**Regulation of Breathing Movements**

Our body undergoes so many changes and we need to be able to have ongoing oxygen and get rid of carbon dioxide waste from cellular respiration

How do we manage this?

1. Chemoreceptors
2. Carotid and Aortic bodies

Chemoreceptors and the Brain

**Chemoreceptor:** specialized nerve receptor that is sensitive to specific chemicals

The **medulla oblongata** is the brainstem and it controls our automatic breathing movements

Two types of chemoreceptors:

1. **oxygen chemoreceptor:** monitors oxygen levels

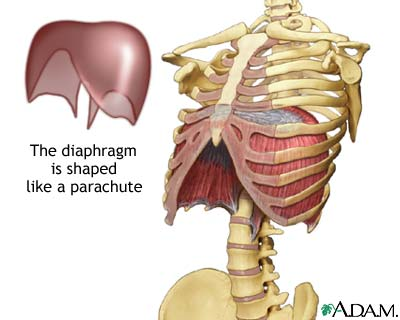
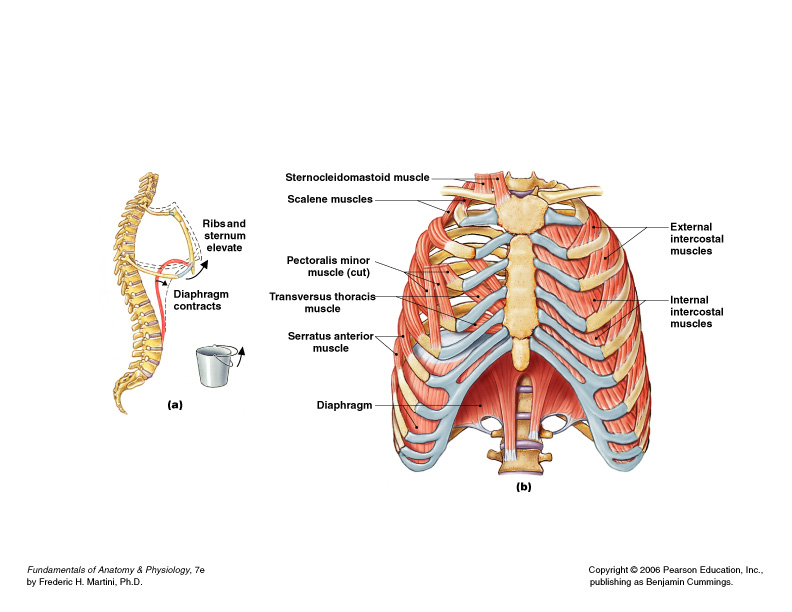
2. **carbon dioxide/acid chemoreceptor**: monitors CO2 levels and carbonic acid levels

* carbon dioxide/acid chemoreceptor is more important because our body is VERY sensitive to too much CO2 build up
* toxic= deadly= not good

If high levels of CO2 are detected:

* initiates increased rib muscles and diaphragm movements
* Result= increased breathing rate

Remember what these muscles look like (just know in general):

**Carotid and Aortic bodies**

* Carotid and Aortic bodies are found in the carotid and aortic arteries.
* Main function: detect ***low levels*** of O2

When they detect ***low levels*** of O2:

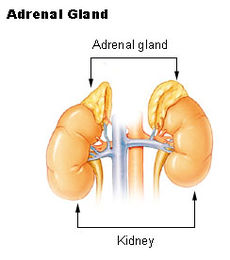
* they send a nerve impulse (message) to the *medulla oblongata* in the brain
* initiates increased rib muscles and diaphragm movements
* Result= increase breathing

Exercise Response #1

* During exercise, cellular respiration increases
* Therefore CO2 levels increase
* This stimulates chemoreceptors in the *medulla oblongata* of our brain
* initiates increased rib muscles and diaphragm movements
* Result= increase breathing
* That’s why you breathe heavy when you are working hard= because your body needs more oxygen and is making more CO2

Exercise Response #2

* Your adrenal gland stimulates the release of epinephrine (adrenaline)
* This causes breathing rate to increase



Do: **9.1-9.3 Study Sheet** and **Respiration Disorder Assignment**