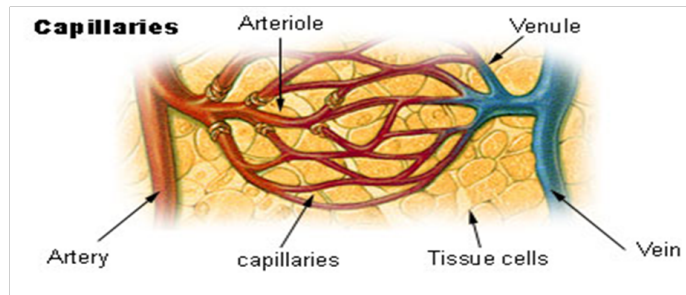


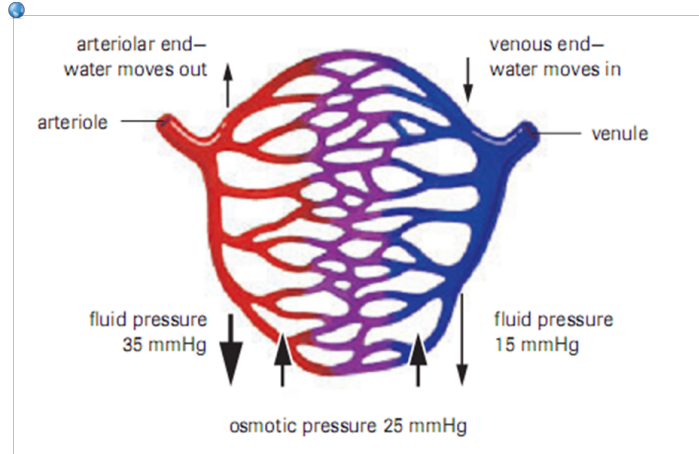
*Human Systems - Circulation - Lesson 3: Capillary Fluid Exchange*



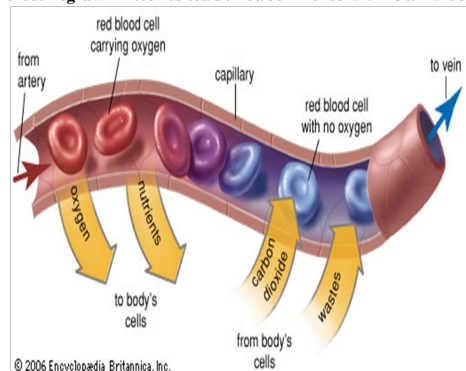
**Capillary Fluid Exchange - pg 336-337**

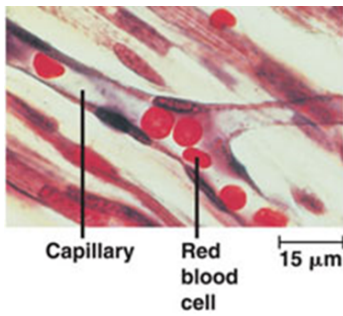
- Every cell in the body is approx **0.1 mm** away from a capillary
- Cells are surrounded by a fluid called **extracellular fluid (ECF)**
- The capillary exchanges **nutrients, gases and waste products** with the ECF
- Two forces regulate the movement of water between the blood and ECF: fluid pressure and osmotic pressure
  - o **Fluid** pressure is the pressure exerted by blood on the wall of the capillary
  - o **Osmotic** pressure is the pressure exerted by the ECF on the outside wall of the capillary
- Fluid moves from an area of high pressure to an area of low pressure
- On the artery end of the capillary the fluid pressure is higher than the osmotic pressure so water moves from the blood into the ECF
  - o The water that moves out of the blood contains oxygen and nutrients
  - o This is called **filtration**
- On the vein end of the capillary, the osmotic pressure is greater than the fluid pressure, so water moves from the ECF into the capillary.
  - o The water that moves into the blood contains carbon dioxide and waste products
  - o This is called **absorption**

<http://health.howstuffworks.com/adam-200084.htm>

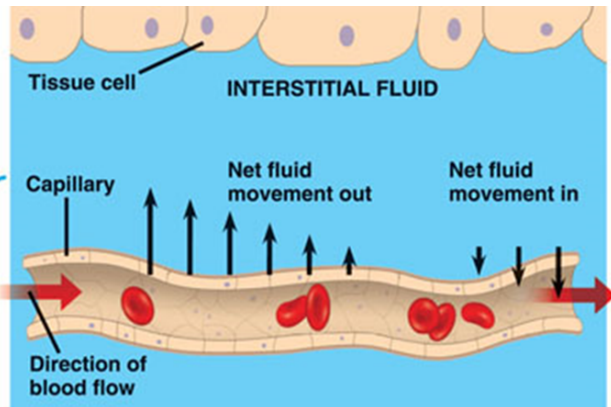


<http://highered.mcgraw-hill.com/sites/dl/free/0072464631/291136/Fluidexchange.swf>

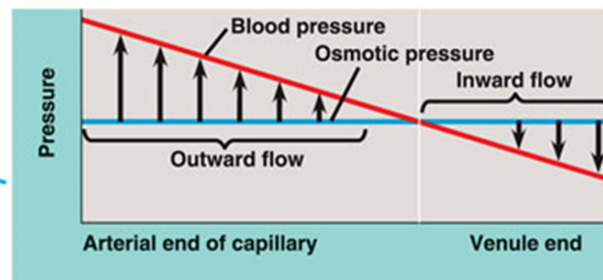




At the arterial end of a capillary, blood pressure is greater than osmotic pressure, and fluid flows out of the capillary into the interstitial fluid.



At the venule end of a capillary, blood pressure is less than osmotic pressure, and fluid flows from the interstitial fluid into the capillary.



## The Lymphatic System - pg 337-339

- Normally, a small amount of protein leaks into the ECF from blood
- This could be bad if they stay there because they would cause osmotic pressure to decrease and more fluid would move into the ECF from blood causing swelling of that area.
- The lymphatic system is a series of vessels that returns excess ECF fluid and protein back into the blood
- These vessels are **similar to veins (have valves)**
- This fluid is called **lymph**, and it is similar to blood
- **Lymph nodes** are enlargements of lymph vessels located at intervals
  - o They contain **white blood cells** which help fight any invading microbes in our body
- The lymph fluid returns to the blood at the subclavian veins (the ones that come from your arm)

