary Sparger, RN, MSN, CEN, MICN
(Deceased)

George L. Sternbach, MD, FACEP
*Clinical Associate Professor of Surgery
 Stanford University Medical Center
 Stanford, California 94305
 Emergency Physician
 Seton Medical Center
 Daly City, California*

John B. Sullivan, Jr., MD
Section of Emergency Medicine
University of Arizona Health Sciences Center
1501 North Campbell
Tucson, Arizona 85724

Robert M. Szabo, MD
Department of Orthopaedics
University of California, Davis
2230 Stockton Boulevard
Sacramento, California 95817

Michael G. Tunik, MD
Assistant Professor of Clinical Pediatrics
New York University School of Medicine
New York, New York
Associate Director, Pediatric Emergency
Services
Bellevue Hospital Center
First Avenue and 27th Street
New York, New York 10016

Elise M. van der Jagt, MD, MPH
Strong Children's Critical Care Center
601 Elmwood Avenue
Rochester, New York 14642

Alexander D. Vargas, MD, FACS, FRCPC
3737 Martin Luther King Jr. Boulevard
Lynwood, California 90262

R. S. Venable, MD, FAAFP, FACEP
Chief Medical Officer
Humana Health Care Plans
Clinical Associate Professor
University of South Florida Medical College
Tampa, Florida 33611

Ron M. Walls, MD, FRCPC
Head, Department of Emergency Medicine
Vancouver General Hospital
855 West 12th Avenue
Vancouver, British Columbia, Canada V5Z 1M9

Carmen Germaine Warner, MSN, RN, FAAN
Consultant, Community Health Systems,
Emergency Care, and Publishing
Coordinating Editor, Topics in Emergency
Medicine
1749 Sky Loft Lane
Leucadia, California 92024

Eric A. Weiss, MD
Assistant Professor
Division of Emergency Medicine
Stanford University Medical Center
300 Pasteur Drive
Stanford, California 94305

Eileen Whalen, RN, BSN
Director of Neonatal Intensive Care Unit
Children's Hospital of Orange County
Orange, California

Jonathan L. White, MD
Department of Urology
Thomas Jefferson University
1020 Walnut Street
Philadelphia, Pennsylvania 19107

John J. Willems, MD, FRCS, FACOG
Staff Physician
Division of Obstetrics and Gynecology
Scripps Clinic and Research Foundation
10666 North Torrey Pines Road
La Jolla, California 92037
Associate Clinical Professor
University of California, San Diego
225 Dickinson Street
San Diego, California 92103

D. Kim Zaiser, MD, FACEP
Assistant Professor
Department of Emergency Medicine
Medical College of Pennsylvania, Allegheny
Campus
Pittsburgh, Pennsylvania
Director, Office of Prehospital Care
Division of Emergency Medicine
Allegheny General Hospital
320 East North Avenue
Pittsburgh, Pennsylvania 15212

Stephen H. Zinner, MD
Professor of Medicine
Head, Division of Infectious Diseases
Brown University
Roger Williams Medical Center
Rhode Island Hospital
825 Chalkstone Avenue
Providence, Rhode Island 02908

Foreword

Textbooks represent information which, when transformed, becomes knowledge. Pursuit of knowledge, through academic training, is a prerequisite to the commencement of a professional career. Today, with research and phenomenal acceleration in the development of new information offered through technological advances, the half-life of medical knowledge has grown ever shorter. Thus, the pursuit of new knowledge through continuing medical education, as represented by this textbook, becomes even more important.

Even though I direct my comments specifically to emergency physicians, I hope others will listen in. Innovation and enhanced levels of dialog are in order if administration, managers, and health care specialists, as well as emergency physicians, are to become more effective.

This textbook, especially with its expanded scope represented by chapters on hazardous and toxic materials and occupational health—both areas of rapidly increasing application to the specialty of emergency medicine—will not only help you as an emergency physician stay abreast but also enhance your position as an indispensable professional in your work environment. At no time in history has competition for the health care dollar been more severe or has change been more rampant in the business and practice of medicine than it is today. However, with this competition and change comes opportunity.

The specialty of emergency medicine is officially recognized and accepted within the house of medicine. Gaining widespread respect, however, will require increased participation in medical politics and widely expanded involvement in research and marketing. Tomorrow's emergency physician will need to acquire knowledge and skill in each of the areas presented in this textbook. Coupled with this clinical expertise is the need to participate in the total health care arena by:

- Committing time and dollars to "R & D"
- Developing proficiency in medical economics and politics
- Learning to market yourself and your facility
- Striving to promote and protect quality patient care

Preparing yourself to be unique, with special skills beyond those of general emergency medicine—toxicology, critical care, occupational medicine, emergency medical systems, metabolic/endocrine and genetic emergencies, pediatrics, traumatology, and other areas outlined in this text—is of vital importance. New staffing patterns will emerge as the more highly skilled and trained—and thus the more experienced—will be utilized only for the tasks for which those skills and training are required. The new staffing patterns will include staff reductions. Part of your challenge as the emergency physician member of the administrative team will be to successfully implement these changes and, at the same time, increase quality of patient care.

You will compete in a zero sum game of medical economics. Formerly one could argue for new programs, and additional dollars were authorized by Congress to fund them. Now the amount of dollars available will be relatively fixed, and you will vie with others to retain what you have had, let alone increase the amount; for your gain will be at someone else's expense. Your enthusiasm may be compromised by new stresses of economic problems as emergency departments strain under the demands of socially and legally required, but yet uncompensated, provision of emergency health care. Also we face the continued specter of egregious malpractice suits despite anticipated tort reform and improved patient communications. It is extraordinarily evident that health care professionals can no longer ignore the need to gain optimal knowledge of the scope and impact of local and national economic and political trends.

New attention to health care costs and patient convenience has led to the development of alternative care centers. This, in turn, has provided a catalyst for hospital emergency departments and physicians' offices to develop and promote new marketing programs. The emergency physician of tomorrow must seize these opportunities to act as an important resource to provide needed service to hospital administration and medical

staff by actively participating in areas such as long-range planning, hospital promotion, patient relation evaluations, and committee membership.

The challenge of our consumer-oriented health care marketplace demands that we assess the needs and desires of each of our patients and strive whenever possible to incorporate them into our provision of professional services. Our success requires that we confront occasionally-held perceptions of physicians and emergency departments as callous, uncaring entities by offering a heightened degree of sensitivity and demonstrated concern for patients. The ever-increasing options the public has for medical care today also demand that we transmit this same concern and desire for optimal cost-effective service from the perspective of payors such as insurers, health maintenance organizations, preferred provider organizations, or industrial employers.

The emergency physician must be aware of competition, adapt to and take advantage of change, and help shape the transformation to the advantage of our specialty and patient care. I am confident that the authors and content of this textbook have helped point the way. Continuing education will strengthen your foundation and make you better prepared to provide what is, and must remain, your first and foremost goal as an emergency physician—optimally satisfying the emergency patient's health care needs.

Richard L. Stennes, MD, FACEP
Associated Emergency Physician
Medical Group APC
San Diego, California

Foreword

The last decade has seen dramatic changes in the specialty of emergency medicine. Not only has the number of visits to emergency departments shown a continuing increase, but also the changes and complexities of the health care industry have expanded the arena in which emergency care is provided to communities. Emergency services do not, as in the past, encompass the hospital's emergency department alone, but include well-defined prehospital systems, trauma centers, ambulatory care centers, and medical air transportation systems.

The providers of emergency care have become more responsive, working together as a multidisciplinary team to the benefit of those persons who require emergency care. Emergency services encompass a broad scope of practice, and providers have increased and will continue to increase their knowledge, skills, and clinical expertise. Emergency nurses expand their realm of accountability through participation in institutionally based performance verification, independent self-study, and continuing education programs through institutions of higher learning. All these can be precursors to the national examination as a Certified Emergency Nurse (CEN). The challenge and the opportunities awaiting those committed to the practice of emergency services have no limits. Emergency nurses as teachers and leaders, now as ever, must define performance expectations of emergency care for themselves and the emergency department team, for this ultimately provides to the clients receiving care and health education the best possible means for health prevention treatment and survival.

This book is a comprehensive reference on emergency medicine. The up-to-date concepts that it presents challenge the intellect and expand the nurse's knowledge in shaping the emergency health care system.

Mildred K. Fincke, RN, BSN
Clinical Director
Passavant Health Center
Zenienople, Pennsylvania
Past President, ENA
Beaver, Pennsylvania

Foreword

Over the past decade, the cost of health care has grown at rates exceeding the wildest imagination. It consumes 10 percent of the U.S. gross national product, currently surpassing almost every other government expenditure. The federal government's decision to decrease health care expenditures "at whatever price" (e.g., through Medicare's diagnosis-related groups and legislative support of prepaid health care) has created an atmosphere of cost restraint within the private sector. DRGs are just the beginning of the process with capitation as the end result.

As medicine refocuses from "service at any cost" to "the same service for less," the emphasis will be on keeping patients out of the hospital. This will ultimately thrust the specialty of emergency medicine into the role of primary gatekeeper.

Emergency medical services (EMS) mirror the current health care fiscal crisis. Simply infusing the four C's—namely, caring, competence, cost-effectiveness, and convenience—into the practice of emergency medicine may be all that is necessary. Whereas ambulatory care facilities in their myriad forms address convenience and cost, emergency medicine must encourage the delivery of cost-effective medical care within both the hospital and EMS system.

Innovative, low-cost systems that involve paramedics but do not compromise patient care (e.g., firefighter-initiated defibrillator programs) should be planned and implemented. Furthermore, greater priority should be placed on the preventive aspects of illness and injury. The active participation of emergency care personnel in public policymaking pertinent to drunk driving, seat belts, infant car seats, motorcycle helmets, handgun control, and smoking will benefit not only our patients, but also our specialty. Just as important, the individual emergency physician will have to place greater reliance on clinical skills than on diagnostic tests—something our founding fathers did well.

The continued commitment of emergency care physicians to clinical competence through board certification, continuing education, and research; the provision of cost-effective care; and the ongoing support of the multidisciplinary team approach will enhance the delivery of quality emergency care in the latter part of this century. This text's second edition assists the emergency physician in attaining these goals because of its emphasis on clinical medical management and its recognition of the need for all emergency health care professionals, including the emergency physician, emergency nurse, and paramedical personnel, to work together.

In our professional dedication, however, let us not forget caring—probably the most important ingredient to patients. It is the least that patients expect from the specialty that provides 24-hour service. Caring . . . isn't that why we're here?

Denis J. Kollar, MD, FACEP
Past President of the California
Chapter of the American
College of Emergency
Physicians
Member, EMS Commission
State of California
West Covina, California

Preface to the Second Edition

The second edition of *Emergency Medicine* continues to strive toward enriching and advancing the quality of care afforded all emergency patients. Consequently, the goals and objectives are identical to those envisioned seven years ago when the concept of this text was developed. Specifically, the emphasis is to share with the interested reader the academic and scientific knowledge, rigor, and skills required to provide the optimum level of care to our patients.

The authors' and editors' ultimate intent may in fact have been achieved. This input comes from clinicians, academicians, and reviews, not only in our country, but throughout the world. Continued satisfaction from these comments is derived from the knowledge that this text may have assisted a colleague in salvaging a life or stimulated the emergence of a new prehospital care system in many locations. What has been striking is the heterogenous character of the interest, skill, knowledge, aspirations, and requirements of the many readers who have shared their views regarding this text.

We as editors have taken the liberty of interpreting this positive feedback as confidence in our intuitive decision to include a heterogenous group of contributors from various disciplines in order to meet the diverse expectations of the reader. This includes not only the emergency department physician, but the other integral members of the health care team such as nurses, emergency medical technicians, paramedics, social workers, and spiritual leaders. Each member of this multidisciplinary team offers a valuable piece to the total plan for wholistic, comprehensive patient care. In the same spirit, we sought, directed, and encouraged the efforts of 49 entirely new authors representing not only emergency personnel, but academicians, surgeons, cardiologists, social workers, lawyers, and ministers as well.

The changing dynamics of emergency care has prompted the editors of several new chapters focusing on the emergency needs within these specialty areas. These areas include occupational emergencies, pain management emergencies, oncology, genetic concerns, and hazardous materials emergencies. We believe that the growth, understanding, and acceptance of these new horizons are instrumental in offering a broad based expertise of all emergencies to those in need.

The second edition of *Emergency Medicine* has incorporated the expertise of three section editors. Their talents and careful design have aided in the development of the prehospital care, pediatric, and orthopedic emergencies sections. Each section editor, along with the chapter authors, has included important advances and changes that have emerged during the past three years, making this text a current, up-to-date account of emergency care standards and interventions. An example of this is the use of MRI in the assessment of patients with central nervous system emergencies. Along with these changes and refinements, we have maintained our original organizational strategy and continued our general format: definition of the disease process, etiology, pathophysiology, and clinical correlates including the mechanism of injury, diagnosis, and treatment with an integration of both prehospital and emergency department care.

Finally, with the broad-based acceptance of centigrade conversion for medical use and application, we have included both centigrade and fahrenheit listings throughout. For accuracy and ease of use, a conversion chart has been incorporated in this text and will be found on page 1394.

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Preface

The third edition of *Emergency Medicine: A Comprehensive Review* continues in the tradition of the previous edition in its goal to provide the knowledge and an outline of the various skills that are required by emergency physicians to provide high-quality, cost-efficient emergency care. Since the first edition was conceived 13 years ago, social, political, and economic pressures have continued to change the character of emergency care. A decade ago emergency medicine was undergoing a revolution that included the development of sophisticated prehospital care systems and high-technology trauma centers. The result of this process was significant increases in the quality of emergency care and access to inpatient care but, at the same time, an enormous increase in health care expenditures. The term *overkill* was increasingly replaced by many with *oversave*.

Two editions later, the character of the evolutionary forces are still in effect as American medicine is poised at the footsteps of major health care reform. There has been an economic depression. Health care costs have been judged by many to be out of control, and the concept of “managed care” has emerged as the panacea. These forces suggest that the American dream of high-quality care for every American at any cost may not be achievable. Indeed, these same pressures have changed many emergency departments into high-volume primary care clinics. This clinic milieu, coupled with an increase in violent multiple trauma victims, has increased the cost per visit: this cost has been borne not only by payors but by the emergency care providers themselves. Concomitantly with these changes, emergency physicians are “burning out” and seeking practice opportunities in new specialties and different practice environments. Just as the volume of patients has erupted, the amount of medical literature in emergency care has exploded in the past several years, and the two original editors are no longer capable of being familiar with all the details and nuances of the many subspecialties now included in the encompassing armamentarium of the emergency physician. Thus, a cadre of respected, knowledgeable, and highly skilled colleagues served as assistant editors to assure that the information provided to the reader of this text would be comprehensive, accurate, and meaningful. Their contributions have been integral to the success of this publication.

With the changing character of emergency medicine, there have been concomitant alterations in this edition that are noteworthy. The earlier editions focused on such topics as systems approaches and roadmaps on how to develop prehospital paramedic systems and advanced trauma life support. Many of these systems have been consolidated and are now often taken for granted. Thus, emergency medicine has empowered talented colleagues such as paramedics, MICNs, nurses, and others to implement these systems while the emergency physician treats emergency patients. Those with administrative inclinations or talents devote more of their time to the supervision and coordination of the individuals and the systems. In the next decade, as care is increasingly “managed,” the emergency physician, as one of the last few true 24-hour a day primary care physicians, will continue to participate as an integral part of the “gatekeeper” function in managed competition. As providers “compete” with one another, patients and payors alike will select and pay providers based on patient satisfaction, cost, and clinical outcome. This text is intended to provide the emergency physician with one important tool in this complex process.

Thomas Clarke Kravis, MD
Medical Director