

**STRUCTURAL BASIS OF MEDICAL PRACTICE**  
**EXAMINATION IV**

September 20, 2002

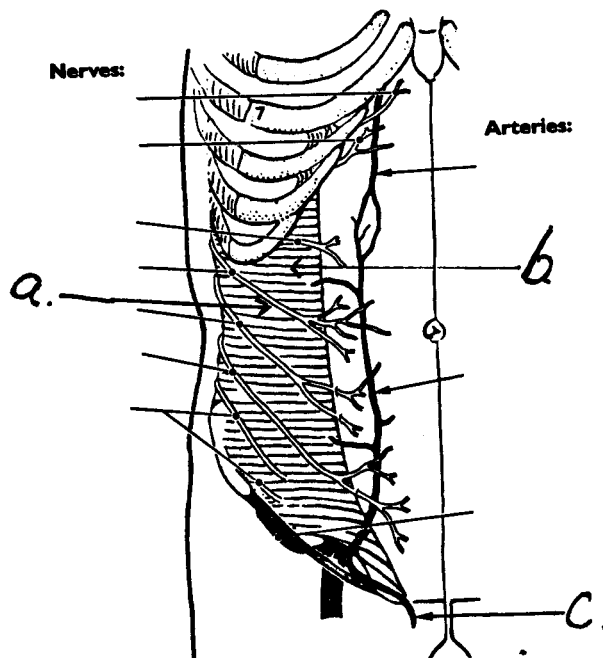
**PART I. Answer in the space provided (be specific). (9 pts)**

1. Identify the structures. (1.5 pts)

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

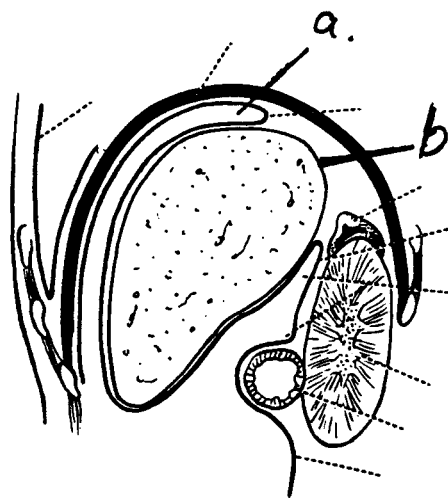


Nerves and arteries within the rectus sheath.

2. Identify the structures. (1 pt)

a. \_\_\_\_\_

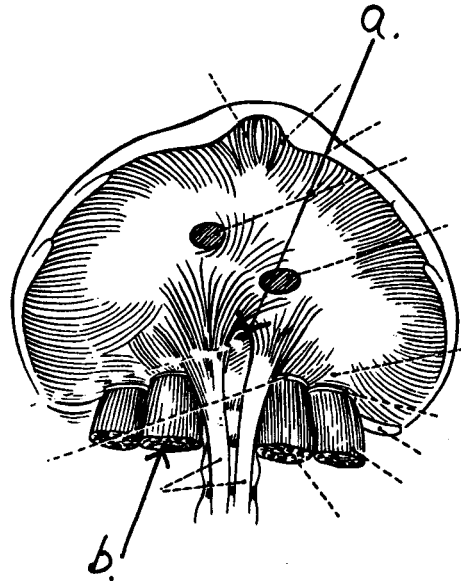
b. \_\_\_\_\_



3. Identify the structures. (1 pt)

a. \_\_\_\_\_

b. \_\_\_\_\_

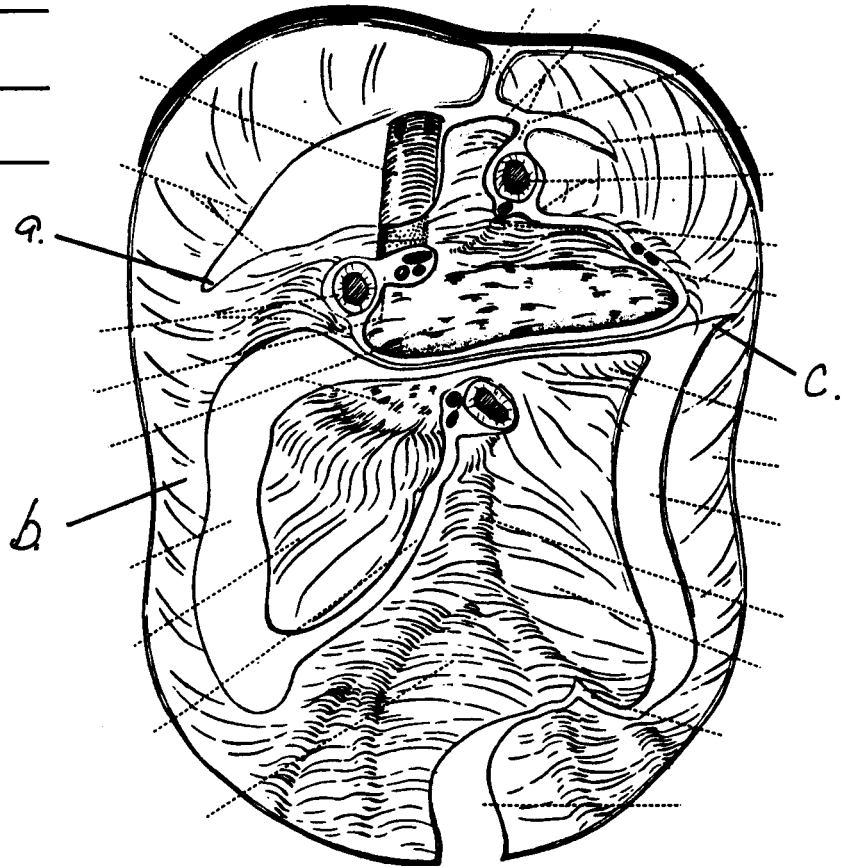


4. Identify the structures. (1.5 pts)

a. \_\_\_\_\_

b. \_\_\_\_\_

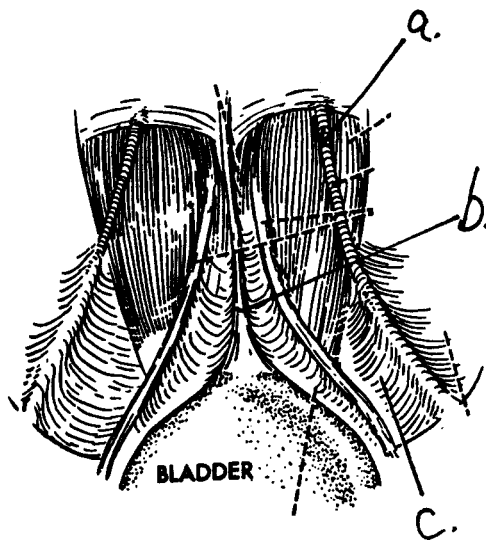
c. \_\_\_\_\_



Peritoneal attachments to the posterior abdominal wall and the diaphragm.

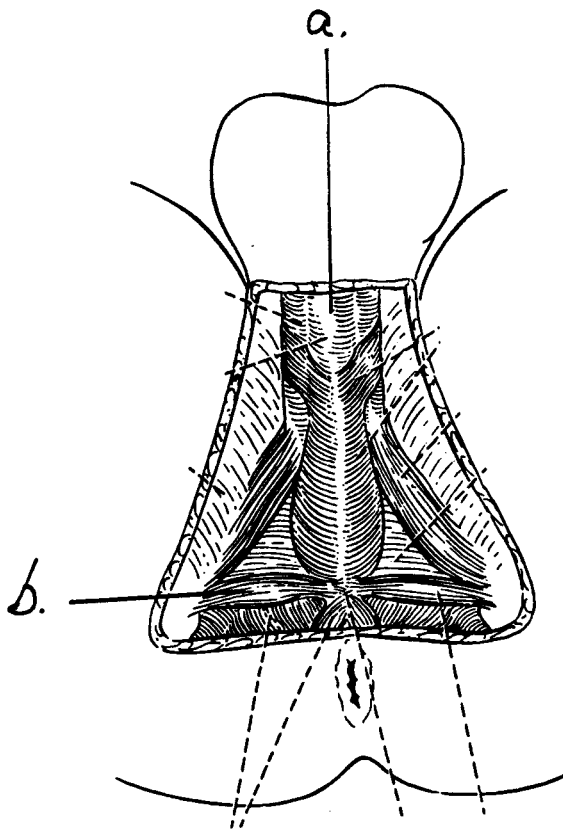
5. Identify the structures. (1.5 pts)

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_



6. Identify the structures. (1 pt)

- a. \_\_\_\_\_
- b. \_\_\_\_\_

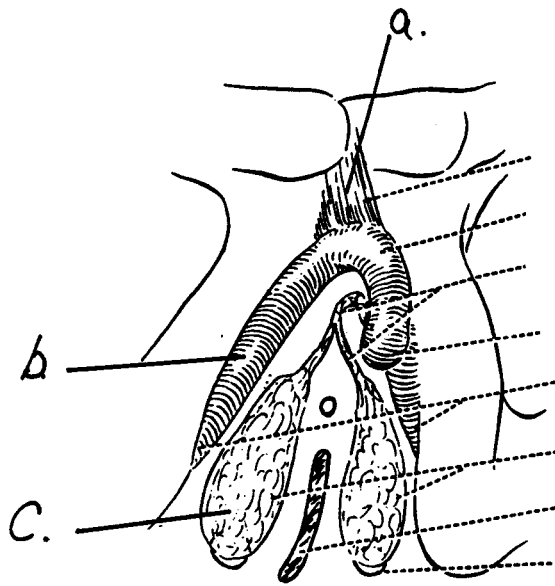


7. Identify the structures. (1.5 pts)

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_



**Part II. Circle the correct answer. All, none, or some may apply. (43 pts)**

1. With regard to the abdominal wall:
  - a. The fundiform ligament is a condensation of the deep (investing) fascia.
  - b. The paraumbilical veins drain into the retroperitoneal veins.
  - c. Membranous superficial fascia attaches to the posterior wall of the urogenital diaphragm.
  - d. The anterior rectus sheath of the rectus abdominis muscle superior to the arcuate line is formed in part by the transversalis fascia.
  - e. The internal oblique muscle arises from the lateral two-thirds of the inguinal ligament.
  - f. The nerves of the abdominal wall travel between the internal oblique and transversus abdominis before reaching their destination.
  - g. The ilioinguinal nerve gives rise to anterior scrotal nerves.
  - h. Dartos tunic contains smooth muscle that is innervated by the genital branch of the genitofemoral nerve.
  
2. With respect to the abdominal cavity and development:
  - a. The greater splanchnic nerve supplies structures derived from the foregut.
  - b. The gastrolial ligament is derived from dorsal mesentery.
  - c. During development, the dorsal border of the stomach rotates to the left and forms the lesser curvature.
  - d. By the 10th week of life, the midgut has undergone a 270 degree counterclockwise rotation.
  - e. Meckel's diverticulum represents the remains of the vitelline duct and is located in the ileum.
  - f. The anterior layer of the coronary ligament of the liver is derived from ventral mesentery.
  - g. The renal fascia is derived from the dorsal mesentery.
  - h. The proper hepatic artery supplies blood to structures derived from the midgut.

3. With regard to the abdominal vasculature:
- a. The arcades of the jejunum are simpler than those of the ileum.
  - b. The vasa recta of the ileum are shorter than those of the ~~jejunum~~ <sup>jejunum</sup>.
  - c. The splenic artery courses through the gastrocolic ligament.
  - d. The short gastric arteries are located in the gastrosplenic ligament.
  - e. The inferior mesenteric artery is derived from the aorta at the level of L3.
  - f. Intestinal arteries are located in the mesentery.
  - g. In portal hypertension, blood normally returning from the superior rectal vein to the inferior mesenteric vein may return by way of the inferior rectal vein to the azygous vein.
  - h. The left renal vein does not drain into the portal vein.
  - i. The right colic artery is located in a retroperitoneal position.
  - j. The left colic and right colic arteries contribute to the marginal artery of Drummond.
4. With regard to the kidneys and suprarenal glands:
- a. Renal fascia is a condensation of the extraperitoneal connective tissue and is found in an intraperitoneal position around the kidneys.
  - b. Pararenal fat is derived from the extraperitoneal connective tissue.
  - c. The renal arteries lie posterior to the renal veins at their origin.
  - d. The inferior suprarenal artery arises from the renal artery.
  - e. The right suprarenal vein drains into the inferior vena cava.
  - f. The renal papilla of the kidney drains into the cortex.
  - g. The renal arteries arise inferior to the superior mesenteric artery.
  - h. The renal columns taper to form the major calyx.

5. With respect to the nervous system in the abdomen:
- a. The vagus nerve provides the parasympathetic innervation to structures supplied by the superior mesenteric artery.
  - b. There are white rami for all of the lumbar, but not sacral, sympathetic ganglia.
  - c. Parasympathetic innervation at the left colic flexure is supplied by the pelvic splanchnic nerves.
  - d. Pain in the right iliac fossa from an inflamed appendix is an example of referred pain.
  - e. The anterior vagal trunk on the stomach contains pre-ganglionic parasympathetic nerve fibers.
  - f. The parietal peritoneum is innervated by the autonomic nervous system.
6. In the perineum:
- a. The bulbourethral gland is located in the deep pouch but has ducts that drain into the spongy urethra.
  - b. The arcuate ligament is formed by the fusion of the superior and inferior fascias of the urogenital diaphragm.
  - c. The inferior fascia of the urogenital diaphragm is derived from a condensation of the visceral pelvic fascia.
  - d. The perineal artery is located in the superficial pouch/space.
  - e. The deep vein in the penis drains into the internal pudendal vein.
  - f. A tear in the membranous urethra that lacerates the inferior fascia of the urogenital diaphragm will allow urine to escape into the superficial pouch/space.
  - g. The fossa navicularis is the narrowest and least dilatable part of the urethra.
  - h. The prepuce of the clitoris is formed by the uniting of two folds composing the labia minora.
  - i. The dorsal nerve of the penis is deep to the tunica albuginea.
  - j. The artery of the vestibular bulb passes from the deep pouch to the superficial pouch by piercing the inferior fascia of the urogenital diaphragm (perineal membrane).

- k. A lateral wall of the ischiorectal fossa is formed by the obturator internus.
  - l. The pudendal canal is formed by fascia of the obturator externus muscle.
7. With regard to the (thoracic) diaphragm:
- a. The right crus of the diaphragm forms the esophageal hiatus.
  - b. The left crus of the diaphragm forms the vena caval hiatus.
  - c. The suspensory ligament of the duodenum (Ligament of Treitz) arises in part from the right crus of the diaphragm.
  - d. The sympathetic trunks descend posterior to the lateral arcuate ligament.
  - e. The greater splanchnic nerve descends from thorax to abdomen by piercing the crura of the diaphragm.
  - f. The foramen of the inferior vena cava is at the level of T8.
8. With respect to the pelvic nerves and vessels:
- a. Transection through the sensory and motor roots at the levels of S2-4 results in an autonomous/neurogenic bladder.
  - b. During urination, activation of the somatic innervation to the sphincter urethrae muscle must be terminated in order to relax the muscle.
  - c. During defecation, activation of somatic innervation to the external anal sphincter must be terminated in order to relax the muscle and permit the passage of fecal material.
  - d. The genitofemoral nerve is often referred to as the "nervi erigentes".
  - e. The helicine veins vasodilate by stimulation of autonomic innervation from the pelvic splanchnic nerves (S2-4).
  - f. The lateral femoral cutaneous nerve crosses anterior to the psoas muscle.
  - g. The parasympathetic nerves in the left hypogastric nerve are preganglionic fibers.
  - f. The subcostal nerve emerges into the abdominal cavity inferior to the lateral arcuate ligament.
  - g. The inferior vesical artery arises from the umbilical artery.



- h. The sympathetic trunks converge anterior to the coccyx bone in a structure termed the ganglion impar.
  - i. The prostatic plexus contains preganglionic parasympathetic nerves and postganglionic sympathetic nerves.
  - j. The pudendal nerve exits the pelvic cavity superior to the coccygeus muscle.
9. With respect to the duodenum, liver, gall bladder, and spleen:
- a. The root of the mesentery crosses the 3rd part of the duodenum.
  - b. The 1st part of the duodenum is enclosed in peritoneum.
  - c. The greater duodenal papilla is located in the 2nd part of the duodenum, and the lesser duodenal papilla is located in the 1st part duodenum.
  - d. According to internal morphology, the quadrate lobe and part of the caudate lobe belong to the left lobe of the liver.
  - e. The hepatogastric ligament of the lesser omentum extends from the liver at the ligamentum venosum to the lesser curvature of the stomach.
  - f. The spiral fold is a channel from the fundus of the gall bladder to the cystic duct.
  - g. The right kidney is related to the visceral surface of the right lobe of the liver.
  - h. The quadrate lobe of the liver lies between the gallbladder and the fissure for the ligamentum teres.
10. With respect to the pelvic viscera and fascia:
- a. Condensation of visceral pelvic fascia forms the pubosacral ligamentous complex.
  - b. The ovarian artery courses through the suspensory ligament of the ovary.
  - c. The perivesical fascia is a condensation of the tela subcutanea.
  - d. Visceral pelvic fascia is found in the ischiorectal fossa.
  - e. The trigone of the bladder is skeletal muscle.
  - f. The mesosalpinx is a specialization of the transversalis fascia.
  - g. The seminal vesicles lie lateral to the ampulla of the ductus deferens.
  - h. The ejaculatory ducts drain at the seminal colliculus.

**Part III. Answer in the space provided (including the back of the page or the additional page for each question). (48 pts)**

1. A one month-old male patient, born prematurely at 35 weeks, is brought to the clinic because of vomiting. Auscultation reveals loud, high-pitched bowel sounds, and light palpation indicates a swelling superior and medial to the pubic tubercle. You suspect an indirect inguinal hernia. At conference you are asked to **present the anatomy of the spermatic cord; include contents, coverings, fascial boundaries, relationships, vasculature, innervation, and lymphatics. Additionally, you are asked to explain the pathway, and location of hernial contents associated with an indirect inguinal hernia that descends into the scrotum. (12 pts).**

2. A 45-yr old male is found to have cancer of the pancreas. As a fellow in gastroenterology, you are requested to present a comprehensive review of the pancreas at morning rounds. **Indicate your understanding of the pancreas providing structure, relationships, vasculature, innervation, and lymphatic drainage. (12 pts)**

3. Prostate cancer is fatal in over 30,000 men each year, with an incidence of upwards of 160,000 individuals. At morning conference in the Department of Urology, you are asked to: **Review the anatomy of the prostate. Include structure, supports, relationships, vascularization, innervation, and lymphatic drainage.** (12 pts)

4. The pelvic diaphragm is responsible for maintaining the position of pelvic organs and acts as a support of the abdominopelvic cavity. Discuss the **anatomy of the pelvic diaphragm. Include structure, fascial coverings, relationships, vascularization, innervation, and lymphatic drainage.** (12 pts)