

-8.5  
36.5

GROSS ANATOMY EXAMINATION I

(September 1, 1993)

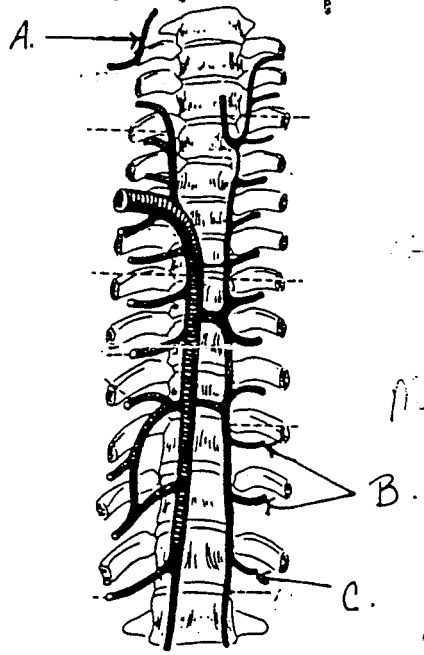
Exam Number

79/120  
65

PART I. Answer in the space provided. (20 pts)

1. Identify the veins. (3 pts)

- a. Supreme intercostal vein
- b. left posterior intercostal vein
- c. left posterior intercostal vein



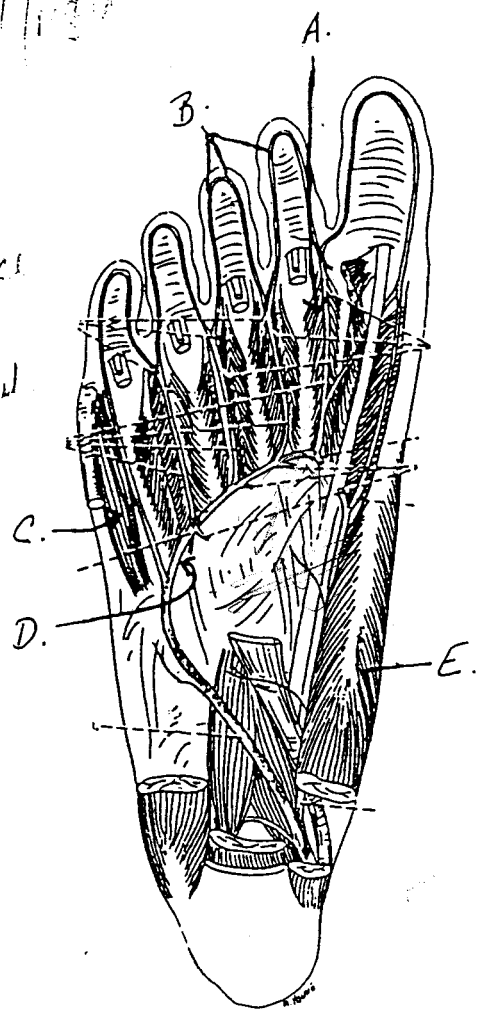
most say 12th

12th space called subcostal

2. Identify the structures. (5 pts)

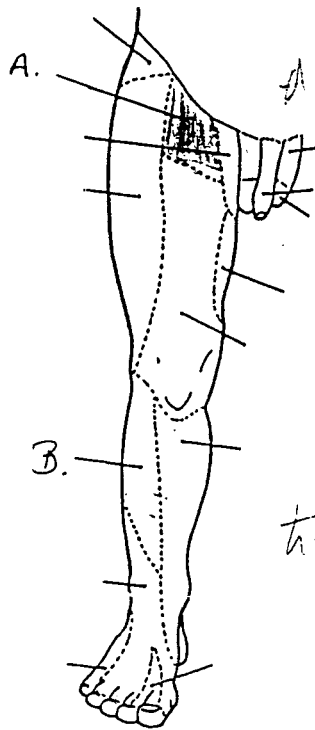
- a. ~~lumbrical muscle~~
- b. plantar digital arteries
- c. flexor digiti minimi brevis muscle
- d. ~~medial plantar artery~~
- e. Abductor Hallucis muscle

DAB



3. Identify the cutaneous innervation to the areas indicated. (2 pts)

- ~~a. superficial femoral nerve~~
- ~~b. superficial peroneal nerve~~ Subcostal



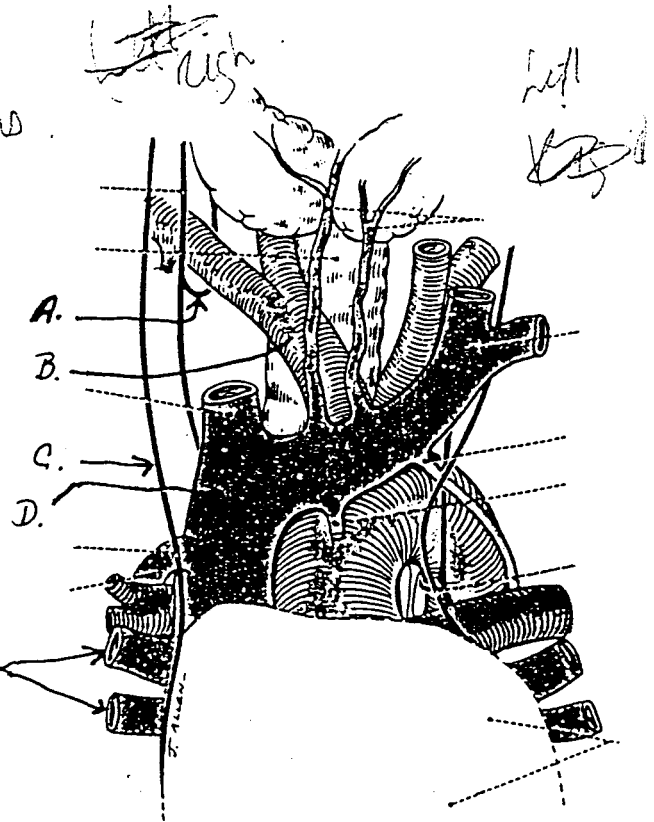
Femoral branch of  
of geniofemoral  
Sural Nerve.

lateral Sural cut.

Label diagrams

4. Identify the structures. (5 pts)

- a. recurrent laryngeal artery
- b. brachiocephalic trunk
- c. phrenic nerve
- ~~d. pulmonary trunk~~ Sup Vena Cava
- e. right pulmonary vein



5. Fill in the blanks using the statements listed below. (5 pts)

(Note: Only numbers with asterisks (\*) will be scored: all other numbers should be used as clues.)

1	P	E	S	A	N	S	E	R	I	N	U	S										
0												U										
3	P	I	R	I	F	O	R	M	I	S		B										
L												C										
I												L										
4	T	H	Y	M	U	S						A										
E												5	E	V	E	Y						
U												I										
6	S	A	P	H	E	N	O	U	S			A										
			I	A								N										
			L	V																		
			U	I								10	H	E	R	S	H	E	Y			
			S	C								U										
												U										
												S							12			
												L							A			
												A							G			
												13	C	R	I	B	R	I	F	O	R	M
																						N

**ACROSS**

- \*1. The aponeurosis for the insertion on the tibia of the tendons of the gracilis, sartorius, and semitendinosus.
- \*3. A gluteal muscle that arises within the pelvis from the front of the sacrum and inserting into the upper border of the greater trochanter. In Latin it means "pear-shaped".
- \*4. A gland that lies in the superior mediastinum, is most prominent in the infant, and is a lymphoid organ.
- 5. The last name of a well-respected teacher of Medical Gross Anatomy at The M.S. Hershey Medical Center and a colleague of 11 Down.
- \*6. A vein in the lower extremity that is named from the Greek word for "clearly visible".
- 10. The sweetest town in America and your home for the next 4 years.
- \*12. Fascia derived from the tela subcutanea that fills an opening (hiatus) just below the inguinal ligament.

**DOWN**

- \*1. A muscle that "unlocks the knee joint".
- \*2. An artery that gives rise to the internal thoracic artery.
- \*7. Portion of the lung where vessels enter and leave.
- \*8. A "boat-shaped" bone in the foot.
- \*9. A broad, fleshy muscle that lies deep to a 2-headed muscle and contributes to the calcaneal tendon.
- 11. The name of a world renowned teacher of Gross Anatomy and a nice guy as well.

Part II. Circle the correct answer(s). All, none, or some may apply. (25 pts)

1.

Structures that one can palpate on a patient include:

- a. Adductor tubercle
- b. Anterior superior iliac spine
- c. Fibular (lateral) malleolus
- d. Interosseous membrane
- e. Falciform margin

2.

A bronchopulmonary segment includes:

- a. Primary bronchus
- b. Parietal pleura
- c. Branch of the pulmonary artery
- d. Pulmonary ligament
- e. Carina

3. In regard to the heart:

- a. The coronary sinus lies to the left of the entrance (aperture) of the inferior vena cava
- b. The SA node lies in the endocardium of the superior surface of the tricuspid (right atrioventricular) valve
- c. The middle cardiac vein drains blood from the coronary sinus
- d. The anterior cardiac veins drain blood from the anterior surface of the left ventricle
- ~~e. There are no trabeculae carnae in the left ventricle~~

4. In respect to the heart:

- a. The time for diastole is equal to that of both atrial and ventricular systole
- b. The inferior vena cava carries oxygenated blood in the fetus
- c. The first heart sound is associated with the closing of the semilunar valves
- d. Close to the moderator (septomarginal trabeculae) the interventricular septum is thin and membranous; this is the pars membranacea
- e. The transverse sinus can be considered a passage from the left to the right side of the pericardial cavity

5. With respect to the nervous system:

- a. the deep cardiac plexus and superficial cardiac plexus only contain autonomic efferent nerves ?
- b. somatic efferent nerves always consist of 2 neurons ?
- c. afferent autonomic nerves synapse (interact) with each other in the dorsal root ganglion ?
- d. a dermatome is an area of skin supplied by a single spinal nerve ✓
- e. parietal pleura is insensitive to pain ✓

6. With respect to the nervous system:

- a. the sympathetic system vasoconstricts blood vessels in the skin
- b. the sympathetic system vasodilates the left coronary artery
- c. the phrenic nerve is part of the autonomic nervous system
- d. the greater splanchnic nerve contains pre-ganglionic neuronal fibers ?
- e. the patellar reflex (knee jerk) is an example of the function of the autonomic nervous system

7. The lateral meniscus of the knee joint:

- a. is C-shaped ~~wrong~~ incomplete O shaped
- b. is attached to the interarticular areas of the tibia ✓
- c. may be united to the medial meniscus by an anterior connection termed the transverse ligament
- d. is located inside the synovial cavity but outside the joint capsule ✓
- e. is firmly attached to the fibular collateral ligament

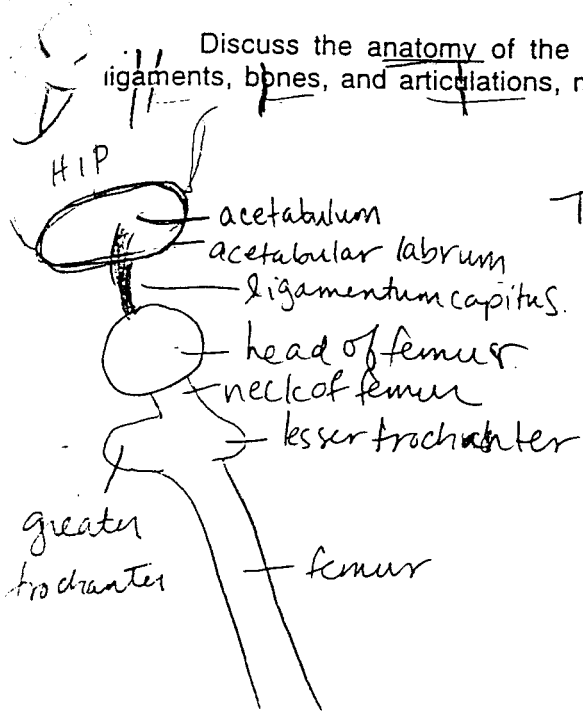
8. In regard to femoral hernias:

- a. involve the adductor canal ✗
- b. occur in the vascular lacuna ✓
- c. have the lacunar ligament as the medial border ✓
- d. occur inferior and lateral to the pubic tubercle ✓
- e. are more common in females than males



Part III. Answer in the space provided. (39 pts)

Discuss the anatomy of the hip joint. Include an account of the innervation, vascular supply, ligaments, bones, and articulations, movements and limitations of movement. (10 pts)



The hip joint is a ball and socket joint. This makes it one of the most flexible joints in the body. It is capable of rotation, abduction and adduction, and flexion and extension. It is capable of  $\sim 120^\circ$  of flexion, but only  $\sim 30^\circ$  of extension. It is also capable of circumduction.

The major nerve supply are branches of the femoral nerve and sciatic nerves that supply the head of the femur. The major blood supply are branches of the femoral artery and veins, which run along the neck of the femur. It is held in place by the ligamentum capitis femoris that goes from the head of the femur to the acetabulum. Ligaments

around it include anteriorly the iliofemoral and pubofemoral, and posteriorly the ischiofemoral. These also help to keep the joint in place and prevent dislocation. There is also synovial fluid which provides lubrication between the articulating bones. There are bursae between the bones and tendons which are fluid filled sacs which protect the overlying muscles from damage, such as the gluteus maximus.

2) The innervation to the pericardium is provided by the parasympathetic vagus nerves which cross and split up into many plexuses, two of which innervate the heart - the superficial + deep cardiac plexuses. Pain in the heart is referred to the inside of the arm, as in the case of angina pectoralis, because the heart is an organ supplied by visceral afferent neurons which are capable of experiencing only dull pain, and transfer this pain <sup>signal</sup> back to the spinal column to be expressed more clearly by somatic afferent neurons. The blood supply is by the internal thoracic artery and drainage by the azygous vein.

3. Discuss the mechanics of breathing. (6 pts)

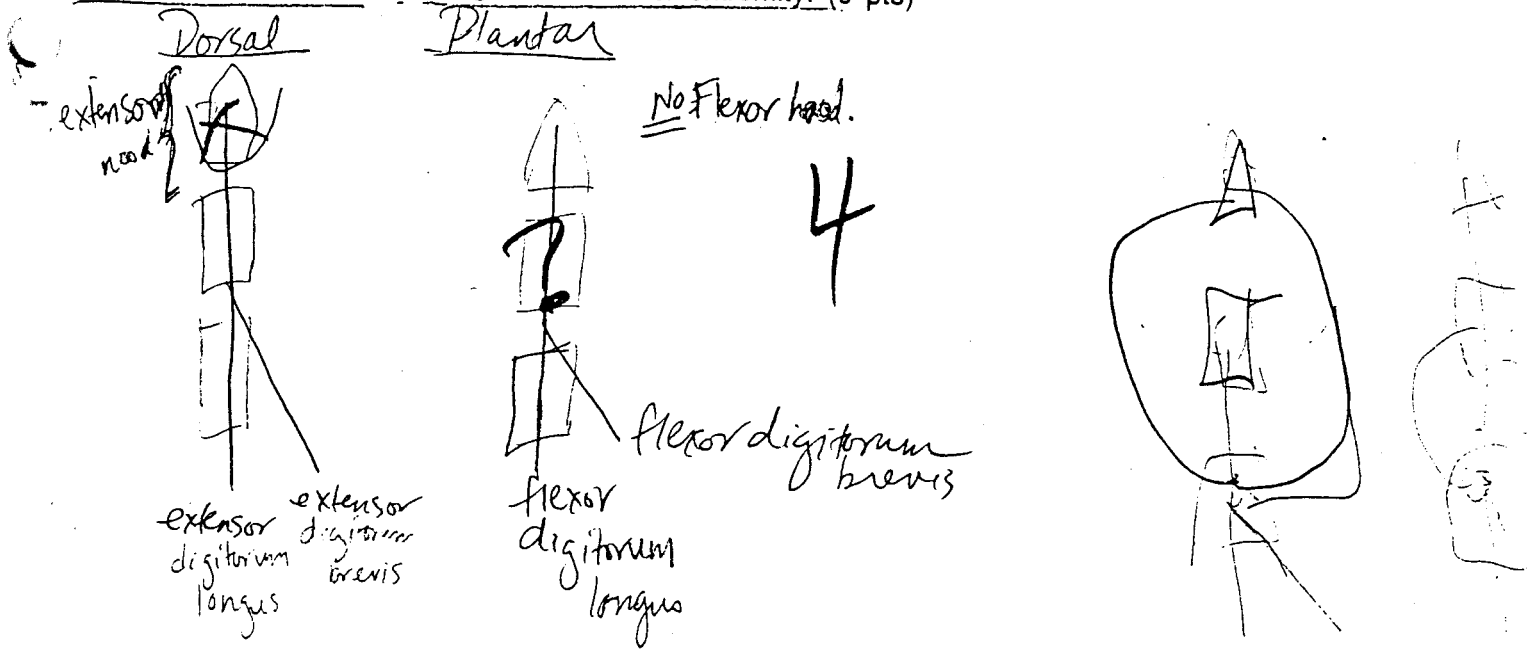
The inspiration phase of breathing takes place when the volume of the thoracic cavity is increased, thereby decreasing the interthoracic pressure to a level below atmospheric pressure, and air rushes in. Expiration is the reverse, but is a passive process. There are 2 major processes which increase the interthoracic volume:

- 1) "pump handle method" - ribs # 1-6 - inc in anterior/posterior directions
- 2) "bucket handle method" - ribs # 7-11 - inc in width of chest cavity
- 3) contraction of diaphragm - inc in depth of chest cavity



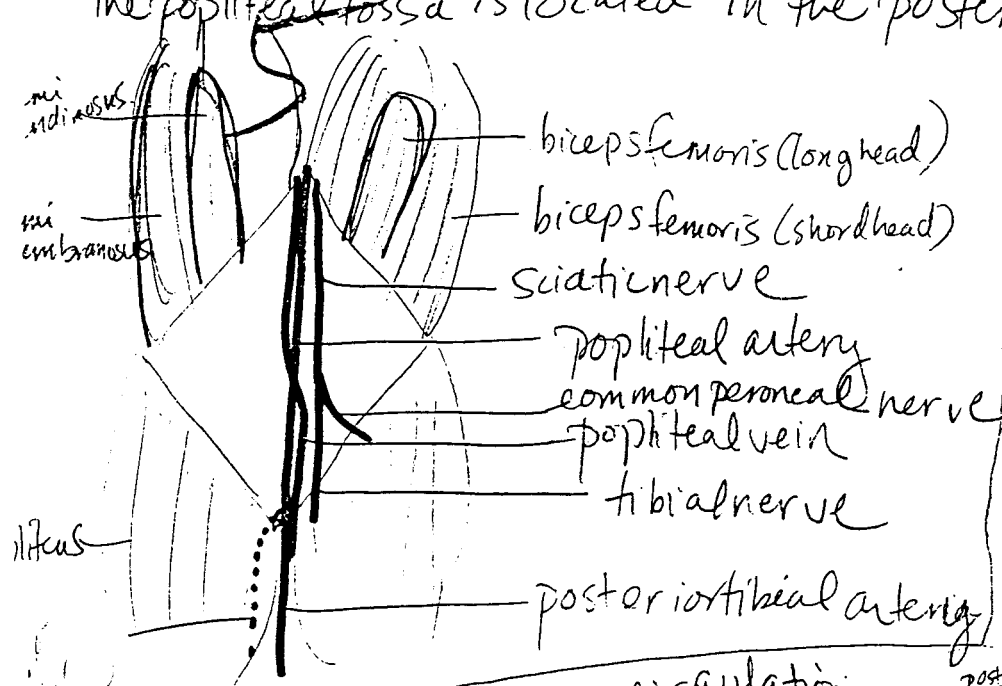


of the phalanges of the 3rd digit of the lower extremity. (6 pts)

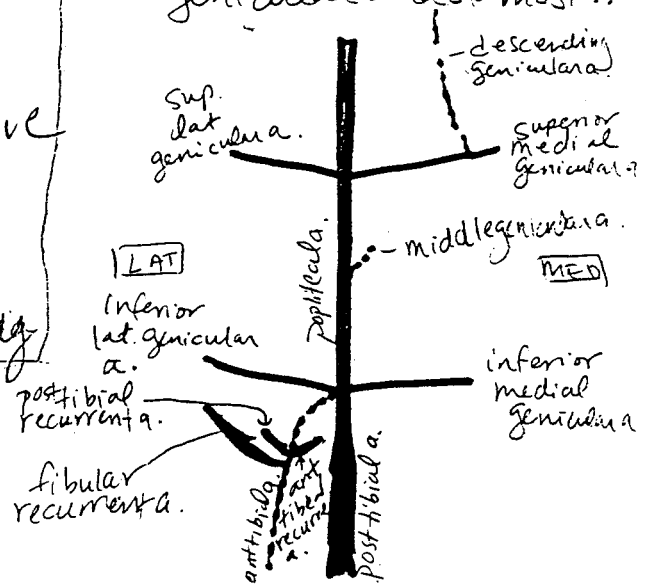


5. Discuss the anatomy (e.g., boundaries, contents) of the popliteal fossa. (6 pts)

The popliteal fossa is located in the posterior knee joint,



It is also site for a collateral circulation system termed the genicular anastomosis:



This collateral circulation system is used in case there is damage or blockage of the main popliteal vessel.

The breast is a frequent site of cancer. Discuss the lymphatic drainage of the breast. (6 pts)

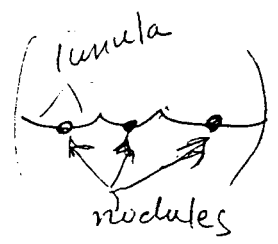
The lymphatic system drains and filters excess interstitial fluid. The lymphatic drainage of the breast is accomplished by the axillary nodes in the armpits, the parasternal nodes, the brachio-sternal nodes. Because the nodes are in close proximity of one another and because the lymphatic ducts can communicate with one another, cancer cells are capable of metastasizing from one breast to the other. Eventually the nodes empty into the thoracic duct on the right hand side and the right lymphatic duct on the right hand side.

1000 on it mean our b/c lymph nodes  
 $5\frac{1}{2} + 8\frac{1}{2} = 14$

Part IV. Indicate your understanding of the following: (16 pts)

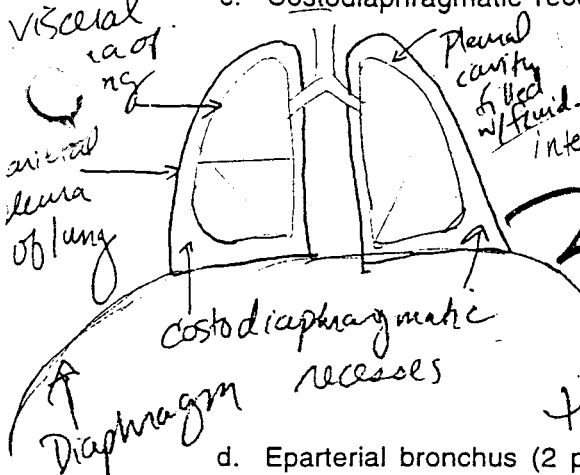
a. Semilunar valves (3 pts)

- are found in the aorta and pulmonary artery
- have 3 cusps
- prevent the backflow of blood to the left ventricle and right ventricle
- do not have chordae tendinae to help them close
- instead, they close by themselves when blood begins to backflow, and also permit filling of the coronary arteries.



b. Subtalar joint (3 pts)

The joint between the talus and the calcaneus bones of the foot. Responsible for inversion and eversion of the foot.



At 13th area posterior to the 8th and 9th intercostal space where there is a pleural space large enough ~~like~~ a fluid sample can be taken if necessary to test for abnormalities such as blood (hemothorax) or air (pneumothorax) in the pleural fluid.

d. Eparterial bronchus (2 pts)

Found in the right lung only.

It is ~~before~~ the bronchus divides further into 2° branch Superior to it is usually the pulmonary arteries, and Inferior to it are usually the pulmonary veins. It is made of thick cartilage, and it has ridges like the trachea.

e. Blood supply to the 1st intercostal space (3 pts)

Arterial: <sup>posteriorly,</sup> from the supreme intercostal arteries coming from the ~~costocervical trunk~~ trunk.

Venous Drainage: <sup>anteriorly,</sup> from the intercostal arteries coming from the internal thoracic artery

~~posteriorly: brachiocephalic v.~~  
~~anteriorly: intercostal v.~~  
From the ~~intercostal~~ veins coming from the azygous and accessory hemiazygous veins.

f. Anterior cruciate ligament (2 pts)

It runs from medial condyle of the tibia to the posterior lateral epicondyle of the femur. It criss crosses with the posterior cruciate ligament. Both are responsible for preventing displacement of the knee joint - the anterior one is to prevent the tibia from moving anteriorly on the femur. The anterior ligament is 1/2 weaker than the posterior and is more likely to be broken along with the medial collateral ligament in knee injuries.