

**STRUCTURAL BASIS OF MEDICAL PRACTICE**  
**EXAMINATION 3**

September 22, 2005

**PART I. Answer in the space provided. (8 pts)**

1. Identify the region. (0.5 pt)

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

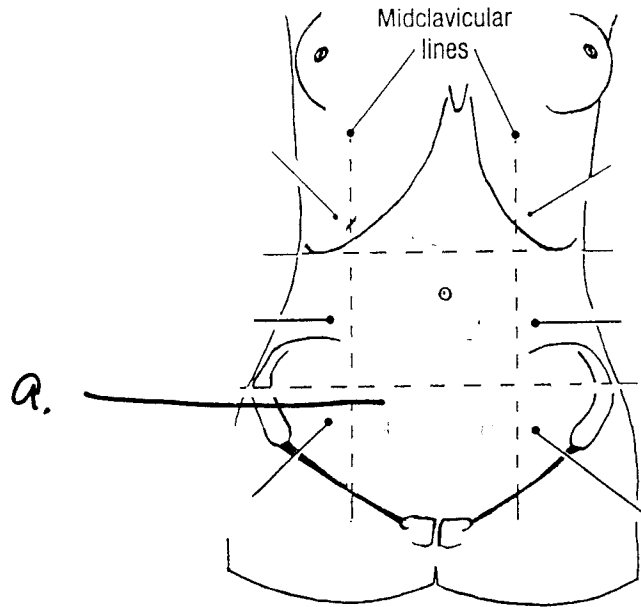


Figure 4.03. The nine abdominal regions.

2. Identify the structures. (1 pt)

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

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

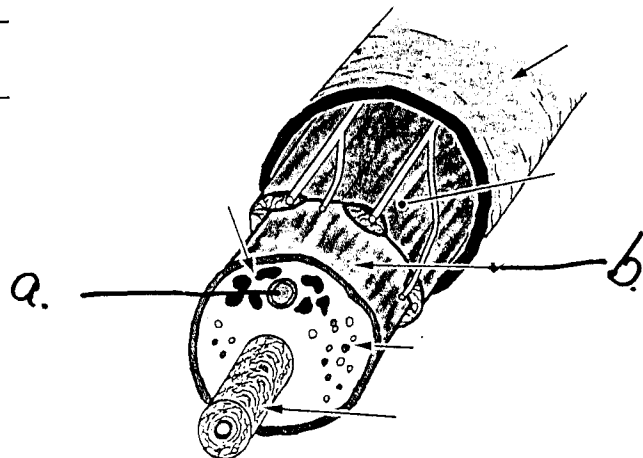


Figure 4.17. Transverse section through the spermatic cord.

3. Identify the structures. (1 pt)

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

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

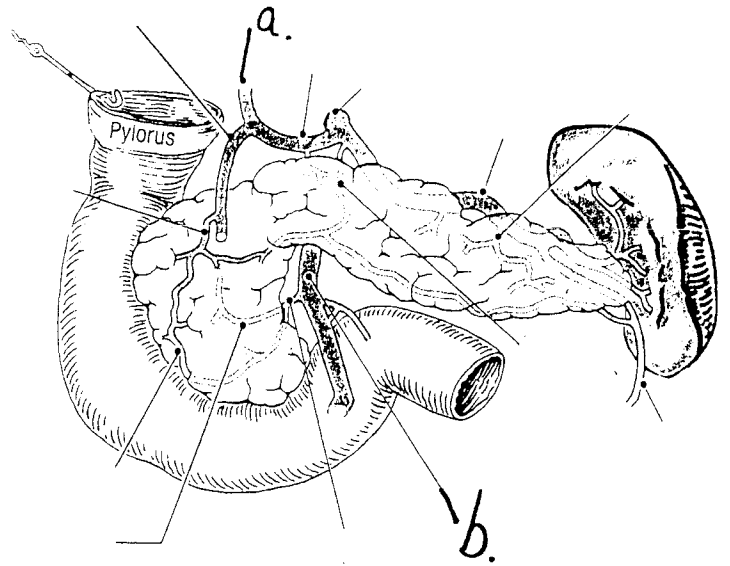
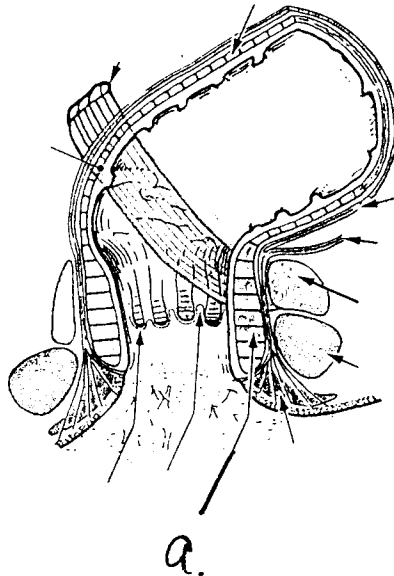


Figure 4.44. Blood supply of the duodenum and pancreas.

4. Identify the structure. (0.5 pts)

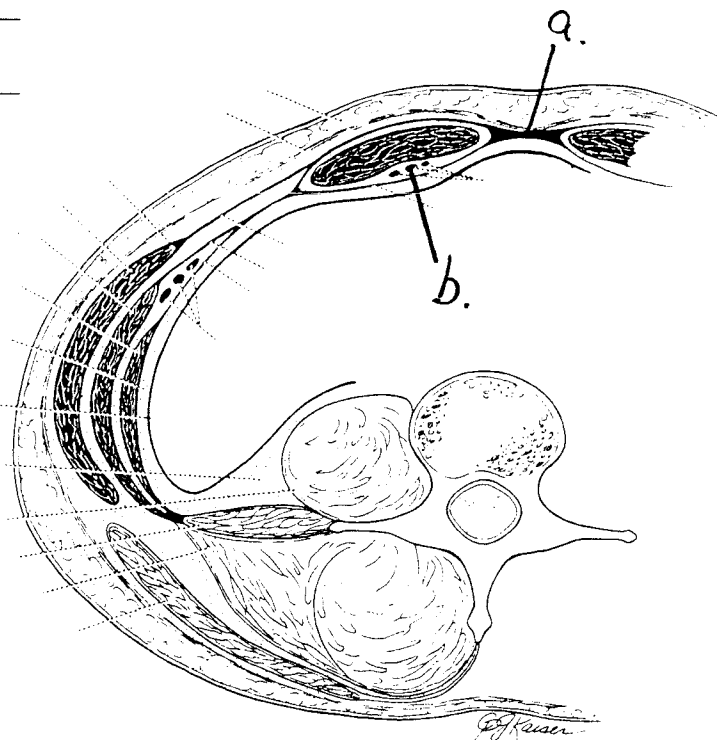
a. \_\_\_\_\_



5. Identify the structures. (1 pt)

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

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



6. Identify the structures. (1 pt)

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

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

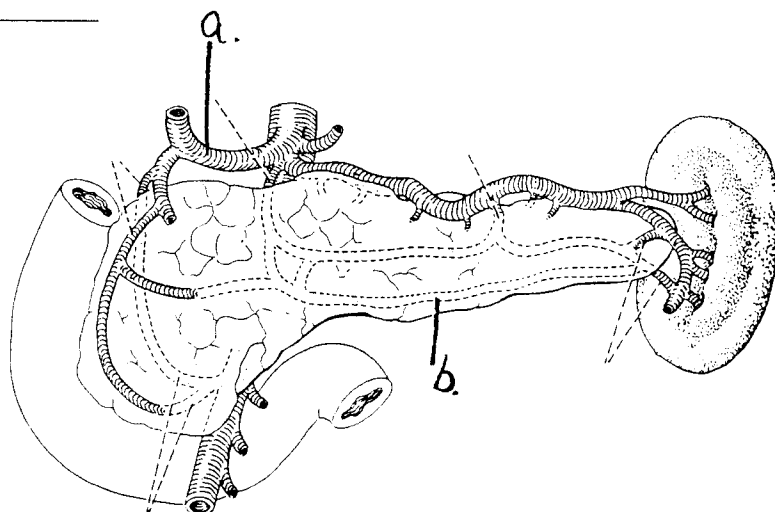


FIGURE 24-25.  
The chief arteries of the pancreas  
and their anastomoses.

7. Identify the structure. (1 pt)

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

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

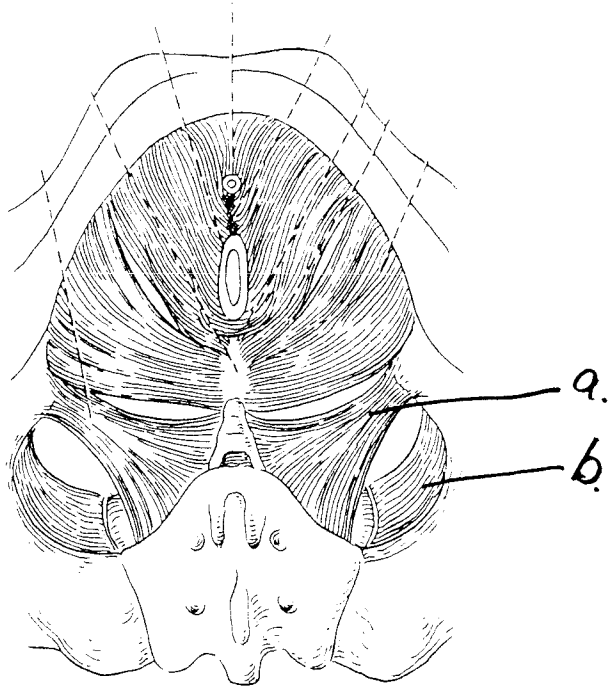


FIGURE 27-5.  
The pelvic diaphragm of the male from below.

8. Identify the structure. (1 pt)

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

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

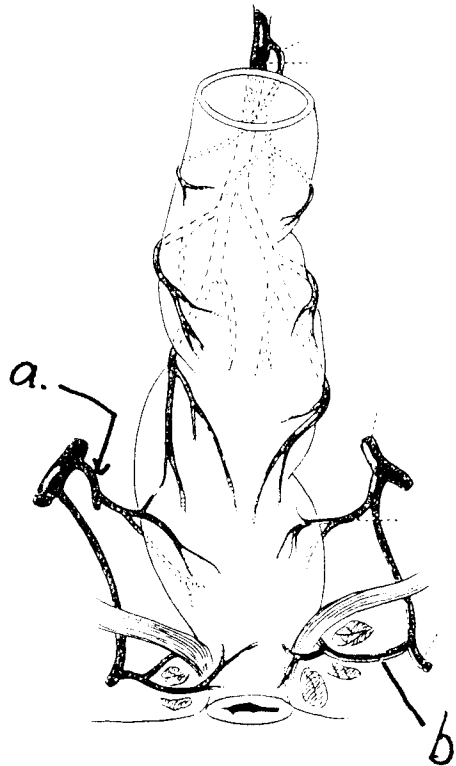
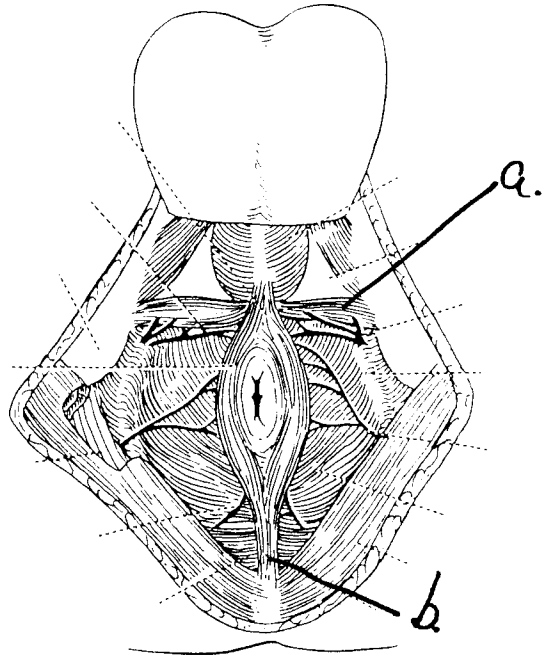


FIGURE 27-19.  
Blood supply of the rectum and anal canal: (A) arteries

9. Identify the structures. (1 pt)

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

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



**Part II. Circle the correct answer. All, none, or some may apply. (44 pts)**

1. In regard to vascular development:
  - a. The vasculature is derived from the endoderm.
  - b. Pharyngeal arches form during the 4th and 5th weeks of development.
  - c. The ductus arteriosus is formed from the 6th left aortic arch.
  - d. The right dorsal aorta becomes the descending aorta.
  - e. The internal iliac arteries are formed from the umbilical arteries.
  - f. The renal arteries are formed from the vitelline arteries.
  - g. The right vitelline vein forms superior mesenteric vein.
  - h. The ligamentum teres in the adult represents the left umbilical vein.
2. With respect to gastrointestinal development:
  - a. Because of the clockwise rotation of the stomach around its longitudinal axis, the left vagus nerve contributes to the innervation of the anterior wall of the stomach.
  - b. The gastroduodenal ligament is formed from the dorsal mesentery.
  - c. The chief pancreatic duct is formed from the ventral pancreas.
  - d. By 10 weeks of life, the midgut of the intestinal tract has rotated 270 degrees counterclockwise (as viewed from the ventral position).
  - e. The spleen is formed from the foregut.
  - f. Persistence of the vitelline duct in adults forms Meckel's diverticulum.
  - g. The phrenicocolic ligament is derived from the dorsal mesentery.
  - h. The left, but not right, triangular ligament is derived from the ventral mesentery.
3. In regard to development of the urogenital tract:
  - a. The smooth muscle of the bladder is derived from splanchnic mesoderm.
  - b. The upper and largest part of the urogenital sinus becomes the urinary bladder.
  - c. In the adult, the urachus is called the medial umbilical ligament.

- d. The urethral folds develop into the labia minora.
  - e. The pronephros develops into the permanent kidney.
  - f. The uterine tubes develop from the paramesonephric ducts.
  - g. The ductus deferens develops from the mesonephric ducts.
  - h. The kidney is initially in the abdomen and shifts caudally to the pelvic region.
4. With regard to the pelvis:
- a. The sacrum consists of 5 fused vertebrae and has 5 sacral foramina.
  - b. The piriformis muscle is part of the pelvic diaphragm.
  - c. Contraction of the puborectal sling (puborectalis muscle) keeps the anorectal region closed.
  - d. The arcus tendineus is a thickening of parietal pelvic fascia that is associated with the obturator externus.
  - e. The false pelvis in females is shallow compared to males.
  - f. The prostatic venous plexus lies deep to the periprostatic fascia.
  - g. The ejaculatory ducts drain into the prostatic sinus.
  - h. The pectinate line is located at the bases of the anal valves and columns.
5. In respect to the abdominal wall:
- a. Nerves and vasculature of the anterior abdominal wall travel in the neurovascular plane, located between the internal oblique and transversus abdominis muscles.
  - b. The paraumbilical veins in the anterior abdominal wall are located deep to the Scarpa's fascia.
  - c. Scarpa's fascia continues into the scrotum as Buck's fascia.
  - d. The fundiform ligament is a specialization of deep fascia.
  - e. The tendinous intersections are related to the internal oblique muscle.
  - f. The arcuate line defines the beginning of Scarpa's and Camper's fascia.
  - g. The umbilicus and the iliac crest are at the level of approximately L4.

h. Superior to the arcuate line, the aponeurosis of the transversus abdominis contributes to the posterior rectus sheath.

6. With regard to the inguinal region:

- a. The conjoint tendon refers to the combined aponeurosis of the transversus abdominis and internal oblique muscles inserted into the pubic tubercle.
- b. The transversus abdominis muscle contributes the internal spermatic fascia to the spermatic cord.
- c. The scrotal ligament represents the gubernaculum in fetal life.
- d. Direct inguinal hernias lie lateral to the lateral umbilical fold.
- e. The innervation of the cremaster muscle is the ilioinguinal nerve.
- f. The processus vaginalis in the spermatic cord lies between the internal spermatic fascia and the cremaster muscle and fascia.
- h. The sympathetic innervation of the testis is by way of the lumbar splanchnics.

7. In respect to the abdominal vasculature:

- a. The testicular arteries are given off inferior to the renal arteries.
- b. The dorsal pancreatic artery lies medial to the great pancreatic artery.
- c. The tail of the pancreas often extends into the lienorenal ligament.
- d. The vasa recta are shorter in the jejunum than in the ileum.
- e. The celiac artery is located at the level of L2.
- f. The right gastric artery courses in the hepatoduodenal and hepatogastric ligaments.
- g. The bifurcation of the aorta occurs at the level of S2-S3.
- h. The left testicular vein empties into the inferior vena cava.

8. With respect to the duodenum and the pancreas:

- a. The common bile duct lies ventral to the 1st part of the duodenum.
- b. Plicae circulares are not found in the 1st part of the duodenum.
- c. The lesser duodenal papilla lies inferior to the greater duodenal papilla.



- d. The suspensory ligament of the duodenum (Ligament of Trietz) is not derived from the dorsal mesentery.
  - e. The 2nd part of the duodenum is crossed ventrally by the transverse mesocolon.
  - f. The 3rd part of the duodenum crosses over the inferior vena cava and the aorta.
  - g. The lesser curvature of the stomach has lymphatic drainage into the left gastroepiploic nodes.
  - h. The root of the mesentery originates at the duodenojejunal flexure.
9. In regard to the kidneys and suprarenals:
- a. The renal fascia is derived from a condensation of the transversalis fascia.
  - b. The renal fascia continues from the left kidney to the right kidney.
  - c. The renal veins lie anterior to the renal arteries.
  - d. The right suprarenal/central vein is joined by the right inferior phrenic vein and drains into the right renal vein.
  - e. The renal pyramids are located in the renal cortex.
  - f. The renal sinus contains perirenal fat.
  - g. The kidneys are around 4-5 inches long and located between L3 and S2.
  - h. The quadratus lumborum muscle lies posterior to the right, but not the left, kidney.
10. In the pelvis and perineum:
- a. The uterine artery lies close to the superior surface of the Cardinal (lateral cervical) ligaments.
  - b. The periuterine fascia forms the mesometrium.
  - c. The inferior surface of the urogenital diaphragm is covered by parietal pelvic fascia.
  - d. The pubovesical ligament is a condensation of parietal pelvic fascia.
  - e. The ovary lies within the ampulla of the uterine tubes.
  - f. The uterus is normally anteverted and anteflexed.

- h. Hemorrhoids superior to the pectinate line have somatic pain afferent fibers.
11. In the nervous system associated with the abdomen and pelvis:
- a. Transection of the spinal cord above S2-4 allows for an automatic "cord" bladder.
  - b. The bulbospongiosus muscle is smooth but is innervated by the somatic nervous system.
  - c. The puborectalis muscle is innervated by the pelvic splanchnic nerves and sympathetic fibers from the lumbar splanchnics.
  - d. The levator ani raises the pelvic diaphragm to close off the urethra at the uvula.
  - e. Lumbar splanchnic nerves stimulate peristaltic movement in the descending colon.
  - f. The helicine veins are dilated by the parasympathetic nervous system and produce an erection of the penis/clitoris.
  - g. The "nervi erigentes" refers to parasympathetic visceral efferent fibers traveling in the pudendal nerve.
  - h. The obturator nerve is derived from L2, 3, 4.

**Part III. Indicate your understanding of the following. Answer in the space provided. (12 pts)**

1. A portion of the gastrointestinal tract descends into the scrotum as a result of an indirect inguinal hernia. Where will the herniated mass be located and what will its relationship be to the testis? (4 pts)

2. Perforation of the posterior part of the stomach by an ulcer can release food contents that pass from the lesser sac to the greater sac through the Epiploic Foramen (of Winslow). What are boundaries of the Epiploic Foramen (of Winslow). (4 pts)

3. Innervation of the transverse colon. (4 pts)

Part IV. Answer in the space provided (including the back of the page or the additional pages for each question). (36 pts)

1. A 65-yr old male is being prepared for bladder surgery. During the process of being catheterized, 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, vascularization, innervation, lymphatic drainage, the relationship of the ischiorectal fossa to the superficial and deep pouches, and provide an explanation of your observation that urine does not accumulate in the superficial pouch. (12 pts).**





2. A 50-yr old female presents to the clinic with cancer of the liver. At Grand Rounds you are asked to: **Review the anatomy of the liver and the 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)







3. A 45-yr old male comes into the clinic with anorectal trauma, and you make the diagnosis of a perforation of the rectum by a foreign object (in this case a piece of bone that was passed along the gastrointestinal tract). Prior to operation, you review the structure of the rectum. **Include the anatomy of the rectum, relationships to peritoneum and surrounding structures, innervation (e.g., preganglionics, postganglionics, afferents, pathways), vasculature, and lymphatic drainage. What structures can be palpated upon rectal examination of the male?** (12 pts)

EXAM NUMBER \_\_\_\_\_

