Head and Neck Anatomy

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1. All PPTs can be downloaded at ccmb.usc.edu (teaching resources)

2. Head and Neck Dissection Guide (your own electronic version and one hard copy per table in the lab)

3. Learning objectives in course syllabus
Anatomy Lab access code: 11111

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Authorized people only
Dr. Snow

I. Anatomical gift program

II. How to use our Head and Neck Anatomy Dissection Guide
Mandibular block and potential clinical complications
Lymphatics of the Head and Neck
Compromised wound healing following radiation therapy and adjacent anatomical structures.
Odontogenic infection
Spread of Odontogenic Infection
Intraoral I&D
Extraoral I&D

Potential damage to the facial nerve (mandibular branch)
Pericoronitis and the spread of odontogenic infection
Alignment of posterior implants
Alignment of posterior implants
Anatomy of the Posterior Mandible

Mylohyoid shelf

Submandibular (submylohyoid) fossa
Important Anatomy for the Posterior Mandible

Lingual Nerve
Submandibular Fossa
Mandibular Canal
Mental Foramen
Neck Anatomy
Learning objectives
1. Learn the anatomy of the neck, anterior & posterior triangles, cervical fascia and the associated clinical considerations
2. Identify and describe all branches of the external carotid artery, identify internal and common carotid arteries. Know the function and innervation of the carotid body and the carotid sinus.
3. Describe all venous structures and nerves in the neck.
4. Describe all muscles in the anterior and posterior triangles of the neck, know their innervations and functions.
5. Identify submandibular and sublingual glands, describe nerve innervations to these salivary glands
6. Learn the lymphatic drainage of the head and neck. Describe the spread of infection in the head and neck region.
7. Describe arteries, veins, nerves and muscles at the root of the neck.
Boundaries of the Neck

• Anterior Aspect:
  Superior: Inferior border of the mandible
  Inferior: Superior surface of the manubrium and clavicle

• Posterior Aspect:
  Superior: Superior nuchal line
  Inferior: Horizontal line between C7 and T1
Platysma

- Covers mainly anterior aspect of the neck.
- Origin: deltoide and pectoralis fasciae.
- Insertion: inferior border of mandible and skin as well as hypodermis in this region.
- Function: assist depression the lower lip and corner of mouth.
- Innervation: cervical br. of facial N. (VII).
Sensory Innervation of Neck

- C1, C2, C3, and most of C4 form the cervical plexus.

- **Front of neck:**
  1. Great aruicular N. (C2 & C3)
  2. Transverse cervical N. (C2 & C3)
  3. Supraclavicular N. (C2 & C4)
     a. Anterior (medial)
     b. Middle (intermediate)
     c. Posterior (lateral)
Posterior Aspect of Neck

- Greater occipital N. (C2)
- Lesser occipital N. (C2)
- Third occipital N. (C3)
- C4 and C5
Ansa Cervicalis

- **Two roots** (formed by C1, C2, and C3)
  - Superior root (travels with CN XII)
  - Inferior root (from cervical region)

Function: Motor innervation of infrahyoid muscles
Accessory Nerve

Two components of fibers
1. Cranial root
2. Spinal root

Function: motor innervation of
1. Sternocleidomastoid muscle (SCM)
2. Trapezius muscle
Phrenic Nerve (C3, C4, and C5)

- Motor: Diaphragm
- Sensory: Mediastinal pleura and pericardium of the heart
Cervical Plexus

Cervical sympathetic trunk, vagus nerve, and glossopharyngeal nerve have been cut. The dashes line indicates a segment of the epineurium of the hypoglossal nerve.
Anterior Triangle of Neck

Boundaries:

Superior: Inferior border of mandible
Posterior: Anterior border of SCM
Anterior: Midline of the neck
Subdivisions of anterior triangle of the neck

1. Muscular Triangle
2. Carotid Triangle
3. Submandibular Triangle
4. Submental Triangle
Subdivisions of anterior triangle of the neck

1. Muscular Triangle

Boundaries:

- Superior: Superior belly of omohyoid
- Inferior: Anterior border of SCM
- Anterior: Midline

Contents:

- a. sternohyoid (ansa)
- b. sternothyroid (ansa)
- c. thyrohyoid (C1 via CN XII)
- d. omohyoid (ansa)
Fig. 707: Infrahyoid and Scalenae Muscles of the Neck
2. Carotid Triangle

Boundaries:

Superior: Posterior belly of digastric muscle
Inferior: Superior belly of omohyoid
Posterior: Anterior border of SCM
28. Common carotid artery  
29. Internal carotid artery  
30. External carotid artery  
31. Superior thyroid artery  
32. External branch of the superior laryngeal nerve  
33. Thyrohyoid  
34. Superior laryngeal artery  
35. Internal branch of the superior laryngeal nerve  
36. Thyrohyoid membrane
Carotid triangle continued:

Contents:

a. common carotid
   - internal carotid artery
   - external carotid artery
b. internal jugular vein
c. vagus N (CN X)
d. ansa cervicalis
3. Submandibular Triangle

Boundaries:

Superior: Inferior border of mandible
Anterior: Anterior belly of digastric muscle
Posterior: Posterior belly of digastric muscle

Contents:

a. SMG (submandibular gland)
b. lymph nodes (submandibular group)
c. facial artery
d. facial vein
4. Submental Triangle

Boundaries:

Lateral: both anterior bellies of digastric muscle

Inferior: hyoid bone
Branches of the external carotid artery
Branches of External Carotid Artery

1. Superior Thyroid Artery
2. Ascending Pharyngeal Artery
3. Lingual Artery
4. Facial Artery
5. Occipital Artery
6. Posterior Auricular Artery
7. Maxillary Artery
8. Superficial Temporal Artery
Branches of External Carotid Artery
Superior thyroid artery
Ascending pharyngeal artery (#3)
   a. pharyngeal
   b. meningeal
   c. inferior tympanic (to tympanic cavity)

Lingual artery (#4)
   travels deep to hypoglossal nerve (CN XII) to the muscles of tongue.

Facial artery (#5)
Occipital artery (#6)
Posterior auricular artery (#7)
Maxillary artery
Superficial temporal artery

Terminal branches of the external carotid artery
Common facial vein
Posterior auricular and retromandibular veins contribute to the external jugular vein.
Root of the neck

- Longus capitis
- Middle scalene
- Anterior scalene
- Ascending cervical artery
- Inferior thyroid artery
- Longus colli
- Vertebral artery
- Cervicodorsal trunk
- Suprascapular artery
- Right phrenic nerve
- Right and left vagus nerves (CN X)
- Right common carotid artery
- Right subclavian artery
- Right recurrent laryngeal nerve
- 1st rib
- Cervical pleura overlying lung
- Right brachiocephalic vein
- Esophagus
- Carotid tubercle (C6)
- Trachea
- Left recurrent laryngeal nerve
- Left phrenic nerve
- Left subclavian artery
- Vertebral artery (entering foramen transversarium of C6 superiorly)
- Thyrocervical trunk
- Cervical pleura
- Left subclavian vein
- Thoracic duct
- Internal thoracic artery
- Costal parietal pleura
- Costal pleura overlying lung
- Left brachiocephalic vein
- Left common carotid artery
Review of lymph formation:

- Blood passes through capillaries
- Net loss of fluid into extracellular space
- Fluid moves into tiny lymph capillaries, bringing cellular debris and antigenic material into lymphatic circulation, where it is captured in the lymph nodes

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Lymphatics in the head & neck

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Lymphatics:

**Thoracic duct** receives lymph from the lower extremities, abdomen, left upper extremity, left chest, left side of the head & neck.

**Right lymphatic duct** receives lymph from the right chest, right upper extremity and right side of the head and neck.

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Lymphatics of Head & Neck

Superficial Lymphatics

Pericervical collar (encircling the cranial base)
Deep Cervical Lymphatics

- Internal Jugular vein
- Jugulodigastric node
- Internal Jugular vein
- Jugulo-omohyoid node
- Transverse cervical nodes
- R. lymphatic duct
- R. lymphatic duct
- Transverse thoracic duct cervical tr.
Cervical Fasciae

A. Superficial
   1. Superficial cervical fascia

B. Deep
   1. Superficial layer of deep cervical fascia
   2. Cervical visceral fascia (pretracheal fascia)
   3. Alar fascia
   4. Carotid sheath
   5. Prevertebral fascia