

# Aortic Stenosis

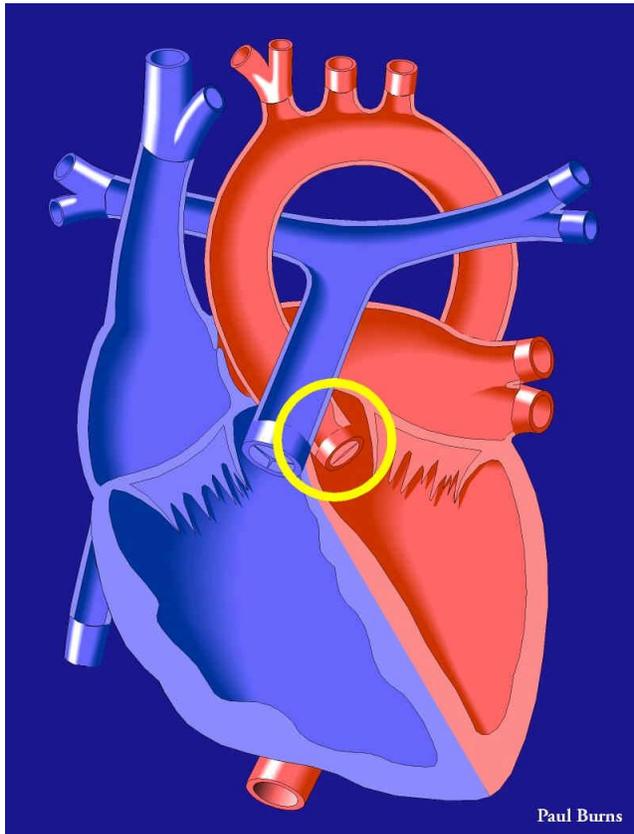


## What Is It?

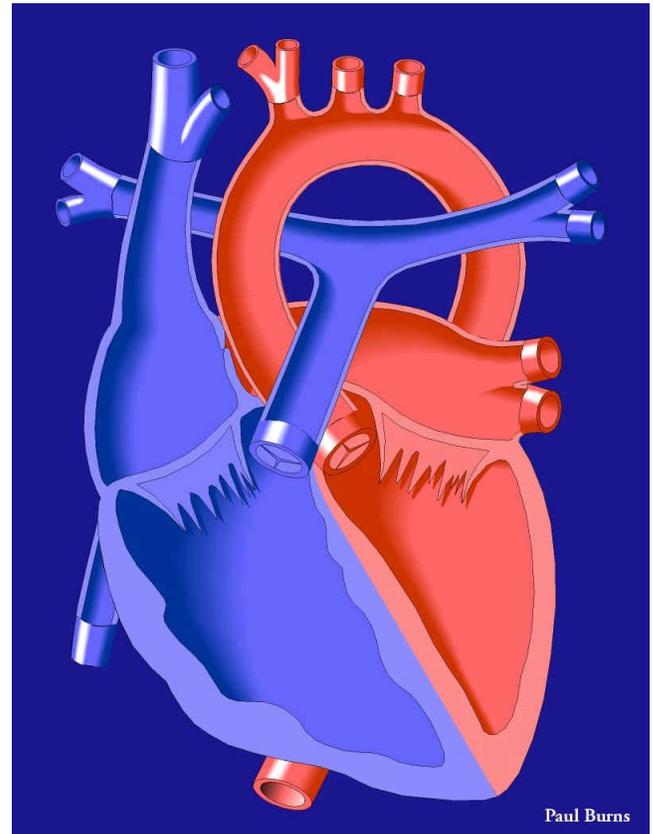
In this defect, the outflow tract leading from the heart into the aorta, which carries oxygen-rich blood to the body, is obstructed.

The most common type of Aortic Stenosis, known as valve stenosis, involves a narrowing of the aortic valve (indicated by the arrow in diagram). This may be caused by the aortic valve leaflets being too small or too thick, or the valve may not open properly.

Occasionally, the obstruction does not involve the aortic valve itself but consists of a narrowing of the passage either above (supravalvular) or below it (subvalvular).



**Aortic Stenosis**



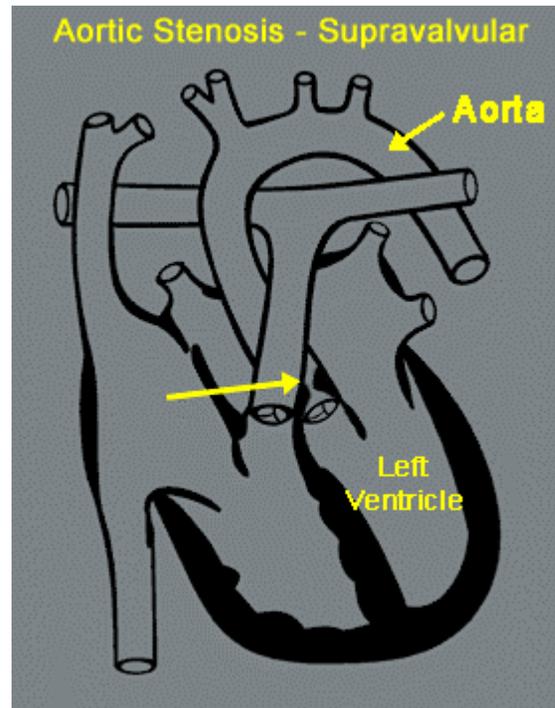
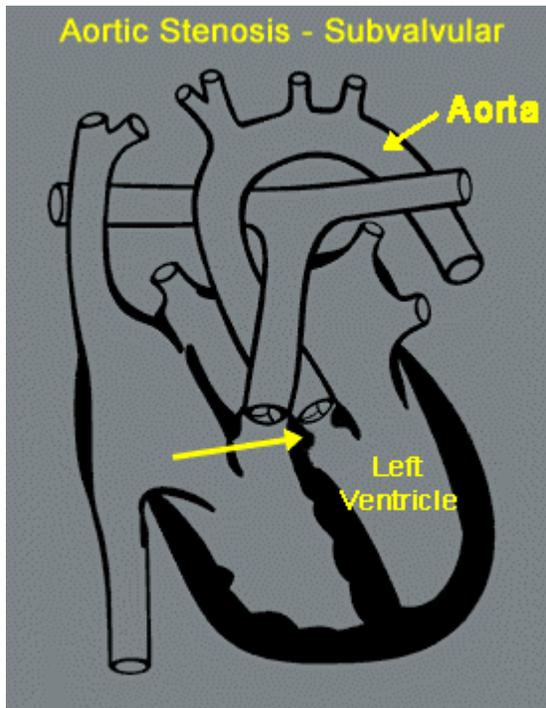
**Normal Heart**

## What Are Its Effects?

The left ventricle, the main pumping chamber of the heart, pumps oxygen-rich blood through the aortic valve into the aorta, which carries it to the body tissues. If the opening to the aorta is obstructed, as in Aortic Stenosis, the left ventricle must work harder to move blood in this way.

In severe cases, this may cause the left ventricle to increase in size (hypertrophy), which may lead to irregular heartbeat (arrhythmia) and sudden death.

In Subvalvular Aortic Stenosis, insufficiency (leaking) of the aortic valve may occur.



## How Is It Treated?

### Valvular Stenosis

When the obstruction is significant, surgical treatment may be necessary.

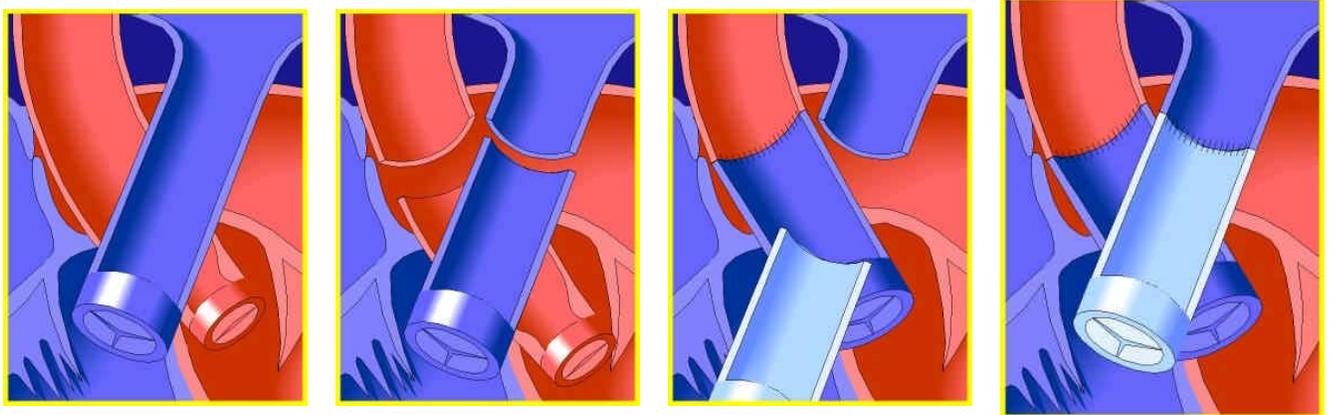
In cases where the aortic valve is undersized, thickened, or malformed (Valvular Aortic Stenosis), the initial treatment involves the widening of the opening to allow a greater flow of blood into the aorta. This may be achieved either by a surgical or a balloon valvuloplasty.

Surgical valvuloplasty involves reshaping the aortic valve during an operation. In a Balloon Valvuloplasty, which may be done in the cath lab, a catheter with a balloon at its end enters the heart, usually by way of an arm or leg vein and the inferior vena cava, and is inflated in the narrowed valve in order to widen the opening.

Eventually, most stenotic aortic valves will become insufficient (leak) and require a valve replacement operation later in life. This may be done with a prosthetic (artificial) valve.

More commonly in children, the aortic valve is replaced in an operation known as a Ross Procedure (see diagram). In this procedure, the aortic valve is replaced by the patient's own pulmonary valve (dark blue). The pulmonary valve in turn is replaced with a homograft pulmonary valve (cold-preserved human tissue, shown in light blue).

The recovery from a Ross Procedure is variable, requiring an average hospital stay of from 1 week to 10 days. With time, another valve replacement may become necessary because of degeneration of the homograft or because the patient's growth requires a larger valve.

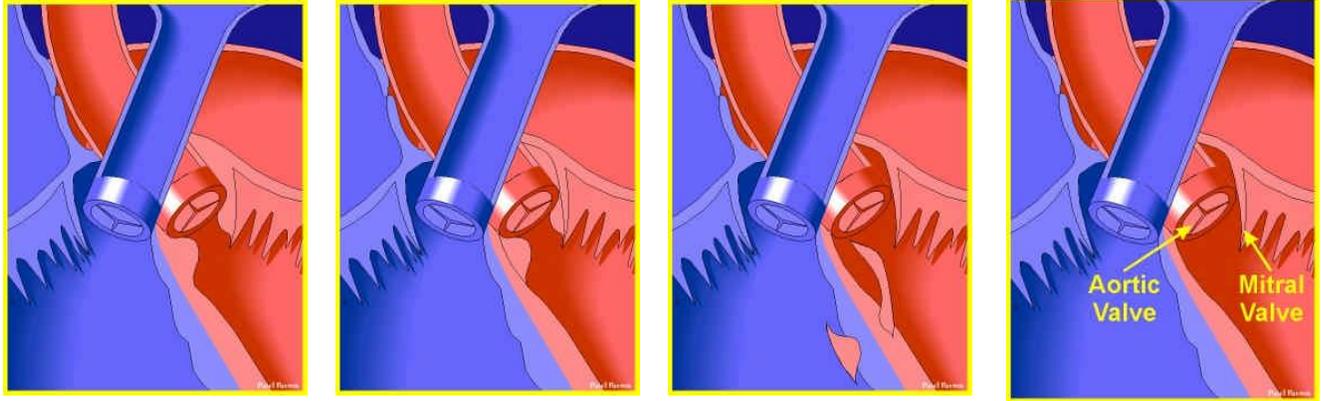


### **Surgical Repair of Valvular Aortic Stenosis (Ross Procedure)**

#### **Subvalvular Stenosis**

In cases where the narrowing is below the aortic valve (subvalvular stenosis), the surgeon enters the heart through the aortic valve and removes the obstructing tissue (see diagrams below). However, excessive muscle tissue may grow back requiring further surgical treatment later in life. Care is taken in this procedure to avoid damaging the mitral valve.

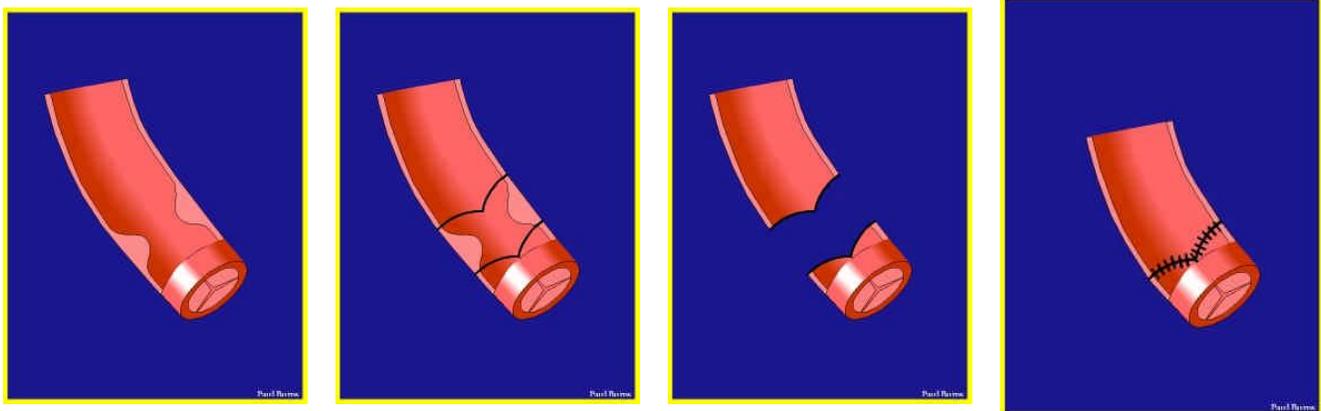
Recovery after this operation is usually straightforward, requiring a typical postoperative hospital stay of 5 to 7 days.



### Surgical Repair of Subvalvular Aortic Stenosis

#### Supravalvular Stenosis

In cases where the narrowing in the aorta is above the aortic valve (supravalvular stenosis), the obstructing portion is removed and the remaining parts of the vessel are stitched together. (see illustrations below)



### Surgical Repair of Supravalvular Aortic Stenosis