

Graduate Anatomy 503
EXAMINATION 3

October 14, 2021

PART I. Answer in the space provided. (16 pts)

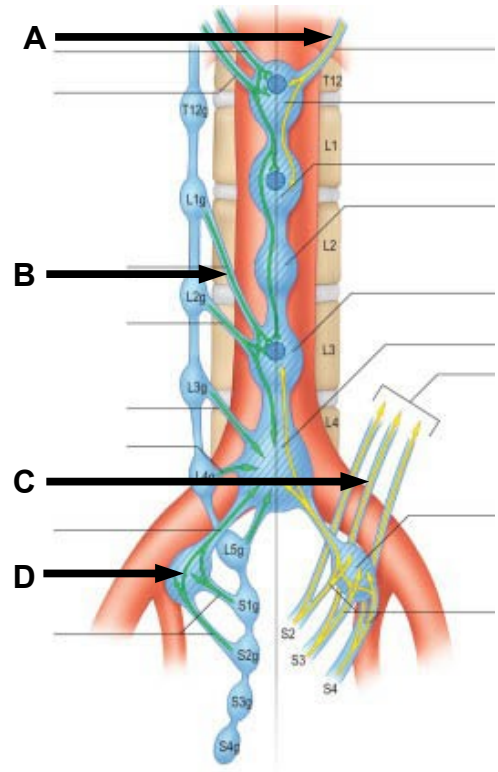
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



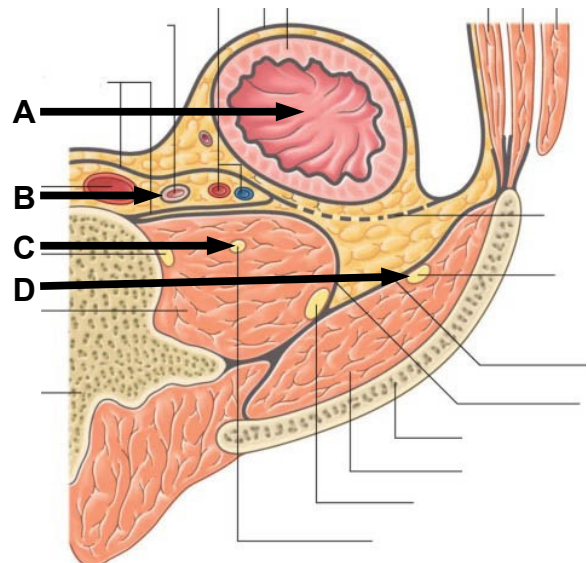
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



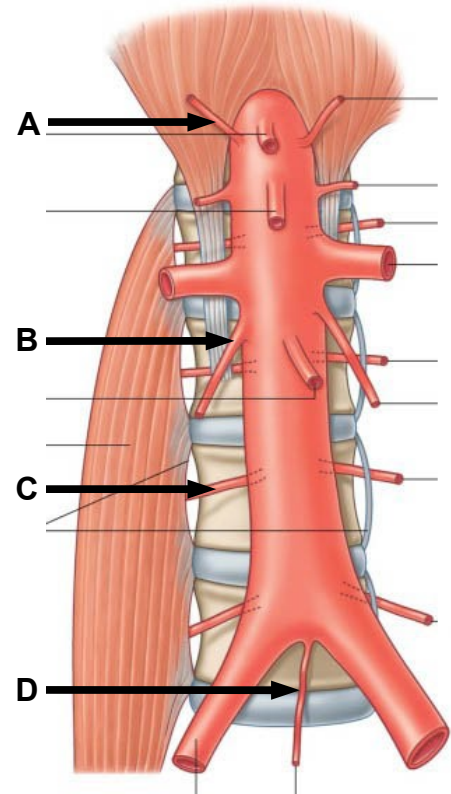
3. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



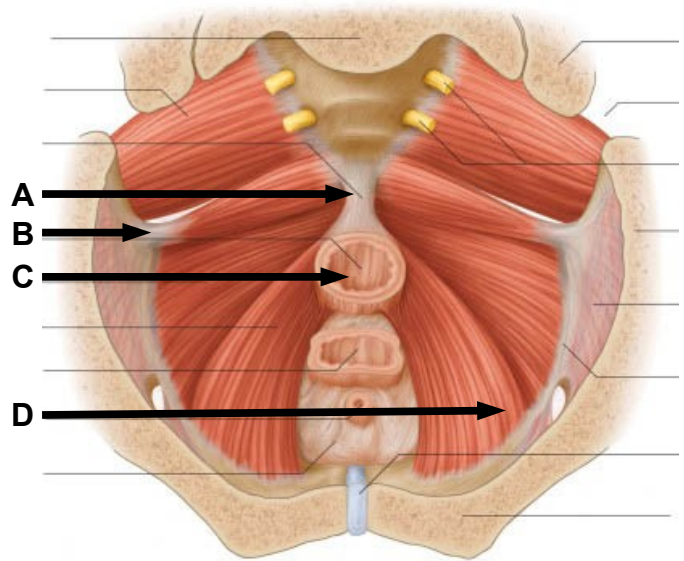
4. Identify the structures. (2 pts)

A. _____

B. _____

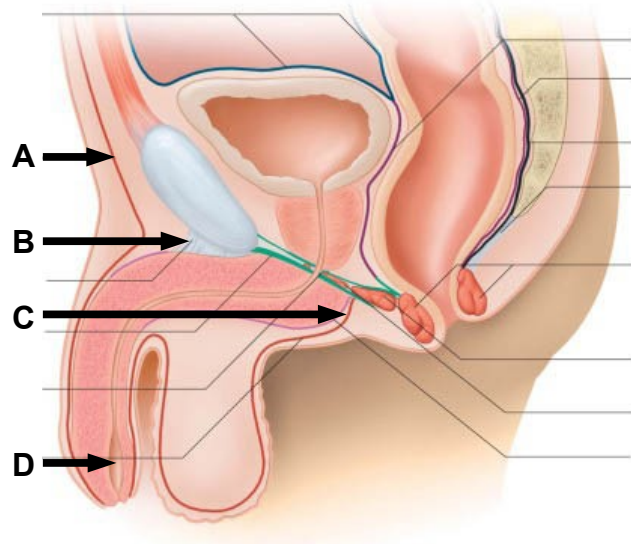
C. _____

D. _____



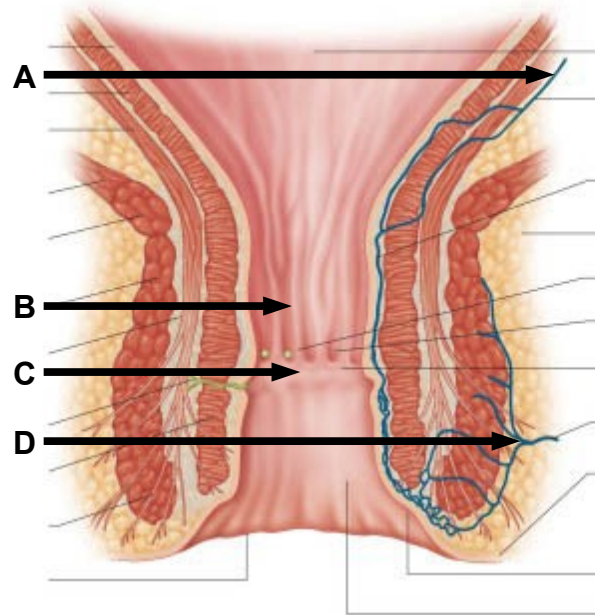
5. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



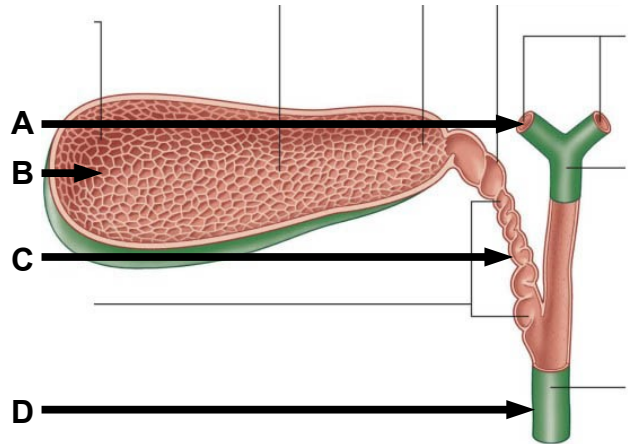
6. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



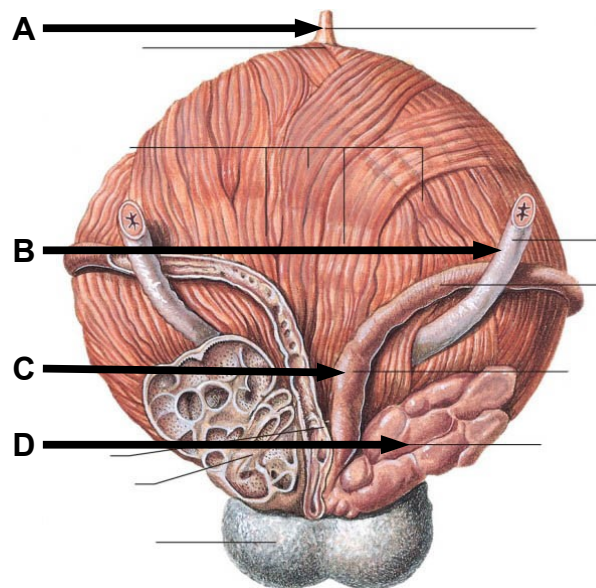
7. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



8. Identify the structures. (2 pts)

- A. _____
- B. _____
- C. _____
- D. _____



Part II. Circle the correct answer. All, none, or some may apply. (18 pts)

1. With regard to anterior abdominal wall and inguinal canal:
 - a) Inferior to the arcuate line, the rectus abdominis muscle is on the superficial surface of the transversalis fascia.
 - b) The umbilicus is at the L3 vertebral level and the T10 dermatome level.
 - c) An indirect inguinal hernia that descends into the scrotum is palpated at the anterior wall of the scrotum.
 - d) The conjoint tendon receives contributions from the transversus abdominis and the internal oblique aponeurosis.
 - e) The medial umbilical fold is a fold of parietal peritoneum deep to the urachus.
 - f) The cremasteric fascia is a derivation of the external oblique aponeurosis.
2. With regard to the abdominopelvic cavity and vasculature:
 - a) The left and right gastroepiploic arteries anastomose along the greater curvature of the stomach.
 - b) The superior and middle rectal veins anastomose proximal to the pectinate line.
 - c) The fundus of the stomach may undergo ischemic necrosis if the short gastric arteries are inadvertently ligated.
 - d) Primary lymphatic drainage from the fundus of the stomach is to the celiac nodes.
 - e) The vagal trunks pass through the aortic hiatus, whereas the greater, lesser, and least splanchnic nerves pass through the crura of the diaphragm.
 - f) The superior vesical arteries supply the anterosuperior region of the bladder and are the final branches of the umbilical artery before it obliterates to become the lateral umbilical ligament.
3. With regard to the liver, duodenum, pancreas, and posterior abdominal structures:
 - a) A blockage of the common hepatic duct is not expected to cause colicky pain, but may cause jaundice.
 - b) The body of the pancreas is located along the transpyloric plane (L1 vertebral level).
 - c) The superior pole of the left kidney is at the T11 vertebral level and related to the lumbocostal trigone and, thus left renal surgery may risk pneumothorax.
 - d) Blood from the portal system normally passes through the liver before draining into the inferior vena cava by way of the hepatic veins.
 - e) The ligament venosum extends from the portal vein to the right hepatic vein.
 - f) The common bile duct is joined by the accessory pancreatic duct to form the ampulla of Vater.
4. With regard to the pelvic viscera and perineum:
 - a) The retropubic space provides surgical access to the pubovesical ligament without the need to enter the peritoneal cavity.

- b) Lymphatic drainage of the anal canal proximal to the dentate line is to inferior mesenteric nodes and to internal iliac nodes (superior and middle rectal vessels).
 - c) The presacral space is a subperitoneal space posterior to the rectum and anterior to the sacrum.
 - d) Taenia coli, semilunar folds, and appendices epiploicae are characteristics of the large intestine.
 - e) Perivisceral fascia is thickened at the posterior wall of the rectum and, at this location, is known as the fascia of Denonvilliers.
 - f) Lymphatic channels passing through the inguinal canal communicate between uterine nodes and superficial inguinal nodes.
5. With regard to the pelvic diaphragm and anal region:
- a) The ischiococcygeus (coccygeus) takes origin from the internal surface of the sacrospinous ligament.
 - b) The external anal sphincter is somatically innervated and is, thus, under voluntary control.
 - c) The puborectalis muscle circles the proximal anal canal superior to the anococcygeal ligament (body) and inferior to the anococcygeal raphe.
 - d) Internal hemorrhoids, more so than external hemorrhoids, may develop during portal hypertension.
 - e) The arcus tendineus is a specialization of the obturator internus fascia that provides a site of attachment for the iliococcygeus muscle.
 - f) Contraction of the ischiococcygeus raises the pelvic floor.
6. With regard to the pelvic nerves and vessels:
- a) Injury to the spinal cord superior to the S2-4 cord levels preserves the spinal reflexes of micturition and, thus, results in a cord bladder.
 - b) The cavernous nerves are predominantly derived from pelvic splanchnic nerves.
 - c) Sectioning of the hypogastric nerves to disrupt visceral afferent fibers removes all sympathetic supply to the uterus.
 - d) Lumbar splanchnic nerves convey preganglionic sympathetic fibers, having cell bodies in the intermediolateral cell column of L1-2, from the lumbar plexus to the aortic plexus.
 - e) The falciform edge is along the medial margin of the ischial tuberosity and contributes to the formation of the pudendal canal.
 - f) The rectouterine pouch of the female and the rectovesical pouch of the male define the most inferior extents of the abdominopelvic cavity.

Part III. Indicate your understanding of the following. (30 pts)

1. Whether bleeding of the gastrointestinal tract is defined as an upper or lower bleed depends on whether the bleed is proximal or distal to the ligament of Treitz. An upper gastrointestinal bleed may manifest as frank blood in vomitus. **Discuss the anatomy and function of the ligament of Treitz. (6 pts)**

2. Cirrhosis of the liver causes portal hypertension. **Discuss the anatomical basis for caput medusae. (6 pts)**

3. Define the boundaries, contents, and relationships of the aortic hiatus. (6 pts)

4. Discuss the role of puborectalis in maintaining fecal continence. (6 pts)

5. Notable symptoms of the nutcracker syndrome include vomiting and an enlarged scrotum. **Discuss the anatomy of the nutcracker syndrome with respect to vomiting green vomitus paired with an enlarged left scrotal sac. (6 pts)**

Part IV. Answer in the space provided. (36 pts)

- 1. Perforation of the posterior stomach wall releases highly corrosive acid into the lesser sac (omental bursa). Indicate your understanding of the lesser sac with respect to boundaries (anterior, posterior, superior, inferior, medial, lateral), surgical access, communications, relationships, and related viscera vulnerable to damage. Discuss the basis for dull and referred pain due to perturbation of the stomach wall and then discuss the basis for rapid onset of sharp pain following perforation of the stomach wall. (12 pts)**

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2. Hirschsprung's disease is caused by a lack of parasympathetic innervation to a segment of the colon. **Review the anatomy of left colic flexure with respect to structure, relationships, sensory innervation, autonomic innervation, vasculature, lymphatic drainage, and support. (12 pts)**

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3. Fournier gangrene is a necrotizing fasciitis that may occur within the boundaries of the ischioanal fossa. **Review the anatomy of the ischioanal fossa. Include boundaries, contents, structure, innervation, vasculature, lymphatic drainage, and relationships. Discuss functional deficits that may result from damage to structures of the ischioanal fossa. Given that none of the boundaries are eroded, what prevents the infection from invading the superficial pouch. (12 pts)**

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