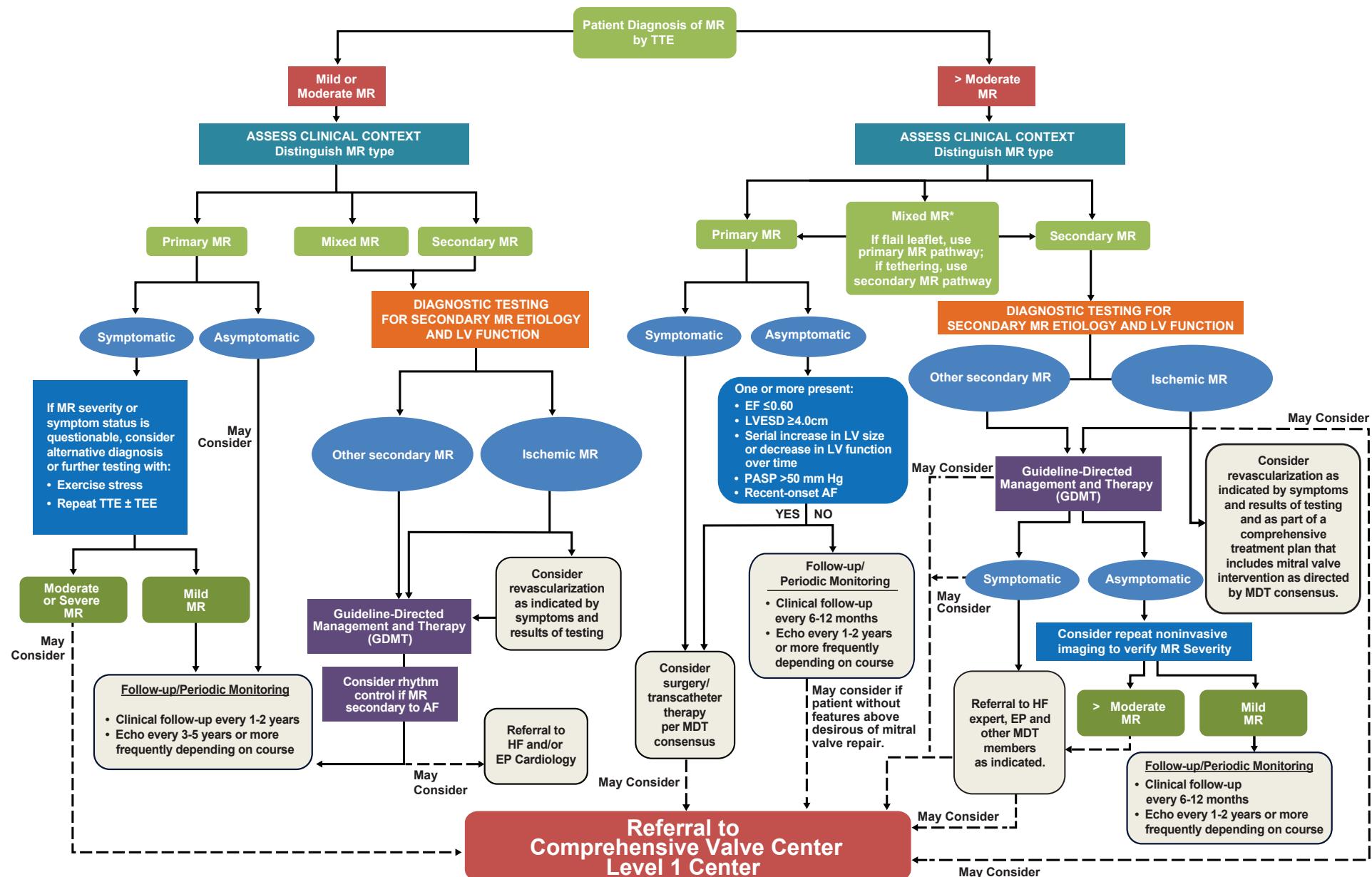




MITRAL REGURGITATION REFERRAL TOOLKIT

REFERRAL ALGORITHM



ABBREVIATIONS:

AF = atrial fibrillation; CAD = coronary artery disease; EF = ejection fraction; EP = electrophysiology; GDMT = guideline-directed management and therapy; HF = heart failure; HFrEF = heart failure with reduced ejection fraction; ICD = implantable cardioverter-defibrillator; JVD = jugular vein distention; LV = left ventricular; LVESD = left ventricular end-systolic diameter; MDT = multidisciplinary team; MI = myocardial infarction; MR = mitral regurgitation; MRA = magnetic resonance angiogram; NYHA = New York Heart Association; PA = pulmonary artery; PASP = pulmonary artery systolic pressure; TEE = transesophageal echocardiogram; TTE = transthoracic echocardiogram

Consideration of local HF and/or EP cardiology is predicated on the potential for advanced therapies including tiered medical treatment, device intervention or arrhythmia management.

* Refer to the 2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease



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CLINICAL CONTEXT:

When interpreting an echocardiogram report, it is essential that one considers the patient's clinical presentation inclusive of symptoms, physical examination findings, and goals of care. Treatment differs based on the etiology and severity of mitral regurgitation (MR). Whenever possible, identifying the mechanism of MR from the echo report or images will help guide next steps in treatment.

The following items should be considered to determine optimal guideline-directed management:

- **Establish the primary reason for the echocardiogram (e.g. new murmur, heart failure, palpitations, etc.):** This pertains to the patient's presenting symptoms or signs and the clinical suspicion of pathology.
- **Define the patient's symptoms and their severity:** Common symptoms of MR include exertional dyspnea (NYHA Class), fatigue and palpitations. Angina or other types of chest pain may be present. Symptoms of more advanced heart failure (orthopnea, edema) should be queried in the appropriate context.
- **Identify additional contributing factors that may impact therapy:** Identify important medical co-morbidities including hypertension, diabetes and chronic kidney disease. Incorporate echocardiographic assessment of LV function, estimated PA pressures and other valve dysfunction in management program.
- **Physical Examination for MR and secondary impact:** The systolic murmur of MR, as well as any associated auscultatory findings (click, s3) will vary depending on the etiology, severity and context. Signs of heart failure and/or elevated PA pressures should be sought.
- **Establish the patient's current medical therapy and ensure optimization:** This includes paying attention to blood pressure, heart rate and rhythm, and volume status.
- **Are the goals of care aligned to pursue additional treatment?** This pertains to the appropriateness of medical or interventional mitral therapy (i.e. life expectancy, patient wishes).

COMPREHENSIVE VALVE CENTER (LEVEL 1):

A dedicated team of physicians skilled in the evaluation and management of MR that includes:

- **Requirements:** Dedicated valve team, access to advanced imaging, transcatheter and surgical valve therapies.
- **Team:** Valve expert, multi-modality imaging expert, HF specialist, interventionalist, MV surgeon, cardiac anesthesiologists, electrophysiologists, and other specialists as needed (e.g., stroke neurologist).
- **Benchmarks:** Mitral valve repair rates for primary MR, peri-operative stroke rate, and survival. Primary MR owing to isolated posterior leaflet disease should not be managed with mitral valve replacement unless a repair has been attempted and failed.

PRIMARY vs. SECONDARY MR:

If not specifically stated in the echocardiogram report, general principles on how best to determine etiology of MR may include:

- **PRIMARY MR:** Presence of degenerative leaflet disease, often manifested by excess leaflet tissue, prolapse or excess leaflet motion, flail, ruptured chordae, vegetation or rheumatic involvement. Eccentric or multiple jets of MR associated with excess leaflet motion may occur in patients with prolapse/flail.
- **SECONDARY MR:** Presence of relatively normal leaflet morphology, manifested by restricted leaflet motion below the annular plane, often secondary to non-leaflet ventricular disease such as previous infarction with remodeling or cardiomyopathy. Central MR jets are most common but an eccentric jet of MR, often posteriorly directed, associated with restricted posterior leaflet motion may occur.
- **MIXED MR:** When both Primary and Secondary mechanisms are present.

DIAGNOSTIC TESTING FOR SECONDARY MR ETIOLOGY AND LV FUNCTION:

If Secondary MR is suspected, determine if it is of ischemic or non-ischemic origin by noting the presence of any of the following:

- **Ischemic MR:** Suspicion of CAD (risk factors, prior MI, regional wall motion abnormalities, etc.)
 - Stress testing
 - Invasive or non-invasive coronary angiography
 - Cardiac MRI
- **Other Secondary MR:** Infiltrative, hypertrophic, or dilated cardiomyopathy
 - Serologies and other blood tests
 - Cardiac MRI
 - Endomyocardial biopsy

GUIDELINE-DIRECTED MANAGEMENT AND THERAPY (GDMT):

GDMT for heart failure or ventricular dysfunction is well established and includes the following as medically appropriate :

- Treat hypertension
- Use diuretics for volume overload
- Consider cardiac device therapy (CRT, ICD) as indicated
- Provide anticoagulation for AF as indicated
- Consider rate vs. rhythm control strategies for AF as indicated
- Medical therapies for HFrEF may include:
 - Beta-blockers
 - ACEI or ARB or ARNI
 - Nitrates + Hydralazine for African Americans or ACEI/ARB intolerance
 - MRAs