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# **GASTROINTESTINAL DISORDERS**

 **Mosby's Clinical Nursing Series**

**Dorothy B. Doughty**

**Debra Broadwell Jackson**



# **GASTROINTESTINAL DISORDERS**

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## AMERICAN CANCER SOCIETY GUIDELINES FOR COLORECTAL CANCER SCREENING

*Screening protocols are intended to identify early curable colorectal cancer in asymptomatic individuals:*

- Beginning at age 40: Digital rectal exam annually
  - Beginning at age 50: Digital rectal exam annually + Stool for guaiac annually + Proctosigmoidoscopic exam every 2 years and then every 3 to 5 years as long as individual is asymptomatic and all indicators remain negative
- Note: Prophylactic polypectomy is recommended in conjunction with proctosigmoidoscopy

**High-risk individuals require more frequent screening:**

- Patients with ulcerative colitis should be screened q 6 months to 1 year (with colonoscopy and biopsy of any suspicious areas) beginning 10 years after onset of the disease
- Children of individuals with familial adenomatous polyposis (FAP) should be screened at least annually from age 15 to age 30
- Individuals with family history of colorectal cancer should discuss appropriate screening frequency with their physician

*Any individual with any of the following signs or symptoms of colorectal cancer should be evaluated immediately:*

- Rectal bleeding or blood in the stool
- Change in bowel habits (e.g., constipation alternating with diarrhea)
- Change in caliber of stools (e.g., pencil-thin stools)
- Abdominal pain

## RESOURCE GROUPS

### **Crohn's and Colitis Foundation of America (CCFA)**

444 Park Avenue South  
New York, New York 10016-7374  
212-685-3440  
800-343-3637

### **United Ostomy Association (UOA)**

36 Executive Park, Suite 120  
Irvine, CA 92714-6744  
714-660-8624  
800-826-0826

### **Wound Ostomy and Continence Nurses Society**

2755 Bristol St. Ste. #110  
Costa Mesa, CA 92626  
712-476-0268

### **American Cancer Society (ACS)**

1599 Clifton Road NE  
Atlanta, GA 30329  
404-320-3333

### **Help for Incontinent People (HIP)**

P.O. Box 544  
Union, SC 29379  
803-579-7900

### **Alcoholics Anonymous World Services**

P.O. Box 459  
Grand Central Station  
New York, New York 10163  
212-870-3400

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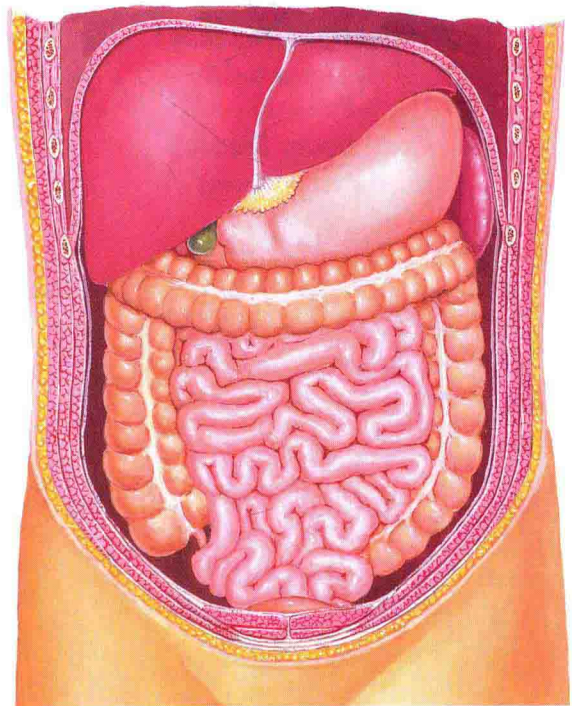
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# **GASTROINTESTINAL DISORDERS**





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***Skin Disorders***

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***Female Disorders***

by Valerie Edge and Mirdi Miller



# Preface

*Gastrointestinal Disorders* is the tenth volume in *Mosby's Clinical Nursing Series*, a new kind of resource for practicing nurses.

The *Series* is the result of the most elaborate market research ever undertaken by Mosby-Year Book, Inc. We first surveyed hundreds of working nurses to determine what kinds of resources practicing nurses require to meet their advanced information needs. We then approached hundreds of clinical specialists—proven authors and experts—and asked them to develop a consistent format that would meet the needs of nurses in practice. This format was presented to nine focus groups composed of working nurses and refined between each group. In the later stages we published a 32-page full-color sample so that detailed changes could be made to improve physical layout and appearance, page by page.

*Gastrointestinal Disorders* is a comprehensive nursing resource for the nurse caring for patients with gastrointestinal disorders. Chapter 1 is a focused review of relevant anatomy and physiology. Multiple illustrations serve to clarify anatomic relationships, and physiologic functions are discussed in terms of clinical applications. Chapter 2 provides guidelines for nursing assessment of patients with gastrointestinal disorders; a detailed interview guide is boxed for easy reference, and a pictorial guide depicts step-by-step physical assessment. In Chapter 3, current diagnostic procedures are presented according to a structured format that focuses on nursing concerns; each procedure is briefly described and is discussed in terms of indications, contraindications, preprocedural and postprocedural nursing care, and guidelines for patient teaching.

Chapters 4 through 7 focus on the nursing care of patients with commonly occurring pathologic states: inflammatory disorders, obstructive disorders, interferences with nutrient intake and absorption, and interferences with fecal elimination. A consistent format makes these chapters “user-friendly”. Each disorder is discussed in terms of epidemiology and pathophysiology; boxed material outlines and highlights potential complications, diagnostic studies and results, and medical-surgical management. Nursing management is the focus of this book, and these pages have a color border to en-

hance quick access. Each nursing care plan is presented in the nursing process sequence, utilizing nursing diagnoses that are accepted by the North American Nursing Diagnosis Association (NANDA). This material can be used to develop individual care plans quickly and accurately. Each nursing care plan is further enhanced by an additional section that outlines key content to be included in patient teaching.

Chapter 8 focuses on the management of patients requiring gastrointestinal intubation or nutritional support, and Chapter 9 presents common surgical procedures. All therapies are discussed according to a structured format that emphasizes nursing management; the therapy or procedure is described, and boxed material outlines indications, contraindications, and potential complications. Nursing management is then detailed, using nursing diagnoses and the nursing process sequence.

In response to requests from scores of nurses participating in our research, a distinctive feature of this book is its usefulness for patient teaching. Background material increases the nurse’s ability to answer common patient questions with authority. The illustrations in the book, particularly those in the anatomy and physiology, assessment, and diagnostic procedures chapters, are specifically designed to support patient teaching. The book concludes with chapter 10, which is a compilation of patient teaching guides that supplement the patient teaching sections of each care plan. The patient teaching guides are ideal for reproduction and distribution to patients.

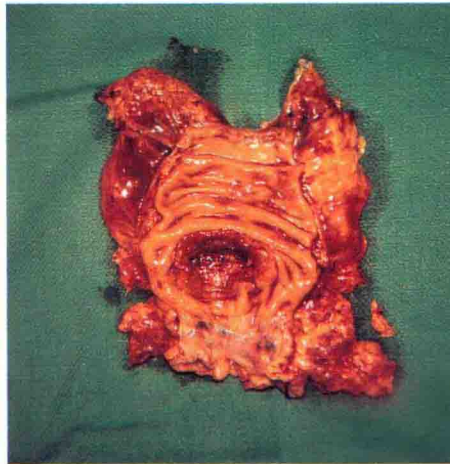
This book is intended for medical-surgical nurses who are frequently involved in the care of individuals with gastrointestinal disorders. The book will provide valuable information for nurses in acute care settings, gastrointestinal diagnostic units, surgical units, outpatient settings, extended care settings, and home health settings. The book also serves as a comprehensive resource for students and nurses returning to practice.

We hope this book contributes to the advancement of professional nursing by providing a comprehensive resource that supports a scientific and holistic approach to professional nursing practice.

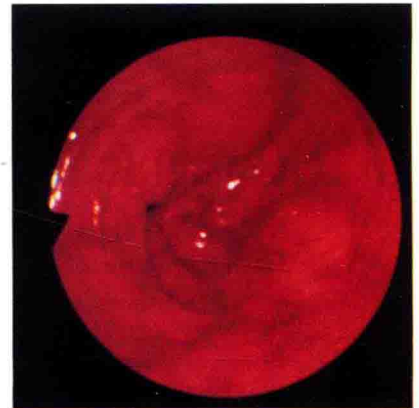
# Color Plates



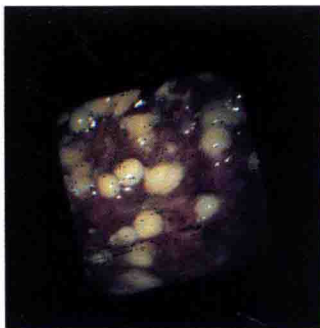
**PLATE 1**  
Primary gingivostomatitis showing lesions on the lips, tongue, and gums.



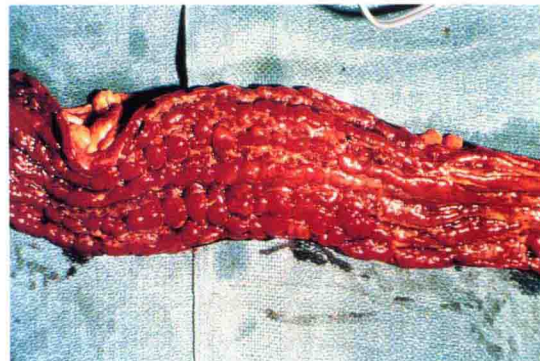
**PLATE 2**  
Adenocarcinoma of distal rectum.



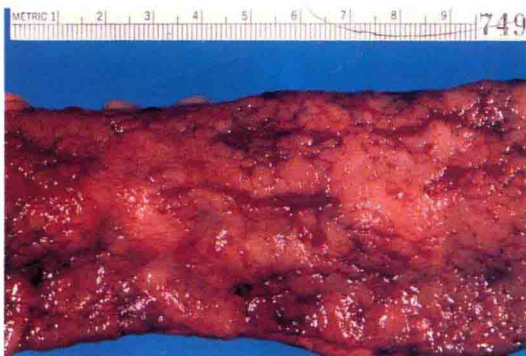
**PLATE 3**  
Erosive gastritis (as seen through endoscope).



**PLATE 4**  
Pseudomembranous colitis (as seen through endoscope).



**PLATE 5**  
Crohn's disease showing deep ulcers and fissures creating "cobblestone" effect.



**PLATE 6**  
Ulcerative colitis showing severe mucosal edema and inflammation with ulcerations and bleeding.



**PLATE 7**  
Caput medusae around abdominal stoma in patient with portal hypertension.



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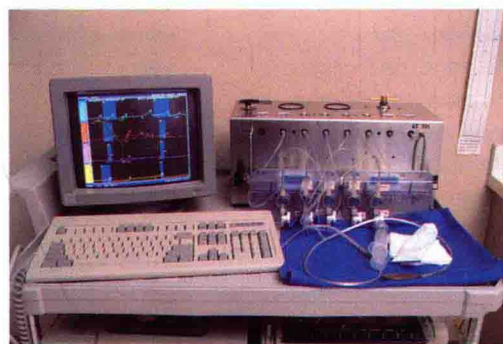
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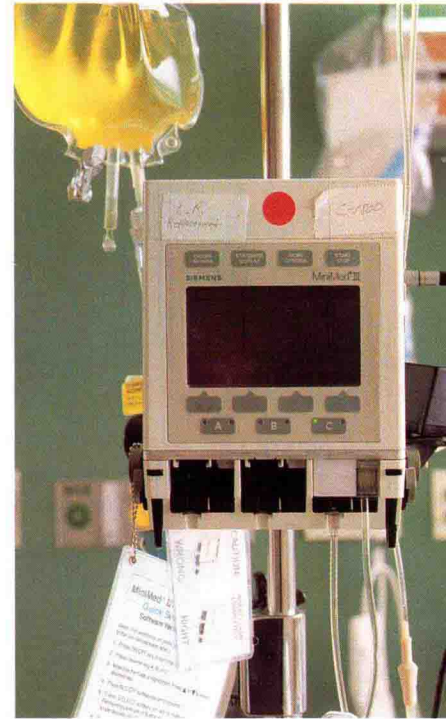
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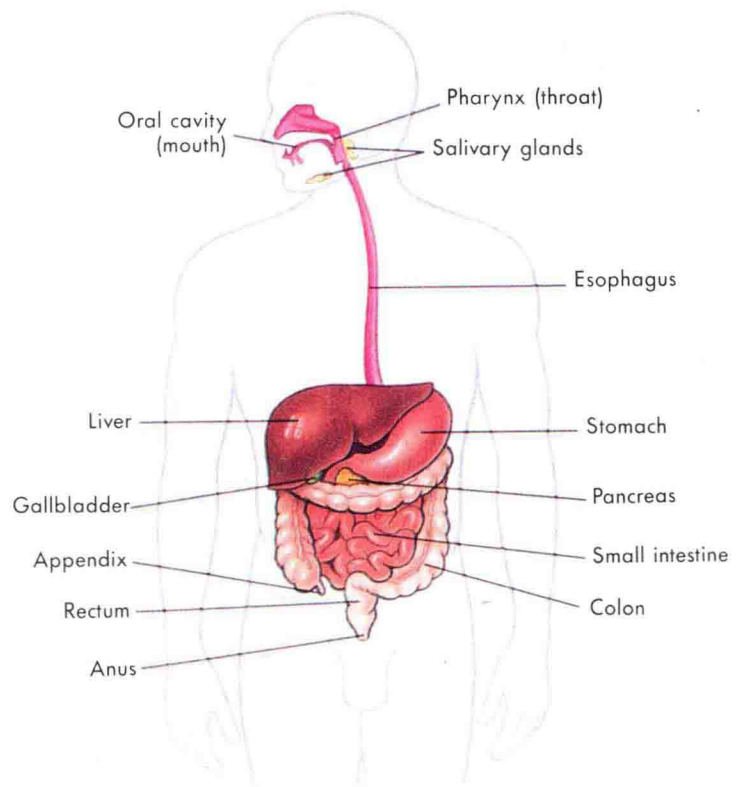
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# Color Atlas of Gastrointestinal Structure and Function

The gastrointestinal (GI) tract is critical to life and health, because it regulates the ingestion, digestion, and absorption of nutrients. It also is responsible for storing and eliminating waste products. Normal function of the gastrointestinal tract depends on a number of interrelated physiologic processes such as hormone production, enzyme secretion, carrier-mediated absorption, peristalsis, and voluntary control of defecation.

The organs within the GI tract are commonly divided into the alimentary canal and the accessory organs. The alimentary canal is the long tube that extends from the mouth to the anus; it includes the mouth, esophagus, stomach, small intestine, colon, rectum, anal canal, and anus (Figure 1-1). Accessory organs are structures outside the alimentary canal that contribute to the processes of nutrient digestion and absorption; the liver, pancreas, and gallbladder are important accessory organs (Figure 1-1).



**FIGURE 1-1**  
Digestive system depicted in place in the body. (From Seeley.<sup>53</sup>)



# ALIMENTARY CANAL

## MOUTH

The mouth, also referred to as the buccal cavity or oral cavity, is the beginning of the alimentary canal. Structures in the oral cavity assist with speech, nutrient ingestion, initiation of mechanical and chemical digestion, and swallowing. Important structures in the mouth are the teeth, the tongue, the hard and soft palates, and the salivary glands (Figure 1-2).

**Teeth** begin mechanical digestion through the process of chewing; they tear and cut food into smaller pieces. Chewing increases the surface area of food particles, and since digestive enzymes work only on exposed surfaces, this promotes chemical breakdown. Mechanically breaking down food into smaller pieces also makes swallowing easier. Thus chewing contributes significantly to the digestive process.

The **teeth** also contribute to the ability to clearly articulate words.

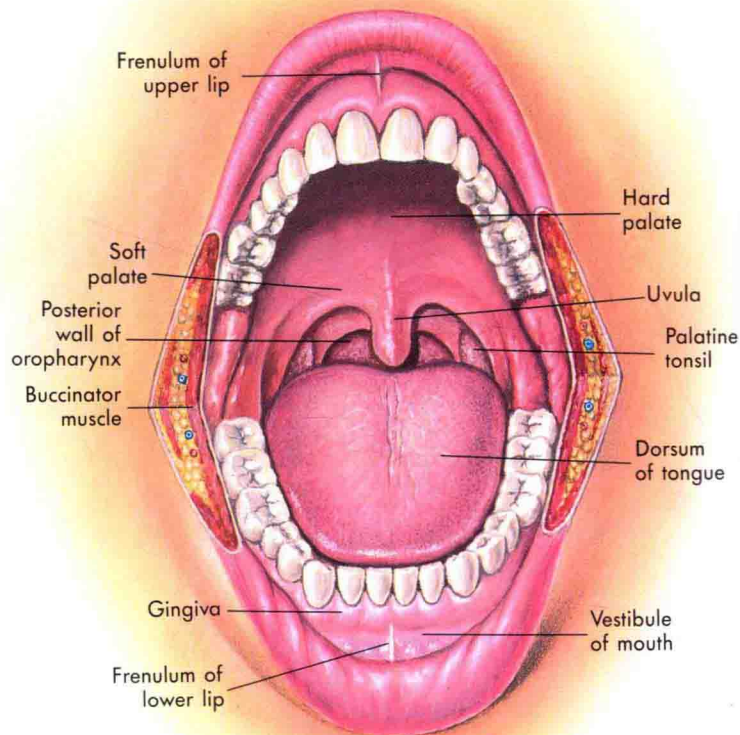
The **tongue** is a muscular organ covered with moist, squamous epithelium. It contains both mucous and serous glands.

The anterior surface of the tongue is covered with papillae, where the taste buds are located. Adults have approximately 10,000 taste buds; however, with age the taste buds begin to degenerate, and the sensation of taste becomes less acute. This can contribute to reduced appetite and nutrient intake in older adults.

In addition to taste, the tongue contributes significantly to speech, chewing, and swallowing.

The **palates** form the “roof” of the mouth, with the “hard” (or bony) palate located anteriorly and the “soft” (or muscular) palate located posteriorly (see Figure 1-2). The soft palate is attached to the posterior portion of the hard palate; it forms the partition between the mouth and the nasopharynx. During swallowing, the soft palate moves upward to close off the nasopharynx and prevent food and fluids from entering.

There are many **glands** in the mouth that contribute to the production of saliva; the three largest pairs are the parotid, the submandibular and the sublingual glands (see Figure 1-2). The parotid glands produce ptyalin (salivary amylase), which begins the chemical breakdown of starches. The submandibular glands produce a mixture of mucus and serous secretions. The sublingual glands produce a lubricating fluid composed primarily of mucus. Daily production of saliva ranges from 1,000 to 1,500 ml, with a pH of 6 to 7. The amount of saliva produced is determined by salivatory nuclei in the brainstem. These nuclei are stimulated by taste and tactile stimuli, with pleasant taste and



**FIGURE 1-2**  
Anatomic structures of the oral cavity. (From Seidel.<sup>52</sup>)

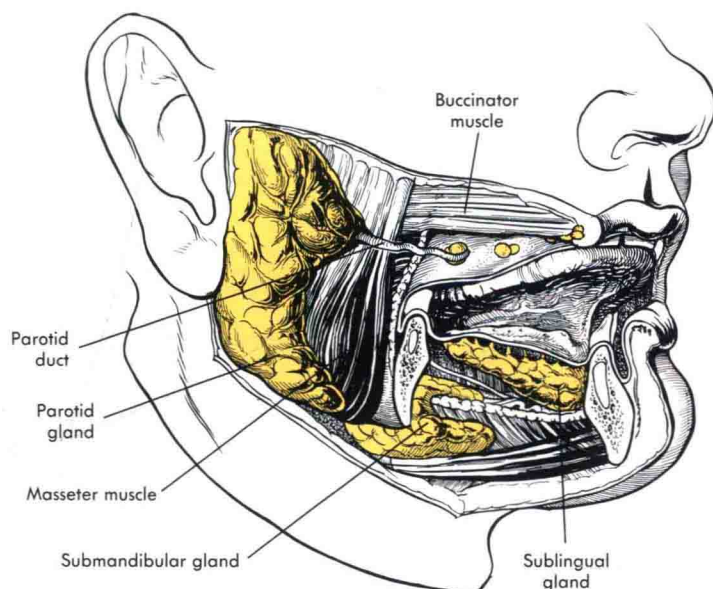
smooth texture providing a greater stimulus than unpleasant tastes and rough-textured foods. Salivation after ingestion of irritants helps dilute or neutralize the irritant.

Saliva also helps prevent infections of the oral cavity, because it constantly “bathes” the mouth, and it has some degree of antibacterial activity.

## Initiation of Digestion

Mechanical digestion of nutrients begins in the mouth with the process of chewing, or mastication. Chewing breaks large food particles into smaller bits and increases the surface available for enzymatic action.

Enzymatic digestion of carbohydrates is also initiated in the mouth by the action of salivary amylase (ptyalin), which reduces polysaccharides to maltose and isomaltose. Only a small percentage (5% to 10%) of ingested starches are digested in the mouth, because most starches are covered with cellulose and thus are protected from enzymatic action. The activity of ptyalin continues in the stomach until the gastric pH drops low enough to inactivate the enzyme.



**FIGURE 1-3**  
Salivary glands. The large salivary glands are the parotid glands, the submandibular glands, and the sublingual glands. The minor salivary glands include the buccal and labial glands. The parotid duct extends anteriorly from the parotid gland. (From Seeley.<sup>53</sup>)

### Swallowing

A very important function of the mouth and related structures is swallowing, which begins transport of the nutrients along the digestive pathway. Any condition that interferes with the ability to swallow places an individual at risk for nutritional compromise as a result of inadequate intake.

Swallowing is a complex act involving the tongue, the soft palate, the muscles of the oropharynx, the upper esophageal sphincter, the epiglottis, the muscles of the esophagus, and gravity (Figure 1-3).

Swallowing is mediated by the swallowing center, which is located in the pons and medulla. Swallowing is begun as a voluntary act and completed by reflex activity. Swallowing is facilitated by the presence of saliva, which acts as a lubricant for food particles.

### GENERAL HISTOLOGY OF ALIMENTARY CANAL STRUCTURES

The histology of the alimentary canal is essentially the same from the esophagus to the anal canal, with minor variations; it consists of four tissue layers: the mucosa, the submucosa, the muscularis, and the serosa, or adventitia (Figure 1-4).

### Mucosa

The mucosa is the innermost layer of the gut wall, and it has three distinct layers: the mucous epithelium, or surface layer; the lamina propria, a connective tissue layer; and the muscularis mucosa, a thin layer of circular muscle that separates the mucosa from the submucosa. Because the mucosal layer has many mucus-secreting glands, it is always moist.

### Submucosa

The submucosa is the second layer of the gut wall; major structures within this layer include connective tissue, blood and lymph vessels, nerve fibers, and reticuloendothelial cells. The nerve fibers in the submucosal layer are known as Meissner's plexus; this plexus is a component of the enteric nervous system.

### Muscularis

The muscularis is the third layer of the gut wall; it actually consists of two layers of smooth muscle, an inner layer of circular muscle and an outer layer of longitudinal muscle. The myenteric plexus, also known as Auerbach's plexus, is located between these two muscle layers. Auerbach's plexus and Meissner's plexus jointly form the intramural plexus, also known as the enteric nervous system. The nerve fibers of the intramural plexus originate in receptors located on the mucosal surface and in the bowel wall. These receptors respond to stretch and may respond to chemical stimuli. The intramural plexus is important, because it is the primary mediator for intestinal secretion and motility.

### Serosa

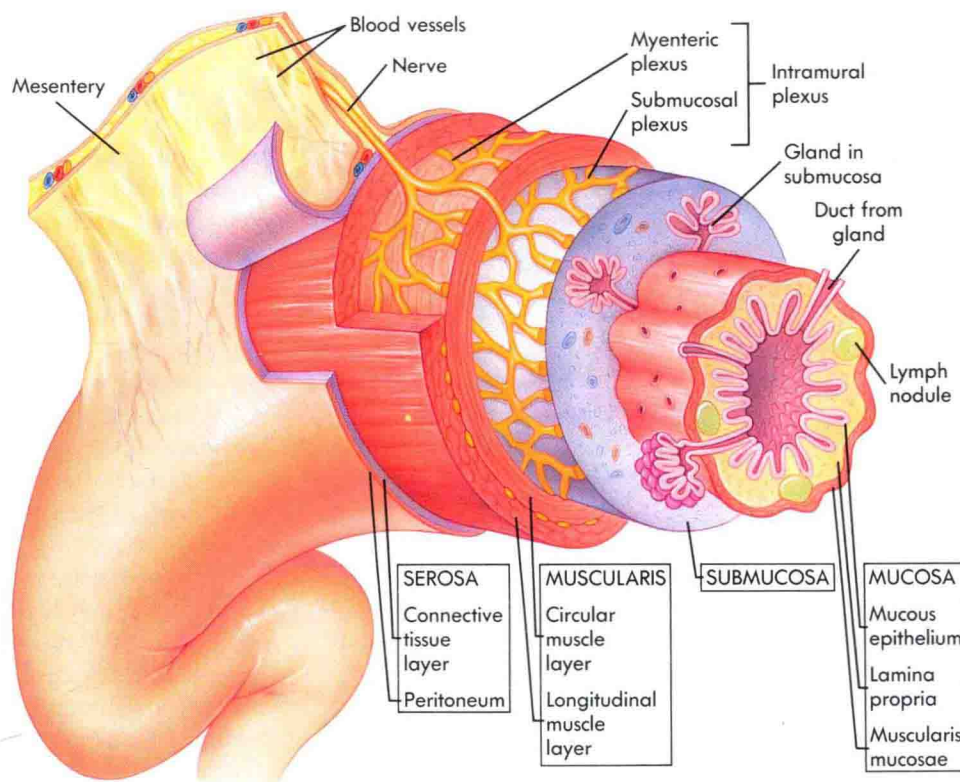
The outermost layer of alimentary canal structures is known either as the serosa or as the adventitia. For structures within the peritoneal cavity, the outer layer is the serosa; it is a connective tissue layer that in turn is covered by the visceral peritoneum. This continuity with the visceral peritoneum helps explain the severe abdominal pain frequently felt by patients with transmural inflammatory bowel disease (Crohn's disease); inflammation involving the serosa may spread to the peritoneum, causing a generalized peritonitis.

Because the serosa has no mucus-secreting glands, exposure to air results in inflammation with edema and eventual necrosis and sloughing of the serosal layer. This is why nurses are taught to cover exposed loops of bowel with sterile, saline-soaked towels in the event of evisceration.

Structures outside the peritoneal cavity, such as the esophagus, are covered with a connective tissue layer known as adventitia.



**FIGURE 1-4**  
Digestive tract histology. The four layers are the mucosa, submucosa, muscularis, and serosa or adventitia. (From Seeley.<sup>53</sup>)



## ESOPHAGUS

The esophagus is the muscular tube that connects the oropharynx to the stomach; it is about 25 cm long. The esophagus passes through the diaphragm and into the abdominal cavity at the tenth thoracic vertebra.

The walls of the esophagus are composed of the four layers discussed in the preceding section, with the following variations. The mucosal layer is made up of moist, stratified squamous epithelium, which changes to a simple columnar epithelium at the distal end of the esophagus. The submucosal layer contains mucus-secreting cells in addition to blood vessels, nerves, and connective tissue. These cells secrete an amphoteric mucus that can neutralize both acids and bases; this mucus helps protect the wall of the esophagus. The muscle layer is unique in that the esophagus contains both striated and smooth muscle. The upper third is striated and is innervated by the vagus nerve, whereas the lower two thirds is primarily smooth muscle and is innervated by both the vagus nerve and the intramural plexus. This is significant, because loss of vagal stimulation causes loss of voluntary swallowing; however, because the intramural plexus can still cause peristalsis in the distal esophagus, any food delivered to the lower esophagus by gravity will still be transported to the stomach. The outer layer of the esophagus is adventitia.

The esophagus is bounded proximally and distally by the upper esophageal (pharyngoesophageal) sphincter and the lower esophageal (esophagogastric) sphincter. These sphincters prevent reflux from the esophagus into the oropharynx and from the stomach into the esophagus.

The major function of the esophagus is to transport food from the mouth and oropharynx into the stomach. The esophageal sphincters normally are closed but open in response to a food bolus. The lower esophageal sphincter is actually an area of hypertrophied circular muscle that creates a high-pressure zone. It relaxes in response to peristalsis but remains tonically contracted at all other times, protecting the esophageal mucosa from gastric contents. Certain factors are known to increase or decrease the resting pressure in the lower esophageal sphincter. Factors that increase the resting pressure include cholinergic agents, antacids, adrenergic agonists, protein meals, and small amounts of alcohol. Factors that reduce the resting pressure include anticholinergics, adrenergic antagonists, glucagon, fat meals, and large amounts of alcohol.

## ABDOMINAL CAVITY AND PERITONEUM

Most of the organs in the gastrointestinal tract are contained in the abdominal cavity, which actually is con-