Summary Table of Mitral Regurgitation (MR)

Category	Details
Hemodynamic Changes in Different Stages of MR	• **Acute MR:** ↑ preload, ↓ afterload, ↑ EF, ↓ forward stroke volume leading to hypotension & cardiogenic shock • **Compensated Chronic MR:** Mildly ↑ preload, normal afterload, initially normal EF, normal forward stroke volume due to compensatory mechanisms • **Decompensated Chronic MR:** Mildly ↑ preload, ↑ afterload, ↓ EF, significantly ↓ forward stroke volume, leading to heart failure Sxs
Causes	• **Acute MR:** Chordae tendineae rupture, ischemic papillary muscle dysfunction • **Chronic Compensated MR:** Progressive valvular degeneration, mitral annular dilation, rheumatic dz • **Chronic Decompensated MR:** LV dilation, progressive myocardial dysfunction
Pathophysiology	• **Acute MR:** Sudden volume overload in LA due to normal compliance, leading to acute pulmonary edema, respiratory distress, hypotension, & cardiogenic shock • **Chronic Compensated MR:** LA dilation prevents acute pressure increase, EF remains normal or high, stroke volume is maintained, minimal pulmonary congestion • **Chronic Decompensated MR:** LV dilation, ↓ contractility, ↓ forward stroke volume, leading to fatigue, hypotension, pulmonary congestion, dyspnea
Murmur Characteristics	Holosystolic murmur best heard at the apex, radiating to the axilla MR due to papillary muscle dysfunction after MI is transient & resolves with revascularization MR due to rheumatic heart disease occurs in younger pts & may progress to mixed valve dz
Determinants of Blood Flow in MR	• **Forward Stroke Volume:** Determined by aortic pressure • **Regurgitant Stroke Volume:** Determined by mitral valve orifice size & LA compliance • **Increased LV Afterload:** Increases regurgitant flow • **Decreased Systemic Vascular Resistance (SVR):** Lowers systemic BP, ↑ the forward-to-regurgitant flow ratio, improves cardiac output, & ↓ pulmonary congestion
Role of S3 Gallop in MR	• **Presence of S3:** Indicates severe MR with volume overload &LV dilation • **Absence of S3:** Suggests that severe chronic MR is *unlikely*
LA Pressure Tracings in MR	• **Characteristic Early & Large V Wave:** Reflects increased regurgitant volume • **Over time:** Atrial dilation occurs, ↑ risk of atrial fibrillation & decompensated heart failure
Comparison with Other Conditions	• **Aortic Regurgitation:** Backflow into LV, causing rapid aortic pressure decline in diastole • **Aortic Stenosis:** Increased LV systolic pressure due to outflow obstruction **Mitral Stenosis:** Persistent high LA pressure, peak atrial pressure occurs at atrial contraction • **Tricuspid Regurgitation:** Large V wave in RA pressure tracing, mimicking MR but affecting the right heart
Educational Objectives	• Acute MR leads to **pulmonary edema** & **hypotension** due to sudden increased LA pressure • Chronic compensated MR allows LA and LV adaptation, maintaining cardiac output • Chronic decompensated MR results in LV dysfunction, reduced EF, & symptomatic heart failure • Lowering SVR increases forward blood flow, improving cardiac output & reducing pulmonary congestion • An S3 gallop is a key indicator of severe MR