

## LAB 6: RESPIRATORY SYSTEM

### ACTIVITY 13: RESPIRATORY SYSTEM ANATOMY

#### INDICATE LEFT/RIGHT WHERE APPLICABLE ON QUIZ/EXAM

*Use the sagittal head & thoracic models to identify these items.*

#### UPPER RESPIRATORY TRACT

1. Frontal sinus
2. Sphenoidal sinus
3. Nostrils (nares)

#### Nasal cavity

4. Nasal conchae (turbinates)
  - a. Superior
  - b. Middle
  - c. Inferior
5. Meatus (*pl. = meati*)
  - a. Superior
  - b. Middle
  - c. Inferior

#### Oral cavity

6. Hard palate
7. Soft palate with uvula
8. Lingual tonsils

#### Pharynx (*Regions and Associated Structures*)

9. Nasopharynx
  - a. Adenoid (pharyngeal tonsil)
  - b. Openings to auditory tubes (Eustachian tubes)
10. Oropharynx
  - a. Palatine tonsils (left and right)
11. Laryngopharynx

#### Larynx (*an organ*)

12. Laryngeal prominence
  13. Thyroid cartilage
  14. Thyroid gland
  15. Cricoid cartilage
  16. Epiglottis
  17. Glottis
  18. Vocal cords
  19. Hyoid Bone {*not a respiratory structure, but connects larynx to tongue*}
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## LAB 6: RESPIRATORY SYSTEM

### ACTIVITY 13: RESPIRATORY SYSTEM ANATOMY, continued

#### INDICATE LEFT/RIGHT WHERE APPLICABLE ON QUIZ/EXAM

*Use the lung/lower respiratory model to identify these items.*

#### LOWER RESPIRATORY TRACT

20. Trachea

- a. Carina

21. Esophagus {not a respiratory structure, but posterior to the trachea}

Bronchi

22. Left primary bronchus

23. Right primary bronchus

24. Left secondary bronchus

25. Right secondary bronchus

Lungs

26. Visceral pleura (*lung's surface*)

27. Parietal pleura (*inner surface of chest cavity*)

28. Right lung

- a. Superior lobe
- b. Middle lobe
- c. Inferior lobe
- d. Horizontal fissure
- e. Oblique fissure

29. Left lung

- a. Superior lobe
- b. Inferior lobe
- c. Oblique fissure

30. Diaphragm

#### Pig Respiratory Tracts

*Use the preserved pig larynx and freeze-dried lungs to view the following items :*

1. Larynx

- a. Thyroid cartilage
- b. Cricoid cartilage
- c. Epiglottis

2. Trachea

- a. Carina

3. Left primary bronchus

4. Right primary bronchus

5. Left lung

6. Right lung

7. Visceral pleura

8. Tongue (*digestive system organ*)

9. Esophagus (*digestive system organ*)

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## LAB 6: RESPIRATORY SYSTEM

Trace the pathway of oxygen from the time it is inhaled through the nares until it reaches the aorta:

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Trace the pathway of carbon dioxide from the time it is in the SVC until it is exhaled through the nares:

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## LAB 6: RESPIRATORY SYSTEM

### ACTIVITY 14: RESPIRATORY PHYSIOLOGY

Upon completing this activity, you should be able to discuss respiratory volumes such as:

**Tidal volume (TV)** – amount of air inhaled or exhaled with each breath at rest (500 mL)

**Expiratory reserve volume (ERV)** – amount of air that forcibly exhaled after a normal exhalation (1200 mL)

**Inspiratory reserve volume (IRV)** – amount of air that can be forcibly inhaled after normal inhalation; ranges from 2100 mL (female) to 3200 mL (male)

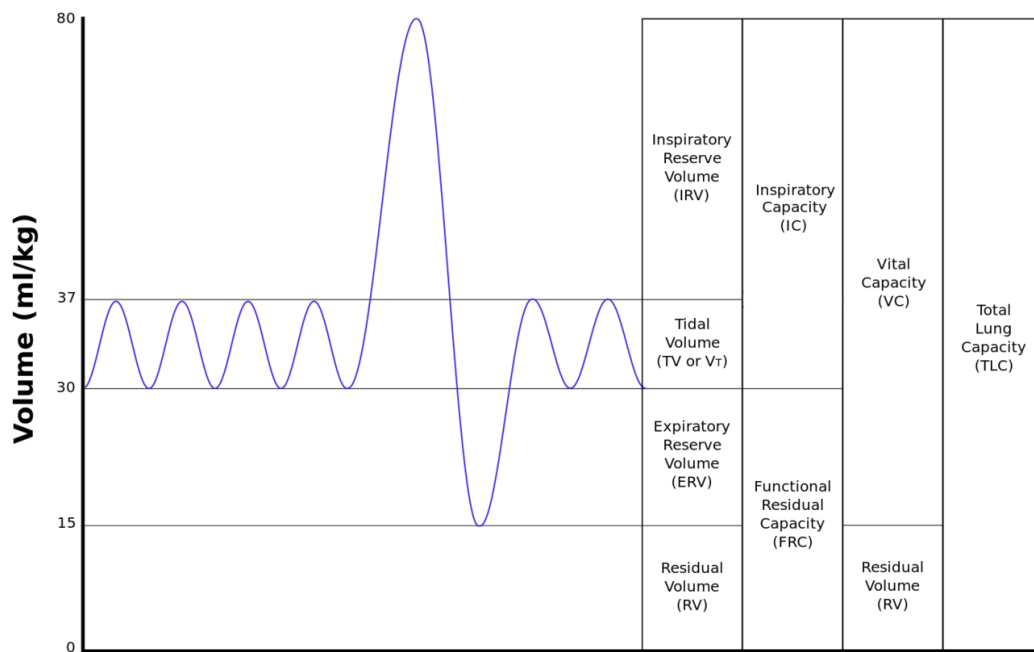
**Residual volume (RV)** – amount of air remaining in the lungs after complete exhalation (1200 mL)

**Vital capacity (VC)** – maximum amount of air a person can expel from the lungs after a maximum inhalation

$$VC = TV + IRV + ERV \text{ (averages around 4800 mL)}$$

$$\text{Total lung capacity (TLC)} = VC + RV \text{ (6000 mL)}$$

Graph 1: Respiratory Volumes



#### Disorders Affecting Respiratory Volumes:

**Obstructive disorders** = difficulty getting air out of the lungs (Obstructive = Out).

COPD (Chronic Obstructive Pulmonary Disease) can be caused by asthma, bronchitis, or emphysema.

**What characterizes obstructive lung diseases?** Increased RV, IRV, and TLC; but decreased VC (why?).

Air moves out of the lungs at a slower rate than that of a healthy person causing inflammation and swelling and the airways become narrow and blocked.

**Restrictive disorders** = difficulty getting air into the lungs due to increased resistance to air flow.

The lungs have limited lung expansion ability from conditions such as a loss of lung mass, pneumonia, paralysis of the diaphragm, cancerous tumors, pleurisy, ascites, rib fractures, or fluids that consume the space of the alveoli.

**What characterizes restrictive lung diseases?** Reduced TLC, IRV, VC, and reduced RV.

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### ACTIVITY 14: RESPIRATORY PHYSIOLOGY

**PATIENT 1: Examine the data below.** This data was taken over a period of about two years from a 65-year-old male with a history of smoking.

**Chart 10: Respiratory Volumes over Time**

Chart Dates	RV (mL)	VC (mL)	TLC (mL)
1/23/2016	1200	4791	5991
6/15/2016	1613	3143	6123
12/8/2016	1908	1963	6254
5/18/2017	2112	1150	6381
11/11/2017	2244	621	6419

1. Determine if this patient is experiencing an *obstructive* or *restrictive* disorder. \_\_\_\_\_

2. Explain why. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PATIENT 2: Examine the data below.** This data was taken over a period of about two years from a 73-year-old female with pulmonary fibrosis.

**Chart 11: Respiratory Volumes over Time**

Chart Dates	RV (mL)	VC (mL)	TLC (mL)
2/13/2016	1108	3724	5991
3/29/2016	1015	3640	4752
9/24/2016	875	3495	3991
10/26/2016	716	3315	3012
2/28/2017	623	3108	1759

1. Determine if this patient is experiencing an *obstructive* or *restrictive* disorder. \_\_\_\_\_

2. Explain why. \_\_\_\_\_

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