Sample Exam Questions for Unit #2

1. Upon speculum examination of a 28 year old female, the physician determines the patient is in the early stages of cervical cancer. The physician recommends a trachelectomy: the surgical removal of the upper portion of the vagina and cervix that leaves the uterus and all other reproductive organs in tact. The trachelectomy procedure allows young women of reproductive age the possibility of maintaining fertility and bearing children.

During the removal procedure, the surgeon ligates (clamps) the uterine and vaginal arteries to limit blood loss to the organs undergoing surgery. What additional artery should the surgeon clamp to prevent blood loss?
   a. internal pudendal a.
   b. middle rectal a.
   c. ovarian a.
   d. superior vesical a.

Answer:
   a. NO. The internal pudendal is the main artery of the perineum and supplies the clitoris and penis with blood
   b. NO. The middle rectal artery supplies the rectum with blood and anastomoses with the superior and inferior rectal arteries.
   c. YES. The ovarian artery arises from the aorta and travels through the suspensory ligament of the ovary, sending off branches through the mesovarium to the ovaries and also through the broad ligament to anastomose with the uterine artery
   d. NO. The superior vesical artery supplies the superior portion of the bladder and distal parts of the ureter.

2. As part of the radical hysterectomy, the vagina is removed and a new, or neo-vagina, is constructed. In a standard TRAM flap (Transverse Rectus Abdominus muscle) procedure, a surgeon relocates a portion of the rectus abdominus muscle from the abdomen to the pelvis to construct the new vagina. The original blood supply of the rectus abdominus muscle is preserved in this technique. After the successful construction of a neo-vagina, trace the path of a red blood cell from the aorta to the vagina. (International Seminars in Surgical Oncology Dec, 2007)

Answer:
LV→ aorta→common iliac a. →external iliac a. →inferior epigastric artery
3. A 6 month-old male is brought into a pediatric urologist’s office for unilateral cryptorchidism (undescended testis) that resulted from his premature delivery. The patient’s left testis is undescended and located in the anterior portion of the abdominal cavity. What corresponding abdominal wall layer does the descended testis lack that the undescended testis has not yet separated from?
   a. Internal oblique m.
   b. Scarpa’s fascia
   c. Transversus abdominis m.
   d. Transversalis fascia

Answer:
   a. NO. The internal oblique m. becomes the cremaster m. and fascia in the scrotum.
   b. NO. Scarpa’s fascia, which is a superficial fascia, is the corresponding layer to the Dartos muscle and fascia in the scrotum.
   c. YES. The normally descended testis lack the presence of the transversus abdominis m. due to the pathway of the processus vaginalis during the descent. The undescended testis will still have a layer of the transversus abdominis lying over top of it.
   d. NO. The transversalis fascia corresponds with the internal spermatic fascia of the scrotum. This fascia is present in both the undescended and fully descended testis.

4. Following surgery to remove a cancerous mass from his lower rectum, a 52 year old Finnish male is no longer able to build and maintain an erection. Prior to the surgery his sexual function was “normal.” What other urogenital function is also likely to be affected?
   (Diseases of the Colon & Rectum, Volume 49, Number 5 / May, 2006)
   a. bladder contractions
   b. mobilization of secretions from the epididymis
   c. smooth muscle contraction of accessory glands of reproductive system
   d. smooth muscle contraction of internal urethral sphincter in men

Answer:
   a. YES. Erection, in males and females, is stimulated by parasympathetic fibers that originate from the pelvic splanchnic nerves (Spinal cord levels S2-S4). Stimulated parasympathetic neurons release NO from endothelial cells causing the relaxation and dilation of blood vessels, leading to tissue perfusion and erection. Parasympathetic neurons from the pelvic splanchnics are also responsible for bladder contraction that is stimulated by stretch as the bladder fills.
   b. NO. Erection, in males and females, is stimulated by parasympathetic fibers that originate from the pelvic splanchnic nerves (Spinal cord levels S2-S4). Stimulated parasympathetic neurons release NO from endothelial cells causing the relaxation and dilation of blood vessels, leading to tissue perfusion and erection. The sympathetic
c. NO. Erection, in males and females, is stimulated by parasympathetic fibers that originate from the pelvic splanchnic nerves (Spinal cord levels S2-S4). Stimulated parasympathetic neurons release NO from endothelial cells causing the relaxation and dilation of blood vessels, leading to tissue perfusion and erection. The sympathetic branch of the autonomic system is responsible actions associated with ejaculation rather than erection.

d. NO. Erection, in males and females, is stimulated by parasympathetic fibers that originate from the pelvic splanchnic nerves (Spinal cord levels S2-S4). Stimulated parasympathetic neurons release NO from endothelial cells causing the relaxation and dilation of blood vessels, leading to tissue perfusion and erection. The contraction of the internal urethral sphincter in men is controlled by the sympathetic NS while the relaxation of the sphincter and passage of urine from the bladder to the urethra is controlled by the parasympathetic NS. It may be helpful to remember that the sympathetic NS contracts during ejaculation and closes the internal urethral sphincter in men to ensure no semen enters the bladder.

5. More than half of men over age 40 have some difficulty building and maintaining an erection. Research at the Heart Institute in Los Angeles, CA has indicated that a main contributing cause to erectile dysfunction are vascular diseases, such as atherosclerosis: the hardening and increased stiffness of arteries and formation of bulky plaques on vessel walls (Current Atherosclerosis Reports Vol 4 No. 5, Sept. 2002) See picture below of normal artery on top, atherosclerotic artery with plaque formation on bottom.

How does a condition like atherosclerosis effect the process of building and maintaining an erection?

a. Atherosclerosis causes the compression of the deep arteries of the penis once the ischiocavernosus and bulbospongiosus muscle become engorged with blood.
b. Atherosclerosis causes the loss of sympathetic innervation to the erectile tissue and associated muscles of the penis.
c. Atherosclerosis increases drainage from the veins of penis such that erectile tissue cannot become properly engorged with blood.
d. Atherosclerosis limits the relaxation of the deep arteries of the penis and decreases blood flow that is necessary for an erection.
Answer:
a. NO. The stiffness in atherosclerotic arteries would make it very difficult for the deep arteries of the penis to become compressed. Additionally, the inability of the atherosclerotic arteries to properly coordinate the blood flow necessary for perfusion to erectile tissue would make the situation in option b. difficult to achieve.
b. NO. Although many conditions, such as diabetes, could lead to peripheral nerve damage (peripheral neuropathy), loss of sympathetic innervation to the erectile tissue would be associated with ejaculation, not erection, which is controlled by parasympathetic innervation.
c. NO. Atherosclerosis has no effect on venous drainage. Hardening and plaque formation occurs in the arteries.
d. YES. The hardening of arteries associated with atherosclerosis effects the ability of the penis to properly coordinate the blood flow necessary to create and maintain an erection. The hardened arteries are unable to relax and allow surrounding erectile tissues to fill with blood, which would normally lead to an erection.

6. Trace the fertilization pathway from the site of spermatozoa production to site of fertilization, include all structures traveled.

Answer:
Seminiferous tubules → Epididymis → Ductus deferens → Ejaculatory duct → Prostatic urethra → Membranous urethra → Spongy urethra → Vaginal cavity → Cervix (external os, cervical canal, internal os) → Uterine cavity → Uterine tube (isthmus, ampulla)
7. A more severe complication of multiple gestations and vaginal deliveries is a prolapsed uterus.

In order to prevent this condition, physicians may advise pregnant or post-partum patients to strengthen their weakened pelvic floor muscles in order to provide better support. These pelvic floor exercises (Kegel exercises) require repeated contraction and relaxation of the main muscle responsible for supporting the uterus. What pelvic floor muscle is being targeted in Kegel exercises?
   a. Coccygeus m.
   b. Obturator Internus m.
   c. Pubococcygeus m.
   d. Puborectalis m.

Answer:
a. NO. The coccygeus mm. are positioned on each side of the coccyx and extend to their attachment on the ischial spines. These muscles are responsible for pulling the coccyx forward after defecation.
b. NO. The obturator internus m. forms a large part of the anterolateral wall of the pelvic cavity. Its main actions are lateral rotation of the extended hip joint and abduction of the flexed hip.
c. YES. The pubococcygeus m. of the levator ani is the main muscular support of the uterus. It originates from the body of the pubis and connects posteriorly to the coccyx.
d. NO. The puborectalis m. helps comprise the levator ani muscle group but its primary responsibility is to maintain the perineal flexure at the anorectal junction. This insures closure of the gastrointestinal tract at its most terminal point.
8. Which of the following patients suffers from a prolapsed bladder and which suffers from a prolapsed uterus.

Patient A | Patient B
---|---

Answer:
A Bladder, B Uterus

8. During your third year rotation in medicine, you flip through a patient chart and read the following physician note: “Upon examination of the supine patient she is found to have a 3x2 cm mass at the 8 o’clock position of the vestibule. It is mildly tender and warm to the touch, as well as red and slightly raised. Enlargement of an inguinal lymph node is noted.” (American Academy of Family Physicians, July 1 Vol. 68, No.1, 2003) What was the most likely diagnosis in this case?

a. Bone infection of ischiotuberossity  
b. Greater vestibular gland abscess  
c. Internal hemorrhoids  
d. Urethral rupture

Answer:

a. NO. The ischiotuberossities demarcate the lateral and posterior borders of the urogenital triangle. The vestibule of the vagina is centrally located. Think of a structure more closely related to the vestibule itself.
b. YES. The greater vestibular glands can become blocked and may enlarge and become infected (with organisms unrelated to sexually transmitted infections). They are located at the 5 and 7 o’clock positions of the vestibule and are two small reddish bodies on the posterolateral aspects of the vestibule.
c. NO. Hemorrhoids (both internal and external) arise from abnormalities within the submucosal veins of the rectum and are palpable upon digital rectal exam. These masses would not be visualized nor palpated in the area of the vestibule.
d. NO. The urethra is located at the anterior portion of the vestibule (12 o’clock). A urethral rupture occurs when the urethra is torn and urine escapes through the rupture into the superficial perineal space.
9. A 30 year old female is in active labor. In preparation for an episiotomy (a surgical incision in the perineum to assist in childbirth) the obstetrician decides to administer a nerve block to the pudendal nerve as it courses around the sacrospinous ligament. With the anaesthetic placed, has the obstetrician effectively blocked a cutaneous field or a dermatome?
   a. A cutaneous field, because more than one spinal cord level contributes
   b. A cutaneous field, because it is a single block administered to the dorsal root of S2.
   c. A dermatome, because more than one spinal cord level contributes
   d. A dermatome, because it is a single block administered to one dorsal root of S2

Answer:
   a. YES. A dermatome is an area of skin supplied by a single spinal cord level. The perineum is supplied with innervation by the pudendal nerve, consisting of spinal cord levels S2-S4. The block would therefore knock out a cutaneous field.
   b. NO. A dermatome is an area of skin supplied by a single spinal cord level. An injection at the dorsal root of S2 would effectively block the dermatome for S2 but not the cutaneous field. This injection is not taking place at the dorsal root of a spinal cord nerve, but rather occurs in the periphery.
   c. NO. A dermatome is an area of skin supplied by a single spinal cord level. The pudendal nerve contributes to the innervation of the perineum and consists of spinal cord levels S2-S4.
   d. NO. The perineum is made up of multiple dermatomes based on the pattern of innervation. This injection is not taking place at the dorsal root of a spinal cord nerve, but rather occurs in the periphery.

10. A study conducted by Columbia University suggested that midwives were able to attain a high level of intact perineums in specific patients in specific circumstances of at home births. Researchers reported only 8 of 1068 women experienced a 3rd degree perineal tear that extended through the external anal sphincter during a home birth. (Birth 1998 Dec;25(4):226-34) For the 8 women in this study what type of motor neurons, originating from spinal cord levels S2-4, will be most directly affected by the occurrence of a 3rd degree tear?
   a. Enteric
   b. Parasympathetic
   c. Somatic
   d. Sympathetic

Answer:
   a. NO. Although the enteric system does effect the internal anal sphincter, it has no effect on the external anal sphincter.
   b. The parasympathetic nervous system affects the internal anal sphincter, not the external anal sphincter.
   c. YES. The external anal sphincter is skeletal muscle and therefore under the control of the somatic nervous system.
d. NO. The sympathetic nervous system does not hold any control over the external or internal anal sphincters.

11. The New England Journal of Medicine reported that 8 out of 10 forceps assisted vaginal deliveries result in damage to the anal sphincters of the mother. The study found that 7 out of the 10 forceps assisted deliveries resulted in damage to the internal anal sphincter. (The New England journal of medicine. 1993 Dec 23; 329(26) 1905-11). As a result, what action will these 7 patients struggle with during their recovery in the following weeks?

   a. Closing the internal anal sphincter
   b. Opening the internal anal sphincter
   c. Inhibiting a bowel movement
   d. Terminating a bowel movement

Answer:
   a. YES. The internal anal sphincter will need to close in order to perform its true function as a sphincter. By affecting the nervous supply to the internal anal sphincters, the sphincter will remain open and unable to close.
   b. NO. Think carefully about the anatomical function of a sphincter and what actions are necessary for it to perform its natural function.
   c. NO. The external anal sphincter is the muscle group responsible for passing a bowel movement “at a socially acceptable time.” An individual has conscious control over their external anal sphincter and decides when to inhibit or initiate a bowel movement.
   d. NO. The external anal sphincter and the puborectalis muscle are responsible for terminating a bowel movement.
Questions 12-13 consider a 24 year-old primigravida, para 0 (first time pregnancy, no previous live births) woman who is struggling with a vaginal delivery.

12. The OB decides to check the station of the baby: the head position in relation to the ischial spines measured from -5 (floating above the pelvis) to +5 (baby’s head visible at opening of vagina). A 0 indicates the baby’s head is at the level of the ischial spines. The OB declares the baby is a +3 and that a structure is limiting the baby’s passage. What structure is specifically inhibiting the baby’s descent?
   a. Coccyx
   b. Ischio-pubic ramus
   c. Ischial tuberosity
   d. Pubic Symphysis

Answer:
 a. NO. The posterior marker of the pelvic outlet is the sacral promonotory. At a +3 station, the sacral promonotory is no longer restricting movement. The coccyx is a flexible structure, as is evidenced by its movement in defecation.
 b. NO. The structure of the female pelvis is wider (from ischial tuberosity to ischial tuberosity) than it is longer (from sacral promonotory to pubic symphysis) and in most women the inferior pubic ramus is not a significant concern.
 c. NO. The structure of the female pelvis is wider (from ischial tuberosity to ischial tuberosity) than it is longer (from sacral promonotory to pubic symphysis) so the ischial tuberosity is not a significant concern.
 d. YES. The structure of the female pelvis is wider (from ischial tuberosity to ischial tuberosity) than it is longer (from sacral promonotory to pubic symphysis). The limiting structure would be the anterior bony landmark, the pubic symphysis.
13. The OB recommends moving the patient into the operating room for a c-section due
to lack of progress moving the baby down the birth canal. The OB chooses to make a
horizontal incision (the “bikini cut”) through abdominal muscle and fascia as opposed to
the vertical incision.

A study conducted by surgeons in the Netherlands reported that 9 out of 243 women
experienced a specific abnormality due to a horizontal incision that would otherwise not
exist if their physician performed the vertical incision. What abnormality did these 9

a. Numbness of the lateral thigh
b. Numbness of the mons pubis
c. Weakness in the external oblique
d. Weakness in the medial compartment of the thigh

Answer:

a. NO. The lateral cutaneous nerve of the thigh courses laterally across the iliacus
muscles toward the anterior superior iliac spines where it passes posterior to the inguinal
ligament and enters the thigh. It would not be severed in a horizontal c-section incision.
b. YES. The OB has cut the iliohypogastric n. (L1) that pierces the transversus
abdominis muscle and internal oblique muscle. The nerve is responsible for cutaneous
sensation of pubic region
c. NO. At the level of the incision, the external oblique muscle has transitioned into the
aponeuritic part of the external oblique. Both the vertical and horizontal incision would
be passing through aponeurotic tissue and would yield the same effect.
d. NO. The medial compartment of the thigh is innervated by the nerves originatig at
spinal cord levels L2 and below. These nerves do not course inferiorly and medially
across the abdomen.
14. An 82-year-old male presents with a large bulge under the skin in the inguinal region on his right side. At surgical repair of the diagnosed inguinal hernia, the surgeon points to a structure that she uses to distinguish an ‘indirect’ inguinal hernia from a ‘direct’ inguinal hernia, which is what the patient has. What structure did she point to?
A. Inferior epigastric artery
B. Obliterated umbilical artery
C. Obliterated umbilical vein
D. Obliterated urachus
E. Obturator artery

Answer: 
A. Yes. When bowel protrudes through the anterior abdominal wall medial to the inferior epigastric vessel it means it is a direct hernia and if the bowel protrudes to the right it is an indirect hernia.
B. No. The obliterated umbilical artery does not serve, as a landmark when determining if an inguinal hernia is direct or indirect.
C. No. The obliterated umbilical vein courses from the umbilicus to the liver. The umbilical vein is not associated with an inguinal hernia.
D. No. The urachus is not associated with an inguinal hernia.
E. No. The Obturator artery courses from the internal iliac artery through the obturator foramen on route to the medial thigh.

15. A 62-year-old woman with a history of uterine bleeding and pelvic pain is diagnosed with uterine sarcoma and is scheduled to undergo surgery. Which of the following structures inferior to the uterine artery must be identified and protected during an abdominal hysterectomy?
A. Internal iliac artery
B. Ovarian artery
C. Pudendal nerve
D. Ureter
E. Urethra

Answer: 
D

16. A patient with severe hepatic cirrhosis has signs and symptoms of long-standing (chronic) portal hypertension. Those signs and symptoms include all each of the following, EXCEPT:
A. dilated veins around the umbilicus
B. dilated veins within the distal end of the esophagus
C. dilated veins within the rectum
D. enlarged spleen (splenomegaly)
E. infarction of hepatic tissue due to lack of oxygenated blood

Answer: 

A. No. The paraumbilical veins would dilate in portal hypertension because they drain into the portal vein or through the superficial epigastric plexus.
B. No. The esophageal veins drain to the portal vein or azygos vein system.
C. No. Rectal veins drain into the inferior mesenteric veins to the portal veins or through the internal pudendal veins.
D. No. The venous drainage of the spleen is the splenic vein which drains into the portal vein and as a result can result in the spleen swelling due to lack of drainage.
E. Yes. Even though the portal vein is not carry a lot of blood through the liver the hepatic arteries are still functioning and provide oxygen to the hepatocytes.

17. Pain from gallstones typically occurs when a gallstone lodges in the cystic duct or common bile duct. Obstruction of either duct by a gallstone will prevent bile from passing through the major duodenal papilla, which is located in the:
A. 1st part of the duodenum
B. 2nd part of the duodenum
C. 3rd part of the duodenum
D. 4th part of the duodenum
E. 5th part of the duodenum

Answer:
B

18. As a result of a straddle injury that occurred when she fell on the crossbeam of her bicycle, a 22-year-old woman sustains a traumatic laceration through the perineal body. Because the perineal body plays a critical role in maintaining stability of the perineum, surgical repair was undertaken. The laceration was found to have damaged not only the perineal body but also several of the structures that attach directly to it. Which of the following structures is most likely to be spared by a laceration through the perineal body?
A. Bulbospongiosus muscle
B. Coccygeus muscle
C. External anal sphincter
D. Levator ani muscle
E. Perineal membrane

Answer:
B
19. The parasympathetic nervous system to the GI tract (gut) is characterized by:
A. Preganglionic cells bodies that originate in either the brainstem or S2-4 spinal cord and provide motor supply to glands and gut smooth muscle
B. Preganglionic cells bodies that originate in either the brainstem or S2-4 spinal cord and provide motor supply to vascular smooth muscle
C. Preganglionic cells bodies that originate in the thoracic region of the spinal cord and provide motor supply to glands and gut smooth muscle
D. Postganglionic cells bodies that originate in either the brainstem or S2-4 spinal cord and provide motor supply to glands and gut smooth muscle
E. Postganglionic cells bodies that originate in either the brainstem or S2-4 spinal cord and provide motor supply to vascular smooth muscle
F. Postganglionic cells bodies that originate in the thoracic region of the spinal cord and provide motor supply to glands and gut smooth muscle

Answer: A

20. A 58-year-old male with severe atherosclerosis sustains a thrombotic occlusion of his superior mesenteric artery. The organs of the foregut that receive their blood supply from that artery continue to function normally because anastomoses between which of the:
A. left gastric artery and esophageal artery
B. left gastroepiploic artery and splenic artery
C. proper hepatic artery and cystic artery
D. right colic artery and middle colic artery
E. superior and inferior pancreaticoduodenal arteries

Answer: E

21. Perforation of a duodenal ulcer is a potential emergency situation because of the possibility for rapid blood loss due to erosion through the ________ artery because that artery is ________.
A. Gastroduodenal artery; lateral to the fundus of the stomach
B. Gastroduodenal artery; posterior to the horizontal portion of the duodenum
C. Gastroduodenal artery; posterior to the superior part of the duodenum
D. Left gastric artery; medial to the esophagus at the cardia of the stomach
E. Right gastric artery; posterior to the horizontal portion of the duodenum

Answer: C
22. Surgical procedures in the region of the posterior abdominal wall require careful dissection of the peripheral nerves, to protect them. The most commonly used nerve from which to identify the neighboring nerves in the posterior abdominal wall is the _________ because it traverses the _________.
A. Genitofemoral nerve; anterior surface of the psoas muscle
B. Iliohypogastric nerve; anterior surface of the psoas muscle
C. Lateral femoral cutaneous nerve; anterior surface of the psoas muscle
D. Obturator nerve; anterior surface of the iliacus muscle

Answer: A

23. The bulbospongiosus muscle:
A. elevates the testis during the cremasteric reflex
B. moves blood from crura into the body of the erect penis
C. removes residual urine from urethra after urination
D. voluntarily closes off the urethral orifice

Answer: C
24. Portal hypertension is an increase in the pressure within the portal vein caused by a blockage in the blood flow through the liver usually due to cirrhosis. Cirrhosis (scar tissue) blocks the flow of blood through the liver and in chronic conditions surgery may be necessary. One surgical procedure is the distal splenorenal shunt (DSRS) in which the splenic vein is detached from the portal vein and reattached to the left renal vein thus relieving the pressure in the portal vein.

The pancreas produces a hormone called glucagon. Glucagon targets hepatocytes in the liver to break down glycogen into glucose.

Explain how glucagon will reach the liver following a DSRS surgical procedure. Start with the pancreas releasing glucagon into the splenic vein and ending with glucagon entering the liver.

Answer:

- Pancreas
- Pancreatic veins
- splenic vein
- left renal vein
- IVC
- heart
- aorta
- superior mesenteric artery
- small intestine capillaries
- superior mesenteric vein
- portal vein
- Liver

- Pancreas
- Pancreatic veins
- splenic vein
- left renal vein
- IVC
- heart
- aorta
- Celiac trunk
- Common hepatic artery
- Hepatic artery proper
- Left/Right Hepatic arteries
- Liver
25. Using the schematics below draw the following two neuronal pathways:

A. **Sympathetic neurons to the sweat glands in the S2 dermatome**: start from the solid circle in the lateral horn of the gray matter of the spinal cord at L2 and end in the skin at the S2 dermatome.

B. **Parasympathetic neurons to the bladder**: start from the solid circle in the gray matter of the spinal cord at S2 and end in the smooth muscle of the bladder.
Answer:
26. A 45-year-old woman has a uterine leiomyoma that is 5 cm in diameter and is pressing on the urinary bladder, causing urinary frequency. Which of the following is the most likely location of the leiomyoma?
   a. Cervical canal
   b. Lateral margin of the uterine cavity
   c. Subendometrially in the uterine cavity
   d. Subperitoneally on the anterior surface of the uterine corpus
   e. Subperitoneally on the posterior surface of the uterine fundus

   Answer: d

27. During a study of bladder function, a healthy 20-year-old male subject drinks 1 L of water and delays urination for 30 minutes after feeling the urge to urinate. Which of the following muscles permits his voluntary control of micturition?
   a. Coccygeus
   b. Detrusor
   c. External urethral sphincter
   d. Internal urethral sphincter
   e. Obturator internus

   Answer: c

28. A 19-year-old woman comes to the physician because of a 5-day history of increasingly severe right lower abdominal pain and bloody vaginal discharge. Her last menstrual period was 8 weeks ago. Abdominal examination shows exquisite tenderness of the right lower quadrant. A serum pregnancy test result is positive. Ultrasonography shows no gestational sac in the uterus. Which of the following is the most likely location of this patient's fertilized egg?
   a. Cervix
   b. Peritoneum of the right lower abdominal wall
   c. Rectouterine pouch (of Douglas)
   d. Right fallopian tube
   e. Right ovary

   Answer: d
29. A 6-year-old boy has a large intra-abdominal mass in the midline just above the symphysis pubis. During an operation, a cystic mass is found attached to the umbilicus and the apex of the bladder. Which of the following is the most likely diagnosis?
   a. Hydrocele
   b. Meckel cyst
   c. Meckel diverticulum
   d. Omphalocele
   e. Urachal cyst

   Answer: e

30. A 5-year-old girl is brought to the emergency department because of fever and severe abdominal pain. Acute appendicitis is diagnosed. In the examination room, she keeps her right hip flexed and resists active extension of the hip. The inflamed structure associated with these symptoms is most likely in contact with which of the following structures?
   a. Abdominal wall and the external oblique muscle
   b. Obturator internus muscle
   c. Psoas major muscle
   d. Quadratus lumborum muscle
   e. Transversus abdominis muscle

   Answer: c

31. A previously healthy 72-year-old man comes to the physician because of decreased urinary output during the past 2 days; he has had no urinary output for 8 hours. Examination shows suprapubic fullness and an enlarged prostate. His serum urea nitrogen concentration is 88 mg/dL, and serum creatinine concentration is 3.5 mg/dL. Which of the following is the most appropriate next step in management?
   a. Ultrasonography of the prostate
   b. Ultrasonography of the kidneys
   c. CT scan of the abdomen
   d. Bladder catheterization
   e. Intravenous pyelography

   Answer
   d
**Mesovarium ligament**

32. The ovary is attached to the posterior lamina of the broad ligament by which mesentery?
   a. Mesovarium
   b. Mesometrium
   c. Mesosalpinx
   d. Mesoappendix

Answer: a

33. Identify the level of the vertebral column, indicated by A – E on the following radiograph, where nerves involved in the cremasteric reflex enter and exit the vertebral canal.

Answer
   B
34. A previously healthy 72-year-old man comes to the physician because of decreased urinary output during the past 2 days; he has had no urinary output for 8 hours. Examination shows suprapubic fullness and an enlarged prostate. His serum urea nitrogen concentration is 88 mg/dL, and serum creatinine concentration is 3.5 mg/dL. Which of the following is the most appropriate next step in management?

a. Ultrasonography of the prostate  
b. Ultrasonography of the kidneys  
c. CT scan of the abdomen  
d. Bladder catheterization  
e. Intravenous pyelography

Answer: d

35. An infection of the anterior abdominal wall inferior to the umbilicus, or bleeding of the superficial vessels in the anterior abdominal wall inferior to the umbilicus, may spread to the perineum because of the inferior continuation of__________ into the perineum.

a. Deep fascia  
b. Camper’s fascia  
c. Parietal peritoneum  
ed. Scarpa’s fascia  
f. Transversalis fascia

Answer: e

36. A patient’s spinal cord has been completely severed at the level of vertebra T10. This patient’s brain will still receive somatic and visceral sensations from all of the following structures, EXCEPT the:

a. Diaphragm  
b. Gall bladder  
c. Skin overlying the xiphoid process  
d. Stomach  
e. Urinary bladder

Answer: e
37. A motor vehicle accident victim was taken to the E.R., and subsequently to surgery, after it was discovered that fractured ribs had lacerated the vascular supply to her liver. In what single location could the surgeon place a clamp (or simply pinch) to stop the bleeding before the surgeon began to repair the laceration?
   a. Falciform ligament
   b. Hepatoduodenal ligament
   c. Hepatogastric ligament
   d. Origin of the common hepatic artery
   e. Origin of the superior mesenteric artery

   Answer: b

38. Which of the following consists of highly modified postganglionic sympathetic neurons?
   a. Adrenal cortex
   b. Greater splanchnic nerve
   c. Inferior hypogastric plexus
   d. Lumbar splanchnic nerves
   e. Superior mesenteric ganglion

   Answer: a

39. The genitofemoral nerve:
   a. carries sensory information from skin over the medial portion of the thigh
   b. courses directly over the iliacus muscle
   c. is a branch of the femoral nerve
   d. passes through the deep inguinal ring
   e. supplies the testis

   Answer: d
40. The superior and inferior gluteal arteries are named for their locations relative to the:
   a. Gluteus maximus muscle
   b. Lesser sciatic foramina
   c. Obturator internus muscle
   d. Piriformis muscle
   e. Sacrotuberous ligament

   Answer:
   d

41. A male cyclist began experiencing difficulty achieving erections. Concerned, he made an appointment with a urologist. The urologist recommended he change to a bicycle seat with a central region cut out of it. The image below shows the seat he was using before his visit to the urologist (“Before”) and the seat his urologist recommended that he use (“After”).

   ![Before and After Images]

   The change in bicycle seat may help to solve this man’s problem by:
   a. enabling for greater airflow around the man’s testes, decreasing the temperature of the testes
   b. decreasing the pressure on the internal pudendal arteries, thereby increasing blood flow to the erectile tissues of the penis
   c. providing a trough for the man’s penis so that it is not compressed while he is riding his bicycle

   Answer:
   b
42. One of the methods of performing a self-induced abortion is through the use of a coat-hanger being inserted into the uterus through the cervix. One of the significant dangers of this type of self-induced abortion is puncture wounds leading to septicemia. The most likely cause of the infection is that the coat hanger pierced the:

a. anterior fornix of the vagina into the paravesicular pouch
b. anterior fornix of the vagina into the vesicouterine pouch
c. posterior fornix of the vagina into the rectouterine pouch
d. posterior fornix of the vagina into the vesicouterine pouch

Answer: c

43. Identify the CORRECT statement for comparison between male and female pelvic anatomy.

a. Lymphatic drainage from gonads in both sexes will reach aortic lymph nodes
b. The pelvic viscera receive only parasympathetic innervation in both sexes
c. The peritoneal cavity is open to the exterior in males but not females
d. The rectum directly rests on the posterior surface of the urinary bladder in both sexes
e. The ureters follow similar, intraperitoneal paths in both sexes

Answer
a

44. Micturition occurs when the detrusor muscle _______ and the external sphincter _______.

a. Contracts; relaxes
b. Relaxes; contracts

Answer:
a
45. A patient presents to the ED after being stabbed in the anterior abdominal wall. The entry point of the knife wound was vertical at the midline, superior to the umbilicus. Small bowel subsequently herniated through the anterior abdominal wall through the hole created by the knife. What structures in the anterior abdominal wall were traversed, in order, from deep to superficial, by the herniated abdominal contents?
   a. Parietal peritoneum, extraperitoneal fat, transversalis fascia, rectus abdominis muscle, aponeuroses of the transverse abdominis, internal oblique and external oblique muscles, superficial fascia
   b. Parietal peritoneum, extraperitoneal fat, transversalis fascia, aponeuroses of the transverse abdominis and internal oblique muscles, rectus abdominis muscle, aponeuroses of the internal oblique and external oblique muscles, superficial fascia
   c. Parietal peritoneum, transversalis fascia, extraperitoneal fat, rectus abdominis muscle, aponeuroses of the transverse abdominis, internal oblique and external oblique muscles, superficial fascia
   d. Parietal peritoneum, transversalis fascia, extraperitoneal fat, aponeuroses of the transverse abdominis and internal oblique muscles, aponeuroses of the internal oblique and external oblique muscles, superficial fascia
   e. Parietal peritoneum, extraperitoneal fat, transversalis fascia, aponeuroses of the transverse abdominis, internal oblique and external oblique muscles, rectus abdominis muscle, superficial fascia

   Answer: b