

ATLAS OF

# Gastroenterology

FOURTH EDITION

EDITED BY

**Tadataka Yamada**

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David H. Alpers

Anthony N. Kalloo

Neil Kaplowitz

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# **Atlas of Gastroenterology**

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## Preface

Among the most important developments in clinical medicine in recent years has been the rapid advancement in imaging technologies. These technologies allow clinicians to gain better insight into the pathophysiological processes underlying their patients' illnesses. The practice of gastroenterology, perhaps more than any other in medicine, is a visual one and has been enriched by such advances. Modalities such as endoscopy, double-contrast radiography, computed tomography, isotopic scintigraphy, ultrasonography, magnetic resonance imaging, and positron emission tomography have facilitated greatly the approach to diagnosing gastrointestinal disorders. The imaging of tissues using standard microscopy has been augmented with newer methodologies such as immunohistochemistry, in situ hybridization, and confocal microscopy, not to mention even more experimental techniques. While we have included descriptions of these advances in the *Textbook of Gastroenterology*, the old adage that "a picture is worth a thousand words" could not be more applicable to anything other than to the teaching of gastroenterology. With this in mind, we have endeavored to provide the fourth edition of the *Atlas of Gastroenterology* with additional graphic material that enhances the reader's understanding of the written material in the *Textbook*. The fourth edition of the *Atlas* expands on the material presented in the third edition by the addition of figures to existing chapters and by the addition of chapters covering new subject matter. The written text in the *Atlas* provides only an abbreviated introduction to the graphic material, and the reader is referred to the *Textbook* for more detailed information. Although the *Atlas* is meant to be especially useful to the reader of the *Textbook*, the quality of many of the figures is unique and not to be found readily in existing publications. Thus, we hope that the *Atlas* will serve as a valuable educational resource for all readers, independent of their familiarity with the *Textbook*.

We are delighted to welcome Tony Kalloo to the editorial team for the fourth edition of the *Atlas of Gastroenterology*. His hands-on experience in the most modern procedural techniques of gastroenterology, in addition to his broad understanding of the discipline, have added immensely to this edition.

We are most pleased as well to have a new publisher, Wiley-Blackwell, for this edition. Their keen insight into the publishing industry and the way in which textbooks are utilized today has been the basis for some of the changes made to the *Atlas*. In addition, their knowledge of the international world of medicine will help us to distribute the contents of the *Atlas* to a global audience. The editors would like especially to thank Elisabeth Dodds at Wiley-Blackwell, whose commitment to excellence has contributed materially to the quality of the book, and Alison Brown and Oliver Walter, without whose assistance this fourth edition of the *Atlas* would not have been published.

Our efforts were especially facilitated by the expert assistance of Lori Ennis and Barbara Boughen, who collaborated as a team, complementing editorial talents with interpersonal skills to maintain the high quality of the text and deliver the manuscripts in a timely fashion. The editors are indebted to their administrative and secretarial assistants, Patricia Lai, Terri Astin, Jennifer Mayes, Sue Sparrow, Patty Pool, Gracie Bernal-Muñoz, and Maria L. Vidrio. In addition, the faculty and fellows of the Gastroenterology Divisions at the University of Michigan, Washington University in St. Louis, and the University of Texas Medical Branch in Galveston provided valuable assistance in reviewing the chapters in the third edition of the *Atlas* in preparation for this, the fourth edition.

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# 1

## Approach to the patient with gross gastrointestinal bleeding

Grace H. Elta, Mimi Takami

Gastrointestinal (GI) bleeding is a common clinical problem that requires more than 300 000 hospitalizations annually in the United States. Most bleeding episodes resolve spontaneously; however, patients with severe and persistent bleeding have high mortality rates. Evaluation of a patient with bleeding begins with assessment of the urgency of the situation. Resuscitation with intravenous fluids and blood products is the first consideration. Once the patient's condition is stable, a brief history and physical examination will help determine the location of the bleeding. For probable or known upper GI bleeding, a nasogastric tube is placed to help determine the location of bleeding and to monitor the rapidity of the bleeding. The algorithm in Figure 1.1 is a general guideline for evaluation of nonvariceal upper GI bleeding. There is an important exception to this algorithm; endoscopy may be used urgently in *all* patients with upper GI bleeding regardless if their bleeding has stopped spontaneously, allowing triage of patients to outpatient, inpatient, or intensive care. This practice has been shown to be safe and to lead to significant cost saving as patients without risk factors such as coagulopathy, serious concomitant diseases, or bleeding stigmata do not require hospitalization.

Patients with liver disease or other causes of portal hypertension have a potential variceal source of hemorrhage.

Urgent diagnostic endoscopy is indicated to confirm the bleeding source, because between one-third and half of these patients have bleeding from nonvariceal sites, and future management is different for bleeding varices. The algorithm in Figure 1.2 is for the evaluation and management of variceal hemorrhage.

Lower GI bleeding is defined as bleeding from below the ligament of Treitz. When patients hospitalized for GI bleeding are identified, lower GI sources account for one-quarter to one-third of all bleeding events. When the location of bleeding is suspected to be the lower GI tract, a nasogastric tube and even upper endoscopy may still be needed to rule out an upper GI source of hemorrhage. It is important to remember that as many as 10% of patients with hematochezia have an upper GI source, and that results of nasogastric aspiration can be falsely negative when bleeding is duodenal and there is no duodenogastric reflux or when the bleeding has ceased. The algorithm in Figure 1.3 is for evaluation of lower GI bleeding. Unfortunately, some patients have both upper and lower GI bleeding sites that defy diagnosis despite the numerous diagnostic modalities available. They need repeated studies if bleeding recurs or becomes a management problem.



**Figure 1.1** Algorithm for evaluation of nonvariceal upper GI bleeding. GI, gastrointestinal; PPI, proton pump inhibitor.