

Gross Anatomy & Embryology Sample Items

1. 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

2. 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

3. A 61-year-old man comes to the physician because of a 3-month history of episodes of headache, heart palpitations, and excessive sweating. He has had a 10-kg (22-lb) weight loss during this period. While being examined, during an episode his blood pressure is 210/110 mm Hg. Physical examination shows no other abnormalities. Urine studies show increased catecholamine concentrations. A CT scan of the abdomen is most likely to show a mass in which of the following locations?
 - (A) Adrenal glands
 - (B) Appendix
 - (C) Kidneys
 - (D) Pancreas
 - (E) Stomach

4. 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

5. A 55-year-old man who has alcoholic cirrhosis is brought to the emergency department because he has been vomiting blood for 2 hours. He has a 2-month history of abdominal distention, dilated veins over the anterior abdominal wall, and internal hemorrhoids. Which of the following veins is the most likely origin of the hematemesis?
 - (A) Inferior mesenteric veins
 - (B) Left gastric vein
 - (C) Periumbilical veins
 - (D) Superior rectal vein
 - (E) Superior vena cava

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6. A 3-year-old girl with mild craniofacial dysmorphism has profound hearing deficits. Further evaluation indicates profound sensory auditory deficits and vestibular problems. Altered development of which of the following is most likely to account for these observations?
- (A) Ectodermal placode
 - (B) Intermediate mesoderm
 - (C) Lateral plate mesoderm
 - (D) Neural crest cell
 - (E) Paraxial mesoderm
 - (F) Prochordal mesoderm
7. 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
8. A 22-year-old man is brought to the emergency department because of a suprahyoid stab wound that extends from one side of the neck to the other. His tongue deviates to the right when protruded; there is no loss of sensory modality on the tongue. The injury most likely involves which of the following nerves?
- (A) Left hypoglossal
 - (B) Left vagus
 - (C) Right hypoglossal
 - (D) Right glossopharyngeal
 - (E) Right lingual
9. A 45-year-old woman is found to have adenocarcinoma of the left breast. Resection of the tumor is scheduled, and the physician also plans to obtain samples of the draining nodes. To find these nodes, a radiotracer is injected adjacent to the tumor and images are obtained. The first draining sentinel node in this patient is most likely found at which of the following locations?
- (A) Contralateral neck
 - (B) Ipsilateral axilla
 - (C) Ipsilateral mediastinum
 - (D) Ipsilateral supraclavicle
 - (E) Medial contralateral breast
10. A 3629-g (8-lb) male newborn is delivered at term. During the initial examination, urine is found to be leaking from the umbilicus. This patient most likely has an abnormality of which of the following fetal structures?
- (A) Umbilical arteries
 - (B) Umbilical vein
 - (C) Urachus
 - (D) Urogenital sinus
 - (E) Urorectal septum

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11. A 70-year-old man has a 90% blockage at the origin of the inferior mesenteric artery. He does not have intestinal angina. Which of the following arteries is the most likely additional source of blood to the descending colon?
- (A) Left gastroepiploic
 - (B) Middle colic
 - (C) Sigmoid
 - (D) Splenic
 - (E) Superior rectal
12. A 30-year-old man comes to the emergency department 1 hour after injuring his left knee in a volleyball game. He says he twisted his left leg when he fell to the floor after he and a teammate accidentally collided. He cannot bear weight on his left leg. Physical examination shows tenderness and swelling of the left knee. When the patient sits on the edge of the examination table, the left knee can be displaced anteriorly at an abnormal degree. Which of the following is most likely injured in this patient?
- (A) Anterior cruciate ligament
 - (B) Fibular collateral ligament
 - (C) Menisofemoral ligament
 - (D) Oblique popliteal ligament
 - (E) Transverse ligament of the knee
13. A 70-year-old man is brought to the emergency department because of a 1-week history of increasingly severe left-sided lower abdominal pain and passing gas in his urine. His temperature is 38.9°C (102°F). A CT scan of the abdomen shows gas in the bladder and edema of the fat surrounding the sigmoid colon. There is no obvious lymph node enlargement. Which of the following is the most likely cause of this patient's condition?
- (A) Appendicitis with fistula
 - (B) Bladder infection
 - (C) Diverticulitis with fistula
 - (D) Prostate cancer with fistula
 - (E) Urinary tract infection
14. A 60-year-old man has tenderness in the region distally between the tendons of the extensor pollicis longus and extensor pollicis brevis (anatomical snuffbox) after falling on the palm of his right hand. A fracture of which of the following carpal bones is most likely in this patient?
- (A) Hamate
 - (B) Lunate
 - (C) Scaphoid
 - (D) Trapezium
 - (E) Triquetrum
15. A 20-year-old man is brought to the emergency department 1 hour after he was involved in a motorcycle collision. He was not wearing a helmet. Physical examination shows clear fluid dripping from the nose. X-rays show a fracture of the cribriform plate of the ethmoid bone. This patient is at greatest risk for impairment of which of the following senses?
- (A) Balance
 - (B) Hearing
 - (C) Olfaction
 - (D) Taste from the anterior two thirds of the tongue
 - (E) Taste from the posterior one third of the tongue
 - (F) Vision

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16. A 7-year-old boy tires easily while running. On auscultation, a harsh continuous murmur is heard at the left of the sternum between the first two ribs. Arterial blood oxygen content is slightly higher in the right hand than in the left hand. X-rays of the chest show no abnormalities. Which of the following is the most likely diagnosis?
- (A) Anomalous return of pulmonary blood to the right atrium
 - (B) Patent ductus arteriosus
 - (C) Patent foramen ovale
 - (D) Stenosis of the aortic valve
 - (E) Tricuspid atresia
17. A 50-year-old woman is brought to the emergency department because of severe upper abdominal pain for 24 hours. She has a 2-day history of intermittent fever and pale stools. Her temperature is 38.9°C (102°F), pulse is 120/min, respirations are 20/min, and blood pressure is 90/50 mm Hg. Physical examination shows jaundice and tenderness of the right upper quadrant of the abdomen. Serum studies show a bilirubin concentration of 5 mg/dL, alkaline phosphatase activity of 450 U/L, and lipase activity of 400 U/L (N=14–280). Which of the following is the most likely cause of this patient's symptoms?
- (A) Impaction of a gallstone in the hepatopancreatic ampulla
 - (B) Intestinal obstruction secondary to diverticulitis
 - (C) Pancreatic mucinous cystadenoma
 - (D) Penetration and perforation of a peptic ulcer
 - (E) Ulcerative colitis
18. A 6-year-old boy is brought to the physician by his parents for a follow-up examination because of a heart murmur that has been present since birth. His only symptom is fatigue. His pulse is 110/min, and blood pressure is 80/40 mm Hg. Physical examination shows no cyanosis or clubbing of the fingers. Cardiac examination shows a normal S₁ and a split S₂. A grade 3/6 pansystolic murmur is heard maximally at the lower left to mid left sternal border. He undergoes cardiac catheterization and is found to have a higher than expected oxygen level in the right ventricle. Which of the following is the most likely cause of these findings?
- (A) Coarctation of the aorta
 - (B) Congenital bicuspid aortic valve
 - (C) Pulmonary artery stenosis
 - (D) Tricuspid stenosis
 - (E) Ventricular septal defect
19. A 32-year-old woman, gravida 2, para 2, develops fever and left lower abdominal pain 3 days after delivery of a full-term male newborn. Abdominal examination shows a tender, palpable mass. Ultrasonography of the mass shows an ovarian vein thrombosis. The thrombus is most likely to extend into which of the following veins?
- (A) Hemiazygos vein
 - (B) Inferior vena cava
 - (C) Left internal iliac vein
 - (D) Left internal pudendal vein
 - (E) Left renal vein
20. During a study of bladder function, a healthy 20-year-old man 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

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Answer Form for Gross Anatomy and Embryology Sample Questions

(Questions 1–20)

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Answer Key for Gross Anatomy and Embryology Sample Questions

(Questions 1–20)

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| 1. | D | 11. | B |
| 2. | C | 12. | A |
| 3. | A | 13. | C |
| 4. | E | 14. | C |
| 5. | B | 15. | C |
| 6. | D | 16. | B |
| 7. | D | 17. | A |
| 8. | C | 18. | E |
| 9. | B | 19. | E |
| 10. | C | 20. | C |