

Gaining a good working knowledge of the equine gastrointestinal tract and associated intra-abdominal organs can appear to be a daunting task, especially for people who are new to the area. However, veterinarians who examine and treat horses with conditions characterized by acute abdominal pain (colic) learn rather quickly that the key to the diagnosis often lies in recognizing changes in anatomic structures or relationships among different organs. With this in mind, this opening chapter focuses on the gross and microscopic structure of the horse's alimentary tract (Figure 1-1A, B, C & D), starting with the esophagus. Because some conditions characterized by colic involve other organs within the abdomen, we have reviewed the relevant structural aspects of the liver, spleen, and pancreas. In compiling this information, it is our goal to provide veterinary students and veterinarians with some of the foundational materials needed to fully understand clinical conditions that result in colic.

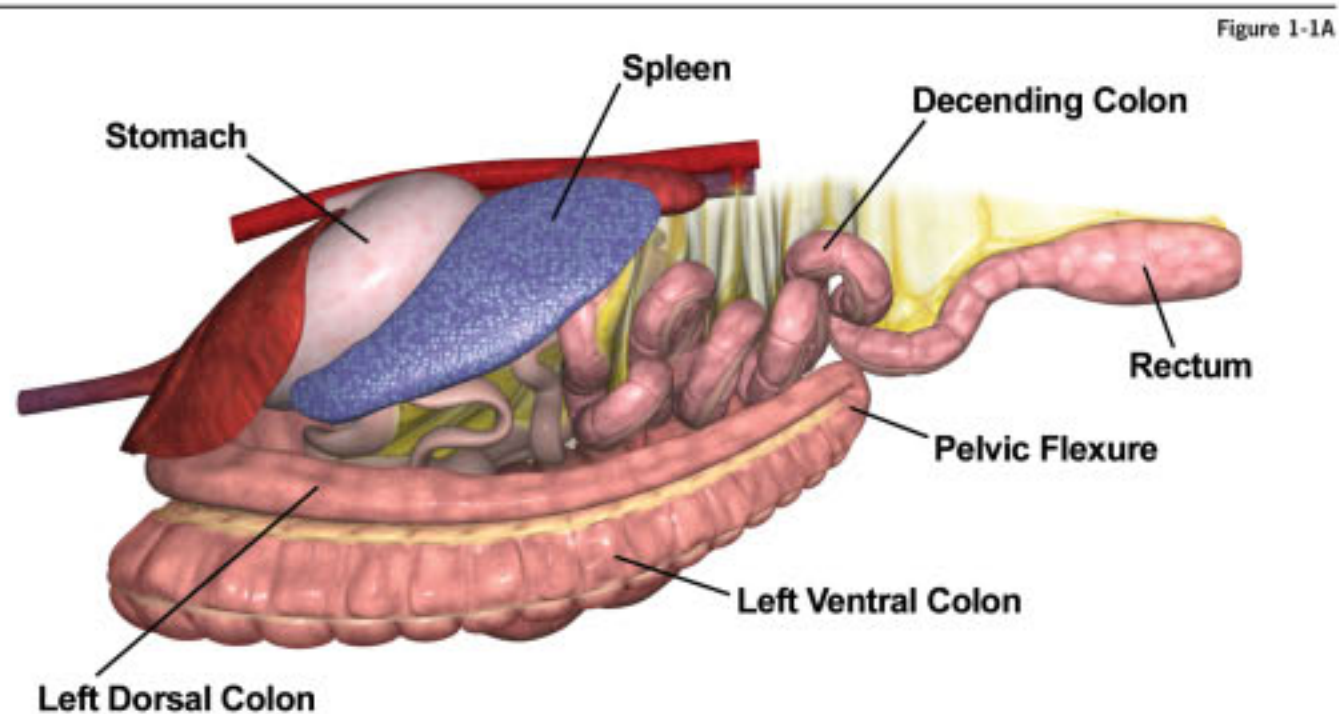


Figure 1-1B

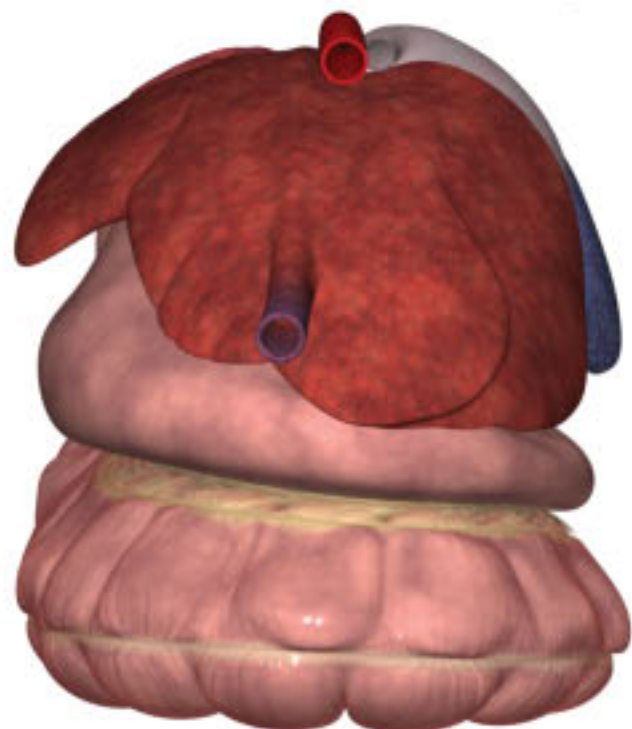


Figure 1-1C

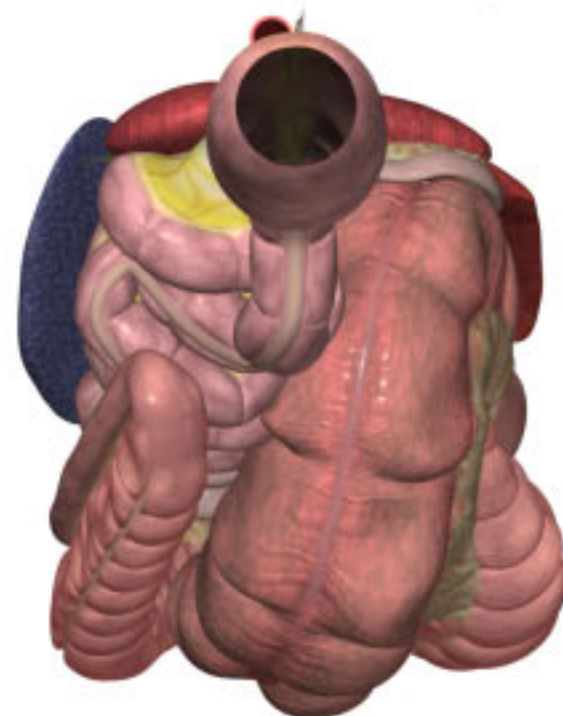
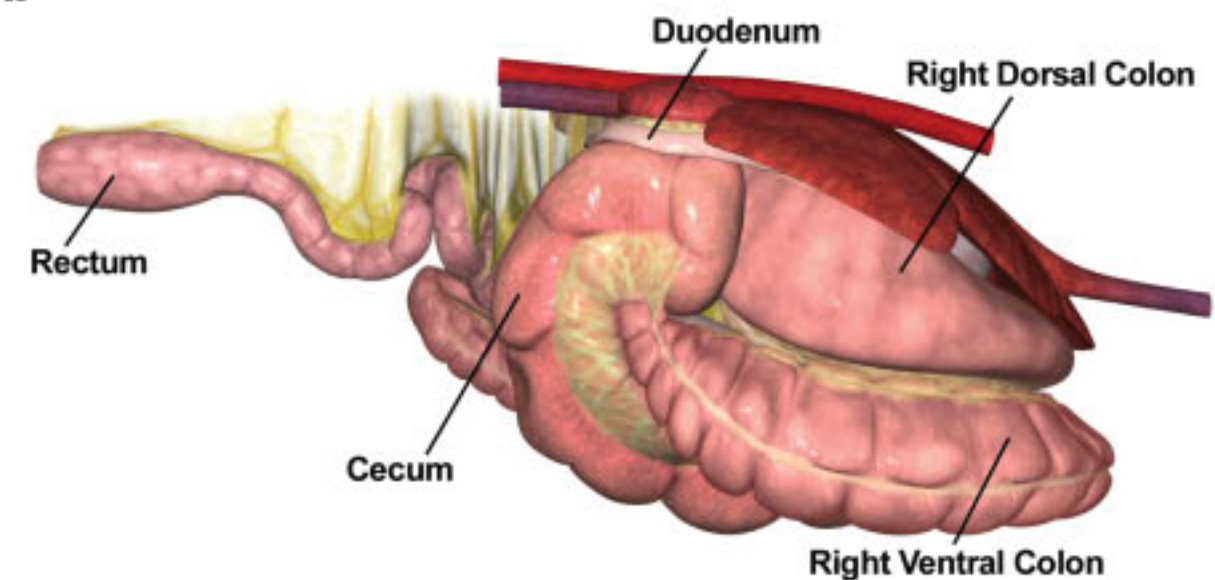


Figure 1-1D



A.) The abdominal organs from the left side of the horse. B.) A view from the cranial-most aspect of the abdomen. C.) The abdominal organs visible from the caudal-most aspect of the abdomen. D.) The abdominal organs from the horse's right side.

Esophagus

Gross Anatomic Features

Grossly, the esophagus consists of three portions: cervical, thoracic, and abdominal. In the cervical region of the neck, the esophagus is positioned on the dorsolateral aspect of the trachea adjacent to the carotid artery, the vagosympathetic trunk, and the left recurrent laryngeal nerve. The esophagus lies deep to the omohyoideus muscle and is enclosed within a sheath, the lateral wall of which comprises the medial wall of the carotid sheath. As the esophagus courses distally, it becomes positioned more laterally on the surface of the trachea. Near the thoracic inlet, the esophagus is positioned dorsal to the trachea. The thoracic portion of the esophagus passes through the mediastinum, over the heart, and through the esophageal hiatus in the diaphragm. The terminal portion of the esophagus in the abdominal cavity joins the stomach at the cardia.

Microscopic Features

The esophagus is a long muscular tube designed to facilitate the delivery of chewed ingesta to the stomach. Longitudinally oriented folds occur along the length of the mucosa of the esophagus to allow for expansion of the lumen during the passage of a food bolus. The mucosa of the esophagus is considerably mobile upon the underlying submucosa.

The tunica mucosa is made up of three layers, or laminae (Figure 1-2). The *lamina epithelialis* is nonkeratinized stratified squamous epithelium (Figure 1-3); mild to moderate keratinization of the epithelium may occur, depending on the nature of the ingesta. The *lamina propria* varies from loose to dense irregular connective tissue. The *lamina muscularis mucosa* is made up of isolated bundles of longitudinally oriented smooth muscle in the cranial esophagus. The muscle bundles increase in density and coalesce into a distinct layer toward the caudal esophagus. Because the *lamina muscularis mucosa* serves as a demarcation between the mucosa and the submucosa, it is difficult to distinguish these layers where the muscularis is sparse or absent.

The tunica submucosa is dense irregular connective tissue. The submucosa typically contains prominent vasculature and the submucosal nerve plexus. Simple branching tubuloalveolar mucous-secreting submucosal glands occur at the pharyngo-esophageal junction (Figure 1-4).

The tunica muscularis is skeletal muscle in the cranial two thirds of the esophagus. The skeletal muscle transitions into smooth muscle in the caudal third of the esophagus. The tunica muscularis has two muscle layers; however, the layers are not always distinguishable because of spiraling and interlacing of the muscle bundles. The cervical region of the esophagus has a tunica adventitia of dense irregular connective tissue that blends with the surrounding tissues.

The thoracic and abdominal regions of the esophagus have a tunica serosa, which is made up of mediastinal pleura and visceral peritoneum, respectively.