

# Heart Valves and Heart Disease

**The heart is a fist-sized muscular pump divided into four chambers. The two upper chambers – the left and right atria – receive blood returning from the veins. The two lower chambers – the left and right ventricles – pump blood into the arteries. Heart valves ensure that blood flows in a single direction into and out of the heart.**

The heart has four valves. Two of the valves control the flow of blood from the upper chambers of the heart (atria) to the lower chambers (ventricles). They are the:

- **Mitral Valve:** located between the left atrium and left ventricle
- **Tricuspid Valve:** between the right atrium and right ventricle

Two additional valves control the blood flow out of the lower chambers (ventricles) into the arteries:

- **Aortic Valve:** between the left ventricle and aorta
- **Pulmonary Valve:** between the right ventricle and pulmonary artery



Each heart valve features two or three strong tissue flaps – or leaflets – which open and close with each heartbeat, approximately once every second throughout life.

Blood pressure controls the flow of blood within the heart and activates the opening and closing of the valves. When working properly, heart valves ensure that blood flows in the right direction. As pressure within the ventricles decreases, the mitral and tricuspid valves open, allowing blood to flow from the atria into the ventricles. This blood inflow to the ventricles pushes the pulmonic and aortic valves shut, preventing blood that was pumped out to the arteries on the previous beat from returning.

## Diseases of the Heart Valves

When diseased or defective, heart valves may not open or close properly and can interfere with the flow of blood. The most common valve problems involve the mitral and aortic valves, which are located on the left side of the heart. The primary types of heart valve disease are:

- **Valve Stenosis or Obstruction:** As a result of certain medical conditions or anatomical abnormalities, a valve can either be exceptionally narrow or have a blockage or obstruction. Either of these conditions can limit the blood flow through the valve, which may result in a “back-up” of blood behind the valve as if behind a dam, causing the heart to pump inefficiently.
- **Valve Regurgitation or Insufficiency:** When a valve’s leaflets fail to close completely, the valve itself can become “leaky,” allowing blood to backwash down through the valve (called “regurgitation”). In addition, the valve may not ever completely move the volume of blood to the next appropriate chamber.

Beyond the two primary types of heart valve disease, there is an additional common diagnosis.

- **Mitral Valve Prolapse:** This is a commonly diagnosed form of valve regurgitation. Mitral valve prolapse is estimated to affect 2-3% of the population. In serious cases, the mitral valve can become weakened or stretched, ballooning out and sometimes causing a backflow of blood. It is often referred to as “click-murmur syndrome,” from the extra clicking sound that can be heard from the leaflets ballooning out and a murmur from the backward flow of blood during a stethoscopic examination. Despite its frequency, only a small percentage of patients develop progressed mitral regurgitation to a degree that requires medical therapy or surgery.

## Causes of Heart Valve Disease

In addition to congenital defects of the valves, heart valve disease can result from infections or calcium deposits that accumulate on the valves and leaflets throughout an individual's lifetime. It can take decades for valve damage to appear and a patient may have advanced stages of valve disease before symptoms develop.

## Symptoms

As advanced heart valve disease is considered a progressive condition, individuals may not notice symptoms for a prolonged period of time. In many cases symptoms develop gradually, with an individual realising a growing intolerance for exercise, rather than an automatic awareness.

In addition, a patient's symptoms often vary depending on the valve affected, the condition of the valve and the severity of a particular patient's disorder. However, there is no concrete predictability for symptoms. Some patients with more severe disease may suffer fewer or less severe symptoms than someone with what may be considered a milder case. Common symptoms may include shortness of breath, dizziness, chest or heart pain, fainting, heart flutters, unusual tiring and weakness.

## Heart Valve Disorder Diagnosis

Heart valve disease and disorders are almost always detected during a medical visit. A heart “murmur” or “click-murmur” heard through a physician's stethoscope is usually the first indication of a valve disorder.

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