

JAYPEE

Inderbir Singh's Textbook of Human Histology

A Clinically Integrated Approach with
Case Scenarios & Clinical Applications

Revised Reprint

Online Videos & Slides

Illustrated Poster Included

Revised and updated as per latest
CBME curriculum by NMC (2024).

11th
Edition

Revised by
Pushpalatha K
Deepa Bhat



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TOC & Sample Chapter



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Why to Buy this Book ?

- The content has been updated while preserving the legacy of the original book.
- The syllabus follows National Medical Commission (NMC) of India requirements, including competencies.
- Content is simplified to aid students in easy understanding and retention.
- Better resolution slides with relevant plates that are student friendly are given.
- A core highlight of this edition is the addition of easily reproducible hand-written diagrams of histology slides observed in practical classes, assisting with practical record writing and examinations.
- Identification points are provided with every slide.
- Applied aspects are included based on relevance.
- Extra information is clearly marked as "Added Information" for optional reference.
- Clinical case scenarios relevant to histology are included in each chapter.
- Review questions and updated MCQs are added.
- Online video lectures of histology of basic structures and different organ systems are included.

COMPETENCY ADDRESSED

ANS2.1: Describe general plan of gastrointestinal system and identify the microanatomical features: Esophagus; fundus of stomach; pylorus of stomach; duodenum; jejunum; ileum; large intestine; appendix.

Upon abdominal examination, tenderness is noted around the umbilicus. His complete blood count reveals an elevated white blood cell count, and the Widal test returns positive, confirming the diagnosis of typhoid fever. The Peyer's patches are infected in this condition causing ulcers parallel to longitudinal axis of ileum. The composition of each layer is crucial for correlating pathophysiology with associated conditions. This knowledge facilitates more efficient management strategies for gastrointestinal disorders.



Case Scenario

A 22-year-old male presents to the emergency department with a five-day history of fever and abdominal pain. He mentions attending a village fair recently. Additionally, he complains of severe weakness, worsening stomach pain, headache, diarrhea, and loss of appetite. Upon abdominal examination, tenderness is noted around the umbilicus. His complete blood count reveals an elevated white blood cell count, and the Widal test returns positive, confirming the diagnosis of typhoid fever. The Peyer's patches are infected in this condition causing ulcers parallel to longitudinal axis of ileum. The composition of each layer is crucial for correlating pathophysiology with associated conditions. This knowledge facilitates more efficient management strategies for gastrointestinal disorders.

GENERAL STRUCTURE OF GIT

- The structure of the alimentary canal, from the oesophagus up to the anal canal is in the form of fibromuscular tube and the tube contains a general plan.
- The wall of the tube is made up of the following layers from within outwards: mucosa, submucosa, muscularis externa and adventitia (Fig. 16.1).

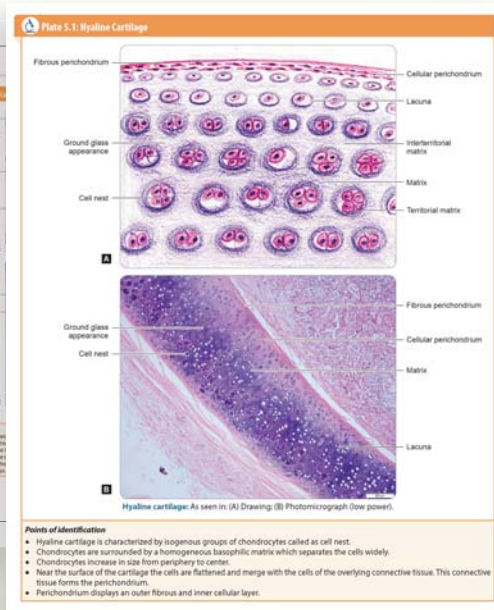
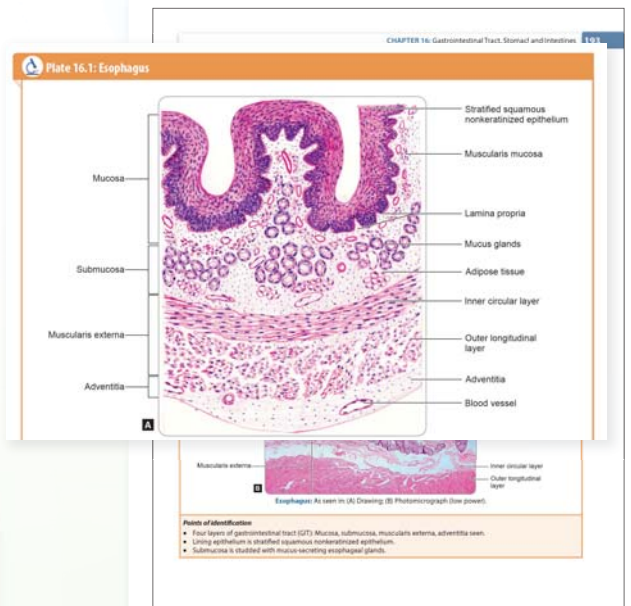
Increase in the surface area:

- Plicae circulares:** The presence of numerous folds involving the entire thickness of the mucosa membrane. These folds can be seen by naked eye. The submucosa extends into the folds (plica circulares of small intestine).
- Crypts:** At numerous places the epithelium dips into the lamina propria forming crypts.

Each chapter begins with a clear outline of the Competencies Addressed.

Case Scenarios are given to highlight the complexity of case-based learning.

Hand-Drawn Diagrams are included to enhance visual learning.



Microscopic Slides are given with the identification points.

Very similar cells are also to be seen in the All these cells are now grouped together under gastrophysiological esophageal constrictor systems.

APPLIED HISTOLOGY

- ESOPHAGUS**
- Gastroesophageal reflux disease (GERD):** Also gastric content which causes heartburn. It is the
 - Barrett's esophagus:** It is a premalignant condition of the lower esophagus. It is related to columnar metaplasia and is caused by factors producing gastritis
 - Achalasia (cardiospasm):** Achalasia of the esophagus is a neuromuscular dysfunction due to which the cardiac sphincter fails to relax during swallowing and results in progressive dysphagia and dilatation of the esophagus (megaesophagus).
- STOMACH**
- Gastritis:** The term 'gastritis' is commonly employed for any clinical condition with upper abdominal discomfort like indigestion or dyspepsia in which the specific clinical signs and radiological abnormalities are absent. The condition is of great importance due to its relationship with peptic ulcer and gastric cancer.
 - Achlorhydria:** Certain clinical conditions (like autoimmune disorders) can cause achlorhydria, where there is absence of HCl due to damaged gastric mucosa. **Achlorhydria** can result in **pernicious anemia** due to lack of intrinsic factor.
 - Peptic ulcer:** This occurs due to peptic digestion of the devitalized mucous membrane with assistance of HCl. It is most common along the lesser curvature and pyloric antrum. Food-pain pattern, vomiting, significant weight loss, and deep tenderness in the midline in epigastrium are the main presentations.
 - Zollinger-Ellison syndrome:** Caused by excessive secretion of gastrin by enter endocrine cells, which in turn continuously stimulate parietal cells to secrete HCl thus causing gastric and duodenal ulcers.
- SMALL INTESTINE**
- Diarrhea:** Loose watery stools that occur more frequently due to infections. This may be fatal if extreme dehydration is not attended timely.
 - Crohn's disease or regional enteritis:** An idiopathic chronic ulcerative inflammatory bowel disease, characterized by transmural, noncontiguous granulomatous inflammation, affecting most commonly the segment of terminal ileum and/or colon, though any part of the gastrointestinal tract may be involved.
 - Celiac sprue:** is the most important cause of primary malabsorption occurring in temperate climates. The condition is characterized by significant loss of villi in the small intestine and thence diminished absorptive surface area. If the intestinal mucosa is exposed to profound irritation by toxic substance, the muscularis externa undergoes intense, swift contractions of long duration called peristaltic rush. This leads to diarrhea.
 - Typhoid and tubercular ulcer:** The typhoid ulcers (lymphatic) causing strictures and circular ulcers.
- COLON AND RECTUM**
- Ulcerative colitis:** is an idiopathic form of acute and chronic inflammatory colitis affecting chiefly the mucosa and submucosa of the rectum and descending colon, though sometimes it may involve the entire length of the large bowel.
 - Acute appendicitis:** Acute inflammation of the appendix. The disease is seen more frequently in the West and in affluent societies which may be due to variation in diet—a diet with low bulk or cellulose and high protein intake more often causes appendicitis.
 - Hemorrhoids or piles:** are the varicosities of the hemorrhoidal veins. They are called 'internal piles' if dilatation is of superior hemorrhoidal plexus covered over by mucous membrane, and 'external piles' if they involve inferior hemorrhoidal plexus covered over by the skin. They are common lesions in elderly and pregnant women. They commonly result from increased venous pressure.

APPLIED HISTOLOGY

- ESOPHAGUS**
- Gastroesophageal reflux disease (GERD):** Mucus glands near the gastric end of esophagus help to protect the regurgitated gastric content which causes heartburn. If the condition persists for longer time it can cause GERD.
 - Barrett's esophagus:** It is a premalignant condition in which, following reflux esophagitis, stratified squamous epithelium of the lower esophagus is replaced by columnar epithelium (columnar metaplasia). The condition is seen more commonly in later age and is caused by factors producing gastritis
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Applied Histology sections are shown in green boxes.

Table organizes essential information sequentially for better understanding.

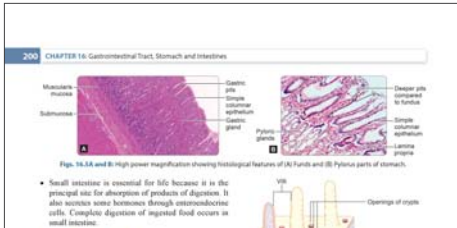


Fig. 16.3A and B: High power magnification showing histological features of (A) Fundus and (B) Pylorus parts of stomach.

Table 16.3: Distinguishing features of duodenum, jejunum, and ileum (Plates 16.4 to 16.6).

Duodenum	Jejunum	Ileum
Lumen—wider, wall—thicker	Lumen—wider, wall—thicker	Lumen—narrow, wall—thinner
Large, thick circular folds in the lumen	Large, thick circular folds in the lumen	Small, few circular folds in the lumen
Numerous broad villi	Numerous tall villi	Only few, short and slender villi
Mucus-secreting duodenal glands or glands of Brunner	Very few Peyer patches extending into submucosa—only in the distal part	Numerous Peyer's patches extending into mucosa

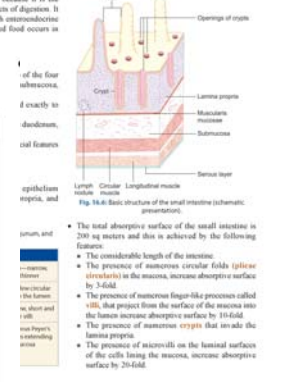


Fig. 16.6: Basic structure of the small intestine (schematic presentation).

The chapter concludes with exam-oriented questions designed to enhance comprehension and support revision.

EXAM-ORIENTED QUESTIONS

- Describe the microscopic anatomy of esophagus, fundus of stomach, pylorus of stomach, duodenum, jejunum, ileum, large intestine, appendix.
- Describe the layers of GIT.
- Describe the changes in epithelium down the GIT.
- Describe the ultrastructure of cells of stomach.
- Compare and contrast histological features of parts of small intestine.
- Compare and contrast histological features of small and large intestine.
- Describe the factors responsible for increase in surface area of small intestine.

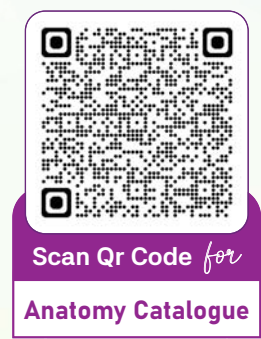
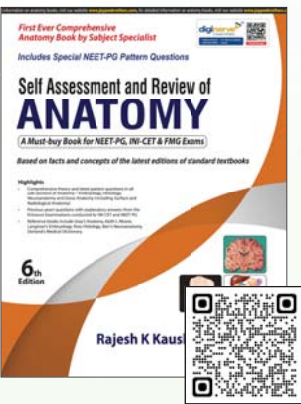
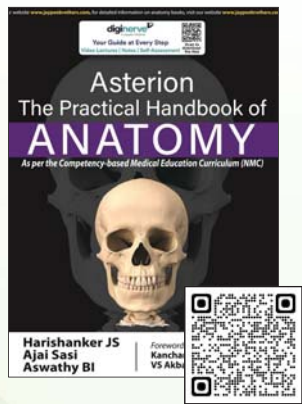
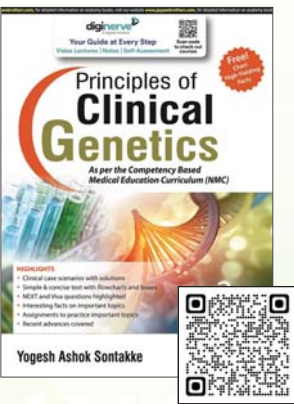
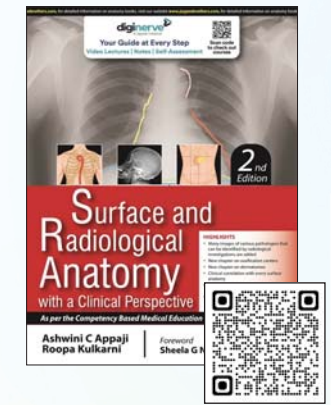
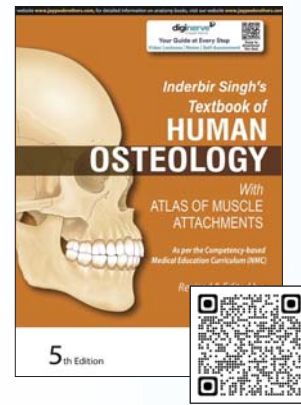
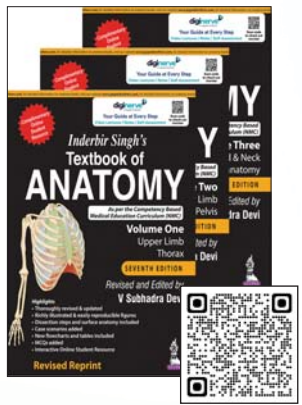
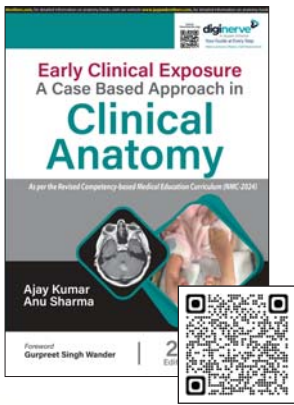
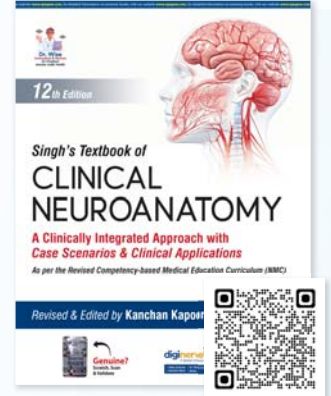
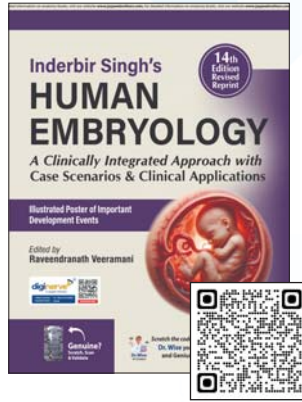
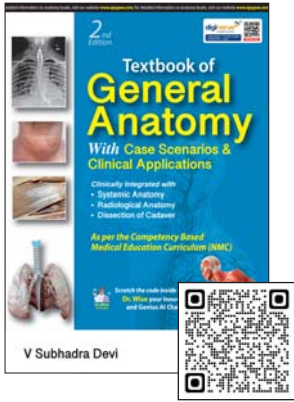
MULTIPLE CHOICE QUESTIONS

- Toughest layer of esophagus is:
 - Mucosa
 - Muscularis
 - Transitional
 - Stratified squamous nonkeratinized
- Lining epithelium of esophagus is:
 - Simple squamous epithelium
 - Transitional epithelium
 - Pseudostratified epithelium
 - Stratified squamous nonkeratinized epithelium
- Mucus glands of esophagus are found in:
 - Lining epithelium
 - Submucosa
 - Muscularis externa
 - Adventitia
- Nerve plexus of muscularis externa is called as:
 - Meissner's plexus
 - Auerbach's plexus
 - Barrett's plexus
 - Brachial plexus
- Brunner's glands are found in the mucosa of:
 - Stomach
 - Colon
 - Duodenum
 - Esophagus
- Following cells are found in small intestine, except:
 - Stem cells
 - Goblet cells
 - Neck cells
 - Paneth cells
- Cells which give beaded cells to the mucosa of the stomach are:
 - Stem cells
 - Chief cells
 - Neck cells
 - Parietal cells
- Peyer's patches are characteristic feature of:
 - Stomach
 - Colon
 - Ileum
 - Esophagus

Answers
1.c 2.d 3.b 4.b 5.c 6.c 7.d 8.c

MCQs are given for easy identification and understanding.

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