EXAM NUMBER_____

STRUCTURAL BASIS OF MEDICAL PRACTICE
EXAMINATION 1

August 23, 2012

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

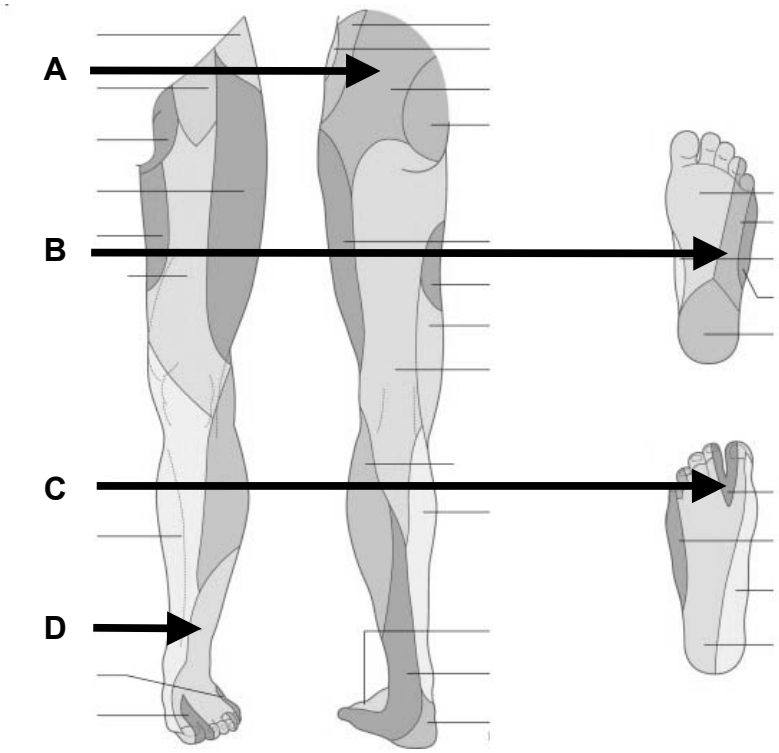
1. Identify the distributions. (2 pts)

A. _____

B. _____

C. _____

D. _____



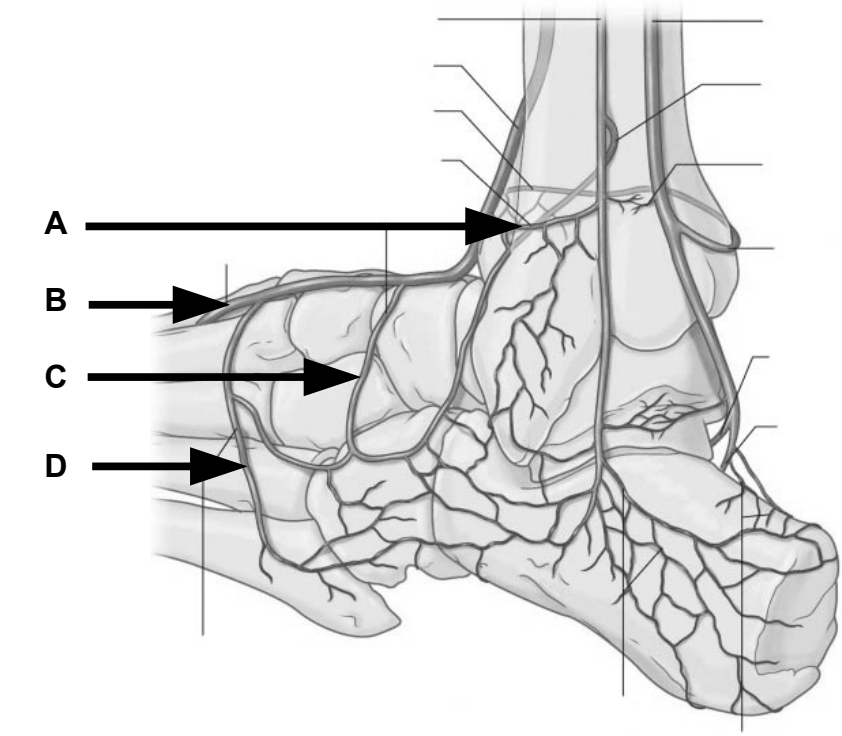
2. Identify the vessels. (2 pts)

A. _____

B. _____

C. _____

D. _____



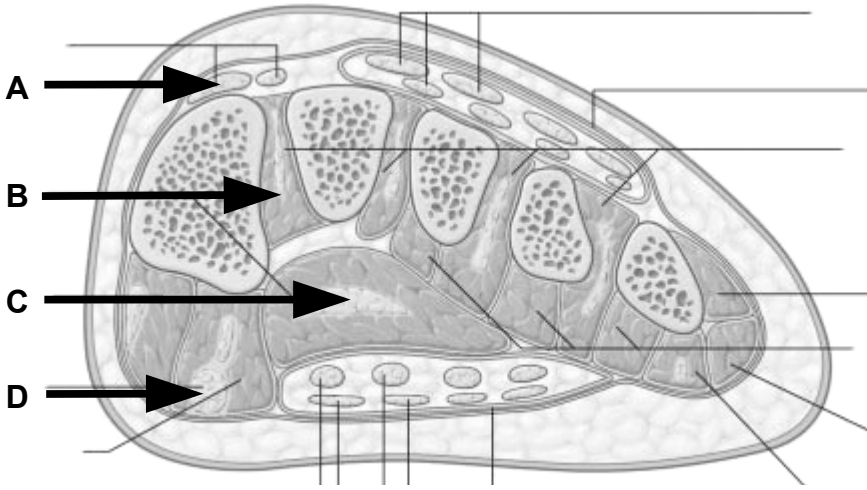
3. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



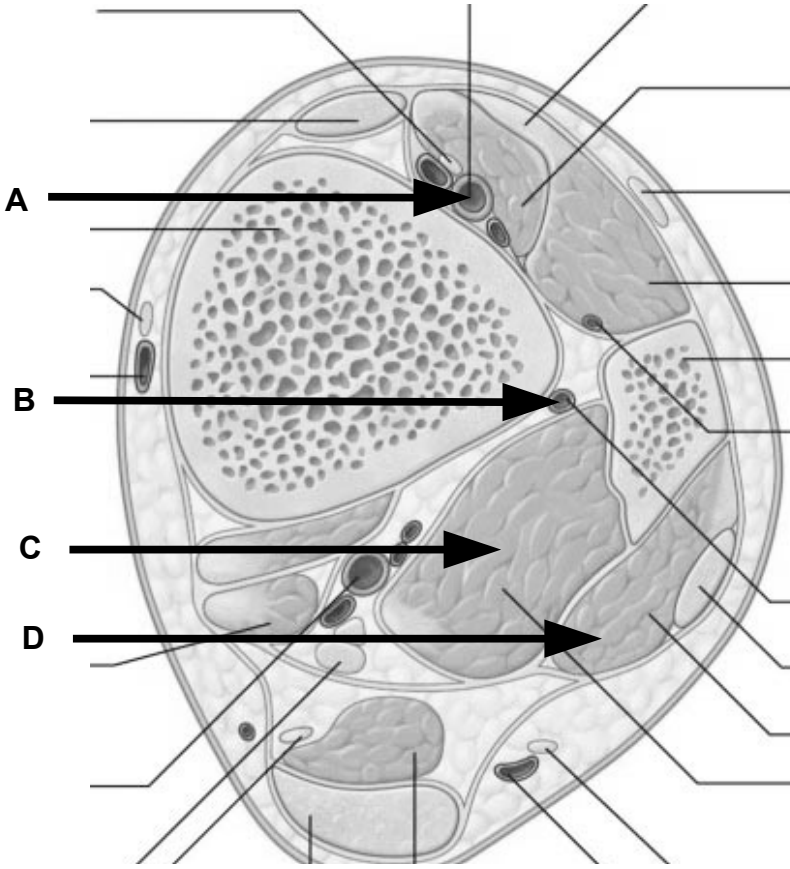
4. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



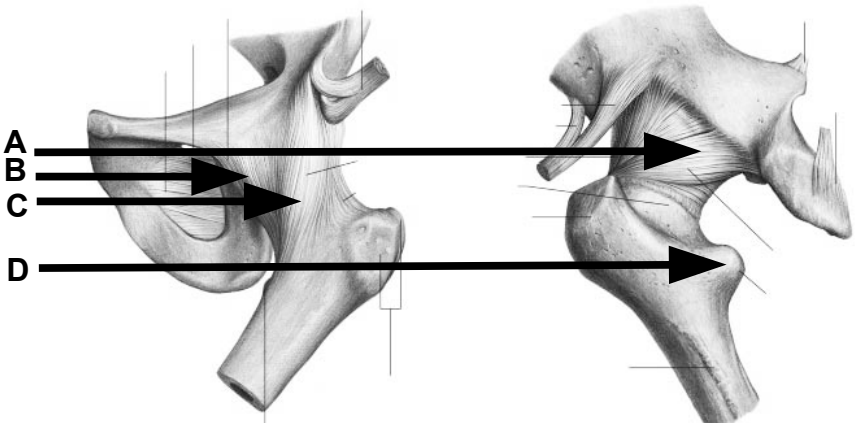
5. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



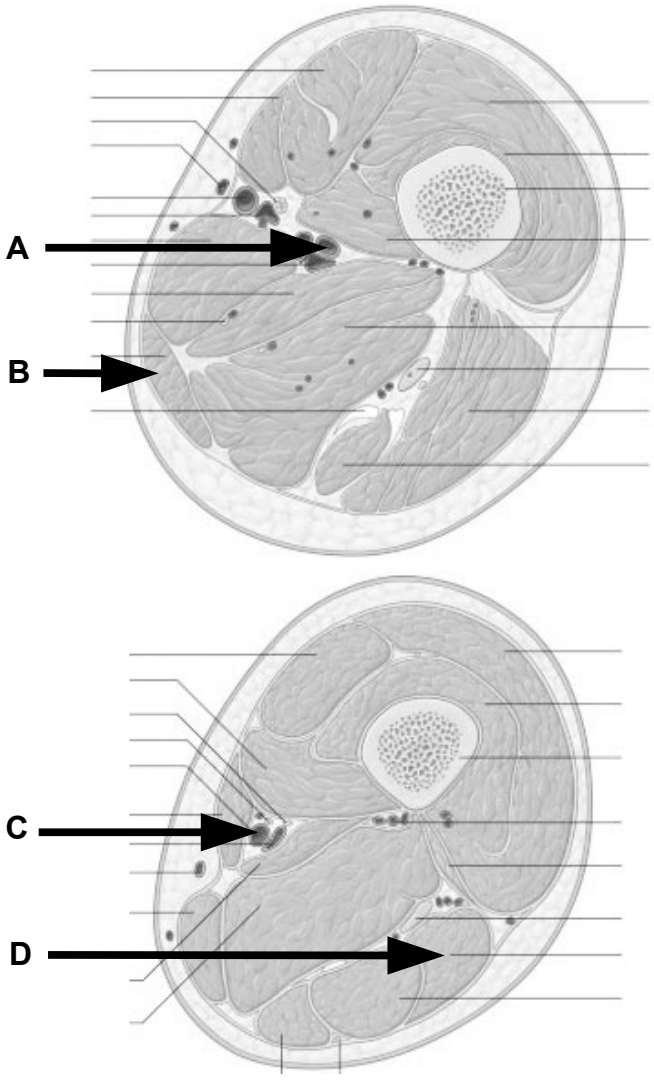
6. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



Part II. Circle the correct answer. All, none, or some may apply. (18 pts)

1. With regard to the gluteal region:

    a. The obturator internus inserts at the trochanteric fossa and medially rotates the thigh.

    b. In addition to the iliotibial tract, the gluteus maximus inserts onto the gluteal tuberosity.

    c. The quadratus femoris laterally rotates the thigh, inserts onto the intertrochanteric crest, and lies anterior to the obturator externus.

    d. The pudendal nerve passes through the lesser sciatic foramen to enter the ischiorectal fossa from the gluteal region.

2. With regard to the thigh:

    a. Within the adductor canal the femoral artery lies superficial to the femoral vein.

    b. The sciatic nerve receives blood supply from the inferior gluteal, perforating, and popliteal arteries.

    c. The rectus femoris, but not the vastus intermedius, extends the hip and flexes the knee.

    d. The short head of the biceps femoris flexes the knee when the hip is extended if the peroneal division of the sciatic nerve is not injured.

    e. The superior lateral genicular artery passes through the adductor hiatus.

    f. The tendons of the sartorius, gracilis, and semitendinosus muscles contribute to the formation of the pes anserinus.

3. With regard to the leg:

    a. The interosseous membrane provides a posterior boundary to the anterior compartment of the leg.

    b. Anterior compartment syndrome may compress the superficial peroneal nerve.

    c. The distal continuation of the posterior tibial artery passes through the interosseous membrane to become the dorsalis pedis artery.

    d. The lateral compartment of the leg is supplied by branches of the peroneal artery and vein.

    e. The tibial nerve enters the deep compartment of the leg by passing anterior to the superior free edge of the soleus muscle.

    f. The sural arteries arise from the popliteal artery within the adductor canal.

4. With regard to the foot:

    a. The plantar interossei adduct the toes toward the third toe.

    b. The tendons of extensor digitorum brevis converge onto the tendons of extensor digitorum longus from the lateral side.

    c. The 5th digit is abducted by a dorsal interosseous muscle.

    d. The foot is more stable in a dorsiflexed (extended) position than in a plantar flexed (flexed) position.

5. With regard to the joints of the lower extremity:

    a. The posterior cruciate ligament resist posterior displacement of the tibia.

    b. The arcuate ligament crosses the anterior surface of the soleus muscle.

    c. The line of gravity passes anterior to the hip, posterior to the knee, and anterior to the ankle when standing erect.

    d. The iliofemoral ligament resists extension and the pubofemoral ligament resists adduction.

6. With regard to the thoracic wall and respiration:

    a. A bronchopulmonary segment consists of lung tissue, pulmonary vein, and a tertiary bronchus

    b. During inspiration the upper ribs increase the transverse diameter of the thoracic cavity.

    c. The costotransverse joints of the lower ribs are more planar than the upper ribs.

    d. The intercostobrachial cutaneous nerve, the lateral branch of the second intercostal nerve, may participate in referred pain from the myocardium.

7. With regard to the mediastinum:

    a. The superior border of the anterior mediastinum is defined by the thoracic inlet.

    b. The phrenic nerve passes anterior to the hilum of the lung.

    c. The ductus venosus shunts oxygenated blood from the left atrium to the left ventricle.

    d. The conus arteriosus is a smooth section of ventricular myocardium leading up to the pulmonary valve.

    e. The atrioventricular node is located in the posterior wall of the right atrium and is influenced by internodal fibers from the sinoatrial node.

f. The cervical dome of the pleura projects superior to the thoracic inlet.

g. The coronary arteries receive blood from the aortic sinuses during systole.

h. The chordae tendineae from a single papillary muscle extend to more than one cusp.

Part III. Indicate your understanding of the following. Answer in the space provided. (30 pts)

1. An atrial septal defect allows errant blood flow between the left and right atria. Symptoms include decreased exercise tolerance, palpitations, and syncope (fainting). **Provide a developmental account for the adult anatomy of the fossa ovalis. (6 pts)**

2. An intragluteal injection into the upper medial quadrant may damage the superior gluteal nerve. **Discuss the anatomy of the superior gluteal nerve and the consequences of damage to this nerve. (6 pts)**

3. The head and neck of the fibula are subcutaneous. Structures that cross this region are easily damaged by compression and trauma. **Discuss the relationships of the head and neck of the fibula (proximal fibula) and the consequences of injury to this area. (6 pts)**

4. A pleural tap is performed by passing a needle through the 9th intercostal space at the midaxillary line into the costodiaphragmatic recess. **Discuss the anatomy of an intercostal space at the midaxillary line and the fascial layers penetrated by a pleural tap. (6 pts)**

5. The incidence for new cases of breast cancer in 2012 is estimated to be 230,000 with 40,000 cases causing death. **Discuss the lymphatic drainage of the right breast. Provide an account for spread of disease to the left breast and to the superficial inguinal lymph nodes. (6 pts)**

Part IV. Questions for Clinical Correlations. (4 pts)

1. A 55 year old male presents to you with a cough for more than 3 months. Recently, he has noted some blood in his sputum when he coughs. You obtain a chest x-ray and a mass is found in the area of the right hilum. A CT scan localizes the mass in the ventral wall of the mainstem bronchus. A CT guided biopsy of the mass is performed by passing a needle through the anterior chest wall.

Which one of the following structures immediately anterior to the mainstem bronchus at this level would be at greatest risk for injury during the procedure?

a. Superior vena cava
b. Pericardium
c. Pulmonary artery
d. Esophagus

2. A 25 year old professional football player injures his right knee while being tackled by several defensive players. He has difficulty bearing weight and is carried off the field. You examine him on the sidelines by putting his knee through several maneuvers. When placing valgus stress on the right knee you note that the joint space on the inside of his knee opens. Varus stress does not cause a similar finding on the joint spaces. When performing the anterior and posterior drawer sign, you note that there is increased translation (movement) of the tibia, backward, on the femur.

Which one of the following structures is most likely torn in this patient?

a. Anterior Cruciate ligament and medial meniscus
b. Anterior cruciate ligament and lateral meniscus
c. Medial collateral ligament and medial meniscus
d. Lateral collateral ligament and lateral meniscus
e. Posterior cruciate ligament and medial collateral ligament
f. Posterior cruciate ligament and lateral collateral ligament

3. A 45 year old male presents to the emergency department complaining of severe substernal chest pain while mowing his lawn. An EKG is performed and when compared to a previous EKG from his family physician there are changes consistent with electrical conduction abnormalities in the atrioventricular node. There is concern that he is having a myocardial infarction resulting in ischemia of this node.

When the patient undergoes coronary angiography, which one of the following arteries is most likely to show occlusion leading to these findings?

a. Circumflex
b. Anterior descending (anterior interventricular)
c. Right coronary or Posterior descending (posterior interventricular)
d. Left marginal

4. A 78 year old female presents to your office with severe pain behind her knee for the last hour. She has a 60 pack year history of cigarette smoking and has uncontrolled hypertension. On exam, you note a pulsatile mass, 3 cm by 3 cm, in the popliteal fossa. An angiogram displays an aneurysm of the popliteal artery.

If this aneurysm expands and places pressure on the nerve lying superficial to the artery in this area, which one of the following best describes the location of the referred pain that this patient is likely to experience?

a. Skin overlying the web between the first and second toe
b. Skin overlying the medial knee joint space and medial malleolus
c. Skin overlying the posterior gastrocnemius and lateral malleolus
d. Skin overlying the entire surface of the leg inferior to the knee

Part V. Answer in the space provided. Include the back of each page if required). (36 pts)

1. A patient was struck on the medial aspect of the ankle by a golf club. Swelling and difficulty bearing weight ensued. **Review the medial region of the ankle. Include bones, articulations, ligaments, tendons, fascia, retinacula, innervation, movements, and arches. (12 pts)**

2. A lacerating injury to the anterior medial region of the thigh may result in severe blood loss. **Review the boundaries (6 in number) and contents of the femoral triangle. State the relationship of structures entering and leaving this region. (12 pts)**

3. Hodgkin lymphoma may involve enlarged posterior mediastinal lymph nodes. Enlarged nodes may, in turn, compress nearby structures in the posterior mediastinum. **Review the anatomy of the posterior mediastinum. Include boundaries, nerves, viscera, lymphatics, vasculature, and relationships. (12 pts)**