



## **Severe Aortic Stenosis**

### **The Condition**

Aortic stenosis is a heart condition that occurs when the aortic valve narrows, preventing it from properly opening and closing, and diminishing blood flow between the heart and the rest of the body. The reduced blood flow increases pressure within the heart, causing the heart to weaken and function poorly. When aortic stenosis becomes severe and symptoms develop, it is life-threatening. As many as 50 percent of aortic stenosis patients with severe symptoms may die within one year without appropriate treatment.

Aortic stenosis primarily affects older people and occurs at higher rates in men than in women. Aortic *sclerosis*, the calcification and thickening of aortic valve leaflets, is a precursor to aortic *stenosis* and, in industrialized countries, is seen in approximately 2 to 3 percent of persons older than age 65. This disease progression is associated with an approximately 50 percent increase in the risks for both death from cardiovascular causes and new myocardial infarction (heart attacks). Severe aortic stenosis affects approximately 300,000 people worldwide, of which 100,000 reside in the U.S.

### **Causes & Symptoms**

The most common cause of aortic stenosis is excessive wear on the aortic valve. This usually develops with age, but the process may be expedited in patients who are congenitally predisposed to disease.

Calcium buildup can also expedite the development of aortic stenosis by stiffening the valve and limiting movement. These calcium deposits, which originate from the blood's calcium supply as it flows through the aorta, accumulate over many years and are thusly more common in elderly patients.

Rheumatic fever can also cause aortic stenosis by producing scar tissue on the aortic valve and forcing the aortic valve to narrow. Rheumatic fever, though rare in developed countries, arises from complications of scarlet fever or strep throat. Aortic stenosis can take years to manifest in patients who have had rheumatic fever. Symptoms of aortic stenosis include:

- ❖ Fatigue
- ❖ Dizziness
- ❖ Chest pain/pressure
- ❖ Heart murmur
- ❖ Shortness of breath during activity
- ❖ Heart palpitations
- ❖ Fainting

### **Treatment**

Treatment for individuals diagnosed with severe aortic valve stenosis is typically managed by a team of experienced cardiologists, cardiac surgeons and other medical specialists who collaborate to determine the most appropriate care for each patient. Medications do not cure aortic stenosis; however, medications are sometimes prescribed to help control symptoms, maximize heart function, control blood pressure and control heart rhythm disturbance.

The standard treatment for patients with severe aortic stenosis is aortic valve replacement (AVR). Two types of replacement valves, mechanical and biological, can be used in this procedure. The patient's age, other medical conditions, potential pregnancy and lifestyle are factors in the choice of replacement valve. Because AVR is an invasive surgical procedure, some patients are at high risk for surgery, or are altogether ineligible for surgery and are not appropriate candidates for AVR.

An alternative to AVR, transcatheter aortic valve replacement is currently approved for use in more than 35 countries worldwide, and is being evaluated in clinical trials for use in the United States. In this investigational procedure, a physician uses a catheter to deliver and implant a prosthetic valve in the heart. The valve is mounted on a catheter and the physician guides the catheter through the body via arteries (typically through an entry point in the leg) and then through the aorta. Once the diseased aortic valve is reached, the replacement valve is deployed and secured in place. In countries where this procedure is approved for commercial use (the device received CE Mark in Europe in 2007), this treatment is typically used for patients with severe aortic stenosis who are considered high-risk for surgery or not eligible for surgery.