

**STRUCTURAL BASIS OF MEDICAL PRACTICE**  
**EXAMINATION II**

September 21, 2001

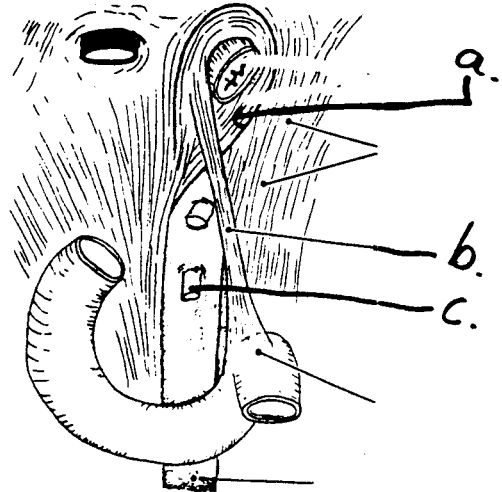
**PART I. Answer in the space provided. (12 pts)**

1. Identify the structures. (1.5 pts)

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

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

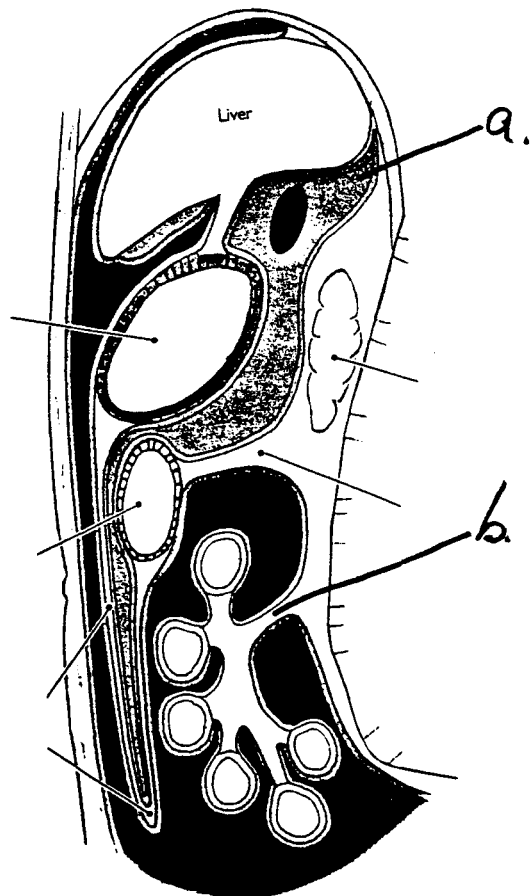
c. \_\_\_\_\_



2. Identify the structures. (1 pt)

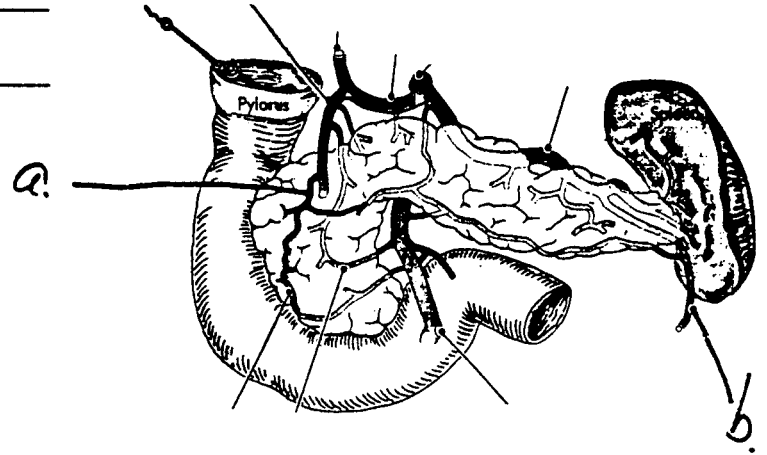
a. \_\_\_\_\_

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



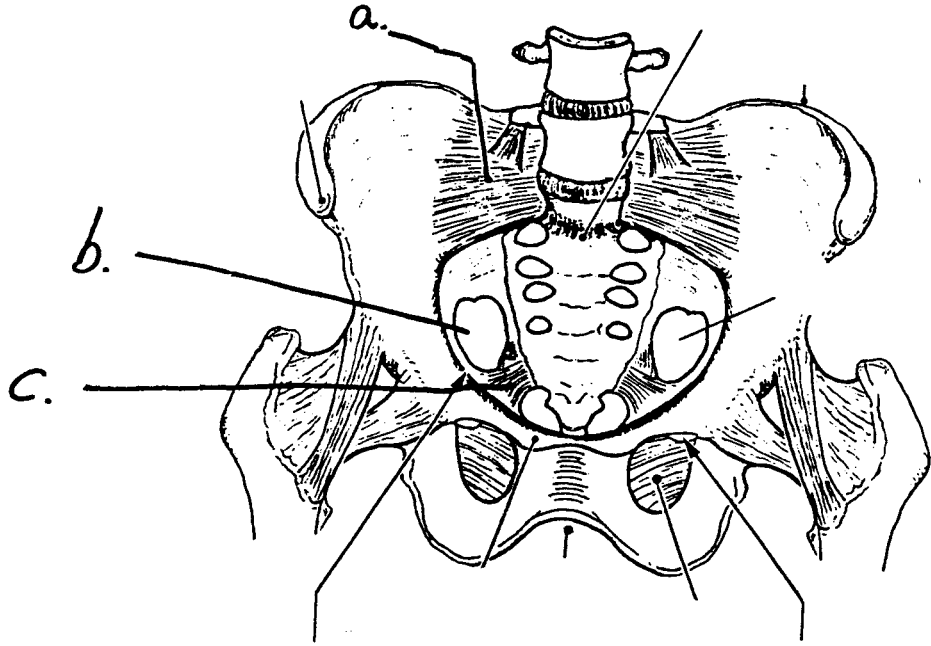
3. Identify the structures. (1 pt)

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



4. Identify the structures. (1.5 pts)

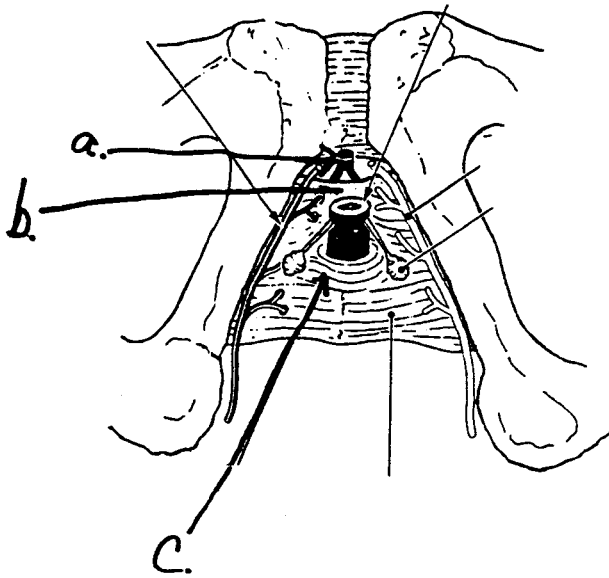
- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_



Bony landmarks and ligaments of the pelvis.

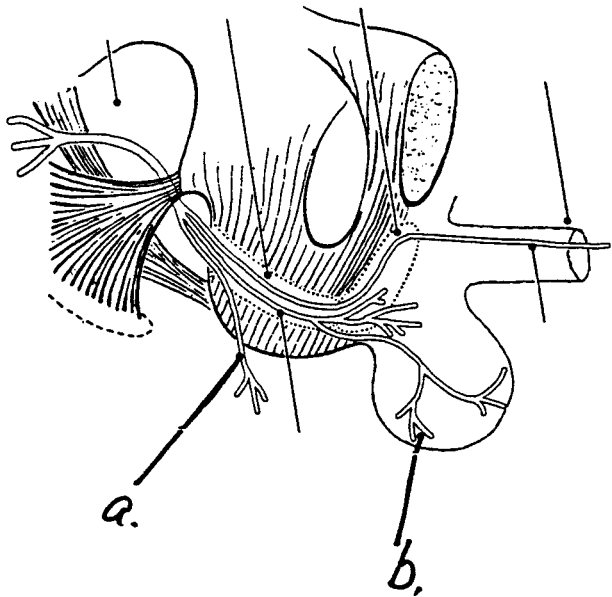
5. Identify the structures. (1.5 pts)

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



6. Identify the structures. (1 pt)

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

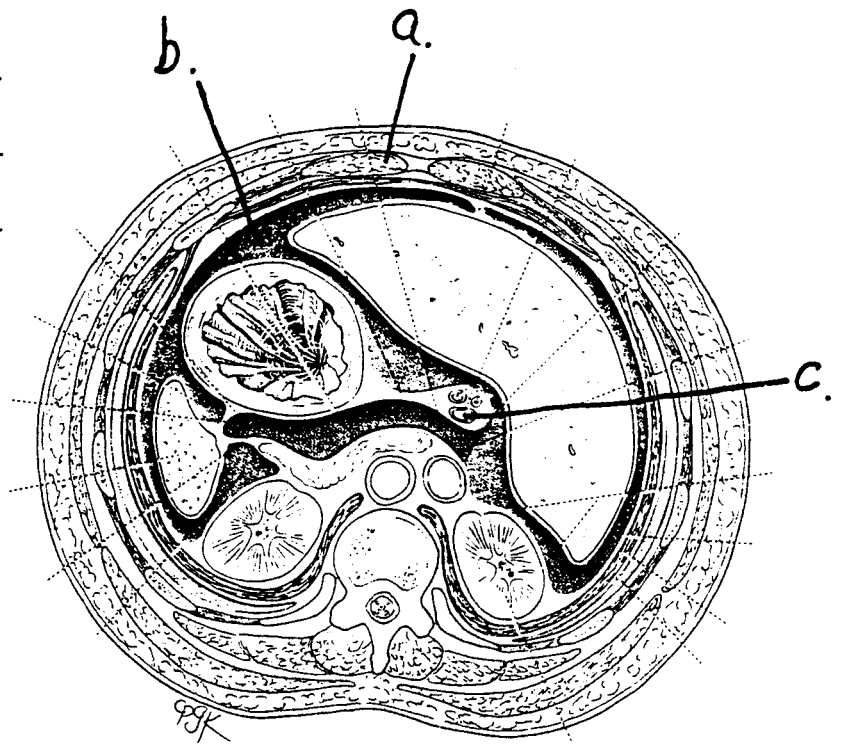


7. Identify the structures. (1.5 pts)

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

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

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



8. Identify the structures. (3.0 pts)

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

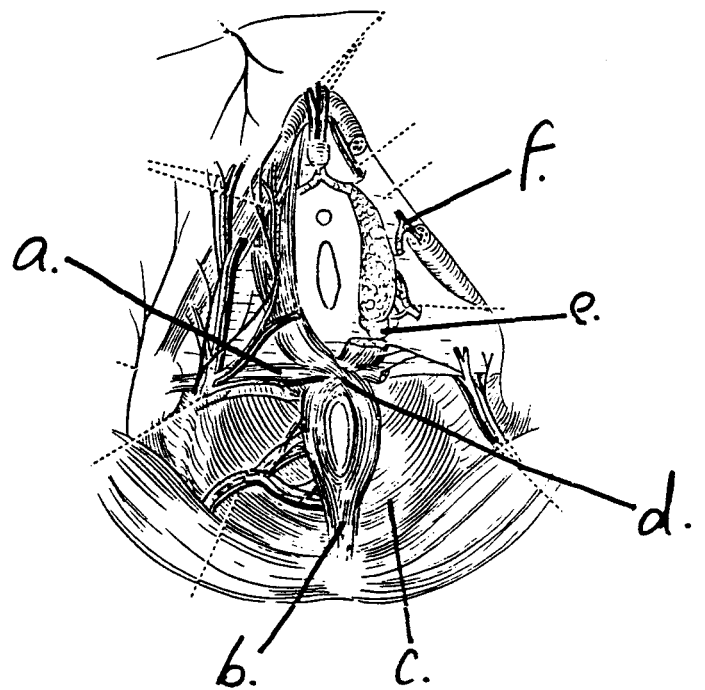
b. \_\_\_\_\_

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

d. \_\_\_\_\_

e. \_\_\_\_\_

f. \_\_\_\_\_



**Part II. Circle the correct answer. All, none, or some may apply. (40 pts)**

1. With regard to the abdominal wall:
  - a. Inferior to the umbilicus, the tela subcutanea consists of the membranous layer of Scarpa and the extraperitoneal connective tissue.
  - b. The paraumbilical veins drain into the portal vein.
  - c. The arcuate line marks the region where the linea alba is formed.
  - d. The posterior boundary of the rectus abdominis muscle inferior to the arcuate line is formed by the transversalis fascia.
  - e. The inferior epigastric artery is located in the extraperitoneal connective tissue and penetrates the peritoneum to enter the rectus abdominis at the arcuate line.
  
2. In the inguinal region:
  - a. The internal oblique muscle has one of its origins from the lateral 2/3's of the inguinal ligament.
  - b. Fibers of the lacunar ligament terminate on the pubic tubercle.
  - c. The cremaster muscle is a skeletal muscle innervated by the genitofemoral nerve.
  - d. Dartos tunic contains fibers of skeletal muscle innervated by the ilioinguinal nerve.
  - e. Indirect inguinal hernias occur lateral to the inferior epigastric artery.
  - f. Direct inguinal hernias may descend into the scrotum and be located in the testicular coelomic cavity between the parietal and visceral layers of the tunica vaginalis.

3. With respect to the abdominal cavity and development:
- a. Meckel's diverticulum is the persistence of the vitelline duct in the adult ileum.
  - b. At the 5th week of life, the gastrointestinal tube herniates into the umbilicus and undergoes a 270 degree counter-clockwise rotation.
  - c. The celiac artery distributes blood to the foregut, including the vascular supply to the pancreas.
  - d. The umbilical veins in the fetus become the medial umbilical ligament after birth.
  - e. The sigmoid mesocolon is comprised of 4 layers of peritoneum.
  - f. During embryological development, the stomach undergoes a 90 degree clockwise rotation resulting in the left side becoming ventral and the right side becoming dorsal.
  - g. The hepatoduodenal ligament is a derivative of the ventral mesentery.
  - h. The lienorenal ligament is a derivative of the dorsal mesentery.
4. With regard to the abdominal vasculature:
- a. The jejunum has longer vasa recta than the ileum.
  - b. The great pancreatic artery lies to the left of the dorsal pancreatic artery.
  - c. The arcades of the ileum are simpler than those of the jejunum.
  - d. The testicular and ovarian arteries originate from the aorta superior to the inferior mesenteric artery.
  - e. The marginal artery (of Drummond) involves contributions from the superior mesenteric artery and the inferior mesenteric artery, but does not involve contributions from the celiac artery.
  - f. In cases of portal hypertension, blood normally returning from the left gastric vein to the portal vein utilizes the esophageal veins which drain into the azygous vein.

5. With respect to the duodenum, pancreas, and spleen:
  - a. Plicae circulares are found in the duodenal cap.
  - b. The bile duct and the pancreatic duct share a common ampulla (of Vater) and empty contents into the duodenum through the greater duodenal papilla.
  - c. The 2nd part of the duodenum is quite moveable and is surrounded by the hepatoduodenal ligament.
  - d. The 2nd part of the duodenum is crossed ventrally by the transverse mesocolon.
  - e. The tail of the pancreas forms the superior border of the 3rd part of the duodenum.
  - f. The phrenicocolic ligament forms a shelf for suspension of the spleen.
  
6. With regard to the kidneys and suprarenal glands:
  - a. Renal fascia is a derivative of the transversalis fascia.
  - b. Perirenal fat can be found in the renal sinus.
  - c. The ureter lies posterior to the renal veins.
  - d. The right suprarenal vein joins the inferior phrenic vein and drains into the inferior vena cava.
  - e. The left suprarenal gland has a posterior boundary of the inferior vena cava and liver.

7. With respect to the nervous system in the abdomen:
- a. The vagus nerve supplies preganglionic the parasympathetic innervation to structures vascularized by the celiac artery.
  - b. The least splanchnic nerve conducts pre-ganglionic sympathetic nerve fibers to the aorticorenal ganglion.
  - c. The lumbar splanchnic nerves are pre-ganglionic sympathetic nerve fibers.
  - d. Referred pain from the gall bladder may be detected in the infrascapular region.
  - e. Gray rami conduct pre-ganglionic parasympathetic fibers from S2,3, and 4 to the pelvic viscera.
  - f. The testis is innervated by vagal parasympathetic fibers.
8. With regard to the (thoracic) diaphragm:
- a. The sympathetic trunk passes from the thorax to the abdomen posterior to the lateral lumbocostal arch (arcuate ligament).
  - b. The median lumbocostal arch is formed at the union of the right and left crus.
  - c. The lesser splanchnic nerve passes through the aortic hiatus at the level of T12 to gain entrance to the abdomen.
  - d. The lumbocostal trigone is a weakening related to the lateral lumbocostal arch (arcuate ligament).
  - e. The sensory innervation to the periphery of the diaphragm is by way of the intercostal nerves.
  - f. The thoracic duct ascends from the abdomen to the thorax through the aortic hiatus.



9. With respect to the pelvic viscera:
- a. The perivesical fascia is a condensation of the visceral pelvic fascia.
  - b. The Cardinal ligaments (lateral cervical ligament) is a condensation of parietal pelvic fascia that extends from the lateral aspect of the uterus to the pelvic wall.
  - c. The rectouterine pouch (Pouch of Douglas) is an infolding of peritoneum between the rectum and the bladder in the female.
  - d. The uterine artery is located on the superior aspect of the Cardinal ligament.
  - e. The parametrium is the peritoneum inferior to the juncture of the mesosalpinx and mesovarium.
  - f. The uterus is normally stated to be anteverted and anteflexed.
  - g. The artery of the ductus deferens is a branch of the umbilical artery
  - h. The internal pudendal artery is located inferior to the piriformis and superior to the coccygeus (ischiococcygeus).
  - i. The inferior vesical artery is a branch of the umbilical artery.
  - j. The right ovarian vein drains into the inferior vena cava.
10. In regard to the perineum:
- a. The labia minora (minus) is a specialization of the visceral pelvic fascia.
  - b. The greater vestibular gland is located in the superficial pouch.
  - c. The bulbospongiosus muscle is skeletal muscle.
  - d. The glans of the clitoris consists of corpora cavernosa, but not corpora spongiosa.

11. With respect to the pelvic musculature and fascia:
- a. The sacrum consists of 5 fused vertebrae, but contains 4 pairs of sacral foramen.
  - b. The coccygeus (ischiococcygeus) muscle is not part of the levator ani, but is part of the pelvic diaphragm.
  - c. The "puborectal sling" is related to the pubococcygeus muscle.
  - d. The false pelvis in females is often described as shallow compared to the male pelvis.
  - e. The pelvic viscera can be found in the true pelvis.
  - f. In the anatomical position, the anterior superior iliac spine and the superior portion of the pubic symphysis are in a vertical plane.
  - g. The prostate gland is enclosed by parietal pelvic fascia.
  - h. The prostatic ducts drain into the ejaculatory duct.
  - i. The middle third of the rectum has peritoneum only on the anterior surface.
  - j. The pectinate line is located at the inferior limit of the anal valves.
  - k. Hemorrhoids above the pectinate line are often described as painful.
12. In regard to the pelvic nerves and vessels:
- a. Transection above the levels of S2-4 results in an automatic/"cord" bladder.
  - b. During urination, the autonomic innervation to the sphincter urethrae muscle must be terminated in order to relax the muscle.
  - c. During defecation, impulses to the puborectalis muscle must be halted in order to relax this muscle and permit the passage of fecal material.
  - d. The pudendal nerve is often referred to as the "nervi erigentes".
  - e. Contraction of the bulbospongiosus and ischiocavernosus muscles contributes to maintaining an erection of the clitoris by limiting venous return.
  - f. The subcostal nerve emerges into the abdominal cavity inferior to the lateral lumbocostal (arcuate) arch.
  - g. The pelvic splanchnic nerves course through the superior hypogastric plexus to serve as parasympathetic innervation to the descending colon.

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

1. A 53-yr old man presents to the clinic with a history of alcohol abuse. In the course of your history and physical, you detect cancer of the liver. At Grand Rounds you are asked to: **Review the anatomy of the liver and gall bladder. Include structure, supporting elements, peritoneal relationships, vasculature, lymphatic drainage, innervation (e.g., preganglionic, postganglionic, afferents, pathways), and relationship to surrounding structures and spaces. (12 pts).**

**Part IV. Answer in the space provided (including the back of the page and additional pages for each question). (54 pts)**

1. While serving as a resident in emergency medicine, a 50-yr old female is admitted with severe pains in the abdomen. Taking a history and physical, the patient reports vomiting what appeared to be coffee grounds; emesis (vomiting) of precipitated blood clots rendered black by the action of gastric acid indicates a hemorrhage of the upper gastrointestinal tract. A diagnosis of carcinoma of the pyloric region is made, and the patient is designated for an immediate partial resection of the stomach. At morning conference the day following the operation, you are asked to review the structure of the stomach. Include the anatomy of the stomach, supporting elements, vasculature, lymphatic drainage, innervation (e.g., preganglionic, postganglionic, pathways), and relationship to surrounding structures. (15 pts)

2. A 33-yr old woman complains of infertility problems. Indicate your understanding of the uterus, uterine tubes, and ovary as to structure, orientation, relationships (anterior, posterior, superior, inferior, medial, lateral), support(s) and peritoneal associations, innervation (e.g., preganglionic, postganglionic, afferents, pathways), vasculature, and lymphatics. (12 pts)

3. A 74 yr-old male is catheterized in preparation for surgery of the bladder. The catheter ruptures the membranous urethra, pierces the superior fascia of the urogenital diaphragm, and urine and blood extravasate into the ischiorectal fossa. **Discuss the boundaries and contents of the ischiorectal fossa, fascial specializations, the relationship of the ischiorectal fossa to the superficial and deep pouches, and provide explanation of your observation that urine does not accumulate in the superficial pouch.** (12 pts)

3. A 55-yr old female returns to the clinic with a bulge in the anterior abdominal wall. A week earlier, the patient had a laporotomy (exploratory surgery) because of complaints of pain in the abdominal cavity. You diagnose that the patient has an incisional hernia, with a protrusion of organs and tissues through a surgical incision due to improper healing of the anterior abdominal wall. **Discuss the organization of the anterior abdominal wall, and include muscles, ligaments, fascia, fascial specializations, nerves, and vascular supply. Do not include the inguinal region in your answer. (12 pts)**

4. A 27 yr-old female and her 28 yr-old male spouse are in an automobile accident, and both have incurred severe injuries to the perineum. At morning conference you are asked to: **Review the anatomy of the perineum. Include structures, supports, fascia, vascularization, lymphatic drainage, innervation (e.g., autonomics, somatics), and relationships, as well as noting differences between females and males. (12 pts)**



4. The extremely vascular vestibular bulbs in the female perineum often bear the trauma of pressure exerted by the fetus during parturition. The bulbar tissues are occasionally torn as a result of fetal pressure or secondary to obstetric manipulations. As a consequence, considerable bleeding into the superficial pouch (space) may occur. **Discuss the organization of the female perineum (including external genitalia), with special attention paid to the superficial/lesser pouch (space). Include vascularization, lymphatic drainage, innervation (e.g., autonomics, somatics), structures, and relationships. (15 pts).**