

### 9.3: Natural Fluid Systems

Natural fluid systems occur all around us! In the atmosphere, in the Oceans, and even in our own circulatory systems!

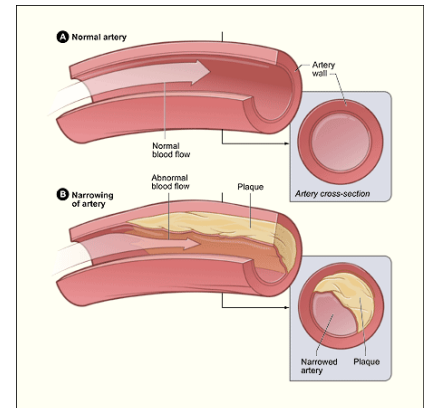
#### Fluid Systems in Humans

- Living things rely on Pressure to keep fluids moving inside our bodies!
- Humans are made of about 66% water, and on average we lose about 2.3L of water every day (more if it is hot or you are active).
  - We learned earlier in the year that water is a very important nutrient in our bodies, with many functions:
    - Absorb food
    - transport nutrients
    - Remove waste
    - Protect tissues
    - Maintaining Blood pressure

#### The Circulatory System:

- The circulatory system is actually one of the most efficient natural hydraulic systems around!
  - Recall it's job is to transport blood all around the body, using blood vessels and the heart acting as a pump.
- When your heart pumps blood through the circulatory system, the pressure from the pushing of the heart moves the blood.
  - The force of the blood on the walls of the vessels is known as Blood pressure

- Blood pressure is constantly monitored in our bodies by specialized cells in the walls of our blood vessels.
  - If they read that your blood pressure is too high or too low, they will send signals to the brain and correct the issue, typically by speeding up or slowing down your heart rate.
- A typical blood pressure reading for a healthy young individual is 120/75 mmHg
  - The first number is the pressure measured as the blood is pushed out of the heart
  - The second number is the pressure measured as the heart relaxes and fills again with blood
- We can use a sphygmomanometer to measure blood pressure in the brachial artery in your arm.
- Blood pressure is considered to be an indicator of general health
- Sometimes arteries can become blocked with fatty deposits, which can cause individuals to have higher than normal blood pressure.
  - This causes the heart to work harder than normal to pump the same amount of blood past a plug in the vessel
  - Overtime high blood pressure can cause arteries to harden and burst!



## The Respiratory System

- Remember that the respiratory system is made of up a group of organs which function to help us obtain oxygen and remove carbon dioxide from our bodies
- The process of breathing actually involves changes in pressure!
  - Remember than under normal conditions, gases will travel from an area of high pressure to an area of low pressure
  - When we inhale, our chest cavity expands and creates a low pressure area inside our lungs.
    - This causes air to rush in from the higher pressure area outside of our bodies
  - When we exhale, our chest cavity contracts and creates a high pressure area inside our lungs

- This causes air to rush out towards the lower pressure area outside of our bodies
- Clogged or swollen passageways in the respiratory system can occur for a variety of reasons:
  - Bacteria
  - Viruses
  - Pneumonia
  - Bronchitis
  - Asthma
- Infections can cause swelling of the tissues, making it difficult to breathe
- Breathing in pollutants and smoke can also be harmful
- Asthma is a disease than interferes with the normal flow of air into the lungs
  - The cause is not known, but we know that asthma attacks can be triggered by things like dust, cold air, exercise, and stress.
  - An asthma attack will narrow the pathway to the lungs, making it hard to breathe properly
  - People often use inhalers to treat asthma

Homework:

- Read p. 334 – 339
- Do Reading Check Q's # 1-5 p. 337
- Do Reading Check Q's # 1-5 p. 339

only #4,5

only #1,2

~~DO NOW~~

- next: 9.3 worksheets.