Valvular heart disease is a subject not often covered in detail in many pharmacy school curriculums. Unlike other areas of cardiology in which large scale, randomized, clinical trials are conducted, data assessing treatments for valvular heart disease are often retrospective case series or observational cohorts. This issue of CLIPS briefly summarizes an article pertaining to aortic and mitral valve disease in terms of the pathophysiology, prognosis, evaluation, surgical conditions, pharmacologic treatments, and patient counseling points. If you need further information, please contact the Samford University Drug Information Service at (205) 726-2659.


**Evaluation of valvular abnormalities**
- Anomalies in valve function cause turbulent blood flow, which is evident on auscultation in the form of a murmur.
- Physical exam is the primary screening method for valvular disease; however, doppler echocardiography is the test of choice for valvular disease.

**Aortic valve stenosis**
- Aortic stenosis is the constriction or narrowing of the aortic valve and is the most common form of valvular disease.
- The disease typically manifests in patients 60-90 years of age but can occur earlier in patients with congenital heart defects.
- Symptoms of aortic stenosis include angina, syncope, heart failure, and dyspnea.
- No proven therapies alter the natural history of aortic stenosis; however, lipid-lowering and antihypertensive therapies are being investigated.
- Excessive vasodilatation can be harmful, since a decrease in vascular resistance would require an increase in cardiac output to maintain blood pressure.
- Replacement of the valve is the only treatment for patients with severe stenosis experiencing symptoms; however, valve replacement in asymptomatic patients is an issue of debate.

**Aortic valve regurgitation**
- Regurgitation, also known as insufficiency, is described as a leaky valve.
- Commonly caused by a congenital malformation, age-related degeneration, endocarditis, rheumatic fever, or a dilated aortic root.
- The onset of aortic regurgitation is typically gradual and progression occurs over decades.
- In severe aortic regurgitation, long term vasodilator therapy is recommended in patients deemed poor candidates for surgery, in short term cases to improve hemodynamic profile in preparation for surgery, and to improve the compensated phase of asymptomatic patients with normal systolic function.
- Surgery is the only known corrective option.

**Mitral valve stenosis**
- Almost exclusively caused by rheumatic heart disease (inflammation of the endocardium, myocardium, and pericardium in response to group A *Streptococcus*). A latent period of 20-40 years may occur after the initial infection.
- The mean age of disease onset is 50-60 years old and is twice as likely to occur in females.
- Symptoms of disease progression are that of right sided heart failure (i.e., edema, weight gain, fatigue, ascites).
- Hydrochlorothiazide or low-dose furosemide associated with fluid overload. Beta blockers and non-dihydropyridine calcium channel blockers are the backbone of therapy.
• Digoxin may assist in slowing the heart rate in patients with atrial fibrillation. Anticoagulation therapy is also warranted. Mechanical intervention is required for patients with moderate mitral stenosis.

Mitral valve regurgitation
• Commonly caused by the syndrome of mitral valve prolapse, distorted papillary muscles from myocardial damage (ischemic mitral regurgitation), and dilation of the left ventricle pulling apart the mitral apparatus (functional mitral regurgitation).
• Ejection fraction (EF) typically remains normal due to the loading conditions, despite substantial muscle damage.
• Symptoms mirror left sided heart failure (i.e., pulmonary congestion).
• For treatment of ischemic mitral regurgitation, preload reducing agents offer benefit.
• For treatment of non-ischemic mitral regurgitation, there are currently no widely accepted recommendations for medical management.
• Once a patient becomes symptomatic, surgical options should be considered in both ischemic and non-ischemic mitral regurgitation.
• Three surgical options exist: valve repair, valve replacement with mitral apparatus preservation, or valve replacement with mitral apparatus removal.

Bioprosthetic or Mechanical Valve Placement

<table>
<thead>
<tr>
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<th>Bioprosthetic (tissue) valves</th>
<th>Mechanical (metal) valves</th>
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<tbody>
<tr>
<td>Life expectancy</td>
<td>&lt; 10-15 years</td>
<td>&gt; 10-15 years AND if patients are both willing and able to adhere to lifelong anticoagulation therapy.</td>
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<td>Thrombolic risks</td>
<td>Less thrombogenic</td>
<td>More thrombogenic</td>
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<tr>
<td>Valve durability</td>
<td>Limited durability; failure rates are improved when implanted in younger patients.</td>
<td>Greater durability</td>
</tr>
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<td>Anticoagulation guidelines</td>
<td>Mitral valve replacement: at least 3 months.</td>
<td>Patients with aortic or mitral valve replacement require long term anticoagulation.</td>
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<td>Patients with concomitant Afib who are at additional risk of thrombosis may require indefinite anticoagulation.</td>
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<td>Goal INR range</td>
<td>2 – 3</td>
<td>2.5 – 3.5</td>
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<tr>
<td>Special cases</td>
<td>Aortic valve replacement: only aspirin 50 – 100 mg/day unless concomitant conditions require additional anticoagulation therapy.</td>
<td>Patients with concomitant Afib who are at additional risk of thrombosis (i.e., low EF, hypercoagulable state) or who have a history of atherosclerotic disease have a goal INR range of 2.5 – 3.5 AND aspirin 50-100 mg/day should be added.</td>
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<td>History of atherosclerotic vascular disease (or other thrombosis risk): add aspirin 50-100 mg/day to warfarin therapy.</td>
<td>Patients with a history of systemic embolism despite a therapeutic INR should EITHER add aspirin 50-100 mg/day OR titrate warfarin therapy to achieve an INR range of 3 – 4.</td>
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<td>Aspirin (unless &gt; 80 years old or have a history of a gastrointestinal bleed).</td>
<td>Aspirin 50-100 mg/day (after 3 month anticoagulation period) should be taken indefinitely.</td>
<td>See special cases.</td>
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Antibiotic Prophylaxis
• Indicated for patients with prosthetic valves undergoing an invasive procedure (e.g., mucosa penetration, likely gingival bleeding, previous endocarditis, unrepaired complex cyanotic heart disease, or heart transplant recipients with major valve lesions).
• Prophylactic therapy for adults is a single 2 gram dose of amoxicillin. If the patient has a penicillin allergy, clindamycin 600 mg is a therapeutic alternative.