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Shoemaker

重症监护学

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Holbrook

Textbook of Critical Care



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4th Edition
(第4版)

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重症监护学

Textbook of Critical Care

第4版·下册

Fourth Edition • Volume 2

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TEXTBOOK OF **CRITICAL CARE**

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**SCIENCE PRESS
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This book is the product of more than 300 authors, all with excellent reputations for their devotion to outstanding, state-of-the-art management of critically ill patients during the worst phase of their disease when in need of intensive care. While we acknowledge the wisdom and foresight of the founders of the Society of Critical Care Medicine and the important influence of the many leaders who have served as presidents of this Society, we realize that the true heroes are the patients themselves. Therefore, we wish to dedicate this new edition of our textbook to all current and future ICU patients.

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Professor of Medicine and Dean for Research, Tufts University School of Medicine. Senior Vice President, Research and Technology, New England Medical Center, Boston, Massachusetts.
Cytokines in Disease

LARRY M. GENTILELLO, MD

Associate Professor of Surgery, University of Washington School of Medicine. Associate Director, Trauma Intensive Care Unit, Harborview Medical Center, Seattle, Washington.
Accidental Hypothermia

HUGO GOMEZ, MD

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Exsanguination; Thoracic Injuries

EDGAR R. GONZALEZ, PharmD

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Inotropic Therapy and the Critically Ill Patient

JOSEPH A. GOVERT, MD

Assistant Professor, Department of Medicine, Division of Pulmonary and Critical Care Medicine, Duke University School of Medicine, Durham, North Carolina.
Fiberoptic Bronchoscopy in the Intensive Care Unit

GEORGE A. GREGORY, MD

Professor of Anesthesia and Pediatrics, University of California, San Francisco, School of Medicine, San Francisco, California.
Resuscitation of the Newborn

AKE GRENVIK, MD, PhD, FCCM

Distinguished Service Professor of Critical Care Medicine, University of Pittsburgh School of Medicine. Director Emeritus, Multidisciplinary Critical Care Training Program, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania.
Air Embolization; History and Organization of Organ Transplantation; Alternative Organ Donor Categories; Future of Transplantation (Including Xenografting); Forgoing Life-Sustaining Therapy in Intensive Care

JEFFREY S. GROEGER, MD

Professor of Clinical Medicine, The Weill Medical College of Cornell University. Medical Director, Special Care Unit—Critical Care Medicine, Department of Anesthesiology and Critical Care Medicine, Memorial Sloan-Kettering Cancer Center, New York, New York.
Medical Complications in the Patient with Cancer

JACQUARD GUENON, MS

Chief Technology Officer, Wired Ventures Ltd., San Francisco, California.
Critical Care Applications of Large Data Bases

DAVID W. HAAS, MD

Associate Professor of Medicine, Division of Infectious Diseases, Vanderbilt University School of Medicine. Director, Clinical Infectious Diseases Services, Vanderbilt University Medical Center, Nashville, Tennessee.
Central Nervous System Infections

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Pharmacy. Critical Care Clinical Pharmacy, Specialist and Clinical Research Study Coordinator, Department of Critical Care Medicine, St. Francis Medical Center, Pittsburgh, Pennsylvania.
Sedatives and Analgesics in Critical Care

PERRY V. HALUSHKA, PhD, MD

Professor of Pharmacology and Medicine, Medical University of South Carolina College of Medicine, Charleston, South Carolina.
Prostaglandins, Thromboxanes, Leukotrienes, and Other Products of Arachidonic Acid

DAVID HANPETER, MD

Assistant Unit Chief, Trauma Surgery "A" Service, Department of Surgery, Division of Trauma Surgery and Critical Care, Los Angeles County-University of Southern California Medical Center, Los Angeles, California.
Exsanguination; Thoracic Injuries

JOHN M. HARLAN, MD

Professor of Medicine and Head, Division of Hematology, University of Washington School of Medicine, Seattle, Washington.
Neutrophil-Endothelial Cell Interactions

MAURENE A. HARVEY, RN, MPH, CCRN, FCCM

Consultant, Critical Care, Inc., Pasadena, California.
Building Bedside Collaborative Practice

ANDREA HASTILLO, MD

Associate Professor of Medicine, Division of Cardiology, Medical College of Virginia School of Medicine, Virginia Commonwealth University, Richmond, Virginia.
Conduction Disturbances and Cardiac Arrhythmias in the Critically Ill

MARILYN T. HAUPT, MD

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Anaphylactic Reactions

DAVID HEIMBACH, MD

Professor of Surgery, University of Washington School of Medicine. Director, Burn Center, Harborview Medical Center, Seattle, Washington.
Accidental Hypothermia

ELIZABETH A. HENNEMAN, RN, PhD, CCRN

Assistant Clinical Faculty, University of California, Los Angeles, UCLA School of Nursing. Clinical Nurse Specialist, UCLA Medical Center, Los Angeles, California.
Preventing Complications in the Intensive Care Unit

DANIEL A. HENRY, MD

Associate Professor, Department of Radiology, Medical College of Virginia School of Medicine, Virginia Commonwealth University; Medical College of Virginia Hospital, Richmond, Virginia.
Critical Care Imaging of the Chest

LYNN J. HERNAN, MD

Assistant Professor of Pediatrics and Anesthesiology, State University of New York at Buffalo School of Medicine and Biomedical Sciences. Associate Director, Pediatric Intensive Care Unit, Children's Hospital of Buffalo, Buffalo, New York.
Congestive Heart Failure in Infants and Children; Partial Liquid Ventilation

CARL ANTHONY HESS, MD

Associate Clinical Professor, Department of Anesthesiology, University of California, Irvine, College of Medicine, Irvine. Director, Memorial Pain Associates; President, PRISM Pain Management; Staff Anesthesiologist, Anaheim Memorial Medical Center, Anaheim, California.

Acute Pain in the Intensive Care Unit

MICHAEL L. HESS, MD, FACC

Professor of Medicine and Chairman, Division of Cardiopulmonary Laboratories and Research, Medical College of Virginia School of Medicine, Virginia Commonwealth University, Richmond, Virginia.

Applied Cardiovascular Physiology in the Critically Ill; Contemporary Thrombolytic Therapy in Acute Myocardial Infarction; Interventional Therapies for Cardiogenic Shock; Inotropic Therapy and the Critically Ill Patient

THOMAS L. HIGGINS, MD, FACP, FCCM

Associate Professor of Medicine and Anesthesiology, Tufts University School of Medicine, Boston. Director, Adult Critical Care Service, Baystate Medical Center, Springfield, Massachusetts.

Severity of Illness Indices and Outcome Prediction: Development and Evaluation

MICHAEL H. HINES, MD

Assistant Professor, Cardiothoracic Surgery, and Director, Extracorporeal Membrane Oxygenation, Wake Forest University School of Medicine. Attending Surgeon, Wake Forest University Baptist Medical Center, Winston-Salem, North Carolina.

Use of Mechanical Circulatory Support Systems in Critically Ill Patients

ELIZABETH HINGSBERGEN, MD

Assistant Professor of Radiology and Pediatrics, Medical College of Virginia School of Medicine, Virginia Commonwealth University. Medical Staff, Children's Hospital, Richmond, Virginia.

Chest Imaging in Pediatric Intensive Care

MICHAEL J. HOCKSTEIN, MD, FCCP

Medical Director, Surgical Intensive Care Unit, Washington Hospital Center, Washington, D.C.

New Techniques in Management of the Cardiac Surgery Patient

STUART HOROWITZ, PhD

Director, Research and Technology, The Heart and Lung Institute, Jewish Hospital, Louisville, Kentucky.

Apoptosis in Critical Illness

JOHN W. HOYT, MD

Clinical Professor of Anesthesiology/Critical Care Medicine, University of Pittsburgh School of Medicine. Chairman, Department of Critical Care Medicine, St. Francis Medical Center, Pittsburgh, Pennsylvania.

Sedatives and Analgesics in Critical Care

F. IDA HSU, BA

Research Assistant, Memorial Sloan-Kettering Cancer Center, New York, New York.

Surgical Problems in the Critically Ill Oncologic Patient

RUSSELL D. HULL, MB BS, MSc

Professor of Medicine, University of Calgary Faculty of Medicine. Director, Thrombosis Research Unit, Foothills Hospital, Calgary, Alberta, Canada.

Treatment of Massive Pulmonary Embolism; Diagnosis and Treatment of Venous Thromboembolism

DAVID H. INGBAR, MD

Professor of Medicine and Pediatrics, Pulmonary, Allergy and Critical Care Division, University of Minnesota School of Medicine. Medical Director, Critical Care; Medical Director, Medical ICU; and Co-Medical Director, Respiratory Care, Fairview University Medical Center, Minneapolis, Minnesota.

Life-Threatening Hemoptysis

JULIE R. INGELFINGER, MD

Associate Professor of Pediatrics, Harvard Medical School. Chief, Pediatric Nephrology, Massachusetts General Hospital, Boston, Massachusetts.

Hypertensive Emergencies in Infants and Children

MICHAEL R. JACOBS, MB, BCh, PhD, MRCPATH

Professor of Pathology, Case Western Reserve University School of Medicine. Director, Clinical Microbiology, University Hospitals of Cleveland, Cleveland, Ohio.

Laboratory Diagnosis of Infection

YVES JANIN, MD

Senior Fellow, Division of Cardiology, Medical College of Virginia School of Medicine, Virginia Commonwealth University, Richmond, Virginia.

Contemporary Thrombolytic Therapy in Acute Myocardial Infarction; Interventional Therapies for Cardiogenic Shock

RANDEEP S. JAWA, MD

Surgical Resident, Howard University College of Medicine, Washington, D.C.

Cellular Effectors of the Septic Process

KHURSHED N. JEEJEEBHOO, MBBS, PhD, FRCPC

Professor of Medicine, Nutrition, and Physiology, University of Toronto Faculty of Medicine. Gastroenterologist, St. Michael's Hospital, Toronto, Ontario, Canada.

Micronutrient Deficiencies

DENNIS M. JENSEN, MD

Professor of Medicine, Division of Gastroenterology, Department of Medicine, University of California, Los Angeles, UCLA School of Medicine, Los Angeles, California.

Severe Gastrointestinal Hemorrhage

HOWARD JOLLES, MD

Senior Associate Consultant, Mayo Clinic Jacksonville, Jacksonville, Florida.

Critical Care Imaging of the Chest

VERN C. JUEL, MD

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Neuromuscular Disorders in Critical Care

GREGORY J. JURKOVICH, MD

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Accidental Hypothermia; Trauma to the Pregnant Patient

ROBERT M. KACMAREK, PhD, RRT, FCCM

Associate Professor, Department of Anesthesia, Harvard Medical School. Director, Respiratory Care Services, Massachusetts General Hospital, Boston, Massachusetts.

Controlled Mechanical Ventilation

ALLEN B. KAISER, MD

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Central Nervous System Infections

GEORGE J. KALOYANIDES, MD, FACP

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Drug-Kidney Interactions

YOOGOO KANG, MD

Professor of Anesthesiology and Critical Care Medicine, University of Pittsburgh School of Medicine. Director, Hepatic Transplantation Anesthesiology and Critical Care Medicine, Department of Anesthesiology/Critical Care Medicine, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania.

Multiple Organ Procurement

BARBARA S. KANNEWURF, PharmD

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Inotropic Therapy and the Critically Ill Patient

JILL D. KAPLAN, MD

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Postoperative Confusion

JOAN E. KAPUSNIK-UNER, PharmD

Associate Clinical Professor, University of California, San Francisco, School of Medicine, San Francisco. Senior Knowledge Engineer, First Data Bank, San Bruno, California.

Antimicrobial Therapy in the Critical Care Setting

ROBERT KATZ, MD

Associate Professor of Pediatrics, University of New Mexico School of Medicine. Director, Pediatric Intensive Care Unit, University of New Mexico Hospital, Albuquerque, New Mexico.

Acute Parenchymal Disease in Childhood

CLIFFORD J. KAVINSKY, MD, PhD

Assistant Professor of Medicine, Rush Medical College of Rush University. Assistant Director, Section of Cardiology, Rush-Presbyterian St. Luke's Medical Center, Chicago, Illinois.

Severe Heart Failure in Cardiomyopathy: Pathogenesis and Treatment

JEFFREY A. KAZAZ, PhD

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Apoptosis in Critical Illness

ROBERT J. KEENAN, MD, FRCS

Professor of Surgery, University of Pittsburgh School of Medicine. Surgical Director of Lung Transplantation, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania.

Critical Care Aspects of Lung Transplantation

JOHN A. KELLUM, MD

Assistant Professor of Anesthesiology/Division of Critical Care Medicine and Medicine, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania.

Diagnosis and Treatment of Acid-Base Disorders; Appraising and Using Evidence in Critical Care

JOHN M. KELLUM, MD, FACS

Professor, Department of Surgery, Medical College of Virginia School of Medicine, Virginia Commonwealth University, Richmond, Virginia.

Intra-abdominal Sepsis

AJAI KHANNA, MD, FRCS

Assistant Professor of Surgery, Department of Surgery, University of California, San Diego, School of Medicine, La Jolla. Attending Transplant Surgeon, UCSD Medical Center, Department of Surgery, San Diego, California.

Principles of Immunosuppression

NABIL E. KHOURY, MD

Clinical Assistant Professor, Department of Internal Medicine, Case Western Reserve University School of Medicine, Cleveland, Ohio. Division Head, Emergency Medicine, and Medical Director, Clinical Decision Unit, Henry Ford Medical Center, West Bloomfield, Michigan.

Clinical Decision Units and Acute Medical Emergencies

THOMAS KILLIP, MD

Professor of Medicine, Albert Einstein College of Medicine of Yeshiva University, Bronx, New York. Director, Heart Institute, Beth Israel Medical Center, New York, New York.

Treatment of Myocardial Infarction

IVAN KIROV, MD

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Hematopoietic Colony-Stimulating Factors

W. ANDREW KOFKE, MD, FCCM

Professor and Vice-Chairman, Department of Anesthesiology, West Virginia University School of Medicine, Morgantown, West Virginia.

Neuropathophysiology

MICHAEL C. KONTOS, MD

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Echocardiography in Critical Care

ROBERT L. KORMOS, MD

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Multiple Organ Procurement

DAVID J. KRAMER, MD

Associate Professor of Anesthesiology/Critical Care Medicine, Medicine, and Surgery, University of Pittsburgh School of Medicine. Co-Director, Liver Transplant Intensive Care Unit Service, University of Pittsburgh Medical Center-Presbyterian University Hospital, Pittsburgh, Pennsylvania.

Intensive Care of Liver Transplant Recipients

JOHN W. KREIT, MD

Assistant Professor of Medicine, University of Pittsburgh School of Medicine. Director, Medical Intensive Care Unit, VA Medical Center, Pittsburgh, Pennsylvania.

Mechanics of the Respiratory System

FRED J. LAINE, MD

Associate Professor of Radiology and Otolaryngology, Medical College of Virginia School of Medicine, Virginia Commonwealth University, Richmond, Virginia.

Imaging of the Central Nervous System in the Critical Care Patient

LUIS LANDÍN, MD, PhD

Associate Professor, Department of Medicine, Universidad de Alcalá de Henares. Attending Physician, Intensive Care Unit, Hospital Ramón y Cajal, Madrid, Spain.

Nitric Oxide in Critical Illness

EDWIN LEE, MD

Director of Endocrinology, Gessler Clinic, Winter Haven, Florida.

Neuroendocrine Immunology in the Critically Ill Patient

KEITH LEWIS, MD

Instructor, Department of Pediatrics, University of California, Los Angeles, UCLA School of Medicine, Los Angeles. Fellow, Pediatric Critical Care, Harbor-UCLA Medical Center, Torrance; Children's Hospital of Orange County, Orange; Charles R. Drew-Martin Luther King Medical Center, Los Angeles, California.

Drowning and Near-Drowning

YUCHI LI, PhD

Research Scientist, Cardiopulmonary Research Institute, Winthrop-University Hospital, Mineola, New York.

Apoptosis in Critical Illness

PETER K. LINDEN, MD, DMD

Associate Professor, Departments of Anesthesiology/Critical Care Medicine and Medicine, University of Pittsburgh School of Medicine. Associate Director, Liver Intensive Care Unit, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania.

Infections After Solid Organ Transplantation

DOUGLAS P. LOHMANN, ME

Coordinator of Circulatory Support, Wake Forest University Baptist Medical Center, Winston-Salem, North Carolina.

Use of Mechanical Circulatory Support Systems in Critically Ill Patients

JOSÉ A. LORENTE, MD, PhD

Attending Physician, Intensive Care Unit, Hospital Universitario de Getafe, Madrid, Spain.

Nitric Oxide in Critical Illness

JOHN M. LUCE, MD

Professor of Medicine and Anesthesia, University of California, San Francisco, School of Medicine. Associate Director, Medical-Surgical Intensive Care Unit, San Francisco General Hospital, San Francisco, California.

Management of HIV and AIDS-Related Infection in the Intensive Care Unit

PHILIP D. LUMB, MB, BS, FCCM

Eric A. Walker Professor and Chairman, Department of Anesthesia, Pennsylvania State University College of Medicine. Director, Division of Anesthesia, South Central Operating Team, Penn State Geisinger Health System, Milton S. Hershey Medical Center, Hershey, Pennsylvania.

Conventional Airway Access

DREW A. MacGREGOR, MD

Assistant Professor of Anesthesiology (Critical Care) and Assistant Professor of Medicine (Pulmonary/Critical Care), Wake Forest University School of Medicine. Associate Medical Director, Adult Intensive Care Unit, Wake Forest University Baptist Medical Center, Winston-Salem, North Carolina.

Basic Pharmacologic Principles and Drug Monitoring

NEIL R. MacINTYRE, MD

Professor of Medicine, Duke University School of Medicine. Medical Director, Respiratory Care, Duke University Medical Center, Durham, North Carolina.

Patient-Ventilator Interactions; Weaning from Ventilatory Support in Hypoxemic Respiratory Failure

ROBERT C. MACKERSIE, MD, FACS

Professor of Surgery, University of California, San Francisco, School of Medicine. Director, Trauma Services, San Francisco General Hospital, San Francisco, California.

Transfusion Therapy

LUIS MALDONADO, MD

Assistant Professor, University of South Florida College of Medicine. Attending Staff, Tampa General Hospital, Tampa, Florida.

Proximal Airway Disorders in the Pediatric Patient

ROBERT J. MANGIALARDI, MD

Attending Physician, Centennial Medical Center, Nashville, Tennessee.

Management Controversies in Acute Respiratory Distress Syndrome

JOHN J. MARINI, MD

Professor of Medicine, University of Minnesota Medical School—Minneapolis. Chairman of Academic Medicine, and Director of Pulmonary and Critical Care Medicine, Regions Hospital, St. Paul, Minnesota.

Partial Ventilatory Assist; Initial Management of Acute Hypoxemia

IGNAZIO ROBERTO MARINO, MD, FACS

Associate Professor of Surgery, University of Pittsburgh School of Medicine. Associate Director, Transplant Division, Veterans Affairs Medical Center. Director, European Medical Division, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania.

Multiple Organ Procurement

LAWRENCE F. MARSHALL, MD

Professor and Head, Division of Neurosurgery, University of California, San Diego, School of Medicine, La Jolla. Chief, Neurosurgery, UCSD Medical Center, San Diego, California.

Management of Traumatic Brain Injury in the Intensive Care Unit

G. DANIEL MARTICH, MD

Assistant Professor of Anesthesiology and Critical Care Medicine, University of Pittsburgh School of Medicine. Co-Director, Cardiothoracic Intensive Care Unit, University of Pittsburgh Medical Center—Presbyterian Hospital; Medical Director, Critical Care Information Systems, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania.

Heart Transplantation

TOM A. MARTIN, PharmD, BCPS

Clinical Assistant Professor of Pharmacy, School of Pharmacy, University of North Carolina at Chapel Hill, Chapel Hill; Clinical Assistant Professor of Pharmacy Practice, School of Pharmacy, Campbell University, Buies Creek. Pharmaceutical Care Coordinator for Critical Care, Department of Pharmacy, Wake

Forest University Baptist Medical Center, Winston-Salem, North Carolina.

Basic Pharmacologic Principles and Drug Monitoring

GEORGE V. MAZARIEGOS, MD

Assistant Professor of Surgery, University of Pittsburgh School of Medicine. Co-Director, Liver Transplant Intensive Care Unit Service, Presbyterian University Hospital and Children's Hospital of Pittsburgh, Pittsburgh, Pennsylvania.

Intensive Care of Liver Transplant Recipients; Intestinal and Multiple Organ Transplantation

JERRY McCAULEY, MD

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Critical Care of Kidney Transplant Recipients

DAVID J. McCONKEY, PhD

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Cellular Signaling and Cell Death

KRISTINE M. McCULLOCH, MD

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Surfactant Physiology, Metabolism, Function, and Therapy

LISA McDUFFIE, MD

Research Fellow, Department of Surgery, Division of Trauma Surgery and Critical Care, Los Angeles County-University of Southern California Medical Center, Los Angeles, California.

Exsanguination

JEFFREY P. McGOVERN, MD

Assistant Clinical Professor of Medicine, Baylor College of Medicine, Houston, Texas.

Oxygenation Strategy

MAGED S. MIKHAIL, MD

Associate Professor of Anesthesiology and Surgery, University of Southern California School of Medicine, Los Angeles County-University of Southern California. Associate Director, Intensive Care Unit and Anesthesia, USC/Kenneth Norris Cancer Hospital, Los Angeles, California.

Hyperthermia; Anesthesia for High-Risk Patients

ADELAIDA M. MIRO, MD

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Acute Respiratory Failure in Patients with Chronic Obstructive Pulmonary Disease

JEROME MODELL, MD

Associate Vice President for Health Affairs and Professor of Anesthesiology, University of Florida College of Medicine, Gainesville, Florida.

Pulmonary Aspiration

ERNESTO P. MOLMENTI, MD

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Future of Transplantation (Including Xenografting)

RICHARD E. MOON, MD, CM, FACP, FCCP, FRCP(C)

Professor of Anesthesiology and Associate Professor of Pulmonary Medicine, Duke University School of Medicine. Medical Director, Hyperbaric Center, and Attending Anesthesiologist/Pulmonologist, Duke University Medical Center, Durham, North Carolina.

Hyperbaric Oxygen in Critical Care

ERNEST E. MOORE, MD

Professor and Vice-Chairman of Surgery, University of Colorado School of Medicine. Chief, Department of Surgery, Denver Health Medical Center, Denver, Colorado.

Role of the Gut in Multiple Organ Failure

MATTHEW L. MORONT, MD

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Intensive Care Management of the Injured Child

GABRIELLE F. MORRIS, MD

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Management of Traumatic Brain Injury in the Intensive Care Unit; Modern Management of Acute Spinal Cord Injury

WILLIAM J. MORRIS, MD

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Pediatric Neurosurgical Emergencies

INGRID MROZ, MS, RN, CCRN, ARNP

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Barriers to Effective Patient Care

JAMES A. MURRAY, MD

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Abdominal Trauma

ANNE L. NACLERIO, MD

Clinical Instructor, Pediatrics, George Washington University School of Medicine and Health Sciences. Fellow, Critical Care Medicine, Children's National Medical Center, Washington, D.C.

Evaluating Pediatric Critical Care

JANICE M. NEWSOME, MD

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Interventional Radiology for the Critically Ill Patient

RONALD LEE NICHOLS, MD, MS, FACS

Professor of Surgery, Tulane University School of Medicine, New Orleans, Louisiana.

Infections in the Surgical Critical Care Unit

J. V. NIXON, MD

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Echocardiography in Critical Care

SCOTT NORWOOD, MD, FACS, FCCM

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Catheter Colonization and Catheter-Related Bacteremia

RICHARD NOWAK, MD, MBA

Clinical Associate Professor, Department of Surgery, Division of Emergency Medical Services, University of Michigan Medical School, Ann Arbor. Vice-Chairman, Department of Emergency Medicine, Henry Ford Medical Center, Detroit, Michigan.

Clinical Decision Units and Acute Medical Emergencies

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Critical Care Aspects of Lung Transplantation

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Use of Mechanical Circulatory Support Systems in Critically Ill Patients

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Endocrine Emergencies

DANILA ODER, BA

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Critical Care Applications of Large Data Bases

WALTER J. O'DONNELL, MD

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Life-Threatening Asthma

GARY J. ORDOG, MD, FAACT

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Medical Toxicology in Critical Care Medicine

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Exsanguination; Thoracic Injuries

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Air Embolization

JOHN T. OWINGS, MD

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The Coagulopathy of Trauma

JOSEPH E. PARRILLO, MD

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Severe Heart Failure in Cardiomyopathy: Pathogenesis and Treatment

CYRUS J. PARSIA, MD

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Intravenous and Intra-arterial Access

M. H. PARSIA, MD

Associate Clinical Professor of Surgery, College of Physicians and Surgeons, Columbia University. Director, Trauma Center, and Chief, Vascular Access and Hyperalimentation Service, Harlem Hospital Center, New York, New York.

Intravenous and Intra-arterial Access; Invasive and Noninvasive Monitoring

DAVID L. PATERSON, MBBS, FRACP

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Pneumonia in the Immunosuppressed Patient

D. GLENN PENNINGTON, MD

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Use of Mechanical Circulatory Support Systems in Critically Ill Patients

JAY I. PETERS, MD

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Bacterial Pneumonia in Adult Respiratory Distress Syndrome

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Bone Marrow Transplantation

MAURICIO PINEDA-ROMAN, MD

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Injuries by Venomous and Poisonous Animals

GRAHAM F. PINEO, MD

Professor of Medicine, University of Calgary Faculty of Medicine. Director, Thrombosis Research Unit, Foothills Hospital, Calgary, Alberta, Canada.

Treatment of Massive Pulmonary Embolism; Diagnosis and Treatment of Venous Thromboembolism

SUSAN K. PINGLETON, MD

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Adjunctive Respiratory Therapy