
Principles and Practice of
**EMERGENCY
MEDICINE**

**SCHWARTZ
SAFAR
STONE
STOREY
WAGNER**

Volume II

Principles and Practice of EMERGENCY MEDICINE

Edited by

GEORGE R. SCHWARTZ, M.D.

Director of Emergency Medicine
University of New Mexico Medical Center;
Associate Professor of Community,
Family and Emergency Medicine
University of New Mexico School of Medicine
Albuquerque, New Mexico

Formerly, Director, Northeastern Emergency
Medical Services (a multi-hospital group);
Clinical Assistant Professor of Emergency Medicine
The Medical College of Pennsylvania
Philadelphia, Pennsylvania

PETER SAFAR, M.D., Dr. h.c.

Distinguished Service Professor
Resuscitation Research Institute
University of Pittsburgh; Past Chairman
Department of Anesthesiology/Critical Care Medicine
University of Pittsburgh
School of Medicine

JOHN H. STONE, M.D.

Professor of Medicine (Cardiology) and
Director, Emergency Medicine Residency
Grady Memorial Hospital/
Emory University School of Medicine, Atlanta, Georgia

PATRICK B. STOREY, M.D.

Professor of Medicine and Associate Dean
University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania

DAVID K. WAGNER, M.D.

Professor of Surgery and Emergency Medicine
Associate Professor of Pediatrics
The Medical College of Pennsylvania, Philadelphia, Pennsylvania

W. B. SAUNDERS COMPANY

Philadelphia, London, Toronto

W. B. Saunders Company: West Washington Square
Philadelphia, PA 19105

1 St. Anne's Road
Eastbourne, East Sussex BN21 3UN, England

1 Goldthorne Avenue
Toronto, Ontario M8Z 5T9, Canada

Library of Congress Cataloging in Publication Data

Main entry under title:

Principles and practice of emergency medicine.

Includes index.

1. Medical emergencies. I. Schwartz, George R.
II. Title: Emergency medicine. [DNLM: 1. Emergencies.
2. Emergency medicine. 3. Critical care.
WB105 P957]

RC86.7.P74 616'.025 75-25277

ISBN 0-7216-8031-3 (v.-1)

Principles and Practice of Emergency Medicine

Volume I ISBN 0-7216-8031-3

Volume II ISBN 0-7216-8033-X

Set ISBN 0-7216-8034-8

© 1978 by the W. B. Saunders Company. Copyright under the International Copyright Union. All rights reserved. This book is protected by copyright. No part of it may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without written permission from the publisher. Made in the United States of America. Press of W. B. Saunders Company. Library of Congress catalog card number 75-25277.

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

CONTRIBUTORS



ELLEN E. ANDERSON, M.D.

Instructor of Surgery, The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Abdominal Procedures

JAY MORRIS ARENA, M.D.

Professor of Pediatrics and Director of the Poison Control Center, Duke Medical Center, Durham, North Carolina

Poisonings

SUBHASH C. BANSAL, M.D.

Associate Professor of Surgery and Director of Surgical Research, The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Immunologic Alterations in Acute Illness and Injury

BÉLA BENCZE, M.D.

General Director, Hungarian National Emergency and Ambulance Service, Budapest, Hungary

EMS in Hungary

GARRETT E. BERGMAN, M.D.

Assistant Professor of Pediatrics, The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Pediatric Emergencies

ROBERT E. BINDA, JR., M.D.

Assistant Professor, Department of Anesthesiology, University of Pittsburgh School of Medicine; Staff Anesthesiologist, Children's Hospital, Pittsburgh, Pennsylvania

Renal Failure and Fluid-Electrolyte Imbalance

WILLIAM FRANCIS BOUZARTH, M.D.

Clinical Professor of Neurological Surgery, The Medical College of Pennsylvania; Deputy Director, Department of Neurosurgery, Episcopal Hospital, Philadelphia, Pennsylvania

Neurosurgical Procedures; Head and Spinal Injuries; Disaster Preparedness

EDWARD L. BRADLEY, III, M.D.

Associate Professor of Surgery, Emory University School of Medicine; Attending Surgeon, Emory University Hospital; Attending Surgeon, Grady Memorial Hospital; Consultant, Atlanta Veterans Administration Hospital, Atlanta, Georgia

Alimentary Tract Obstruction

GARRY L. BRIESE

Executive Director, Florida Chapter, American College of Emergency Physicians,
Jacksonville, Florida

EMS Transportation

RICHARD A. BROSE, Ph.D.

Associate Professor of Medicine, University of Missouri-Kansas City School of Medicine; Director, Emergency Medical Services Training and Research Center, University of Missouri-Kansas City School of Medicine, Kansas City, Missouri

Categorization of Emergency Facilities

JOHN BULETTE, M.D.

Assistant Professor, Department of Psychiatry, The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Evaluation of the Potentially Suicidal Patient

FRANK M. CALIA, M.D.

Professor of Medicine, University of Maryland School of Medicine; Chief, Medical Service, Veterans Administration Hospital, Baltimore, Maryland

Infectious Diseases

GEORGE J. CARANASOS, M.D.

Associate Professor of Medicine, University of Florida, College of Medicine; Chief, Division of General Medicine, Shands Teaching Hospital, Gainesville, Florida

Drug Reactions

RICHARD WAYNE CARLSON, M.D., Ph.D.

Assistant Professor of Medicine and Assistant Director, Shock Research Unit and the Center for the Critically Ill, University of Southern California School of Medicine, Los Angeles County/USC Medical Center and the Hollywood Presbyterian Medical Center, Los Angeles, California

Cardiovascular System Failure

NANCY L. CAROLINE, M.D.

Medical Director, Magen David Adom, Tel Aviv, Israel

Acute Respiratory Insufficiency; Respiratory Care Techniques and Strategies

ELSIE R. CARRINGTON, M.D.

Professor and Chairman, Department of Obstetrics and Gynecology, The Medical College of Pennsylvania and Hospital of The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Obstetric and Gynecologic Procedures

C. GENE CAYTEN, M.D., M.P.H.

Assistant Professor of Surgery, University of Pennsylvania School of Medicine; Director, Center for the Study of Emergency Health Services; Attending Surgeon, Hospital of the University of Pennsylvania, and Veterans Administration Hospital, Philadelphia, Pennsylvania

Traumatology; EMS Planning and Evaluation

YOGINDER K. CHITKARA, M.D.

Research Associate, Alma D. Morani Laboratory of Surgical Immunobiology, The Medical College of Pennsylvania, Philadelphia, Pennsylvania

Immunologic Alterations in Acute Illness and Injury

STEPHEN D. CLEMENTS, JR., M.D.

Assistant Professor of Medicine, Emory University School of Medicine; Attending Physician, Emory University Hospital, Atlanta, Georgia

*Disorders Caused by Coronary Atherosclerotic Heart Disease;
Effect of Electrolyte Abnormalities on the Electrocardiogram*

LEONARD A. COBB, M.D.

Professor of Medicine, University of Washington; Director, Division of Cardiology, Harborview Medical Center, Seattle, Washington

Sudden Death

ERRIKOS CONSTANT, M.D., D.D.S.

Associate Clinical Professor, Department of Surgery, College of Human Medicine, Michigan State University, East Lansing; Staff Surgeon (Plastic Surgery), Michigan State University Olin Health Center, East Lansing; Staff Surgeon (Plastic Surgery), Sparrow Hospital, St. Lawrence Hospital, Ingham Medical Center, Lansing, Michigan

Facial Trauma

MILTON CORN, M.D.

Professor of Internal Medicine, Georgetown University School of Medicine; Director, Emergency Department, Georgetown University Hospital, Washington, D.C.

Bleeding Disorders

R ADAMS COWLEY, M.D.

Professor of Thoracic and Cardiovascular Surgery, University of Maryland School of Medicine; Director, Maryland Institute for Emergency Medical Services, Baltimore, Maryland

Specialized Patient Care Units; Operating Rooms

ROBERT H. DAILEY, M.D.

Clinical Associate Professor of Medicine and Community and Ambulatory Medicine (Emergency Medicine), University of California at San Francisco; Chief, Department of Emergency Medicine, Valley Medical Center, Fresno, California

Difficulty in Breathing

JOHN K. DAVIDSON, M.D., Ph.D.

Professor of Medicine, Emory University School of Medicine; Director of Diabetes Unit, Grady Memorial Hospital, Atlanta, Georgia

Diabetic Ketoacidosis; Hyperglycemic States

WILLIAM E. DEMUTH, JR., M.D.

Professor of Surgery, The Pennsylvania State University College of Medicine, Philadelphia; General Surgeon, The Milton S. Hershey Medical Center, Hershey, Pennsylvania

Neck Trauma

ROBERT L. DONALD, M.D.

Clinical Assistant Professor of Medicine, University of Texas Medical School, Houston, Texas; former Chairman, Committee on Emergency Medical Services, American Medical Association, Texas Medical Association, and Harris County Medical Society; former Delegate from the AMA to the Commission on Emergency Medical Services; charter member of the American College of Emergency Physicians

EMS Transportation

MICHAEL E. ERVIN, M.D.

Assistant Clinical Professor, Wright State University School of Medicine; Director of Emergency Services, Miami Valley Hospital; Medical Director of Western Ohio Emergency Medical Services, Dayton, Ohio

Minor Surgical Procedures

RICHARD L. FABIAN, M.D.

Instructor in Otolaryngology, Harvard Medical School, Boston; Chief of Plastic Service and active staff member, Massachusetts Eye and Ear Infirmary, Boston; Chief of Surgery, E. K. Shriners Center for Mental Retardation, Waltham; Active Staff, N. E. Deaconess Hospital, Boston; Consultant in Otolaryngology, Veterans Administration Hospital, W. Roxbury, Massachusetts

Otolaryngologic Procedures

ALAN O. FEINGOLD, M.D.

Assistant Professor of Clinical Medicine, Emory University Medical School, Atlanta; Staff Physician, Dekalb General Hospital and Grady Memorial Hospital, Decatur, Georgia

Disorders of the Red Blood Cells; Splenomegaly

ROBERT DAVID FINK, M.D.

Clinical Associate Professor, Department of Psychiatry, University of Tennessee, Center for the Health Sciences; Superintendent, Memphis Mental Health Institute; Consulting Psychiatrist, Alcohol and Drug Dependence Clinic, Memphis Mental Health Institute, Memphis, Tennessee

Intoxication and the Alcohol Abstinence Syndrome

GERALD F. FLETCHER, M.D.

Professor of Internal Medicine (Cardiology), Emory University School of Medicine; Director of Internal Medicine, Georgia Baptist Hospital, Atlanta, Georgia

Insertion of a Temporary Transvenous Pacemaker

URI FREUND, M.D.

Hadassah Medical Center, Jerusalem, Israel

Cardiovascular System Failure

ARNOLD P. FRIEDMAN, M.D., F.A.C.P.

Professor of Neurology, University of Arizona Medical School; Attending Neurologist, Tucson Medical Center and St. Joseph's Hospital, Tucson, Arizona

Headache

AURÉL A. GÁBOR, M.D. (deceased)

Hungarian National Emergency and Ambulance Service, Budapest, Hungary

EMS in Hungary

JOHN T. GALAMBOS, M.D.

Professor of Medicine, Emory University School of Medicine; Chief of Gastroenterology, Grady Memorial Hospital; Associate Physician, Gastroenterology, Emory University Hospital, Atlanta, Georgia

Hepatic Disease

DONALD S. GANN, M.D.

Professor of Emergency Medicine, The Johns Hopkins University School of Medicine; Director, Division of Emergency Medicine, and Surgeon, The Johns Hopkins Hospital, Baltimore, Maryland

General Body Response to Trauma

JAMES G. GARRICK, M.D.

Head, Division of Sports Medicine, and Associate Professor, Department of Orthopedics, University of Washington, Seattle, Washington

Emergencies in Sports

JAMES E. GEORGE, M.D., J.D.

Emergency Physician, Underwood Memorial Hospital, Woodbury, New Jersey; Board Member, American College of Emergency Physicians

Medicolegal Problems

JAMES E. GERACE, M.D., Maj., M.C.

Chief, Pulmonary Disease Service, Tripler Army Medical Center; Associate Clinical Professor of Medicine, University of Hawaii; Visiting Pulmonologist, University of Hawaii and Queens Medical Center, Honolulu, Hawaii

Near-Drowning

GEOFFREY GIBSON, Ph.D.

Associate Professor, The Johns Hopkins University School of Medicine and The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland

Utilization of EMS

RAY W. GIFFORD, JR., M.D.

Head, Department of Hypertension and Nephrology, The Cleveland Clinic Foundation, Cleveland, Ohio

Hypertensive Crises

LEON GOLDMAN, M.D.

Professor and Chairman, Department of Dermatology; Director, Laser Laboratory, University of Cincinnati Medical Center; Director, Dermatology, Cincinnati General Hospital and Children's Hospital Medical Center, Cincinnati, Ohio

Laser and Microwave Injuries

ROBERTA BECKMAN GONZALEZ, M.D.

Clinical Associate in Medicine, University of Pennsylvania Medical School, Presbyterian University of Pennsylvania Hospital, and Graduate Hospital, Philadelphia, Pennsylvania

Endocrinologic Problems

GARY J. GRAD, M.D.

Clinical Assistant Professor, Downstate Medical Center; Acting Director, Child and Adolescent Outpatient Department, Kings County Hospital Center, Brooklyn, New York

Psychiatric Emergencies

BARBARA HARTLEY GREENE, M.D.

Assistant Professor of Medicine, Emory University School of Medicine; Staff Physician, Grady Memorial Hospital, Atlanta, Georgia

Porphyrias; Pheochromocytoma

ARTHUR H. GRIFFITHS

Communications Specialist, Division of Emergency Medical Services, Public Health Service, U.S. Department of Health, Education, and Welfare, Washington, D.C.

EMS Communications

WILLIAM F. HAMILTON, Ph.D.

Associate Professor of Decision Sciences and Management, Wharton School, University of Pennsylvania; Associate Director, Leonard Davis Institute of Health and Economics, University of Pennsylvania, Philadelphia, Pennsylvania

Financing the EMS

LINTON C. HOPKINS, M.D.

Assistant Professor of Neurology, Emory University School of Medicine; Attending Neurologist, Emory University Hospital and Grady Memorial Hospital, Atlanta, Georgia

Neuromuscular Diseases

J. WILLIS HURST, M.D.

Professor and Chairman, Department of Medicine, Emory University School of Medicine, Atlanta, Georgia

Chest Pain

LOREN A. JOHNSON, M.D.

Instructor in Emergency Medical Technology, Orange Coast College, Costa Mesa; Emergency Physician, Saint Francis Hospital, Lynwood, California

Trauma Due to Cold; Toxic Bites and Stings

E. JEFF JUSTIS, JR., M.D.

Clinical Assistant Professor of Orthopaedic Surgery, University of Tennessee College of Medicine; Consultant in Hand Surgery to Tennessee and Mississippi Crippled Children Services; Active Staff, The Campbell Clinic, Baptist Memorial Hospital, City of Memphis Hospital; Consulting Staff, LeBonheur Hospital and Arlington Hospital, Memphis, Tennessee

Trauma to the Hand

ALAN S. KAPLAN, M.D., M.P.H.

Director, Professional Programs, Office of the Assistant Commissioner for Professional and Consumer Programs, Food and Drug Administration, Rockville, Maryland

Legislative Aspects of Emergency Care

LESTER KARAFIN, M.D., F.A.C.S.

Professor of Urology, The Medical College of Pennsylvania; Clinical Professor of Urology, Temple University Medical Center; Chief, Section of Urology, Hospital of The Medical College of Pennsylvania; Attending Urologist, Temple University Hospital and St. Christopher's Hospital for Children, Philadelphia, Pennsylvania

Genitourinary Injuries

DOROTHY KARANDANIS, M.D.

Assistant Professor of Medicine, Emory University School of Medicine, Atlanta, Georgia

Diseases of Veins

JAMES W. KELLER, M.D.

Assistant Professor of Medicine, Emory University School of Medicine; Attending Hematologist and Medical Oncologist, Emory University Hospital and Grady Memorial Hospital, Atlanta, Georgia

Disorders of Leukocytes

ROBERT R. KELLY, M.D.

Emergency Physician, Salem Memorial Hospital, Salem, Oregon

Pericarditis

A. RICHARD KENDALL, M.D.

Professor and Chairman, Department of Urology, Temple University School of Medicine; Clinical Professor of Urology and Attending Urologist, The Medical College of Pennsylvania; Attending Urologist, St. Christopher's Hospital for Children, Philadelphia, Pennsylvania

Genitourinary Injuries

THOMAS C. KENNEDY, M.C.P.

Staff Associate, Center for the Study of Emergency Health Services, University of Pennsylvania, Philadelphia, Pennsylvania

Accident Prevention, Consumer Education and Community Involvement in EMS

YEHEZKIEL KISHON, M.D.

Lecturer in Internal Medicine, University of Tel-Aviv Medical School; Associate Director, Heart Institute, Sheba Medical Center, Tel-Hashomer, Israel

EMS in Tel-Aviv

NATHAN S. KLINE, M.D., F.A.C.P., F.R.C.Psych.

Director, Rockland Research Institute, Orangeburg; Clinical Professor of Psychiatry, College of Physicians and Surgeons, Columbia University, New York; Attending Physician, Lenox Hill Hospital, New York, New York

Psychiatric Emergencies

DAVID HOWARD KNOTT, M.D., Ph.D.

Clinical Associate Professor, Department of Psychiatry, University of Tennessee Center for the Health Sciences; Medical Director, Alcohol and Drug Dependence Clinic, Memphis Mental Health Institute; Assistant Superintendent, Research and Training, Memphis Mental Health Institute, Memphis, Tennessee

Intoxication and the Alcohol Abstinence Syndrome

WILLIAM G. LAVELLE, M.D.

Instructor in Otolaryngology, Harvard Medical School, Boston; Chief of Otolaryngology, Whidden Memorial Hospital, Everett; Active Staff, Massachusetts Eye and Ear Infirmary and Children's Hospital Medical Center, Boston, Massachusetts

Otolaryngologic Procedures

JEFFREY A. LEONARD, M.D.

Clinical Associate Professor, Department of Psychiatry, University of Pennsylvania, Attending Psychiatrist, Institute of Pennsylvania Hospital, Philadelphia, Pennsylvania

Headache

ROBERT L. LEOPOLD, M.D.

Professor of Psychiatry, School of Medicine; Professor of Health Care Systems, Wharton School; University of Pennsylvania, Attending Psychiatrist, Hospital of the University of Pennsylvania; Associate Neurologist, Psychiatrist, Graduate Hospital of the University of Pennsylvania; Attending Psychiatrist, Institute of Pennsylvania Hospital, Philadelphia, Pennsylvania

Crisis Intervention Services

DAVID G. LEVINE, M.D.

Assistant Clinical Professor of Psychiatry, School of Medicine, University of California, San Francisco; Mental Health Director and Program Chief, Community Mental Health Services, Marin County, California

Alcohol and Drug Abuse

JEAN-PIERRE LINDENMAYER, M.D.

Assistant Professor of Psychiatry, State University of New York; Acting Director, Psychiatric Inpatient Service, University Hospital, Downstate Medical Center, Brooklyn, New York

Psychiatric Emergencies

JOSEPH LINDSAY, JR., M.D.

Professor of Medicine, Division of Cardiology, The George Washington University School of Medicine; Director of Coronary Care Unit, George Washington University Hospital, Washington, D.C.

Aorta and Peripheral Arteries

GEORGE I. LITMAN, M.D.

Chairman, Sub-council of Cardiology, Northeastern Ohio Universities College of Medicine; Chief, Cardiology Service, Akron General Medical Center, Akron, Ohio

Use of Flow-Directed Balloon Tipped Catheter

GERALD L. LOONEY, M.D., M.P.H.

Assistant Professor, Department of Emergency Medicine, University of Southern California School of Medicine; Attending Staff, LAC-USC Medical Center; Director of Emergency Department, Glendale Adventist Medical Center, Glendale, California

EMS Manpower and Training; Education in the Emergency Department

MILTON N. LURIA, M.D.

Professor of Medicine and Health Services, University of Rochester School of Medicine and Dentistry; Physician, Strong Memorial Hospital, Rochester, New York

Syncope

WILLIAM R. MACAUSLAND, JR., M.D.

Associate Clinical Professor in Orthopaedic Surgery, Harvard Medical School; Assistant Clinical Professor in Orthopaedic Surgery, Tufts University Medical School, Boston, Massachusetts

Orthopedic Procedures; Trauma to Extremities and Soft Tissues

JAMES ROBERTSON MACKENZIE, M.D., F.R.C.S.(C.), F.A.C.S.

Assistant Clinical Professor of Surgery, McMaster University; Active Staff, Hamilton General Hospital; Chief of Emergency Department and active staff member, Chedoke General Hospital; Associate Staff Member, McMaster University Medical Center, Hamilton, Ontario, Canada

Abdominal Trauma

KARL G. MANGOLD, M.D.

Clinical Instructor, University of California, San Francisco; Vice President, American College of Emergency Physicians; Director, Department of Emergency Medicine, Vesper Memorial Hospital, San Leandro, California

Financing the Emergency Department

BENEDICT S. MANISCALCO, M.D.

Assistant Professor of Medicine (Cardiology), University of South Florida College of Medicine, Tampa, Florida

Cardiogenic Shock

JOHN P. MARIANO, B.S.

Emergency Medical Services Coordinator, Philadelphia Department of Public Health, Philadelphia, Pennsylvania

Disaster Preparedness

FRANK I. MARLOWE, M.D.

Associate Professor of Otolaryngology, The Medical College of Pennsylvania; Staff, Hospital of The Medical College of Pennsylvania; Staff, Presbyterian-University of Pennsylvania Medical Center; Consultant, Naval Regional Medical Center, Philadelphia, Pennsylvania

Vertigo

KENNETH L. MATTOX, M.D.

Assistant Professor of Surgery, Cora and Webb Mading Department of Surgery, Baylor College of Medicine; Deputy Surgeon-in-Chief and Director of Emergency Surgical Services, Ben Taub General Hospital, Houston, Texas

Hemoptysis

LEON MENZER, M.D.

Instructor in Neurology, Harvard Medical School; Instructor in Neurology, Tufts University Medical School; Assisting Physician in Neurology, Boston City Hospital, Boston, Massachusetts

Convulsions

SYLVIA H. MICIK, M.D.

Associate Professor, Clinical Pediatrics and Community Medicine, University of California School of Medicine, La Jolla; Director of Emergency Medical Services, San Diego; Attending Physician, University of California Medical Center, San Diego, California

Poison Control Centers

JAMES DEWITT MILLS, JR., M.D.

Clinical Instructor in Medicine, Georgetown University, Washington, D.C.; Chairman, Emergency Department, Mt. Vernon Hospital, and Emergency Department, Alexandria Hospital, Alexandria, Virginia

Organization and Staffing of the Emergency Department

JOHN A. MONCRIEF, M.D.

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

Burns

WILLIAM W. MONTGOMERY, M.D.

Professor of Otolaryngology, Harvard Medical School; Senior Surgeon in Otolaryngology, Massachusetts Eye and Ear Infirmary; Chief, Head and Neck Tumor Clinic, Massachusetts General Hospital and Massachusetts Eye and Ear Infirmary; Consultant in Otolaryngology, Children's Hospital Medical Center, Boston, Massachusetts

Otolaryngologic Procedures

JACK COLBERT MORGAN, M.D.

Clinical Instructor, Department of Psychiatry, University of Tennessee Center for the Health Sciences, Memphis, Tennessee

Intoxication and the Alcohol Abstinence Syndrome

GARY G. NICHOLAS, M.D.

Assistant Professor of Surgery, The Pennsylvania State University College of Medicine, Philadelphia; General Surgeon, The Milton S. Hershey Medical Center, Hershey, Pennsylvania

Trauma to the Neck

EDDY D. PALMER, M.D.

Clinical Professor of Medicine, Rutgers Medical School, Piscataway; Attending Physician, Hackettstown Community Hospital, Hackettstown, New Jersey

Hematemesis and Melena

LEONARD F. PELTIER, M.D., Ph.D.

Professor of Surgery, University of Arizona College of Medicine; Chief, Orthopedics, Arizona Medical Center, Veterans Administration Hospital, Tucson, Arizona

Fat Embolism

THOMAS N. PERLOFF, M.Sc.

Associate Director, Urban Health Services Center, University of Pennsylvania, Philadelphia, Pennsylvania

The Health Maintenance Organization; National Health Insurance

ROBERT PAUL PROULX, M.D.

Associate Professor, Los Angeles County/USC Medical Center; Emergency Department Physician, St. Joseph Medical Center, Burbank, California

Heart Distress

JOHN JOSEPH PURCELL, JR., M.D.

Assistant Clinical Professor of Ophthalmology and Director of Cornea Service, Saint Louis University School of Medicine; Director of Cornea and External Disease Service, Saint Louis University Hospitals and Saint Mary's Hospital, Saint Louis, Missouri

Examination of the Eye and Its Adnexa; Ocular Trauma

JONATHAN E. RHOADS, JR., M.D.

Assistant Professor of Surgery and Attending Surgeon, The Medical College of Pennsylvania; Chief of Surgery, Philadelphia Veterans Administration Hospital, Philadelphia, Pennsylvania

Vascular Procedures

ARTHUR E. RIKLI, M.D., M.P.H.

Professor, Department of Community Health and Medical Practice, University of Missouri, Columbia, Missouri

Tokyo EMS

JAMES R. ROBERTS, M.D.

Instructor of Emergency Medicine, The Medical College of Pennsylvania; Attending Physician, Department of Emergency Medicine, Frankfort Hospital, Philadelphia, Pennsylvania

Snakebites

PETER ROSEN, M.D.

Director, Division of Emergency Medicine, Department of Health and Hospitals, Arizona Medical Center, Veterans Administration Hospital, Tucson, Arizona

Hypovolemic Shock

CONSTANTINE C. ROUSSE, M.D.

Chairman, Department of Emergency Medicine, Akron General Medical Center, Akron, Ohio

Diarrhea

ROBERT BARRY RUTHERFORD, M.D.

Associate Professor of Surgery, University of Colorado Medical School; Associate Professor of Surgery, Colorado General Hospital, Denver, Colorado

Trauma to the Peripheral Vascular System

G. ANTHONY RYAN, M.D., B.S., M.P.H.

Senior Lecturer, Department of Social and Preventive Medicine, Monash University, Melbourne, Australia

EMS in Australia

THOMAS D. SABIN, M.D.

Associate Professor of Neurology, Boston University; Director, Neurologic Unit, Boston City Hospital, Boston, Massachusetts

Coma; Confusion; Convulsions; Neurologic Emergencies

ALFRED M. SADLER, JR., M.D.

Clinical fellow in medicine at Harvard Medical School, Department of Internal Medicine; Resident Physician, Department of Medicine, Massachusetts General Hospital, Boston, Massachusetts

Emergency Medical Services in Perspective

BLAIR L. SADLER, J.D.

Vice President, Scripps Clinic and Research Foundation; Director, Green Hospital of Scripps Clinic, California

Emergency Medical Services in Perspective

ARTHUR P. SAFRAN, M.D.

Assistant Professor of Medicine, Instructor in Neurology, Boston University; Instructor in Neurology, Tufts University; Lecturer on Neurology, Harvard University, Boston; Staff, The Framingham Union Hospital, Framingham; Staff, Neurological Unit, Boston City Hospital, Boston, Massachusetts

Confusion

ATEF A. SALAM, M.D.

Associate Professor of Surgery, Emory University School of Medicine; Director of Vascular Surgery Service, Grady Memorial Hospital, Atlanta, Georgia

Upper Gastrointestinal Bleeding

HERBERT STANLEY SHUBIN, M.D. (deceased)

Associate Professor of Medicine and Associate Director, Shock Research Unit and the Center for the Critically Ill, University of Southern California School of Medicine, Los Angeles County/USC Medical Center and the Hollywood Presbyterian Medical Center, Los Angeles, California

Cardiovascular System Failure

HARVEY M. SILVERMAN, M.D.

Emergency Physician, Springfield Hospital, Springfield, Vermont

Smoke Inhalation

MARK E. SILVERMAN, M.D.

Associate Professor of Medicine (Cardiology), Emory University School of Medicine; Attending Cardiologist, Grady Memorial Hospital and Piedmont Hospital, Atlanta, Georgia

Arrhythmias

DAVID P. SIMMONS, M.D.

Clinical Instructor in Orthopaedic Surgery, Harvard Medical School, Boston, Massachusetts

Orthopedic Procedures; Trauma to Extremities and Soft Tissues

HOWARD M. SIMONS, M.D.

Assistant Dermatologist, University of Pennsylvania School of Medicine, Philadelphia; Physician-in-Chief, Dermatology Department, Abington Memorial Hospital, Abington; Attending Dermatologist, Doylestown Hospital, Doylestown, and Warminster General Hospital, Warminster, Pennsylvania

Pruritus; Dermatologic Emergencies

ALVIN J. SLOVIN, M.D.

Assistant Professor of Surgery, The George Washington University School of Medicine, Washington, D.C.

Vascular Emergencies

GEORGE L. SPAETH, M.D.

Professor of Ophthalmology, Jefferson Medical College; Director of Glaucoma Service and Attending Surgeon, Wills Eye Hospital; Associate Ophthalmologist, Graduate Hospital, Philadelphia, Pennsylvania

Examination of the Eye and Its Adnexa; Ocular Trauma

H. HARLAN STONE, M.D.

Professor of Surgery, Emory University School of Medicine; Chief of Trauma, Burn, and Pediatric Surgical Services at Grady Memorial Hospital; Attending Surgeon, Emory University Hospital, Atlanta, Georgia

Gastrointestinal Emergencies; Gastrointestinal Inflammations

CHARLES HERBERT STUART-HARRIS, M.D., D.Sc., F.R.C.P.

Professor and Postgraduate Dean of Medicine, The University of Sheffield, Sheffield, England

Atmospheric Pollution

PANAGIOTIS N. SYMBAS, M.D.

Professor of Surgery, Thoracic and Cardiovascular Surgery Division, Emory University School of Medicine; Director, Thoracic and Cardiovascular Surgery Department, Grady Memorial Hospital; Attending Surgeon, Emory University and Veterans Administration Hospital, Atlanta, Georgia

Chest and Heart Injuries

J. WILLIAM THOMAS, M.B.A.

Lecturer, Wharton School, and Associate Director, Center for the Study of Emergency Health Services, University of Pennsylvania, Philadelphia, Pennsylvania

EMS Planning and Evaluation

THORSTEN THOR

Managing Director, SPRI (The Swedish Planning and Rationalization Institute), Stockholm, Sweden

Stockholm EMS

JAMES R. UNGAR, M.D.

Attending Physician, Department of Family Practice, Los Alamitos General Hospital, Los Alamitos, California

Respiratory Emergencies

GEORGE L. VOELZ, M.D.

Health Division Leader, University of California, Los Alamos Scientific Laboratory,
Los Alamos, New Mexico

Radiation Injury

JULIAN A. WALLER, M.D., M.P.H.

Professor and Chairman, Department of Epidemiology and Environmental Health,
University of Vermont College of Medicine; Consultant in Injury Control and
Emergency Medical Services, Vermont Health Department, Burlington, Vermont

Epidemiologic Factors

STEPHEN G. WAXMAN, M.D., Ph.D.

Professor of Neurology, Stanford Medical School, Veterans Administration Hospital
Neurological Unit, Palo Alto, California

Coma

SAMUEL B. WEBB, JR., Ph.D.

Associate Professor of Public Health and Director of the Program in Hospital Ad-
ministration, Department of Epidemiology and Public Health, Yale University School
of Medicine, New Haven, Connecticut

Emergency Medical Services in Perspective

MAX HARRY WEIL, M.D., Ph.D.

Clinical Professor of Medicine and Biomedical Engineering and Director of the Shock
Research Unit and the Center for the Critically Ill, University of Southern California
School of Medicine, Los Angeles County/USC Medical Center and the Hollywood
Presbyterian Medical Center, Los Angeles, California

Cardiovascular System Failure

NANETTE K. WENGER, M.D.

Professor of Medicine (Cardiology), Emory University School of Medicine; Director,
Cardiac Clinics, Grady Memorial Hospital, Atlanta, Georgia

Pulmonary Embolism

ROBERT L. WHIPPLE, III, M.D.

Clinical Assistant Professor of Medicine (Cardiology), Emory University School of
Medicine, Atlanta, Georgia

Cardiogenic Shock

C. H. WILSON, JR., M.D.

Professor of Medicine and Director, Division of Rheumatology-Immunology, Emory
University School of Medicine; Attending Physician and Chief of Rheumatology,
Grady Memorial Hospital and Emory University Hospital, Consultant and Chief of
Rheumatology, Atlanta Veterans Administration Hospital, Atlanta, Georgia

Acute Arthritis

JACLYNE M. WITTE, B.A.

Research Assistant, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts

Otolaryngologic Procedures

ROBERT J. WOLFSON, M.D.

Professor and Head, Division of Otolaryngology, The Medical College of Pennsyl-
vania, Associate in Otolaryngology, Presbyterian Hospital, University of Pennsylvania
Medical Center, Philadelphia, Pennsylvania

Vertigo

THEODORE E. WOODWARD, M.D.

Professor and Head, Department of Medicine, University of Maryland School of Medicine, Baltimore, Maryland

Infectious Disease

MOHAMMED T. YOUNIS, M.D., M.S. (surgery)

Assistant Professor of Surgery, The Medical College of Pennsylvania; Attending Surgeon and Director of the Surgical Intensive Care Unit, Hospital of The Medical College of Pennsylvania; Consultant, Veterans Administration Hospital, Philadelphia, Pennsylvania

Evaluation of Acute Abdominal Pain