

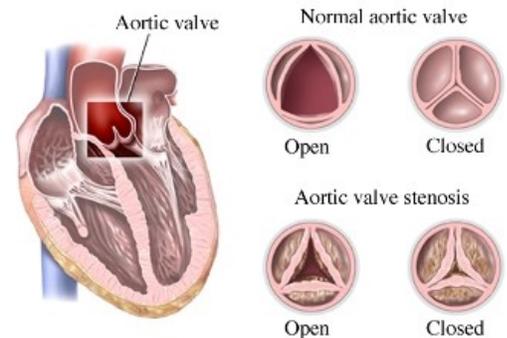
## Degenerative Aortic Stenosis

Heather Lander, MD

### BACKGROUND

Degenerative aortic stenosis is the most common form of valvular heart disease in the United States. It is a progressive disease, identified in 3-5% of individuals 65 years and older<sup>2</sup>. It is defined by narrowing of the aortic valve, which results in pressure overload of the left ventricle, hypertrophy, and ultimately left ventricular failure if not treated.

The aortic valve has three thin, highly mobile leaflets that open and close with each cardiac cycle with a normal area of 3-4 cm<sup>2</sup>. There is often minimal gradient across a normal aortic valve (<10 mmHg); however, with aging, degenerative changes such as inflammation, lipid accumulation, and calcification can affect the aortic leaflets. This results in reduced aortic valve opening, minimal leaflet excursion, and progressive pressure overload of the left ventricle. Severe aortic stenosis is defined by a valve area less than 1.0 cm<sup>2</sup>, a mean gradient >40 mmHg, and aortic jet velocity >4 m/s<sup>3</sup>.



The three classic symptoms of aortic stenosis are angina, syncope, and heart failure. Once a patient with aortic stenosis develops symptoms, mortality rises abruptly with an average survival of 2-3 years<sup>4</sup>. Aortic stenosis is a progressive disease and close monitoring is essential.

#### History

- A comprehensive medical history including family history and functional status are essential.
- Assessing for classic symptoms are essential; however, in older patients, recent falls or adaptive limitations may also be important warning signs of progressive disease.

#### Physical Exam

- A thorough physical exam is vital. Aortic stenosis is characterized by a harsh, late-peaking systolic murmur heard best over the right, second intercostal space with radiation to the carotid arteries.
- It is also important to assess for the presence of signs of congestive heart failure such as dependent edema or pulmonary edema.

#### Workup/ Testing

- Electrocardiogram (ECG)
- Chest X-ray
- Echocardiography – Assesses severity of valve calcification, aortic valve area, aortic valve gradient, left ventricular function, and left ventricular wall thickness

#### Referral

- If a patient has classic symptoms and echocardiographic evidence of aortic stenosis, a prompt referral to cardiology is recommended for further assessment and management.
- Additional testing including CT scan or cardiac catheterization may also be completed by the cardiologist.

## Management

There are several options for treatment of patients with severe symptomatic aortic stenosis. It is important to recognize that treatment is a personal decision that is based on shared decision making, incorporating the patient's overall values, health, and preferences. Options include:

### Symptom Management

This approach involves controlling symptoms with medication and lifestyle adjustments, without surgery. This approach focuses on minimizing symptoms with medications, eating a heart healthy diet (avoiding foods high in fat and salt), and medically guided exercise.

It is also recommended to treat other medical conditions such as diabetes, hypertension, and hyperlipidemia.

### Surgical Aortic Valve Replacement

This is an open-heart procedure where a new valve replaces the diseased valve through a surgical incision. This approach involves a sternotomy and cardiopulmonary bypass. The average hospital stay is 4 days and average recovery is 4-8 weeks.

This method is only an option for certain patients, depending on their underlying health conditions.

### Transcatheter Aortic Valve Replacement

This is a minimally invasive procedure where a new valve replaces the diseased valve through a catheter. This approach involves a small incision and can be done under sedation for some patients. The average hospital stay is 1-2 days and average recovery time is 1-2 weeks.

This method is only an option for certain patients, depending on their underlying health conditions and surgical risk.

### The Bottom Line

- Aortic stenosis is a common, progressive condition in older adults and may be associated with significant problems if undiagnosed or untreated.
- It is often first identified when a murmur is identified on physical exam.
- Symptoms associated with aortic stenosis include fatigue, shortness of breath, chest pain, or syncope.
- There are multiple treatment options including symptom management, surgery, or transcatheter procedures.
- The decision about which is right for a particular patient is best decided by shared decision making and consideration of comorbidities, surgical risk, and patient preference.

### References

1. Lindman BR, Patel JN. Multimorbidity in Older Adults with Aortic Stenosis. *Clin Geriatr Med*. 2016 May;32(2):305-14. doi: 10.1016/j.cger.2016.01.006. Epub 2016 Feb 12. PMID: 27113148; PMCID: PMC4848459.
2. Manning WJ (October 2013). "Asymptomatic aortic stenosis in the elderly: a clinical review". *JAMA*. **310** (14): 1490–7. doi: 10.1001/jama.2013.279194. PMID: 24104373.
3. Nishimura RA, Otto CM, Bonow RO, et al. 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol* 2014; 63:e57
4. Ramaraj R, Sorrell VL. Degenerative aortic stenosis. *BMJ*. 2008;336(7643):550-555. doi:10.1136/bmj.39478.498819.AD