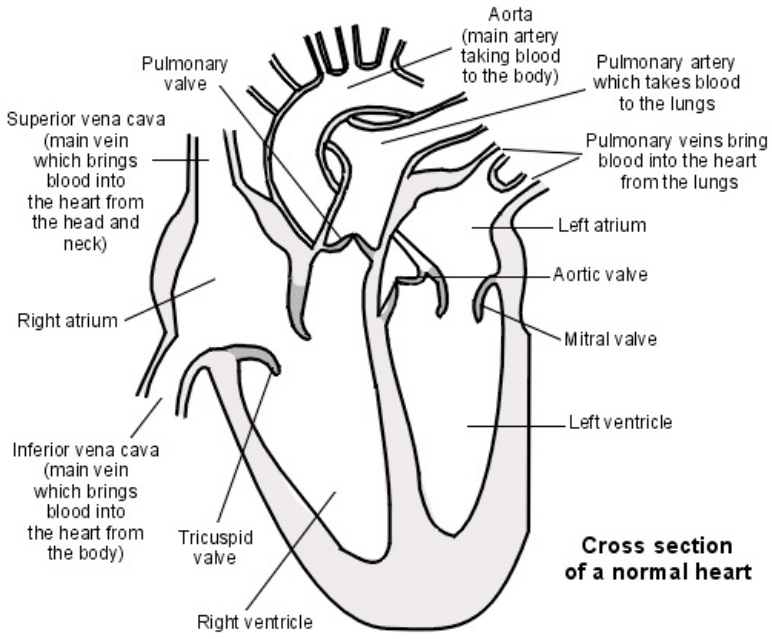
Heart Valves and Valve Disease

This leaflet gives an overview of heart valve disease. There are four separate leaflets that give details of the four common types of valve problem - mitral stenosis, mitral regurgitation, aortic stenosis, and aortic regurgitation.

Understanding the heart

The heart has four chambers - two atria and two ventricles. The walls of these chambers are mainly made of special heart muscle.



During each heartbeat both of the atria contract first to pump blood into the ventricles. Then both ventricles contract to pump blood out of the heart into the arteries. There are one-way valves between the atria and ventricles, and also between the ventricles and the large arteries that take blood from the heart. These are:

- The mitral valve - between the left atrium and the left ventricle.
- The tricuspid valve - between the right atrium and the right ventricle.
- The pulmonary valve - between the right ventricle and the pulmonary artery (the main artery that takes blood from the heart to the lungs to collect oxygen).
- The aortic valve - between the left ventricle and the aorta (the main artery that takes oxygen-rich blood from the heart to the body).

The valves make sure that when the atria or ventricles contract, the blood flows the correct way through the heart and into the arteries.

See separate leaflet called *'Heart and Blood Vessels'* for more details on the function of the heart and how the heart beats.

What is heart valve disease?

A valve that is diseased or damaged can affect the flow of blood through the heart. There are two main types of valve problem:

- **Valve stenosis**. This means that the opening of the valve is narrowed and the valve does not open fully. So, there is some restriction in blood flow through the valve.
- **Valve regurgitation** (sometimes called valve incompetence, or a leaky valve). This means that the valve does not close properly and there is backflow of blood through the leaky valve.

Any of the valves can be affected by these problems. However, the mitral and aortic valves are the ones that most commonly become diseased. See separate leaflets called *'Mitral Stenosis'*, *'Mitral Regurgitation'*, *'Aortic Stenosis'*, and *'Aortic Regurgitation'* for details of these conditions.

What are the symptoms of heart valve disease?

Basically, the more narrow or leaky a valve is, the greater the problem is likely to be. Some minor narrowing or leakiness may cause no problems or symptoms. However:

- If the narrowing is severe - the heart has to pump harder to get blood past the narrowing.
- If leakiness is severe - the heart has to pump harder to pump the blood that leaks back, in addition to the normal amount of blood flowing through the heart.

In both cases, this can put a strain on the heart. There may be an increase in pressure behind the affected valve. This back pressure can cause blood and fluid to build up in the lungs or lower part of the body (depending on which valve is affected).

The symptoms that may develop include:

- Shortness of breath. Mainly on exertion at first, but may occur at rest if it is more severe.
- Tiredness, dizziness or episodes of fainting.
- Abnormal heart rhythms which can cause palpitations and other problems.
- Swelling of tissues due to fluid congestion.
- Chest pain or angina. This may occur if there is not enough blood flow to the coronary arteries (the arteries that take blood to the heart muscle).

Various complications may develop, depending on the valve affected and the severity of the problem.

What causes heart valve disease?

Degenerative changes

This is one of the most common causes of leaky heart valves. The structures supporting the heart valves weaken and stretch over time and this prevents the valves from closing properly.

Rheumatic heart disease

This is the most common overall cause of valve problems. Rheumatic heart disease is a general term which means any heart problem which develops after having an episode of rheumatic fever.

Rheumatic fever is a condition which sometimes follows an infection with a bacterium called the streptococcus. Your body makes antibodies to the bacterium to clear the infection. But, in some people, the antibodies also attack various parts of the body - in particular, the heart valves. Inflammation of one or more valves may develop which can cause permanent damage and lead to thickening and scarring years later.

Rheumatic fever used to be common in the UK in the era before antibiotics, but it is now rare. It is still quite common in some developing countries.

Other causes

Other causes of valve disease include:

- Deposits of calcium (calcification) in parts of the valve. This is the most common cause of aortic stenosis in older people.
- A floppy valve, which is a common cause of mild mitral valve regurgitation.
- Some congenital heart problems. It is then usually part of a complex heart deformity.
- Infection of the valve (endocarditis).
- A complication of various uncommon diseases.

What is the treatment for heart valve disease?

If the narrowing or leakiness is mild, and you have no symptoms, then you usually do not need any regular treatment. If you develop symptoms or complications, various medicines may be advised to ease the symptoms. Surgery to stretch, repair or replace the valve may be needed in some cases. Surgical treatment has greatly improved the outlook for many cases of severe valve disease. Heart operations have been made easier by the endo-aortic balloon occlusion technique. A tube with a balloon on the end is inserted into the groin and fed into the aorta. When the balloon is inflated the blood circulation to the heart is stopped for long enough to give the surgeon a chance to operate on the heart. Surgery has a very good success rate.

Heart valve disease and endocarditis

If you have a diseased valve then endocarditis is a possible complication. Endocarditis is an infection of the valve. (Damaged valves are more prone to infection than normal valves.) Unless promptly treated, endocarditis can cause serious illness. See separate leaflet called *'Endocarditis - Infective'* for details.

Antibiotics used to be offered to all people with heart valve disease before dental treatment and some surgical procedures to prevent the development of endocarditis. However, the National Institute for Health and Clinical Excellence (NICE) issued guidance in 2008 which advised that people at risk of endocarditis only need to take antibiotics if they actually have an infection at the time that dental or surgical procedures are undertaken.

Further help and information

British Heart Foundation
Greater London House, 180 Hampstead Road, London, NW1 7AW
Tel (Heart Help Line): 0300 330 3311 Web: www.bhf.org.uk

Further reading & references

- Guidelines on the management of valvular heart disease, European Society of Cardiology (2007)
- Antimicrobial prophylaxis against infective endocarditis, NICE Clinical Guideline (March 2008)
- Endoaortic balloon occlusion for cardiac surgery, NICE Interventional Procedure Guideline (May 2008)

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