Randall H. T. & Hardy J. D. (eds.)

Manual of Preoperative & Postoperative

Care

MANUAL OF PREOPERATIVE and POSTOPERATIVE CARE

BY THE COMMITTEE ON PRE AND POSTOPERATIVE CARE



AMERICAN COLLEGE OF SURGEONS

Editorial Subcommittee

HENRY T. RANDALL, M.D., Chairman JAMES D. HARDY, M.D. FRANCIS D. MOORE, M.D.

W.B. SAUNDERS COMPANY

Philadelphia and London. 1967

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

> 12 Dyott Street London W.C.1

Manual of Preoperative and Postoperative Care

© 1967 by 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 duplicated or reproduced in any manner 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 67-17450.

Contributors

CURTIS P. ARTZ, M.D., F.A.C.S.

Professor of Surgery and Chairman of the Department, Medical College of South Carolina, Charleston.

WALTER F. BALLINGER II, M.D., F.A.C.S.

Associate Professor of Surgery, Johns Hopkins University School of Medicine. Surgeon, The Johns Hopkins Hospital, Baltimore.

MARION A. CARNES, M.D., F.A.C.A.

Professor of Anesthesiology, University of Kentucky Medical School. Senior Anesthesiologist, University of Kentucky Medical Center, Lexington, Ky.

EUGENE E. CLIFFTON, M.D., F.A.C.S.

Associate Professor of Surgery, Cornell University Medical College. Attending Surgeon, Memorial Hospital and James Ewing Hospital; Associate Attending Surgeon, New York Hospital; Associate Visiting Surgeon, Bellevue Hospital, New York.

GEORGE H. A. CLOWES, JR., M.D., F.A.C.S.

Clinical Professor of Surgery, Harvard Medical School. Fifth Surgical Service, Boston City Hospital.

OLIVER COPE, M.D., F.A.C.S.

Professor of Surgery, Harvard Medical School. Visiting Surgeon, Massachusetts General Hospital, Boston.

BEN EISEMAN, M.D., F.A.C.S.

Professor and Chairman, Department of Surgery, University of Kentucky College of Medicine. Director of Surgery, University of Kentucky Hospital; Attending Staff, Central Baptist, Good Samaritan, St. Josephs and Veterans Administration Hospitals, Lexington, Ky.

TILDEN C. EVERSON, M.D., Ph.D., F.A.C.S.

Clinical Professor of Surgery, University of Illinois College of Medicine. Attending Surgeon, Cook County Hospital and Hines Veterans Administration Hospital, Chicago.

R. KENNEDY GILCHRIST, M.D., F.A.C.S.

Clinical Professor of Surgery, University of Illinois College of Medicine. Attending Surgeon, Presbyterian-St. Lukes Hospital, Chicago.

DAVID V. HABIF, M.D., F.A.C.S.

Professor of Surgery, Columbia University College of Physicians and Surgeons. Attending Surgeon, Presbyterian Hospital, New York.

JAMES D. HARDY, M.D., F.A.C.S.

Professor and Chairman, Department of Surgery, The University of Mississippi Medical Center. Surgeon-in-Chief, Hospital of the University of Mississippi; Chief Surgical Consultant, Veterans Administration Hospital; Chief Surgical Consultant, Mississippi Tuberculosis Sanatorium, Jackson, Miss.

JOHN MALONE HOWARD, M.D., F.A.C.S.

Professor of Surgery, Hahnemann Medical College and Hospital. Senior Attending Surgeon, Hahnemann Hospital, Philadelphia; Consultant in Surgery, Veterans Administration Hospital, Wilmington, Del.; Oncologic Hospital, Philadelphia; Walter Reed Army Institute of Research, Washington.

DAVID M. HUME, M.D., F.A.C.S.

Professor of Surgery and Chairman of the Department, Medical College of Virginia. Surgeon-in-Chief, Medical College of Virginia Hospitals, Richmond.

WILLIAM B. KIESEWETTER, M.D., F.A.C.S.

Professor of Pediatric Surgery, University of Pittsburgh. Surgeon-in-Chief, Children's Hospital of Pittsburgh.

IOHN M. KINNEY, M.D., F.A.C.S.

Associate Professor of Surgery, Columbia University College of Physicians and Surgeons. Associate Attending in Surgery, Presbyterian Hospital, New York.

JOHN W. KIRKLIN, M.D., F.A.C.S.

Professor and Chairman, Department of Surgery, University of Alabama Medical College. Chief-of-Staff, University of Alabama Hospitals and Clinics, Birmingham.

ROBERT A. MACBETH, M.D., M.Sc., F.A.C.S.

Professor of Surgery, University of Alberta Faculty of Medicine. Director of Surgical Services, University of Alberta Hospital, Edmonton.

WILLIAM V. McDERMOTT, JR., M.D., F.A.C.S.

Professor of Surgery, Harvard Medical School. Director, Fifth Surgical Service and Sears Surgical Laboratory, Boston City Hospital.

FRANCIS D. MOORE, M.D., F.A.C.S.

Moseley Professor of Surgery, Harvard Medical School. Surgeon-in-Chief, Peter Bent Brigham Hospital, Boston. CONTRIBUTORS vii

STEWART L. NUNN, M.D.

Instructor, University of Minnesota Mayo Graduate School of Medicine. Consultant in Medicine, Mayo Clinic, Rochester, Minn.

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

Professor of Urology, Western Reserve University School of Medicine. Urologist, University Hospitals of Cleveland; Chief of Urology, Cleveland Veterans Administration Hospital; Chief of Urology, Cleveland Metropolitan General Hospital.

HENRY T. RANDALL, M.D., F.A.C.S.

Professor of Surgery, Cornell University Medical College. Attending Surgeon, Memorial Hospital for Cancer and Allied Diseases, New York.

WILLIAM R. SANDUSKY, M.D., F.A.C.S.

Professor of Surgery, University of Virginia School of Medicine. Surgeon, University of Virginia Hospital, Charlottesville.

HOWARD ULFELDER, M.D., F.A.C.S.

Meigs Professor of Gynaecology, Harvard Medical School. Chief, Vincent Memorial Hospital, Boston.

CARL W. WALTER, M.D., F.A.C.S.

Clinical Professor of Surgery, Harvard Medical School. Surgeon, Peter Bent Brigham Hospital, Boston.

W. DEAN WARREN, M.D., F.A.C.S.

Professor of Surgery, University of Miami School of Medicine. Chairman, Department of Surgery, and Attending General Surgeon, Jackson Memorial Hospital, Miami; Consultant, Veterans Administration Hospital, Coral Gables.

BEN J. WILSON, M.D., F.A.C.S.

Attending Surgeon, St. Mary's Hospital; Consultant, Veterans Administration Hospital, Grand Junction, Colo.

EDWARD ROY WOODWARD, M.D., F.A.C.S.

Professor and Chairman, Department of Surgery, University of Florida College of Medicine. Chief of Surgery, University of Florida Teaching Hospital, Gainesville.

BERNARD ZIMMERMANN, M.D., Ph.D., F.A.C.S.

Professor and Chairman, Department of Surgery, West Virginia University School of Medicine. Chief Surgeon, West Virginia University Hospital, Morgantown; Consultant, Veterans Administration Hospital, Clarksburg.

Contents

PART I GENERAL PRINCIPLES	
Chapter 1	
INTRODUCTION AND GUIDE TO THE MANUAL	3
Chapter 2	
PREOPERATIVE EVALUATION OF THE SURGICAL	
PATIENT	6
Walter F. Ballinger, II	
Chapter 3	
FLUID AND ELECTROLYTE THERAPY	15
Henry T. Randall	
Chapter 4	
METABOLIC RESPONSE TO INJURY	52
Francis D. Moore	
Chapter 5	
SURGICAL NUTRITION: Parenteral and Oral	66
Francis D. Moore	-
Chapter 6	
HEMORRHAGIC AND TRAUMATIC SHOCK	78
Ben Eiseman and Marion A. Carnes	
	ix

Chapter 7
INFECTION
William R. Sandusky
Chapter 8
METABOLIC PROBLEMS OF SURGICAL PATIENTS 10'
MANAGEMENT OF DIABETES 107 Tilden C. Everson
ADRENAL INSUFFICIENCY
DISTURBANCE OF THYROID FUNCTION
DISTURBANCE OF PARATHYROID FUNCTION
METABOLIC PROBLEMS RELATED TO THE USE OF DRUGS AND DIETS
ANESTHETIC MANAGEMENT OF PATIENTS WITH METABOLIC PROBLEMS
Chapter 9 EVALUATION AND MANAGEMENT OF VENTILATION 149 John M. Kinney
Chapter 10
THE CARDIOVASCULAR SYSTEM IN CARE OF THE SURGICAL PATIENT
Chapter 11
EVALUATION AND CARE OF THE URINARY TRACT IN PATIENTS UNDERGOING SURGERY178 Lester Persky
Chapter 12
THE DIAGNOSIS AND MANAGEMENT OF ACUTE RENAL FAILURE

CONTENTS xi

Chapter 13
PREDICTION, DIAGNOSIS AND TREATMENT OF
EXCESSIVE BLEEDING190
Eugene E. Cliffton
5 14 14 1 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Chapter 14
BLOOD DONORS, BLOOD AND TRANSFUSION 197
Carl W. Walter
Chapter 15
BURNS 211
Curtis P. Artz
Chapter 16
SPECIAL PROBLEMS IN INFANTS AND CHILDREN 227
William B. Kiesewetter
Chapter 17
SPECIAL PROBLEMS IN THE AGED PATIENT 240
George H. A. Clowes, Jr.
Chapter 18
EMERGENCIES OF THE INTRAOPERATIVE AND
IMMEDIATE POSTOPERATIVE PERIODS252
James D. Hardy
Chapter 19
CARDIAC ARREST
James D. Hardy
Chapter 20
THE RECOVERY ROOM AND INTENSIVE CARE UNIT 278
John M. Kinney

PART II PATIENT CARE IN THE SURGERY OF BODY ORGANS AND SYSTEMS	,
Chapter 21	
SURGERY OF THE LUNG, ESOPHAGUS AND	
MEDIASTINUM2	293
George H. A. Clowes, Jr.	
Chapter 22	
STOMACH AND DUODENUM	309
Edward Roy Woodward	
Chapter 23	
SMALL INTESTINAL OBSTRUCTION	317
W. Dean Warren	
Chapter 24	
POSTOPERATIVE ILEUS	24
Ben J. Wilson	
Chapter 25	
SMALL BOWEL FISTULAS AND ILEOSTOMY3	32
James D. Hardy	
Chapter 26	
SURGERY OF THE COLON AND RECTUM	46
R. Kennedy Gilchrist	
Chapter 27	
EXTRAHEPATIC BILIARY TRACT AND PANCREAS 3	53
William V. McDermott, Jr.	
Chapter 28	
LIVER AND PORTAL VEIN	61
William V. McDermott, Ir.	

Chapter 29 BENIGN PANCREATIC DISEASE	37
Chapter 30 CARDIAC SURGERY	73
Chapter 31 THYROID AND PARATHYROID SURGERY	
Hyperparathyroidism39	
Chapter 32 UROLOGIC SURGERY)4
Chapter 33 GYNECOLOGIC SURGERY	2
Chapter 34 SURGERY OF THE ADRENALS	9
Chapter 35 SURGERY OF THE EXTREMITIES	5
VENOUS AND LYMPHATIC SYSTEMS	

X	ıv

APPENDIX

NORMAL BLOOD, PLASMA AND SERUM VALUES	447
FUNCTION TESTS FOR EVALUATION OF ORGANS	
AND SYSTEMS	453
SELECTED SURGICAL DIETS	459
NOMENCLATURE AND EQUIVALENT VALUES IN	
ACID-BASE BALANCE	475
INDEX	483

Part I

GENERAL PRINCIPLES



INTRODUCTION AND GUIDE TO THE MANUAL

The purpose of this Manual of Preoperative and Postoperative Care is to provide a useful outline for modern methods of handling the major problems of preoperative preparation and postoperative management of patients undergoing both elective and emergency surgery. It is intended to provide for the busy clinical surgeon, and for the surgical house officer, quick and concise access to recent advances in surgical metabolism and nutrition; fluid and electrolyte balance; endocrine, cardiac, respiratory and renal physiology; clotting disorders; infection; and shock. In the latter chapters of the book, the authors have described their methods of handling preoperative and postoperative care of patients undergoing surgery of major body systems, including the management of common complications and of surgical emergencies. Chapters are included on the treatment of burns and the organization and function of recovery and intensive care units; the appendix includes data on laboratory tests and diets and formulas of proven value.

The manual has been prepared by the Committee on Pre and Postoperative Care of the American College of Surgeons with approval of the Regents of the College. Many active and senior members of the Committee have contributed chapters to the manual and, in addition, other Fellows of the College with particular areas of interest and competence in a specific field have been asked by the Editorial Committee to participate. Deepest appreciation is expressed to Doctors Eugene E. Cliffton, Oliver Cope, R. Kennedy Gilchrist, Lester Persky, William R. Sandusky, Howard Ulfelder and Carl W. Walter for their important contributions.

This manual is an outgrowth of the activities of the Committee on Pre and Postoperative Care in conducting the annual Course in Pre and Postoperative Care and in preparing the associated manuals of outlines for the Courses. Since the Committee's formation in 1959 under the chairmanship of Dr. Francis D. Moore of Boston, a major activity has been the sponsoring of teaching sessions in pre and postoperative care. Another major activity was to be the preparation of a book, or a handbook or pamphlet, on the metabolic management of surgical patients. Of these two responsibilities, the former was more pressing, and in many ways the easiest, as the many members of the Committee joined together in producing courses year after year with continuing rotation of young teachers participating with the established men.

The manual went through several false starts, but finally, with the stimulation of the late Dr. Champ Lyons, Chairman of the Committee from 1961 until his death in 1965, an editorial subcommittee was formed

three years ago, and work began. Initial plans called for a strict outline format, similar to that of the highly successful Manuals on Fractures and or Early Care of Soft Tissue Injuries produced by the Committee on Trauma. After many chapters had been written, a wise decision was made by the Editorial Board of the College, at the suggestion of the publisher, in favor of the present format, using weight of type for emphasis, rather than a strict outline form. The editors of Saunders have worked hard to make the many revisions necessary in the manuscripts to accomplish this change.

Inevitably with a multiauthored volume, initially there was considerable repetition of some of the basic principles of preoperative and postoperative care from chapter to chapter. The editorial subcommittee felt that if the manual was to be kept to reasonable size, repetitive material must be eliminated and cross references provided to chapters de-

signed to cover the particular subject. This has been done extensively, and the editorial chairman assumes full responsibility for the changes that have been made.

Finally, the manual does not attempt to be a text, nor to give extensive details of management of individual procedures. References to standard texts will be found at the ends of most chapters, and from them additional information can be obtained. The Committee does not claim that other methods or approaches than those presented in this volume may not be equally successful in the management of surgical patients. What we have endeavored to do in this first edition of the manual is to provide a useful guide for the preoperative and postoperative management of surgical patients, together with descriptions of the metabolic and physiologic principles that underlie successful treatment.

JAMES D. HARDY

FRANCIS D. MOORE

HENRY T. RANDALL, Chairman Editorial Subcommittee