

## VIRTUAL DISSECTION LABORATORY ASSIGNMENT THE LARYNX

The Anatomage © table displays real-life anatomy of virtual cadavers. Keep in mind that these are real people who have donated their bodies for science, so please be respectful as you are using the table. Please only have one person touching the table at a time. No food or drinks are allowed near the table, and do not set anything on top of the table.

**Health and Safety Precautions:** Prior to interacting with the table, please wash your hands and put on gloves. Be sure to touch the table only with gloves or a stylus. Do not wipe or clean the table; your instructor will take care of this.

**General Touch-Screen Instructions:** To zoom in on a structure, place two fingers on the structure and pull them apart. To move the entire structure at once, place two fingers on the structure and drag in the desired direction. Use one finger to tilt or rotate the structure. Tap once on an icon to select it. Additional instructions for interacting with the Anatomage table can be found on their website.

**Custom Presets:** This laboratory was created using the Anatomage© Clinical Table. Custom presets are required in order to complete this assignment. A preset guide has been included.

### **PART 1: LOCATING THE LARYNGEAL STRUCTURES**

Step 1: Open the Table Application.

Step 2: Select “High Res Regional Anatomy”.

Step 3: Tap “Head and Neck-Male” and select open in the top right corner.

Step 4: Select the “Eye” icon and uncheck all the boxes **EXCEPT:**

- Skeletal,
- Musculature
- Respiratory

(This will remove irrelevant structures).

Select the “X” in the corner when finished.



Step 5: Select the explore icon to access the removal tool. Select the removal icon. Once selected, tap on a desired structure to remove it.

Remove structures until you obtain a clear view of the larynx.

Exit the icon.



**Question 1:** Name three structures you had to remove view the larynx.

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## **PART 2: PRIMARY LARYNGEAL STRUCTURES**

Now we will take a closer look at the larynx using a high-resolution image.

### **General Structures:**

Step 6: Open the home icon in the bottom left corner.

Step 7: Select “High Res Regional Anatomy”.

Step 8: Tap “Pharynx-male” and select open in the top right corner.

Step 9: Select the “Eye” icon and **uncheck** all boxes **EXCEPT:**

- Skeletal
- Respiratory

Exit the icon.



Step 10: Locate the following structures:

- Hyoid Bone
- Thyroid Cartilage
- Cricoid Cartilage
- Trachea

(Tap once on a structure to display its name.)

**Question 2:** What membrane connects the thyroid cartilage to the hyoid bone?

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**Question 3:** What ligament connects the thyroid cartilage to the cricoid cartilage?

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Step 11: Locate the hyoid bone (anterior view).

Step 12: Color coordinate the hyoid bone and locate the following specific parts:

- Lesser cornu/horn
- Greater cornu/horn
- Corpus/Body

**\* To color coordinate any structure:**

1. Tap on the structure. This will highlight the entire structure.
2. Select the eye icon.
3. Select the small green box in the bottom right corner to open the 'Details' column.
4. Select the 'Bony Landmarks' dropdown.
5. Placing a checkmark next to desired structures.
6. Close the icon to view the structure.



Step 13: Place a pin on the right lesser cornu of the hyoid.

**\*\* To place a pin:**

1. Select the pin icon.
2. Select any type of pin.
3. Tap the structure where you want to place the pin.
4. To move the pin, hold and drag the red cube located around the pin.
5. To rotate the angle of the pin, drag the yellow sphere located above the pin.

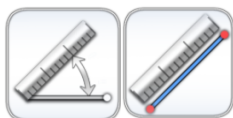


Step 14: Locate the thyroid cartilage and place a pin on the thyroid notch.

Exit the icon.



Step 15: Measure the distance between the two pins by selecting the measuring icon in the bottom left corner followed by the first ruler icon.



Step 16: Place your first point on your first pin and your second point on your second pin.

**Question 4:** What is the distance between the right lesser cornu of the hyoid bone and the thyroid notch (in mm)? \_\_\_\_\_ mm

Step 17: Clear the measurement by reselecting the measuring icon followed by the “Clear” icon.



Step 18: Clear the pins by selecting the pin icon followed by “Delete All”.

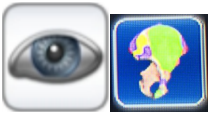
Exit the icon.



Step 19: Remove color coordination of Hyoid bone.

**\*\*\* To remove color coordination from any structure:**

1. Open the “Eye” icon.
2. Tap the color wheel next to the desired structure in the ‘Structure’ column.
3. A new box will appear; deselect the colored pelvic bone button by tapping on it.
4. Exit out of the icon.



### **Thyroid Cartilage:**

Step 20: Locate and select the thyroid cartilage.

Step 21: Locate and label the following specific features:

- Lamina
- Oblique Line
- Thyroid Notch
- Thyroid Prominence
- Superior Horn
- Inferior Horn

**\*\*\*\* To label any structure:**

1. Tap on the structure. This will highlight the entire structure.
2. Select the eye icon.
3. Select the small green box in the bottom right corner to open the ‘Details’ column.
4. Select the ‘Annotations dropdown.
5. Placing a checkmark next to desired structures.
6. Close the icon to view the structure.



Step 22: Remove labels.

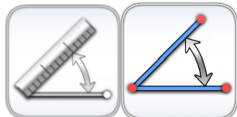
**\*\*\*\*\* To remove labels of any structure:**

1. Open the “Eye” icon.
2. Tap the ‘A’ next to the desired structure in the ‘Structure’ column.
3. Ensure all checkmarks are removed from annotation column.
4. Exit out of the icon.

Step 23: Measure the angle of the thyroid prominence (a.k.a “the Adam’s apple”).  
First, select the “sagittal view” icon on the left side of the screen.



Step 24: Select the measurement icon followed by the second angle ruler icon.



Step 25: You will need to place three points to measure the angle.

- First point: where the thyrohyoid membrane attaches to the thyroid cartilage.
- Second point: on the laryngeal prominence.
- Third point where the cricothyroid ligament meets the inferior thyroid.

**Question 5:** What is the angle of the thyroid prominence (in mm)? \_\_\_\_\_ mm

**Question 6:** *The angle you just measured was a male's thyroid prominence. In the average female, it would be expected that: (circle one)*

- a) the thyroid angle would be greater than the male's, as the thyroid prominence is less noticeable in females.
- b) the thyroid angle would be less than the male's, as the thyroid prominence is less noticeable in females.
- c) the thyroid angle would be greater than the male's, as the thyroid prominence is more noticeable in females.
- d) the thyroid angle would be less than the male's, as the thyroid prominence is more noticeable in females.

Step 26: Clear the measurements by reselecting the measuring icon followed by the "Clear" icon.



Step 27: Select the "coronal view" icon on the left side of the screen. (Anterior view of the larynx).



**Cricoid Cartilage:**

Step 28: Locate the cricoid cartilage.

**Question 7:** *Where is the cricoid cartilage located? (Choose one)*

- a) *Inferior to the hyoid bone*
- b) *Inferior to the trachea*
- c) *Inferior to the thyroid cartilage*
- d) *a and c are both correct*

**Question 8:** *What is the connection between the cricoid cartilage and thyroid cartilage called?*

\_\_\_\_\_

**Question 9:** *What is the shape of the cricoid cartilage?* \_\_\_\_\_

**Question 10:** *True or false? The cricoid cartilage wraps completely around the trachea.*

\_\_\_\_\_

## **Epiglottis:**

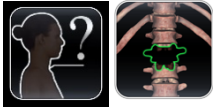
Step 29: Tilt the structure to obtain a superior view of the larynx (looking down into the throat).  
Locate the epiglottis.

**Question 11:** *What structure connects the epiglottis to the hyoid bone?*

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Step 30: Use the removal tool to remove the epiglottis.

Exit the icon.



**Question 12:** *What important structure does the epiglottis cover?*

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**Question 13:** *What is the primary function of the epiglottis (hint- consider your response to the previous question)?*

Step 31: Use the removal tool to remove the following structures:

- Hyoid bone
- Hyoepiglottic ligament
- Thyrohyoid membrane
- Thyroepiglottic ligament
- Epiglottis
- Cricoid cartilage
- Trachea

Exit the icon.



## **Arytenoid Cartilage:**

Step 32: Locate the Arytenoid cartilages.

Step 33: Locate and label the following specific features:  
(see \*\*\*\* above for detailed instructions).

- Corniculate cartilage
- Muscular process
- Vocal process
- Apex of the arytenoid

**Question 14:** What is the connection between the arytenoid cartilage and cricoid cartilage called? \_\_\_\_\_

Step 34: Remove labels.  
(see \*\*\*\*\* above for detailed instructions).

**Vocal Folds:**

Step 35: Locate the vocal folds.

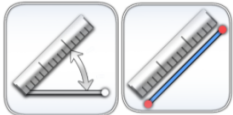
**Question 15:** *What are the two attachment sites of the vocal folds?*

Anterior attachment: \_\_\_\_\_

Posterior attachment: \_\_\_\_\_

Step 36: Use the measuring tool to measure the length of the vocal folds.

Select the measuring icon in the bottom left corner followed by the first ruler icon.



Step 37: Place your first point on one end of the right vocal fold.

Place the second point on the opposite end of the same fold.

**Question 16:** *What is the length of the vocal folds (in mm)?* \_\_\_\_\_ mm

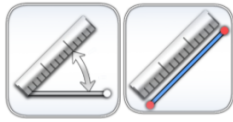
Step 38: Clear the measurements by reselecting the measuring icon followed by the “Clear” icon.





Step 39: Measure the space between the vocal folds.

Select the measuring icon and the first ruler icon.



Step 40: Place your first point on one vocal fold (near the middle of the fold).

Place the second point directly across from the first on the other vocal fold.

**Question 17:** What is the distance between the vocal folds (a.k.a., the “glottis”)?

\_\_\_\_\_ mm

**Question 18:** Are the vocal folds abducted or adducted? \_\_\_\_\_

**Question 19:** What ligament is connected across the entire length of the vocal folds?

\_\_\_\_\_

### **PART 3: LARYNGEAL MUSCULATURE (Use notes and online resources as necessary)**

Step 41: Select the home icon in the bottom left corner.

Step 42: Select “High Res Regional Anatomy”.

Step 43: Select “Pharynx-female” and select open in the top right corner.

Step 44: Explore the laryngeal musculature. Use the removal tool to remove muscles as you wish.



Step 45: Open Preset 1.



Step 46: Use the color coordinated muscles to fill in the chart below regarding the extrinsic muscles of the larynx. Tap each muscle once to display its name.

| Muscle | Color  | Attachment Sites | Main Function  |
|--------|--------|------------------|----------------|
|        | Orange |                  | Elevate larynx |

|  |              |  |                                 |
|--|--------------|--|---------------------------------|
|  | Red          |  | Elevate larynx                  |
|  | Yellow       |  | Elevate larynx                  |
|  | Gray         |  | Elevate larynx                  |
|  | Dark Purple  |  | Depress & retract tongue        |
|  | Pink         |  | Elevate larynx & pharynx        |
|  | Light Purple |  | Elevate larynx & pharynx        |
|  | Green        |  | Elevate larynx (potentially)    |
|  | Navy Blue    |  | Depress larynx                  |
|  | Blue         |  | Depress larynx                  |
|  | Dark Teal    |  | Depress hyoid bone              |
|  | Light Teal   |  | Elevate thyroid & depress hyoid |

**Question 20:** *What are the primary purposes of the extrinsic laryngeal muscles?*

Step 47: Open Preset 2.



Step 48: Obtain a clear view the inner musculature. Use the color coordinated muscles to fill in the chart below. Use notes and online resources as needed.

| Muscle | Color      | Attachment Sites | Function                                      |
|--------|------------|------------------|---|
|        | Lime Green |                  | Tenses & lengthens vocal folds                |
|        | Blue       |                  | Reduce tension of vocal folds                 |
|        | Burgundy   |                  | Adduct vocal folds                            |
|        | Black      |                  | Abduct vocal folds                            |
|        | Yellow     |                  | Adduct arytenoids/vocal folds & close glottis |

**Question 21:** *What are the primary purposes of the intrinsic laryngeal musculature?*

**Question 22:** *From memory, try to sketch a lateral view of the larynx (without muscles) and label the following structures:*

- *Thyrohyoid membrane*
- *Cricothyroid ligament*
- *Hyoid bone*
- *Corpus of hyoid*
- *Greater horn of hyoid*
- *Lesser horn of hyoid*
- *Thyroid cartilage lamina*
- *Superior horn of thyroid cartilage*
- *Inferior horn of thyroid cartilage*
- *Oblique line*
- *Thyroid notch*
- *Thyroid Prominence*
- *Cricoid cartilage*
- *Trachea*

*When you are done, check your drawing using the Anatomage table and fill in any parts you missed.*

Step 49: Press the home icon followed by “Exit Application”. This will take you back to the desktop. Return the stylus but keep your gloves on until you leave the lab.

**Question 23:** *List 1-2 things you found interesting/insightful about the larynx through completion of this lab.*