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Valvular Heart Disease: ACC/AHA Guideline for the Management of Patients with Valvular Heart Disease (2020)

About the Guideline

- The American College of Cardiology (ACC) and American Heart Association (AHA) sponsored the development and publication of this guideline using volunteers from the organizations and without any commercial support.
- Scientific evidence was used to develop the guideline for the specific care of these patients.
- The evidence collected was systematically evaluated and classified for specific use.
- The guideline has become an official policy for both the ACC and AHA and is intended for use with patients who have or who are at risk for developing cardiovascular disease.
- While the guideline is intended to improve patient care and define practices that will meet the needs of most patients, it is not a replacement for clinical judgment based on the unique needs of individual patients.

Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in an acute care setting.

General Principles of Medical Therapy

- Infective endocarditis prophylaxis
    - Antibiotic prophylaxis is reasonable for patients at increased risk of developing infective endocarditis—including patients with transcatheter prosthetic valves (prosthetic material used to repair valves)—during high-risk dental procedures (those that involve manipulation of the gingival tissue, periapical region of teeth, oral mucosal perforation).
    - Antibiotic prophylaxis is not considered reasonable for gastrointestinal and genitourinary procedures without known infection risk.
- Infective endocarditis (IE) surgical recommendations
    - The timing of surgical intervention should be determined by a multidisciplinary team that includes an infectious disease specialist and cardiologists.
    - Early surgery is indicated for patients with IE and valve dysfunction with heart failure symptoms; left-sided IE caused by *S. aureus*, fungi, or resistant organisms; IE complicated by heart block and annular or aortic abscess; destructive penetrating lesions; and IE with persistent infection despite antimicrobial therapy.
    - Early surgery is reasonable for patients with IE who present with recurrent emboli and persistent vegetations despite antimicrobial therapy or for patients with IE with native valve endocarditis who display mobile vegetations greater than 10 mm in length.
    - Surgery is recommended for patients with recurrent prosthetic valve endocarditis without other identifiable sources of infection.
    - The complete removal of pacemaker or defibrillator systems, including all leads and the generator, is indicated in the following situations:
        - For early management of IE with documented infection of the device or leads.
        - For valvular IE caused by *S. aureus* or fungi, even without evidence of device or lead infection.
        - For patients undergoing surgery for valvular IE.

- Anticoagulation is recommended for atrial fibrillation in patients with VHD.
    - Vitamin K antagonist (VKA) therapy should be used instead of direct oral anticoagulants to prevent thromboembolic events in patients with atrial fibrillation and rheumatic mitral stenosis.
    - Anticoagulation for patients with valvular heart disease and atrial fibrillation should follow guideline-directed management and therapy according to their CHA_2DS_2-VASc score.
        - CHA_2DS_2-VASc is a rating system that stands for the following:
            - **C**ongestive heart failure
            - **H**ypertension
            - **A**ge greater than or equal to 75 years (**2** points)
            - **D**iabetes mellitus
            - **S**troke/transient ischemic attack/thromboembolic event (**2** points)
            - **V**ascular disease (e.g., prior myocardial infarction, peripheral arterial disease, aortic plaque)
            - **A**ges 65 to 74 years
            - **S**ex **c**ategory (male/female)
        - Direct oral anticoagulants and VKA therapies for patients with atrial fibrillation and native aortic valve disease, tricuspid valve disease, or mitral regurgitation and CHA_2DS_2-VASc score of 2 or more are equally effective in patients with or without valvular heart disease.

Aortic Stenosis

- The determination whether to use transcatheter aortic valve implantation (TAVI) or surgical aortic valve repair (AVR) should be made according to an assessment of the surgical risks, patient condition, comorbidities, and patient preferences.
- Patients with severe symptomatic aortic stenosis should be evaluated and treated.
- Surgical risk categories are as follows:
    - Low surgical risk: Surgical AVR (class I)
    - Intermediate surgical risk: Surgical AVR (class I) or TAVI (class IIa)
    - High surgical risk: Surgical AVR or TAVI (class I)
    - Prohibitive surgical risk: TAVI (class I)
- Percutaneous balloon dilation can be used as a bridge to both surgical AVR and TAVI.
- Transcatheter aortic valve replacement (TAVR) is not recommended for patients who have existing comorbidities that would preclude any benefit from correction of aortic stenosis.
- Surgical AVR is typically recommended for patients less than 65 years old.
- Medical treatment is necessary for patients with aortic stenosis to treat hypertension and hyperlipidemia. Angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) may be recommended to reduce mortality in patients post TAVI.

Aortic Regurgitation

- Diagnosis of aortic regurgitation using TEE is recommended. Severe aortic regurgitation due to aortic dissection can be diagnosed with computed tomography (CT) imaging.
- Medical therapy cannot substitute for surgical intervention, but it can be helpful for patients who are at very high surgical risk.

Mitral Stenosis

- Mitral stenosis is generally caused by rheumatic heart disease in low-income countries and by calcifications in higher income countries.
- For patients with rheumatic mitral stenosis and atrial fibrillation or tachycardia, heart-rate control can help manage symptoms. Patients with rheumatic mitral stenosis and atrial fibrillation or prior embolus are indicated for anticoagulation therapy.
- Percutaneous mitral balloon commissurotomy is the surgical intervention in such cases.

Mitral Regurgitation (MR)

- The determination of severe mitral regurgitation that needs surgical repair should be made in the same manner for both primary (degenerative) and secondary (functional) mitral regurgitation.
- Stage classification of mitral regurgitation is as follows:
    - Grade A: At risk for mitral regurgitation (patient has coronary artery disease or cardiomyopathy with no signs of mitral regurgitation or mitral valve anomaly).
    - Grade B: Progressive mitral regurgitation (mild leaflet tethering with regional wall motion abnormalities or annular dilation with mild loss of central coaptation of leaflets).
    - Grade C: Asymptomatic severe mitral regurgitation (severe leaflet tethering with left ventricular (LV) dilation or regional wall motion abnormalities, or annular dilation with severe loss of central coaptation of leaflets).
    - Grade D: Symptomatic severe mitral regurgitation (severe leaflet tethering with LV dilation or regional wall motion abnormalities, or annular dilation with severe loss of central coaptation of leaflets).
- Surgical repair should be considered for patients who have severe mitral regurgitation (those who demonstrate an effective regurgitant orifice greater than or equal to 0.4 cm^2 and a regurgitant volume greater than or equal to 60 mL with consideration given to clinical and echocardiographic findings).
- Mitral valve repair is preferred over replacement.
- Surgery is recommended for primary mitral regurgitation as follows:
    - Chronic severe, symptomatic primary mitral regurgitation with LV ejection fraction greater than 30%.
    - Chronic severe, asymptomatic primary mitral regurgitation with LV dysfunction.
    - Chronic severe, asymptomatic primary mitral regurgitation with preserved LV dysfunction with an increase in LV size or decrease in LV ejection fraction.
- Repair is recommended for the following patient groups:
    - Patients for whom surgical treatment is indicated and who have chronic, severe, primary mitral regurgitation limited to the posterior leaflet.
    - Patients for whom surgical treatment is indicated and who have chronic, severe, primary mitral regurgitation involving the anterior leaflet or both leaflets when a successful repair can be accomplished.
- Surgical repair is indicated for patients with chronic, severe, or moderate primary mitral regurgitation who are undergoing cardiac surgery for other indications.
- Mitral valve replacement should not be performed for isolated severe primary mitral regurgitation that is limited to less than one-half of the posterior leaflet unless a repair was attempted and unsuccessful.
- Chronic secondary mitral regurgitation recommendations:

  - Mitral valve replacement surgery is reasonable for patients with chronic, severe, secondary mitral regurgitation who are undergoing coronary arterial bypass graft (CABG) or AVR, and for whom repair is not recommended.
  - Repair or replacement should be considered for the severely symptomatic client with persistent symptoms regardless of optimal guideline-directed management and therapy for heart failure.

Mixed Valve Disease

- Mixed valve disease occurs when one valve has regurgitation *and* stenosis, or when two valves have regurgitation *or* stenosis.
- Comprehensive imaging is needed.
- In patients with aortic stenosis and primary mitral regurgitation, double valve replacement may be indicated if the mitral valve cannot be surgically repaired.

Selection of Prosthetic Valves

- The type of prosthetic valve should be determined based on patient preferences, indications for risks of anticoagulant therapies, and the potential need for reintervention.
- A bioprosthesis is recommended for any patient who has contraindications to anticoagulant therapy.
- A mechanical prosthesis is recommended for patients less than 50 years old who do not have anticoagulation contraindications.
- For patients ages 50 to 65, the type of valve should be based more on client preference and individual factors.
- A bioprosthesis is the most reasonable for patients older than 65.
- For patients less than 50 years of age who have a contraindication to VKA anticoagulation therapy, aortic valve replacement with use of a pulmonary autograft is recommended.

Antithrombotic therapy after valve replacement

- VKA therapy with international normalized ratio (INR) monitoring is recommended for mechanical valve replacements:
  - Achieving an INR of 2.5 is recommended with a current-generation single-tilting disc AVR or a mechanical bileaflet and no risk factors for thromboembolism.
  - Achieving an INR of 3.0 is recommended with mechanical AVR and other risks for thrombosis or an older-generation mechanical AVR.
  - Achieving an INR of 3.0 is recommended for a mechanical mitral valve replacement.
  - Achieving INR of 2.5 is reasonable for 3 to 6 months after bioprosthetic mitral valve replacement or AVR or TAVR in patients with a low risk of bleeding.
  - Lower INR targets of 1.5 to 2.0 are reasonable for patients with a mechanical On-X AVR without thromboembolic factors.
- Aspirin 75 to 100 mg daily is recommended, in addition to VKA, with all mechanical valves.
- Aspirin 75 to 100 mg daily is reasonable for all bioprosthetic aortic or mitral valves.
- Clopidogrel 75 mg daily for 6 months after TAVR and lifelong aspirin therapy of 75 to 100 mg daily is reasonable.

Bridging therapy for prosthetic valves

- VKA therapy continuation is recommended for patients with mechanical valves undergoing minor procedures.

- Temporary interruption of VKA therapy is recommended without bridging agents for patients with bileaflet mechanical AVRs and no other risk factors for thrombosis who are having invasive or surgical procedures.
- The use of bridge therapy for patients with atrial fibrillation who do not have a mechanical valve is not recommended due to the increase of bleeding risks and the lack of effect on thrombolytic events.
- Patients with mechanical valves using VKA who require emergency noncardiac surgery or invasive procedures can receive fresh frozen plasma or prothrombin complex concentrate.

Acute mechanical valve thrombosis

- Urgent multimodality imaging is recommended to rule out any suspected mechanical valve thrombus. This is preferred over single imaging techniques (transthoracic echocardiography [TTE], TEE, fluoroscopy, and/or CT scanning).
- Slow-infusion fibrinolytic therapy has been shown to be highly successful and lower risk than emergency surgery to correct mechanical valve thrombosis. Multiple factors should be considered when deciding on emergency surgery versus fibrinolytic therapy.

Prosthetic valve stenosis

- For severe symptomatic prosthetic valve stenosis, a repeat valve replacement is recommended.
- VKA therapy is recommended for patients with bioprosthetic valve stenosis.
- Severely symptomatic patients with bioprosthetic aortic valve stenosis can be reasonably treated with a transcatheter valve-in-valve procedure.

Prosthetic valve regurgitation

- Surgery is recommended for operable patients who have mechanical valves and intractable hemolysis or heart failure due to regurgitation.
- Surgery or a transcatheter valve-in-valve procedure should be considered for patients with asymptomatic severe bioprosthetic regurgitation.
- For patients with prosthetic heart valves and intractable hemolysis or New York Heart Association class III/IV heart failure who are too high-risk for surgery, percutaneous repair for paravalvular regurgitation is reasonable.
- For patients with severely symptomatic bioprosthetic aortic valve regurgitation and with a high or prohibitive surgical risk, a transcatheter valve-in-valve procedure is reasonable.

Management after Valve Intervention

- Postoperative atrial fibrillation occurs in up to one-third of patients. Other complications include vascular and bleeding complications, stroke, heart block requiring temporary or permanent pacing, kidney dysfunction, pericarditis, or infection.
- A baseline postprocedural transthoracic echocardiogram, followed by periodic transthoracic echocardiogram monitoring may be recommended.

Reference

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