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# ELDER CARE

## A Resource for Interprofessional Providers

### Aortic Stenosis in Older Adults

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Numerous abnormalities of the aortic valve occur in different age groups. This edition of Elder Care will discuss degenerative calcific aortic stenosis, which is the most common form of aortic stenosis seen in older adults.

#### Definitions

Aortic sclerosis, a common precursor to degenerative, calcific aortic stenosis, is defined as aortic valve calcification without significant obstruction to blood flow through the aortic valve. Aortic stenosis (AS) is defined as a hemodynamically significant obstruction to blood flow through the aortic valve. AS is a structural abnormality which, when of sufficient severity, requires treatment with surgery or other interventional procedures. Medical therapies have limited benefit.

#### Prevalence

The prevalence of AS is highest in older adults, reaching 10% in persons over 80. The prevalence is higher in Caucasians than African Americans, possibly due to lower rates of congenital valve abnormalities in African Americans. African Americans are less likely to be referred for valve replacement than white or Hispanic patients with a similar degree of valve disease. Women tend to be more symptomatic before referral for valve replacement, and therefore, they are referred at older ages than are men.

#### Clinical Presentation

AS is often subclinical for years. Older adults often present with a systolic ejection murmur heard during routine examination of an asymptomatic patient. An echocardiogram is obtained, and AS is diagnosed.

As stenosis progresses, patients may develop shortness of breath due to heart failure (as the left ventricle strains to pump blood through the narrowed valve), angina (due to inadequate blood flow through the valve to meet the oxygen demand of the heart), and syncope or unexplained falls (due to arrhythmias or low cardiac output through the valve). Unexplained falls in older adults should prompt clinicians to consider AS as the cause. Similarly, episodes of dizziness, which may occur long before syncope episodes or falls, should also prompt consideration of AS.

Without treatment, the average survival is 1 year after the onset of heart failure, 3 years after the first episode of syncope, or 5 years after the onset of angina.

#### Evaluation

The initial test in patients with suspected AS is a transthoracic echocardiogram (TTE) to evaluate the aortic valve, the aorta and ventricular function. If intervention is not required at the time of initial diagnosis, repeat TTEs should be performed at intervals depending on the severity of AS (Table 1).

Table 1. Recommend Surveillance Intervals for Repeat Transthoracic Echocardiogram (TTE) Based on AS Severity				
Severity	Max Aortic Flow Velocity (m/s)	Mean Gradient Across Valve (mmHg)	Aortic valve area (cm <sup>2</sup> )	TTE Surveillance Interval
Mild	2.6-2.9	<20	>1.5	3-5 years*
Moderate	3.0-3.9	20-39	>1.0-1.5	1-2 years*
Severe	≥4.0	40	≤1.0	6 months if asymptomatic*
Very Severe	≥5.0	60		Requires intervention

\* Sooner if clinically indicated

#### TIPS FOR DEALING WITH AORTIC STENOSIS IN OLDER ADULTS

- When evaluating older adults who have experienced unexplained falls, consider the possibility that the fall was caused by syncope due to significant aortic stenosis.
- Cardiac output is often decreased in patients with aortic stenosis. Therefore, avoid clinical situations that can further reduce cardiac output, such as tachycardia or volume depletion (dehydration). In the absence of hypertension, avoid vasodilating medications that can lower blood pressure, such as nitrates, angiotensin converting enzyme (ACE) inhibitors, alpha blockers, hydralazine, minoxidil, etc.
- Treatment of aortic stenosis requires surgical or transcatheter intervention. Carefully assess patients to assure they are appropriate candidates for such procedures. In some cases, palliative care may be more appropriate.

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Other testing may be required particularly when interventions are being considered. Such testing may include cardiac stress testing, magnetic resonance or computed tomographic angiography, or cardiac catheterization.

## Management

AS is a structural abnormality that is treated by relieving the obstruction of the valve by replacing or repairing the valve. Medical therapy is limited. Indications for intervention treatment are listed in Table 2.

**Table 2. Indications for Interventional Treatment of AS**

- Severe AS – symptomatic by history or during exercise testing, or with LV ejection fraction < 50%
- Severe AS with low-flow, low-gradient across valve and LV ejection fraction <50%
- Severe AS with low-flow, low-gradient across valve and LV ejection fraction >50% (in patients with a small LV cavity and low cardiac output)
- Asymptomatic but very severe AS on TTE
- Asymptomatic but rapidly worsening TTE findings
- When cardiothoracic surgery is being performed for other reasons in a patient who also has AS

The type of intervention for a given patient depends on a variety of factors including the patient's medical comorbidities, frailty score, surgical risk score (<http://riskcalc.sts.org/stswebriskcalc/#/>), left ventricular function, and patient preference. Selection of the appropriate intervention is best made by a multidisciplinary heart team. The various interventions are discussed in the paragraphs that follow.

**Balloon Aortic Valvuloplasty (BAV):** This is a temporary, minimally invasive catheter-based procedure offered as a palliative option or as a bridge to definitive intervention for patients unable to undergo definitive intervention immediately. A balloon is introduced via percutaneous route and expanded across the aortic valve to dilate the valve. The procedure can temporarily relieve symptoms of AS, although restenosis is common in the first few months after the procedure.

## References and Resources

- Nishimura RA, et al. 2014 AHA/ACC guideline for the management of patients with valvular heart disease. *J Thorax Cardiovasc Surg.* 2014; 148: e1-e132
- Nishimura RA, et al. 2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease. *Circulation.* 2017; 135: e1159-e1195

**Transcatheter Aortic Valve Replacement (TAVR):** TAVR is a minimally invasive procedure that delivers a bioprosthetic (tissue) valve into the site of the patient's aortic valve via a catheter. TAVR was initially used for patients at high surgical risk with predicted poor short-term outcomes after cardiac surgery, but it is now also used in intermediate-risk patients eliminating the need for open heart surgery. Stroke rate and post-AVR pacemaker implantation may be slightly higher in TAVR patients in selected patients. With current procedural advances, most patients are discharged home within 24 hours of the procedure, thereby minimizing delirium that can develop with longer hospital stays.

**Surgical Aortic Valve Replacement (SAVR):** SAVR is the "gold standard" valve procedure with proven durability and safety for most patients, although advances in TAVR techniques are competing with SAVR indications. Either a mechanical valve and tissue (biological) valve can be used, with the choice for a given patient based on expected life span (mechanical valves last longer than tissue valves) and the need for long-term anticoagulation with mechanical valves. Bioprosthetic valves are being used more often in older adults because they do not need the long-term durability of mechanical valves and thus avoid the risks of long-term anticoagulation.

## Post-Procedure Care

For patients requiring anticoagulation, warfarin is the drug of choice. The newer oral anticoagulants are not approved for prosthetic valves. All patients should receive anti-platelet therapy, even if already on anticoagulation. They also need endocarditis prophylaxis which includes dental procedures (other than routine cleaning). TTEs should be obtained shortly after the procedure, again later if symptoms or signs of valve dysfunction occur, and annually for patients with tissue valves starting 10 years after the procedure.

## Palliative Care

The integration of palliative care concepts is important for all patients with aortic stenosis. Some of these patients may not be appropriate candidates even for minimally invasive therapies because of co-morbid illnesses such as advanced dementia or malignancies with a limited life expectancy less than 1 year. For such patients, enrolling in a hospice program can help manage symptoms and provide supportive care.

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