

MEDICAL GROSS ANATOMY/EMBRYOLOGY
TLE - extremities & torso
December 1, 1999

Choose the single best answer.

1. In a fall from a scaffold a 25-y.o. male construction worker has landed on the top of his right shoulder in such a way as to stretch his head and neck away from the shoulder. Examination of the patient reveals no fractures, but a likely neurological deficit is a severely compromised ability to
 - 1- medially rotate the arm.
 - 2- flex arm and forearm.
 - 3- extend arm.
 - 4- detect cutaneous sensation on the medial forearm and hand.
 - 5- adduct digits.

2. Sympathetic postganglionic axons responsible for vasoconstriction in the upper limb reach the appropriate spinal nerves via
 - 1- the greater thoracic splanchnic n.
 - 2- gray rami communicantes.
 - 3- ventral roots of the spinal cord.
 - 4- white rami communicantes.
 - 5- the vagus n.

3. Due to the presence of a "cervical" rib a patient suffers from partial obstruction of the main arterial trunk to the upper limb at the level of the first thoracic rib. Angiography demonstrates that the scapular anastomosis is the major collateral route for supply of the affected limb. Afferent supply to this anastomosis in this patient would include the
 - 1- subscapular a.
 - 2- lateral thoracic a.
 - 3- posterior humeral circumflex a.
 - 4- thoracodorsal a.
 - 5- suprascapular a.

4. When asked a question in gross anatomy laboratory, an M1, obviously suffering from chronic sleep deprivation, simply shrugged his shoulders. The principal nerve responsible for this action
 - 1- traverses the scapular notch.
 - 2- passes immediately superior to the scapular notch.
 - 3- courses medially under cover of the levator scapulae m.
 - 4- is not derived from the brachial plexus.
 - 5- courses with the dorsal scapular a.

5. As the result of breaking a glass window with his right fist a teenage boy has lacerated his brachioradialis m. at mid-forearm. There is profuse arterial bleeding requiring surgical repair. A likely neurologic problem is
 - 1- weakened supination of hand.
 - 2- loss of ability to flex proximal interphalangeal joints.
 - 3- anesthesia of lateral dorsum of hand.
 - 4- weakened abduction of thumb.
 - 5- weakened pronation of hand.

6. A 45-y.o. woman seen in clinic complains of pain in her right breast of four months duration. Dimpling of the skin in the superolateral quadrant of the breast is noted. This dimpling is most likely due to involvement of the
- 1- clavipectoral fascia.
 - 2- lymphatic drainage.
 - 3- pectoral fascia.
 - 4- axillary fascia.
 - 5- suspensory ligaments.
7. A patient suffering from ventilatory problems due to primary lung disease is frequently seen to lean forward over chair backs or high counters and rest his upper body weight on his elbows and forearms. He then inspires deeply. In so fixing his arms, the patient is recruiting which upper limb muscle as an accessory muscle of respiration?
- 1- Pectoralis major.
 - 2- Latissimus dorsi.
 - 3- Serratus anterior.
 - 4- Trapezius.
 - 5- Serratus posterior superior.
8. A young woman active in sports suffers from left knee pain that is diagnosed as being due to a tendency for her left patella to track excessively laterally on the patellar surface of the femur. Physical therapy should be designed to strengthen her
- 1- rectus femoris m.
 - 2- vastus medialis m.
 - 3- sartorius m.
 - 4- tensor fasciae latae m.
 - 5- adductor magnus m.
9. A 16-y.o. high school basketball star has sustained a ligamentous injury to her right foot/ankle as the result of landing on it in an inverted position after jumping for a rebound. The injury most likely involves the
- 1- deltoid ligament.
 - 2- "spring" ligament.
 - 3- calcaneofibular ligament.
 - 4- long plantar ligament.
 - 5- short plantar ligament.
10. During the physical exam of a 29-y.o. woman you note a herniating, subcutaneous mass inferior to the inguinal ligament in the region of the femoral triangle. The neck (origin) of this hernia most likely lies
- 1- between the femoral a. and n.
 - 2- between the femoral a. and v.
 - 3- in the lateral compartment of the femoral sheath.
 - 4- medial to the femoral v.
 - 5- external to the transversalis fascia.
11. A 58-y.o. woman suffering from intermittent claudication (painful leg cramps due to vascular insufficiency during walking) has a strong pulse in the artery adjacent to the extensor hallucis longus tendon. This suggests that there would be a weak pulse
- 1- in the femoral triangle.
 - 2- posterior to the medial malleolus.
 - 3- posterior to the knee.
 - 4- on the dorsum of the foot.

12. The nerve fibers defining a given dermatome course through a

- 1- dorsal primary ramus only.
- 2- ventral primary ramus only.
- 3- ventral root.
- 4- dorsal root.
- 5- gray ramus communicans.

Questions 13 & 14 are based on the following case:

During surgery in the posterior mediastinum a surgery resident accidentally lacerates a longitudinally coursing structure lying immediately posterior to the esophagus between major longitudinal venous and arterial structures. Postoperatively the patient is seen to be slowly accumulating material in the thoracic cavity.

13. The accumulating material is most likely to be

- 1- lymph.
- 2- venous blood.
- 3- arterial blood.
- 4- air.
- 5- swallowed water.

14. The space occupied by this substance is the

- 1- right costodiaphragmatic recess (sinus).
- 2- pericardial cavity.
- 3- left pleural cavity.
- 4- mediastinum.
- 5- right costomediastinal recess (sinus).

15. A patient presents with a deep, paravertebral stab (knife) wound in the left 11th intercostal space immediately superior to the 12th rib. Structures and/or spaces penetrated by the knife blade would include the

- 1- lung (lower lobe).
- 2- costodiaphragmatic recess and lung.
- 3- diaphragm and kidney.
- 4- pleural and pericardial cavities.
- 5- pleural space and spleen.

16. A tuberculous lesion in the apical bronchopulmonary segment of the lung bearing the impression of the arch of the azygous v. would drain its infectious contents into the

- 1- hyperarterial bronchus.
- 2- eparterial bronchus.
- 3- middle lobe bronchus.
- 4- superior segmental bronchus.
- 5- lingular division bronchus.

17. An infarction localized to the posterosuperior aspect of the left ventricle most likely involves the

- 1- circumflex branch.
- 2- posterior interventricular artery.
- 3- anterior interventricular artery.
- 4- AV nodal branch.
- 5- left marginal artery.

18. In the ER you examine a 35-y.o. male construction worker who has suffered a "straddle" injury to the perineum. You note the presence of fluid in the lower abdominal wall that appears to be localized rather superficially. You should suspect that this is urine confined
- 1- between Scarpa's (membranous) and Camper's (fatty) fasciae.
 - 2- deep to Scarpa's fascia.
 - 3- in the extraperitoneal connective tissue space.
 - 4- to a space continuous with the deep perineal space (pouch).
 - 5- in the inguinal canals.
19. A 65-y.o. man with a history of cigarette smoking and alcohol consumption is seen in clinic with massively dilated subcutaneous veins on the anterior thorax and abdomen. He complains of persistent cough and recent weight loss. Caput medusae is absent. The likely explanation for the dilated veins is
- 1- an obstructed azygous vein.
 - 2- portal hypertension.
 - 3- obstruction of the hepatic veins.
 - 4- an obstructed superior vena cava.
 - 5- portocaval anastomoses.
20. A 48-y.o. man forcefully walked into a spoke on a locked turnstile at an amusement park. The spoke struck him immediately superior to the inguinal ligament at the level of the linea semilunaris. A bulge developed at the site over the ensuing days. Upon elective surgery the hernia was found to have no contribution from the transversus abdominis or internal abdominal oblique mm./aponeuroses. The hernial covering immediately external to the parietal peritoneum in this case would be the
- 1- falx inguinalis (conjoined tendon).
 - 2- external abdominal oblique aponeurosis.
 - 3- transversalis fascia.
 - 4- internal spermatic fascia.
 - 5- processus vaginalis.
21. The pain of appendicitis becomes localized at McBurney's point due to involvement of the
- 1- general visceral afferent nerve fibers.
 - 2- mesoappendix.
 - 3- cecum.
 - 4- parietal peritoneum.
 - 5- sensory neurons supplying the paraumbilical region.
22. Pancreatitis may lead to the release of pancreatic enzymes from necrotic (dead) regions of the gland. These escaping enzymes will be initially released into the
- 1- retroperitoneal space.
 - 2- lesser peritoneal sac (omental bursa).
 - 3- perirenal fat.
 - 4- space external to transversalis fascia.
 - 5- greater peritoneal sac.
23. The postganglionic sympathetic fibers that are vasomotor to the first part of the duodenum distribute via the
- 1- artery to the foregut derivatives.
 - 2- superior mesenteric a.
 - 3- greater thoracic splanchnic nn.
 - 4- branches of the posterior vagal trunk.
 - 5- lumbar splanchnic nn.

24. Which of the following contributes to both the anterior and posterior walls of the inguinal canal?
- 1- External abdominal oblique m./aponeurosis
 - 2- Internal abdominal oblique m./aponeurosis
 - 3- Transversus abdominis m./aponeurosis
 - 4- Transversalis fascia
 - 5- Parietal peritoneum
25. A patient suffering from portal hypertension has developed hemorrhoids. In this condition blood from the portal system can return to the inferior vena cava from the rectal venous plexus via a route that traverses the
- 1- superficial epigastric v.
 - 2- pampiniform venous plexus.
 - 3- hepatic vv.
 - 4- thoracoepigastric vv.
 - 5- internal iliac v.
26. A 25-y.o. woman presents to the clinic with an ulcerated lesion in the vestibule of the vagina. The lymph nodes immediately draining this region and therefore likely to be enlarged are the
- 1- internal iliac nodes.
 - 2- external iliac nodes.
 - 3- deep inguinal nodes.
 - 4- superficial inguinal nodes.
 - 5- lumbar (aortic) nodes.
27. The major supply of sympathetic innervation to the pelvic viscera is via the
- 1- pelvic splanchnic nn.
 - 2- hypogastric nn.
 - 3- sacral splanchnic nn.
 - 4- postganglionics from the inferior mesenteric ganglion.
 - 5- neuronal cell bodies located in the lateral horns of S2,3,4.
28. A 50-y.o woman who has four children has developed a partial prolapse of the uterus (descent of the cervix and uterus into the vagina). This condition is primarily due to damage (eg, stretching) to the
- 1- pelvic diaphragm.
 - 2- lateral (cardinal) ligaments of the uterus.
 - 3- round ligament of the uterus.
 - 4- broad ligament.
 - 5- urogenital diaphragm.
29. A 40-y.o. nulliparous (never borne children) woman is diagnosed with ovarian cancer. A very aggressive group of cancers that disseminate by local extension and metastases (detached cells), lymphogenous spread would be first to the
- 1- external iliac nodes.
 - 2- internal iliac nodes.
 - 3- lumbar (aortic) nodes.
 - 4- deep inguinal nodes.
 - 5- cisterna chyli.

30. Pudendal nerve blocks for anesthesia of the perineal region may not be sufficient for some procedures in the perineum because of additional sensory supply by the
- 1- inferior rectal nn.
 - 2- perineal nn.
 - 3- dorsal nn. of the penis/clitoris.
 - 4- iliohypogastric nn.
 - 5- ilioinguinal nn.
31. In the process of fertilization all of the following occur involving the spermatozoa, EXCEPT
- 1- the acrosomal reaction.
 - 2- capacitation of the sperm.
 - 3- digestion of the cumulus by hyaluronidase.
 - 4- blockage of polyspermy due to zona hardening.
 - 5- degeneration of sperm tails before sperm penetration of the oocyte.
32. Routine ultrasound examination of a pregnant woman revealed the presence of 10 live embryos. (This is a true clinical case.) Which of the following is the probable cause?
- 1- The inner cell mass has divided into 10 independent embryos
 - 2- Progesterone secretion was increased
 - 3- The woman was treated with an anti-fertility drug
 - 4- Ten oocytes were fertilized by ten sperms
 - 5- Release of gonadotropins was reduced
33. During the second week of development all of the following structures are formed, EXCEPT the
- 1- amniotic cavity.
 - 2- neural plate.
 - 3- yolk sac
 - 4- connecting stalk.
 - 5- chorion.
34. Which of the following materials usually does not cross the placental membrane?
- 1- Vitamins.
 - 2- Bacteria.
 - 3- Drugs.
 - 4- Heparin.
 - 5- Thyroxine.
35. Hyaline membrane disease in premature infants is caused by
- 1- a deficiency of pulmonary surfactant.
 - 2- an excess of pulmonary surfactant.
 - 3- abnormal differentiation of type I alveolar cells.
 - 4- intrauterine asphyxia.
 - 5- atelectasis (lung deflation).

36. Anorectal agenesis is more common in males than females and is usually associated with a rectourethral fistula. The embryologic basis of the fistula is
- 1- failure of the proctodeum to develop.
 - 2- agenesis of the urorectal septum.
 - 3- failure of fixation of the hindgut.
 - 4- abnormal partitioning of the cloaca.
 - 5- premature rupture of the anal membrane.
37. The feminization of the external genitalia is determined by the
- 1- sinovaginal bulbs.
 - 2- H-Y antigen.
 - 3- ovaries.
 - 4- absence of androgens.
 - 5- epoothoron.
38. The metanephric diverticulum (ureteric bud) is derived from the
- 1- mesonephric duct.
 - 2- splanchnic mesoderm.
 - 3- metanephric mesoderm.
 - 4- urogenital sinus.
 - 5- somatic mesoderm.
39. Congenital heart disease is the most common cardiac condition in childhood and most frequently results from
- 1- maternal medications.
 - 2- genetic and environmental factors.
 - 3- rubella virus.
 - 4- fetal distress.
 - 5- mutant genes.
40. All of the following statements regarding the apical ectodermal ridge are correct, EXCEPT
- 1- It first appears in the upper limb
 - 2- It exerts an inductive influence on the limb mesenchyme
 - 3- It appears at the proximal end of the limb bud
 - 4- It promotes growth and development of the limb
 - 5- Injury to it results in severe limb defects

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ANSWER KEY

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|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. | (2) | 11. | (2) | 21. | (4) | 31. | (5) |
| 2. | (2) | 12. | (4) | 22. | (1) | 32. | (4) |
| 3. | (5) | 13. | (1) | 23. | (1) | 33. | (2) |
| 4. | (4) | 14. | (4) | 24. | (2) | 34. | (4) |
| 5. | (3) | 15. | (3) | 25. | (5) | 35. | (1) |
| 6. | (5) | 16. | (2) | 26. | (4) | 36. | (4) |
| 7. | (1) | 17. | (1) | 27. | (2) | 37. | (4) |
| 8. | (2) | 18. | (2) | 28. | (1) | 38. | (1) |
| 9. | (3) | 19. | (4) | 29. | (3) | 39. | (2) |
| 10. | (4) | 20. | (3) | 30. | (5) | 40. | (3) |