

READING HOSPITAL
SCHOOL OF HEALTH SCIENCES
MEDICAL IMAGING PROGRAM
CROSS SECTIONAL ANATOMY-2022



Neck Anatomy

1

Cervical Spine

- ▶ Location: Between the base of the skull and the thoracic spine
- ▶ Size: Has largest vertebral foramina of spine
- ▶ Bifid spinous process (except C1)
- ▶ Lateral mass
 - Articular processes (IAP and SAP)
 - Transverse foramina for the vertebral arteries and veins

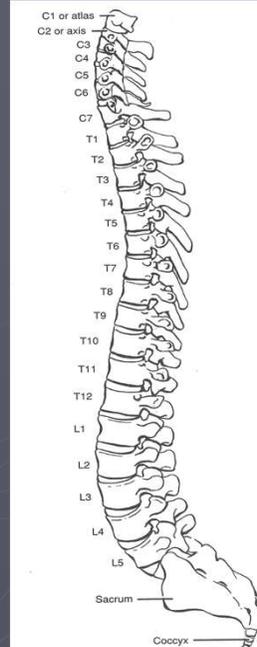
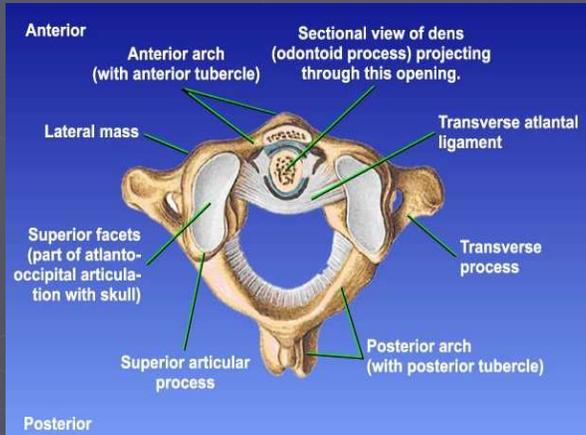


Figure 6-1 Lateral view of entire vertebral column.

2

Cervical Spine

- ▶ Atlas (C1)
 - Circular shape with no body or spinous process
 - Anterior and posterior arches
 - Receives the dens of C2
 - ▶ Transverse ligament
 - Articulates with the skull base
 - ▶ Atlanto-occipital joint



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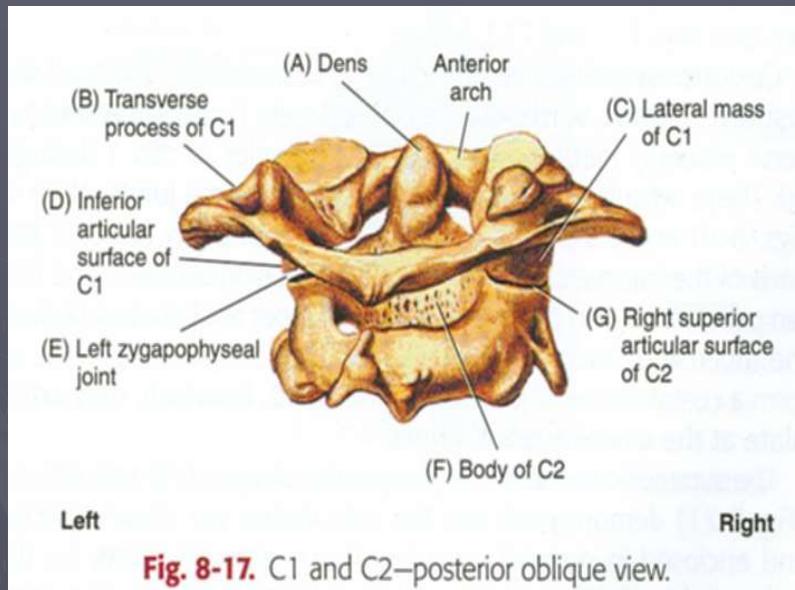


Fig. 8-17. C1 and C2—posterior oblique view.

4

Cervical Spine

- ▶ Axis (C2) or Epistropheus
 - *Function:* Forms pivot for rotation of the atlas and head
 - Dens (odontoid)
 - ▶ 1.5 cm long
 - Thick, bifid spinous process

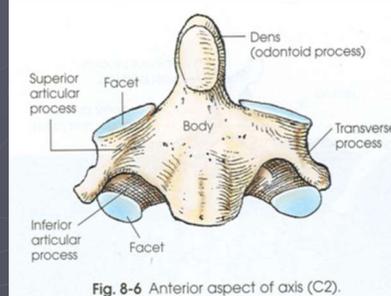
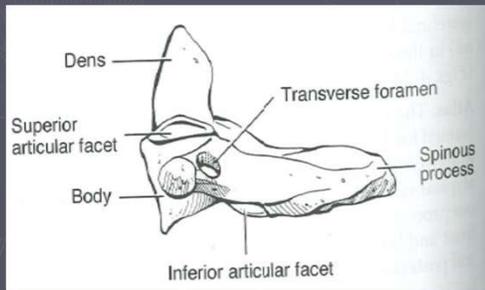


Fig. 8-6 Anterior aspect of axis (C2).

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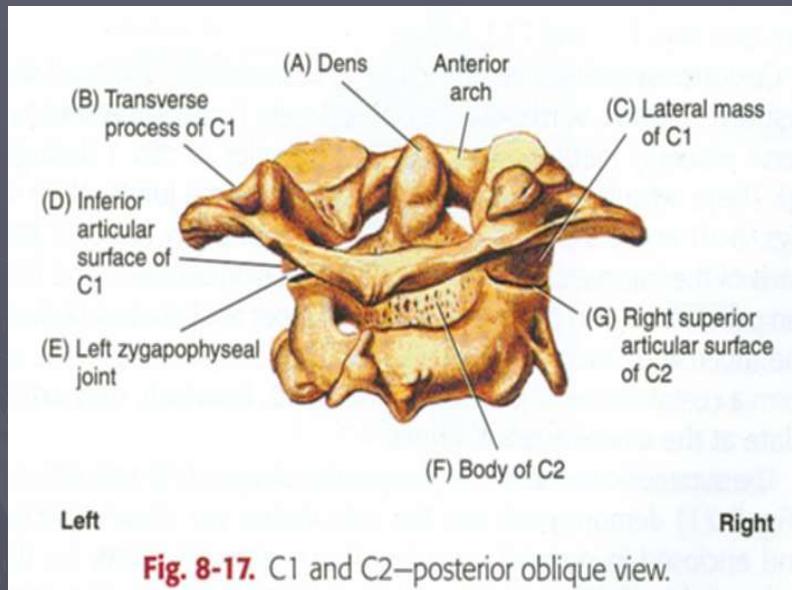
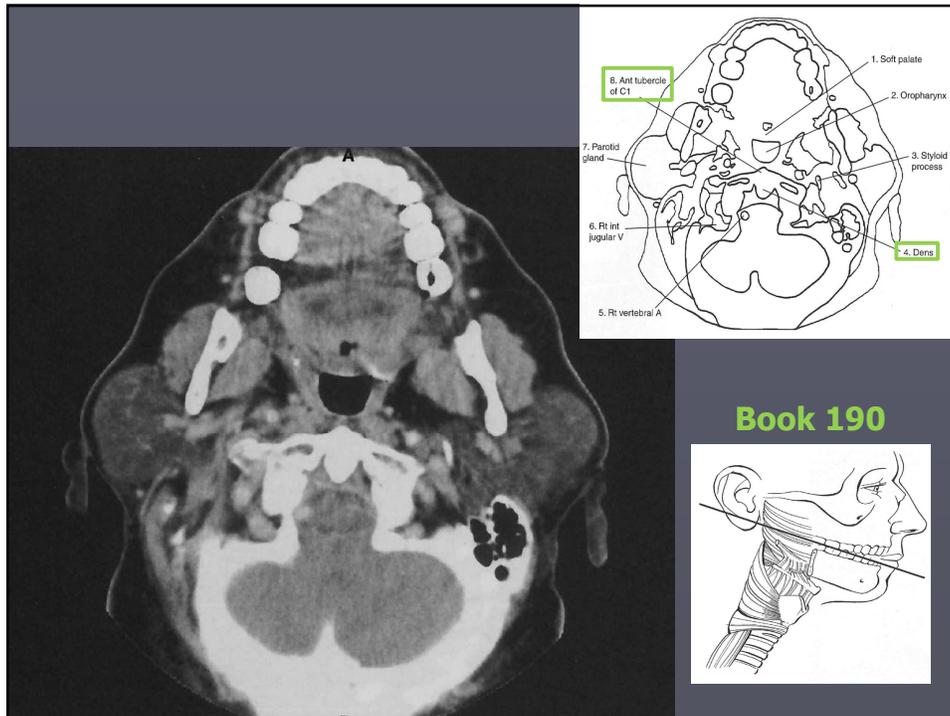


Fig. 8-17. C1 and C2—posterior oblique view.

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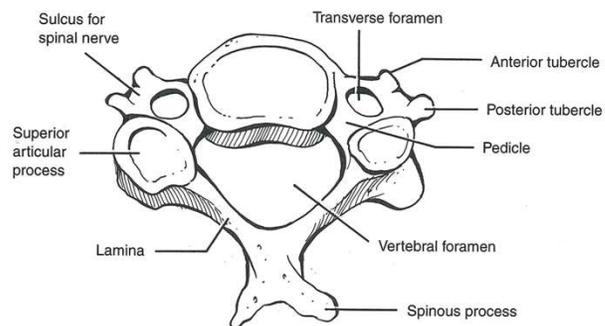
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Cervical Spine

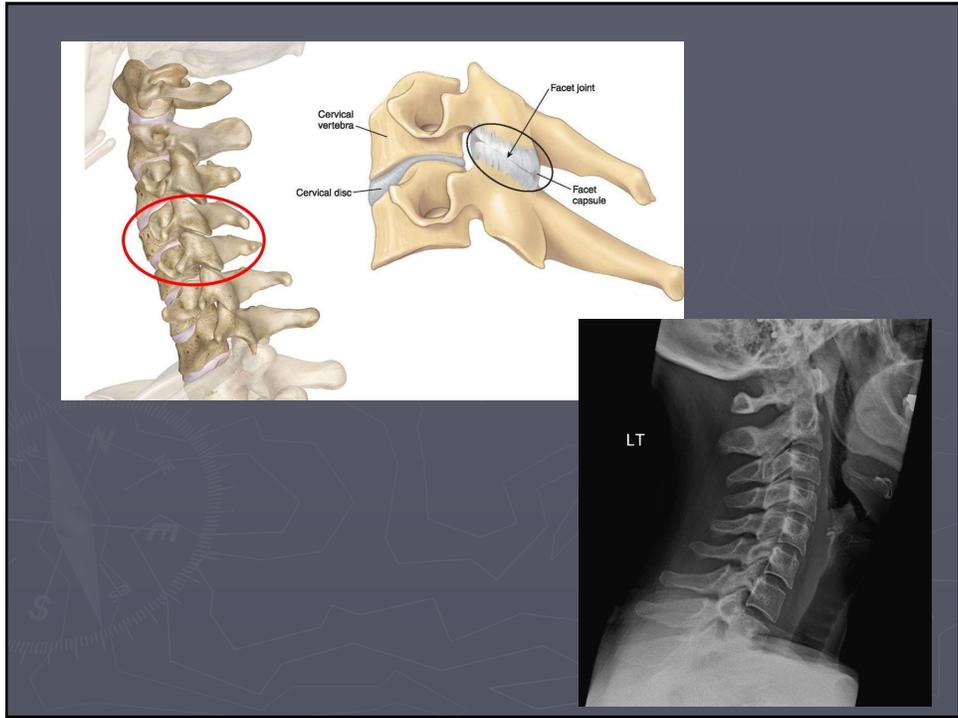
► C3-C6

- Bifid spinous processes; Lateral masses
- Zygapophyseal joints (**See example in next slide*)
- Transverse foramen – Encase vertebral arteries and veins

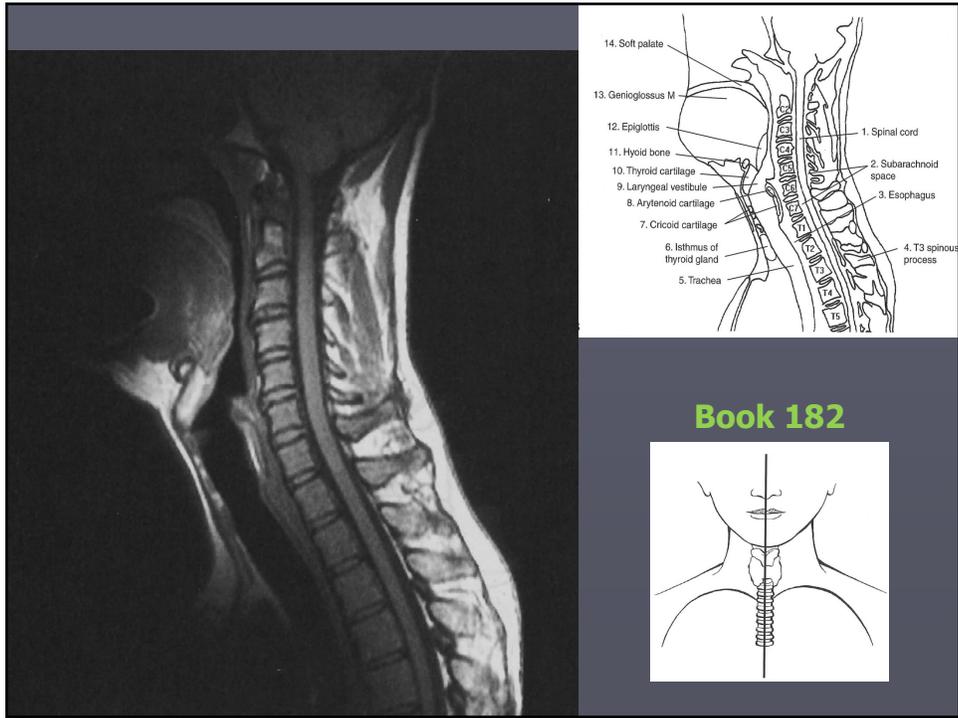
► C7- Also known as vertebra prominens



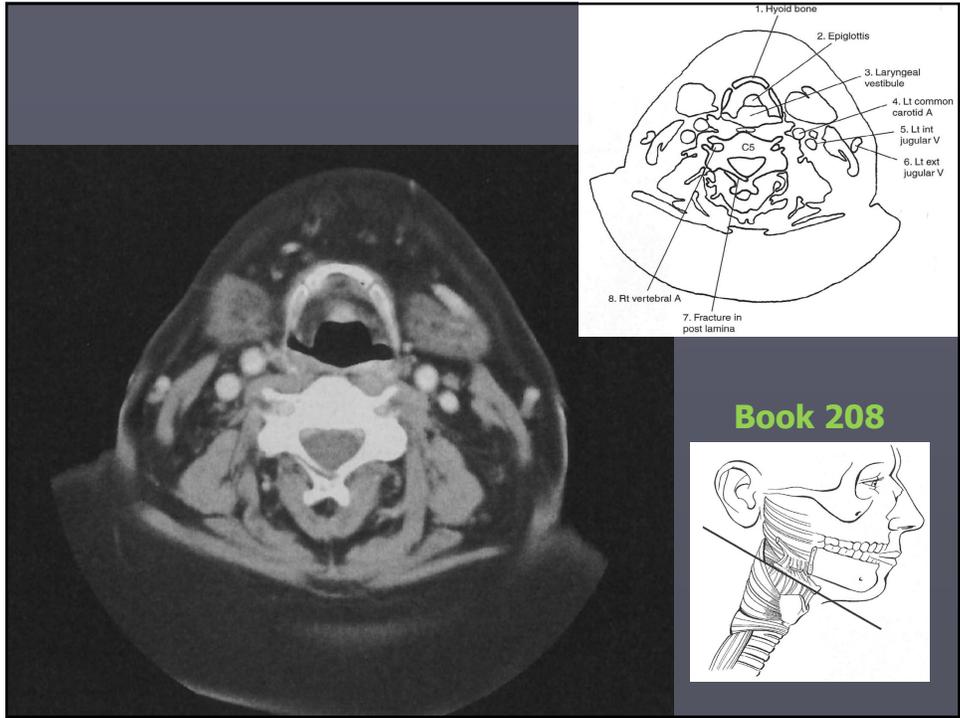
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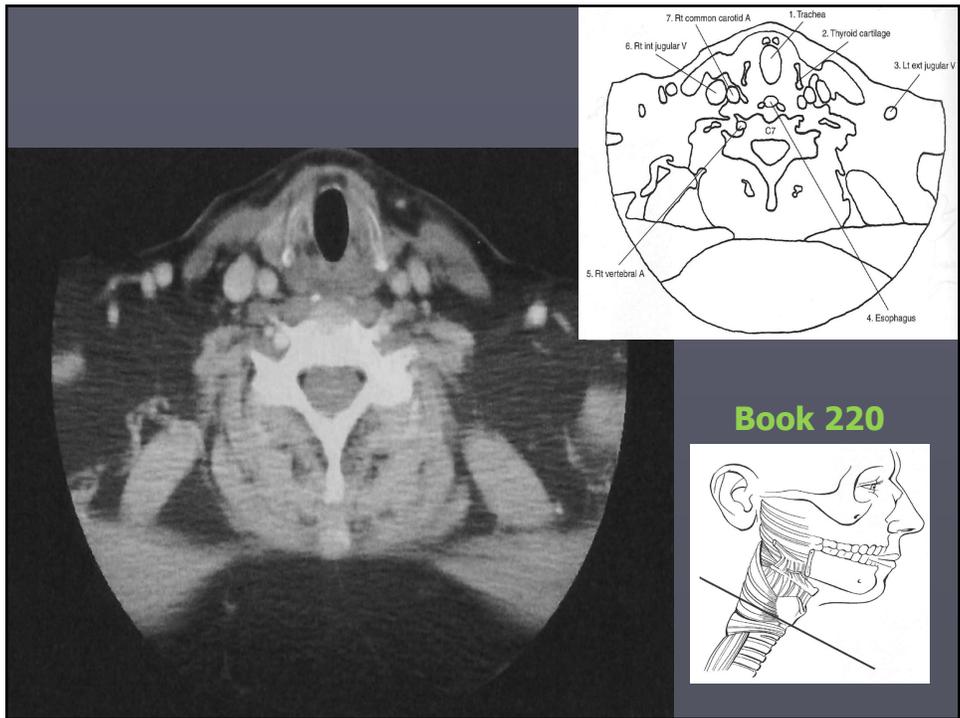
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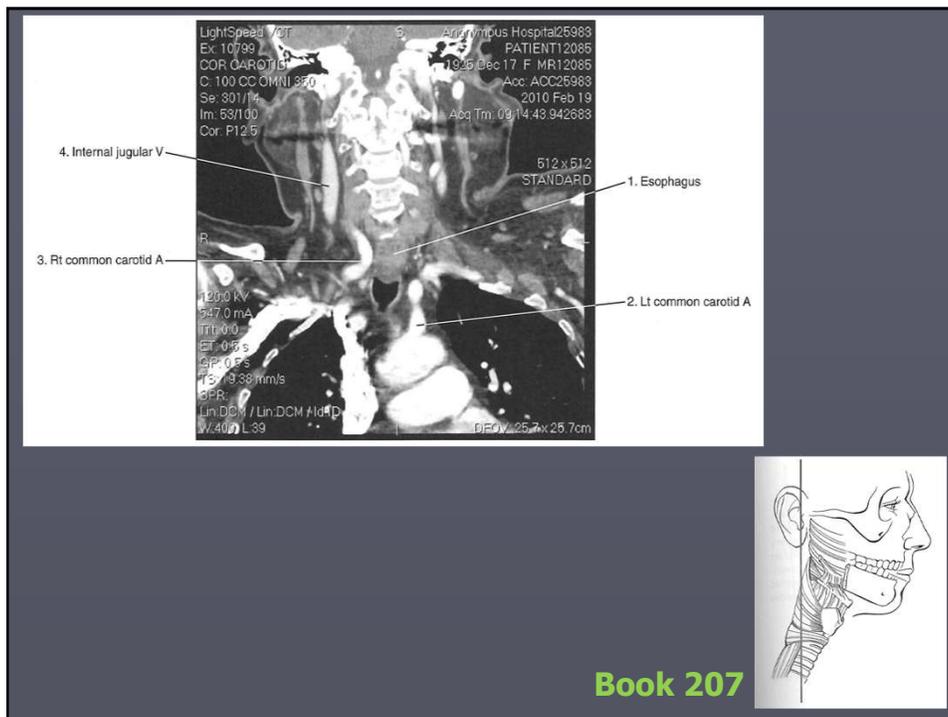
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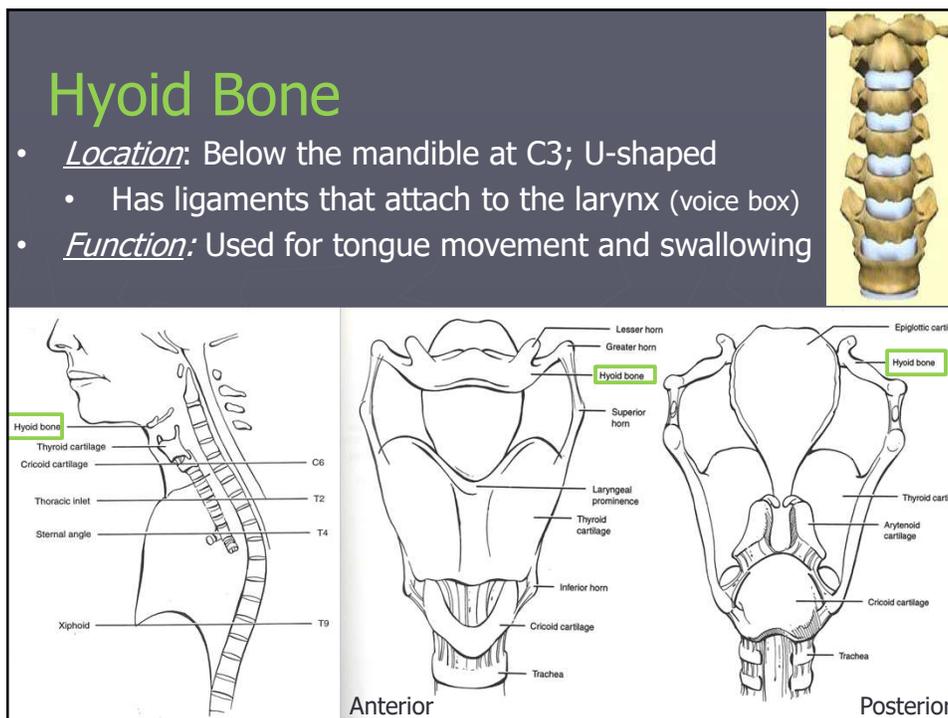
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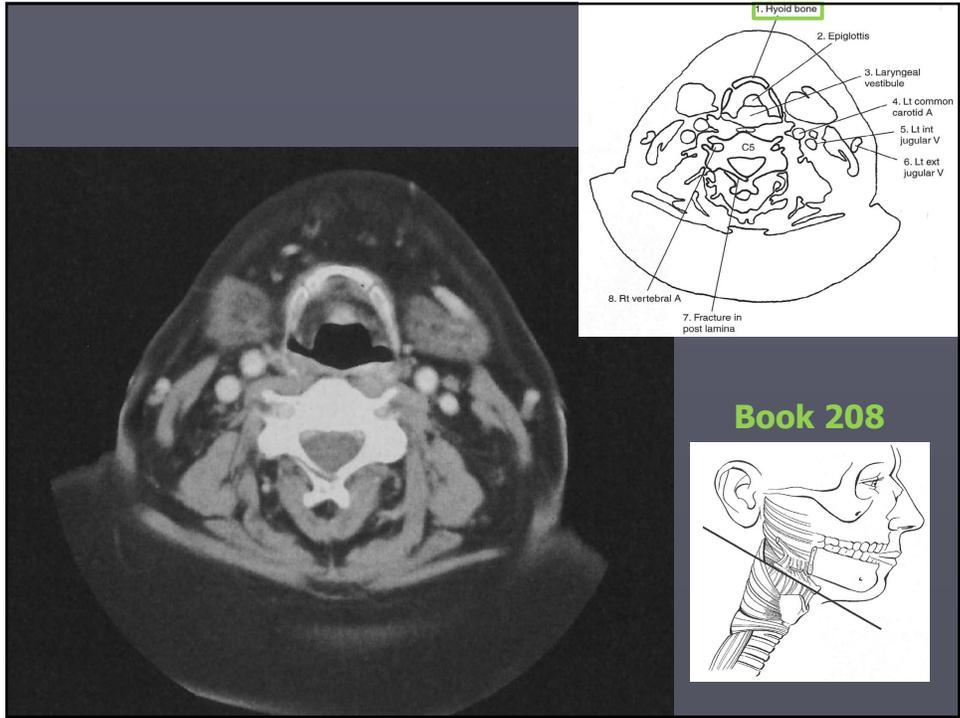
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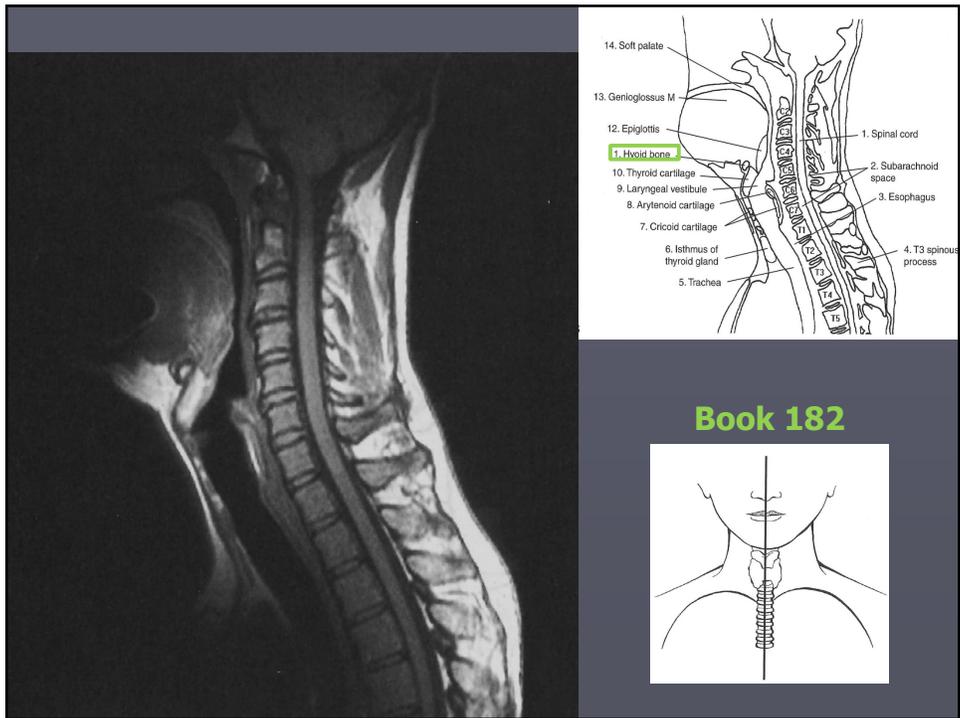
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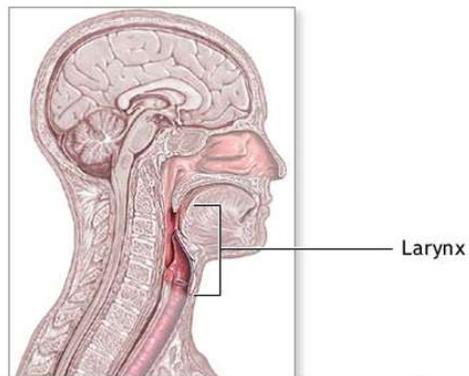
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Larynx (Voice box)

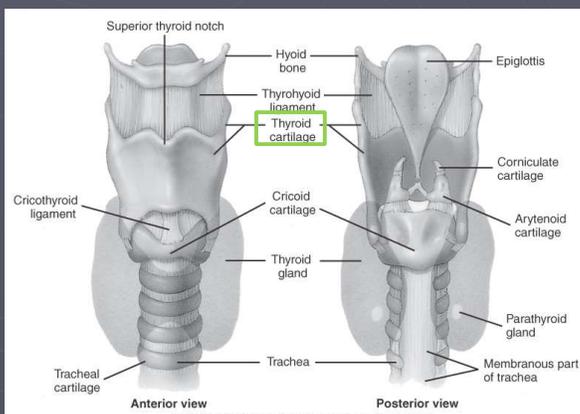
- ▶ Location: Appears from C3-C6; Part of airway in anterior neck; 4.5cm long
- ▶ Function: Air passage way
 - Laryngeal cartilages are unique
 - ▶ Connected with ligaments and muscles which are capable of voice production



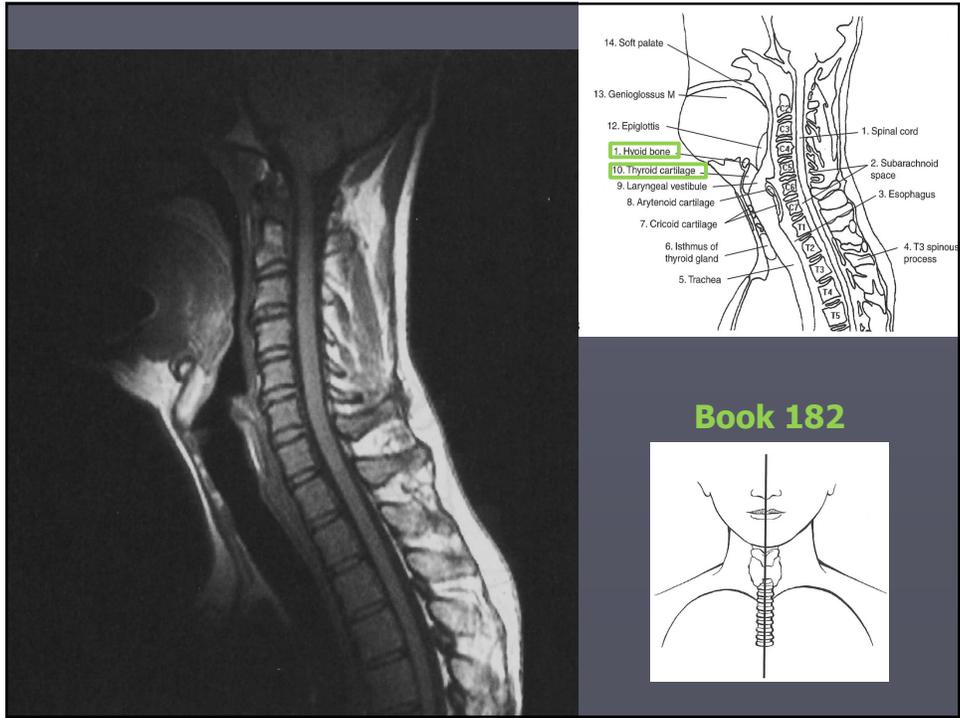
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Thyroid Cartilage

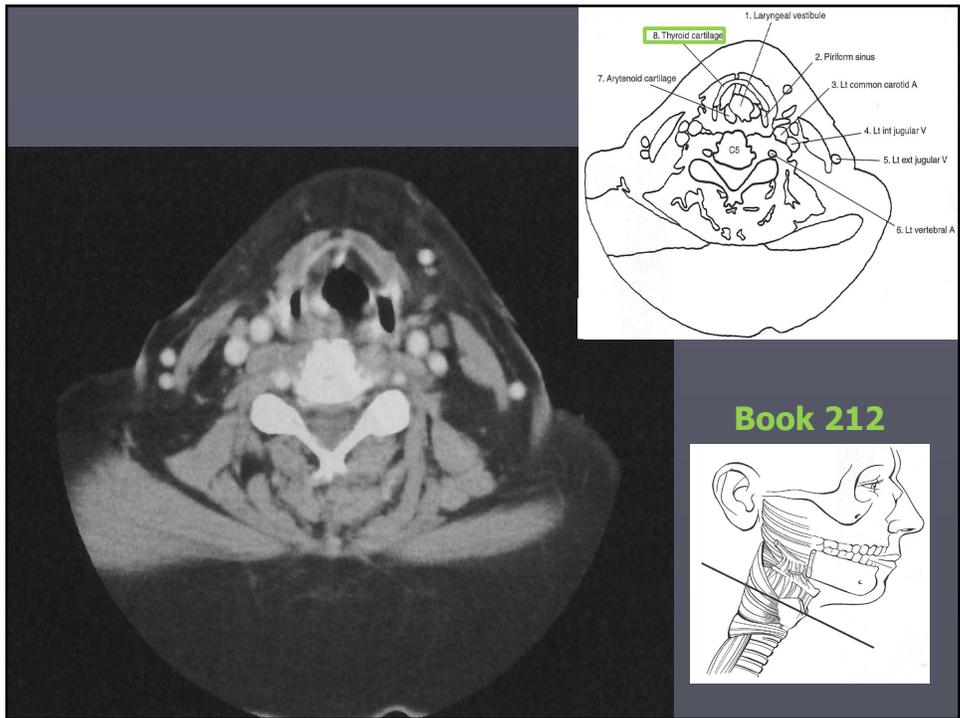
- ▶ Location: Just inferior of the hyoid
- ▶ Largest of the cartilage structures in the larynx
- ▶ U-shaped
 - Open posteriorly
- ▶ Anterior surface forms the Adam's apple
 - Laryngeal prominence
 - C4



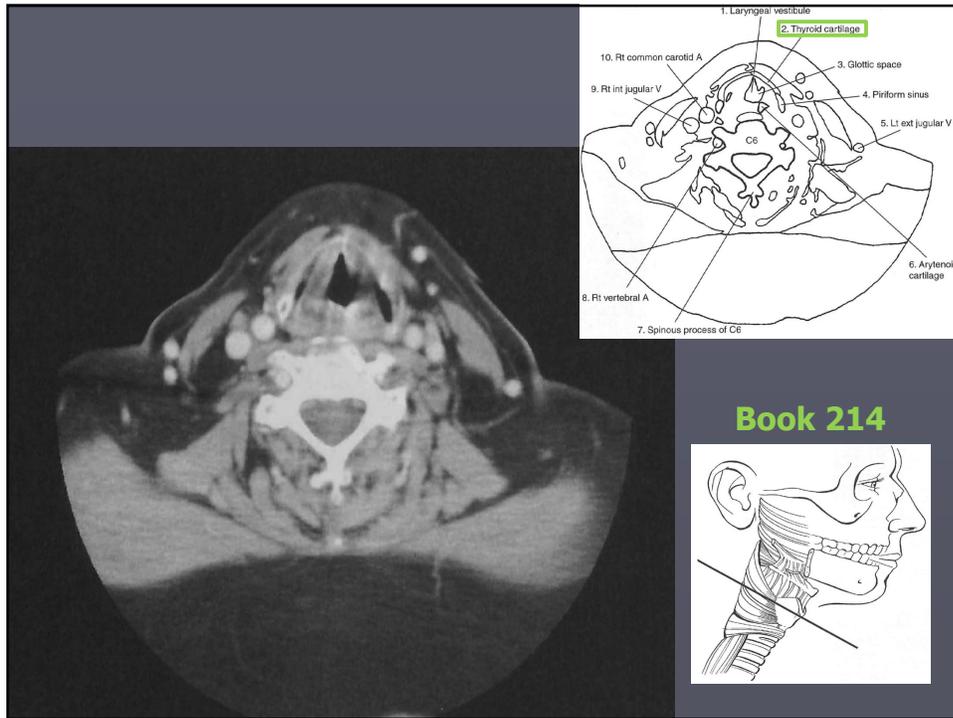
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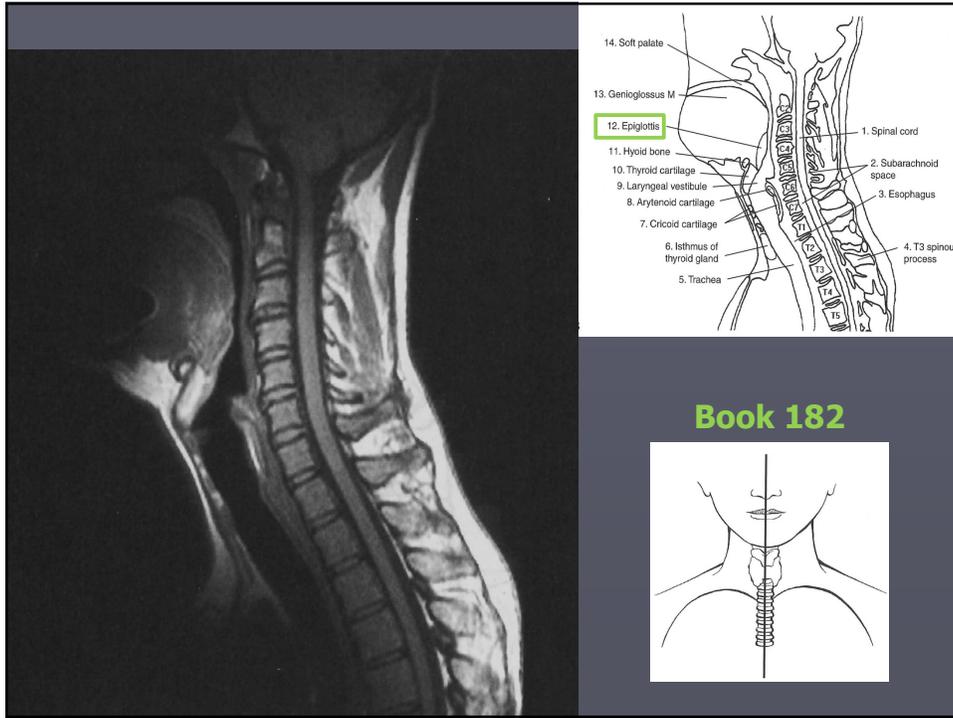


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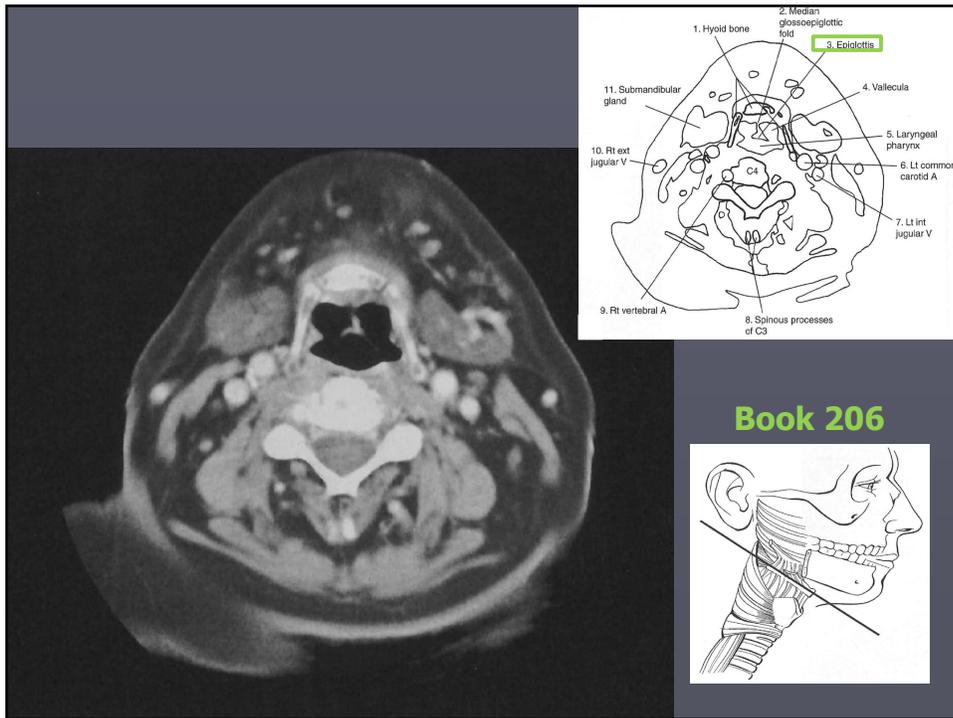
Epiglottis

- ▶ Location: Spoon-shaped cartilage; Inferior part anchors to the thyroid cartilage
 - Posterior to hyoid bone
- ▶ Function: Closes the opening to the larynx when drink or food is moved down the pharynx

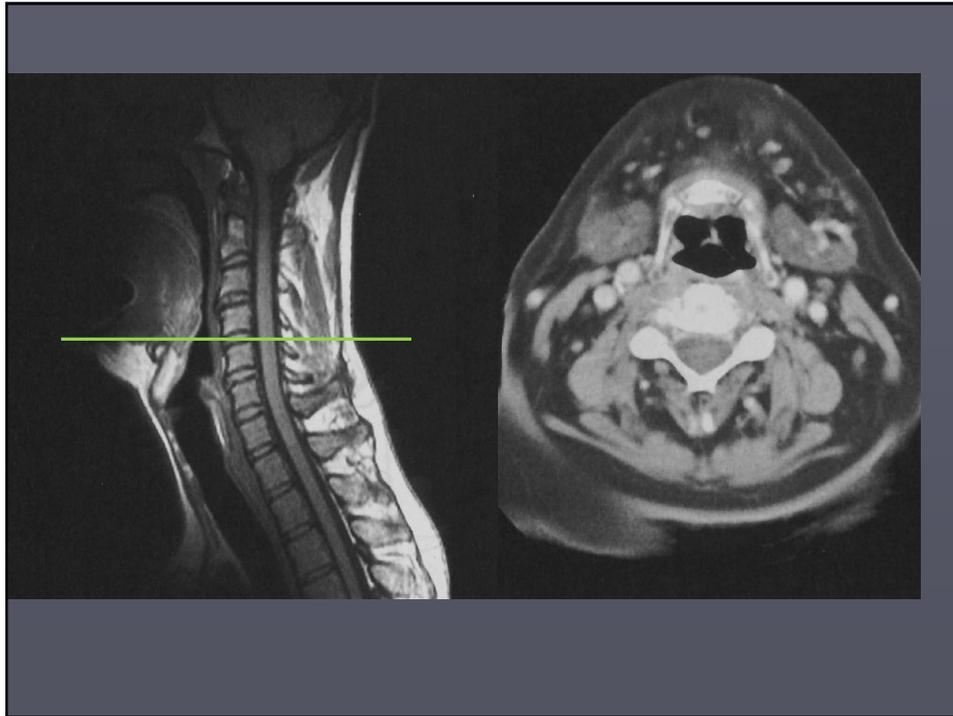
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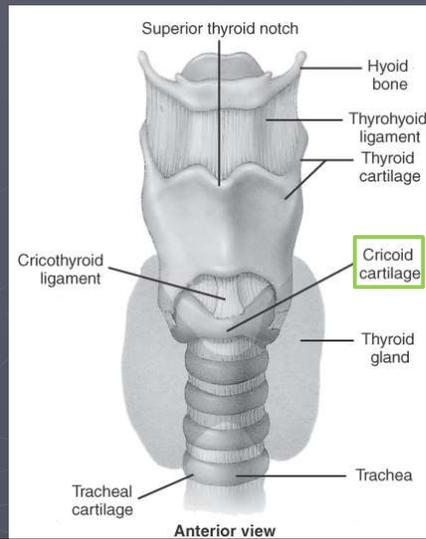
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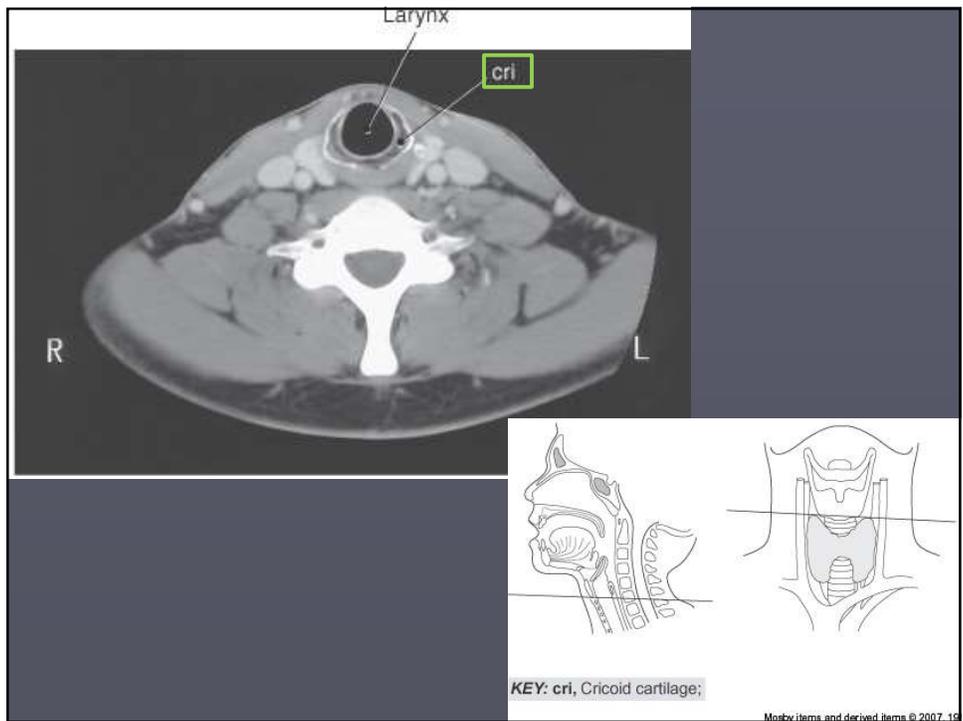
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Cricoid Cartilage

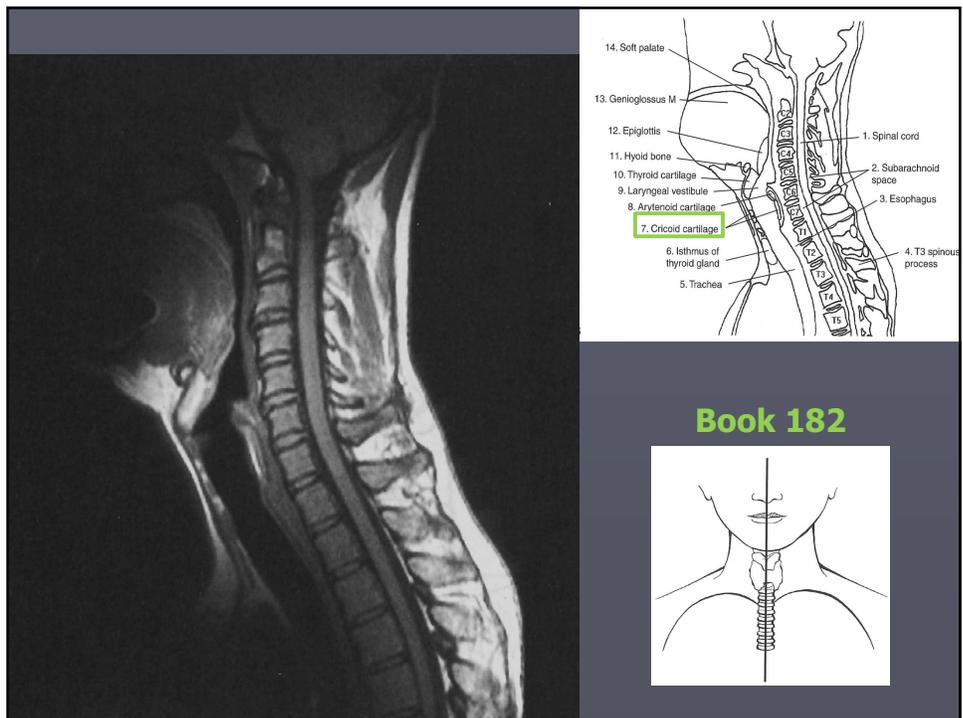
- ▶ Location: Inferior to the thyroid cartilage; Wraps around the airway; Single cartilage
 - Ring is wider posteriorly
 - Posterior may be visible on axial without anterior portion



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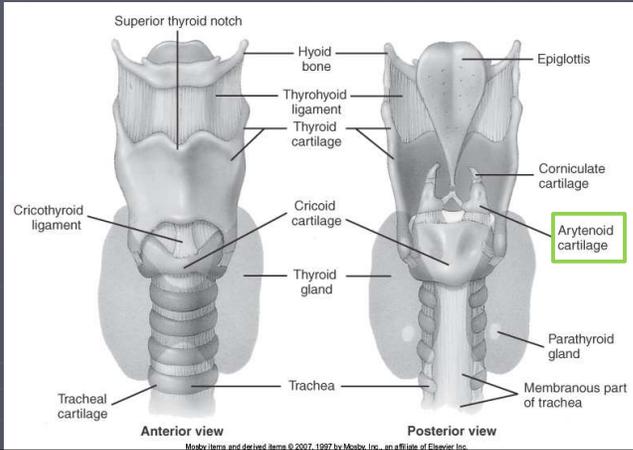


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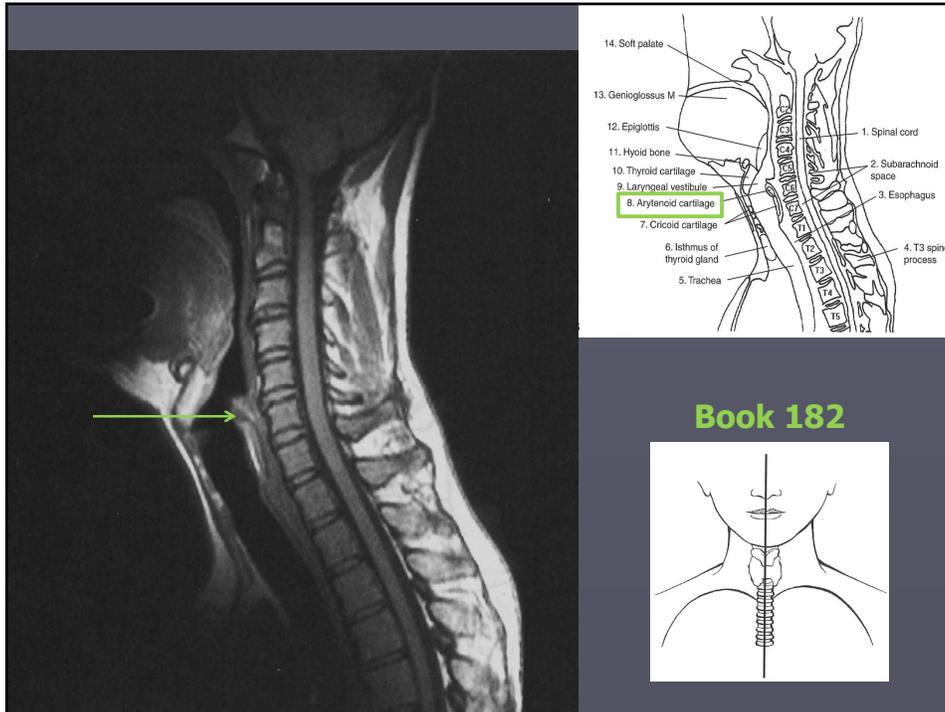
Arytenoid Cartilage

- **Location:** Rest on the posterior cricoid processes; Just below the laryngeal prominence
 - Two pyramid-shaped cartilages

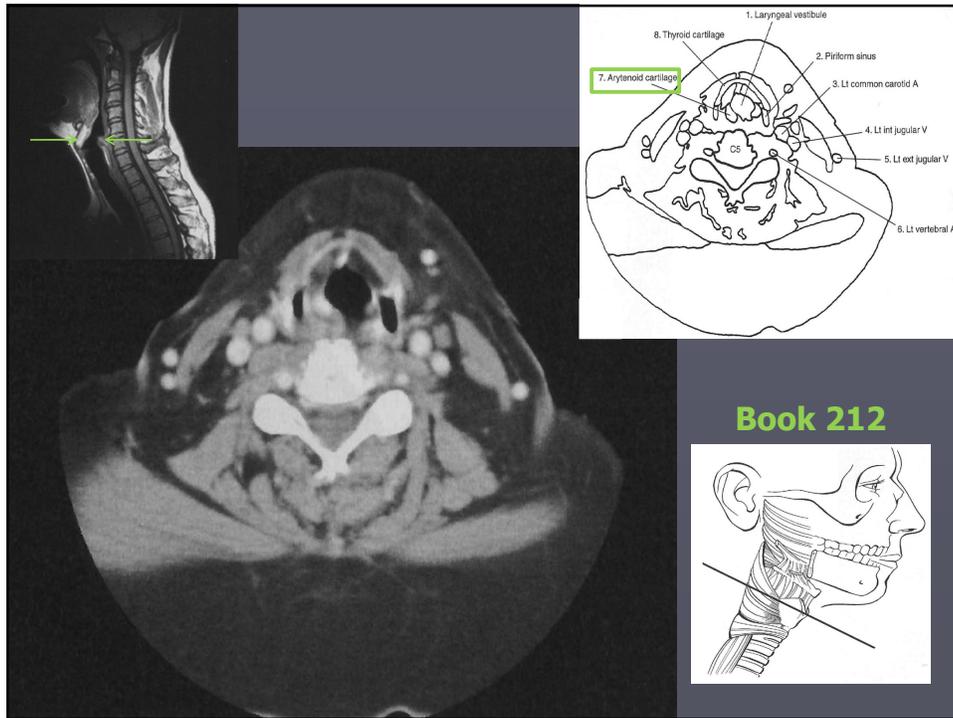
- **Function:** Vocal cord attachment



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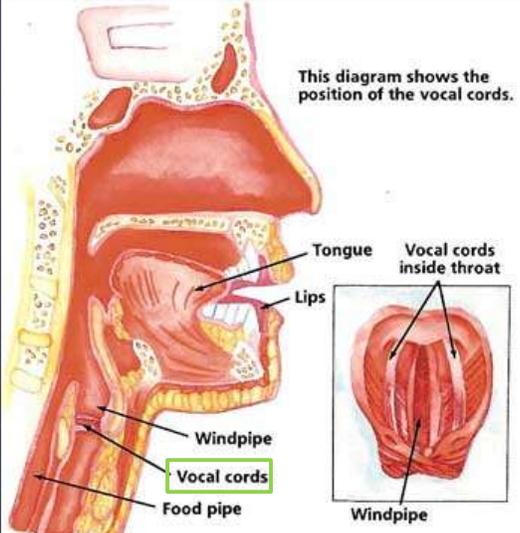
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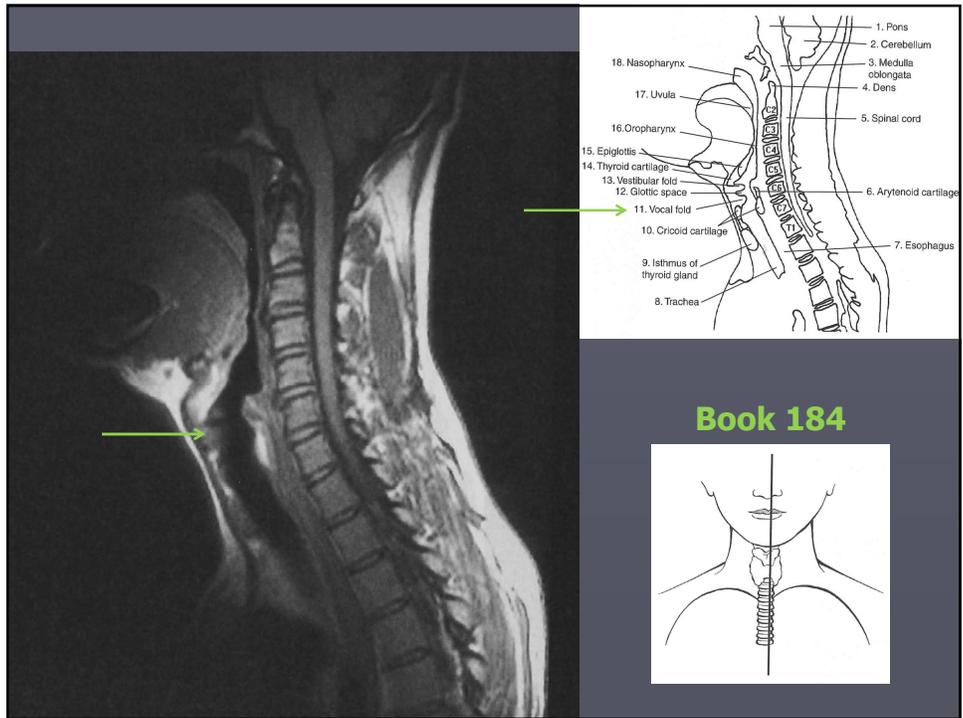
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Vocal Cords

- ▶ Location: Ligaments that extend between arytenoid cartilages and thyroid cartilages
 - Covered by mucous membrane
- ▶ Function: Muscles move the cartilage changing tension on the ligaments



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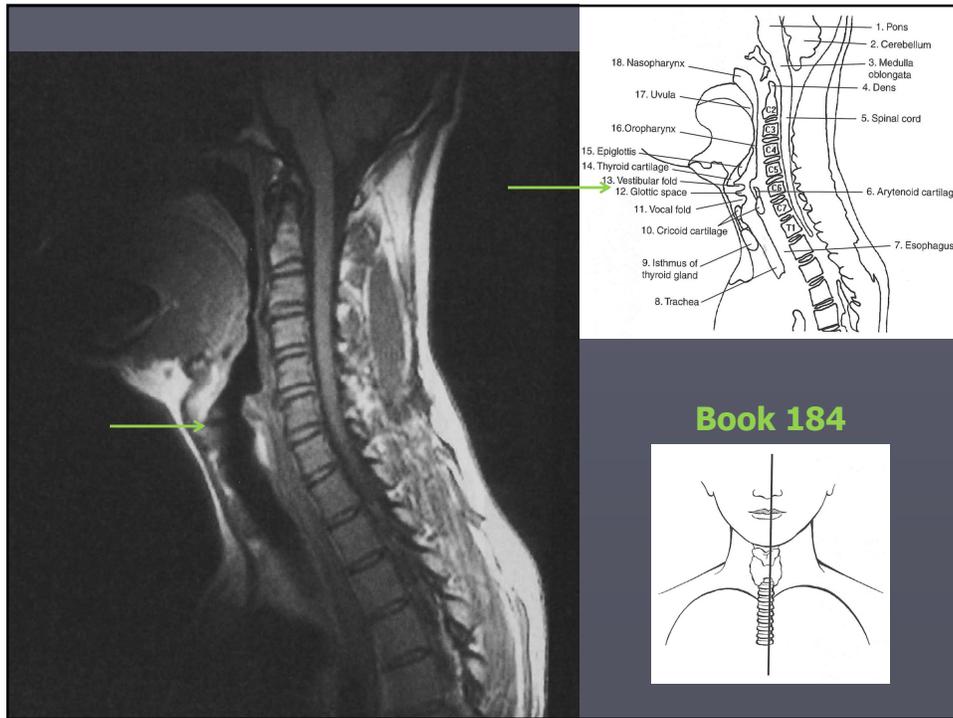
Glottic Space (Ventricle)

- ▶ Location: Space within the larynx
 - Bounded by the vestibular folds and vocal folds

***Sagittal View**

***Posterior View**

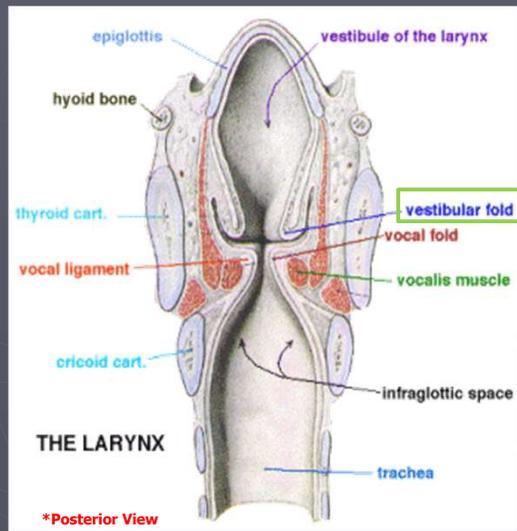
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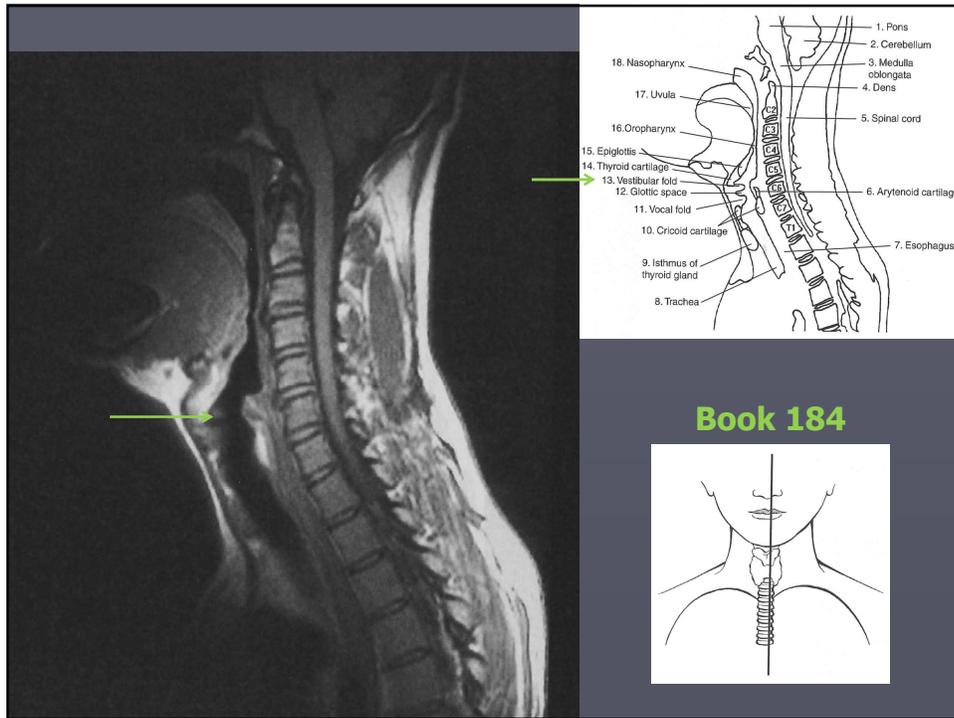
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Vestibular Folds (False Vocal Cords)

- ▶ Location: Mucous membrane structures just superior to the glottic space
- ▶ Not like ligament of vocal cords
 - No role in voice production



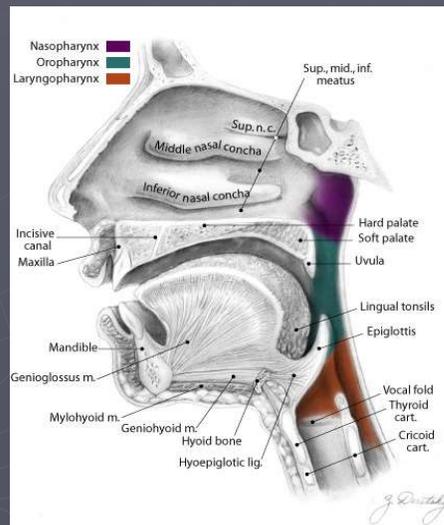
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Pharynx

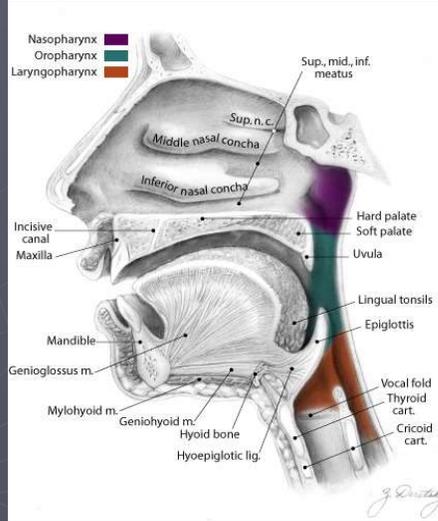
- ▶ Location: Tubular structure--Starts at the base of the skull and ends at C6 and becomes continuous with the esophagus
 - Lies next to the bodies of the vertebra
 - Has three parts: nasopharynx, oropharynx and laryngeal pharynx
- ▶ Function: Serves both respiratory and digestive functions



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Nasopharynx

- ▶ Location: Posterior to the nasal cavity; Extends from skull base to the soft palate
 - 1st section of the pharynx



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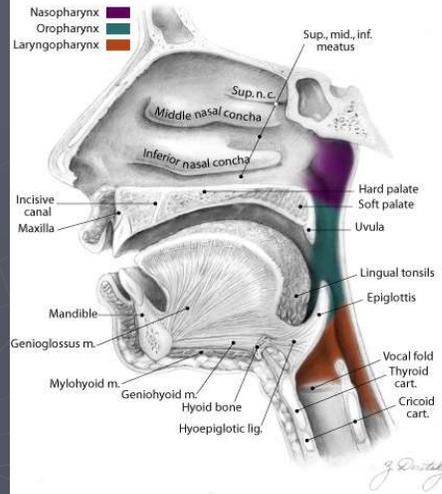
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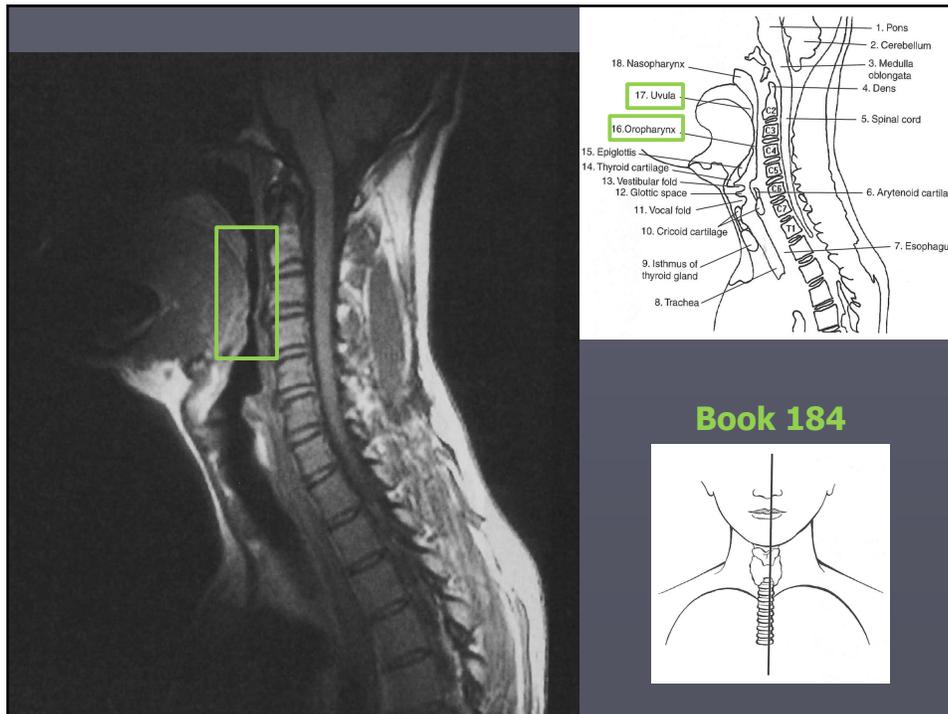
Oropharynx

► Location: Posterior to the oral cavity; soft palate to the epiglottis

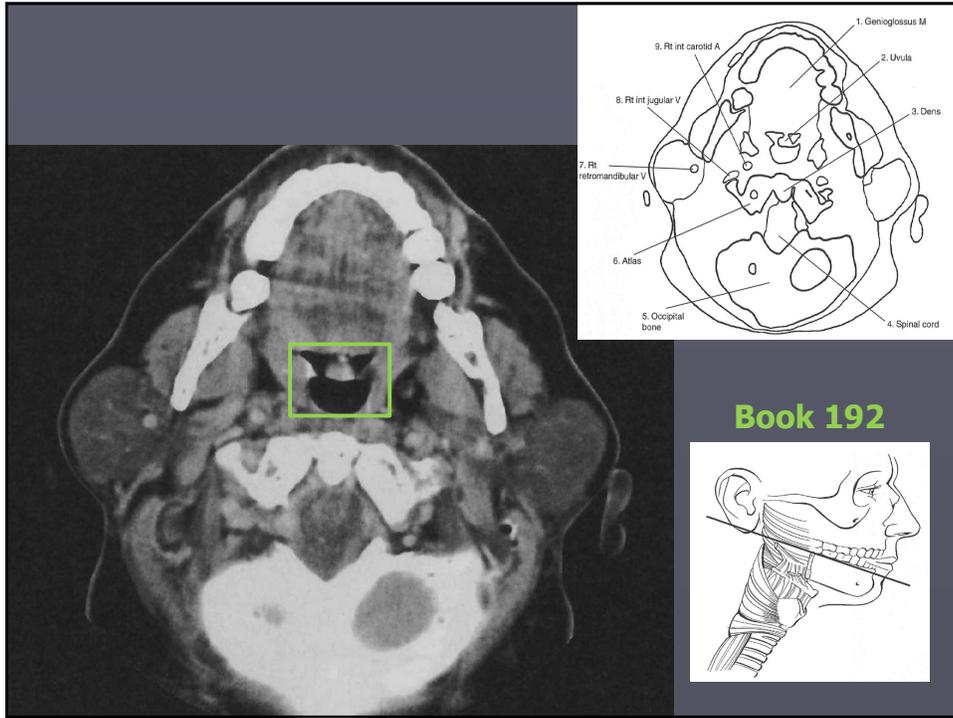
- 2nd section of the pharynx
- *Uvula* – Free edge of soft palate that hangs in the back of throat



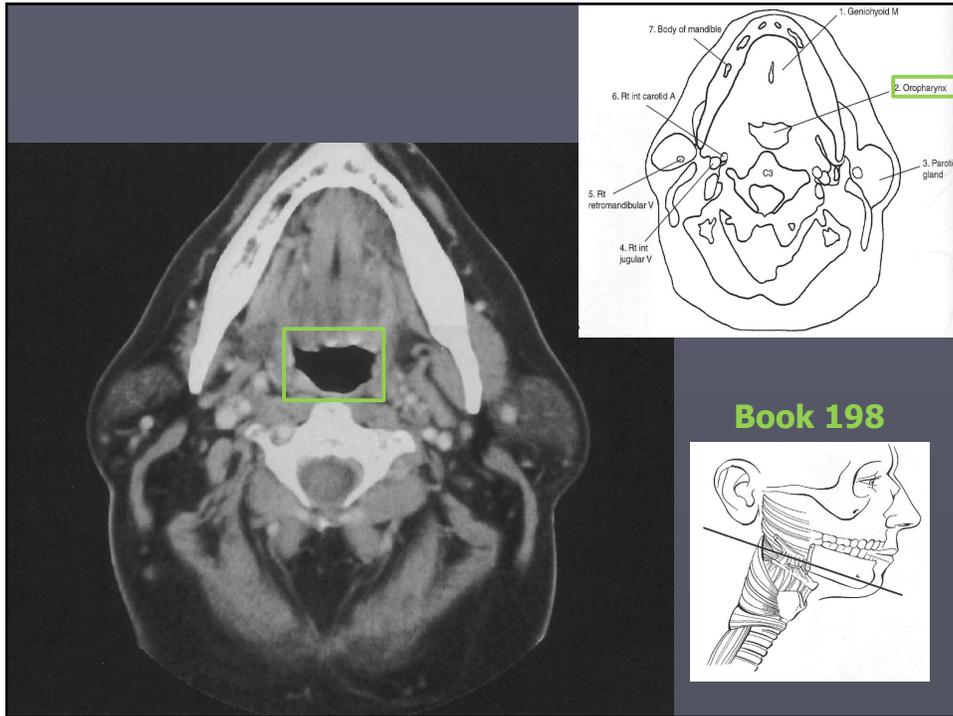
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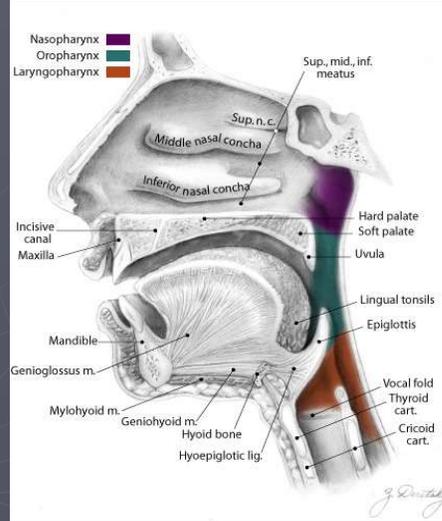
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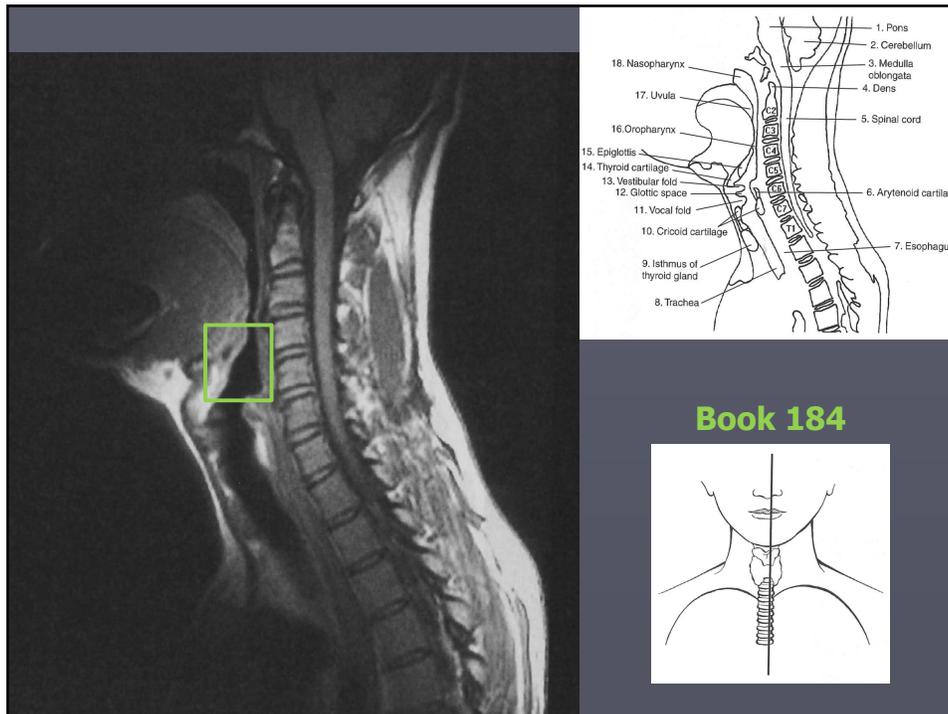
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Laryngeal Pharynx

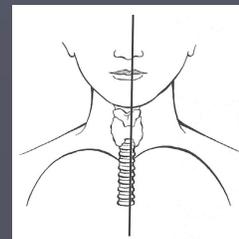
- ▶ Location: Posterior to the larynx; below the epiglottis, ending at esophagus
 - 3rd section of the pharynx



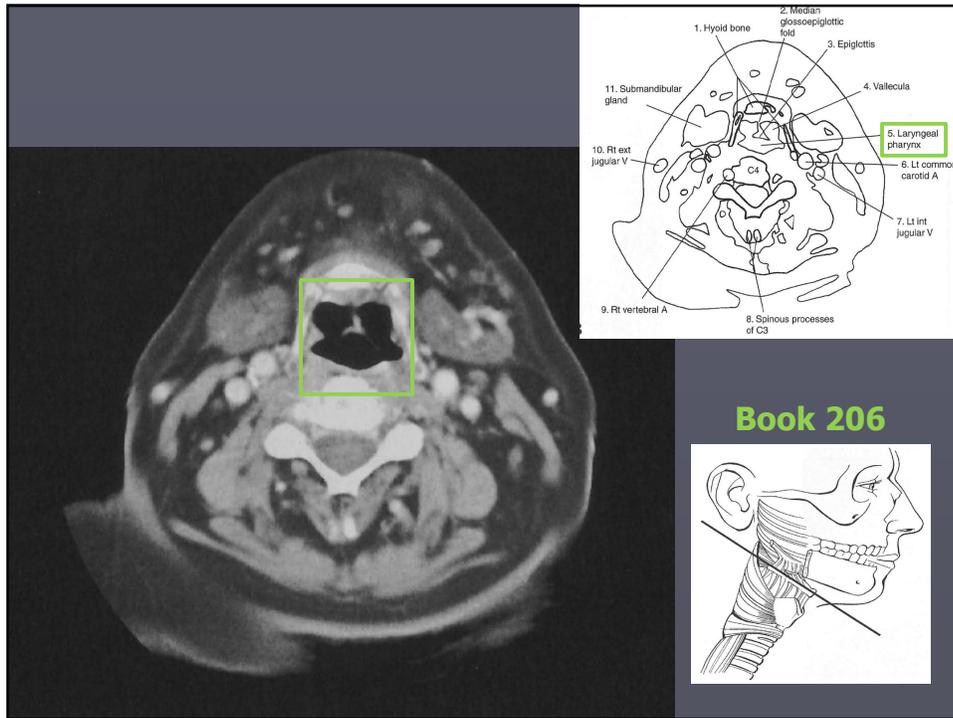
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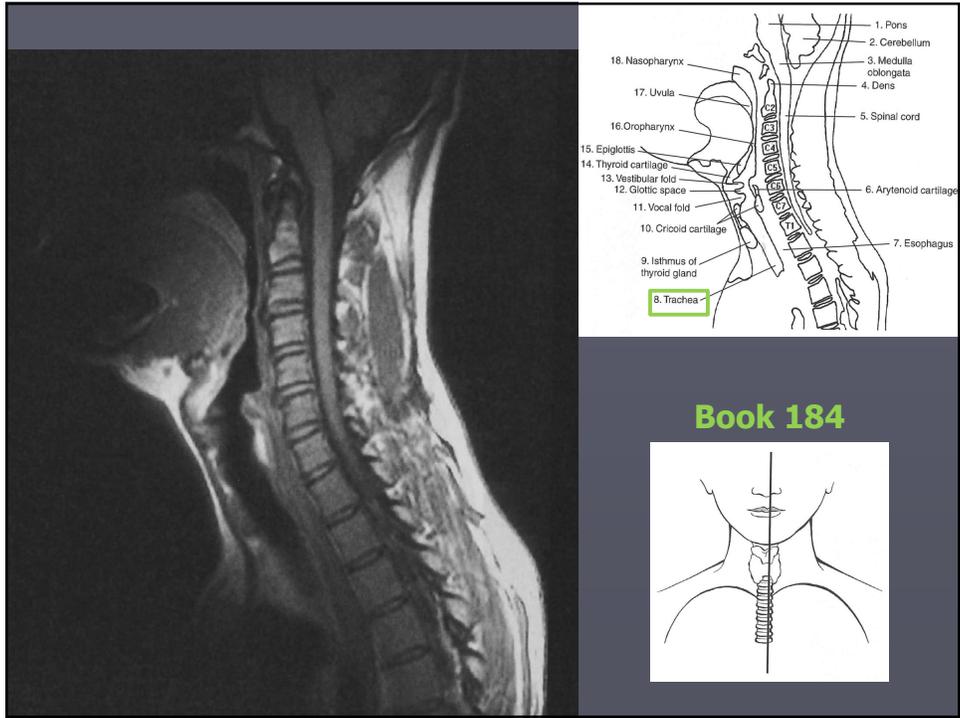
Trachea

- ▶ Location: Main airway; Extends from the larynx to the main bronchi
 - Level of C6-T4
 - Anterior to the esophagus and the bodies of the vertebra

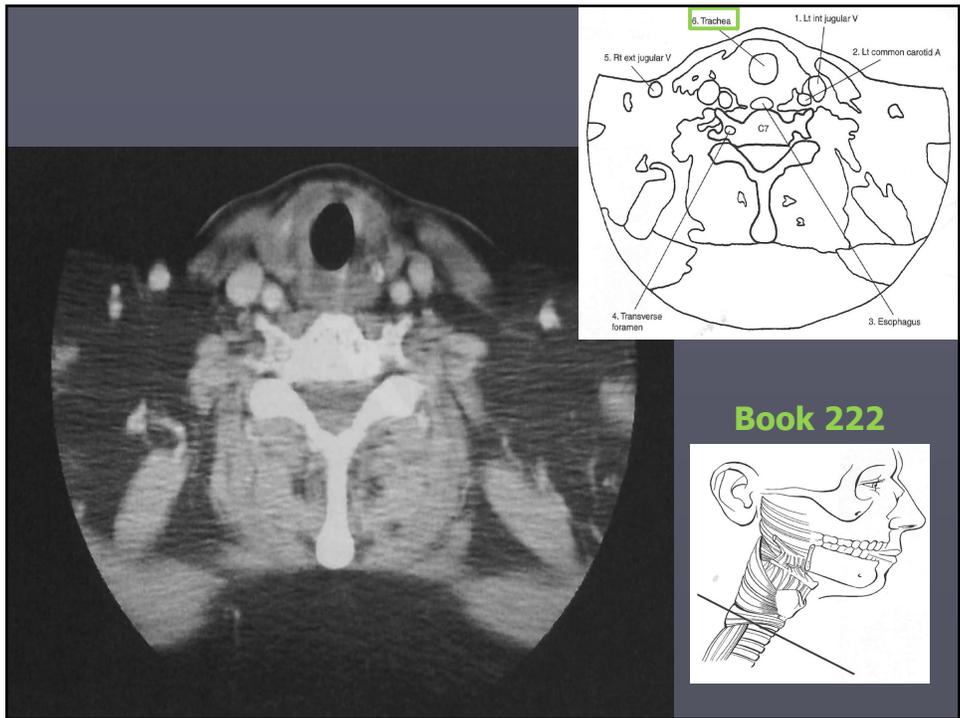
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(a) Anterior view

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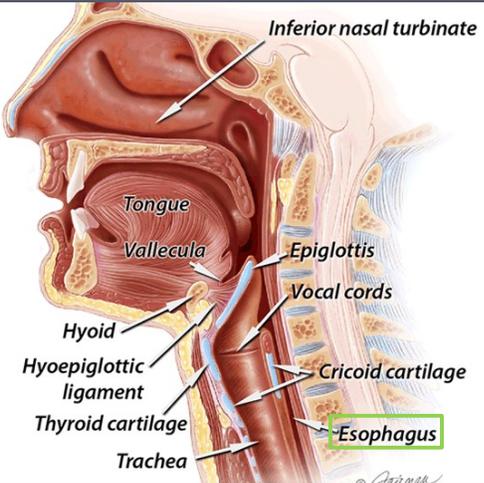
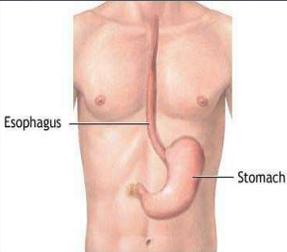
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Esophagus

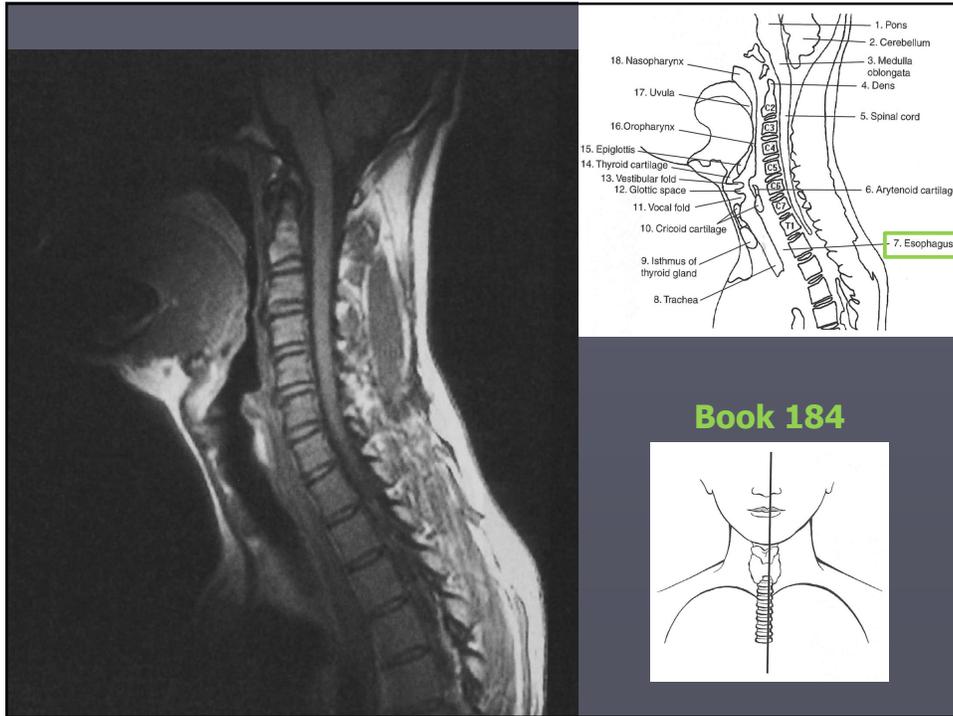
- ▶ Location: Starts at the level of C6
 - Extends from pharynx to the stomach
 - Medial and anterior to the bodies of the vertebra



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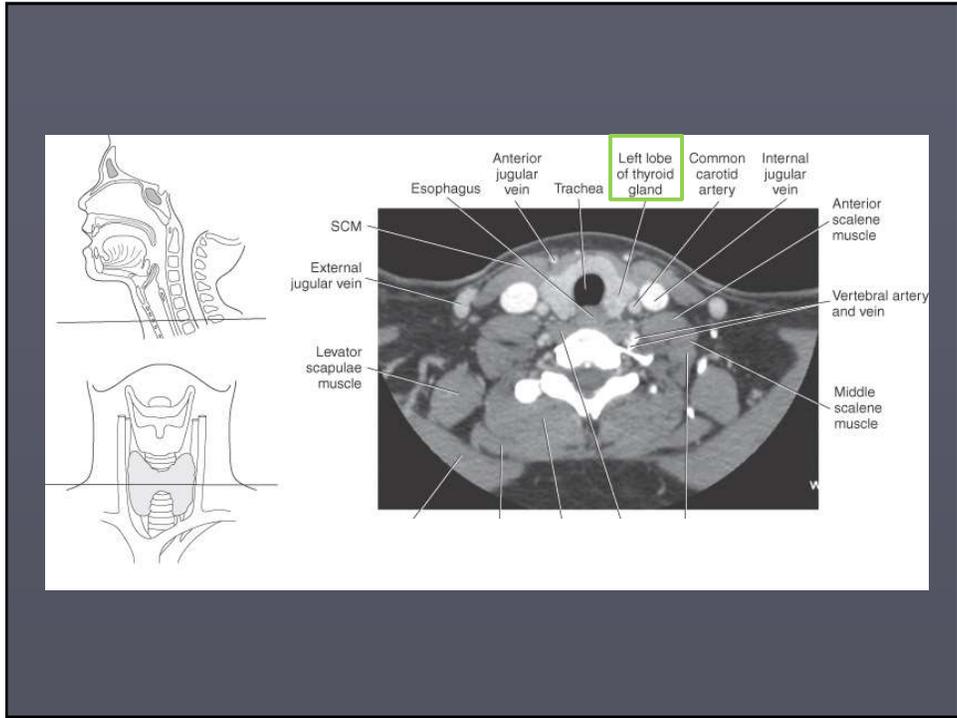


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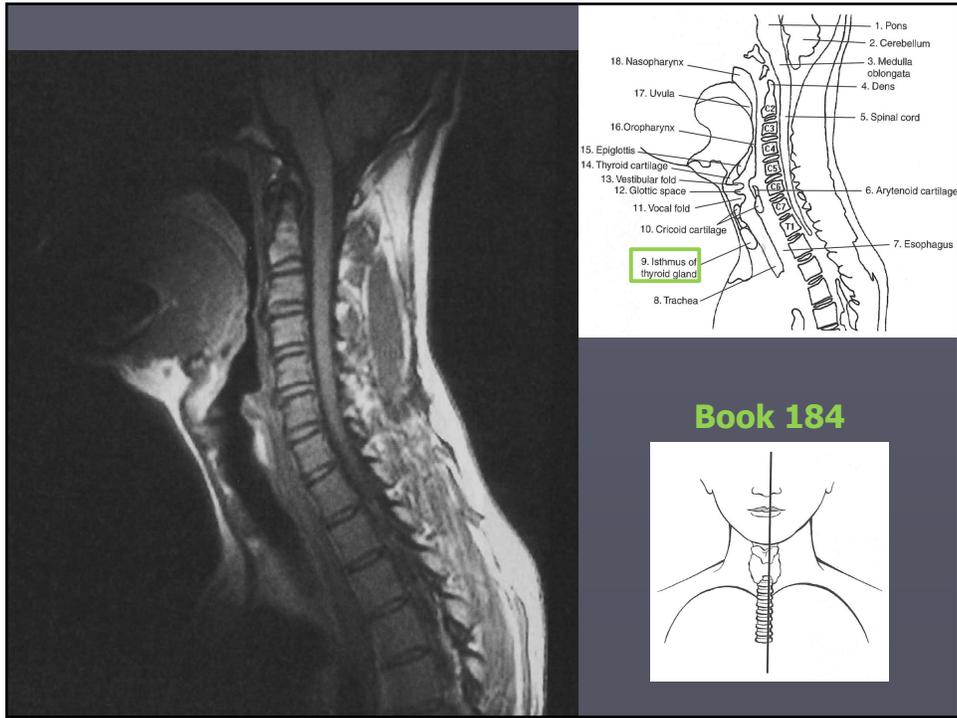
Thyroid Gland

- ▶ Location: U-shaped; Inferior to the larynx
 - Two lobes on either side of the trachea
 - ▶ Connected by the isthmus
- ▶ Function: Hormone production: influencing metabolism, growth and development, and body temperature

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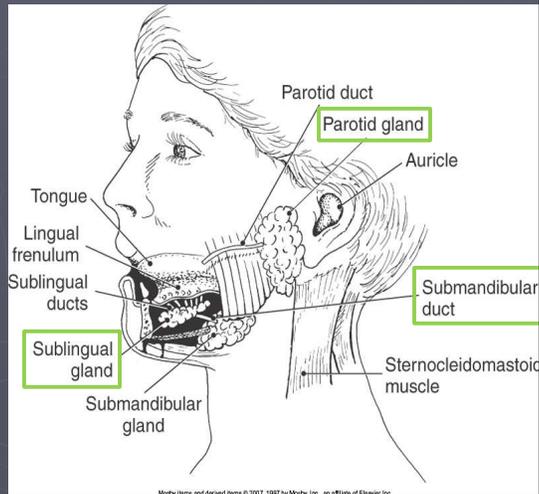
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Salivary Glands

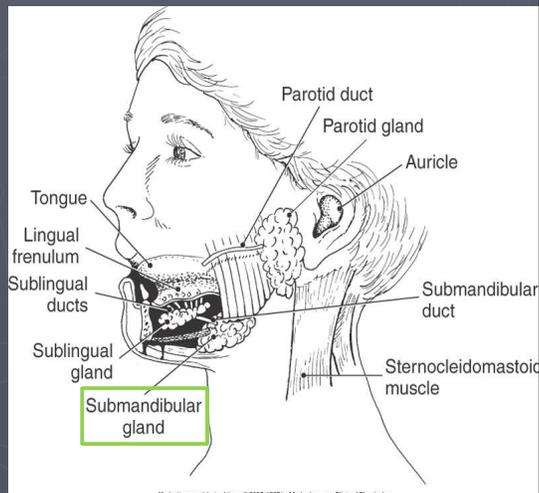
- ▶ Location: 3 large salivary glands – Submandibular, Parotid, Sublingual
- ▶ Function: Produce and empty saliva into the oral cavity by way of ducts to aid in digestion



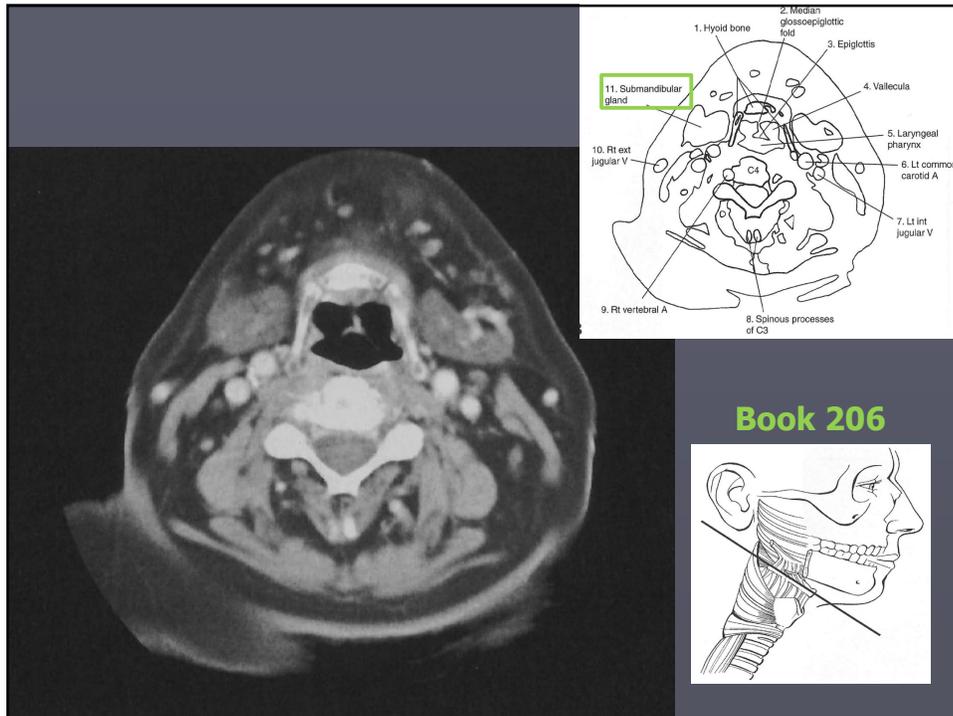
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Submandibular Glands

- ▶ Location: Just below the mandible on either side
 - Size of a walnut
 - Second largest salivary glands
- ▶ Function: Secretions from the glands are drained by submandibular (Wharton's) duct to an opening in the anterior floor of the mandible



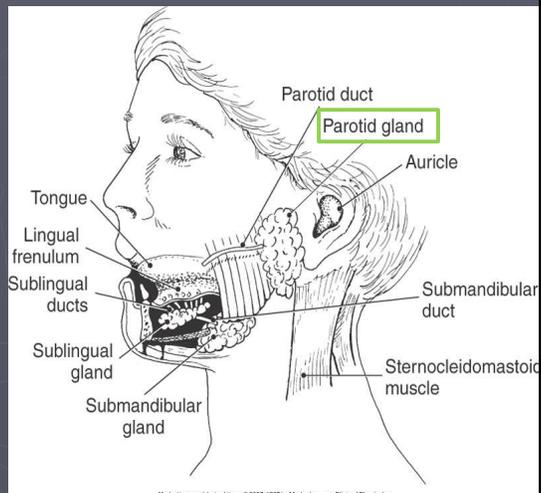
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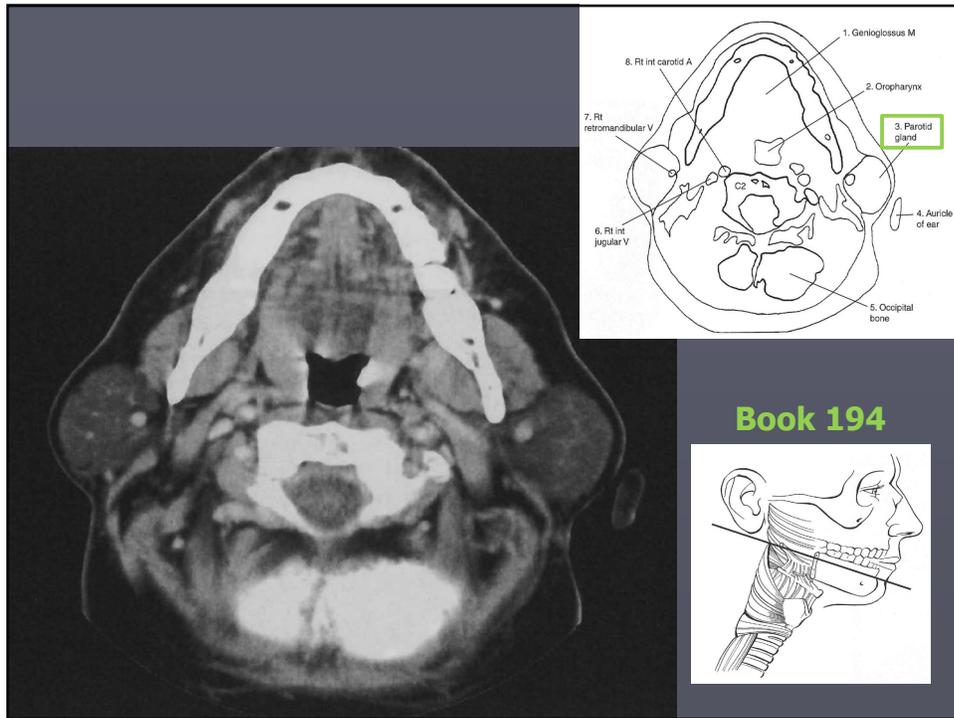
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Parotid Glands

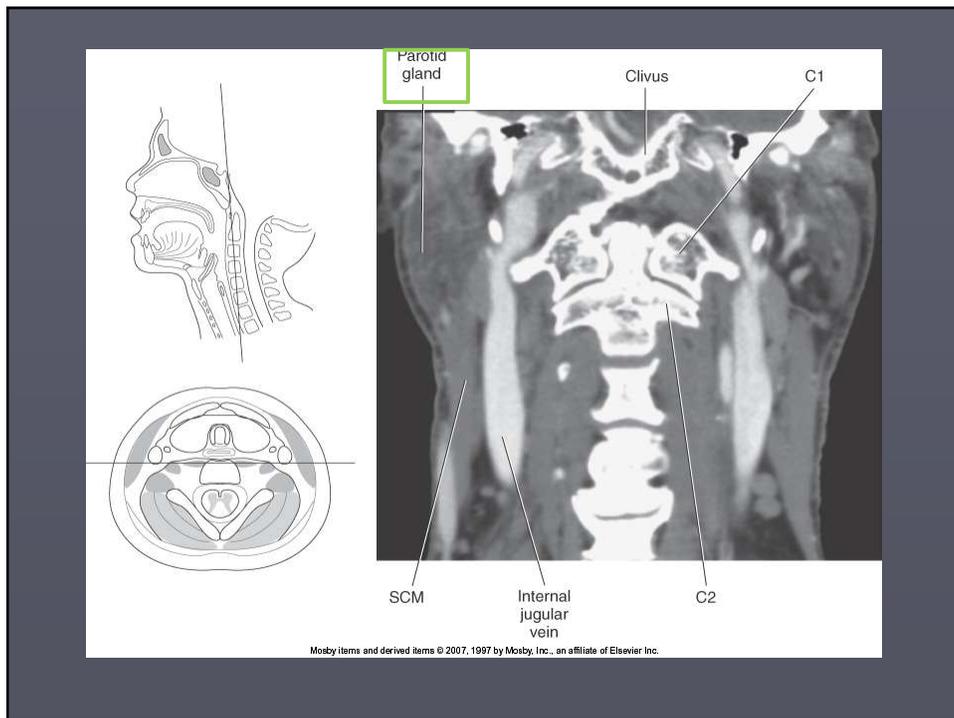
- Location: Found in front of auricle
 - Between ramus of mandible and sternocleidomastoid muscle
 - Extend inferiorly from level of EAM to the angle of the mandible
 - Largest of salivary glands



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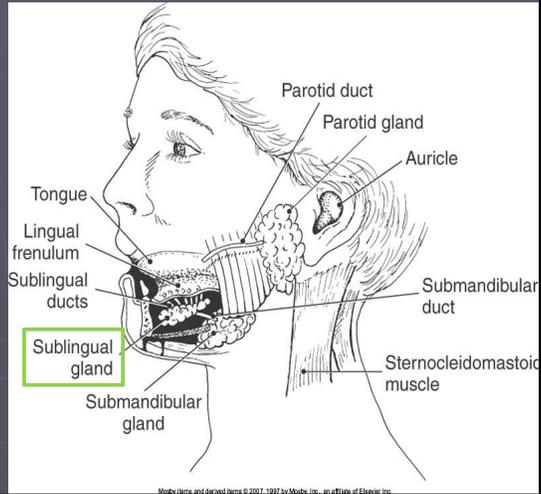
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Sublingual Glands

- ▶ Location: Lies under the tongue on the floor of the mouth; smallest of the salivary glands



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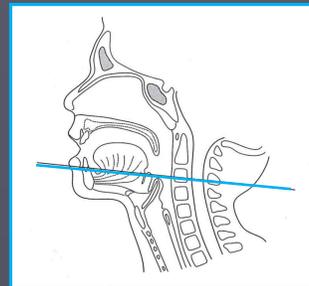
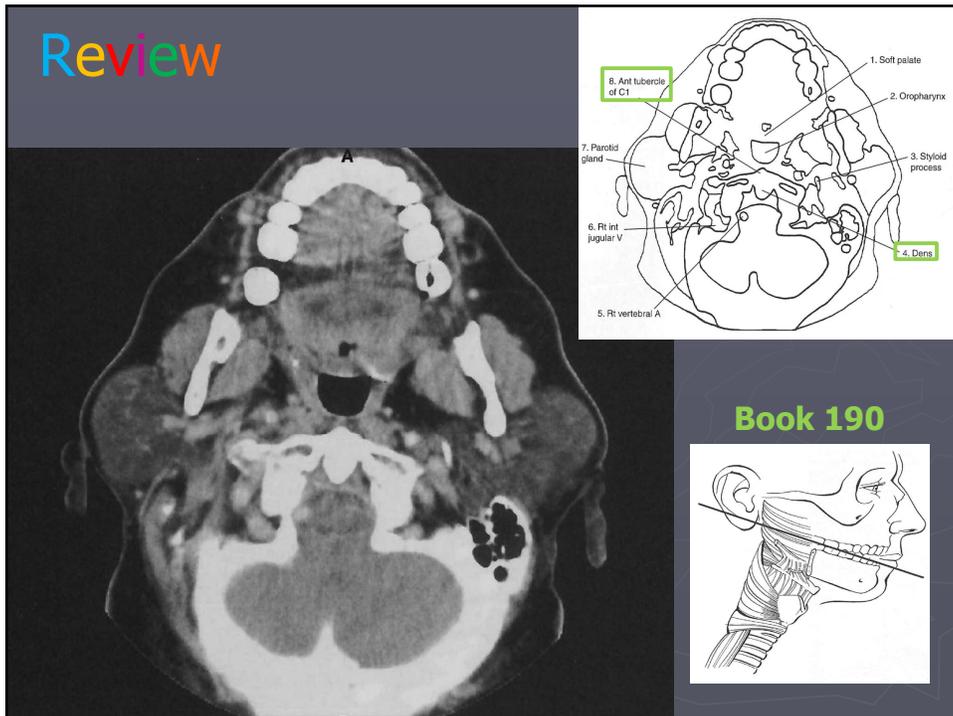


Figure 5.39
Axial, T1-weighted MR scan of neck with submandibular and sublingual glands.

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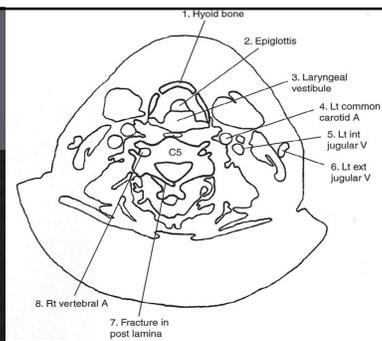
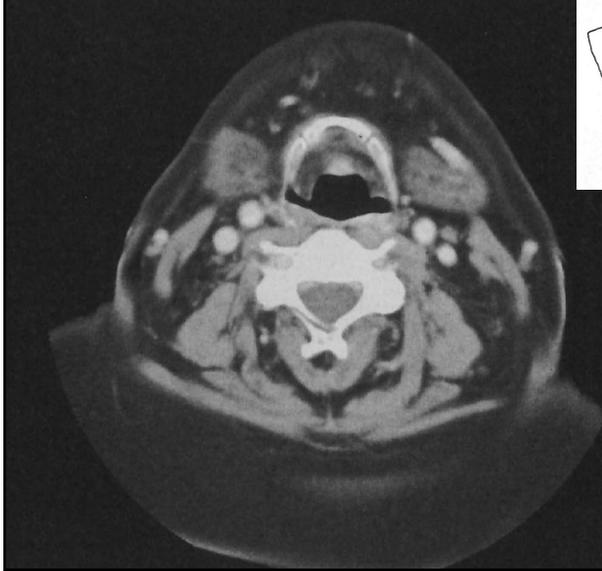


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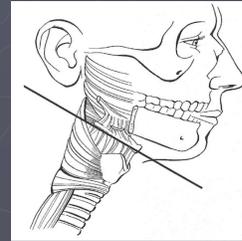


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Review

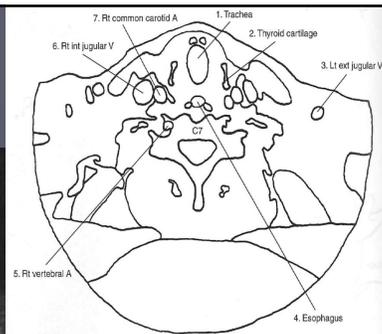


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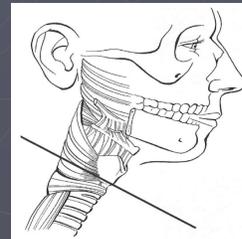


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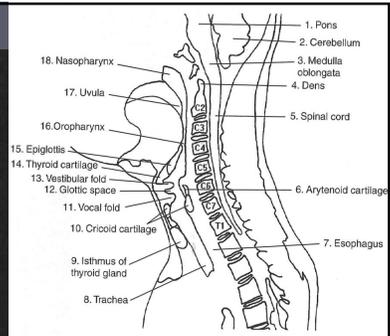


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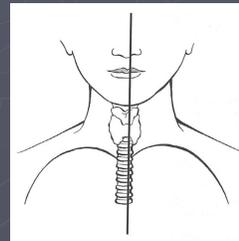


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Review



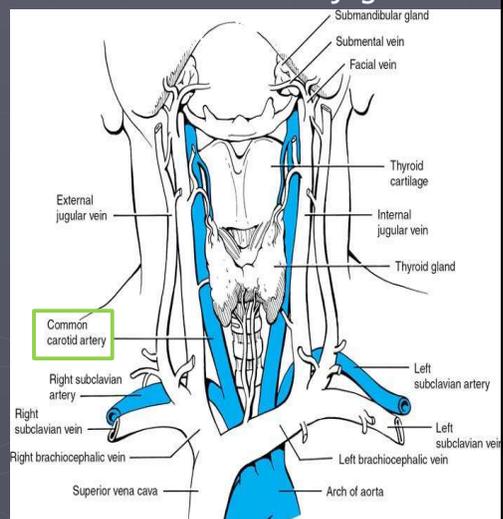
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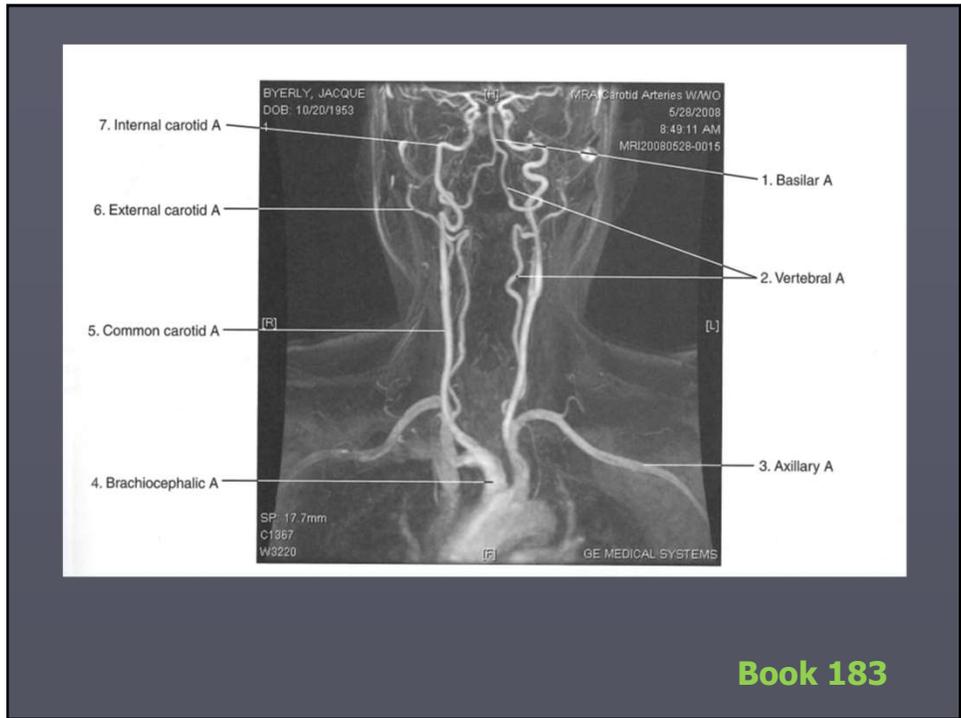
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ARTERIAL FLOW*** Common Carotid Arteries

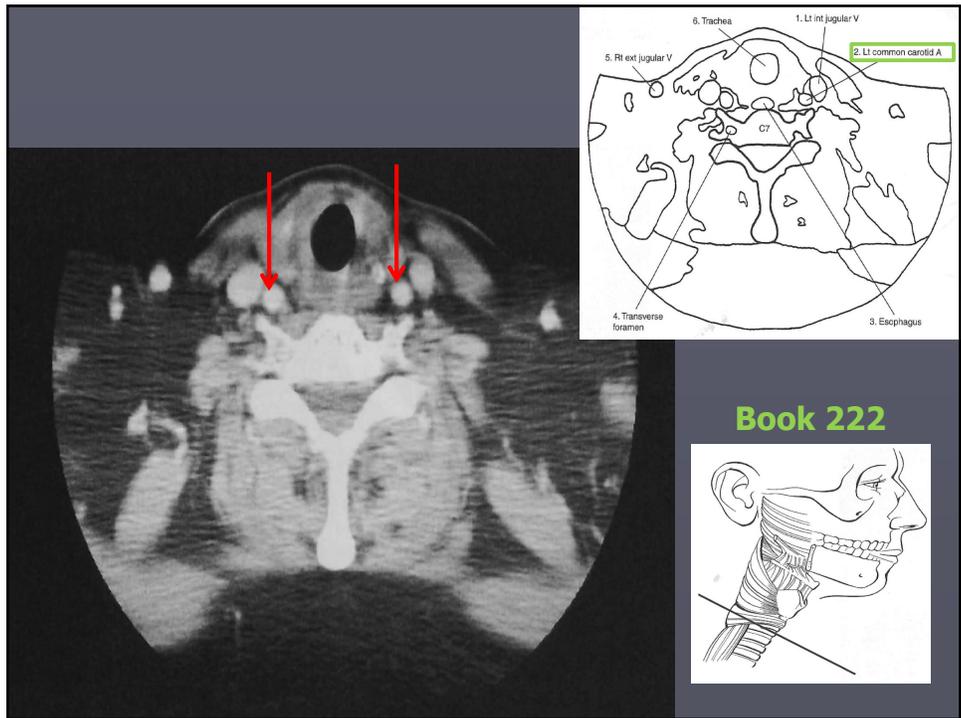
- ▶ Location: Ascend through the neck with the internal jugular veins; Beside the trachea
- ▶ Bifurcation takes place at approximately C3-C4
 - ▶ External and internal carotids
 - ▶ Above thyroid cartilage
 - ▶ Around angle of mandible
- **Right** originates from the brachiocephalic artery
- **Left** is the second major branch off the aortic arch



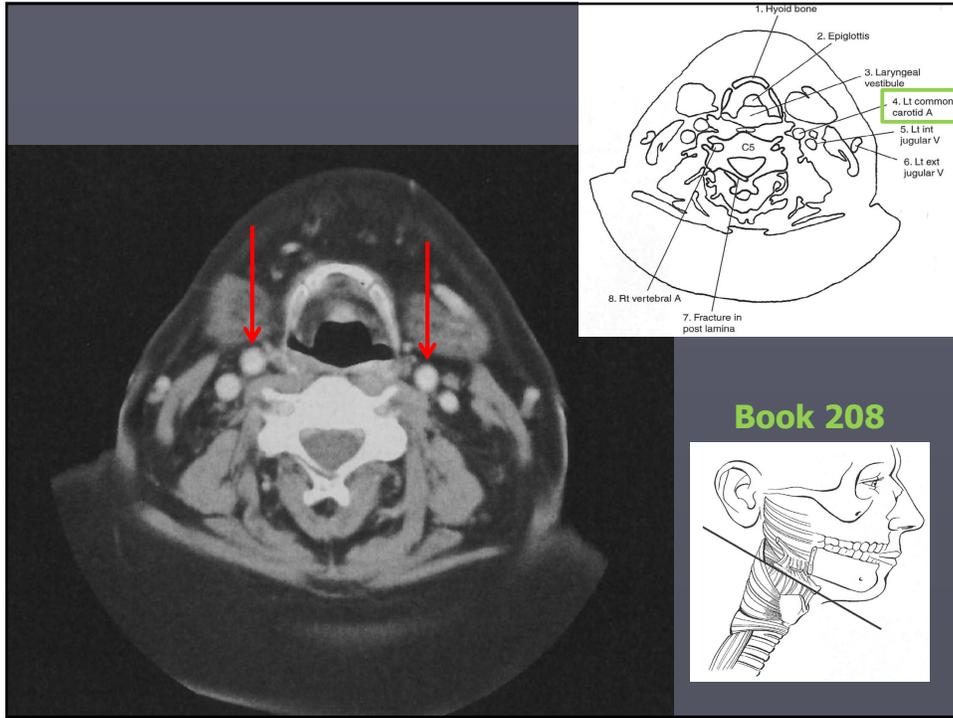
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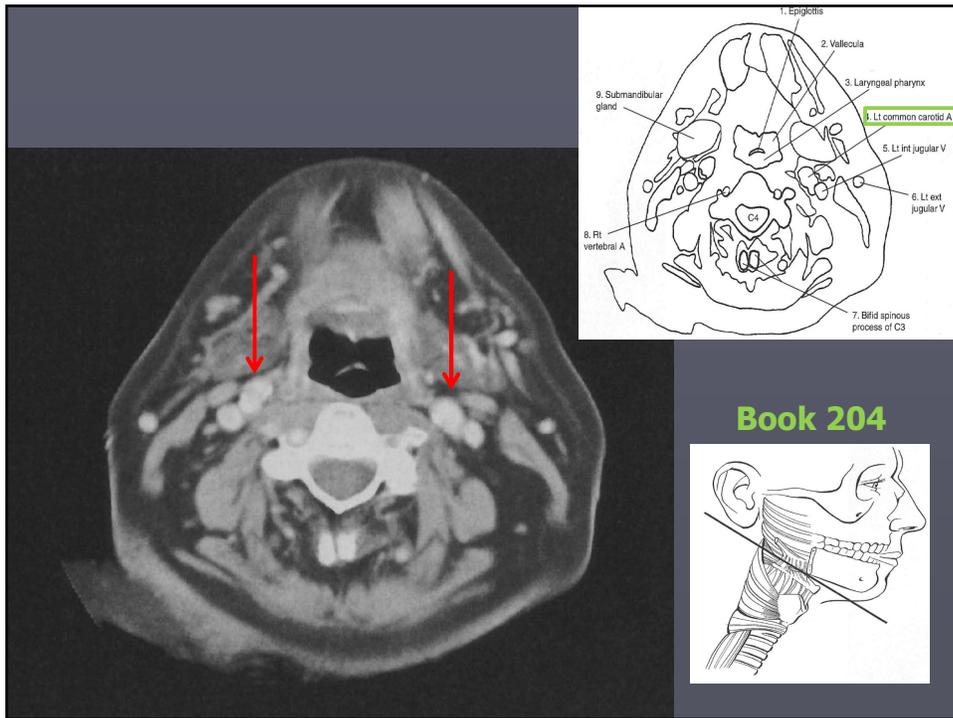
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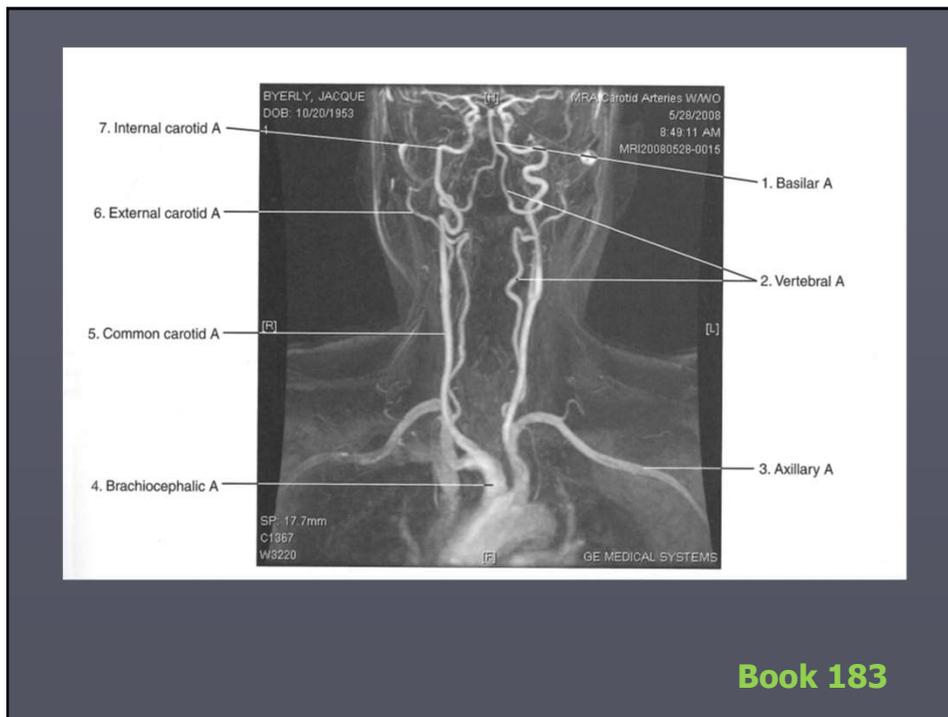
72



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Carotid Arteries

Internal Carotids**

- ▶ Location: Originate from the common carotids
 - Ascend up and next to the internal jugular vein
 - the aortic arch
- ▶ Function: Supply blood to the anterior and middle cerebrum

Internal carotid artery

External carotid artery

Facial artery

Common carotid artery

Vertebral artery

Subclavian artery

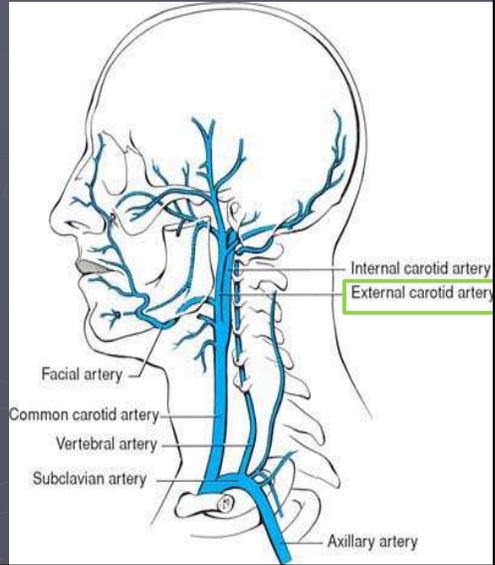
Axillary artery

76

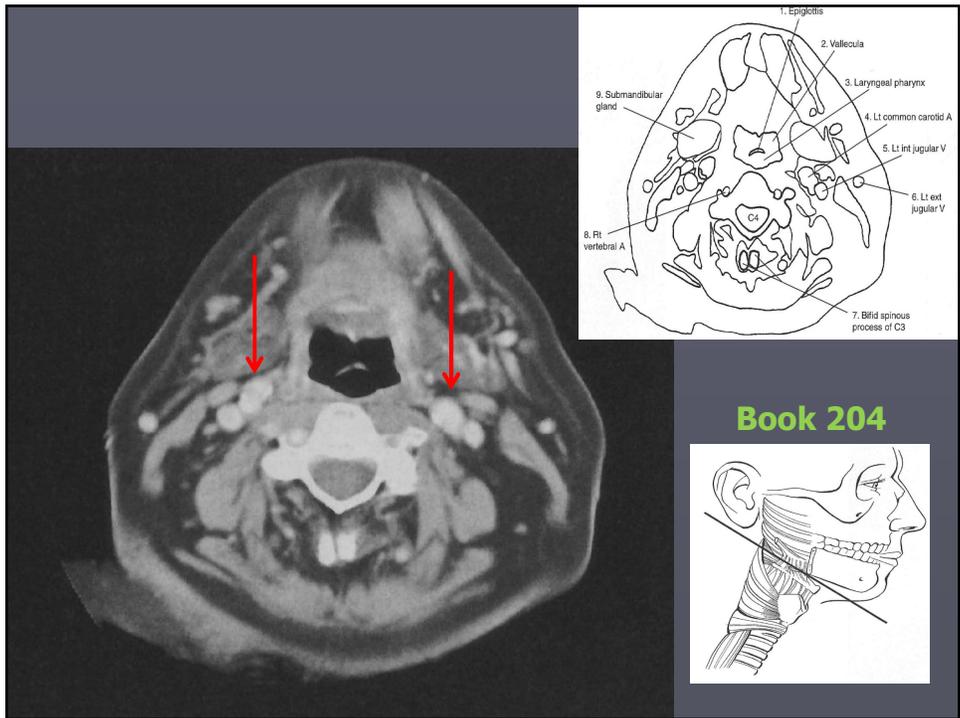
Carotid Arteries

External Carotids**

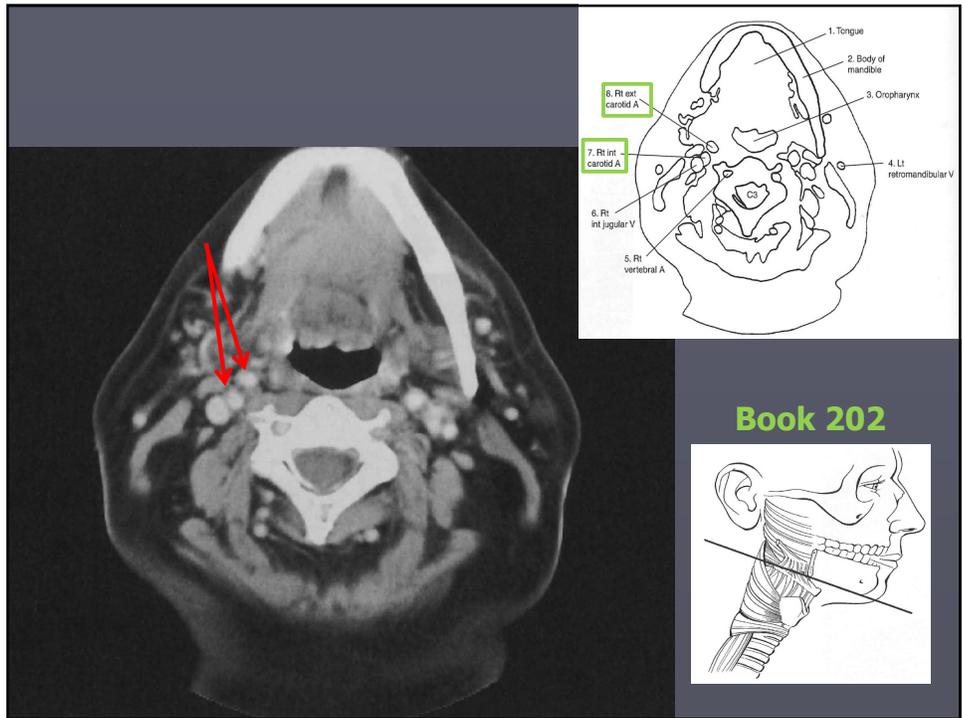
- ▶ Location: Arise from the common carotid artery
- ▶ Function: Supply blood to the external head



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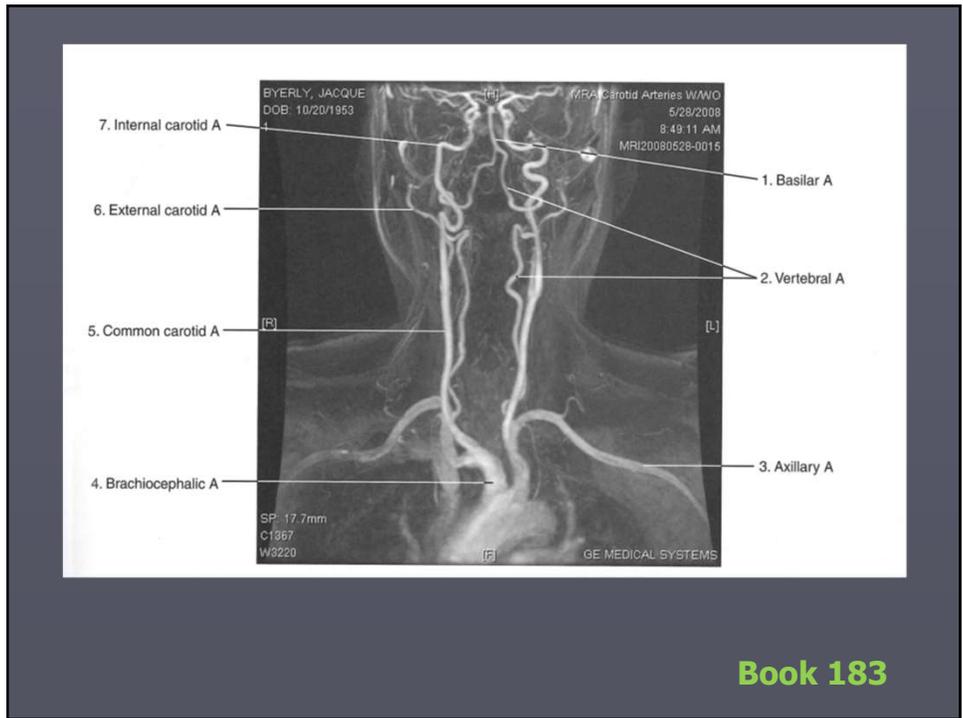


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Book 202

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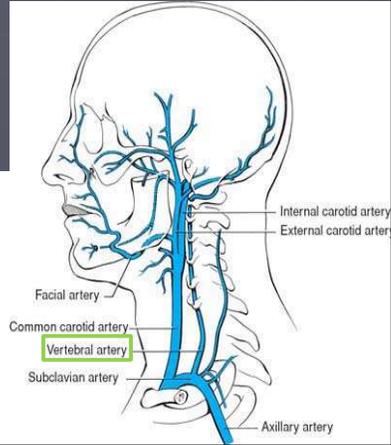
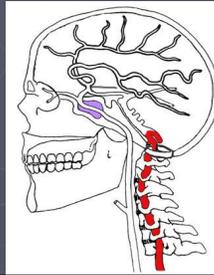


Book 183

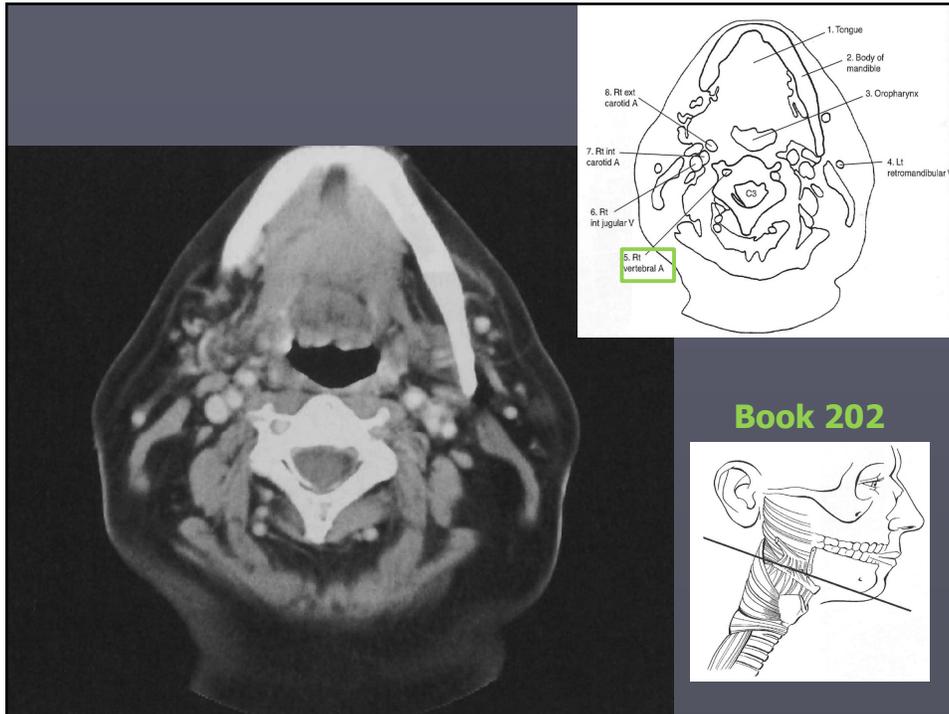
80

Vertebral Arteries

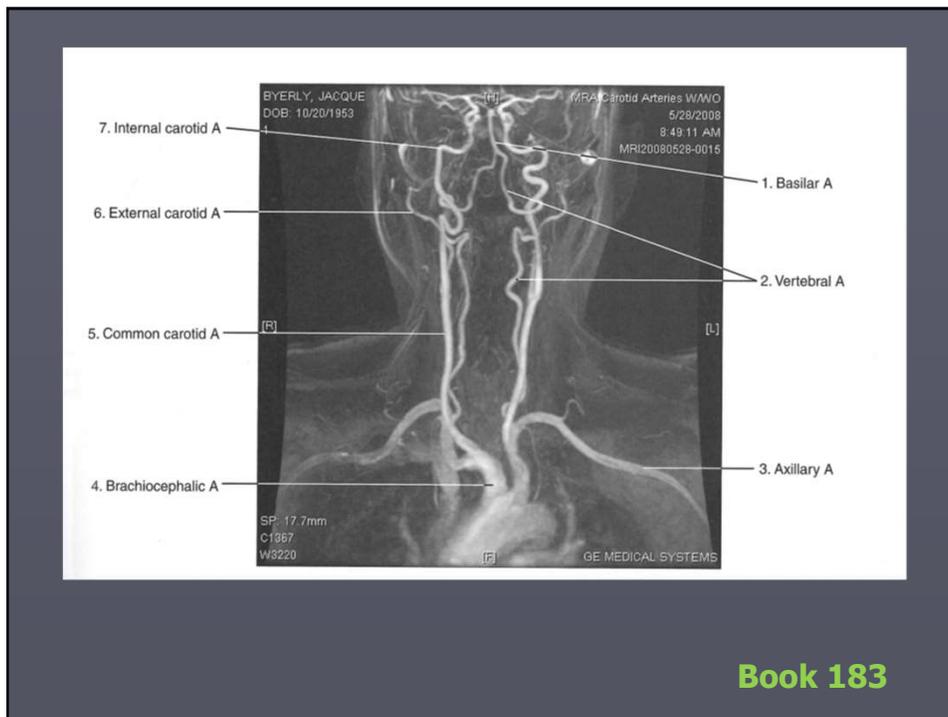
- ▶ Location: Ascend superiorly through the transverse cervical foramina; Enter the skull through the foramen magnum
 - Both sides start at the subclavian arteries
 - ▶ Become basilar artery
- ▶ Function: Supply blood to the posterior brain



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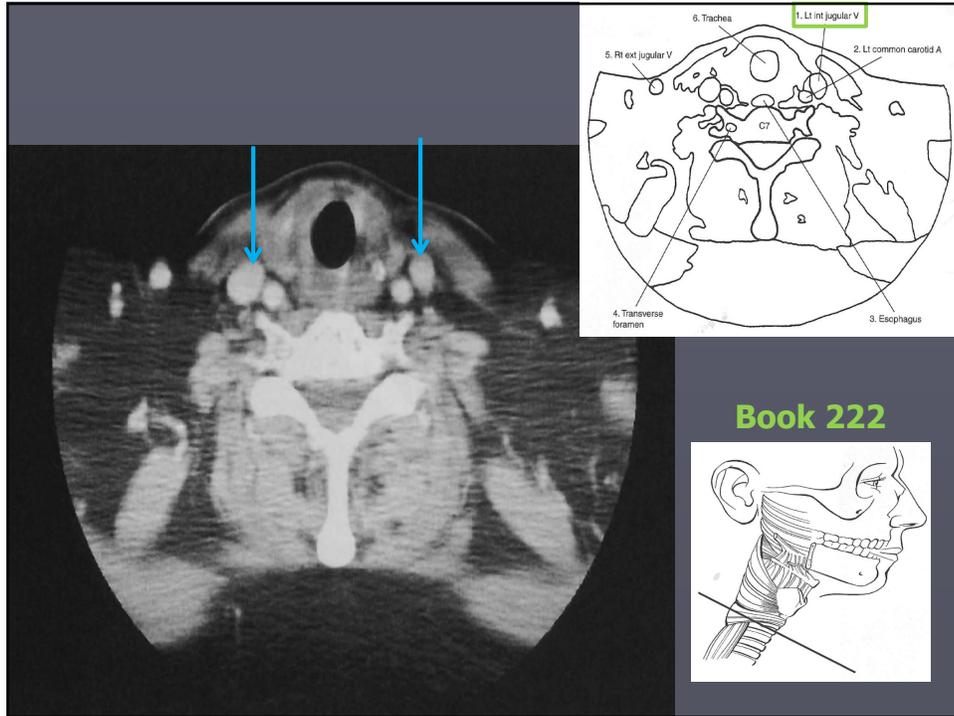
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VENOUS FLOW***

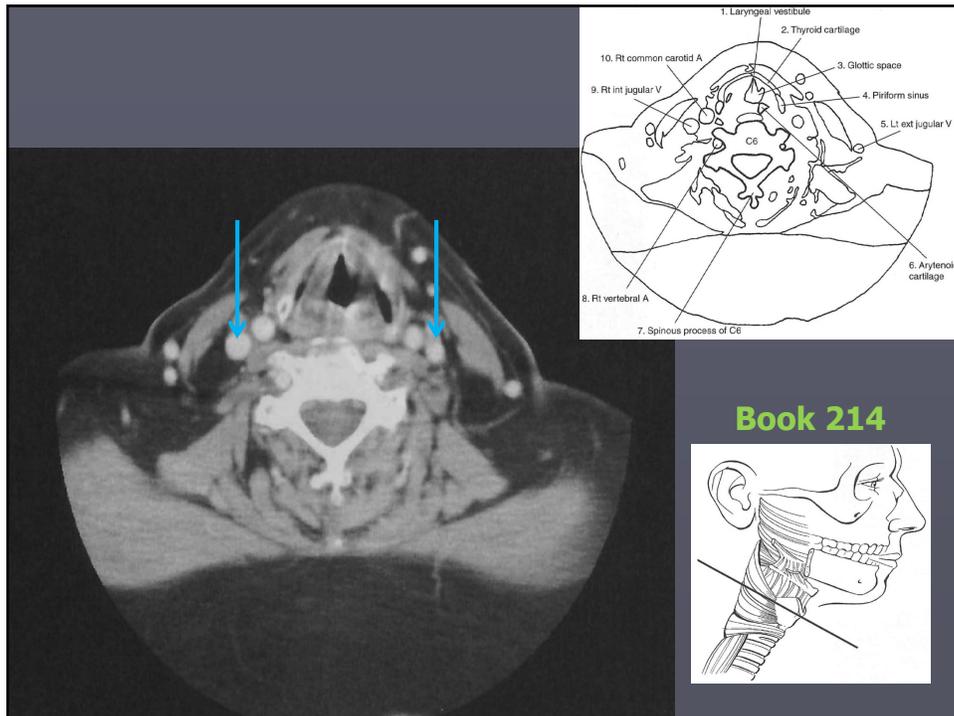
Internal Jugular Veins

- ▶ Location: Either side of neck bilaterally, next to the common carotid arteries
 - Join with the subclavian veins to form the brachiocephalic veins
- ▶ Function: Drain blood from brain, face and neck

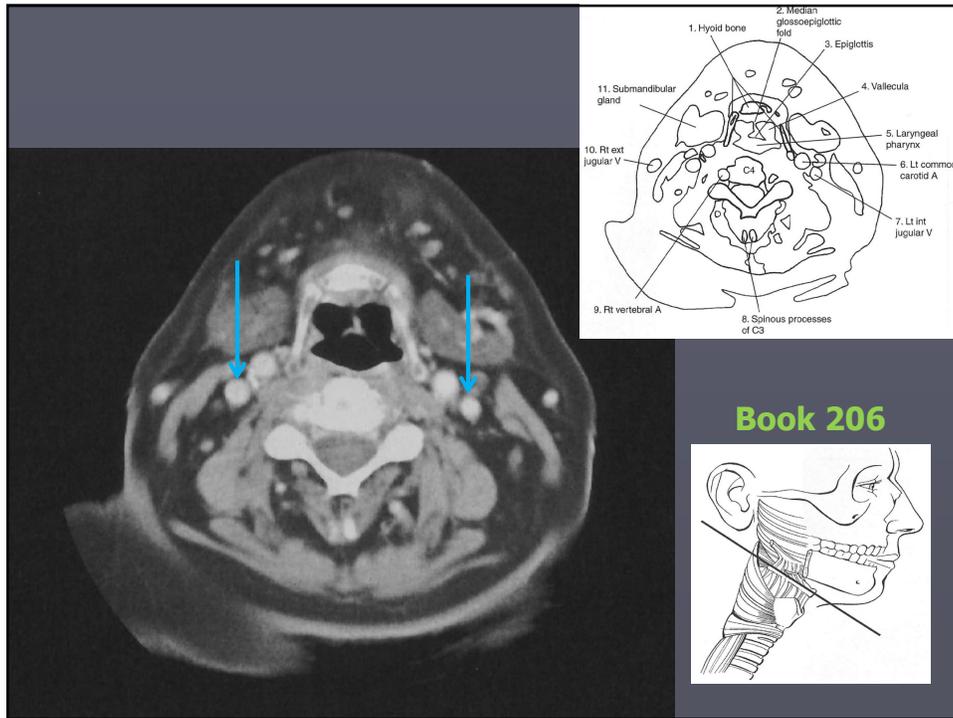
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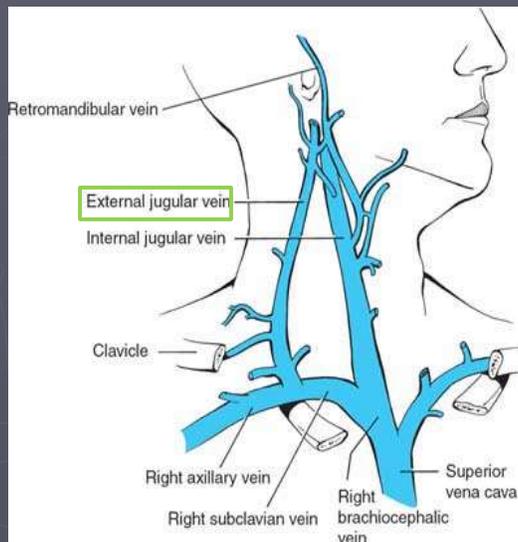
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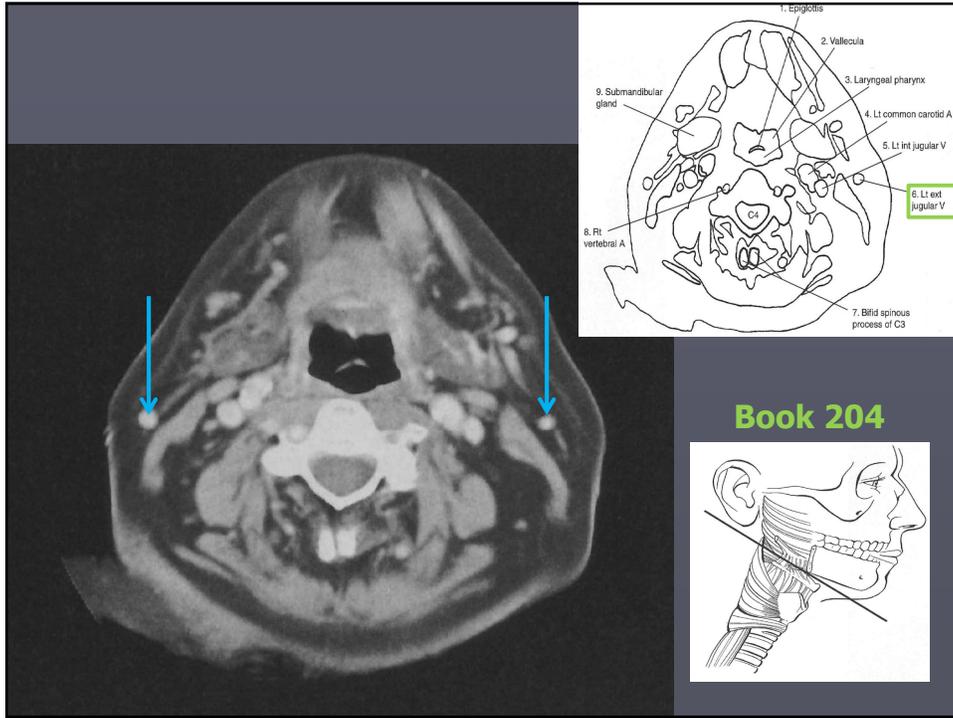
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External Jugular Veins

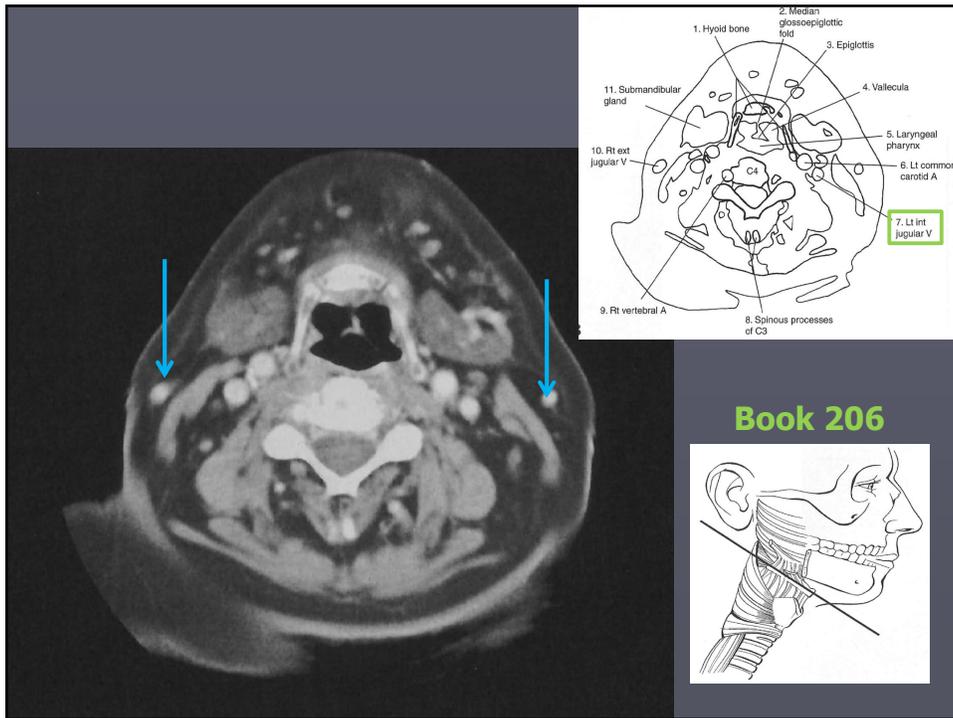
- ▶ **Location:** Extend from subclavian vein through the neck
 - Will begin to visualize just below the parotid gland
 - ***Begin around angle of mandible/parotid gland
- ▶ **Function:** Drain blood from the exterior cranium (scalp) and deep structures within the facial area



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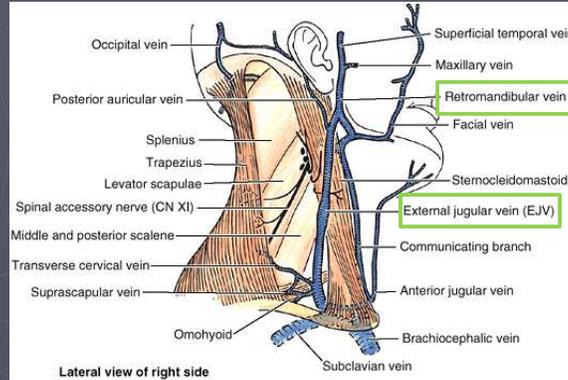
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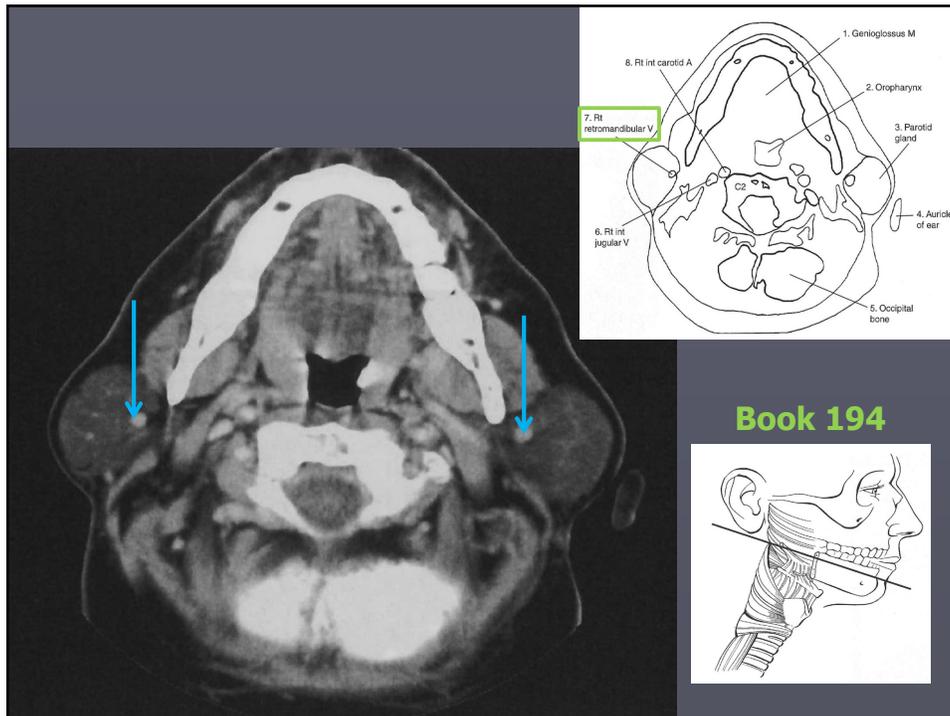
90

Retromandibular Veins

- ▶ Location: Two small veins behind the mandible
 - Medial to the parotid gland
 - Terminate at the external jugular vein
- ▶ Function: Drain smaller veins from the temporal and maxillary regions



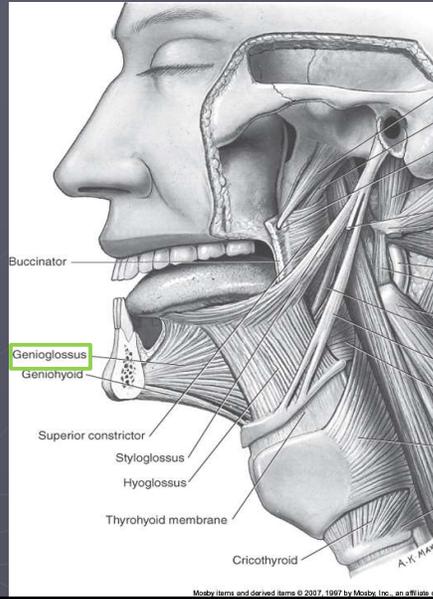
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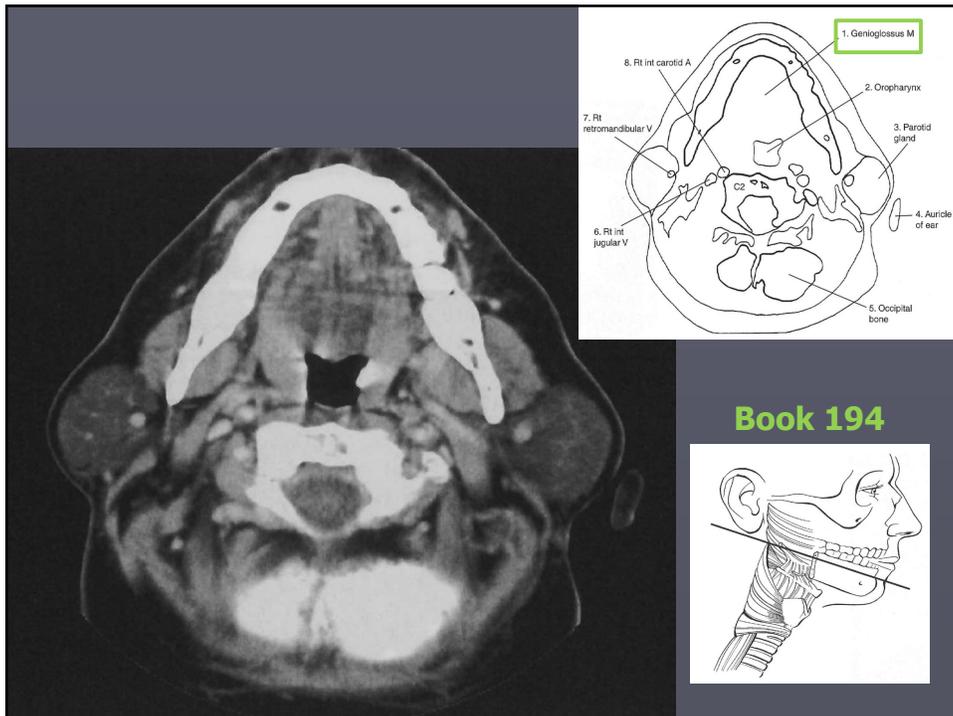
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Genioglossus Muscle

- ▶ Location: Extends from the superior-posterior aspect of the mentum to the hyoid bone
- ▶ Function: Forms most of the musculature of the tongue



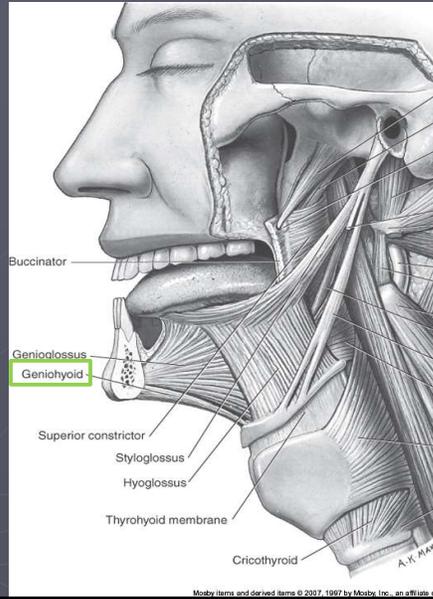
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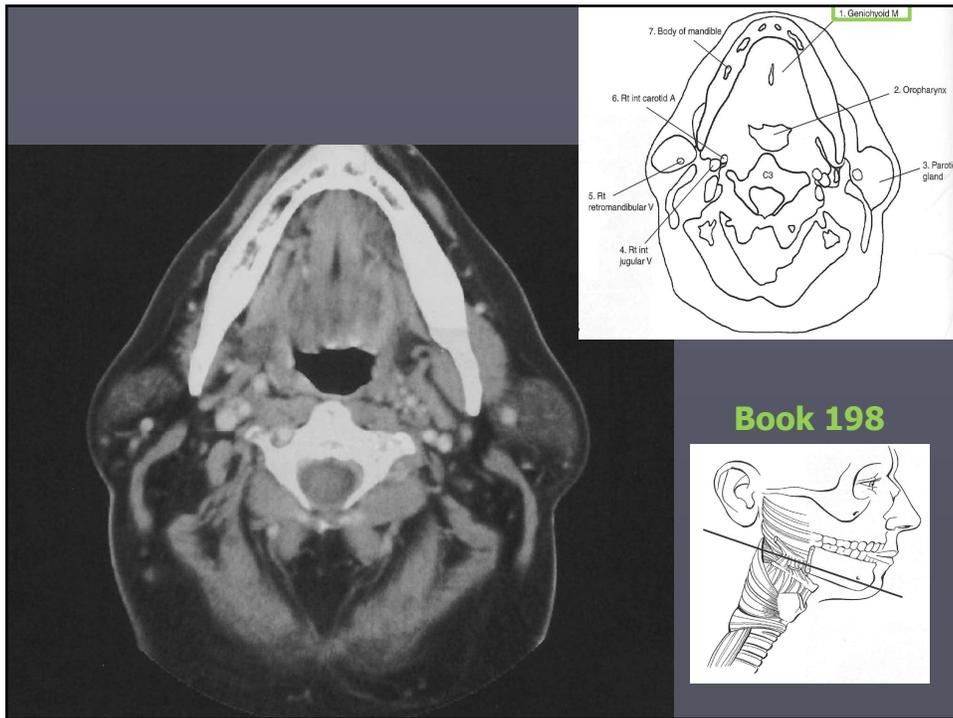
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Geniohyoid Muscle

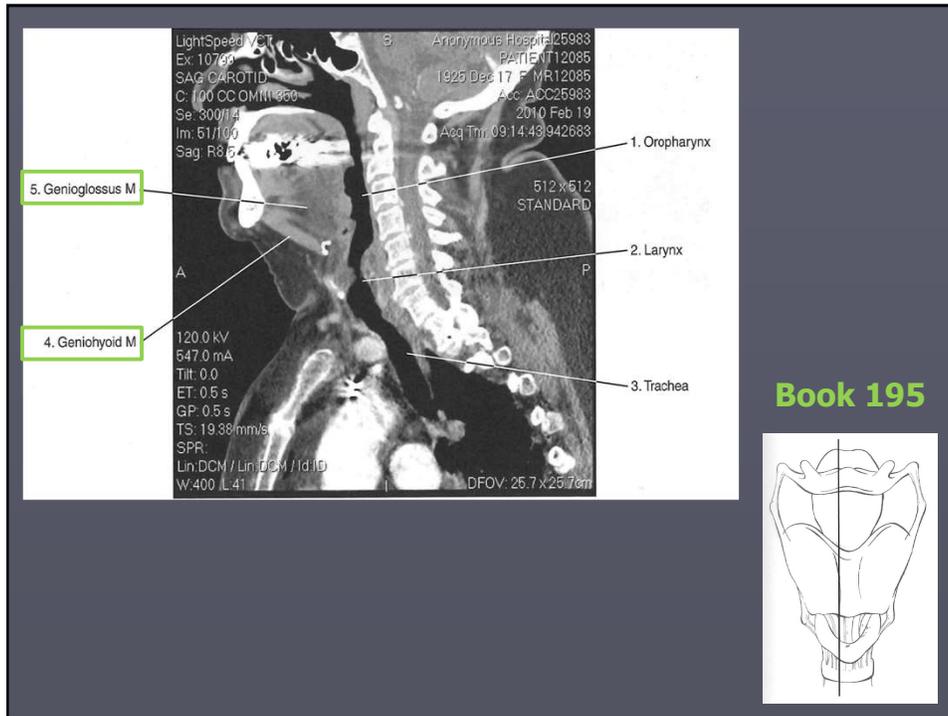
- ▶ Location: Extends from the inferior-posterior aspect of the mentum to the hyoid bone; just below the genioglossus
- ▶ Function: Raises up the hyoid bone and depresses the mandible



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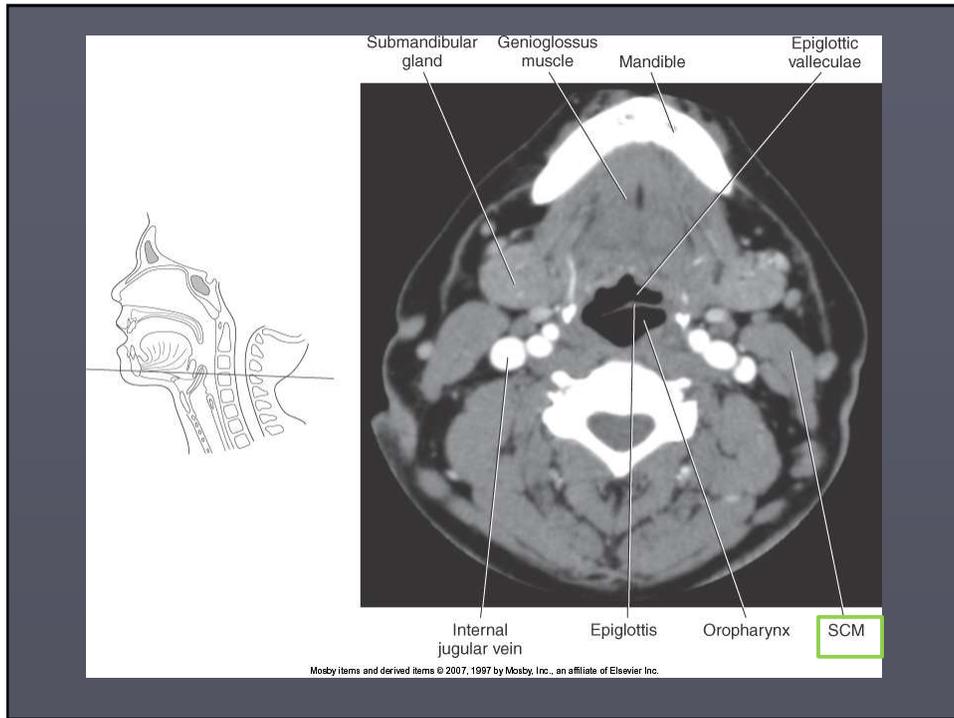
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Sternocleidomastoid Muscle

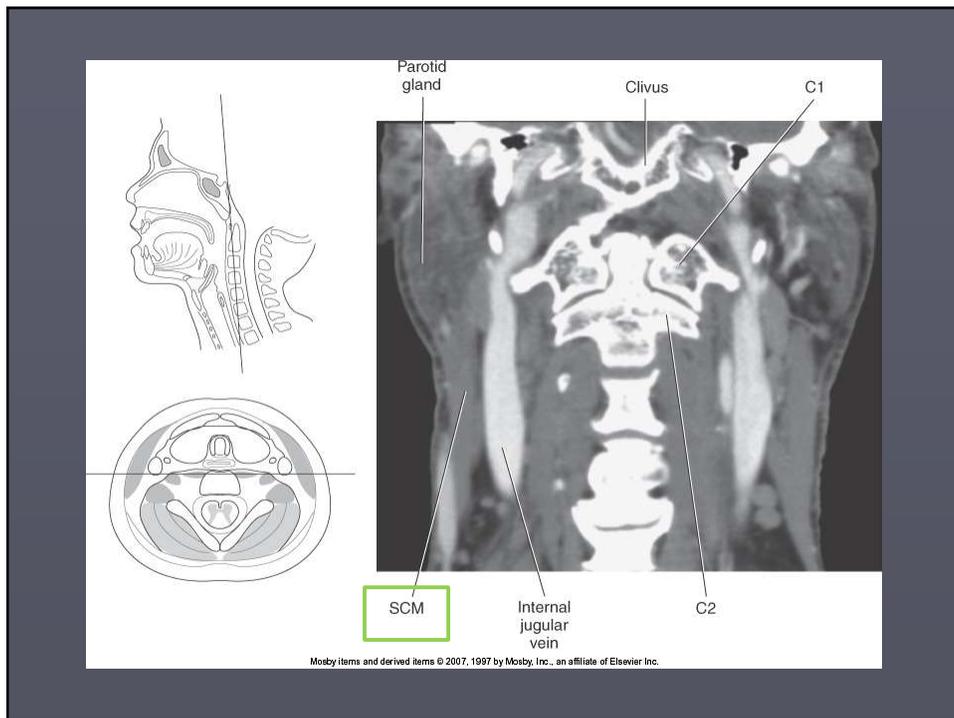
- ▶ **Location:** Originates at the sternum and clavicle
 - Attaches to the mastoid process of the temporal bone
- ▶ **Function:** Aids in bending and rotating of the head

Sternocleidomastoid muscle
 Sternal head
 Clavicular head

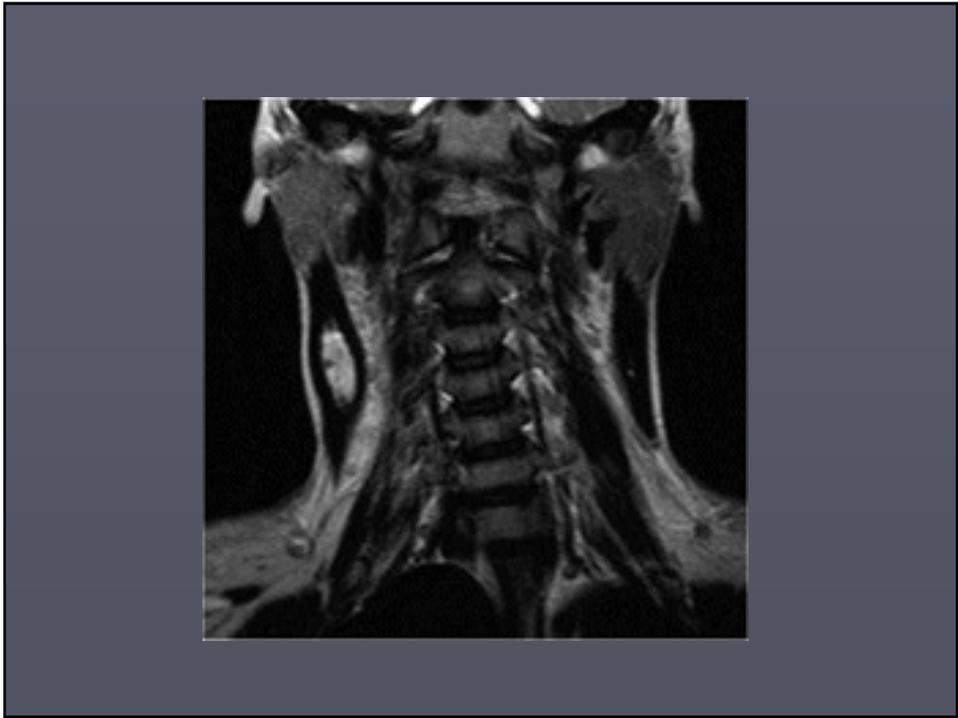
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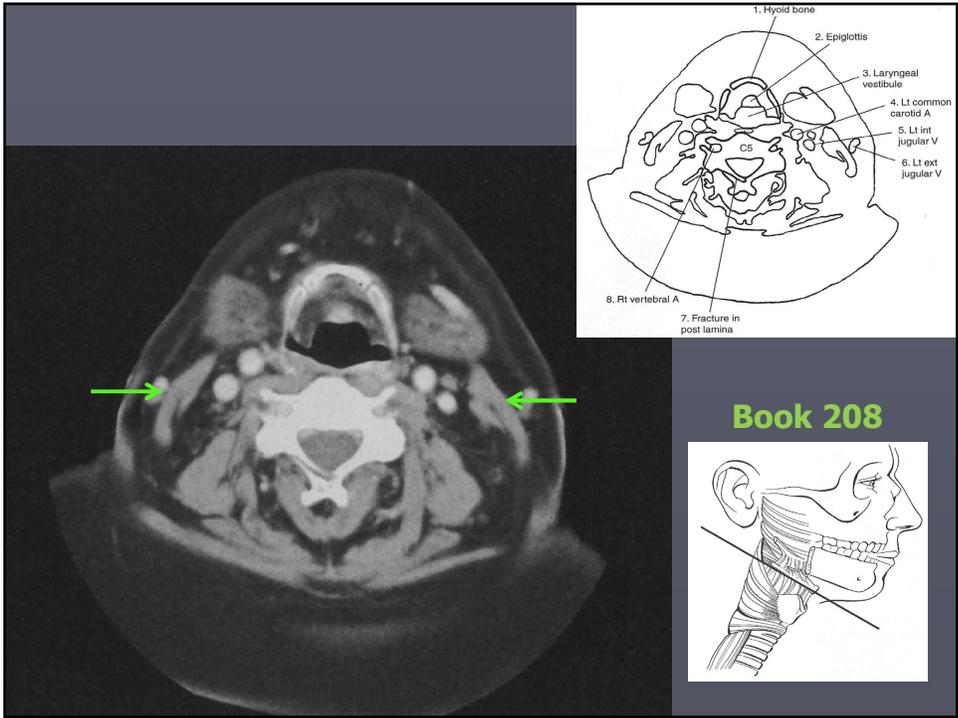
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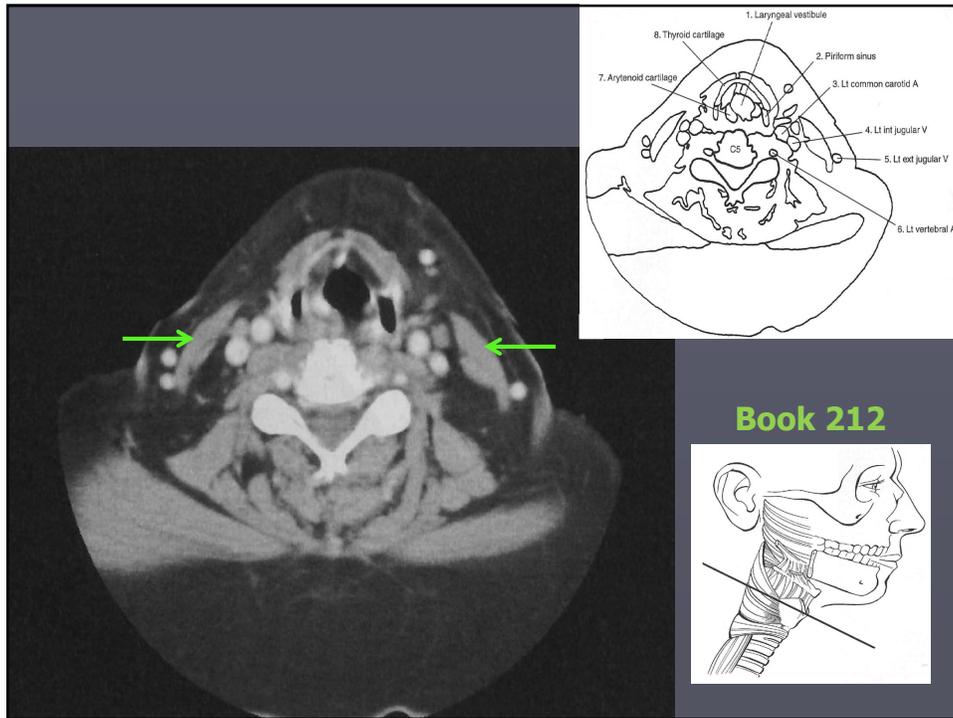
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101



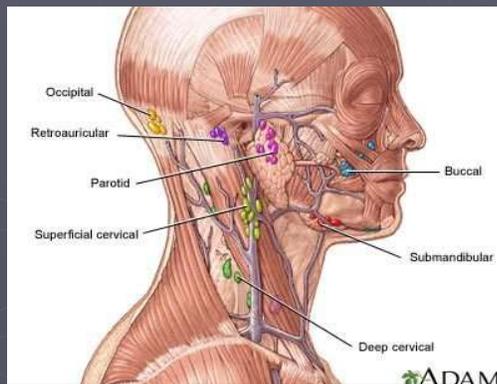
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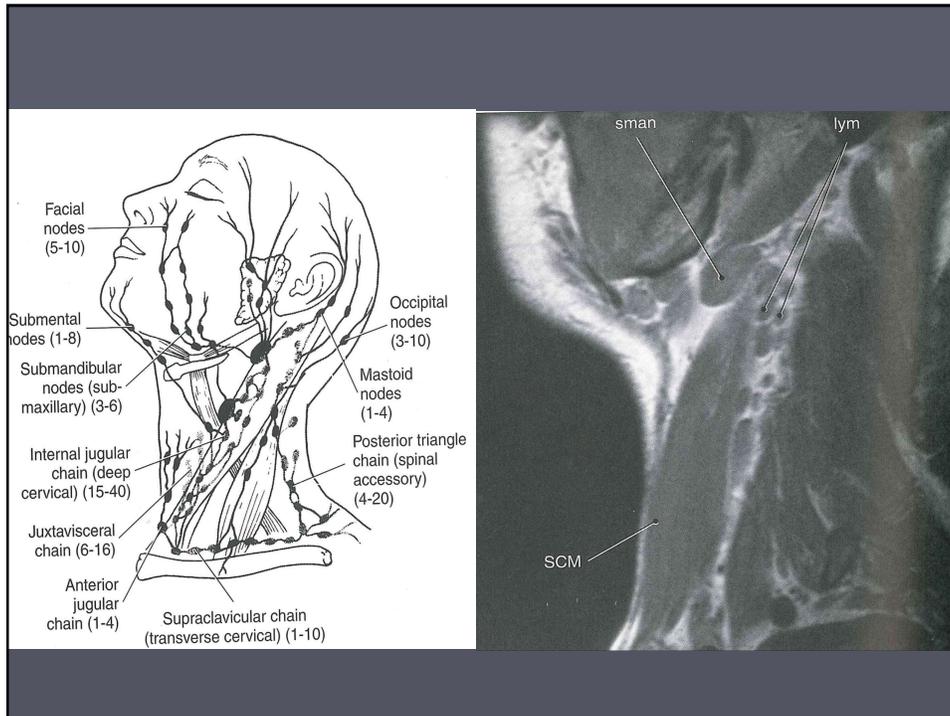
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Cervical Lymph Nodes

- ▶ Location:
 - Grouped along the lower of the jaw
 - In front/behind the ears
 - Deep into the neck along the larger blood vessels
- ▶ Function: Carry fluid from the interstitial spaces to the regional lymph nodes
 - Filter lymphatic fluid of harmful foreign particles before being emptied into the venous blood supply



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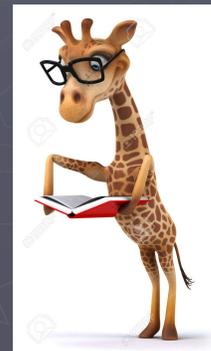


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Items for Next Class

Please have the following---

- ▶ Completed Review Worksheet
- ▶ Completed Workbook Assignment
- ▶ Textbook – if you prefer
- ▶ Additional Notebook/Paper
 - If you would like to take notes during the review



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