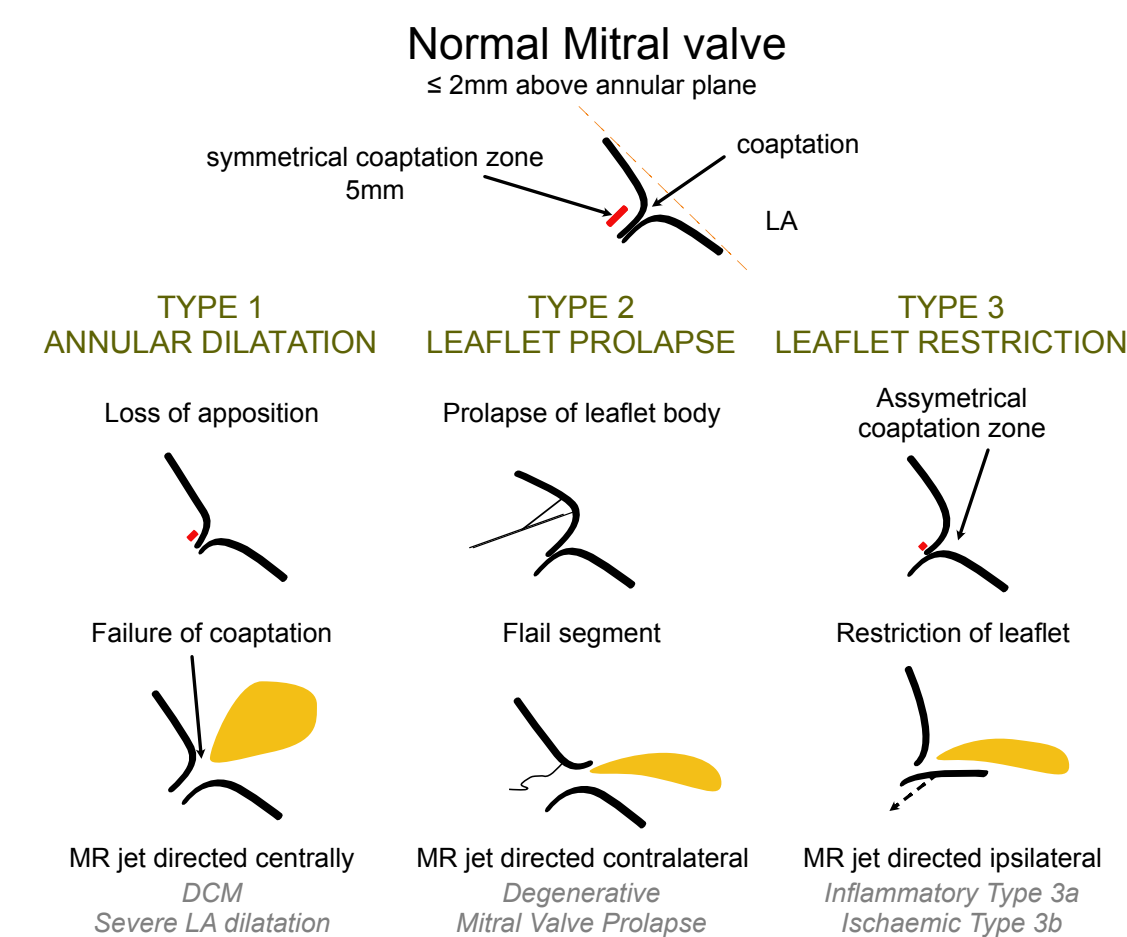
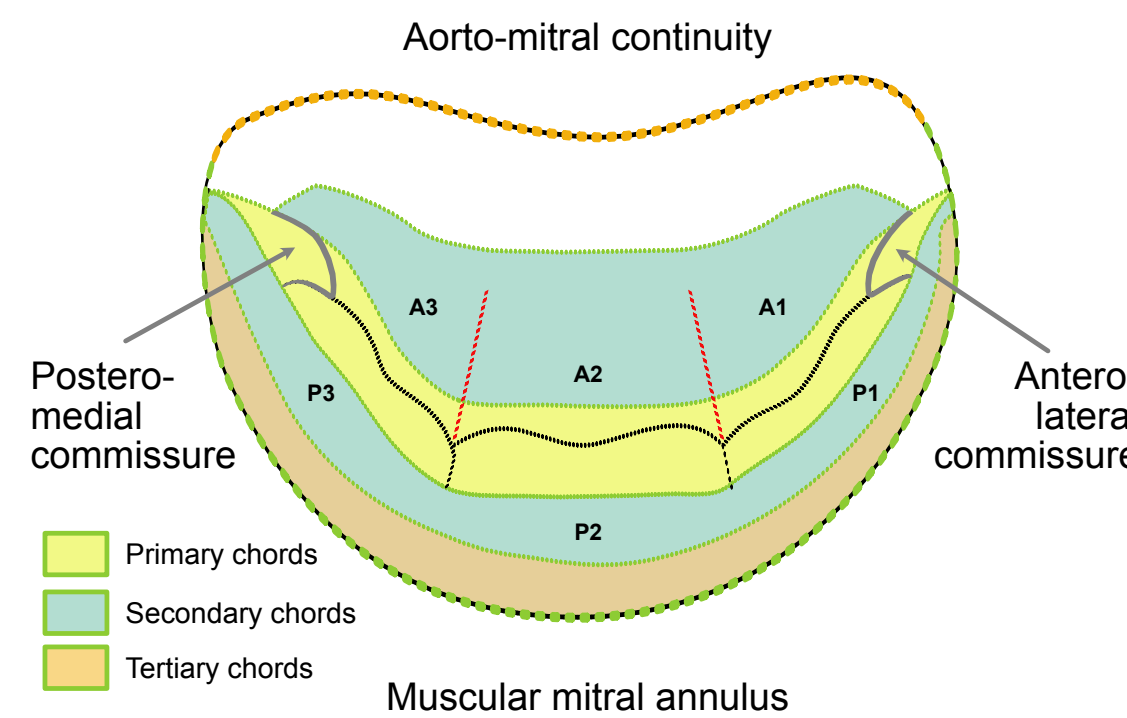
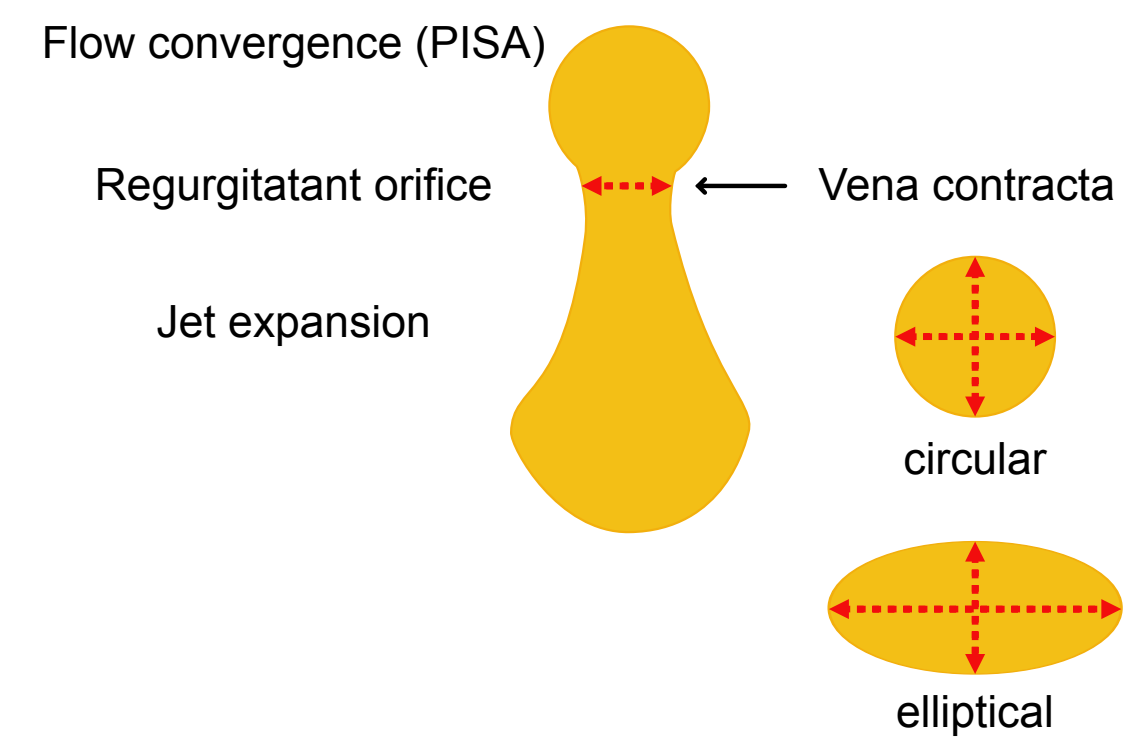
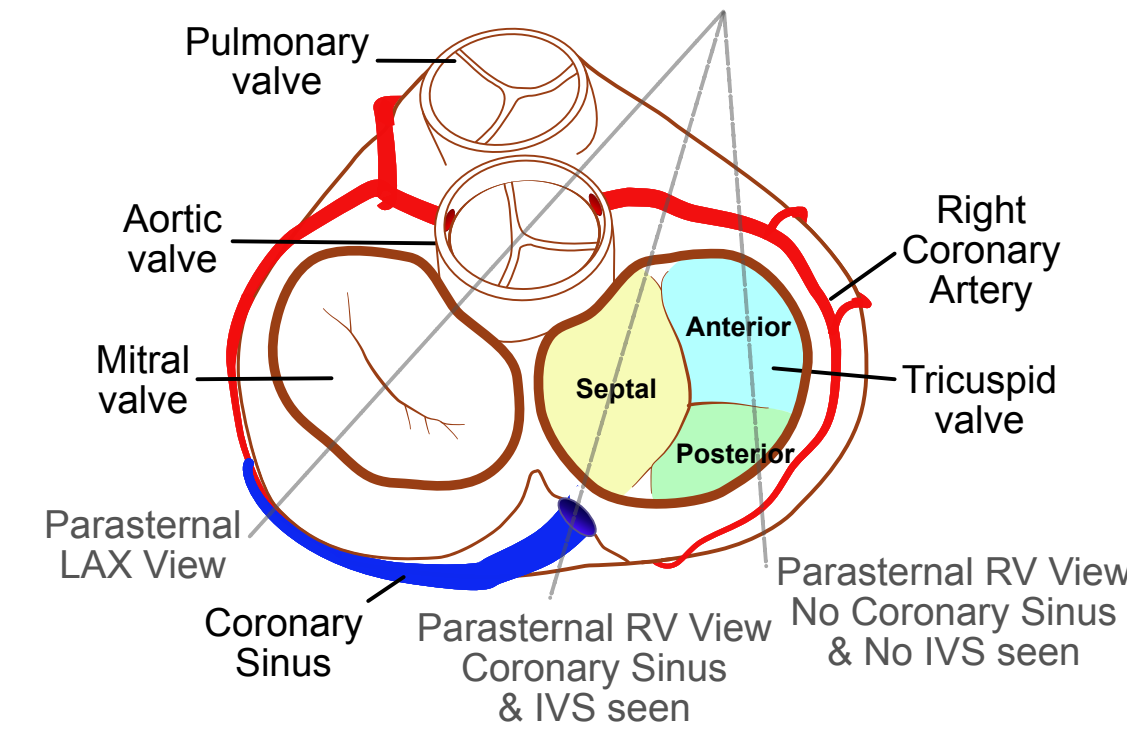


Echocardiography: Valve Disease Assessment

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LEFT HEART				
	MILD	MODERATE	SEVERE	VERY SEVERE
AORTIC STENOSIS				
Peak velocity (m/s)	2.5–2.9	3.0–3.9	4.0–4.9	≥5.0
Mean gradient (mmHg)	<20	20–39	40–59	≥60
Valve area (cm ²)	>1.5	1.0–1.5	<1.0	≤0.6
Valve area/BSA (cm ² /m ²)	>0.85	0.60–0.85	<0.60	
Velocity ratio	>0.5	0.25–0.5	<0.25	
AORTIC REGURGITATION				
Regurgitant fraction (%)	≤30	31–49	≥50	
Regurgitant orifice area (cm ²)	<0.1	0.10–0.29	≥0.30	
Regurgitant volume (mL)	<30	31–59	≥60	
Vena contracta width (cm)	<0.3	0.3–0.6	>0.6	
Jet width / LVOTd* (%)	<25	25–64	≥65	
Jet CSA/LVOT CSA* (%)	<5	5–59	≥60	
Dao end-diastolic velocity (cm/s)			≥20	
Aortic leaflets	Normal or abnormal		Abnormal, flail, restriction, perforation or wide coaptation defect	
LV size	Normal		Usually dilated. May be normal in acute severe AR	
Jet width colour flow*	Small		Large	
Flow convergence colour flow	None/very small		Large	
Jet density CW	Incomplete/faint	Dense	Dense	
Pressure half time (ms)	>500	200–500	<200	
Diastolic flow reversal desc Ao	Brief, early	Intermediate	Prominent holodiastolic	
MITRAL REGURGITATION				
Regurgitant orifice area (cm ²)	<0.20	0.20–0.39	≥0.40 [†]	
Regurgitant volume (mL)	<30	30–59	≥60 [†]	
Regurgitant fraction (%)	<30	30–49	≥50	
PISAr at Nyquist 40cm/s (cm)	<0.3	0.4–1.0	≥1.0	
Vena contracta width (cm)	<0.3	0.30–0.69	≥0.7	
Biplane VC width (cm)	<0.3	0.30–0.79	≥0.8	
Pulmonary vein systolic flow	Dominance [‡]	Blunting [‡]	Flow reversal	
Dominant mitral inflow wave (cm/s)	A-wave [§]	variable	E-wave >1.5	
MV inflow VTI/LVOT VTI	<1		>1.4	
Mitral leaflets	Normal		Abnormal, flail, restriction, perforation or wide coaptation defect	
LV size (chronic primary MR)	Normal		Dilated indicates severe primary MR, although normal size does not rule out severe MR	
LA size (chronic primary MR)	Normal		Dilated	
Jet area/LA (%)	Small, brief	20–50	Large, >50	
Flow convergence	None, brief, small	Intermediate	Large & holosystolic	
CW Doppler	Faint, partial, parabolic	Intermediate	Similar in density to forward flow. Triangular waveform suggests torrential or acute severe MR	
MITRAL STENOSIS				
Valve area ^{¶¶} (cm ²)	1.6–2.0	1.0–1.5	<1.0	
Mean gradient (mmHg)	<5	5–10	>10	
Systolic PA pressure (mmHg)	<30	30–50	>50	



RIGHT HEART			
	MILD	MODERATE	SEVERE
TRICUSPID REGURGITATION			
EROA by PISA (cm ²)	<0.20	0.20–0.39	≥0.40
EROA by 3D (cm ²)			>0.4
Regurgitant volume by PISA (mL)	<30	30–44	≥45
Colour flow area (cm ²)	<5	05–10	>10
Vena contracta width (cm)	<0.3	0.3–0.69	≥0.7
3D VC area (cm ²)			>0.4
PISAr at Nyquist 28 cm/s (cm)	<0.5	0.5 - 0.9	>0.9
Hepatic vein flow	Systolic dominance	Systolic blunting	Systolic flow reversal
TV E velocity	Variable	Variable	More than or equal to 1 m/s
TV E/A ratio	Variable	Variable	More than or equal to 1
Colour flow area/RA area (%)	Small, narrow, central		Large, >50%
Flow convergence zone	Not seen/transient	Intermediate	Large holosystolic
CW Doppler signal	Faint/partial/parabolic	Variable contour	Variable – triangular confirms severe
Tricuspid leaflets	Normal, mildly abnormal		Severe lesions (Abnormal, flail, restriction, perforation or wide coaptation defect)
RV size (chronic primary TR)	Normal	Normal	Dilated indicates severe primary TR, although normal size does not rule out severe TR
RA size (chronic primary TR)	Normal	Normal	Dilated
IVC diameter (cm)	Variable	Variable	<21 mm with >50% inspiratory collapse is unlikely in severe TR
TRICUSPID STENOSIS			
Mean pressure gradient (mmHg)			≥5
Pressure half time (ms)			≥190
Valve area by continuity (cm ²)			<1
PULMONARY REGURGITATION			
Jet width/RVOT (%)			>65
Vena contracta/PV annulus (%)	<50		>70
Pressure half time (ms)			<100
PR Deceleration time (ms)			<260
Flow reversal	Absent	Absent	Flow reversal seen within a PA branch
Doppler PR Index			<0.77
PULMONARY STENOSIS			
Peak velocity (m/s)	<3	3–4	>4

* Central jets, variable in eccentric jets
[†] May be lower in secondary MR or when EROA is elliptical
[‡] May be blunted in AF or LV dysfunction
[§] E may be dominant in young or moderate+ diastolic dysfunction
^{¶¶} Valve area is a specific sign, others are supportive

Parameters of heart valve disease are affected by loading conditions, blood pressure and heart rate. These should be considered when diagnosing disease severity

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