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**COURSE:** ANA 206- SYSTEMIC EMBRYOLOGY {ORGANOGENESIS}.

**COLLEGE:** MEDICINE AND HEALTH SCIENCES.

**DEPERTMENT:** ANATOMY.

**MATRIC NUMBER:** 18/MHS01/254.

ASSIGNMENT.

Discuss the rotation of the intestine

ANSWER.

During the fifth week of gestation, the midgut undergoes a rapid elongation that occurs much faster than that of the abdominal cavity, resulting in the formation of the **primary intestinal loop**. At its apex, the loop remains in open communication with the yolk sac via the **vitelline duct**, while the superior mesenteric artery runs along the axis of the loop. The **cranial limb** of the loop will develop into the inferior half of the duodenum, the jejunum, and proximal half of the ileum. The **caudal limb** of the loop will develop into the distal half of the ileum, the cecum, the ascending colon, and the proximal two-thirds of the transverse colon.

By the sixth week, the continuing elongation of the midgut, combined with the pressure exerted by the dramatic growth of the abdominal organs, force the primary intestinal loop to protrude into the **umbilicus** (physiological herniation). Concurrently, the loop rotates 90 degrees counterclockwise around the axis of the superior mesenteric artery, resulting in the cranial limb to move caudally and to the embryo’s right, and the caudal limb to move cranially and to the embryo’s left. While this rotation takes place until the eighth week of gestation, the lengthening jejunum and ileum develop into a series of folds known as the **jejunal-ileal loops**, whereas the expanding cecum gives rise to a wormlike diverticulum, the **vermiform appendix**.

During the tenth week, the herniated midgut retracts into the [abdomen](https://www.kenhub.com/en/library/anatomy/regions-of-the-abdomen). The mechanism responsible for this retraction is not fully understood, but may involve the increase in size of the abdominal

cavity. As the intestinal loops reenter the abdomen, it rotates an additional 180 degrees counterclockwise around the axis of the superior mesenteric artery, thus having travelled for a total of 270 degrees. As a result, the [cecum](https://www.kenhub.com/en/library/anatomy/cecum-and-vermiform-appendix), being initially positioned under the liver, becomes displaced inferior, pulling down the proximal hindgut to form the ascending colon.

By the eleventh week, the intestines have completely retracted into the abdomen. The dorsal mesenteries of the ascending and descending colon shorten and fold, anchoring these organs to the dorsal body wall, where they become secondarily retroperitoneal. The jejunum, ileum, cecum, and the transverse and sigmoid colon remain suspended by a short mesentery from the dorsal body wall, thus becoming intraperitoneal.