BIO 4432 – Human Anatomy

Resource #10

The concepts this resource covers are the topics typically covered during this week of the semester. If you do not see the topics your particular section of class is learning this week, please take a look at other weekly resources listed on our website for additional topics throughout the semester.

We also invite you to look at the group tutoring chart on our website to see if this course has a group tutoring session offered this semester.

If you have any questions about these study guides, group tutoring sessions, private 30 minute tutoring appointments, the Baylor Tutoring YouTube channel or any tutoring services we offer, please visit our website www.baylor.edu/tutoring or call our drop in center during open business hours. M-Th 9am-8pm on class days 254-710-4135.

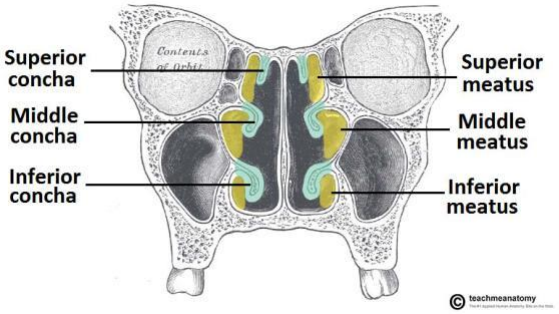
Keywords: Respiratory system, Anatomy of the lungs, Innervation of the lungs, Larynx, Vagus nerve

Topic of the Week: Respiratory System

The Pharynx

- Nasopharynx: from nasal cavity down to soft palate
- Oropharynx: from soft palate to epiglottis
- Laryngopharynx: below the epiglottis

Nasal Conchae

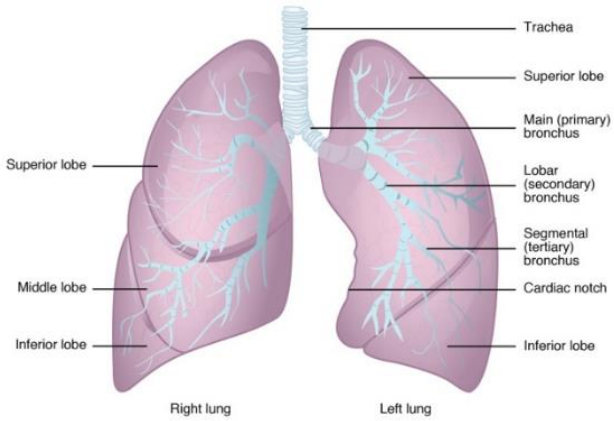


This image was taken from teachmeanatomy.com.

Nasolacrimal duct drains into the inferior meatus.
Maxillary, ethmoidal, and frontal sinuses drain into the middle meatus.
Posterior ethmoidal air cells drain into the superior meatus.

Anatomy of the Lungs

The right lung has 3 lobes and 2 fissures. The left lung has 2 lobes, 1 fissure, and the cardiac notch.



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How do we tell the right lung from the left lung? Look at the positioning of the pulmonary artery in comparison to the bronchus.

RALS:

- For the right lung: pulmonary artery is **anterior** to the bronchus.
- For the left lung: pulmonary artery is **superior** to the bronchus.

Pleura of the lungs:

- Parietal pleura – innervated by phrenic and intercostal nerves; external pleura
  - Costal parietal pleura – intercostal n.
  - Diaphragmatic parietal pleura – phrenic n.
  - Cervical parietal pleura – phrenic n.
  - Mediastinal parietal pleura – intercostal n.
- Visceral pleura – innervated by autonomics; internal pleura

Innervation of the Lungs

Parasympathetics: branches of CN X → bronchoconstriction
Sympathetics: post-ganglionic fibers from cardiopulmonary nerves (T1-T4) → bronchodilation

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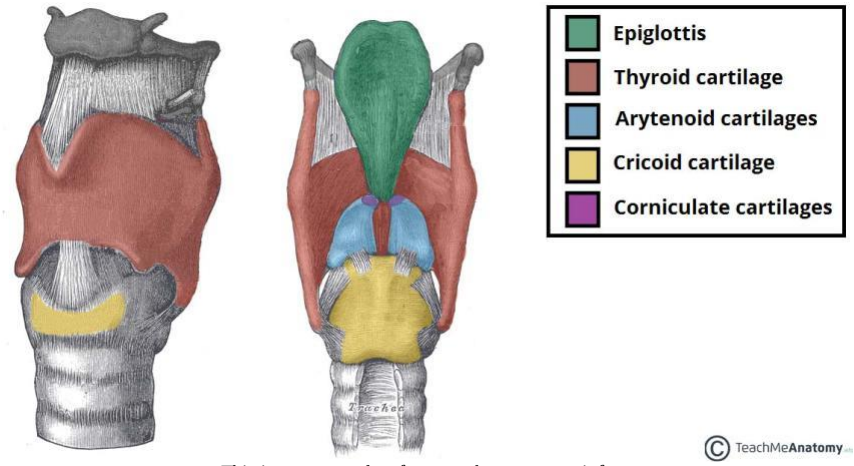
Highlight #1: The Larynx

Watch Acland's video on the laryngeal cartilages and this Anatomy of the Larynx video:
https://www.youtube.com/watch?v=Lifn9L2lLWE



This image was taken from teachmeanatomy.info.

Muscles of the Larynx

*Watch Acland's video on these too for a good visual!

Respiratory muscles – move the vocal cords apart

- Posterior cricoarytenoid (only abductor of the vocal folds!)

Phonatory muscles – move the vocal cords together

- Lateral cricoarytenoid, arytenoids, cricothyroid, and thyroarytenoid

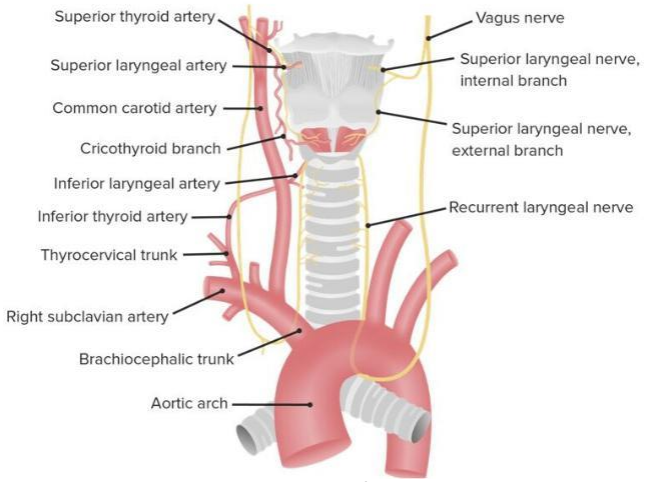
Vessels of the Larynx (the bold blue arteries are the ones you need to focus on; I just included their origins for completeness!)

External carotid artery → superior thyroid artery → **superior laryngeal artery:**

- Supplies above the vocal folds
- Runs with internal laryngeal nerve

Thyrocervical trunk → inferior thyroid artery → **inferior laryngeal artery:**

- Supplies below the vocal folds
- Runs with recurrent laryngeal nerve



This image was taken from lecturio.com.

Highlight #2: Vagus Nerve and Innervation of the Larynx

The vagus nerve has a branch called the recurrent laryngeal nerve:

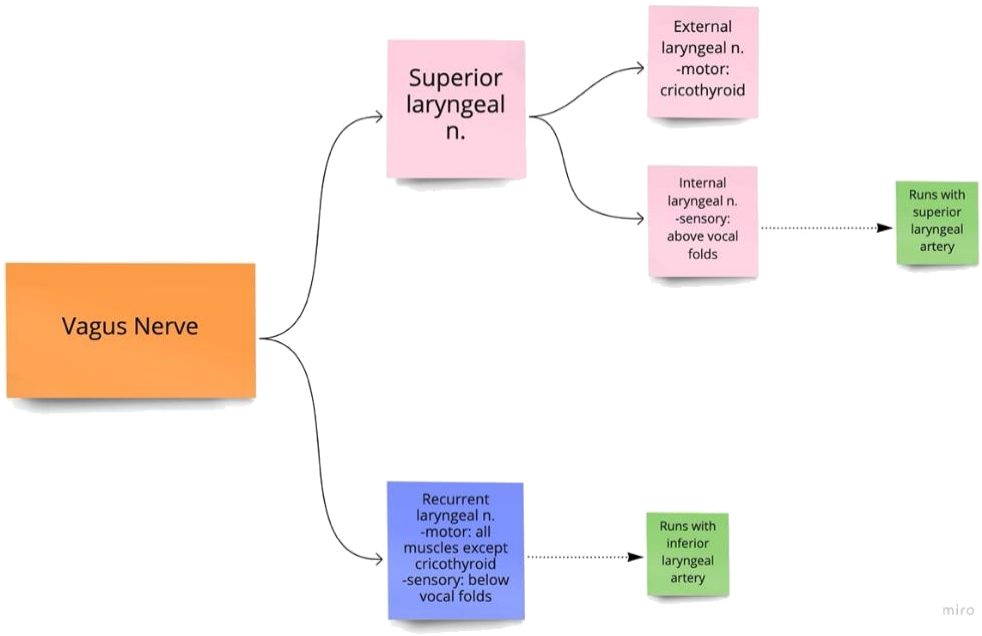
- On the right it loops around the right subclavian artery
- On the left loops around the arch of aorta behind the root of the lung.

Innervation of the larynx

Recurrent laryngeal n.

- Motor innervation to all intrinsic muscles of the larynx except for the cricothyroid muscle
- Sensory innervation to below the vocal folds

- Internal laryngeal n. supplies sensation to above the vocal folds
  - Runs with superior laryngeal artery
- External laryngeal n. innervates the cricothyroid



I created this flow chart on miro.com.

Week 13 Knowledge Checkpoint:

1. Paralysis of which nerve would result in asphyxiation and why?
2. If the pulmonary artery is superior to the bronchus, which lung are you looking at?
3. Which nerve runs with the inferior laryngeal artery?
4. Which of the following laryngeal cartilage(s) in/are unpaired?
    a. Corniculate
    b. Thyroid
    c. Arytenoid
    d. Cricoid

THINGS YOU MAY STRUGGLE WITH!

1. ***Laryngeal cartilages and muscles:*** For this I highly recommend watching Acland's videos on the larynx. These structures can be difficult to understand without watching these videos.
2. ***Vessels and nerves:*** I made a flow chart to help with this but looking at images such as the one I provided and the ones in Dr. Parizi's lectures can help you grasp these better. It could also help to make your own flow chart and write out the muscles/structures each nerve innervates.

CONGRATS: You made it to the end of the resource! Thanks for checking out these weekly resources! Don't forget to check out our website for group tutoring times, video tutorials and lots of other resources: www.baylor.edu/tutoring!

Answers

1. Recurrent laryngeal nerve: it innervates the posterior cricoarytenoid which abducts the vocal folds
2. Left (RALS)
3. Recurrent laryngeal nerve
4. b, d