

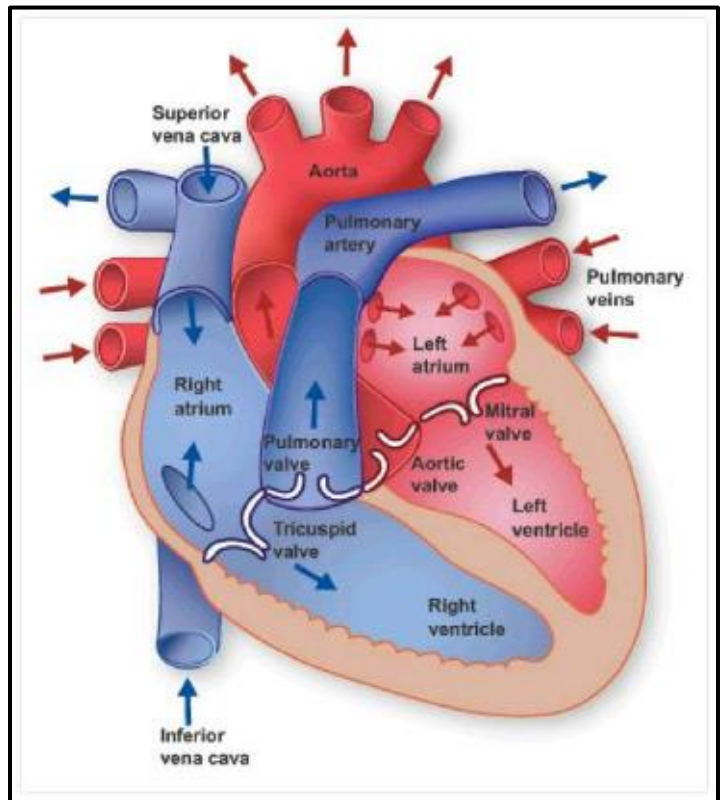
# Understanding normal heart function

## Heart Chambers

- **Atria:** the top 2 chambers that act as “reservoirs” and help pump blood into the ventricles
- **Ventricles:** bottom 2 *muscular* chambers that actually pump blood throughout the body

## Normal Heart Function

- **The basics:** The heart actually functions as 2 different pumps that are separated by the lungs. The right heart pumping blood from the body to the lungs in order to receive more oxygen. The blood then returns from the lungs to the left heart, when it is pumped throughout the body. Doctors normally think about the heart in terms of the *right heart* and the *left heart* when treating heart failure.
- **Right heart:** the blood returning from the veins, after the body has taken up on the oxygen, goes into the *right atrium and ventricle*, and then to the lungs via the *pulmonary arteries*. The right ventricle is not as muscular since in a normal heart since it only needs to pump blood to the lungs.
- **Left heart:** the blood returns from the lungs and goes into the *left atrium and ventricle* before pumping the oxygen-rich blood throughout the body. The left ventricle is bigger and stronger since it needs to pump blood throughout the entire body. Most heart failure is due to problems with the *left ventricle* since it does most of the work in the heart.



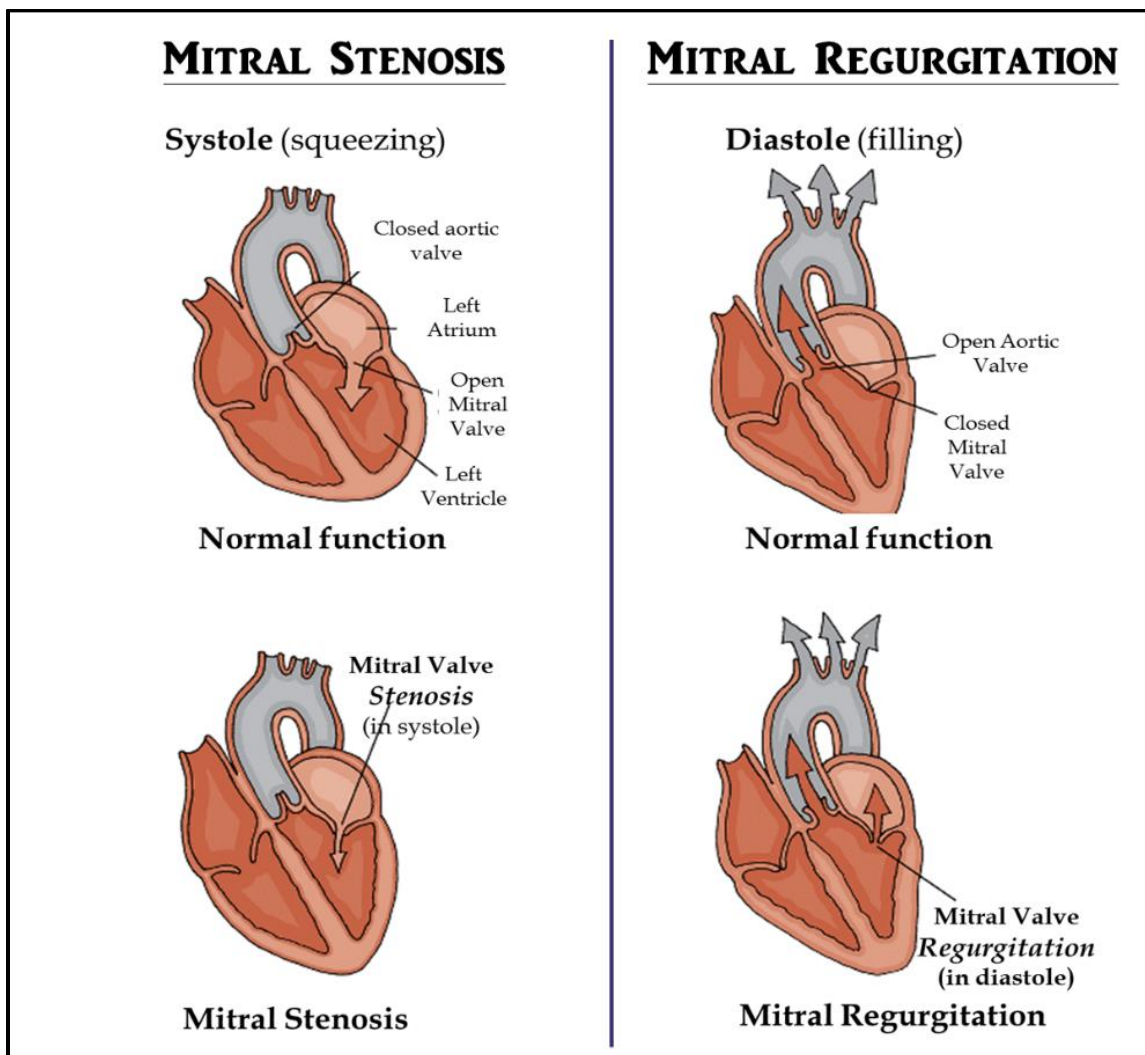
## Heart Valves

- **Tricuspid valve:** valve that separates the *right* atrium and ventricle
- **Pulmonary valve:** valve as separates the *right* ventricle and the blood flow to the lungs
- **Mitral valve:** valve that separates the left atrium and left ventricle.
- **Aortic valve:** valve that separates the left ventricle from the blood flow to the rest of the body

## Heart Valve Problems – The Basics

- **Valve *stenosis*:** this term means the valve can't open all the way usually due to thickening and calcium buildup on the valves
- **Valve *regurgitation*:** Also sometimes called insufficiency, these terms both mean the valve become leaky and the blood flows backwards when it should be closed. A small amount of regurgitation is common and not concerning for all of the valves *except* the aortic valve
- **Severity of valve dysfunction:** for both *stenotic* and *regurgitant* valve problems, the valve is normally monitored until there is severe dysfunction or if there are symptoms due to the valve problem. This is because most valve problems do not cause problems until they are severe and develop slowly over time. Sometimes the valves never become severe enough to require surgery and in certain cases, treating heart failure can improve the valve function.

## Valve Stenosis & Regurgitation Examples – in the Mitral Valve



# Understanding Heart Failure

## What is Heart Failure:

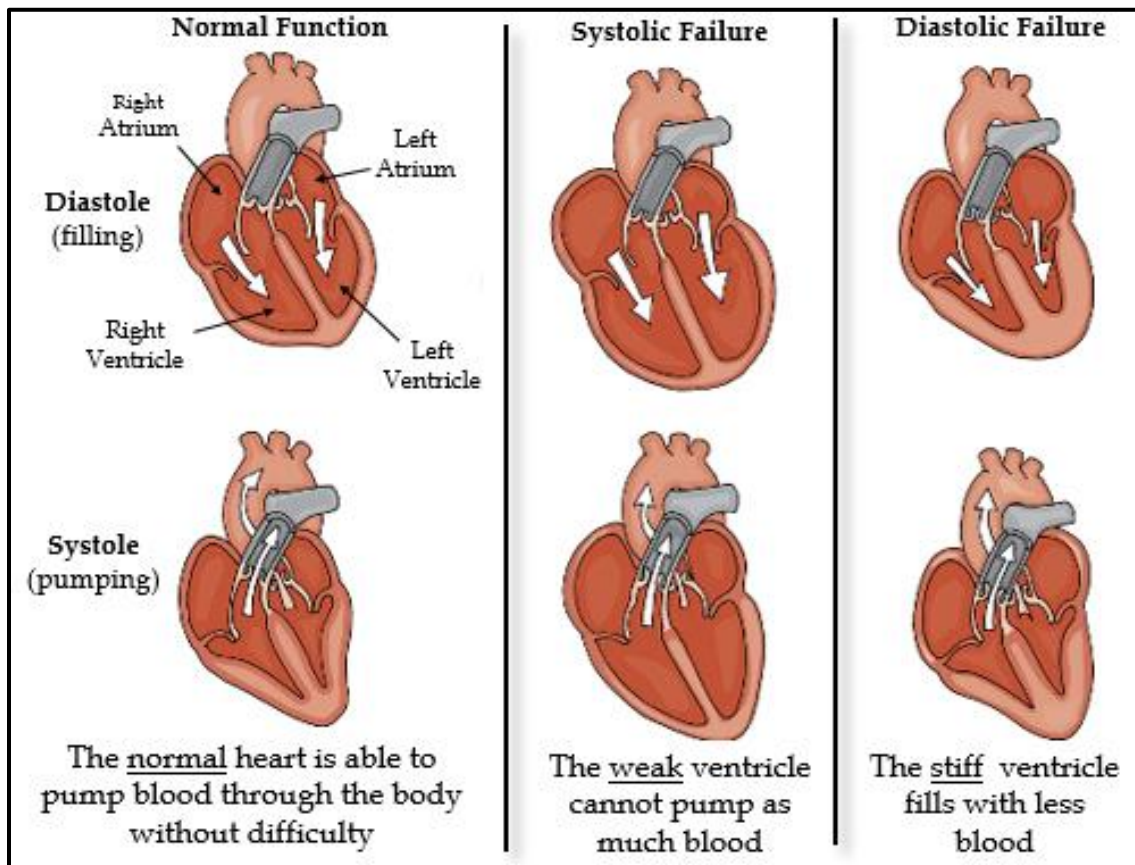
Heart failure is the term used when the heart is not able to fully pump the blood out of the heart. Since this typically effects the left heart, the blood will back up into the lungs and then back up into the right heart and the rest of the body. Although there are several reasons this can happen, heart failure is typically broken down into different categories.

## Common Heart Failure Signs & Symptoms

- Feeling more winded or short of breath with activity
- Feeling short of breath when laying down
- Sleeping and breathing better when you prop your head up or sit in a recliner
- Swelling in your legs

## Types of Heart Failure

1. **Systolic Heart Failure:** When the heart becomes weak and cannot squeeze as much blood out
  - a. A normal ejection fraction (EF) is 55-70%. An EF less than 50% is considered abnormal
2. **Diastolic Heart Failure:** When the heart still squeezes normally, but becomes stiff and can't relax as much as a normal heart
  - a. The "EF" is still normal, but since the heart can't fill all the way, heart failure occurs



3. **Right Heart Failure:** when the right heart is not able to squeeze strong enough for blood to go into the lungs
  - a. mostly occurs when the pressure in the lungs (called pulmonary hypertension) is increased
  - b. the most commonly due to *systolic* or *diastolic* heart failure in the left heart
  - c. can also occur in other less common conditions mostly affecting the lungs
  
4. **Miscellaneous Heart Failure:** There are other *uncommon and rare* forms of heart failure that do not fit the above categories such of diseases of the pericardium (lining around the heart) or abnormal growth of the heart. While uncommon, our cardiologists have significant experience with these conditions and can determine if these uncommon are present.