Contents

Section 1: General Chapters

1. Topics in Intraoperative Gastrointestinal Pathology for Practicing Surgeons **3**
Nicole C Panarelli, Debra Beneck
- Review *3*

2. Hepatic, Biliary, and Pancreatic Imaging **14**
Allen Sanchez, Gayle Rudofsky Salama, Douglas Brylka
- Imaging of the Liver *14*
- Lesions of the Liver *19*
- Metastases *30*
- Imaging of the Biliary System *32*
- Imaging of the Pancreas *43*

3. Interventional Radiology Techniques **69**
Jessica A Rotman, Adam D Talenfeld

Part I: Percutaneous Treatment of Benign Liver Disease **69**
- Portal Hypertension *69*
- Biliary Obstruction *73*

Part II: Percutaneous Treatment of Primary and Metastatic Hepatic Malignancy **77**
- Percutaneous Tumor Ablation *77*
- Transarterial Interventions *81*

4. Radiotherapy for Gastrointestinal and Liver Pathology **102**
John Ng, Baoqing Li, Tony JC Wang, David P Horowitz
- Evidence-Based Review *103*
- Landmark Trials *107*
- Conclusion and Future Directions *107*

5. Novel Techniques in Advanced Endoscopy **110**
Christine Boumitri, Nikhil Kumta, Prashant Kedia, Michel Kahaleh
- Interventional Endoscopic Ultrasound *110*

6. Pediatric Gastrointestinal and Hepatobiliary Surgery **136**
Oliver J Muensterer, Samir Pandya
- General Aspects of Surgery in Children *136*
- Pediatric Foregut Surgery *136*
- Midgut and Hindgut Pediatric Surgery *143*
- Hepatobiliary Surgery in Children *152*
- Conclusion and Future Directions *159*

7. Early Recovery after Gastrointestinal Surgery **162**
Benjamin Perakath, Rohin Mittal
- Aim and Rationale of the ERAS Pathway *162*
- Components of ERAS *162*
- Preoperative Interventions *162*
- Perioperative Interventions *164*
- Postoperative Interventions *165*
- Audit *166*
- Outcomes of the ERAS Pathway *166*

8. Nutrition for the Gastrointestinal and Hepatobiliary Surgery Patient **169**
Alissa J Ritter Lupu
- Preoperative Nutrition Optimization *169*
- Enteral and Parenteral Nutrition Support *173*
- Selection of EN Formula *174*
- Oral Diet Advancement *175*
- Postoperative Medical Nutrition Therapy Guidelines *175*
- Medical Nutrition Therapy for Specific Surgeries *178*

9. Stoma Care **182**
Kelly Hicks, Nora Sammon, Danielle Hunton
- Preoperative Considerations *182*
- Stomal Complications *182*
- Peristomal Skin Complications *184*
- Other Skin Complications *189*
- Psychological Impact *189*

10. Genetic Counseling and Genetic Testing for Colorectal Cancer Risk—A Case-based Review **192**
Francesca Tubito, Diana Moglia Tully, Michelle E Ernst
- Genetic Counseling *192*
- Introduction to Hereditary Colorectal Cancer Syndromes *197*
- Hereditary Colorectal Cancer Syndromes without Significant Polyposis *199*
- Adenomatous Polyposis Syndromes *210*
- Hamartomatous Polyposis Syndromes *225*
- Other Polyposis Syndromes *231*
- Other Hereditary Syndromes with GI Findings *232*
- Types of Genetic Tests and Technologies *232*

Section 2: Esophagus
Section Editor—*Subroto Paul*

11. Benign Disorders of the Esophagus **245**
Subroto Paul
- Overview *245*

12. Gastroesophageal Reflux Disease 246
Stefan S Kachala, Brendan M Finnerty, Rasa Zarnegar
- Review of Landmark Studies *246*
- Minimally Invasive Gastric Fundoplication *247*
- Operative Tips *251*

13. Surgical Options for Achalasia 253
Jon Wee, Nestor Villamizar
- Laparoscopic Heller Myotomy *253*
- Peroral Endoscopic Myotomy (POEM) *260*
- Conclusion and Future Directions *263*

14. Surgical Treatment of Esophageal Diverticula 265
Desmond M D'Souza, Siva Raja
- Zenker's Diverticulum *265*
- Diverticulectomy and Myotomy *265*
- Thoracic Diverticula *267*
- Conclusion and Future Directions *269*

15. Endoscopic Treatment for Achalsia: Peroral Endoscopic Myotomy 271
Nikhil Kumta, Christine Boumitri, Michel Kahaleh
- Evidence-Based Review *271*
- Procedure *271*
- Outcomes *274*
- Conclusion and Future Directions *275*

16. Barrett's Esophagus 277
Amir Soumekh, Felice Schnoll-Sussman
- Preoperative Planning *280*
- Surgical Anatomy *280*
- Step-by-Step Illustration of Procedure *280*
- Operative Tips *280*
- Complications *280*
- Outcomes *280*
- Conclusion and Future Directions *281*

17. Malignant Disorders of the Esophagus 283
Subroto Paul
- Overview *283*

18. Short- and Long-Term Outcomes in Esophageal Cancer 284
Subroto Paul
- Postoperative and Short-Term Outcomes *284*
- Long-Term Survival *286*

19. Esophagectomy 291
Elliot Servais
- Overview *291*

- Preoperative Evaluation *292*
- Open Esophagectomy *292*
- Minimally Invasive Esophagectomy *294*
- Future Directions *296*

20. Robotically Assisted Minimally Invasive Ivor Lewis Esophagectomy **299**
R Taylor Ripley, Inderpal S Sarkaria
- Evidence-Based Review *299*
- Preoperative Planning *299*
- Anesthetic Considerations *300*
- Procedure and Surgical Anatomy *300*
- Postoperative Care *303*
- Illustrations *303*
- Complications *303*
- Outcomes (Literature Review) *303*
- Conclusion and Future Directions *308*

Section 3: Stomach

21. Gastric Bypass and Biliopancreatic Diversion **313**
Adam Levy, Katherine D Gray, Gregory Dakin
- Evidence-Based Review: Indications *313*
- Evidence-Based Review: Physiology *314*
- Landmark Trials *315*
- Procedures *315*
- Operative Tips *319*
- Complications *319*
- Outcomes in Bariatric Surgery *321*

22. Laparoscopic Adjustable Gastric Banding and Sleeve Gastrectomy **325**
Nabeel R Obeid, Christine J Ren-Fielding, Manish Parikh
- Evidence-Based Review *325*
- Landmark Trials *326*
- Preoperative Planning *327*
- Surgical Anatomy *327*
- Procedure: Laparoscopic AGB *328*
- Procedure: Laparoscopic SG *334*
- Conclusion and Future Directions *340*

23. Role of Surgery in Developing Economies **342**
HV Shivaram, Natarajan A
- Synergism of Growing Economies and Illnesses *342*
- Evidence-Based Review *343*

- Landmark Trials *360*
- Procedures *361*
- Surgical Anatomy and Operative Technique *363*
- Conclusion and Future Directions *371*

24. Metabolic Surgery **378**

Alpana P Shukla, Alfons Pomp

- Mechanisms of Glycemic Control after Metabolic Surgery *378*
- Outcomes of Metabolic Surgery *379*
- Patient Selection and Surgical Options for the Obese Patient with T2DM *380*

25. Gastric Cancer **384**

Savio George Barreto, Ankesh Rawat, Parul J Shukla

- Etiology *384*
- Classification of Gastric Cancer *384*
- Signs and Symptoms of Gastric Cancer *384*
- Diagnosis and Staging of Gastric Carcinoma *386*
- Treatment of Gastric Cancer *387*

Section 4: Liver

26. Anatomic Resections of the Liver **399**

Neel P Chudgar, Govind Nandakumar

- Anatomy *399*
- Preoperative Planning *404*
- Procedures *405*
- Postoperative Care *412*
- Operative Tips *413*
- Outcomes *414*
- Conclusion and Future Directions *414*

27. Benign Tumors of the Liver **416**

Ashwin Rammohan, Sanjay Govil

- Introduction and Classification *416*
- Incidental Liver Tumors *416*
- Cavernous Hemangioma *418*
- Focal Nodular Hyperplasia *420*
- Hepatocellular Adenoma *421*
- Benign Cystic Tumors *423*
- Hepatobiliary Cystadenoma with OS *424*
- Hepatobiliary Cystadenoma without OS *425*
- Intraductal Papillary Mucinous Neoplasm of the Bile Duct *426*

28. Hepatocellular Carcinoma **429**

Teo Jin Yao, Lee Ser Yee, Chan Chung Yip, Chung Yaw-Fui Alexander

- Risk Factors *429*

- Evidence-Based Review *429*
- Landmark Trials *433*
- Procedure *434*
- Surgical Anatomy *436*
- Step-by-Step Illustration of Procedure *439*
- Parenchymal Transection *447*
- Laparoscopic Resections *447*
- Robotic Liver Surgery *450*
- Operative Tips *451*
- Postoperative Complications *452*
- Outcomes *453*
- Conclusion and Future Directions *456*

29. Intrahepatic and Perihilar Cholangiocarcinoma: Surgical Management **459**
Kayvan Roayaie, Sasan Roayaie
- Epidemiology *459*
- Risk Factors *460*
- Intrahepatic Cholangiocarcinoma *460*
- Perihilar Cholangiocarcinoma *463*
- Liver Transplantation for PCCA *466*

30. Colorectal Liver Metastasis **468**
Ramraj Vemala Nagendra Gupta, Govind Nandakumar
- Surgical Anatomy *469*
- Diagnosis *469*
- Management *471*
- Landmark Trials *473*
- Operative Tips *474*
- Outcome and Surveillance *475*
- Future *475*

31. Gallbladder Cancer **478**
Pankaj Kumar Garg, Rambha Pandey, Durgatosh Pandey
- Evidence-Based Review of Different Aspects of Surgical Management of GBC *480*
- Radical Cholecystectomy *482*
- Conclusion and Future Directions *486*

32. Ex Vivo Resection of Complex Abdominal Masses **489**
Abhishek Mathur, Tomoaki Kato
- Ex Vivo Surgery in Liver Pathology *489*
- Ex Vivo in Cholangiocarcinomas and Klatskin Tumors *489*
- Ex Vivo in HCC *491*
- Ex Vivo and Colorectal Metastases *492*
- Ex Vivo for Benign Liver Lesions or Lesions with Low Malignant Potential *492*
- Ex Vivo and Pancreatic Adenocarcinoma *496*

- Ex Vivo for Pancreatic Lesions with Low Malignant Potential *497*
- Ex Vivo for Lesions at the Root of the Mesentery *500*

33. Operative Techniques for Liver Transplantation **506**
Pejman Radkani, Vikram Wadhera, Sander Florman
- History *506*
- Preoperative Planning *506*
- Operative Techniques *507*

34. Perioperative Management of Liver Transplantation **513**
Parissa Tabrizian, Josep Marti-Sanchez, Antonios Arvelakis, Sander Florman
- Pathophysiology and Preoperative Evaluation *513*
- Intraoperative Monitoring *514*
- Surgical Techniques *516*
- Challenges Associated with Transplantation *516*
- Postoperative Care after Liver Transplantation *517*
- Complications *518*

35. Indications and Contraindications for Liver Transplantation **522**
Parissa Tabrizian, Sander Florman
- Allocation Systems *522*
- Preoperative Evaluation *523*
- Indications *523*
- Contraindications *527*
- Living Donor Liver Transplantation *528*

Section 5: Pancreas

36. Management of Acute and Chronic Pancreatitis: Focus on Surgical Management **533**
Beth Schrope
- Acute Pancreatitis *533*
- Chronic Pancreatitis *543*
- Conclusion and Future Directions *563*

37. Pancreatic Cancer **566**
Jumana Jaloudi, Michael D Kluger
- Diagnostic Approach *568*
- Surgical Management *570*
- Other Procedures *581*
- Outcomes and Considerations *585*
- Landmark Trials *585*

38. Borderline Resectable Pancreatic Cancer **589**
Abhishek Mitra, Bhawna Sirohi, Mahesh Goel, Shailesh V Shrikhande
- Evidence-Based Review *589*
- Landmark Trials *593*
- Preoperative Planning *594*

- Surgical Anatomy *594*
- Operative Tips for Vein Resection *596*
- Postoperative Management and Complications *598*
- Outcomes *599*
- Future Trends *599*

39. Endocrine Tumors of the Pancreas **603**
Kareem Ibrahim, Hasan Aldailami, Thomas J Fahey III
- Anatomy and Physiology of the Pancreas *603*
- Diagnosis *605*
- Insulinoma *606*
- Gastrinoma *609*
- Glucagonoma *612*
- Somatostatinoma *613*
- Incidentaloma *613*
- Operative Strategies *614*

40. Pancreas Transplantation **619**
Samuel Sultan, Anthony Watkins
- Evidence-Based Review *619*
- Landmark Trials *621*
- Donor Procurement *622*
- Pancreas Transplantation *624*
- Operative Tips *628*
- Complications *631*
- Outcomes *632*
- Conclusion and Future Directions *632*

Section 6: Small Bowel and Abdomen

41. Crohn's Disease of the Small Bowel **637**
Daniele Scoglio, Alessandro Fichera
- Preoperative Planning *637*
- Surgical Procedure *638*
- Operative Technique: Gastrojejunostomy *638*
- Operative Technique: Strictureplasty *640*
- Operative Technique: Laparoscopic Ileocolic Resection *644*

42. Gastrointestinal Stromal Tumors **652**
John Creasy, Benjamin Golas, Melanie Ongchin
- Pathology *652*
- Prognostic Features and Risk Stratification *654*
- Clinical Presentation *654*

- Diagnosis *654*
- Treatment and Prognosis *657*
- Future Directions *664*

43. Carcinoid Tumors of the Gastrointestinal Tract **667**
Tushar Samdani, Vanessa Hui, Rashmi S, Govind Nandakumar
- Clinical Presentations and Symptoms *667*
- Pathological Diagnosis and Reporting of NET *669*
- Management of Locoregional Unresectable or Metastatic Carcinoid Tumors *671*
- Landmark Trials *672*
- Outcomes *674*
- Conclusion and Future Directions *675*

44. Trauma of the Gastrointestinal Tract **678**
Soumitra R Eachempati, Philip S Barie
- Initial Diagnosis of Abdominal Injuries *678*
- Management of Hollow Viscus Injuries *678*
- Injuries to the Stomach *679*
- Duodenal Injuries *680*
- Small and Large Bowel Injuries *680*
- Rectal Injuries *681*
- Injuries to the Spleen *682*
- Liver Injuries *684*
- Injuries to the Pancreas *687*

Section 7: Colon

45. Volvulus **693**
Evan N Feldman
- Sigmoid Volvulus *693*
- Cecal Volvulus *695*
- Ileosigmoid Knotting *695*
- Volvulus of the Transverse Colon or Splenic Flexure *695*
- Colonic Volvulus in Pregnant Women *696*

46. Diverticulitis **697**
Gregory Charak, Chukwuma Apakama, Steven Lee-Kong
- Evidence-Based Review *697*
- Trials *699*
- Rationale for Minimally Invasive Approach *699*
- Conclusion and Future Directions *704*

47. Surgical Management of Constipation **705**
Christopher T Aquina, Christian P Probst, Kristin N Kelly, Christina Cellini
- Prevalence *705*

- Etiology and Risk Factors *705*
- Classification *705*
- Diagnosis and Workup of Constipation *705*
- History and Physical Exam *706*
- Overview of Diagnostic Schema *708*
- Disordered Defecation Studies *708*
- Colonic Transit Studies *709*
- Lifestyle Modification *710*
- Medication Therapy *710*
- Biofeedback *712*
- Surgical Options for Slow Transit Constipation *712*
- Surgical Options for Defecatory Disorders *715*

48. Surgical Management of Ulcerative Colitis **719**
Vitaliy Y Poylin, Thomas Cataldo
- Preoperative Planning *722*

49. Surgical Management of Crohn's Colitis **732**
Mukta K Krane
- Clinical Presentation *732*
- Indications for Surgery *732*
- Failure of Medical Management *733*
- Procedures *733*

50. Hereditary Nonpolyposis Colorectal Cancer Syndromes **739**
Joongho Shin
- Hereditary Nonpolyposis Colorectal Cancer Syndromes (Lynch Syndrome, LC) *739*
- Hamartomatous Tumor Syndrome *739*
- Conclusion and Future Directions *743*

51. Inherited Polyposis Syndromes **745**
Maria Ximena Traa Kiely, Lilian Chen, James Yoo
- Investigation of Polyposis Syndromes *748*
- Management *748*
- Prevention *756*
- Conclusion and Future Directions *756*

52. Difficult Polypectomy **760**
Erman Aytac, Emre Gorgun
- Endoscopic Mucosal Resection *761*
- Endoscopic Submucosal Dissection *762*
- Combined Endoscopic and Laparoscopic Surgery *769*

53. Laparoscopy for Colon Cancer **773**
Jared Wong, James Fleshman
- Colon Cancer *773*

- Right Colectomy *775*
- Hepatic Flexure Mobilization *777*
- Splenic Flexure Mobilization *781*

54. Cytoreductive Surgery and Intraperitoneal Chemotherapy **787**
Michael Polcino, Leandro Feo, Garrett M Nash
- Technique *787*
- Evidence-Based Review and Outcomes *791*

Section 8: Rectum

55. Rectal Prolapse **803**
Azah A Althumairi, Bashar Safar
- Clinical Presentation and Patient Evaluation *803*
- Evidence-Based Review and Landmark Trials *803*
- Surgical Procedures *805*
- Outcomes *808*
- Conclusion and Future Directions *809*

56. Transanal Endoscopic Microsurgery **811**
Joshua A Tyler, Steven R Hunt
- Clinical Anatomy *811*
- Preoperative Evaluation *811*
- Operative Steps *812*
- Postoperative Care *815*
- Clinical Tips and Pitfalls *815*

57. Rectal Cancer **816**
Usmaan Hameed, Anand Govindarajan
- Evidence-Based Review and Landmark Trials *816*
- Procedures *819*
- Complications *821*
- Conclusion and Future Directions *821*

58. Management of Recurrent Rectal Cancer **823**
Paul RA O'Mahoney, Govind Nandakumar, Heather Yeo
- Risk Factors for Recurrence *823*
- Classification of Local Recurrence *823*
- Presentation and Incidence *825*
- Patient Selection *826*
- Preoperative Planning *826*
- Anatomic Considerations and Consultants *826*
- Imaging *826*
- Operative Technique *827*
- Intraoperative Radiation Therapy *828*

- Postoperative Care *829*
- Complications *829*
- Palliative Treatment *830*
- Future Directions *830*

59. Laparoscopic Proctectomy **833**
Alexis L Grucela, John-Paul Bellistri, Aida Taye
- Evidence-Based Review *833*
- Preoperative Preparation and Prevention *834*
- Surgical Anatomy *837*
- Step-by-Step: Laparoscopic Low Anterior Resection *839*
- Operative Tips *846*
- Outcomes and Complications *847*
- Future Directions *850*
- Landmark Trials and Key Studies *850*

60. Robotic Proctectomy **855**
Carrie Y Peterson, Govind Nandakumar
- Indications *855*

61. Acute and Chronic Pouch Complication **867**
Lilian Chen, Joseph Batac, Todd D Francone
- Acute Complications *867*
- Chronic Complications of IPAA *872*
- Pouch Dysfunction *876*

62. Retrorectal Tumors **887**
Rebecca A Levine, Rahul Narang
- Evidence-Based Review *887*
- Procedure *893*
- Complications *896*
- Outcomes *896*
- Future Directions *897*

Section 9: Anus

63. Hemorrhoids **903**
Ziad N Kronfol, Melissa M Alvarez-Downing
- Surgical Anatomy *903*
- Preoperative Planning *905*
- Closed Hemorrhoidectomy (Ferguson) *905*
- Open Hemorrhoidectomy (Milligan-Morgan) *907*
- Stapled Hemorrhoidopexy (Procedure for Prolapse and Hemorrhoids, PPH) *908*

- Ligasure Emorrhoidectomy *910*
- Transanal Hemorrhoidal Devascularization or Hemorrhoidal Artery Ligation *911*

64. Surgical Therapy for Fecal Incontinence **915**
Kelly A Garrett
- Etiology *915*
- Assessment *917*
- Physiologic Testing *917*
- Treatment *919*

65. Perianal Crohn's Disease **929**
Emily Steinhagen, Randolph M Steinhagen
- Evaluation *929*
- Treatment *929*
- Skin Tags *930*
- Anal Fissure and Ulceration *930*
- Stricture *931*
- Abscess and Fistula *931*
- Carcinoma *934*

66. Anorectal Sexually Transmitted Diseases **937**
Maria Camilla Ramirez, Lester Gottesman
- Bacterial STD *937*

67. Anal Cancer and Anal Intraepithelial Neoplasia **943**
Jason R Bingham, Amit K Agarwal, Scott R Steele
- Evidence-Based Review *945*
- Landmark Trials *951*
- Preoperative Planning *952*
- Surgical Anatomy *952*
- Abdominoperineal Resection *954*
- Technique for AIN *963*
- Conclusion and Future Directions *965*

Index *971*