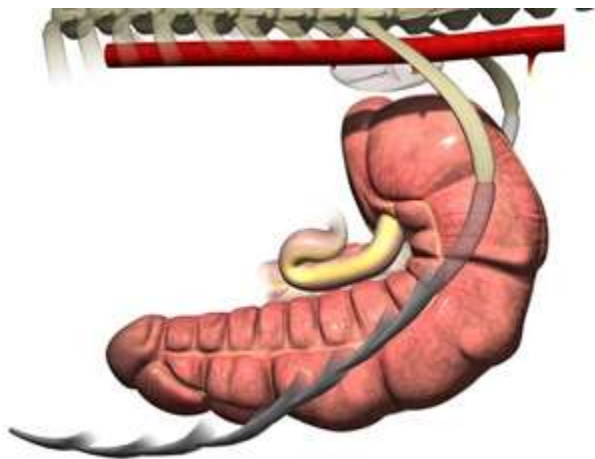


## ANATOMY OF THE EQUINE GASTROINTESTINAL TRACT

The horse is a monogastric animal, with a relatively small stomach (capacity 8–10 L) that is located on the left side of the abdomen beneath the rib cage. The junction of the distal oesophagus and the cardia is a functional 1-way valve, permitting gas and fluid to move into the stomach but not out. Consequently, conditions that impede the normal aboral movement of gas and fluid through the small intestine may result in severe dilation and rupture of the stomach. Because of its position, the stomach is difficult to visualize with radiography or ultrasonography in large adult horses. The smaller size of the foal, however, permits assessment of gastric emptying by contrast radiography.



### ILEUM & CAECUM OF THE HORSE (RIGHT)

The small intestine comprises the duodenum, jejunum, and ileum, with the latter joining the caecum at a distinct ileocecal junction. The duodenum is positioned primarily dorsally on the horse's right side, where it is suspended from the dorsal body wall by a

short mesentery of 3–5 cm. Consequently, the duodenum is not involved in small-intestinal displacements involving the mesentery (volvulus). At the base of the caecum in the right paralumbar fossa region, the duodenum turns toward the midline. It is at this point that the duodenum, if distended with gas or fluid (eg, in horses with proximal enteritis), can be felt on rectal examination.

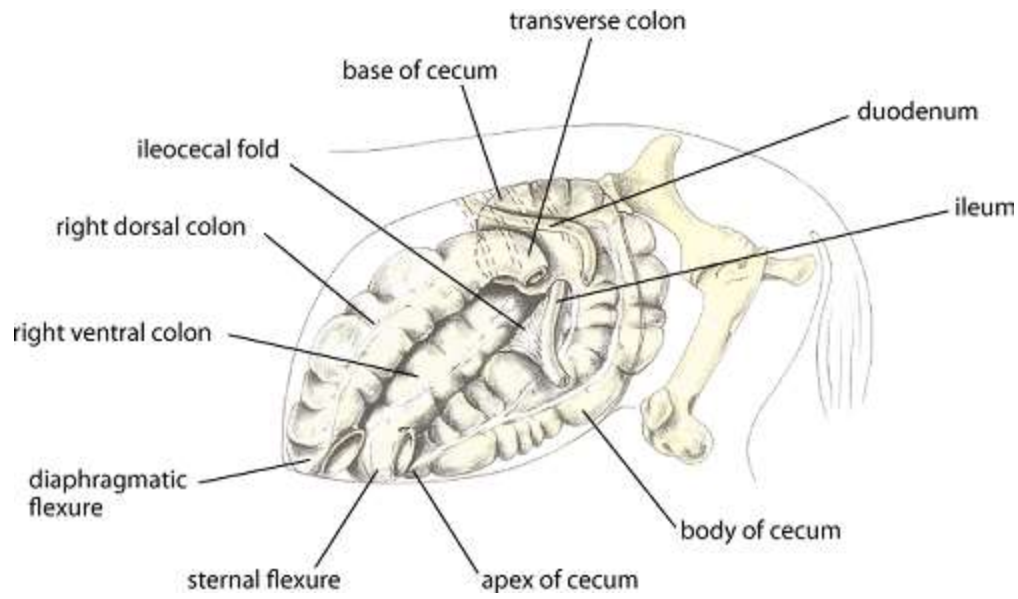
As the small intestine reaches the dorsal midline, it turns anteriorly, its mesentery lengthens, and it becomes known as the jejunum. The characteristic long mesentery allows loops of the jejunum to rest on the contents of the ventral portion of the abdomen. The jejunum is ~65 ft (19.5 m) long; its length, coupled with its long mesentery, allow it to be involved in small-intestinal

volvulus and incarcerations. At the end of the jejunum, the wall of the intestine becomes more muscular, the lumen is narrowed, and an additional mesenteric attachment becomes apparent. The last 18 in. (45 cm) of the small intestine, the ileum, joins the cecum at its dorsal medial aspect. This junction is identified by the attachment of the ileocecal fold from the ileum to the dorsal band of the cecum. This ileocecal fold is used as a landmark to locate the ileum during abdominal surgery.

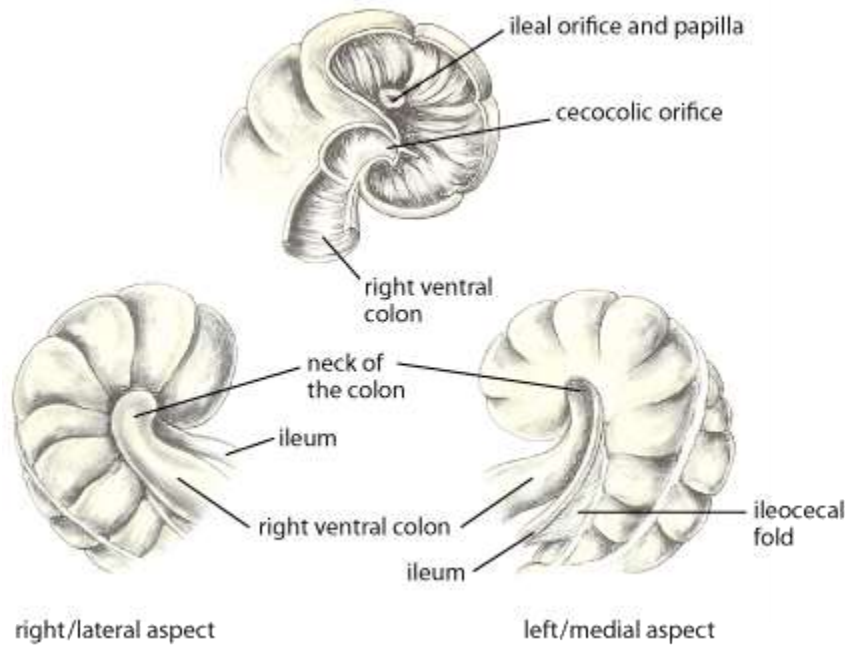
From the ileum, the ingesta enters the cecum, a large, blind-ended fermentation vat situated primarily on the horse's right side, extending from the region of the paralumbar fossa to the xiphoid cartilage on ventral midline. The cecum is 4–5 ft (1.2–1.5 m) long and can hold 27–30 L of feed and fluid. Under the influence of the caecal musculature, the ingesta in the cecum is massaged, mixed with microorganisms capable of digesting cellulose, and eventually passed through the caecocolic opening into the right ventral colon. The attachment of the cecum to the dorsal body wall is wide, thus minimizing the likelihood the cecum can become displaced or twisted on its own.

The right ventral colon is divided into sacculations that help mix and retain plant fibers until they are digested. It is positioned on the ventral aspect of the abdomen, extending from the flank region to the rib cage. The ventral colon then turns toward the left, becoming the sternal flexure and then the left ventral colon. The left ventral colon, which also is large and sacculated, passes caudally to the left flank area. Near the pelvic region, the diameter of the colon decreases markedly, and the colon folds back on itself. This region, called the pelvic flexure, is the initial portion of the unsacculated left dorsal colon. Presumably because of the abrupt decrease in diameter, the junction between the left ventral colon and pelvic flexure is the most common location for impactions.

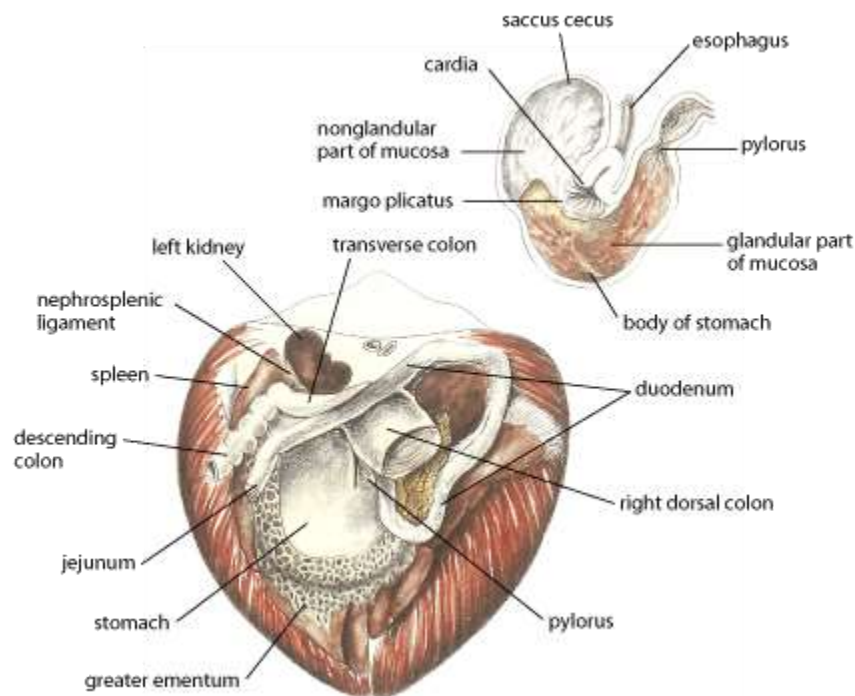
CAECUM & RIGHT COLON OF THE HORSE (BELOW)



BASE OF CAECUM OF THE HORSE (BELOW)



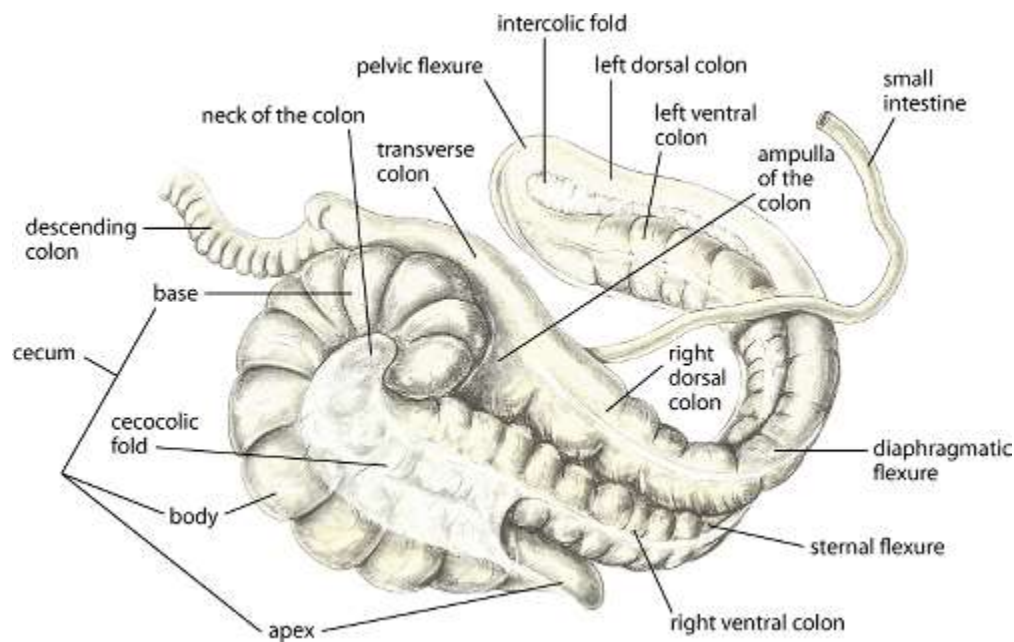
## EQUINE GASTROINTESTINAL ANATOMY RELATING TO COLIC (BELOW)



The diameter of the dorsal colon is largest either at its diaphragmatic flexure or in the right dorsal colon. There are no sacculations in either the left or right portion of the dorsal colon. The right dorsal colon is closely attached to the right ventral colon by a short intercolic fold and to the body wall by a tough, common mesenteric attachment with the base of the cecum. In contrast, neither the left ventral nor left dorsal colons are attached directly to the body wall, allowing these portions of the colon to become displaced or twisted.

Ingesta moves from the large right dorsal colon into the short transverse colon, which has a diameter of ~10 cm and is fixed firmly to the most dorsal aspect of the abdominal cavity by a strong, short, fibrous mesentery. The transverse colon is located cranial to the cranial mesenteric artery. Finally, the ingesta enters the sacculated descending colon, which is 10–12 ft (3–3.6 m) long.

## LARGE INTESTINE OF THE HORSE (BELOW)



### Blood Supply to the GI Tract

The celiac and cranial mesenteric arteries (branches of the abdominal aorta) supply blood to the GI tract. The celiac artery supplies arterial blood to the stomach, pancreas, liver, spleen, and the first portion of the duodenum. The cranial mesenteric artery supplies arterial blood to the remaining portion of the duodenum; to all of the jejunum, ileum, cecum, large colon, and transverse colon; and to the first portion of the descending colon. Because the large colon is attached to the body wall only in the region near the cranial mesenteric artery, the blood supplying all portions of the colon must traverse the entire length of the colon. The pelvic flexure receives its blood supply from two branches of the cranial mesenteric artery; one branch supplies the right and left dorsal colons before reaching the pelvic flexure, and the other branch supplies the right and left ventral colons before reaching the pelvic flexure. Thus, volvulus of the large colon near the junction of the colon and cecum may impede the flow of blood to the entire left colon.

The major branches of the cranial mesenteric artery can be damaged by the migrating forms of *Strongylus vulgaris*.

### **Colonic Motility Patterns**

Normograde peristalsis in the left ventral colon moves ingesta toward the left dorsal colon, and the muscles in the wall of the left dorsal colon contract to move the ingesta toward the diaphragmatic flexure. There is evidence, however, that the muscles in the left ventral colon contract in a retrograde fashion, from the pelvic flexure region toward the sternal flexure.

Furthermore, these contractions appear to originate from a pacemaker region in the pelvic flexure. It has been hypothesized that this pacemaker senses either the size or the consistency of the feed particles in the ingesta and then initiates the appropriate motility pattern. If the ingesta has been digested sufficiently, it is moved in a normograde direction; if additional digestion is necessary, the ingesta is moved in a retrograde direction to retain it in the ventral colon. This theory has been proposed to help account for the common clinical occurrence of obstruction at or near the pelvic flexure.