

Key 2013
fall

Biology 20

Respiratory System Study Guide

Checklist, Can you explain / describe:

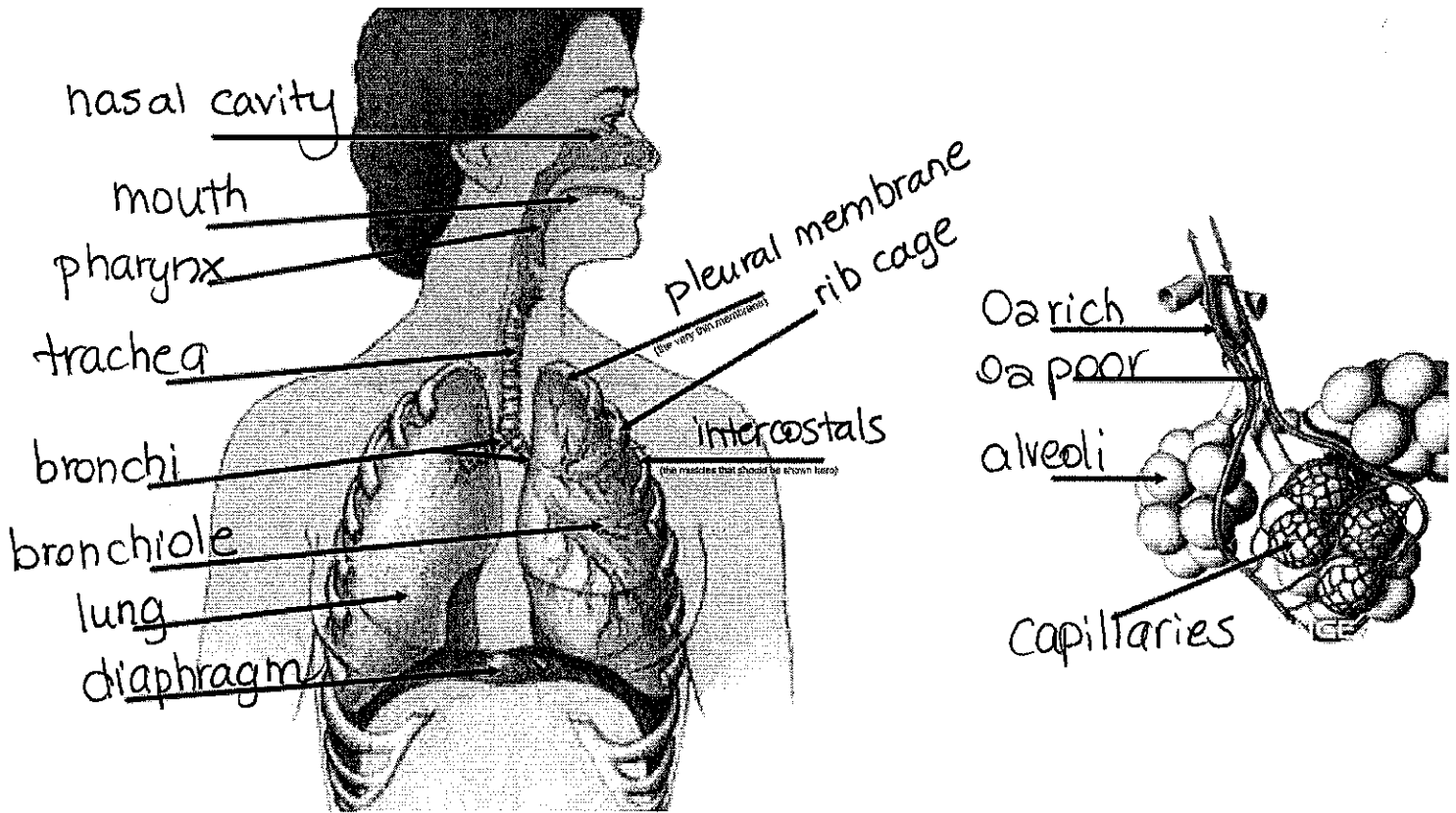
	The structures and functions of the Upper and Lower respiratory Tract p. 245-247
	Alveolar function p. 247
	Mechanics of breathing - inhalation and exhalation 7.2
	Regulation of Breathing p. 250
	Respiratory volumes (lung capacity) p. 250.
	Analysis of spirometer readings
	How is oxygen and carbon dioxide carried in the blood (be specific)
	How does blood remain a constant pH (ie. Buffered)
	Disorders - causes and symptoms Asthma, Pneumonia, Bronchitis, Emphysema, Laryngitis, Pleurisy, Cystic Fibrosis, Lung cancer, smoker's cough p. 256
	Chapter Review Questions: Pages 264 - 265

TRY THIS for REVIEW

Air that you breathe in contains about 21 % O₂ gas. It also needs to be conditioned by the upper respiratory tract before it reaches the lungs. In the upper tract, there is a mucus layer that traps bacteria and particulates, as well as dust the air. There are also cilia, which are tiny hairs that beat in unison to move particulates up and out of the respiratory system. If these two things fail, then a Cough (for things trapped deep in the lungs) or sneeze (for things irritating the upper tract) reflex will kick in to remove particles.

In your windpipe, you have two ligaments housed in cartilage that vibrate when air is forced past them. This structure is called your larynx and an infection in it is called laryngitis.

Label the following diagrams:



1. How do the two diagrams above relate to each other?
right diagram is found @ the end of bronchioles

2. In order to breath regularly, you mostly use the DIAPHRAGM muscle. When this muscle contracts, you breath IN due to a(n) decrease in pressure in the thoracic cavity. In order to take a deep breath in or out, you add your inter-costal muscles

3. Match the description of a breathing volume with it's term and then with it's graph:

#	Letter	Term	Description	Graph
<u>3</u>	<u>C</u>	Expiratory reserve volume	1. The amount of air breathed in during a normal, relaxed breath.	
<u>2</u>	<u>B</u>	Inspiratory reserve volume	2. The amount of air you can breath in forcefully	
<u>4</u>	<u>D</u>	Residual volume	3. The amount of air you can force out of your lungs if you try	
<u>1</u>	<u>A</u>	Tidal volume	4. The amount of air that remains in the lungs even after forceful exhalation	
<u>6</u>	<u>F</u>	Total lung volume	5. The amount of air your you can breath in after a forceful exhalation	
<u>5</u>	<u>E</u>	Vital capacity	6. The amount of air your lungs can hold	

True or False:

- F When you breath in, O_2 is diffused ~~actively transported~~ into the blood from the alveolus.
- T The majority of O_2 is carried through the blood attached to hemoglobin.
- F When blood reaches its target cell, O_2 and glucose ~~diffuse~~ out of the capillary into the target cell.
- F The target cell uses CO_2 and H_2O in cellular respiration.
- T CO_2 and H_2O together form carbonic acid. This is bad for blood.
- F Carbonic acid dissociates into H^+ and HCO_3^- ions. The HCO_3^- ions ^{H^+} get carried back to the lungs on the hemoglobin.
- F Your breathing rate is monitored and controlled by the hypothalamus ^{medulla} of the brain.
- F Your brain is most sensitive to the amount of O_2 in the blood which is then used to regulate your breathing. CO_2

Match the respiratory disease with its description:

<u>D</u>	Pneumonia	A	Can be caused by a variety of factors – an irritation or infection of the outer membrane of the lung- causes friction and pain during breathing.
<u>H</u>	Cystic Fibrosis	B	Any infection or inflammation of the back of the throat.
<u>G</u>	Bronchitis	C	Walls of the alveoli break down and lose elasticity – can burst open as well.
<u>E</u>	Asthma	D	The alveoli of the lungs are infected by either a bacteria or virus and they fill with fluid. Can be fatal, as the patient can literally drown in their own fluids.
<u>F</u>	Lung Cancer	E	Causes tightening of the bronchiole muscles during times of stress or exercise – exactly the times when the muscles should be dilating. Treated with inhalers to dilate and relax the muscles.
<u>B</u>	Pharyngitis	F	Uncontrolled cell division that causes a lump of non-functional tissue – often blocks off airflow in the lungs. Treated with chemotherapy, radiation, and/or surgery.
<u>A</u>	Pleurisy	G	An infection of the bronchi – excess mucous is produced, and a cough is present. Usually caused by bacteria or cigarettes.
<u>C</u>	Emphysema	H	A genetic disorder that causes the salt balance to be wrong in the lungs, causing fluid and mucous to build up inside the lungs. This must be dislodged and expelled or the person gets chronic infections.

Muscular System Study Guide

Chapter Review Questions: Pages 352 – 353

Checklist, are you able to:

	Explain that muscles can only pull , they cannot push.
	Explain the relationship between pairs of muscles in the skeletal muscular system
	Explain the characteristics of the three types of muscle and identify them from a slide
	Label the structures in a muscle fibre (p 335) and explain their heirarchy
	Describe the roles of the myofilaments (actin and myosin) in the sliding filament model of muscle contraction
	Explain the role of Ca++ and ATP in muscle contraction
	identify the sources of energy for muscle contraction and order in which they are used
	Disorders - causes and symptoms
	Distinguish between the roles of fast-twitch and slow-twitch muscles

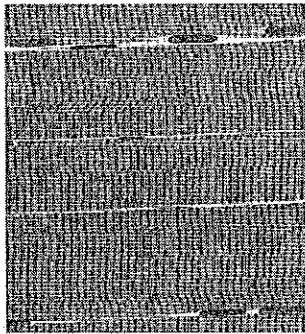
	Cardiac	Skeletal	smooth.
location	walls of heart	attach to bones	walls of internal organs
autonomic somatic	INVOL	VOL.	INVOL
striation	Yes	Yes	NO
nucleation	one	many	one
Shape	tubular branched	tubular	long and tapered @ each end.

Complete the chart for the three types of muscle:

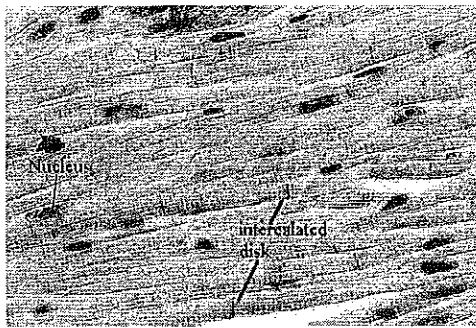
***** (autonomic = automatic = involuntary)

***** (somatic = voluntary)

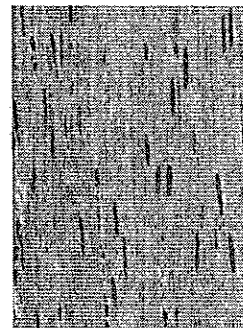
Label the three microscopic views of muscle tissue:



skeletal



smooth



cardiac

Organize the following terms according to size:
(number them 1-5 from smallest to largest)

Muscle (5) Muscle fiber (3) Muscle fiber bundle (4) Myofibrils (2) Myofilaments (1)

Match the following terms with their explanations:

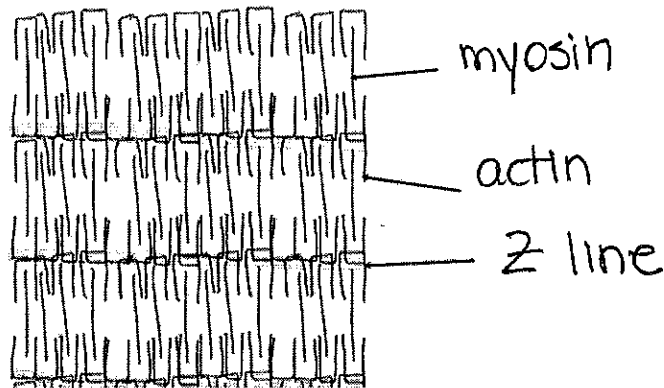
- | | |
|---------------------------------|---|
| <u>F</u> Muscle Fibers | A. Actin and Myosin – proteins that work together to cause contractions in the muscle cell. |
| <u>C</u> Myosin | B. The thin filament – actually moves in relation to the other filament. |
| <u>E</u> Sarcoplasmic Reticulum | C. The thicker filament – has heads that flex to move the other filament past it. |
| <u>A</u> Myofilaments | D. Stores Oxygen in the muscle cell for use in contractions. |
| <u>B</u> Actin | E. Stores Calcium ions until stimulated by a nerve to release it. |
| <u>D</u> Myoglobin | F. Also called muscle cells, they are bundled together into strings. |

Put the following events in the correct order:

1. Actin Moves
2. The Ca^{2+} ions move troponin out of the way
3. The Myosin Head Flexes
4. Ca^{2+} is released from the sarcoplasmic reticulum
5. ATP bonds to the myosin head (and splits in to ADP and Pi)

Answer: 4 2 3 1 5

Label:



What type of muscle cell is this found in? **SKELETAL**

True or False:

- Creatine phosphate**
- T / F ATP is the **first source of energy** for muscle cells to use to contract
- T / F Creatine phosphate is broken down in muscle cells to provide ATP ~~after~~ **first**
all the ATP has been used up.
- T / F Muscle Cells that have used up their creatine phosphate then use **anaerobic respiration** to provide ATP.
- T / F Anaerobic respiration provides **more ATP energy** than aerobic respiration for the muscle cells.
- T / F A **muscle cramp** is caused in cases of anaerobic respiration due to the **build-up of Calcium ions** in the cell, causing involuntary contractions. **p.341**
- T / F Slow-twitch muscle fibers have **higher endurance but lower speed** than fast-twitch fibers.
- T / F Fast-twitch muscle fibers are the "**dark meat**" due to the **presence of** myoglobin which holds O_2 in the cells. **light** **lack of**

Bonus Question:

Why does an animal go "stiff" after it dies? (It's called Rigor-mortis)

NO ATP to break ACTIN-MYOSIN bond
therefore muscle contraction
is maintained.