EXAM NUMBER_____

STRUCTURAL BASIS OF MEDICAL PRACTICE

EXAMINATION 5

October 5, 2007

PART I. Answer in the space provided. (8 pts)

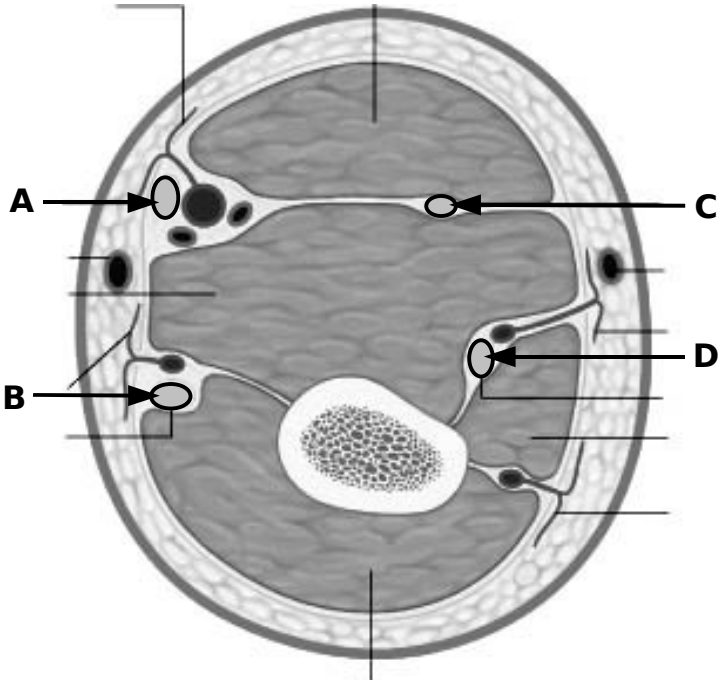
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



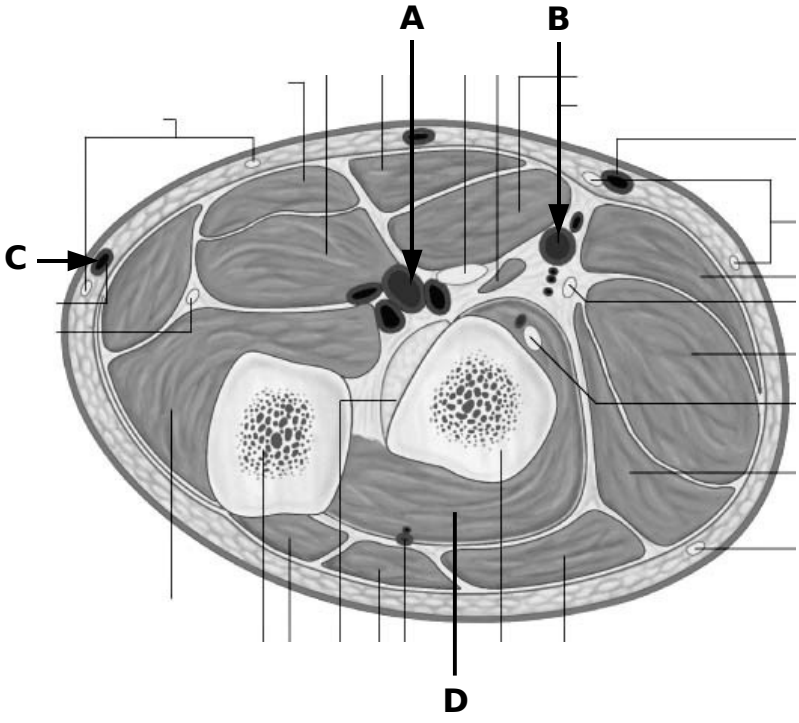
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



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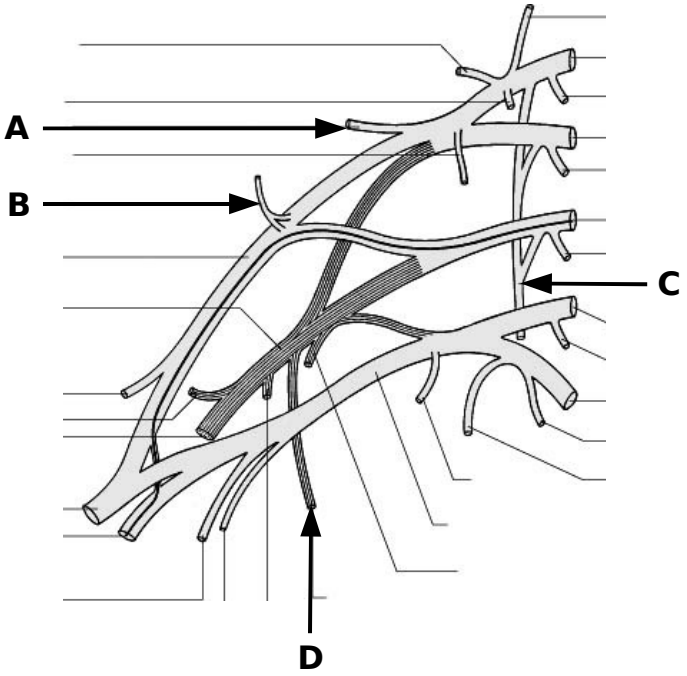
3. Identify the structure. (2 pts)

A._____

B. _____

C. _____

D. _____



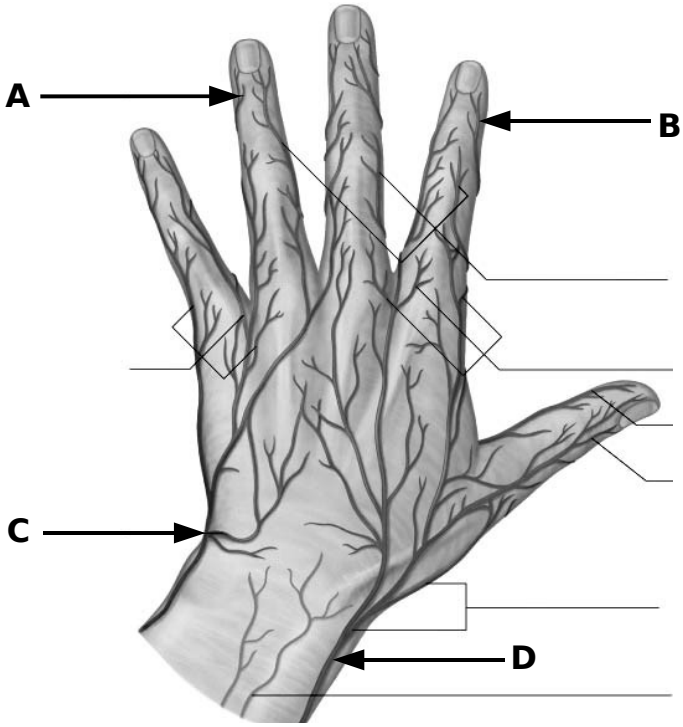
4. Identify the structure. (2pts)

A. _____

B. _____

C. _____

D. _____



Part II. Circle the correct answer. All, none, or some may apply. (36 pts)

1. With regard to the back and the vertebral column:

    a. The anterior longitudinal ligament limits extension of the back.

    b. The serratus posterior inferior muscle is innervated by the thoracodorsal nerve.

    c. The suboccipital nerve provides motor innervation to the rectus capitis posterior major and minor and the superior and inferior obliquus capitis muscles.

    d. The denticulate ligaments are extensions of the **arachnoidea**.

    e. The thoracolumbar fascia provides a site of origin for the latissimus dorsi muscle.

    f. The dural sac extends inferiorly to the level of the 2nd sacral vertebrae.

    g. The internal posterior vertebral venous plexus is within the subarachnoid space.

    h. The anterior longitudinal ligament of the spine forms part of the anterior boundary of the vertebral canal.

    i. The ligamentum fuscia extends between adjacent spines.

    j. The levator scapula muscle originates from transverse processes C1-C4 and inserts onto superior angle of scapula.

    k. A lesion of the upper root of the brachial plexus would weaken protraction of the scapula.

    l. The long thoracic nerve is derived from the lower 3 roots of the brachial plexus.

    m. A lesion of the long thoracic nerve would affect complete abduction of the arm.

    n. Entrapment of the suprascapular nerve at the suprascapular notch could cause uncompensated loss of arm abduction from 0 - 15 degrees and compensated loss of medial rotation of the arm.

    o. A lesion of the lower subscapular nerve would cause weakened arm adduction.

2. With regard to the axilla and brachial plexus:

    a. The dorsal scapular nerve arises from the posterior cord of the brachial plexus.

    b. A lesion of the medial and lateral pectoral nerves would weaken medial rotation and abduction of the arm.

    c. The thoracoacromial artery usually arises from the second segment of the axillary artery.

    d. Transection (complete division) of the medial cord of the brachial plexus would result in loss of elbow flexion.

    e. A lesion of the ulnar nerve within the axilla would cause the resting hand to be extended and adducted.

f. A lesion of the radial nerve within the axilla would cause anesthesia of the dorsum of the hand in the region of the anatomical snuffbox.

g. The ascending branch of the profunda brachii artery enters an anastomosis in the shoulder region.

h. Complete lesions of the ulnar, median, and musculocutaneous nerves within the axilla will cause total loss of flexion at the elbow.

i. A lesion of the radial nerve at the spiral groove would cause loss of extension at the elbow.

j. The ulnar nerve enters the anterior arm by passing through the heads of origin of the flexor carpi ulnaris.

k. Ligation of the axillary artery distal to the thyrocervical trunk and proximal to the subscapular artery causes reverse blood flow in the circumflex scapular artery.

l. Ligation of the axillary artery immediately distal to the posterior humeral circumflex artery causes reverse blood flow in the ascending branch of the profunda brachii artery.

m. The upper subscapular nerve sends a lateral branch to the teres major muscle.

3. With regard to the arm:

a. The brachioradialis muscle assists the biceps brachii in flexing the arm.

b. The pectoralis major muscle crosses the transverse humeral ligament prior to inserting on the lateral lip of the intertubercular sulcus (bicipital groove).

c. The radial collateral artery, within the cubital fossa, is between brachioradialis and the medial border of the brachialis.

d. Within the cubital fossa the median nerve lies lateral to the brachial artery.

e. The median cubital vein crosses the superficial surface of the bicipital aponeurosis.

f. The interosseous recurrent artery is, in part, within the cubital fossa.

g. The humeral head of the pronator teres takes origin from the lateral humeral epicondyle.

h. The lateral head of the triceps brachii originates superior and lateral to the spiral groove whereas the medial head of the triceps brachii originates medial and inferior to the spiral groove.

i. The profunda brachii artery gives rise to the middle collateral artery and the radial recurrent artery.

j. The ulnar head of the pronator teres takes origin from the coronoid process of the ulna.

k. A complete lesion of the radial nerve at the spiral (radial) groove causes uncompensated loss of pronation of the forearm.

l. The radial nerve passes posterior to the superior free edge of teres minor to enter into the triangular interval.

m. Both the coracobrachialis and the short head of the biceps flex the forearm and both arise from the corocoid process.

4. With regard to the forearm:

a. The ulnar nerve passes between the two heads of origin of the extensor carpi radialis muscle.

b. The pronator quadratus muscle has a ulnar origin and an radius insertion.

c. A complete lesion of the ulnar nerve at the ulnar groove would cause loss of willful flexion at the distal interphalangeal joints for the medial two digits.

d. A complete lesion of the ulnar nerve at the ulnar groove would cause the wrist joint of the resting hand to be partially extended and partially adducted.

e. A complete lesion of the median nerve in the axilla will weaken flexion at the elbow joint.

f. A complete lesion of the median nerve superior to the cubital fossa will cause the wrist to be partially extended and partially adducted.

g. The ulnar artery leaves the cubital fossa by passing between the humeral and ulnar heads of origin of the pronator teres muscle whereas the ulnar nerve proceeds into the forearm between the humeral and ulnar heads of origin of the flexor carpi ulnaris muscle.

h. The median nerve passes anterior to the superior free edge of the flexor digitorum profundus.

i. Within the distal forearm the median nerve is along the medial border of flexor carpi radialis.

j. The extensor carpi ulnaris and flexor carpi ulnaris are synergists in regards to adduction of the hand at the wrist.

k. The posterior interosseus nerve pierces the interosseus membrane to innervate pronator quadratus.

l. Flexor Carpi Radialis is included in the carpal tunnel.

m. The anterior interosseous artery passes anterior to pronator quadratus.

n. The anterior ulnar recurrent artery courses between the brachialis muscle and pronator teres muscle to anastomose with the inferior ulnar collateral artery.

o. The primary action of the pronator quadratus muscle is pronation, however this muscle can "switch" origin and insertion and act as a supinator if the forearm and hand are fully pronated.

5. With regard to the hand:

a. The ulnar nerve enters the palm of the hand medial to the pisiform bone and then passes the lateral aspect of the hook of the hamate.

b. In part, the origin of the abductor digiti minimi muscle is from the pisiform bone.

c. The interossei and the lumbricals resist hyperextension at the MP joint.

d. The deep branch of the ulnar nerve passes deep into the palm of the hand by passing between the heads of origin of abductor digiti minimi and flexor digiti minimi brevis.

e. The superficial radial nerve provides sensation to the nail bed of the fifth digit.

f. The radial artery passes deep into the palm by passing between the heads of origin of the first dorsal interosseous.

g. The anterior interosseous artery enters into the dorsal carpal rete.

h. The princeps pollicis artery passes along the posterior border of the first metacarpal bone medial to the radial head of the first dorsal interosseous and lateral to the oblique head of adductor pollicis.

i. The extensor hood of the third digit receives contributions from the attachments of five tendons.

j. The pisiform bone is a sesamoid bone within the tendon of flexor carpi ulnaris.

k. Ulnar nerve injury at the level of the hook of the hamate is expected to result in claw hand (flexed interphalangeal joints and hyperextended metacarpalphalangeal joints).

l. Recurrent median nerve injury is expected to result in simian (ape) hand (supinated thumb).

m. The ulnar boundary of the anatomical snuff box is the tendon of extensor pollicis longus.

n. The trapezium makes up the floor of the anatomical snuff box.

o. The interossei muscles attach to the extensor hood distal to the attachment of the lumbrical muscles.

p. Distal to the extensor pollicis brevis the posterior interosseus nerve runs superficial to extensor pollicis longus.

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Part III. Indicate your understanding (characteristics, importance, function, relationships, boundaries and/or contents) of the following. Answer in the space provided. (20 pts)

1. Quandrangular space: Boundaries (6), contents, and significance. (4 pts)

2. Suboccipital triangle: Boundaries (5), contents, and significance. (4 pts)

3. Anatomical snuffbox: Boundaries (6), contents, and significance. (4 pts)

4. Triangular interval: Boundaries (5), contents, and significance. (4 pts)

5. Ulnar groove (of the humerus): Immediate relationships and significance. (4 pts)

Part IV. Answer in the space provided (including the back of the page or the additional pages for each question). (36 pts)

1. A 36 y.o.f. comes to your office with complaints of severe low back pain and episodes of urinary incontinence. She is 22 weeks gestation and had developed low back pain over the last few weeks. Concerned about exposing her fetus to analgesics she sought treatment from an alternative health provider. Since then the pain has been severe, constant, and it to the point that she is having difficulty walking. On exam, she is in obvious distress. Her pelvic exam displayed poor rectal sphincter tone and "saddle anesthesia." **Review the anatomy of the spinal canal. Include boundaries, bones, articulations, ligaments, stability, spaces, contents, vascularization, relationships, and lymphatic drainage. (12 pts)**

2. A 55 y.o. female comes to your office with persistent right shoulder pain. She states she had begun a weight-training program recently. After increasing her weight on the military press she noted the next morning that her shoulder was quite painful. She felt she may have slept on it wrong but it has not been improving and she is now having difficulty raising her arm above her head. On physical exam, her "oil can" test is positive on the right side. She has difficulty abducting her right arm above her shoulder. She cannot hold her right arm up when you apply resistance during abduction. **Review the anatomy of the rotator cuff. Include bones, muscles, movements, vascularization, innervation, relationships, and lymphatic drainage. (12 pts).**

3. A 56 y.o. female presents with complaints of "numb hands" in the morning. She states her hands are numb when she first awakens and will resolve after she shakes her hands for a few seconds. She has awakened, occasionally at night with pain in her hands that, again, improves soon after she awakens and rubs them. Physical exam displays no neurovascular compromise in her upper extremities. There is no thenar or hypothenar atrophy. Her Phalen's and Tinnel's tests are positive. **Review the anatomy of the carpal tunnel. Include bones, ligaments, contents, relationships, nerve injury, and lymphatic drainage. (12 pts)**