

TEXTBOOK OF

Gastroenterology

FIFTH EDITION

EDITED BY

Tadataka Yamada

ASSOCIATE EDITORS

David H. Alpers

Anthony N. Kalloo

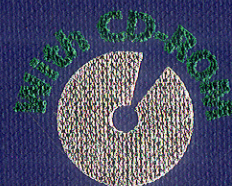
Neil Kaplowitz

Chung Owyang

Don W. Powell

VOLUME 1

 WILEY-BLACKWELL



Contents

Contributors, x
Preface, xxi

VOLUME 1

Part 1 Basic mechanisms of normal and abnormal gastrointestinal function

A Components

- 1 Integrative responses of the gastrointestinal tract and liver to a meal, 3
Stephen J. Pandol, Helen E. Raybould, Hal F. Yee Jr
- 2 The enteric nervous system and its extrinsic connections, 15
John B. Furness, Trung V. Nguyen, Kulmira Nurgali, Yasutake Shimizu
- 3 Sensory neurons of the gastrointestinal tract, 40
John B. Furness
- 4 Gastrointestinal hormones and receptors, 56
Laurence J. Miller
- 5 The brain–gut axis, 86
Graham J. Dockray
- 6 Smooth muscle of the gut, 103
Gabriel M. Makhoulf, Karnam S. Murthy
- 7 The mucosal immune system and gastrointestinal inflammation, 133
Fabio Cominelli, Kristen O. Arseneau, Richard S. Blumberg, William F. Stenson, Theresa T. Pizarro
- 8 Epithelia: biological principles of organization, 169
Jerrold R. Turner, James L. Madara

B Motility

- 9 Esophageal motor function, 187
Peter J. Kahrilas, John E. Pandolfino
- 10 The physiology of gastric motility and gastric emptying, 207
William L. Hasler

- 11 Motility of the small intestine and colon, 231
William L. Hasler
- 12 Motility of the biliary tract, 264
Gary M. Mawe, Peter L. Moses, Gino T.P. Saccone, Maria J. Pozo

C Secretion and absorption

- 13 Gastric secretion, 284
John Del Valle, Andrea Todisco
- 14 Electrolyte secretion and absorption: small intestine and colon, 330
Stephen J. Keely, Marshall H. Montrose, Kim E. Barrett
- 15 Pancreatic secretion, 368
Chung Owyang, John A. Williams
- 16 Bile secretion and cholestasis, 401
Steven A. Weinman, Sajid Jalil

D Nutrition

- 17 Carbohydrate assimilation, 429
Eric Sibley
- 18 Intestinal lipid absorption, 445
William Sun, Chun-Min Lo, Patrick Tso
- 19 Protein digestion and assimilation, 464
Vadivel Ganapathy, Malliga E. Ganapathy, Frederick H. Leibach
- 20 Vitamins and minerals, 478
Charles H. Halsted, Mark A. Levine, Bo L. Lönnerdal, Robert B. Rucker
- 21 General nutritional principles, 508
David H. Alpers, Beth Taylor, Samuel Klein

E Miscellaneous

- 22 Gastrointestinal blood flow, 540
Philip T. Nowicki, D. Neil Granger
- 23 Development of the gastrointestinal system, 567
Ben Z. Stanger, Daniel K. Podolsky

- 24 Neoplasia of the gastrointestinal tract, 603
Barbara H. Jung, C. Richard Boland, John M. Carethers
- 25 The human intestinal microbiota and microbiome, 635
Ruth E. Ley, Jeffrey I. Gordon
- 26 Drug metabolism and transport in the liver and intestine, 645
Paul B. Watkins
- 27 Pathogenesis of hepatic fibrosis, 658
Ramón Bataller, David A. Brenner
- 28 Hepatic regeneration, 680
George K. Michalopoulos, Marie C. DeFrances
- 29 Molecular biological approaches to the diagnosis and treatment of gastrointestinal diseases, 703
David A. Brenner, Robert Schwabe, Christoph Oesterreicher

Part 2 Gastrointestinal diseases

A Esophagus

- 30 Esophagus: anatomy and developmental and structural anomalies, 719
Ikuo Hirano
- 31 Motility disorders of the esophagus, 740
Peter J. Kahrilas, John E. Pandolfino
- 32 Gastroesophageal reflux disease, 772
Joel E. Richter
- 33 Eosinophilic esophagitis, 802
Marc E. Rothenberg, Glenn T. Furuta
- 34 Esophageal infections and disorders associated with acquired immunodeficiency syndrome, 813
C. Mel Wilcox
- 35 Barrett esophagus and esophageal adenocarcinoma, 826
Stuart Jon Spechler, Rhonda F. Souza
- 36 Esophageal neoplasms, 849
Weijing Sun, Anil K. Rustgi
- 37 Miscellaneous diseases of the esophagus: foreign bodies, physical injury, and systemic and dermatological diseases, 871
Evan S. Dellon, Nicholas J. Shaheen

B Stomach

- 38 Stomach and duodenum: anatomy and structural anomalies, 889
Jean-Pierre Raufman, Eric Goldberg
- 39 Disorders of gastric emptying, 903
Henry P. Parkman, Frank K. Friedenberg, Robert S. Fisher

- 40 Peptic ulcer disease, 936
Andrew H. Soll, David Y. Graham
- 41 Zollinger–Ellison syndrome, 982
John Del Valle
- 42 Gastritis and gastropathy, 1005
Mary Kay Washington, Richard M. Peek Jr
- 43 Tumors of the stomach, 1026
Wai K. Leung, Enders K.W. Ng, Joseph J.Y. Sung
- 44 Surgery for peptic ulcer disease and postgastrectomy syndromes, 1054
Robert E. Glasgow, Sean J. Mulvihill
- 45 Miscellaneous diseases of the stomach, 1071
John C. Rabine, Timothy T. Nostrant

C Small intestine

- 46 Small intestine: anatomy and structural anomalies, 1085
Deborah C. Rubin
- 47 Dysmotility of the small intestine and colon, 1108
Michael Camilleri, Lawrence Szarka
- 48 Bacterial, viral, and toxic causes of diarrhea, gastroenteritis, and anorectal infections, 1157
Phillip I. Tarr, Dorsey M. Bass, Gail A. Hecht
- 49 Chronic infections of the small intestine, 1225
George T. Fantry, Lori E. Fantry, Stephen P. James
- 50 Celiac disease, 1245
Peter H.R. Green, Anne R. Lee
- 51 Disorders of epithelial transport in the small intestine, 1259
Martín G. Martín, Ernest M. Wright
- 52 Bacterial overgrowth, 1284
Philip M. Sherman, Karen L. Madsen
- 53 Short bowel syndrome, 1295
Richard N. Fedorak, Lana Bistriz
- 54 Tumors of the small intestine, 1322
Robert S. Bresalier, Sharmila Anandasabapathy
- 55 Miscellaneous diseases of the small intestine, 1343
Marc S. Levin, C. Prakash Gyawali

D Colon (for colonic infections see Chapter 48)

- 56 Colon: anatomy and structural anomalies, 1369
Steven M. Cohn, Elisa H. Birnbaum, Charles M. Friel
- 57 Inflammatory bowel disease, 1386
William F. Stenson, Stephen B. Hanauer, Russell D. Cohen

- 58 Surgical treatment of inflammatory bowel disease, 1473
Emily Finlayson, Fabrizio Michelassi
- 59 Miscellaneous inflammatory and structural disorders of the colon, 1507
Meredythe A. McNally, Thomas C. Smyrk, William J. Tremaine
- 60 Irritable bowel syndrome, 1536
Chung Owyang
- 61 Diverticular disease of the colon, 1574
Tonia M. Young-Fadok, Michael G. Sarr
- 62 Colorectal cancer screening, 1598
Graeme P. Young, James E. Allison
- 63 Neoplastic and nonneoplastic polyps of the colon and rectum, 1611
Finlay A. Macrae, Graeme P. Young
- 64 Polyposis syndromes, 1640
Randall W. Burt, Russell F. Jacoby
- 65 Malignant tumors of the colon, 1669
Francis M. Giardiello, Stanley R. Hamilton
- 66 Anorectal diseases, 1717
Adil E. Bharucha, Arnold Wald

Index

VOLUME 2

E Pancreas

- 67 Pancreas: anatomy and structural anomalies, 1745
David G. Heidt, Michael W. Mulholland, Diane M. Simeone
- 68 Acute pancreatitis, 1761
Mark Topazian, Stephen J. Pandol
- 69 Chronic pancreatitis, 1811
Chung Owyang, Matthew J. DiMagno
- 70 Nonendocrine tumors of the pancreas, 1853
James J. Farrell, Howard A. Reber
- 71 Endocrine neoplasms of the pancreas, 1875
Robert T. Jensen
- 72 Hereditary diseases of the pancreas, 1921
Jonathan A. Cohn

F Gallbladder and biliary tract

- 73 Gallbladder and biliary tract: anatomy and structural anomalies, 1940
Theodore H. Welling, Diane M. Simeone
- 74 Gallstones, 1952
Cynthia W. Ko, Sum P. Lee
- 75 Primary sclerosing cholangitis and other cholangiopathies, 1978
Kymberly D.S. Watt, Jayant A. Talwalkar, Russell H. Wiesner

- 76 Cystic diseases of the liver and biliary tract, 2009
Jung W. Suh, Albert J. Chang, Shelly C. Lu
- 77 Tumors of the biliary tract, 2022
Christopher J. Smolock, Jeffrey A. Drebin
- 78 Sphincter of Oddi dysfunction (postcholecystectomy syndrome), 2043
John O. Clarke, Anthony N. Kalloo

G Liver

- 79 Liver: anatomy, microscopic structure, and cell types, 2057
Gary C. Kanel
- 80 Acute viral hepatitis, 2073
Marc G. Ghany, T. Jake Liang
- 81 Chronic hepatitis B viral infection, 2112
Robert G. Gish, Stephen Locarnini
- 82 Hepatitis C virus infection, 2139
Aijaz Ahmed, Emmet B. Keeffe
- 83 Drug-induced liver disease, 2167
William M. Lee, Emmanuel Seremba
- 84 Autoimmune hepatitis, 2184
E. Jenny Heathcote
- 85 Primary biliary cirrhosis, 2193
Marlyn J. Mayo, Dwain L. Thiele
- 86 Hemochromatosis, 2211
Jacob Alexander, Kris V. Kowdley
- 87 Metabolic diseases of the liver, 2223
Ronald J. Sokol
- 88 Alcoholic liver diseases, 2247
Suthat Liangpunsakul, David W. Crabb
- 89 Nonalcoholic fatty liver disease, 2274
Arun J. Sanyal
- 90 Ascites and its complications, 2302
Guadalupe Garcia-Tsao
- 91 Central nervous system and pulmonary complications of end-stage liver disease, 2327
Javier Vaquero, Andres T. Blei, Roger F. Butterworth
- 92 Liver transplantation, 2352
Francis Y.K. Yao, Sandy Feng, Nathan M. Bass
- 93 Hepatocellular carcinoma, 2386
Lewis R. Roberts, Gregory J. Gores
- 94 Liver abscess, 2412
David S. Raiford
- 95 Vascular diseases of the liver, 2418
Laurie D. DeLeve

- 96 Experimental therapies: hepatocyte transplantation, gene therapy, and liver assist devices, 2432
Jayanta Roy-Chowdhury, Namita Roy-Chowdhury, Simon P. Horslen, Ira J. Fox
- 97 Liver biopsy and histopathological diagnosis, 2449
Sugantha Govindarajan, Maurizio Bonacini

H Abdominal cavity

- 98 Abdominal cavity: anatomy, structural anomalies, and hernias, 2480
Sareh Parangi, Richard A. Hodin
- 99 Intraabdominal abscesses and fistulae, 2494
Paul Knechtges, Ellen M. Zimmermann
- 100 Diseases of the peritoneum, retroperitoneum, mesentery, and omentum, 2505
Shawn D. Larson, B. Mark Evers

I Miscellaneous

- 101 Nutritional supplementation, 2525
David H. Alpers, Beth Taylor, Samuel Klein
- 102 Obesity, 2561
Louis A. Chaptini, Steven R. Peikin
- 103 Eating disorders, 2574
Henry C. Lin, Eric E. Stone
- 104 Complications of AIDS and other immunodeficiency states, 2588
Phillip D. Smith, Edward N. Janoff
- 105 Gastrointestinal manifestations of immunological disorders, 2612
Fergus Shanahan
- 106 Parasitic diseases: protozoa, 2632
Ellen Li, Samuel L. Stanley Jr
- 107 Parasitic diseases; helminths, 2651
Carlos Seas, Martin Montes, A. Clinton White Jr
- 108 Gastrointestinal and hepatic manifestations of specific genetic disorders, 2672
Elizabeth M. Petty
- 109 Gastrointestinal manifestations of systemic diseases, 2711
Joel S. Levine
- 110 Skin lesions associated with gastrointestinal and liver diseases, 2755
Matilde Iorizzo, Joseph L. Jorizzo
- 111 Oral manifestations of gastrointestinal diseases, 2774
John C. Rabine, Timothy T. Nostrant

- 112 Gastrointestinal vascular malformations or neoplasms: arterial, venous, arteriovenous, and capillary, 2785
Mitchell S. Cappell
- 113 Intestinal ischemia, 2811
Julián Panés, Josep M. Piqué
- 114 Radiation injury in the gastrointestinal tract, 2831
Steven M. Cohn, Stephen J. Bickston
- 115 Complementary and alternative medicine in gastroenterology, 2844
Craig J. McClain, Gerald W. Dryden, Kristine Krueger

Part 3 Diagnostic and therapeutic modalities in gastroenterology

A Endoscopic

- 116 Reprocessing of gastrointestinal endoscopes and accessories, 2863
Gregory Zuccaro Jr
- 117 Sedation and monitoring for gastrointestinal endoscopy, 2875
Hala Fatima, Douglas K. Rex
- 118 Upper gastrointestinal endoscopy, 2888
William R. Brugge
- 119 Capsule and small bowel endoscopy, 2903
C. Paul Swain
- 120 Colonoscopy and flexible sigmoidoscopy, 2917
Jerome D. Waye, Christopher B. Williams, Sharmila Anandasabapathy
- 121 Endoscopic retrograde cholangiopancreatography, endoscopic sphincterotomy and stone removal, and endoscopic biliary and pancreatic drainage, 2933
Tony E. Yusuf, Daniel K. Mullady, David L. Carr-Locke
- 122 Gastrointestinal dilation and stent placement, 2958
James D. Lord, Richard A. Kozarek
- 123 Percutaneous endoscopic gastrostomy, 2974
Brian J. Dunkin, Jeffrey L. Ponsky
- 124 Management of upper gastrointestinal hemorrhage related to portal hypertension, 2987
Paul J. Thuluvath
- 125 Endoscopic diagnosis and treatment of nonvariceal upper gastrointestinal hemorrhage, 3018
David J. Bjorkman
- 126 Endoscopic therapy for polyps and tumors, 3032
Sergey V. Kantsevov
- 127 Laparoscopy and laparotomy, 3049
Wenliang Chen, David W. Rattner

B Imaging

- 128 Plain and contrast radiology, 3061
*Marc S. Levine, Stephen E. Rubesin, Hans Herlinger,
Igor Laufer*
- 129 Diagnostic sonography, 3083
*Philip W. Ralls, R. Brooke Jeffrey Jr, Robert A. Kane,
Michelle L. Robbin*
- 130 Endoscopic ultrasonography, 3113
Sanjay B. Jagannath, Marcia I. Canto
- 131 Applications of computed tomography to the
gastrointestinal tract, 3140
*Karen M. Horton, Pamela T. Johnson, Elliot K. Fishman,
Alec J. Megibow*
- 132 Magnetic resonance imaging, 3173
Diane Bergin, Donald G. Mitchell
- 133 Positron emission tomography, 3212
Uri Ladabaum, Satoshi Minoshima
- 134 Applications of radionuclide imaging in
gastroenterology, 3226
Harvey A. Ziessman

135 Angiography, 3246
Kyung J. Cho

136 Interventional radiology, 3269
Kyung J. Cho

C Pathology

137 Endoscopic mucosal biopsy: histopathological
interpretation, 3299
Elizabeth Montgomery, Anthony N. Kalloo

D Gastrointestinal function studies

138 Evaluation of gastrointestinal motility: emerging
technologies, 3393
John W. Wiley, Chung Owyang

139 Tests of gastric and exocrine pancreatic function and
absorption, 3414
William D. Chey, Matthew J. DiMagno, William Y. Chey

140 Natural orifice transluminal endoscopic surgery
(NOTES), 3431
Samuel A. Giday, Anthony N. Kalloo

Index

A companion CD-ROM with a searchable version of the full text is included in the inside front cover of Volume 1.