

STRUCTURAL BASIS OF MEDICAL PRACTICE

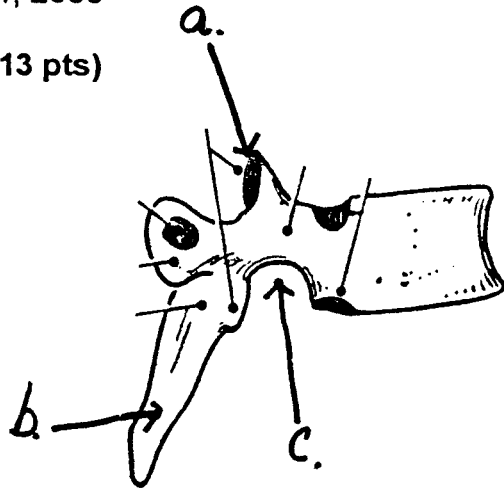
EXAMINATION I

September 1, 2000

**PART I. Answer in the space provided. (13 pts)**

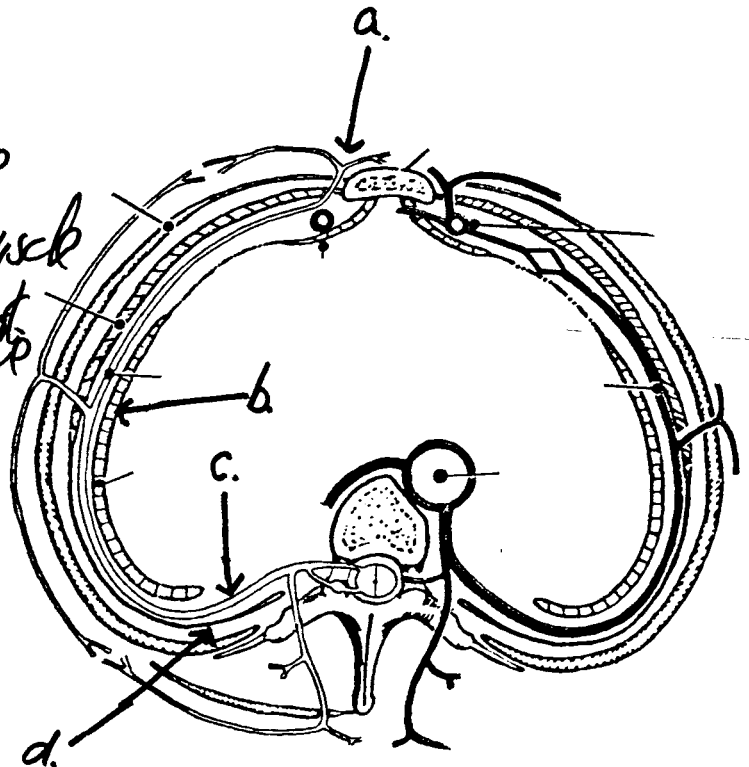
1. Identify the structures. (1.5 pts)

- a. Superior Articular process
- b. Spinous process
- c. Anterior vertebral notch



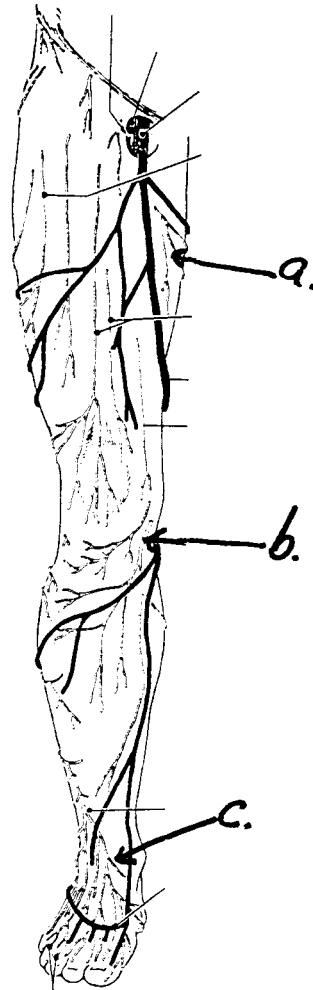
2. Identify the structures. (2 pts)

- a. Ant. Cutaneous Nerve
- b. Innermost intercostal muscle
- c. Vertical semi post. intercostal nerve
- d. Intercostal thoracic, rhomboid



3. Identify the structures. (1.5 pts)

- a. Cutaneous branch of tibial nerve
- b. Saphenous nerve
- c. Superficial peroneal nerve



4. Identify the structures. (1 pt)

- a. Tibialis posterior
- b. Saphenous nerve

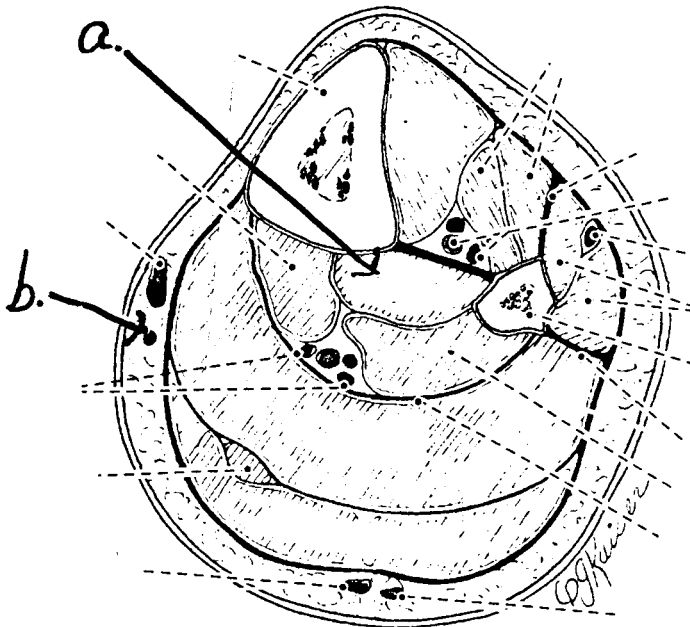
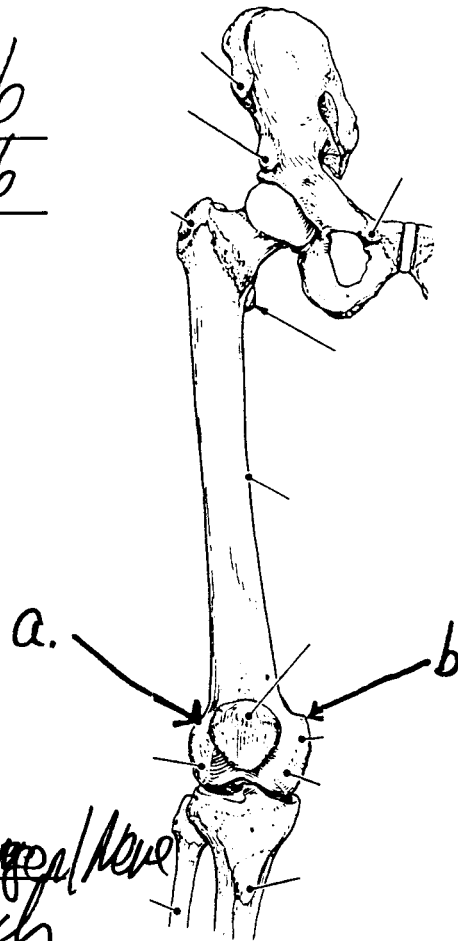


Figure 5.2. Superficial nerves and veins.

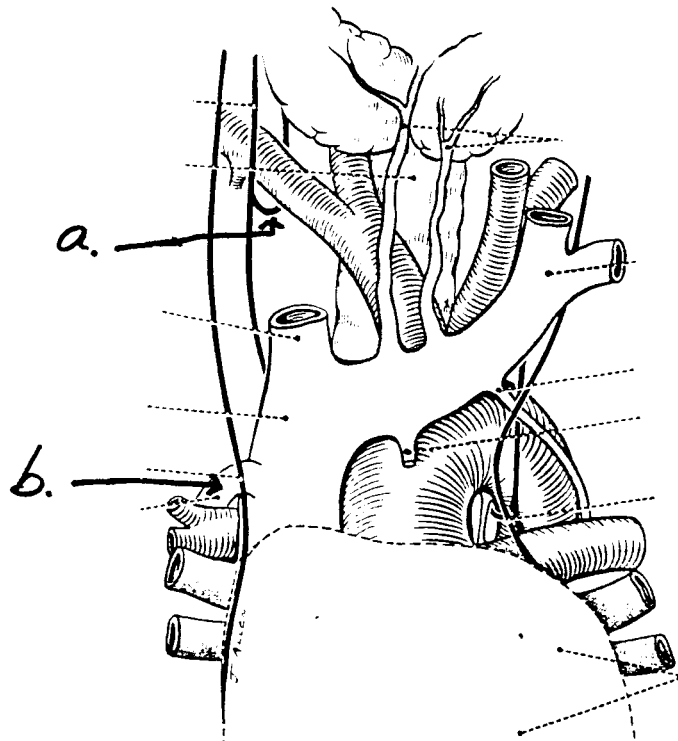
5. Identify the structures. (1 pt)

- a. Lateral epicondyle
- b. Adductor tubercle



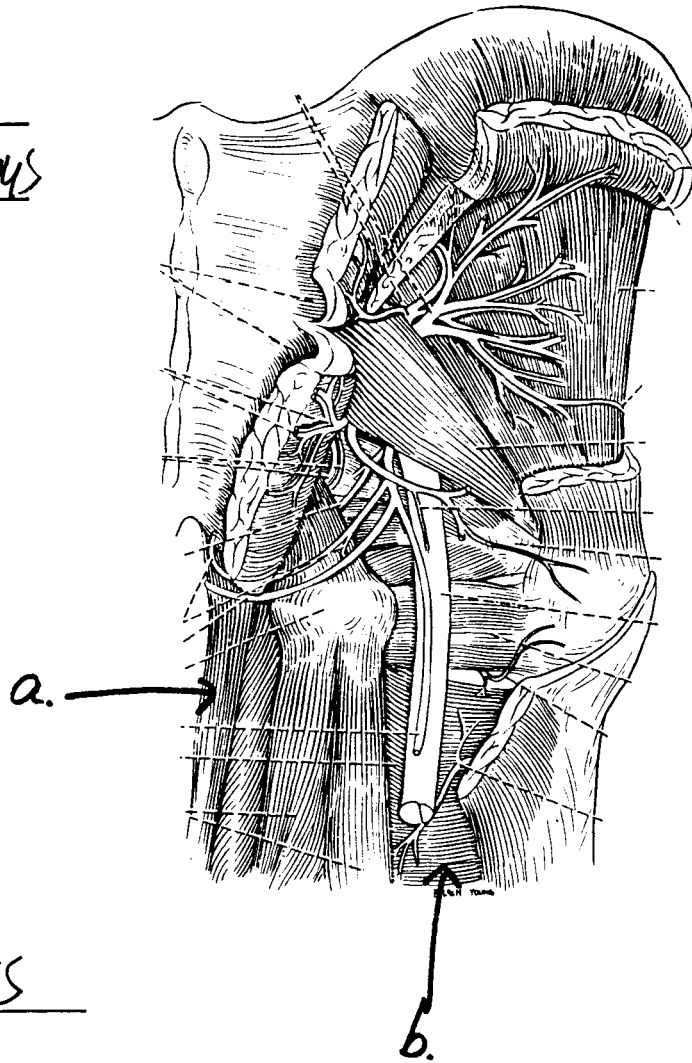
6. Identify the structures. (1 pt)

- a. Right recurrent laryngeal nerve
- b. Right subclavian vein



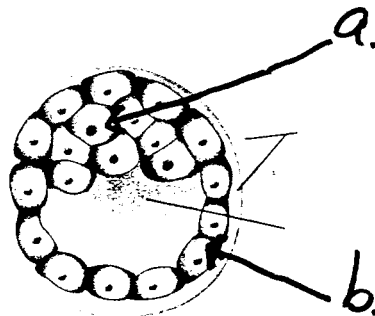
7. Identify the structures. (1 pt)

- a. Gracilis
- b. Rectus femoris



8. Identify the structures. (1 pt)

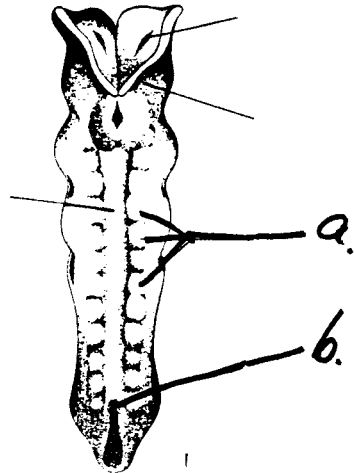
- a. Inner cell mass
- b. Trophoblast



Early blastocyst

9. Identify the structures. (1 pt)

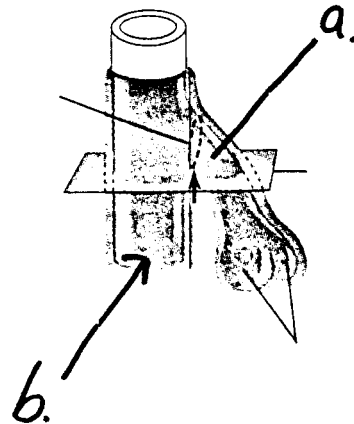
- a. Somites
- b. (Aeoloh) (p) (terio) Neurospira



23 Days

10. Identify the structures. (1 pt)

- a. Larynx or tracheal tube
- b. Esophagus

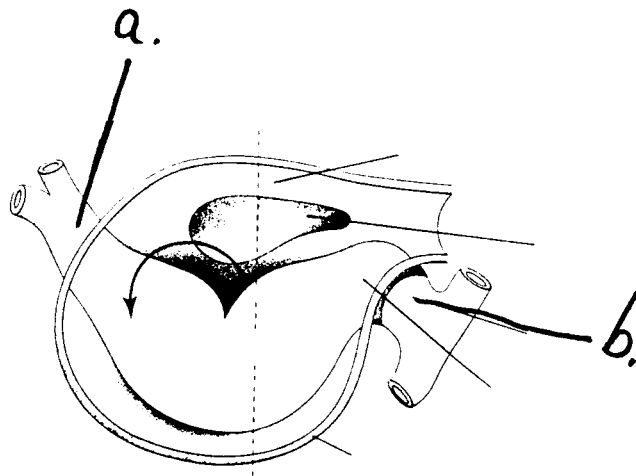


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11. Identify the structures. (1 pt)

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

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



Drawing of a dorsal view of an embryo (about 20 days).

**Part II. Circle the one best answer. (6 pts)**

1. Which statement about the 14-day blastocyst is *false*?
  - a. It is completely implanted in the endometrium
  - b. The extraembryonic mesoderm is split into two layers
  - c. The primordial uteroplacental circulation is established
  - d. Extraembryonic coelom surrounds the yolk sac
  - e. Primary chorionic villa are absent
  
2. The primitive streak
  - a. Extends from the primitive node to the oropharyngeal membrane
  - b. Becomes the vertebral column
  - c. Is a thickening of endoderm
  - d. Is caudal to the notochord
  - e. Induces the formation of the neural tube
  
3. Lung development is divided into 4 periods. Which of these is incorrect?:
  - a. Pseudoglandular - 5 to 17 weeks
  - b. Canalicular - 16 to 25 weeks
  - c. Terminal sac - 24 weeks to birth
  - d. Infundibular - 36-48 weeks
  - e. Alveolar - late fetal to 8 years of age

4. Closure of the foramen primum results from fusion of the
  - a. Septum primum and the septum secundum
  - b. Septum primum and the endocardial cushions
  - c. Septum secundum and the septum spurium
  - d. Septum primum and the right sinoatrial valve
  - e. Septum secundum and the endocardial cushions
  
5. Each of the following statements about the apical ectoderm ridge is correct *except*:
  - a. It appears at the proximal end of the limb bud
  - b. It first appears in the upper limb bud
  - c. It exerts an inductive influence on the limb mesenchyme
  - d. It promotes growth and development of the limb
  - e. Injury to it results in severe limb defects
  
6. Which of the following is *incorrect*:
  - a. The limbs begin to appear toward the end of the 4th week
  - b. The upper limbs rotate laterally through 90 degrees
  - c. The lower limbs rotate medially through almost 90 degrees
  - d. Primary ossification centers are present in long bones by the 7th week
  - e. At the apex of each limb bud the ectoderm thickens to form an apical ectodermal ridge



**Part III. Circle the correct answer. All, none, or some may apply. (27 pts)**

1. With respect to the respiratory system:

- a. The bucket-handle movement of respiration involves ribs 1-6
- b. The plane of pump-handle movement expands the anterior-posterior diameter
- c. The inferior border of the lung in the midaxillary plane is at the 10th rib
- d. A foreign body inhaled into the trachea is much more likely to lodge in the right bronchus
- e. The phrenic nerves are posterior to the hilum of the lung.

2. In regard to the respiratory system:

- a. The right pulmonary artery is longer than the left pulmonary artery.
- b. The left bronchus is smaller in diameter but almost twice as long as the right bronchus.
- c. The left bronchus passes above (superior) the arch of the aorta on its way to the hilum of the left lung.
- d. The trachea bifurcates at the level of the sternal angle.
- e. There is an impression of the azygous vein on the right lung.

3. In the leg:

- a. The tibia can be palpated but the fibula, the bone serving for muscle attachment cannot be palpated.
- b. The popliteus muscle rotates the tibia medially when the leg is off the ground.
- c. The gastrocnemius, but not the soleus, can be palpated.
- d. The superior extensor retinaculum has a characteristic Y-shape.
- e. The peroneus tertius helps form the extensor expansion (hood) of the 5th digit.

4. With respect to the hip joint:

- a. The line of gravity passes behind the hip joint and the iliofemoral ligament becomes taut in extension and maintains erect posture.
- b. The "screw-home" effect of the hip joint occurs in full flexion of the joint.
- c. The posterior branch of the femoral artery gives rise to the artery of the ligamentum capitis.
- d. Abduction of the thigh is limited by the pubofemoral ligament.
- e. The rectus femoris is the only member of the quadriceps femoris that can flex the hip joint.

5. With regard to the knee joint:

- a. The line of gravity passes in front of the axis of the knee joint.
- b. The posterior cruciate ligament prevents the back displacement of the femur.
- c. The fibular collateral ligament can be palpated, especially when the knee is flexed.
- d. The anterior cruciate ligament is intracapsular but extrasynovial.
- e. The tendon of origin of the popliteus muscle is intracapsular.

6. With respect to the ankle joint:

- a. The weight of the body is transmitted from to the talus through the tibia.
- b. The medial longitudinal arch is formed by the calcaneus, talus, navicular, three cuneiforms, and three medial metatarsal bones.
- c. Inversion and eversion take place at the subtalar and transverse talar joints.
- d. The posterior lateral calcaneal artery is a branch of the posterior tibial artery.
- e. The triceps surae muscles are the chief (strongest) for plantar flexion.

7. In the thigh:
- a. The inguinal ligament, but not the pubic tubercle, can be palpated.
  - b. The femoral canal lies lateral to the femoral vein.
  - c. The deep fascia, termed cribriform fascia, serves as a roof for the saphenous opening.
  - d. Tendon fibers from the insertion of the tensor fasciae latae and the gluteus maximus contributes to the iliotibial tract.
  - e. The pectineus is termed a hybrid muscle because it is often innervated by both the femoral nerve and the obturator nerve.
8. With respect to the nervous system:
- a. The superficial cardiac plexus contains preganglionic sympathetic fibers.
  - b. There are white rami communicans at the level of S2,3, and 4.
  - c. The diaphragm is an example of an autonomic innervated muscle.
  - d. The dorsal root ganglion contains the cell bodies of preganglionic sympathetic neurons.
  - e. The greater splanchnic nerve contains postganglionic sympathetic fibers.
9. The contents of the middle mediastinum include:
- a. Roots of the great vessels
  - b. Pericardial cavity and heart
  - c. Inferior portion of the thymus gland
  - d. Arch of the aorta
  - e. Phrenic nerves

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10. In the posterior mediastinum:

- a. The right posterior intercostal arteries cross the vertebral column deep to the azygous vein.
- b. The aorta gives rise to 9 pairs of posterior intercostal arteries.
- c. The right superior intercostal artery derives from the brachiocephalic artery.
- d. The esophagus is narrowed where it is in contact with the arch of the aorta.
- e. The thoracic duct ends at the confluence of the left subclavian and left internal jugular veins.

11. Relationships:

- a. The sternal angle is situated at the level of the 3rd costal cartilage.
- b. The costal margin is formed by the 7th to 10th costal cartilages.
- c. "Floating ribs" do not articulate with the vertebral column.
- d. The highest point of the iliac crest is at the level of L4.

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**Part III. Answer in the space provided (including the back of the page for each question. (54 pts)**

1. Breast cancer afflicts 200,000 women each year, and is responsible for a mortality of 40,000/yr. Breast cancers have the capability of metastasizing (spreading) through the lymphatic channels. **Describe the lymphatic drainage of the breast into the venous system. (6 pts).**

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2. You are examining a patient with arteriosclerosis obliterans of the lower extremity. This is an age-related progressive arterial disease in which the arterial lumen is narrowed, and patients exhibit intermittent claudication, pain, spasm, and/or weakness of muscles especially during walking. To evaluate the chances of success for a bypass of the blocked femoral artery, you need to assess the competency of the profunda femoris and its branches. **Review the anatomy of the profunda femoris artery, including its course, key relationships (especially when the artery and/or its branches leaves one region of the thigh to another), and branches.** (12 pts)

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3. As a 2nd year resident in cardiology, you diagnose a patient with cor pulmonale - an enlargement of the right ventricle secondary to pulmonary malfunction. In considering the medical management of this patient you need to understand the structural entities that support the function of the right ventricle. **Review the anatomy of the right ventricle including structure, relationships, and innervation.** (8 pts)

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4. A 70-yr old female has a raspy and hoarse voice. Angiography shows an aneurysm (dilation) of the aortic arch, and you conclude that the left recurrent laryngeal nerve is compressed. **Review the course of the vagus nerve and its branches in the thorax.** (8 pts)



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5. A patient has just returned from vacation and complains of an injury to the dorsum of the foot while on a sailboat. The dorsal surface is red and tender, movements are limited, and it appears that the foot is infected. **Review the anatomy of the dorsum of the foot and include muscles, relationships, vasculature, and innervation.** (12 pts)

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**6. The gluteus medius and minimus serve important functions in walking. Discuss the anatomy and function of the gluteus medius and minimus muscles, and include a review of the vascular supply, relationships, and innervation. In addition, explain the ramifications of a loss of these muscles with respect to walking. (8 pts)**