EXAM NUMBER_____

GROSS ANATOMY – ANAT 503

Examination 7 – Head and Neck

October 11, 2013

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

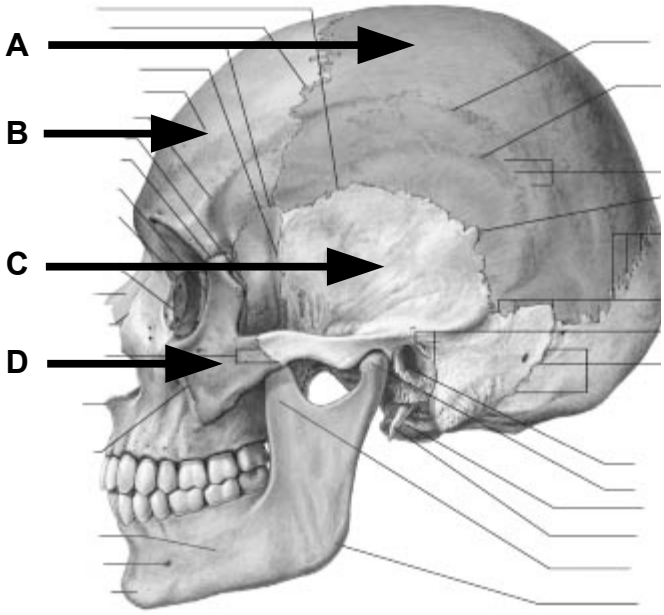
1. **Identify the structures. (2 pts)**

   a. _____

   b. _____

   c. _____

   d. _____



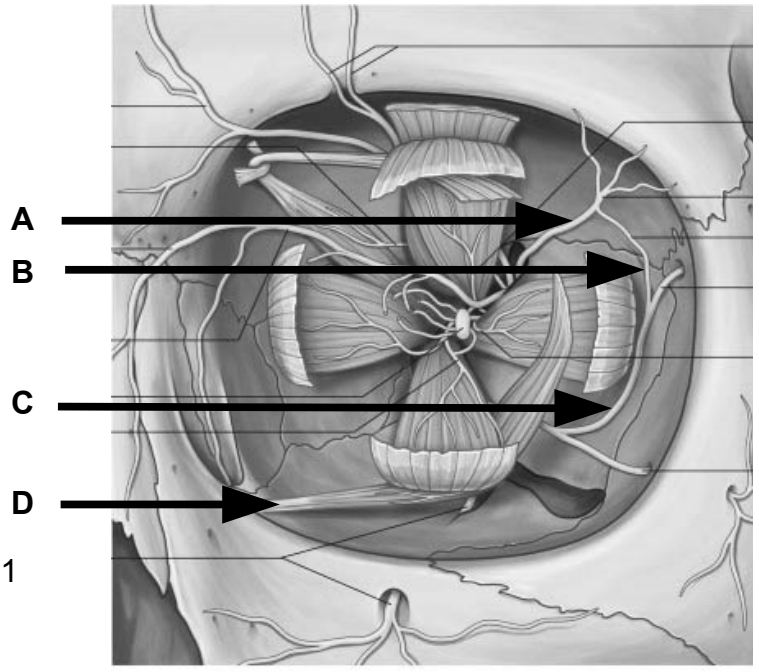
2. **Identify the structures. (2 pts)**

   a. _____

   b. _____

   c. _____

   d. _____



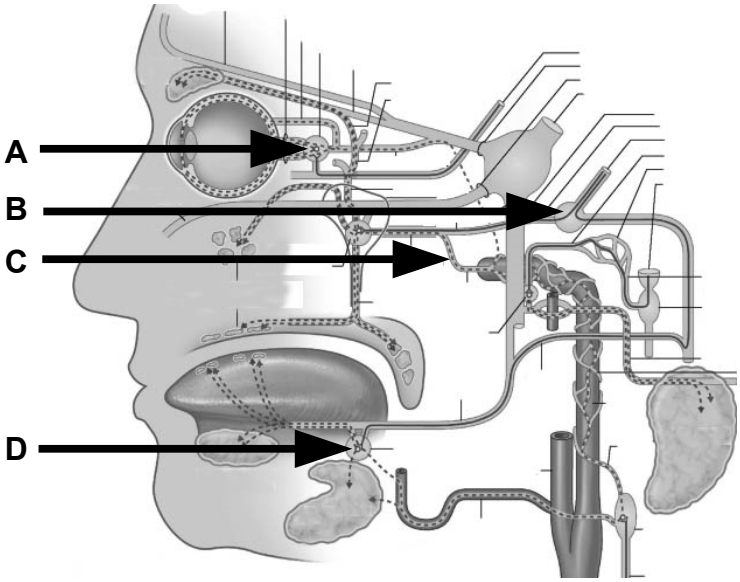
3. **Identify the structures. (2 pts)**

a. _____

b. _____

c. _____

d. _____



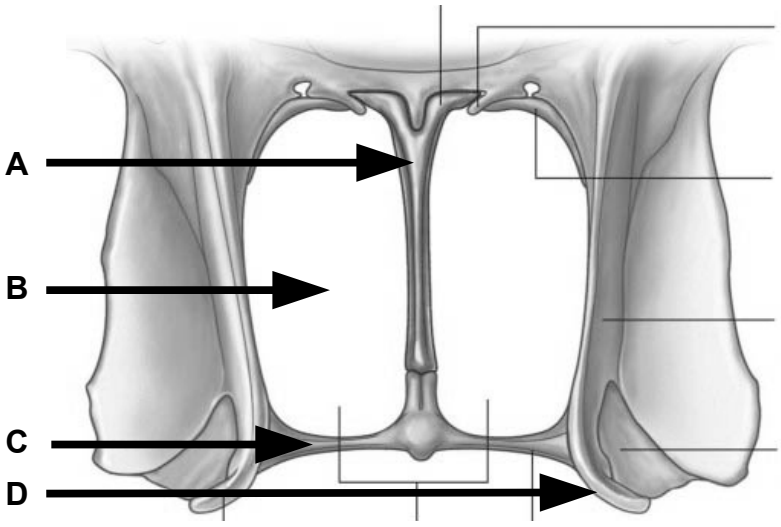
4. **Identify the structures. (2 pts)**

a. _____

b. _____

c. _____

d. _____



EXAM NUMBER_____

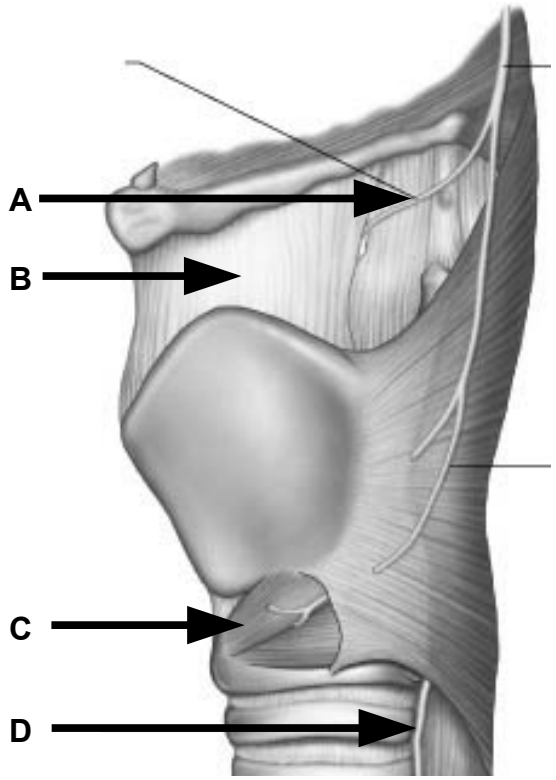
5. Identify the structures. (2 pts)

a. _____

b. _____

c. _____

d. _____



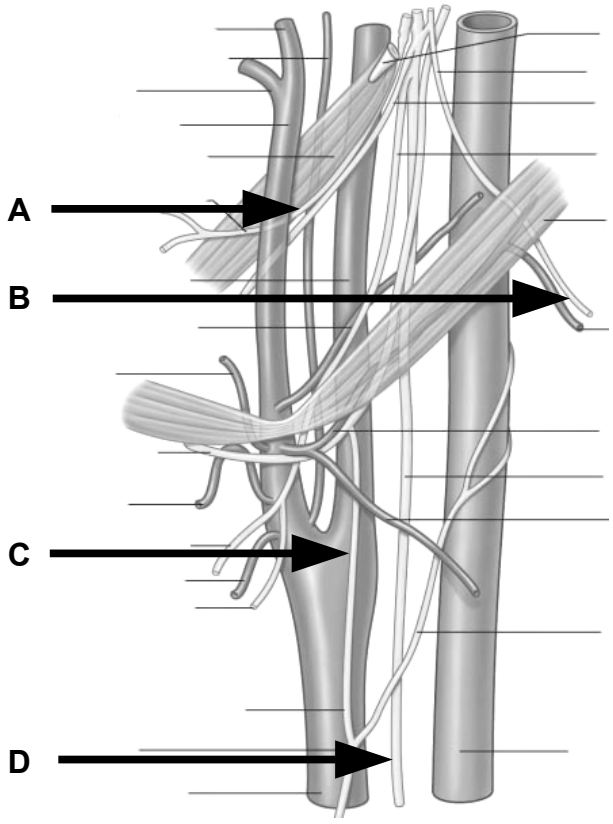
6. Identify the structures. (2 pts)

a. _____

b. _____

c. _____

d. _____



Part II. Circle the correct answer. All, none, or some may apply. (22 pts)

1. With regard to the cranial nerves:

a. A pituitary tumor may compress the optic tracts and disrupt central vision

b. The deep petrosal nerve combines with the greater superficial petrosal nerve to form the nerve of the pterygoid canal.

c. A lesion of the lingual nerve at the foramen ovale disrupts temperature, touch, and pain sensation (GSA) to the ipsilateral anterior two thirds of the tongue but does not disrupt taste sensation (SVA).

d. The trigeminal nerve provides SVE innervation to the lacrimal gland by way of the greater superficial petrosal nerve branch of the maxillary division.

e. The SVE functional component of the trigeminal nerve contributes to the elevation of the soft palate and to the equalization of air pressure within the middle ear.

f. Bilateral lesions of the recurrent laryngeal nerves may lead to airway obstruction secondary to adduction of the true vocal cords.

g. A deviated protrusion of the tongue to the left side indicates a lesion of the right hypoglossal nerve.

h. The lesser superficial petrosal nerve controls watery, but not thick, salivary secretion from the submandibular gland.

i. A lesion of the glossopharyngeal nerve at the jugular foramen disrupts elevation of the larynx during swallowing, the gag reflex, salivary secretion, and taste and touch sensation to the posterior one-third of the tongue.

j. The GSA fibers that ultimately make up the external nasal nerve pass through the posterior, middle, and anterior cranial fossae, the cavernous sinus, orbit, anterior ethmoidal air cells, cribriform plate, and nasal cavity.

k. The maxillary nerve exits the middle cranial fossa to enter the pterygopalatine fossa by passing through the foramen ovale.

l. The lacrimal, frontal, and trochlear nerves do not pass through the annulus tendineus (of Zinn).

m. A lesion of the superior division of the oculomotor nerve at the annulus tendineus is expected to disrupt GSE and GVE functional components.

n. The recurrent tympanic nerve, a branch of the chorda tympani, enters the tympanic cavity to provide SVE innervation to the tensor tympani muscle.

2. **With regard to the anterior and posterior triangles of the neck:**

   a. The phrenic nerve is deep to the prevertebral fascia and posterior to the suprascapular artery.

   b. The nerve to thyrohyoid travels, in part, with the hypoglossal nerve.

   c. Fibers from the cervical plexus travel with the hypoglossal nerve and then leave the hypoglossal nerve to form the inferior root of the ansa subclavia.

   d. The cricothyroid muscle lowers the pitch of the voice.

   e. The lingula of the mandible is a site of attachment for the sphenomandibular ligament.

   f. The internal laryngeal nerve passes through the thyrohyoid membrane with the superior laryngeal artery.

   g. The ansa subclavia circles the subclavian artery lateral to the branching of the internal thoracic artery.

3. **With regard to the skull, face, and scalp:**

   a. The buccal branch of the facial nerve provides GVA fibers to the mucosa lining of the buccinator muscle and SVE fibers to the parotid gland.

   b. Parietal emissary veins may spread infections from the “loose areolar space” of the scalp to the intracranial venous sinuses.

   c. The buccal nerve, derived from the mandibular division of the trigeminal nerve, provides GSA fibers to the oral mucosa the lines the internal surface of the buccinator muscle.

   d. The parotid duct pierces the buccinator muscle adjacent to the lower second molar.

   e. The occipitalis belly of the occipitofrontalis muscle is innervated by SVE fibers from the greater occipital nerve.

4. **With regard to the temporomandibular joint, temporal fossa, and infratemporal fossa:**

   a. The mylohyoid line of the mandible is a site of origin for the mylohyoid muscle.

   b. Injury to the auriculotemporal nerve within the infratemporal fossa disrupts salivation from the parotid gland.

   c. The chorda tympani nerve passes through the middle ear and then enters the infratemporal fossa by way of the tympanic canaliculus.

   d. The inferior orbital fissure provides a bony communication between the infratemporal fossa and the orbit.

5. With regard to the cranial fossae and dural sinuses:

a. The superior petrosal sinus passes inferior to the trigeminal nerve.

b. The foramen cecum of the skull provides a venous communication between the superior sagittal sinus and the sphenoid sinus.

c. The straight sinus, inferior sagittal sinus, and the great vein of Galen meet at the tentorial notch.

d. The diaphragma sellae forms a dural shelf superior to the hypophyseal fossa and contains the intercavernous sinuses.

e. An emissary vein connects the cavernous sinus to the pterygoid venous plexus.

6. With regard to the larynx, pharynx, and oral cavity:

a. The posterior free edge of the mylohyoid muscle provides a pathway for infections of the upper molar teeth to spread to the spaces defined by cervical fascia.

b. The buccinator muscle and the superior constrictor muscle have a common site of attachment at the pterygomandibular raphe.

c. The lateral cricoarytenoid muscle adducts the true vocal fold.

d. The palatoglossus and salpingopharyngeus muscles are innervated by the vagus nerve.

e. Levator veli palatini, tensor veli palatini, and salpingopharyngeus muscles contribute to the movements of swallowing and to the equalization of air pressure in the middle ear.

f. The palatine tonsils are located within the pharyngeal arch defined by the palatopharyngeus and salpingopharyngeus muscles.

7. With regard to the temporal bone and ear:

a. Excavation of the mastoid air cells may endanger the sigmoid sinus.

b. The tensor tympani muscle is innervated by SVE fibers from the facial nerve and the stapedius muscle is innervated by GSE fibers from the trigeminal nerve.

c. The footplate of the stapes is oval shaped and attaches to the oval window.

Part III. Questions for Clinical Correlations. Comment on your evaluation for each choice. (18 pts)

1. A 45 year old male undergoes arthroscopic temporomandibular joint surgery due to chronic pain. An incision is made into the lateral joint space capsule and the articular disc is freed of its muscle attachments. **As a result of this procedure, which of the following mandibular movements is most likely to be affected? (6 pts)**

   a. Elevation and protrusion

   b. Elevation and retraction

   c. Depression and protrusion

   d. Depression and retraction

   e. Ipsilateral deviation

2. A 44 year old female is injured during a fall while rock climbing. Her mental capacity is diminished. A CT scan reveals a skull fracture and an epidural hematoma causing increased intracranial pressure. **A fracture through which of the following structures is most likely the cause of the resulting hematoma? (6 pts)**

a. Cavernous sinus

b. Jugular foramen

c. Floor of the orbit

d. Squamous portion of the temporal bone

e. Lesser wing of the sphenoid bone

3. A 76 year old male patient complains that his sense of taste has diminished over the past 3 months. On exam, his tongue protrudes without deviation. He has normal distribution of the papillae but decreased sensation to touch and taste over the posterior tongue surface. An MRI shows a 2 x 2 centimeter tumor adjacent to the jugular foramen. **Which of the following is most likely to occur as a result of this tumor? (6 pts)**

a. Weakness in swallowing

b. Reduced taste in the anterior 2/3's of the tongue

c. Deviation of the uvula to the side of the tumor

d. Increased gag reflex

e. Decreased saliva production from the submandibular gland

Part IV. Short essay. Indicate your understanding of the following. Answer in the space provided. Include the back of each page if required. (12 pts)

1. A 61-year-old female complains of coughing when she swallows. Her physical examination reveals weakness in elevating the floor of the mouth and larynx. **Review the muscles and nerves that elevate the larynx and pharynx and mention the clinical significance of these movements. (6 pts)**

2. A 45-year-old female complains of numbness along the left side of her chin and tongue. Her physical examination reveals a unilateral loss of touch sensation to the anterior two-thirds of her tongue. Her ability to taste is unimpaired. **Review the innervation of the tongue. Where may there be nerve damage that is consistent with loss of touch, but not taste, to the anterior tongue. (6 pts)**

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

1. A seventy two year-old male comes to your office with complaints of hoarseness and postnasal drip. You note the distinct smell of tobacco. He has ptosis of the left eye and the left pupil is smaller than the right. There is fullness over the left supraclavicular region. A Pancoast tumor is highly suspected. **Discuss the anatomy of the left vertebral triangle. Include boundaries, contents, relationships, fascial specializations, vasculature, innervation, lymphatic drainage, and the clinical significance of damage to structures in the area. (12 pts)**

2. Treatment for trigeminal neuralgia is to anesthetize the maxillary nerve within the pterygopalatine fossa. This procedure blocks all nerves within the pterygopalatine fossa. **Review the anatomy of the pterygopalatine fossa. Include contents, relationships, foramina, nerve distributions, and functional components. Discuss the clinical consequences of blocking each nerve branch within the pterygopalatine fossa. (12 pts).**

3. An apical abscess of the lower molars may erupt into the floor of the mouth and then enter the submandibular space by way of the posterior free edge of the mylohyoid muscle. This infection may then erode into deeper cervical regions. **Discuss the spaces defined by the cervical fasciae. Include boundaries, contents, relationships, lymphatic drainage, and clinical significance. (12 pts)**