Gastrointestinal Disease

Volume 1

Pathophysiology
Diagnosis
Management

FOURTH EDITION

MARVIN H. SLEISENGER, M.D.



Gastrointestinal Disease

Volume 1

Pathophysiology Diagnosis Management

FOURTH EDITION

W. B. SAUNDERS COMPANY Harcourt Brace Jovanovich, Inc.

The Curtis Center Independence Square West Philadelphia, PA 19106

Library of Congress Cataloging-in-Publication Data

Gastrointestinal disease: pathophysiology, diagnosis, management/ [edited by] Marvin Sleisenger, John S. Fordtran; with a foreword by Thomas P. Almy.-4th ed. p. cm.

Includes bibliographical references and index.

ISBN 0-7216-2298-4 (set)

1. Gastrointestinal system—Diseases. I. Sleisenger, Marvin H. II. Fordtran, John S.

RC801.G384 1989

616.3'3-dc19

88-15668

Listed here is the latest translated edition of this book together with the language of the translation and the publisher.

Italian (3rd Edition)—Piccin Nuova Libraria S.P.A., Padova, Italy. Spanish (3rd Edition)—Panamericana, Buenos Aires, Argentina. Portuguese (2nd Edition)-Editora Guanabara Koogan S.A., Rio de Janeiro, Brazil

Editor: Edward Wickland

Developmental Editor: David Kilmer

Designer: W. B. Saunders Staff Production Manager: Bob Butler Manuscript Editor: Mark Coyle Illustration Coordinator: Peg Shaw

Indexer: Helene Taylor

Single Volume ISBN 0-7216-2078-7

Volume I ISBN 0-7216-2079-5 Volume II **ISBN** 0-7216-2080-9

0-7216-2298-4 Set ISBN

Gastrointestinal Disease

© 1989 by W. B. Saunders Company. Copyright 1973, 1978 and 1983 by W. B. Saunders Company. Copyright under the Uniform Copyright Convention. Simultaneously published in Canada. 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. Library of Congress catalog card number 88-15668.

Last digit is the print number:

MARVIN H. SLEISENGER, M.D.

Professor of Medicine
Vice Chairman for Academic Affairs
Department of Medicine
Director, Clinical Training Program in Gastroenterology
University of California, San Francisco
Attending Physician, Moffitt-Long Hospital
San Francisco, California

JOHN S. FORDTRAN, M.D.

Professor of Medicine, Chief, Department of Internal Medicine, Baylor University Medical Center, Dallas, Texas

with a foreword by

Volume 1

THOMAS P. ALMY, M.D.

1989

W.B. SAUNDERS COMPANY

Harcourt Brace Jovanovich, Inc.

Philadelphia London Toronto Montreal Sydney Tokyo

Pathophysi

W. B. SAUMTERS COMPANY Harcourt Brace Joyanovich, Inc. The Curis Center

Library of Congress Cataloging in Publication Data

Gastrointestinal disease: pathophysiology, diagnosis, management/ fedited by Marvin Sleisenger, John S. Fordtren, with a foreword by Thomas P. Aimy,—4th ed.

TOTAL TOTAL TOTAL A (Cot)

 Gastrointestinal system—Diseases. I. Sleisenger, Marvin H. H. Fordtran, John S.

RC801.G384-1989

616.3'3—dc19 88-

Gastrointestinal Disease

Volume 1

Pathophysiology Diagnosis Management

FOURTH EDITION

此为试读,需要完整PDF请访问: www.ertongbook.com

CONTRIBUTORS

THOMAS P. ALMY, M.D.

Professor of Medicine and Community and Family Medicine, Emeritus, Dartmouth Medical School; Staff Member, Mary Hitchcock Memorial Hospital, Hanover, New Hampshire, and Veterans Administration Hospital, White River Junction, Vermont Diverticular Disease of the Colon

DAVID H. ALPERS, M.D.I.M. MASTEROT & MHO

Professor of Medicine and Chief, Gastroenterology Division, Washington University School of Medicine; Physician, Barnes Hospital, St. Louis, Missouri

Absorption of Vitamins and Divalent Minerals; Eating Behavior and Nutrient Requirements; Nutritional Deficiency in Gastrointestinal Disease; Dietary Management and Vitamin-Mineral Replacement Therapy

DAVID F. ALTMAN, M.D.

Associate Dean of Student and Curricular Affairs, University of California, San Francisco, School of Medicine; Director, Gastroenterology Clinic, University of California Medical Center, San Francisco, California

The Effect of Age on Gastrointestinal Function; Neoplasms of the Gallbladder and Bile Ducts

Professor of Pediatrics, University of California, Los Angeles, School of Medicine; Chief, Division of Pediatric Gastroenterology and Nutrition, and Chief, Hospital Parenteral and Enteral Nutritional Support Service, UCLA Medical Center, Los Angeles, California The Stomach and Duodenum: Anatomy, Embryology, and Developmental Anomalies

JAMES L. AUSTIN, M.D.

Assistant Professor of Surgery, University of Missouri School of Medicine; Staff Surgeon, Truman Veterans Administration Hospital, Columbia, Missouri

Abdominal Abscesses and Gastrointestinal Fistulas

JOHN G. BARTLETT, M.D.

Professor of Medicine, Johns Hopkins University School of Medicine; Chief of Infectious Diseases Division, Johns Hopkins Hospital, Baltimore, Maryland

The Pseudomembranous Enterocolitides

THEODORE M. BAYLESS, M.D.

Professor of Medicine, Johns Hopkins University School of Medicine; Medical Director, Meyerhoff Digestive Disease-Inflammatory Bowel Disease Center, Johns Hopkins Hospital, Baltimore, Maryland

Small Intestinal Ulcers and Strictures: Isolated and Diffuse

MICHAEL D. BENDER, M.D.

Associate Clinical Professor of Medicine and Family and Community Medicine, University of California, San Francisco, School of Medicine, San Francisco, California; Chief of Medicine and Director of Medical Education, Peninsula Hospital, Burlingame, California Ascites; Diseases of the Peritoneum, Mesentery, and Diaphragm

IEFFREY A. BILLER, M.D.

Assistant Clinical Professor of Pediatrics, Tufts University School of Medicine; Pediatric Gastroenterologist, Division of Pediatric Gas-

troenterology and Nutrition, The Floating Hospital, New England Medical Center, Boston, Massachusetts

Pancreatic Disorders in Childhood

Assistant Choical Professor, University of Arkansas for Medical

HENRY J. BINDER, M.D.

Professor of Medicine and Director, Gastrointestinal Research Training Program, Yale University School of Medicine; Director, General Clinical Research Center, Yale-New Haven Medical Center, New Haven, Connecticut

Absorption and Secretion of Water and Electrolytes by Small and Large Intestine

C. RICHARD BOLAND, M.D.

Associate Professor of Medicine, University of Michigan Medical School; Chief of Gastroenterology, Ann Arbor Veterans Administration Medical Center, Ann Arbor, Michigan Colonic Polyps and the Gastrointestinal Polyposis Syndromes

GEORGE W. BO-LINN, M.D.

St. John's Mercy Medical Center, St. Louis, Missouri Obesity, Anorexia Nervosa, Bulimia, and Other Eating Disorders

JOHN H. BOND, M.D.

Professor of Medicine, University of Minnesota; Chief, Gastroenterology Section, Veterans Administration Medical Center, Minneapolis, Minnesota

Intestinal Gas

H. WORTH BOYCE, JR., M.S., M.D.

Professor of Medicine; Director, Division of Digestive Diseases and Nutrition; Director, The Center for Swallowing Disorders, University of South Florida College of Medicine, Tampa, Florida Tumors of the Esophagus

ROBERT S. BRESALIER, M.D.

Assistant Professor of Medicine, University of California, San Francisco, School of Medicine; Attending Physician, Veterans Administration Medical Center, San Francisco, California

Malignant Neoplasms of the Large and Small Intestine

JOHN P. CELLO, M.D.

Associate Professor of Medicine, University of California, San Francisco, School of Medicine; Chief of Gastroenterology, San Francisco General Hospital, San Francisco, California Ulcerative Colitis; Chronic Pancreatitis; Carcinoma of the Pancreas

RAY E. CLOUSE, M.D.

Assistant Professor of Medicine, Washington University School of Medicine; Assistant Physician, Barnes Hospital, St. Louis, Missouri Motor Disorders of the Esophagus; Intensive Nutritional Support

SIDNEY COHEN, M.D.

Professor, Temple University School of Medicine; Chairman, Department of Medicine, Temple University Hospital, Philadelphia, Pennsylvania

Movement of the Small and Large Intestine

JEFFREY CONKLIN, M.D.

Assistant Professor, Division of Gastroenterology, Department of Internal Medicine, University of Iowa Hospitals and Clinics, Iowa City, Iowa

Gastrointestinal Smooth Muscle

JEFFREY R. CRIST, M.D.

Instructor in Medicine, Harvard Medical School; Assistant in Medicine, Gastroenterology Division, Beth Israel Hospital, Boston, Massachusetts

Neurology of the Gut

GLENN R. DAVIS, M.D.

Assistant Clinical Professor, University of Arkansas for Medical Science; Staff Physician, St. Vincent Infirmary, Little Rock, Arkansas

Neoplasms of the Stomach

IOHN DELVALLE, M.D.

Instructor of Internal Medicine, Division of Gastroenterology, University of Michigan Medical School, Ann Arbor, Michigan Secretory Tumors of the Pancreas

GHISLAIN DEVROEDE, M.D.

Professor of Surgery and Physiology, Université de Sherbrooke; Attending Physician, Centre Hospitalier Universitaire, Sherbrooke, Québec, Canada Constination

NICHOLAS E. DIAMANT, M.D., F.R.C.P.(C)

Professor of Medicine and Physiology, University of Toronto, Head, Division of Gastroenterology, Toronto Western Hospital, Toronto, Ontario, Canada

WYLIE J. DODDS, M.D. Sent Classical var. M. andol. 18

Professor of Radiology and Medicine, Medical College of Wisconsin; Staff Radiologist, Milwaukee County Medical Center and Froedtert Memorial Lutheran Hospital, Milwaukee, Wisconsin Gastroesophageal Reflux Disease (Reflux Esophagitis)

ROBERT M. DONALDSON, JR., M.D.

David Paige Smith Professor of Medicine, Yale University School of Medicine; Attending Physician, Yale-New Haven Hospital, New Haven, Connecticut

The Relation of Enteric Bacterial Populations to Gastrointestinal Function and Disease; The Blind Loop Syndrome; Crohn's Disease

DOUGLAS A. DROSSMAN, M.D.

Associate Professor of Medicine and Psychiatry, Division of Digestive Diseases, University of North Carolina School of Medicine; Associate Attending, North Carolina Memorial Hospital, Chapel Hill, North Carolina

The Physician and the Patient: Review of the Psychosocial Gastrointestinal Literature with an Integrated Approach to the Patient

DAVID L. EARNEST, M.D.

Professor of Medicine, University of Arizona College of Medicine; Attending Physician, Gastroenterology Section, University of Arizona Health Sciences Center, Tucson, Arizona

Radiation Enteritis and Colitis; Other Diseases of the Colon and Rectum

ABRAM M. EISENSTEIN, M.D.

Clinical Professor of Medicine, University of Texas Southwestern Medical School at Dallas; Chief of Gastroenterology, Presbyterian Hospital of Dallas; Attending Physician, Parkland Memorial Hospital, Dallas, Texas

Caustic Injury to the Upper Gastrointestinal Tract

THOMAS H. ERMAK, Ph.D.

Assistant Research Cell Biologist, Department of Medicine, University of California, San Francisco, School of Medicine; Attending Staff, Cell Biology and Aging Section, Veterans Administration Medical Center, San Francisco, California

The Pancreas: Anatomy, Histology, Embryology, and Developmental Anomalies

ANTHONY S. FAUCI, M.D.

Director, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland Acquired Immunodeficiency Syndrome (AIDS)

MARK FELDMAN, M.D.

Professor of Internal Medicine, University of Texas Southwestern Medical School at Dallas; Associate Chief of Staff for Research and Development, Dallas Veterans Administration Medical Center, Dallas, Texas

Nausea and Vomiting; Gastric Secretion in Health and Disease

KENNETH D. FINE, M.D.

Resident in Internal Medicine, Baylor University Medical Center, Dallas, Texas

Diarrhea

JOHN S. FORDTRAN, M.D. M. 28391/A. H. 31/A.

Professor of Medicine and Chief, Department of Internal Medicine, Baylor University Medical Center, Dallas, Texas

SCOTT L. FRIEDMAN, M.D.

Assistant Professor of Medicine, University of California, San Francisco, School of Medicine; Attending Physician, San Francisco General Hospital, San Francisco, California
Gastrointestinal Manifestations of AIDS and Other Sexually Transmissible Diseases

SHERWOOD L. GORBACH, M.D.

Professor of Community Health and Medicine, Tufts University School of Medicine, Boston, Massachusetts Infectious Diarrhea

RAJ K. GOYAL, M.D. GAA THISMA & HIVSAM

Charlotte F. and Irving W. Rabb Professor of Medicine, Harvard Medical School; Chief, Gastroenterology Division, Beth Israel Hospital, Boston, Massachusetts

Neurology of the Gut; Gastrointestinal Smooth Muscle

DAVID Y. GRAHAM, M.D.

Professor of Medicine and Virology, Baylor College of Medicine; Chief of Digestive Disease Division, Veterans Administration Medical Center, Houston, Texas Complications of Peptic Ulcer Disease and Indications for Surgery

RICHARD J. GRAND, M.D.

Professor of Pediatrics, Tufts University School of Medicine; Chief, Division of Pediatric Gastroenterology and Nutrition, The Floating Hospital, New England Medical Center, Boston, Massachusetts Pancreatic Disorders in Childhood

JAMES H. GRENDELL, M.D.

Assistant Professor of Medicine and Physiology, University of California, San Francisco, School of Medicine; Attending Physician, San Francisco General Hospital, San Francisco, California

The Pancreas: Anatomy, Histology, and Developmental Anomalies; Chronic Pancreatitis; Vascular Diseases of the Bowel

I. KENT HAMILTON, M.D.

Clinical Instructor of Medicine, University of Texas Southwestern Medical School at Dallas; Attending Physician, Baylor University Medical Center, Dallas, Texas Foreign Bodies in the Gut

MELVIN B. HEYMAN, M.D., M.P.H.

Assistant Professor, Department of Pediatrics, University of California, San Francisco, School of Medicine; Associate Director, Division of Pediatric Gastroenterology and Nutrition, University of California Children's Medical Center, San Francisco, California Food Sensitivity and Eosinophilic Gastroenteropathies

MARTIN F. HEYWORTH, M.D., M.R.C.P.

Associate Professor of Medicine, University of California, San Francisco, School of Medicine; Staff Physician, Veterans Administration Medical Center, San Francisco, California Maldigestion and Malabsorption

ALAN F. HOFMANN, M.D., Ph.D.

Professor of Medicine in Gastroenterology, University of California, San Diego, School of Medicine; Professor of Medicine, University of California, San Diego, Medical Center The Enterohepatic Circulation of Bile Acids in Health and Disease

WALTER J. HOGAN, M.D.

Professor of Medicine, Medical College of Wisconsin; Chief, Gastrointestinal Diagnostic Laboratory, Froedtert Memorial Lutheran Hospital, Milwaukee, Wisconsin

Gastroesophageal Reflux Disease (Reflux Esophagitis)

R. THOMAS HOLZBACH, M.D.

Head, Gastrointestinal Research Unit, Research Institute, and Department of Gastroenterology, Cleveland Clinic Foundation, Cleveland, Ohio

Pathogenesis and Medical Treatment of Gallstones

STEVEN H. ITZKOWITZ, M.D.

Assistant Professor of Medicine, University of California, San Francisco, School of Medicine; Research Associate, Veterans Administration Medical Center, San Francisco, California
Chronic Polyps and the Gastrointestinal Polyposis Syndromes

GRAHAM H. JEFFRIES, M.S., Ch.B. (N.Z.), D. Phil. (Oxon), F.A.C.P.

Professor and Chairman, Department of Medicine, Pennsylvania State University College of Medicine, Hershey, Pennsylvania Protein-Losing Gastroenteropathy

R. SCOTT IONES, M.D.

Stephen H. Watts Professor and Chairman, Department of Surgery, University of Virginia; Surgeon-in-Chief, University of Virginia Medical Center, Charlottesville, Virginia Intestinal Obstruction, Pseudo-Obstruction, and Ileus

PAUL H. JORDAN, JR., M.D.

Professor of Surgery, Baylor College of Medicine; Senior Attending Surgeon, The Methodist Hospital, Houston, Texas Operations for Peptic Ulcer Disease and Early Postoperative Complications

MARTIN F. KAGNOFF, M.D.

Professor of Medicine, University of California, San Diego, School of Medicine; Attending Physician, University of California, San Diego, Medical Center, San Diego, California
Immunology and Disease of the Gastrointestinal Tract

GORDON L. KAUFFMAN, JR., M.D.

Professor of Surgery and Physiology, and Chief, Division of General Surgery, The Milton S. Hershey Medical Center, Pennsylvania State University, Hershey, Pennsylvania

Stress Ulcers, Erosions, and Gastric Mucosal Injury

YOUNG S. KIM. M.D.

Professor of Medicine and Pathology, University of California, San Francisco, School of Medicine; Director, Gastrointestinal Research Laboratory, Veterans Administration Medical Center, San Francisco, California

Colonic Polyps and the Gastrointestinal Polyposis Syndromes; Malignant Neoplasms of the Large and Small Intestine

FREDERICK A. KLIPSTEIN. M.D.

Professor of Medicine, University of Rochester; Attending Physician, Strong Memorial Hospital, Rochester, New York
Tropical Sprue

O. DHODANAND KOWLESSAR, M.D.

Professor of Medicine and Associate Chairman, Department of Medicine, Jefferson Medical College of Thomas Jefferson University, Philadelphia, Pennsylvania

The Carcinoid Syndrome

GUENTER J. KREIS, M.D.

Professor and Chairman, Department of Internal Medicine, Karl Franzens University, Graz, Austria

MICHAEL D. LEVITT, M.D.

Professor of Medicine, University of Minnesota; Associate Chief of Staff for Research, Veterans Administration Medical Center, Minneapolis, Minnesota Intestinal Gas

MARVIN LIPSKY, M.D.

Research Fellow in Medicine, Harvard Medical School; Research/ Clinical Fellow in Medicine, Brigham and Women's Hospital, Boston, Massachusetts The Short Bowel Syndrome

PETER M. LOEB, M.D.

Clinical Professor of Medicine, University of Texas Southwestern Medical School at Dallas; Gastroenterologist, Presbyterian Hospital; Attending Gastroenterologist, Parkland Memorial Hospital and Veterans Administration Medical Center, Dallas, Texas Caustic Injury to the Upper Gastrointestinal Tract

TIMOTHY P. MARONEY, M.D.

Assistant Professor of Radiology, University of California, San Francisco, School of Medicine; Attending Physician, University of California Medical Center, San Francisco, California Endoscopic/Radiologic Treatment of Biliary Tract Diseases

HENRY MASUR, M.D.

Deputy Chief, Critical Care Medicine Department, Clinical Center, National Institutes of Health, Bethesda, Maryland; Clinical Professor of Medicine, George Washington University School of Medicine, Washington, D.C.

Acquired Immunodeficiency Syndrome (AIDS)

RICHARD W. McCALLUM, M.D., F.A.C.P., F.R.A.C.P. (Aust.), F.A.C.S.

Paul Janssen Professor of Medicine, University of Virginia School of Medicine; Chief, Division of Gastroenterology, University of Virginia Medical Center, Charlottesville, Virginia; Director of Gastrointestinal Fellowship Program at University of Virginia and Salem Veterans Administration Center, Salem, Virginia Motor Function of the Stomach in Health and Disease

GEORGE B. McDONALD, M.D.

Professor of Medicine, University of Washington School of Medicine; Attending Physician, Veterans Administration Medical Center, Fred Hutchinson Cancer Research Center, University Hospital, Harborview Medical Center, and Pacific Medical Center, Seattle, Washington

Esophageal Diseases Caused by Infection, Systemic Illness, and Trauma

JAMES E. McGUIGAN, M.D.

Professor and Chairman, Department of Medicine, University of Florida College of Medicine; Physician-in-Chief, Shands Hospital, Gainesville, Florida

Anatomy, Embryology, and Developmental Anomalies; The Zollinger-Ellison Syndrome

JAMES H. MEYER, M.D.

Chief of Gastroenterology, Veterans Administration Medical Center, Sepulveda, California Chronic Morbidity after Ulcer Surgery; Pancreatic Physiology

ARTHUR NAITOVE, M.D.

Professor of Surgery, Dartmouth Medical School; Attending Physician, Mary Hitchcock Memorial Hospital, Hanover, New Hampshire; Attending Physician, Veterans Administration Medical Center, White River Junction, Vermont Diverticular Disease of the Colon

THOMAS F. O'BRIEN, JR., M.D.

Professor of Medicine, East Carolina University School of Medicine, Greenville, North Carolina

Benign Neoplasms and Vascular Malformations of the Large and Small Intestine

ROBERT K. OCKNER, M.D.

Professor of Medicine, University of California, San Francisco, School of Medicine; Chief. Division of Gastroenterology, Moffitt-Long Hospitals; Attending Physician, San Francisco General Hospital and Veterans Administration Medical Center; Consultant, Letterman Army Medical Center, San Francisco, California Ascites; Vascular Diseases of the Bowel

ROBERT L. OWEN, M.D.

Professor of Medicine, Epidemiology, and International Health, University of California, San Francisco, School of Medicine; Staff Physician, Veterans Administration Medical Center, San Francisco, California

Parasitic Diseases; Gastrointestinal Manifestations of AIDS and Other Sexually Transmissible Diseases

WALTER L. PETERSON, M.D.

Associate Professor of Internal Medicine, University of Texas Southwestern Medical School at Dallas; Chief, Gastroenterology Section, Dallas Veterans Administration Medical Center, Dallas, Texas Gastrointestinal Bleeding

SIDNEY F. PHILLIPS, M.D. AM SHIZAMA YSIMOH

Professor of Medicine, Mayo Medical School; Director, Gastroenterology Unit, Mayo Clinic, Rochester, Minnesota Megacolon: Congenital and Acquired; Conventional and Alternative Reostomies

DANIEL E. POLTER, M.D.

Clinical Professor of Medicine, University of Texas Southwestern Medical School at Dallas; Attending Staff, Baylor University Medical Center, Dallas, Texas Foreign Bodies in the Gut

CHARLES E. POPE, II, M.D.

Professor of Medicine, University of Washington School of Medicine; Chief, Gastroenterology, Veterans Administration Medical Center, Seattle, Washington

Heartburn, Dysphagia, and Other Esophageal Symptoms; The Esophagus: Anatomy and Developmental Anomalies; Rings and Webs; Diverticula

STEVEN B. RAFFIN, M.D., F.A.C.P.

Associate Clinical Professor of Medicine, University of California, San Francisco, School of Medicine, San Francisco, California; Attending Physician, Peninsula Hospital and Medical Center, Burlingame, California

The Stomach and Duodenum: Diverticula, Rupture, and Volvulus; Bezoars

HOWARD A. REBER, M.D.

Professor of Surgery and Vice Chairman, Department of Surgery, University of California, Los Angeles, School of Medicine, Los Angeles, California; Chief, Surgical Service, Sepulveda Veterans Administration Hospital, Sepulveda, California Abdominal Abscesses and Gastrointestinal Fistulas

CHARLES T. RICHARDSON, M.D.

Patterson Professor of Medicine, University of Texas Southwestern Medical Center at Dallas; Chief of Staff, Dallas Veterans Administration Medical Center, Dallas, Texas Gastric Ulcer

ERNEST J. RING, M.D.

Professor of Radiology and Chief of Interventional Radiology, University of California, San Francisco, School of Medicine Endoscopic/Radiologic Treatment of Biliary Tract Diseases

ANDRÉ ROBERT, M.D., Ph.D.

Senior Scientist, Drug Metabolism Research, The Upjohn Company, Kalamazoo, Michigan Stress Ulcers, Erosions, and Gastric Mucosal Injury

IRWIN H. ROSENBERG, M.D.

Professor of Medicine and Nutrition, and Director of USDA Human Nutrition Research Center on Aging, Tufts University; Attending Physician, New England Medical Center, Boston, Massachusetts Eating Behavior and Nutrient Requirements; Nutritional Deficiency in Gastrointestinal Disease; Intensive Nutritional Support

TODD L. SACK, M.D. A STINOSISTI H MENTE

Assistant Professor of Medicine in Residence, University of California, San Francisco, School of Medicine; Attending Physician, University of California Medical Center and Veterans Administration Medical Center, San Francisco, California

Effects of Systemic and Extraintestinal Disease on the Gut; Oral Diseases and Cutaneous Manifestations of Gastrointestinal Disease

BRUCE F. SCHARSCHMIDT, M.D.

Professor of Medicine, University of California, San Francisco, School of Medicine; Attending Physician, University of California, San Francisco, Affiliated Hospitals, San Francisco, California Jaundice; Bile Formation and Gallbladder and Bile Duct Function

LAWRENCE R. SCHILLER, M.D.

Clinical Assistant Professor of Internal Medicine, University of Texas Southwestern Medical School at Dallas: Associate Attending Physician and Director, Gastroenterology Physiology Laboratory, Baylor University Medical Center, Dallas, Texas Fecal Incontinence

BRUCE D. SCHIRMER, M.D.

Assistant Professor of Surgery, University of Virginia Medical Center, Charlottesville, Virginia
Intestinal Obstruction, Pseudo-Obstruction, and Ileus

DAVID J. SCHNEIDERMAN, M.D.

Assistant Professor of Medicine, University of Arizona School of Medicine; Director, Gastrointestinal Endoscopy Unit, Arizona Health Sciences Center, Tucson, Arizona Ulcerative Colitis; Other Diseases of the Colon and Rectum

THEODORE SCHROCK, M.D.

Professor of Surgery, University of California, San Francisco, School of Medicine, San Francisco, California

Complications of Gastrointestinal Endoscopy; Acute Appendicitis; Examination of the Anorectum, Rigid Sigmoidoscopy, Flexible Sigmoidoscopy, and Diseases of the Anorectum

MARVIN M. SCHUSTER, M.D., F.A.C.P., F.A.P.A.

Professor of Medicine with Joint Appointment in Psychiatry, Johns Hopkins University School of Medicine; Director, Division of Digestive Diseases, Francis Scott Key Medical Center, Baltimore, Maryland

Irritable Bowel Syndrome and management and bank to accept the

HOWARD A. SHAPIRO, M.D.

Clinical Professor of Medicine, University of California, San Francisco, School of Medicine; Attending Physician, University of California, Medical Center, San Francisco, California

Endoscopic/Radiologic Treatment of Biliary Tract Diseases

JAMES SHOREY, M.D.

Chief, Hepatology Section, Medical Service, Dallas Veterans Administration Medical Center, Dallas, Texas Evaluation of Mass Lesions in the Liver

SOL SILVERMAN, JR., M.A., D.D.S.

Professor and Chairman, Division of Oral Medicine, University of California, San Francisco, School of Dentistry; Attending Dentist, Moffitt-Long Hospital, San Francisco, California Oral Diseases and Cutaneous Manifestations of Gastrointestinal Disease

DENNIS R. SINAR, M.D.

Associate Professor of Medicine, East Carolina University School of Medicine; Chairman, Laser Committee, Pitt County Memorial Hospital, Greenville, North Carolina

Benign Neoplasms and Vascular Malformations of the Large and Small Intestine

MARVIN H. SLEISENGER, M.D.

Professor of Medicine and Vice Chairman for Academic Affairs, Department of Medicine; Director, Clinical Training Program in Gastroenterology, University of California, San Francisco, School of Medicine; Attending Physician, Moffitt-Long Hospital, San Francisco, California

Effects of Systemic and Extraintestinal Disease on the Gut; Cholelithiasis; Chronic and Acute Cholecystitis; Biliary Obstruction, Cholangitis, and Choledocholithiasis; Postoperative Syndromes

WILLIAM J. SNAPE, JR.

Professor of Medicine, University of California, Los Angeles, School of Medicine; Chief of Gastroenterology, Harbor-UCLA Medical Center, Los Angeles, California

Movement of the Small and Large Intestine

KONRAD H. SOERGEL, M.D.

Professor of Medicine and Chief, Division of Gastroenterology, Medical College of Wisconsin; Chief, Gastroenterology Service, Froedtert Memorial Lutheran Hospital and Milwaukee County Medical Complex, Milwaukee, Wisconsin

Acute Pancreatitis

ANDREW H. SOLL, M.D.

Professor of Medicine, University of California, Los Angeles, School of Medicine; Key Investigator, Center for Ulcer Research and Education, Wadsworth Veterans Administration Medical Center, Los Angeles, California

Duodenal Ulcer and Drug Therapy

M. MICHAEL THALER, M.D.

Professor of Pediatrics and Director, Pediatric Gastroenterology and Nutrition, University of California, San Francisco, School of Medicine; Attending Physician, University of California Medical Center, San Francisco, California

The Biliary Tract: Embryology and Anatomy; Biliary Disease in Infancy and Childhood

RICHARD C. THIRLBY, M.D.

Staff Surgeon, The Virginia Mason Clinic, Seattle, Washington Postoperative Recurrent Ulcer

PHILLIP P. TOSKES, M.D.

Professor of Medicine and Director, Division of Gastroenterology, Hepatology and Nutrition, University of Florida College of Medicine and Gainesville Veterans Administration Medical Center; Attending Physician, Shands Hospital of the University of Florida, Gainesville, Florida

The Relation of Enteric Bacterial Populations to Gastrointestinal Function and Disease; The Blind Loop Syndrome

ROGER B. TRAYCOFF, M.D.

Associate Professor of Medicine and Anesthesiology, Department of Medicine, Section of Algology, Southern Illinois University School of Medicine, Springfield, Illinois

The Management of Abdominal Pain

JERRY S. TRIER, M.D.

Professor of Medicine, Harvard Medical School; Co-Director, Gastroenterology Division, and Senior Physician, Brigham and Women's Hospital, Boston, Massachusetts

Anatomy, Embryology, and Developmental Abnormalities of the Small and Large Intestine and Colon; The Short Bowel Syndrome; Celiac Sprue; Whipple's Disease; Radiation Enteritis and Colitis

REBECCA W. VAN DYKE, M.D.

Assistant Professor of Medicine, University of California, San Francisco, School of Medicine; Attending Physician, Moffitt-Long Hospital, University of California Medical Center, San Francisco, California

Mechanisms of Digestion and Absorption of Food

JOHN H. WALSH, M.D.

Professor of Medicine, Division of Gastroenterology, University of California, Los Angeles, School of Medicine; Director, Center for Ulcer Research and Education, Wadsworth Veterans Administration Medical Center, Los Angeles, California

Gastrointestinal Peptide Hormones

LAWRENCE W. WAY, M.D.

Professor of Surgery, University of California, San Francisco, School of Medicine; Attending Surgeon, University of California Medical Center; Chief, Surgical Service, Veterans Administration Medical Center, San Francisco, California

Abdominal Pain; Cholelithiasis; Chronic and Acute Cholecystitis; Biliary Obstruction, Cholangitis, and Choledocholithiasis; Postoperative Syndromes; Neoplasms of the Gallbladder and Bile Ducts

WILFRED M. WEINSTEIN, M.D.

Professor of Medicine, Division of Gastroenterology, University of California, Los Angeles, School of Medicine; Attending Physician, UCLA Medical Center, Los Angeles, California Gastritis

HARLAND S. WINTER, M.D.

Assistant Professor of Pediatrics, Harvard Medical School; Associate in Gastroenterology, The Children's Hospital; Associate Pediatrician, Massachusetts General Hospital, Boston, Massachusetts Anatomy, Embryology, and Developmental Abnormalities of the Small Intestine and Colon

TERESA L. WRIGHT, B.M., B.S., M.D.

Assistant Professor of Medicine, University of California, San Francisco, School of Medicine; Attending Staff, Veterans Administration Medical Center, San Francisco, California

Maldigestion and Malabsorption

TADATAKA YAMADA, M.D.

Professor of Internal Medicine and Chief of Division of Gastroenterology, University of Michigan Medical School, Ann Arbor, Michigan

Secretory Tumors of the Pancreas

FOREWORD

Since its first publication in 1973, the appearance of a new edition of this widely acclaimed text has served as a milestone in the progress of our knowledge of digestive disease. For twenty years the Editors, themselves deeply involved in the logarithmic growth of fundamental research and in the rising standards of clinical training and education, have enlisted more than one hundred of the major North American participants in that progress as contributors to this trusted resource for learning and for patient care.

Like its predecessors, the Fourth Edition affords the reader a sound orientation to current concepts of biology, human behavior, pathophysiology, pharmacology, and nutrition essential for understanding the broad spectrum of manifestations of digestive illness; yet its chief emphasis is on the rational and effective management of the principal gastrointestinal diseases and disorders encountered in developed Western countries. As before, the Editors have excluded from the scope of the book only the diseases of the liver, some conditions common in children, and most specific infections of the gut, in view of excellent coverage of those fields by other texts.

The veteran reader of this work will find extensive revisions, incorporating new advances in the basic and clinical aspects of our field and bringing into play the insights of thirteen new authors or coauthors. Eight wholly new chapters present important fresh perspectives on, among other things, the acquired immunodeficiency syndrome (AIDS), the gastrointestinal effects of aging, the management of intrahepatic masses disclosed by modern methods of imaging, and the endoscopic treatment of biliary tract disease. The material on cytoprotection of the gut mucosa, on the pathogenesis of gallstones, on premalignant conditions in the digestive tract, and on psychological interactions between physician and patient has been thoroughly updated. The section on nutritional management has been revised to reflect recent advances in basic nutritional concepts and to provide authoritative guidance on the benefits and limitations of enteral and parenteral feedings for functionally impaired patients. The coverage of new diagnostic procedures is no less extensive than in the previous edition but will be found, suitably indexed, in the chapters that describe their most important clinical applications. This change should facilitate the most appropriate, timely, and costeffective use of these rapidly evolving and expensive resources.

The Editors are to be congratulated on their conspicuous success in keeping their far-flung readership abreast of the current rapid advances in digestive disease. Their Fourth Edition is a volume of large but still manageable proportions, whose weight will be measured not in pounds but by its continuing impact on the modern practice of gastroenterology.

THOMAS P. ALMY

ACKNOWLEDGMENTS

The Editors are grateful to the many authors of this book who have written wisely and well. Numerous colleagues have aided us by their constant encouragment and support; among them we would like especially to thank Dick Root, Holly Smith, Bob Ockner, John Cello, Bruce Scharschmidt, and Young Kim; and Boone Powell, Jr., Don Seldin, Dan Foster, Floyd Rector, Carol Santa Ana, and Lawrence Schiller. The Editors have also benefited from the continuing advice and support of the veteran contributors who helped to plan the First Edition: Bob Donaldson, Chuck Pope, Jerry Trier, and Larry Way, and Dave Alpers and Irv Rosenberg for their efforts in behalf of the section on Nutrition. For excellent secretarial assistance we thank Eva Fruit, Connie Van, Janie Francis, Marcia Horvitz, and Sharon Michael. We also happily acknowledge the fine efforts of the professionals at the W. B. Saunders Company: Lew Reines, Ed Wickland, Bob Butler, Dave Kilmer, Mark Coyle, Peg Shaw, and Helene Taylor.

We are especially proud to acknowledge the encouragement of our wives, Lenore Sleisenger and Jewel Fordtran; and of our children and grandchildren, Tom Sleisenger; Bill, Micki, Joey, and Amy Fordtran; and Bess, Bryan, Emily and Sarah Stone.

Again, we cannot fail to mention the influence of the late Mort Grossman and the late Franz Ingelfinger, and the continuing encouragement of Tom Almy. Directly and indirectly they all influenced this work. We hope we have justified their efforts and confidence.

PREFACE

In the five years since the Third Edition, the avalanche of information has been greater than during the intervals between preceding editions. Once again we have found it impossible to eliminate enough of the older material in making way for the newer to maintain constant the size of the work. So, the Fourth Edition is a bit bigger. Fortunately, availability of thinner and lighter paper has allowed this to be done with little increase in the book's weight. The bibliography remains rather complete, reflecting our belief that all important statements require documentation.

Many chapters have been completely rewritten, and all the others were thoroughly updated. In Part I, Some Psychologic and Biologic Aspects of Gastrointestinal Disease, we have a new chapter, The Effect of Age on Gastrointestinal Function. New additions to Part II, Major Symptoms and Syndromes, include chapters on Complications of Gastrointestinal Endoscopy, Fecal Incontinence, and Evaluation of Mass Lesions in the Liver. We have also given greater emphasis to the oral and cutaneous manifestations of gastrointestinal disease by discussing these important clinical findings in a separate chapter. In Part V, The Small and Large Intestine, there is a new chapter on Acquired Immunodeficiency Syndrome, and several chapters have been expanded considerably (including those on Colon Cancer and Food Sensitivity and Eosinophilic Gastroenter-opathies. Part VI, The Biliary Tract: Anatomy, Physiology, and Disease, contains a new chapter on Endoscopic and Radiologic Treatment. Finally, much new information on nutrition will be found in Part IX, particularly on the biomedical effects of alcohol, on vitamin and mineral deficiencies, and on enteral nutrition therapy.

We have deleted the section in the Third Edition entitled Special Diagnostic Procedures. Indications for endoscopy of the upper intestinal tract, biliary tract, pancreas, and colon and for the various scanning techniques will be found in the chapters devoted to the diseases of the various organ systems.

Although we have tried our best to control it, we are still guilty of some repetition. We hope it will be looked upon as educational reinforcement rather than poor editing. We hope this Fourth Edition will be found both helpful and stimulating for all who are interested in the theory and practice of gastroenterology.

CONTENTS

C shortnesdral Diseases of the Ederly

SOME PSYCHOLOGIC AND BIOLOGIC ASPECTS OF GASTROINTESTINAL FUNCTIONS AND DISEASES

Chapter 1	Hormone Release and Postsecretory	
The Physician and the Patient	Processing	87
Douglas A. Drossman		90
REVIEW OF THE PSYCHOSOCIAL GASTROINTESTINAL	Hormones in Gastrointestinal Diseases	92
LITERATURE WITH AN INTEGRATED APPROACH TO THE	References	102
The isophagus traited		
Review of the Literature 4	Chapter 5 bes stiming account absecut yet	
Clinical Applications	The Relation of Enteric Bacterial Populations	100
Conclusion and Epilogue	to Gastrointestinal Function and Disease	107
References	Robert M. Donaldson, Jr. and Phillip P. Toskes	
Chapter 2	Nature and Development of Enteric Bacterial	
Neurology of the Gut	Populations	
Raj K. Goyal and Jeffrey R. Crist	Factors That Influence the Enteric Flora	
General Neurobiology21	Effects of Enteric Flora on the Intestine	-
General Organization of Nerves of the Gut 30	Metabolism of Drugs and Other Compounds	
Central Nervous System Connections of	by Enteric Bacteria	
Gastrointestinal Nerves	Role of Indigenous Flora in Intestinal Disease	
Enteric Nervous System	References.	
References	od Evallowine (Odynophaga) 201	
OLS	Chapter 6	
Chapter 3	Immunology and Disease of the	
Gastrointestinal Smooth Muscle	Gastrointestinal Tract	114
Jeffrey Conklin and Raj K. Goyal	Martin F. Kagnoff	
Organization of Smooth Muscle in the Gut 53	General Characteristics and Development	
Smooth Muscle Cells	of the Immune System	
Contractile Apparatus: Contractile Proteins 56	The Intestine as a Lymphoid Organ	
Mechanism of Contraction in Smooth Muscle 58	Intestinal Cell-Mediated Cytotoxic Responses.	
Electrical Activity of Smooth Muscles	Immunodeficiencies	
Second Messengers Mediating Effects of	Alpha Heavy Chain Disease and Intestinal	
Neurohormonal Agents	Lymphoma	
Smooth Muscle Energy Metabolism	Graft-Versus-Host Disease	121
Mechanics of Smooth Muscle	Inflammatory Bowel Disease	
References	Celiac Disease	
	Whipple's Disease	
Chapter 4	References	
Chapter 4 Gastrointestinal Peptide Hormones		
John H. Walsh	Chapter 7	
Localization of Gut Hormones	The Enterohepatic Circulation of Bile Acids in	
Hormone Chemistry 80	Health and Disease	144
Gut Peptide Hormone Receptors 83	Alan F. Hofmann and bas northward and I	
Hormone Measurement: Radioimmunoassay 85	Overall Physiology	145
		xvii

xviii / CONTENTS

Chemical Constituents: Steady-State		References	159
Description	146		
Dynamics of Enterohepatic Circulation	150	Chapter 8	
Disturbances in the Enterohepatic Circulation of	4.00	The Effect of Age on Gastrointestinal	
Bile Acids	152 155	Function	162
Diagnostic Value of Serum Bile Acid		Changes in Gut Function with Aging	162
Measurements	156	Nutritional Requirements of the Elderly	164
Methods for Quantifying Individual		Gastrointestinal Diseases of the Elderly	165
Components of the Enterohepatic		References	168
Circulation of Bile Acids	158	SOME PSYCHOLOGIC AND	
NS AND DISEASES	OHO		
one Release and Postsecretory		TIL	
		AND SYNDROMES:	
PAIHOPHYSIOLOGY,	DIAG	NOSIS, AND MANAGEMENT	акая
Chapter 9		The Esophagus	211
Obesity, Anorexia Nervosa, Bulimia, and		The Stomach	214
Other Eating Disorders	173	The Duodenum and Small Bowel	214
George W. Bo-Linn		The Colon and Rectum	214
Obesity		Summary	215
Eating Disorders		References	215
References		이 선생님의 사람이 많아 있다. 그는 사람들은 이번 사람들은 사람들이 되었다. 그 그 그 사람들은 그 사람들은 그는 그 그를 가지 않는데 그 그 없다.	
vot anobalego		Chapter 13	
Chapter 10 sioil stream arts amount is the		Complications of Gastrointestinal	
Heartburn, Dysphagia, and Other		Endoscopy	
Esophageal Symptoms		Theodore R. Schrock	
Charles E. Pope, II	d	General and Systemic Complications	
Dysphagia		Complications of Upper Endoscopy	
Heartburn (Pyrosis)		Complications of Sigmoidoscopy and	
Pain on Swallowing (Odynophagia)		Colonoscopy	
Chest Pain		References	220
Respiratory Symptoms		Chapter 14 observe its our to chapter 14	
Belching		Nausea and Vomiting	222
Rumination		Mark Feldman	
di li disemmine System		The Act of Vomiting	
Chapter 11 namO blongmy is as antizate		Neural Pathways and Pathophysiology of	
(1) 보다 (1) - 10 : 10 : 10 : 10 : 10 : 10 : 10 : 10	neand	Vomiting	
Tract		Clinical Characteristics of Vomiting	225
Peter M. Loeb and Abram M. Eisenstein		Inability to Vomit	
Caustic Agents		Specific Syndromes Associated with	
Pathogenesis and Pathology	203	Vomiting	
Clinical Features	204	Consequences of Vomiting	233
Diagnostic Studies		Therapy of Vomiting	
Treatment of Caustic Injuries		Rumination	
Late Complications		References	
References	208		
		Chapter 15	
Chapter 12 A office to robustion 13 abaquatecime		Abdominal Pain	
Foreign Bodies in the Gut		Lawrence W. Way	222
J. Kent Hamilton and Daniel E. Polter		Anatomy and Physiology	239
The Hypopharynx	210	Stimuli for Abdominal Pain	239

Types of Abdominal Pain	241	Pathophysiology	294
Perception of Pain	241	Diagnosis	298
Pain From Specific Organs		Special Considerations	
Principles of Clinical Management: Acute and		References	313
Chronic Pain	243		
The Acute Abdomen	246	Chapter 21	
References.	249	Fecal Incontinence	317
References.	249	Lawrence R. Schiller	317
Chapter 16		Prevalence	317
The Management of Abdominal Pain	250	Mechanisms of Continence and	
Roger B. Traycoff		Incontinence	317
Simple Analgesics		Differential Diagnosis	322
Opiate Drugs		Evaluation of Patients with Fecal	
Adjuvant Analgesics	254	Incontinence	323
Neuroblockade	255	Treatment	327
Placebo Therapy	256	References	328
Psychiatric Care	256		
Conclusion		Chapter 22	
References		Constipation	331
		Ghislain Devroede	
Chapter 17		Clinical Definition and Ethnologie	
	257	Considerations	331
Michael D. Levitt and John H. Bond	237	Associated Symptoms	332
	257		
Composition.			
Sources of Intestinal Gas		Etiology	336
Clinical Gas Syndromes		Mechanisms of Constipation Secondary to an	
References	262	Organic Disease	339
		Mechanisms of Chronic Idiopathic	
Chapter 18		Constipation	
Maldigestion and Malabsorption	263	Evaluation	349
Teresa L. Wright and Martin F. Heyworth		Treatment	353
Pathophysiologic Mechanisms	264	References	361
Clinical Manifestations	267	anenda Crations for the Keller of Billian	
Specific Disease States	268	Chapter 23	
Clinical Tests of Digestion and Absorption	272	Intestinal Obstruction, Pseudo-Obstruction,	
Management of Patients with Malabsorption	279	and lleus	
References	280	R. Scott Jones and Bruce D. Schirmer	307
	200	Intestinal Obstruction	
Chapter 19		Intestinal Pseudo-Obstruction	377
사이들이 가게 통해 없이 하는 사람들이 하고 있다면 나를 가장하면 하는 사람들이 가장 하는 것이 되었다.	202		
Protein-Losing Gastroenteropathy		Paralytic Ileus	
Graham H. Jeffries Historical Perspective		References	380
Methods for Measuring Gastrointestinal	PER P	Chapter 24	
Loss of Plasma Proteins	283	Abdominal Abscesses and Gastrointestinal	
Enteric Loss of Plasma Protein in Normal		Fistulas	381
Subjects	284	Howard A. Reber and James L. Austin	
Excessive Enteric Loss of Plasma Proteins	285	Abdominal Abscesses	381
References	288	Gastrointestinal Fistulas	392
		References	
Chapter 20			
Diarrhea	290	Chapter 25	
Kenneth D. Fine, Guenter J. Krejs,		Gastrointestinal Bleeding	307
and John S. Fordtran		Walter L. Peterson	
Definitions	290	Manner of Presentation	307
Normal Physiology	202	Assessment of the Patient	
	LJL	Absessificite of the radelit	391

XX / CONTENTS

Upper Versus Lower GI Tract Bleeding...... 399

Initial Management and Diagnosis of Acute		James Shorey	
Upper GI Bleeding	400	Approach to the Diagnosis of Focal Liver	
Approach to Specific Upper GI Bleeding		Lesions	467
Lesions	402	Identification of Masses in the Liver	468
Initial Management and Diagnosis of Acute		Specific Diseases and Conditions Presenting as	
Lower Gl Bleeding	411	Focal Hepatic Lesions	472
Approach to Specific Lower GI Bleeding		References	485
Lesions	413		
Occult GI Bleeding	415	Chapter 29	
GI Bleeding of "Obscure" Origin	416	Effects of Systemic and Extraintestinal	
Overall Approach to the Patient with		Disease on the Gut	488
Gastrointestinal Bleeding	417	Todd L. Sack and Marvin H. Sleisenger	
References	417	Endocrine Disease	488
		Pregnancy	500
Chapter 26		Deficiency States	500
Ascites	428	Neoplastic Diseases	501
Michael D. Bender and Robert K. Ockner		Hematologic Diseases	502
General Aspects	428	Rheumatologic Disease	505
Causes of Ascites	433	Neurohumeral Disease	509
Miscellaneous Disorders	444	Infiltrative Disease	509
References	447	Miscellaneous	511
		Renal Disease	512
Chapter 27	20,00	Nervous System Disease	514
Jaundice	454	Pulmonary Disease	517
Bruce F. Scharschmidt		Cardiac Disease	517
Bilirubin Metabolism	454	References	517
Differential Diagnosis of Hyperbilirubinemia	455		
Approach to the Jaundiced Patient	457	Chapter 30	
Distinguishing Intrahepatic from Extrahepatic		Oral Diseases and Cutaneous Manifestations	
Cholestasis	460	of Gastrointestinal Disease	529
Therapeutic Options for the Relief of Biliary		Todd L. Sack and Sol Silverman, Jr.	
Obstruction	462	Oral Diseases	529
Medical Treatment of Cholestasis and Its	3111	Diseases Affecting the Mouth, Skin, and Gut	535
	464	Diseases Affecting the Skin and Gut	536
Complications	465	References.	537
266 Comment of the Comment of		References	337
	500		
	PART		
		orical Pewaractive 25	
THE ESOPHAGUS: ANAT	OMY,	PHYSIOLOGY, AND DISEASE	
Inchestrosteral breakenanteste festerb		EM CONTRACTOR REPORTED	
Chapter 31		Coordinated Esophageal Motor Activity	551
Anatomy and Developmental Anomalies	541	Pathogenesis of Esophageal Motor Disorder	
Charles E. Pope, II		References	
Anatomy	541		33'
Developmental Anomalies	543	Chapter 33	
	546	Motor Disorders	559
		Ray E. Clouse	
198 . S. A. S.		Diagnostic Techniques	560
Chapter 32		Disorders of the Upper Sphincter and Cervical	
Physiology of the Esophagus	548	Esophageal Region	563
N. E. Diamant		Achalasia	567
Anatomy of the Esophagus	549	Spastic Disorders of the Smooth Muscle	
Innervation of the Esophagus		Segment of the Esophagus	581
		O	

Types of Abdominal Pain.

Chapter 28

Chapter 28

Evaluation of Mass Lesions in the Liver...... 467