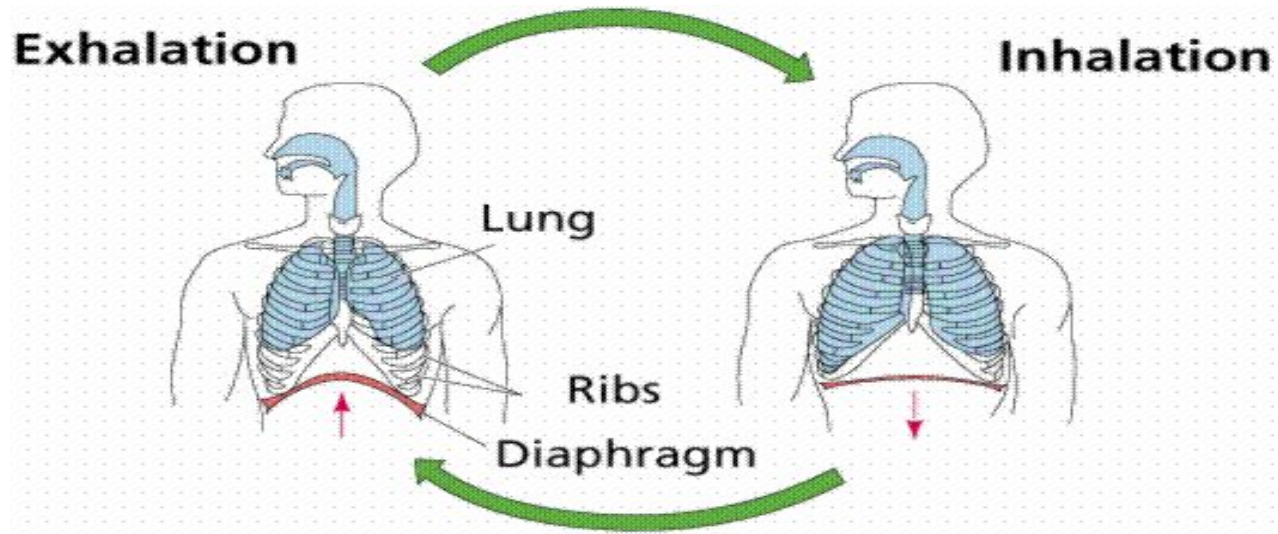


Respiratory Physiology

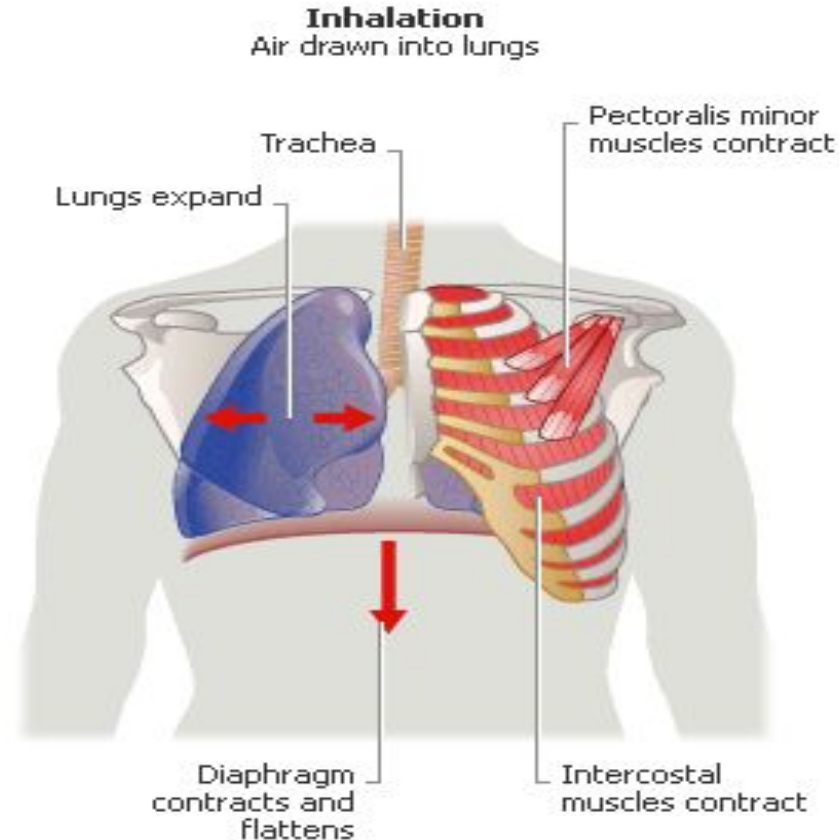
HOW DO WE BREATHE?

- Two main stages:
 - **Inspiration**: inhaling – air moves into the lungs
 - **Expiration**: exhaling – air is forced out of lungs



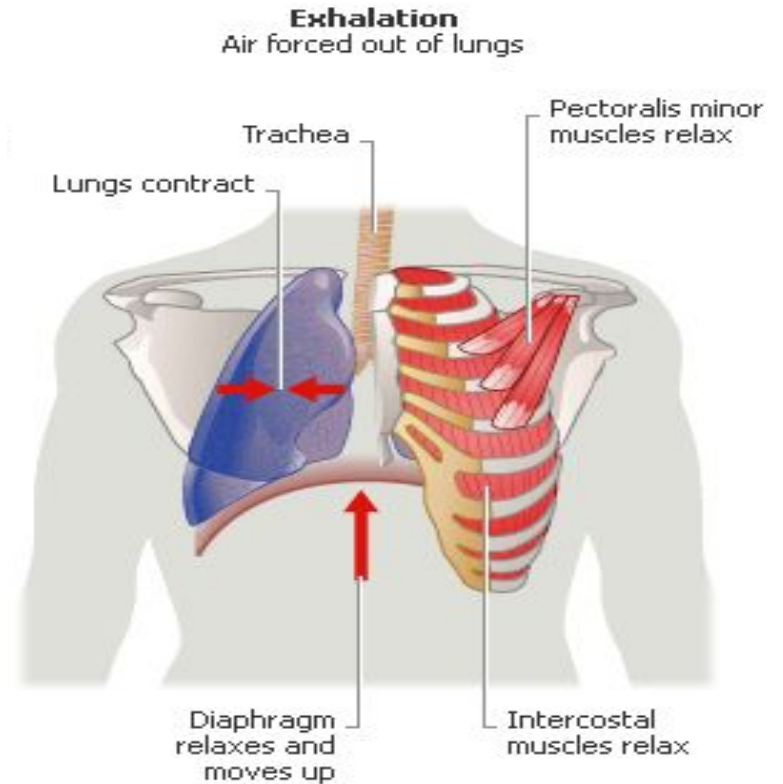
Inhalation

- Diaphragm **contracts**
- Ribs move **up and out**, chest cavity **enlarges** and **pressure decreases**
- **Air rushes in** from higher pressure environment



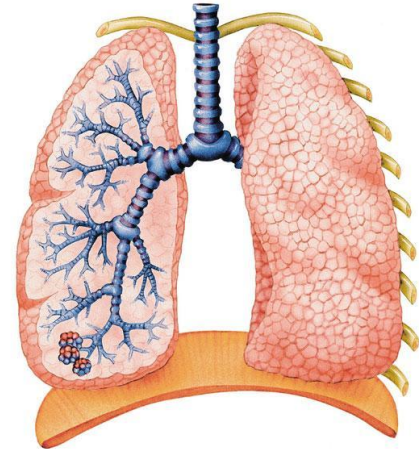
Exhalation

- Diaphragm **relaxes**
- Ribs **compress**, chest cavity **gets smaller** and **pressure increases**
- **Air escapes** to lower pressure environment



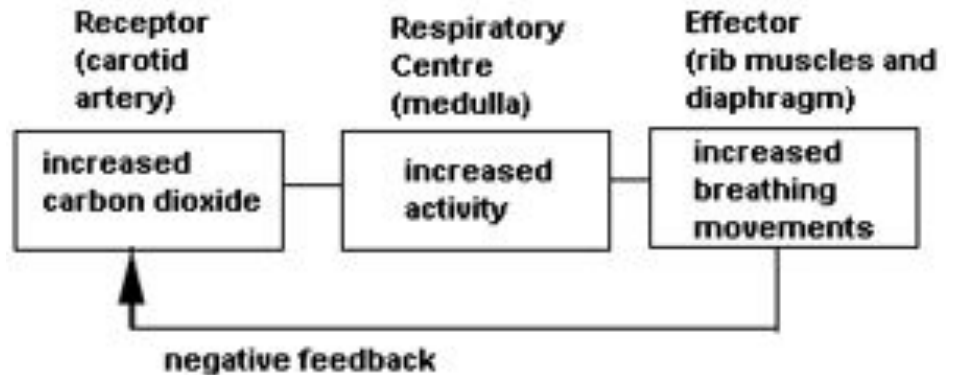
Breathing

- Involuntary inhalation and exhalation
- Delivers O_2 to alveoli and removes CO_2
- Medulla oblongata
 - Brain region that controls breathing



Control of Breathing

- Chemoreceptors detect change in blood pH
 - Blood high in CO_2 has lower pH (more acidic)
- Drop in pH causes medulla oblongata to stimulate breathing
- Brain sends signals to rib muscles and diaphragm to contract faster or slower



Normal blood pH



Increase in CO₂ alters blood pH



Stimulation of chemoreceptors



Activation of medulla oblongata



Increase in breathing rate (increase in O₂)



Decrease in CO₂



Restoration of normal blood pH

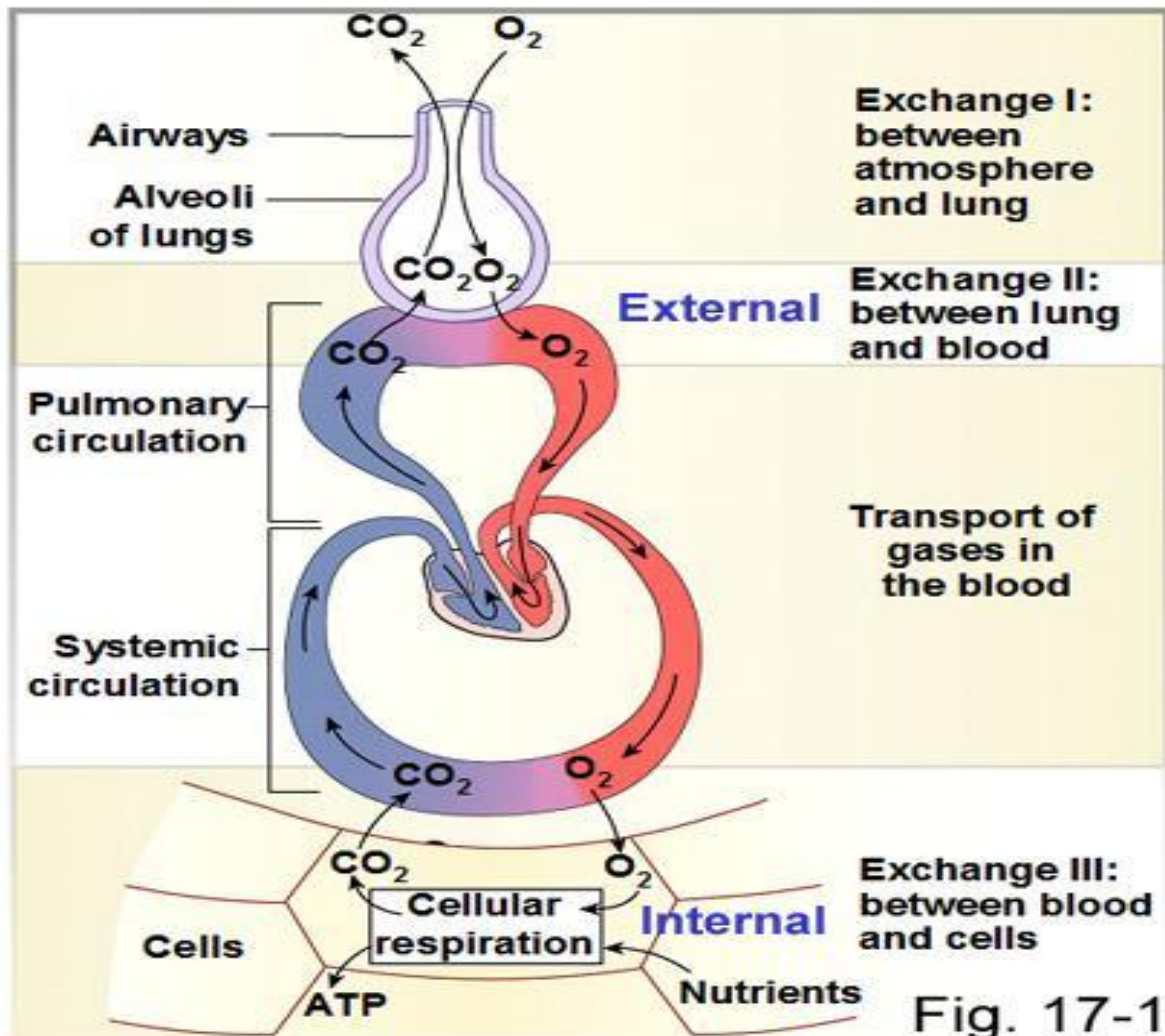


Fig. 17-1

Can you think of some FACTORS THAT AFFECT BREATHING?



Videos to Help Illustrate Respiratory Physiology

- O₂ Transport from Lungs to Cells (3:08 mins):
<http://www.youtube.com/watch?v=5LjLFrmKTSA>
- What do the Lungs Do? (3:21 mins)
<https://www.youtube.com/watch?v=8NUxvJS- Ok>
- Crash Course in Respiration, Part 2 (10:22 mins):
<https://www.youtube.com/watch?v=Cqt4LjHnMEA&t=6s>
- Pressure Changes During Breathing (9:29 mins)
<https://www.youtube.com/watch?v=ZvTdc1nAuBo>