EXAM NUMBER_____

STRUCTURAL BASIS OF MEDICAL PRACTICE
EXAMINATION 5

October 1, 2010

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

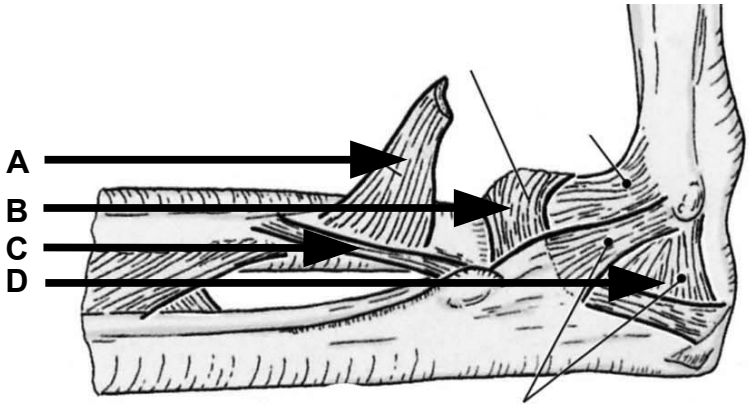
1. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



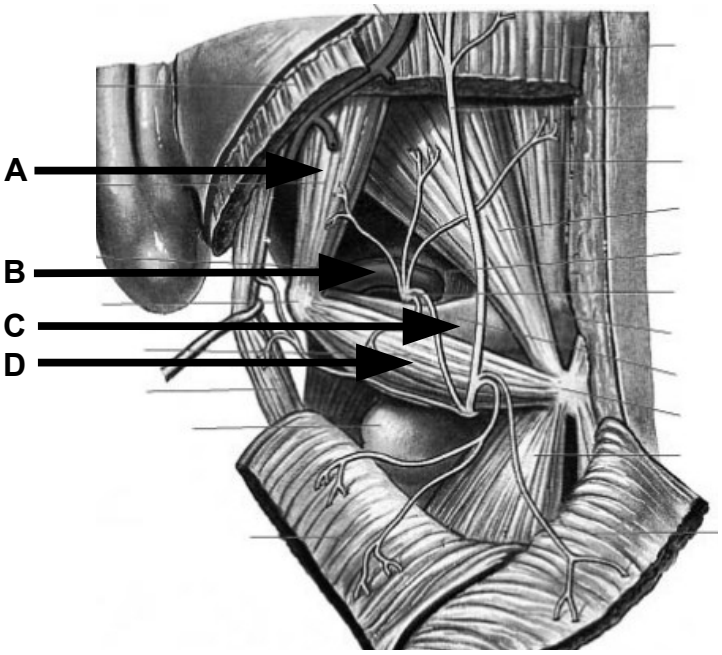
2. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



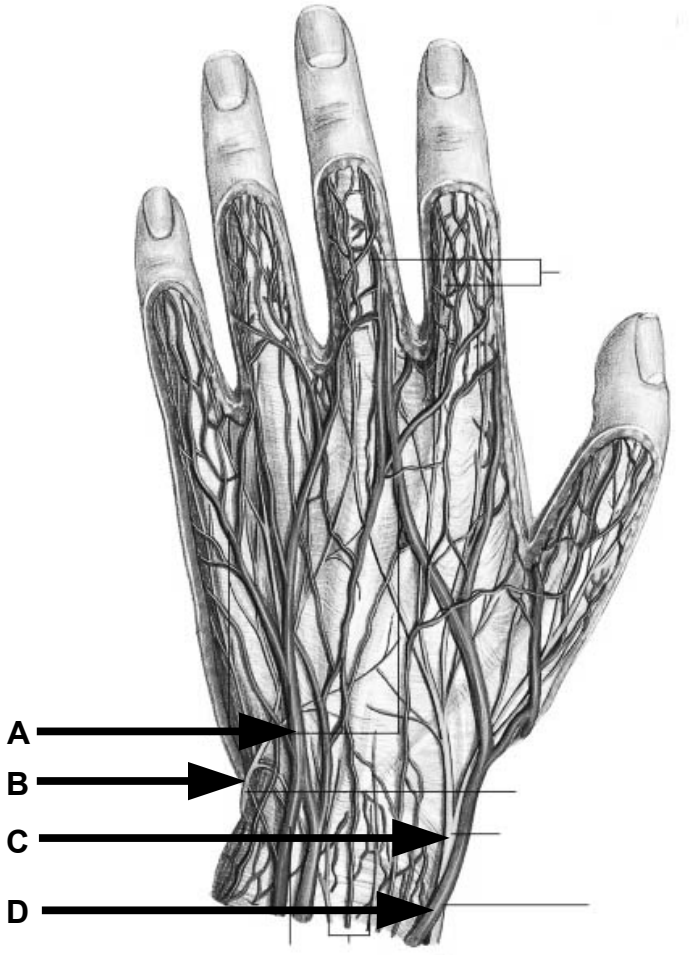
3. Identify the structures. (2 pts)

A._____

B. _____

C. _____

D. _____



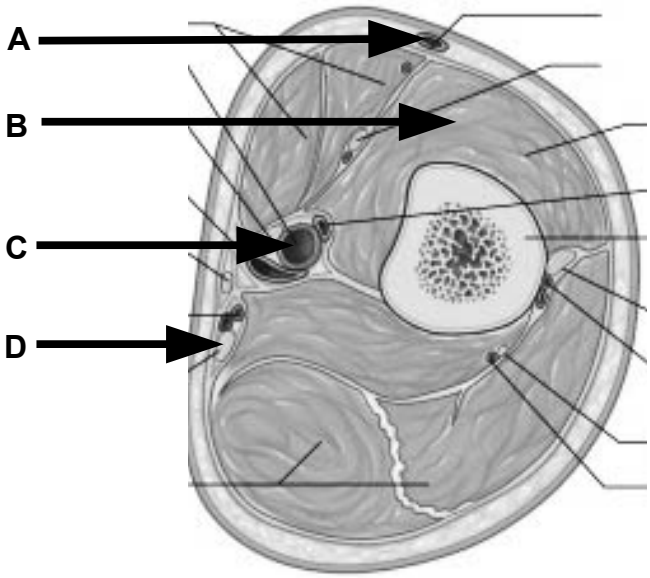
4. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



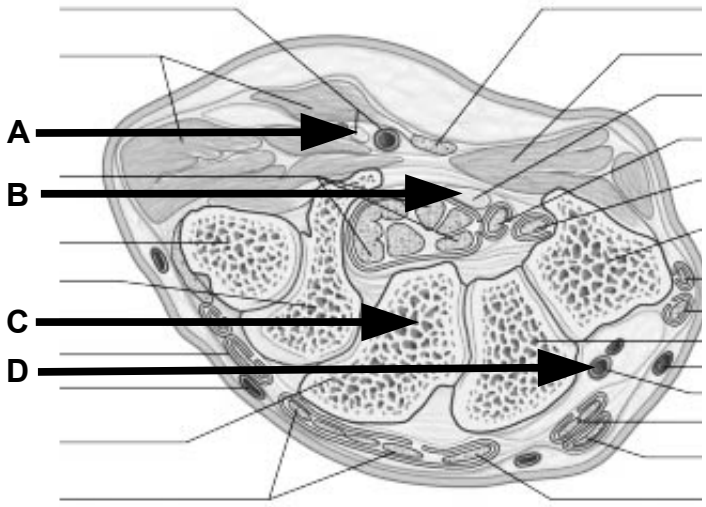
5. Identify the structures. (2 pts)

A. _____

B. _____

C. _____

D. _____



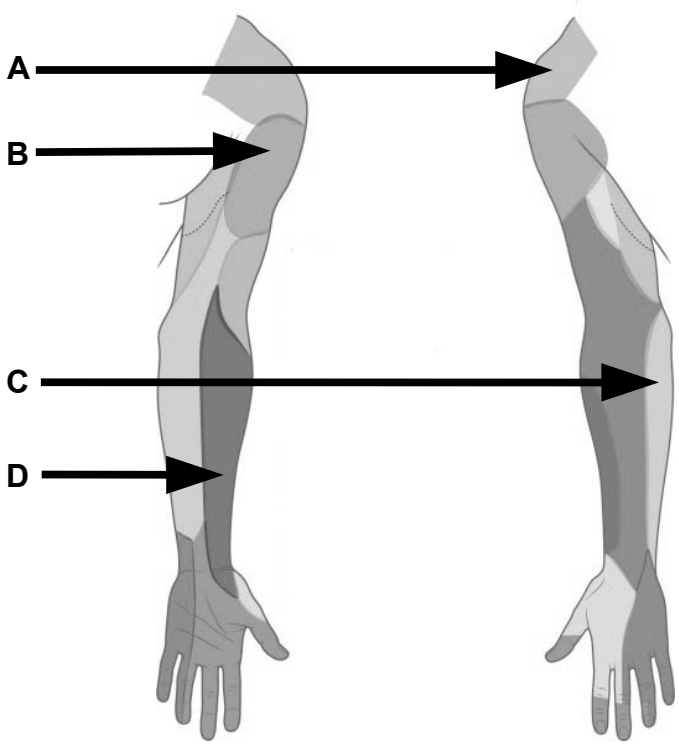
6. Identify the nerve distributions. (2 pts)

A. _____

B. _____

C. _____

D. _____



Part II. Circle the correct answer. All, none, or some may apply. (28 pts)

1. With regard to the back, suboccipital region, and scapular region:

    a. Severance of the C5 ventral ramus causes an uncompensated loss of retraction of the scapula.

    b. The serratus posterior superioris muscle pulls the lower ribs in the superior direction and is a muscle of inspiration.

    c. The rectus capitis posterior major muscle flexes the head at the atlantoaxial joint.

    d. From proximal to distal, the greater occipital nerve passes through the suboccipital triangle before passing through the splenius capitis muscle and then the semispinalis capitis muscle.

    e. The latissimus dorsi muscle, a lateral rotator of the arm, can act as a flexor when the arm is fully flexed.

    f. The triangular space provides a communication between the axilla and the infraspinous fossa.

    g. Superior fibers from the trapezius muscle attach to the medial part of the scapular spine. Inferior fibers from the trapezius muscle attach to the lateral part of the scapular spine. Contraction of these fibers causes an upward rotation of the scapula.

2. With regard to the axilla:

    a. The medial wall of the axilla is, part, defined by the serratus anterior muscle.

    b. The medial lip of the intertubercular sulcus is within the axilla.

    c. The first part of the axillary artery begins distal to the pectoralis minor muscle.

    d. Ligation of the axillary artery at a location distal to the thoracoacromial trunk and proximal to the subscapular artery causes retrograde blood flow in the circumflex scapular artery.

    e. A lesion of the long thoracic nerve weakens scapular retraction and causes a condition known as “winging” of the scapula.

    f. A lesion of the musculocutaneous nerve proximal to the coracobrachialis muscle causes a complete loss of flexion at the elbow.

    g. A lesion of the radial nerve in the axilla weakens flexion at the elbow.

    h. The teres major muscle inserts on the lateral lip of the intertubercular sulcus and is a lateral rotator of the arm.

3. With regard to the arm and cubital fossa:

    a. A lesion of the musculocutaneous nerve proximal to the coracobrachialis muscle causes an uncompensated loss of flexion at the elbow.

    b. The radial collateral artery passes posterior to the lateral epicondyle.

    c. The coracobrachialis muscle and the short head of the biceps muscle arise from the coracoid process and flex the forearm.

    d. The anterior cutaneous nerve of the forearm is a distal continuation of the musculocutaneous nerve.

    e. The lateral head of the triceps muscle arises inferior and lateral to the spiral groove, whereas the medial head of the triceps arises superior and medial to this groove.

    f. The radial recurrent artery is applied to the medial border of the brachioradialis.

    g. The posterior ulnar recurrent artery passes between the humeral and ulnar heads of the flexor carpi radialis.

    h. Within the cubital fossa the median nerve lies medial to the brachial artery.

    i. The superior ulnar collateral artery passes anterior the medial epicondyle of the humerus to anastomose with the anterior ulnar recurrent artery.

    j. The medial brachial cutaneous nerve is located in the cubital fossa.

    k. The coracobrachialis and the short head of the biceps are both biarticulate and have a common site of origin.

    l. The brachioradialis, innervated by the radial nerve, flexes the forearm and extends the wrist.

4. With regard to the extensor region of the forearm and the dorsum of the hand:

    a. The extensor carpi radialis longus muscle is primarily an abductor of the wrist and the extensor carpi radialis brevis muscle is primarily an adductor of the wrist.

    b. The extensor indicis muscle receives the most distal motor innervation of the anterior interosseous nerve.

    c. The ulnar two tendons of the extensor digitorum are innervated by the ulnar nerve

    d. The extensor carpi radialis longus muscle originates from the lateral epicondyle of the humerus and passes the posterior surface of the scaphoid bone.

    e. The tendons of the extensor digitorum muscle are joined by the tendons of the extensor digitorum brevis to the form the extensor hood.

    f. The extensor hood for the index finger of the right hand has a lumbrical muscle inserting on the ulnar side.

    g. The dorsal carpal arch (rete) receives blood from the anterior interosseous artery.

5. With regard to the hand:

   a. The lumbrical muscles resist hyperextension at the metacarpophalangeal joint.

   b. The ring finger of the left hand has a dorsal interosseous muscle on the radial side, a palmar interosseous muscle on the ulnar side, and a lumbrical muscle on the radial side.

   c. The princeps pollicis artery is a branch of the superficial palmar arch.

   d. The ulnar artery is radial to the ulnar nerve at the proximal entrance to Guyon's canal.

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

   f. The muscles of the thenar eminence are innervated by the recurrent ulnar nerve.

   g. The middle finger is not capable of abduction.

   h. The lateral bands of the extensor hood extend distal to the central band and insert on the posterior surface of the distal phalanx.

   i. The pisiform bone is anterior to the trapezoid bone.

   j. The origin of the flexor digiti minimi is, in part, from the pisiform bone.

   k. The superficial branch of the ulnar nerve provides cutaneous sensation to the radial 1.5 fingers on the palmar side, whereas the superficial radial nerve innervates the nail bed of these same fingers.

   l. Branches of the superficial radial nerve can be palpated as they cross the superficial surface of the extensor pollicis longus tendon.

6. With regard to the joints of the upper limb:

   a. The fiber direction of the interosseous membrane resists proximal movement of the ulna.

   b. The middle glenohumeral ligament resists anterior dislocation of the shoulder joint.

   c. The tendons of the interosseous muscles cross posterior to the deep transverse metacarpal ligament and posterior to the axis of the metacarpophalangeal joint.

   d. A treatment for permanent radial nerve injury in the axilla is to fuse the wrist in a flexed position.

   e. An articular disk contributes to pivoting movements at the distal radioulnar joint.

   f. The long extensor muscles of the wrist help to strengthen a strong grip.

   g. The radial collateral ligament of the elbow provides support to the annular ligament.

   h. A shoulder separation occurs when the head of the humerus dislocates from the glenoid fossa.

   i. The rotator cuff muscles blend with the internal surfaces of the glenohumeral joint capsule.

   j. The coracoclavicular joint has an articular disk, two synovial cavities, and is a pivot joint.

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

1. Boundaries and contents of the quadrangular space. (4 pts)

2. Neurovascular relationships of the levator scapulae muscle. (4 pts)

3. Relationships (bones, muscles, vessels) of the interosseous recurrent artery. (4 pts)

4. Relationships (muscles, vessels, nerves) of the bicipital aponeurosis. (4 pts)

5. Boundaries and contents of the anatomical snuffbox. (4 pts)

6. Functional deficits following ulnar nerve injury at the wrist. (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 year-old female 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 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 vertebral column, spinal canal, and spinal cord. Limit your discussion of the spinal cord to gross anatomical features and to stability of the spinal cord within the spinal canal. Include bones, articulations, ligaments, dural spaces, boundaries, muscles, movements and limitations of movement, vasculature and lymphatic drainage, innervation, and relationships. Include mention of the fascial layers penetrated during lumbar puncture. (12 pts)**

2. A 44 year-old female comes into the clinic and presents with entrapment of the median nerve within the heads of the pronator teres muscle. At morning call you are asked to: **Review the anatomy of the flexor region of the forearm. Include bones, ligaments, compartments and fascia, contents, muscles, movements, limitations of movement, vasculature, innervation, relationships, and lymphatic drainage. (12 pts)**

3. Dr. Greensmith demonstrated how electrical nerve stimulation is used to guide to the application of local anesthetics to the nerves of the brachial plexus. This technique requires a keen knowledge of the brachial plexus and the actions of the muscles it innervates. **Review the structure (roots, trunks, divisions, cords, and branches) of the brachial plexus. Discuss the relationships of the cords of the brachial plexus to the axillary artery. Discuss the functional deficits and compensations that result from nerve injury to each of the nerve branches of the posterior cord. (12 pts)**