American Heart Association®
Heart Valve Initiative™

Valvular Heart Disease:

A PRIMARY CARE TOOLKIT



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INTRODUCTION

Valvular heart disease is a growing global health challenge, with an estimated 28.4 million people affected by nonrheumatic valvular heart disease worldwide in 2021.[1] As the burden of disease continues to rise, primary care professionals need to be familiar with the diagnosis and management of the most prevalent valvular conditions.[1]

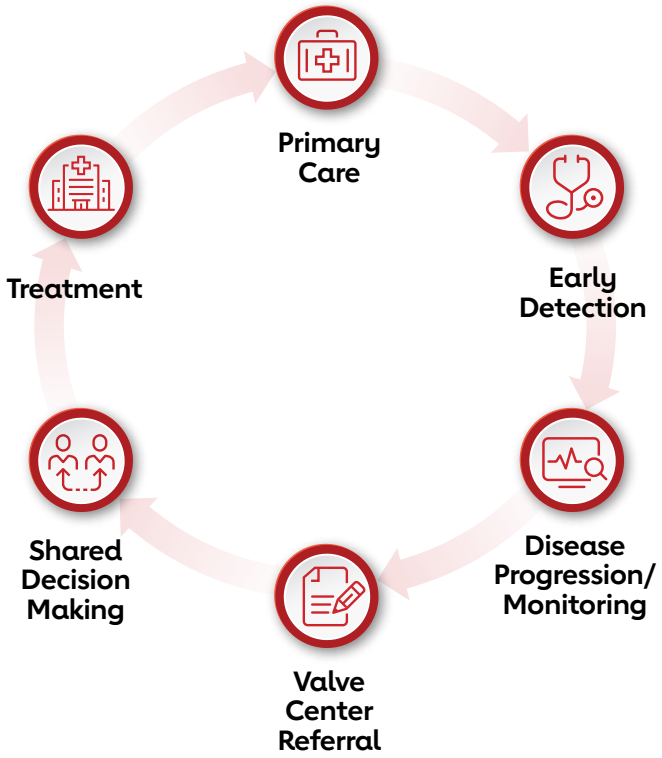
Because patients with heart valve disease often present with nonspecific symptoms or may remain asymptomatic until the disease has progressed, primary care professionals play a critical role in early recognition, routine cardiac auscultation, risk assessment, timely diagnostic evaluation and referral to cardiology when appropriate. Earlier detection can help improve patient outcomes by facilitating appropriate monitoring and treatment before significant complications develop.

This toolkit has been developed as part of a heart valve disease awareness and education initiative in conjunction with the Centers for Disease Control and Prevention to support healthcare professionals in identifying patients who may be at risk for heart valve disease. The toolkit provides practical resources, clinical education, patient-facing materials and evidence-based tools to help increase awareness, support detection and evaluation efforts, facilitate patient-clinician conversations and promote timely diagnosis and treatment.[2,3]

ASSESSMENT AND EARLY DETECTION

Primary care professionals are often the first point of contact for patients with heart valve disease, making them critical to early detection and timely referral. Because symptoms may be subtle, develop gradually, or be attributed to aging or other chronic conditions, heart valve disease can go unrecognized until the disease is advanced. A thorough history, physical examination, assessment of risk factors and careful cardiac auscultation can help identify patients who may benefit from further diagnostic evaluation and specialist referral.[4]

THE HEART VALVE DISEASE CARE CONTINUUM



Individual patient pathways vary. Referral, shared decision making, surveillance and treatment decisions are guided by symptom status, valve severity, imaging findings and clinical judgment and do not necessarily occur in the sequence shown.



HISTORY AND PHYSICAL

A comprehensive history and physical examination can help identify symptoms suggestive of valve disease, uncover risk factors, assess functional status and detect signs of heart failure or hemodynamic compromise.

CLINICAL PEARL

▸ **FOR ADVANCED HEART VALVE DISEASE:**

Aortic Stenosis: Delayed, diminished carotid pulse (pulsus parvus et tardus).[5]

Aortic Regurgitation: Bounding peripheral pulses and, in severe cases, visible head bobbing (De Musset sign).[5]

Mitral Stenosis: Malar flush (mitral facies) in advanced disease.[6]

Mitral Regurgitation: Laterally displaced apical impulse due to LV volume overload.[7]

Tricuspid Regurgitation: Jugular venous distention with prominent c-v waves, peripheral edema, ascites and hepatomegaly.[8]

ASSESS RISK FACTORS

By learning about family health history and individual risk, patients can better understand what concerns to discuss regarding heart valve disease with their health care team:[9]

Non-Modifiable Risk Factors

- Older age
- Family history of valvular or cardiovascular disease
- Congenital heart disease

Medical History

- Prior rheumatic fever or rheumatic heart disease
- Infective endocarditis
- Prior myocardial infarction or heart failure
- Certain autoimmune diseases

Cardiovascular Risk Factors

- Hypertension
- Hyperlipidemia
- Diabetes
- Tobacco use
- Obesity

Treatment and Exposure History

- Prior chest radiation
- Certain chemotherapies



Symptoms:

Heart valve disease can develop quickly or over a long period. New onset of symptoms, or complaints of the symptoms below, should prompt suspicion for valve disease.[4]

- Shortness of breath
- Reduced exercise tolerance or inability to perform ADLs
- Pain, tightness or pressure in the chest
- Palpitations
- Rapid weight gain related to fluid retention
- Lightheadedness, dizziness or fainting
- Swollen ankles or abdomen
- Orthopnea and/or paroxysmal nocturnal dyspnea
- Fatigue, or feeling tired, especially during activity or walking short distances

CLICK HERE for a checklist you can send home with patients to track symptoms.

CARDIAC AUSCULTATION

Cardiac auscultation is a valuable first step in cardiovascular assessment. When performed comprehensively, it provides immediate, low-cost insight into cardiac structure and hemodynamics at the point of care. Early identification of abnormal heart sounds, particularly new or changing murmurs, can prompt timely evaluation, guide appropriate diagnostic testing and reduce preventable morbidity and mortality.

While auscultation alone cannot determine the severity of valve disease, it can identify patients who may benefit from further evaluation with echocardiography. Primary care providers should maintain a high index of suspicion when murmurs are accompanied by symptoms such as dyspnea, fatigue, syncope, chest discomfort, palpitations or signs of heart failure.[10,4]

Quick tips for auscultation **LINK**

Listen to live murmurs **LINK**

ASK THE RIGHT QUESTIONS

Often, symptoms are not volunteered unless specifically elicited. If a family member or caregiver is present, ask if they've noticed changes. Patients could attribute symptoms such as fatigue, shortness of breath, reduced exercise tolerance or dizziness to normal aging. When these symptoms are new, progressive, or unexplained, consider underlying heart valve disease as part of the differential diagnosis. Use the following questions to prompt symptom disclosure and help differentiate symptoms.

DISCUSSION GUIDE

- *Have you seen a decrease in ability to do your basic daily routines?*
- *Do you get tired more easily than you did 6–12 months ago?*
- *Have you cut back on walking or yardwork (dependent on season):*
  - *> Shoveling driveway (With the change of seasons, have you noticed anything you haven't been able to do that you were able to do last year?)*
  - *> Ask them to monitor per season as well (Make sure to tell me this fall if you have any changes in ability to rake your leaves.)*
- *Ask about holidays as reference points for symptoms (Last fourth of July your family had a ping pong tournament, were you able to participate again this year?)*
- *Do you have to pause going up your stairs to catch your breath?*
- *Have your family or friends noticed any changes in your activity levels?*



ECHOCARDIOGRAPHY

Transthoracic Echocardiography (TTE) is the primary diagnostic tool used to confirm suspected valvular heart disease identified through history, physical examination, risk factor assessment and cardiac auscultation. TTE provides comprehensive evaluation of valve anatomy, hemodynamics, ventricular function and disease severity, helping guide monitoring, referral and treatment decisions.[4]

These values are intended to help clinicians recognize key echo findings, but interpretation should be based on the full echo report, clinical presentation and comparison to prior imaging when available.[4,13]

CLINICAL PEARL

▶ **CONSIDER TTE IN PATIENTS WITH:**[4,11,12]

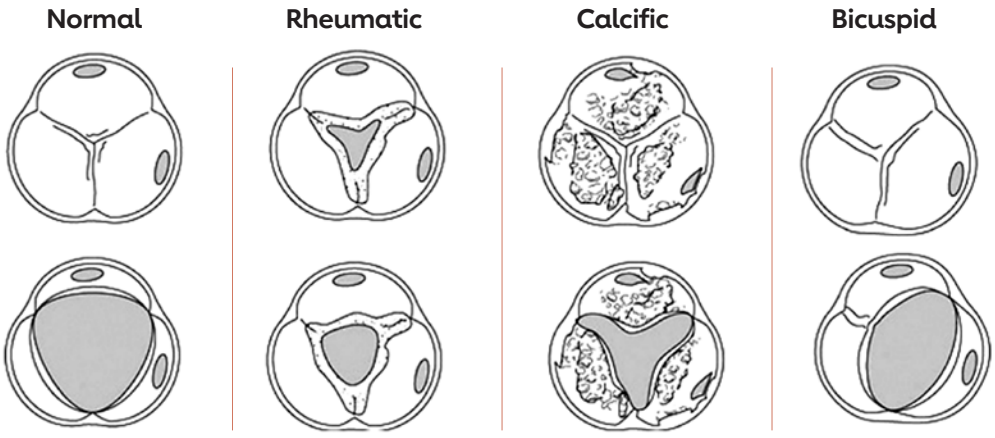
- New heart murmur
- Change in an existing murmur
- Unexplained dyspnea
- Syncope or presyncope
- Reduced exercise tolerance
- Heart failure symptoms
- Suspected valvular heart disease based on history or physical examination

AORTIC STENOSIS[13]

	AORTIC SCLEROSIS	MILD	MODERATE	SEVERE
Peak Velocity (m/s)	≤ 2.5 m/s	2.6–2.9	3.0–4.0	≥ 4.0
Mean Gradient (mmHg)	—	< 20	20–40	≥ 40
AVA (cm^2)	—	> 1.5	1.0–1.5	< 1.0
Indexed AVA (cm^2/m^2)	—	> 0.85	0.60–0.85	< 0.6
Velocity Ratio	—	> 0.50	0.25–0.50	< 0.25

Values shown in table above are AESCI/ASE Clinical Recommendations

AORTIC STENOSIS AETIOLOGY



Adapted from C. Otto, Principles of Echocardiography, 2007

MITRAL STENOSIS [14]

Recommendations for Classification of Mitral Stenosis Severity

	MILD	MODERATE	SEVERE
SPECIFIC FINDINGS Valve Area (cm^2)	> 1.5	1.0–1.5	< 1.0
SUPPORTIVE FINDINGS Mean Gradient (mmHg)[a] Pulmonary Artery Pressure (mmHg)	 < 5 < 30	 5-10 30–50	 > 10 > 50

Values shown in table above are AESCI/ASE Clinical Recommendations

MITRAL REGURGITATION [15]

	MILD	MODERATE	SEVERE
Regurgitant Volume	< 30 mL	30–59 mL	≥ 60 mL
Regurgitant Fraction	< 30%	30–49%	≥ 50%
ERO (effective regurgitant orifice)	< 0.2 cm^2	0.2–0.39 cm^2	≥ 0.40 cm^2
LV and LA Size	Usually Normal	Normal or Mild Dilation	Dilated

TRICUSPID REGURGITATION [4,15]

	PROGRESSIVE TR	ASYMPTOMATIC SEVERE TR	SYMPTOMATIC SEVERE TR
Central Jet	< 50% RA	≥ 50% RA	≥ 50% RA
Vena Contracta	< 0.7 cm	≥ 0.7 cm	≥ 0.7 cm
ERO (effective regurgitrant orifice)	< 0.40 cm^2	≥ 0.40 cm^2	≥ 0.40 cm^2
Regurgitant Volume	< 45 mL	≥ 45 mL	≥ 45 mL

- Referral decisions should be individualized based on valve severity, symptoms, ventricular function and patient-specific factors. When uncertainty exists regarding disease severity, symptom attribution, timing of intervention, or treatment options, consultation with a heart valve specialist or multidisciplinary valve team should be considered.
- Patients with moderate valve disease may also benefit from specialist evaluation when symptoms appear disproportionate to imaging findings, disease progression is suspected or there is concern regarding appropriate surveillance intervals and timing of intervention.[4]

Classification of valve disease severity is based on multiple criteria, including symptoms, valve anatomy, valve hemodynamics and the effects of valve dysfunction on ventricular and pulmonary vascular response to valve dysfunction.



ECHO REPORT INTERPRETATION

Echo summaries vary based on echo lab protocols and reading provider. American Society of Echocardiography suggests the summaries should include impressions, ideally the comparison echo (if available), and in some cases, a clinical recommendation.[16] Critical findings should be labeled as such and appear obvious to the reader. Below is an example of a clinical recommendation:

"This patient has significant aortic stenosis that may warrant treatment according to current ACC/AHA valvular heart disease guidelines. Valve severity was classified using ASE echocardiographic parameters."

Examples of valvular echocardiography findings that are new or significant and may warrant consultation and/or follow-up testing:[16]

EXAMPLES OF SIGNIFICANT CHANGES

- Changes in the severity of native or prosthetic valvular stenosis or regurgitation, especially if progression to severe
- Changes in valve morphology and structure, including flail leaflet, perforation, dehiscence, papillary muscle rupture
- Any masses or other abnormal structures affecting the cardiac valves

EXAMPLES OF COMPARISON STATEMENTS

- "Aortic/mitral/tricuspid/pulmonic stenosis/regurgitation is now severe"
- "There is new (+/-mild)/moderate/severe aortic/mitral/tricuspid/pulmonic/prosthetic valve stenosis/regurgitation"
- "The reported change in AS gradient severity might be due to" (consider selecting from the following):
  - > an actual worsening in the severity of the AS — an actual worsening in the AS severity
  - > might be due to a difference in imaging or measurement technique; change in imaging quality
  - > change in LV stroke volume
  - > change in BP

CLINICAL PEARL

▶ **WHAT TO FOCUS ON IN THE ECHO REPORT** [4,17]

- Valve lesion and severity
- Is the finding new or progressive; is there a comparison echo?
- Left ventricular function (EF) and size
- Pulmonary pressures/right-sided findings when relevant
- Does the interpreting physician recommend repeat imaging, additional testing or referral?

NOTE: *After review, ask yourself, "Does the echocardiographic finding explain the patient's symptoms?"*



Click the links below for individual fact sheets to use as discussion guides and information to send home with your patients.

- **Mitral Regurgitation**
- **Tricuspid Regurgitation**
- **Aortic Stenosis**
- **Mitral Valve Prolapse**

Click **here** to review valve disease stages and key reminders on recommended echocardiographic surveillance intervals based on established guideline criteria.

REFERRAL TO HEART VALVE CENTER

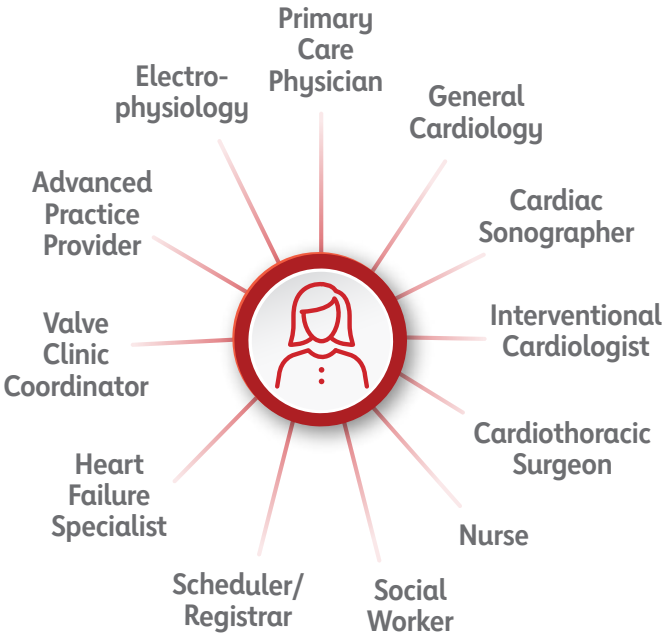
Patients are often unfamiliar with the role of a specialized valve center. Setting expectations before referral can reduce anxiety and prepare patients for shared decision-making discussions.

Below is an example of a referral you might consider when sending your patient to valve center so the patient knows what to expect:

"Valve specialist to review echocardiogram results and discuss surveillance or treatment options; additional testing (CT scan, MRI, or stress test) may be ordered by valve team."

MULTIDISCIPLINARY TEAM AND SHARED DECISION MAKING

Clinical evidence, evolving care models and healthcare policies increasingly support multidisciplinary heart team (MDHT)-based care as a leading approach for delivering coordinated, integrated care to patients with heart valve disease.[18] Multidisciplinary care is a key component of managing complex cardiac conditions, combining expertise from multiple subspecialties to support informed clinical decision-making. Consultation by an MDHT is a class I recommendation in guidelines related to the treatment of complex cardiovascular diseases by international societies, albeit based on low levels of evidence.[4,19] This model is based on the principle that collaborative decision-making among healthcare professionals can lead to better outcomes for patients and more effective use of healthcare resources across systems.



TREATMENT OPTIONS

Valvular heart disease is a progressive condition that requires proactive management and longitudinal follow-up. Although medical therapy may alleviate symptoms and treat associated cardiovascular conditions, it does not correct the underlying valve abnormality. Early recognition, routine surveillance and timely referral are essential to prevent disease progression, worsening cardiac function and delayed intervention. Decisions regarding referral and treatment should be guided by symptom status, valve severity, ventricular function and other patient-specific factors.

Patients with moderate valvular heart disease may benefit from cardiology evaluation to support disease monitoring, optimize management and determine appropriate surveillance intervals. Referral to a structural heart program or heart valve specialist should be considered when symptoms develop, disease progression is suspected or questions arise regarding the timing or type of intervention. Even in patients who report few or no symptoms, objective findings from echocardiography and other diagnostic studies should inform clinical decision-making.

For patients with mild to moderate valvular heart disease, ongoing surveillance, patient education and guideline-directed management are critical to optimizing outcomes. Appropriate and timely intervention can improve symptoms, preserve ventricular function, enhance quality of life and reduce the risk of adverse outcomes, including heart failure, atrial fibrillation, pulmonary hypertension, stroke and irreversible cardiac dysfunction.[4]

Medications with indications in patients with valvular heart disease:[19]

- ACE inhibitors and ARBs
- Anticoagulants
- Diuretics
- Anti-arrhythmic
- Beta-blockers
- Vasodilators



While surgical and transcatheter interventions are most commonly reserved for patients with severe valvular heart disease, patient education, risk factor management, routine surveillance and medical management of associated cardiovascular conditions remain essential components of care for patients with mild to moderate valve disease. The goals of timely intervention are to improve symptoms, preserve cardiac function, enhance quality and longevity of life and reduce the risk of complications associated with progressive valve disease. For some patients, transcatheter therapies may offer a less invasive alternative to conventional surgical valve intervention.[4]

SURGICAL VALVE REPLACEMENT AND REPAIR OPTIONS

VALVE	SURGICAL OPTIONS	TRANSCATHETER OPTIONS
AORTIC VALVE	**Mechanical Valve Replacement:** Durable prosthetic valve typically requiring lifelong anticoagulation. **Bioprosthetic (Tissue) Valve Replacement:** Human or animal tissue valve that generally avoids lifelong anticoagulation but may have limited durability compared with mechanical valves. **Ross Procedure:** The RP is an operation to replace a dysfunctional aortic valve that involves transplanting the native pulmonary valve into the aortic position (autograft) and reconstructing the right ventricular outflow tract (RVOT) with a donated human allograft (homograft).[20]	**Transcatheter Aortic Valve Replacement (TAVR):** Minimally invasive procedure in which a new valve is implanted within the diseased native valve using a catheter-based approach.
MITRAL VALVE	**Surgical Repair:** May include annuloplasty, leaflet reconstruction, or chordal repair/ replacement to preserve the native valve. **Mechanical Valve Replacement:** Durable prosthetic valve typically requiring lifelong anticoagulation. **Bioprosthetic Valve Replacement:** Tissue valve that generally avoids lifelong anticoagulation but may have reduced durability compared with mechanical valves.	**Transcatheter Edge-to-Edge Repair (TEER):** A catheter-based therapy for selected patients with mitral regurgitation that improves leaflet coaptation and reduces regurgitation.[21] **Transcatheter Mitral Valve Replacement (TMVR):** Emerging option for selected patients who require mitral valve replacement.[22]
TRICUSPID VALVE	**Surgical Repair:** May include annuloplasty or other reconstructive techniques to preserve the native valve. **Mechanical Valve Replacement:** Durable prosthetic valve typically requiring lifelong anticoagulation. **Bioprosthetic Valve Replacement:** A bioprosthetic (tissue) tricuspid valve may be used when valve repair is not feasible.	**Transcatheter Edge-to-Edge Repair (TEER):** A catheter-based therapy for selected patients with tricuspid regurgitation that improves leaflet coaptation, reduces regurgitation severity and may improve symptoms and quality of life.[23] **Transcatheter Tricuspid Valve Replacement (TTVR):** A transcatheter option for carefully selected patients with severe tricuspid regurgitation, particularly when surgical intervention or transcatheter repair is not feasible. Clinical studies have shown TTVR can markedly reduce tricuspid regurgitation and improve symptoms and quality of life.[24]

Click **here** to access a pre-transcatheter procedure checklist for patients.

Click **here** for a recovery milestones checklist for patients.

CLINICAL PEARL

Not all patients with severe valve disease will receive the same treatment. Age, frailty, comorbidities, anatomy, patient preferences and procedural risk are all considered when determining whether surgical or transcatheter intervention is most appropriate.

POST-TREATMENT CARE

Following valve repair or replacement, primary care providers play an important role in supporting recovery, reinforcing treatment recommendations, coordinating ongoing care and monitoring for changes in symptoms or functional status.

CARDIAC REHABILITATION

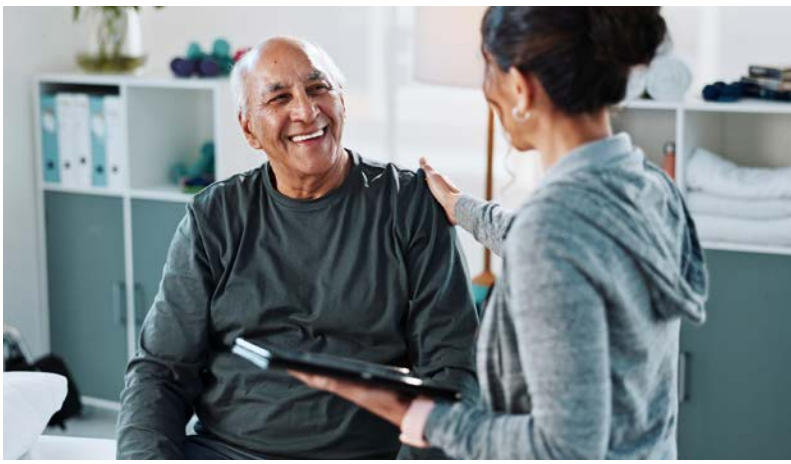
Patients who undergo heart valve repair or replacement may be eligible for cardiac rehabilitation and should be encouraged to participate when appropriate. Cardiac rehabilitation is an important program for anyone recovering from a heart attack, heart failure or other heart problems that require surgery or medical care.[25]

Surgical or Transcatheter heart valve repair or replacement is a qualifying diagnosis for referral to cardiac rehabilitation for Medicare patients.[26]

Cardiac rehabilitation is a medically supervised program that combines:

- Structured exercise training and physical activity counseling
- Education on heart-healthy lifestyle behaviors and cardiovascular risk reduction
- Medication management and adherence support
- Nutrition counseling and weight management guidance
- Tobacco cessation counseling and support
- Psychosocial assessment, stress management and mental health support[28]

Participation in cardiac rehabilitation reduces mortality and improves functional capacity, health-related quality of life, cardiovascular risk factor management and recovery following cardiovascular procedures, including surgical and transcatheter valve interventions.[28] Although valve repair or replacement often improves valve function and alleviates symptoms, many patients, particularly older adults and those undergoing transcatheter valve procedures, may continue to experience deconditioning, frailty, reduced physical performance and uncertainty about resuming normal activities.



Cardiac rehabilitation supports recovery through supervised exercise training, education, risk factor modification and psychosocial support. Participation can help patients safely improve strength, endurance, confidence and overall functional status while promoting long-term cardiovascular health and quality of life.[28]

CLINICAL PEARL

Do not assume a patient will enroll in cardiac rehabilitation simply because a referral was placed. Patients are significantly more likely to participate in cardiac rehabilitation when healthcare professionals consistently endorse and encourage enrollment throughout follow-up care, with clinician recommendation being one of the strongest predictors of participation.[31]

ROLE OF THE PRIMARY CARE CLINICIAN

Following valve repair or replacement, primary care professionals play an important role in supporting recovery, reinforcing treatment recommendations, coordinating care and monitoring for disease progression or procedural complications.[27]

During post-procedure follow-up visits, primary care providers should consider:

- Emphasizing the value of cardiac rehab during follow-up visits, as provider endorsement is one of the strongest predictors of patient enrollment and participation[27]
- Reviewing medications and adherence
- Monitoring blood pressure and cardiovascular risk factors
- Assessing recurrent or new symptoms, including dyspnea, fatigue, palpitations, dizziness, edema or declining exercise tolerance
- Reinforcing lifestyle recommendations
- Coordinating care with cardiology and valve specialists
- Verifying that a referral to cardiac rehab has been placed for eligible surgical or transcatheter procedure patients
- Encouraging adherence to scheduled surveillance imaging and specialist follow-up[4,28]

ADDRESSING BARRIERS TO CARDIAC REHABILITATION

Despite proven benefits, cardiac rehabilitation remains underutilized. Participation rates are particularly low among women, racial and ethnic minority populations, older adults and individuals living in rural communities. Primary care providers can play a critical role in improving participation by endorsing cardiac rehabilitation, identifying and addressing barriers to attendance and reinforcing referrals throughout the recovery process.[29,30]

LONG-TERM MANAGEMENT

Heart valve disease requires lifelong surveillance. Even after successful surgical or transcatheter intervention, patients should continue regular follow-up with their health care team, including surveillance echocardiography when indicated, to monitor valve function, detect complications and identify recurrent or progressive disease.[4]

PATIENT RESOURCES:

- **Help with transportation, food, housing and more**
- **Help finding a cardiac rehab clinic**
- **Patient support network**
- **CDC Article: How Cardiac Rehabilitation Can Help Heal Your Heart**
- **Patient-friendly heart valve education**

TIMING OF FOLLOW-UP IMAGING AFTER VALVE INTERVENTION

VALVE INTERVENTION	MINIMAL IMAGING FREQUENCY	LOCATION
Mechanical Valve (surgical)	Baseline	Primary Valve Center
Bioprosthetic valve (surgical)	Baseline, 5 and 10 years after surgery, then annually	Primary Valve Center
Bioprosthetic valve (transcatheter)	Baseline and then annually	Primary Valve Center
Mitral Valve Repair (surgical)	Baseline, 1 year, then every 2-3 years	Primary Valve Center
Mitral Valve Repair (transcatheter)	Baseline and then annually	Comprehensive Valve Center
Bicuspid Aortic Valve Disease	Continued post-AVR monitoring of aortic size if aortic diameter is ≥ 4.0 cm at time of AVR	Primary Valve Center

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