

Systolic LV Function				
Parameter	Good	Reasonable	Moderate	Poor
WMSI	1.0	1.0 - 1.5	1.5 - 2.0	>2.0
LVEF ♂ (%)	52 - 72	41 - 51	30 - 42	<30
LVEF ♀ (%)	54 - 74	41 - 53	30 - 42	<30
LIMP (Tei)	<0.40			
dP/dt (mmHg/s)	>1100			<500

Diastolic LV function				
Parameter	Normal	Stage 1	Stage 2	Stage 3
Septal é (m/s)	>8	<8	<8	<8
Lateral é (m/s)	>10	<10	<10	<10
LAVI (mL/m ²)	<34	>34	>34	>34
E/A	>0.8	<0.8	0.8 - 1.5	>2
Dec T (ms)	192 ± 40	>200	160 - 200	<160
E/é	6.7 ± 2.2	<8	9 - 12	<12
Ar - A (ms)	<0	<0	0 - 30	>30
E/A Valsalva	>0.5	<0.5	>0.5	>0.5
Pulm. vein flow	S>D	S=D	S<D	S<<D
Vp (m/s)	>0.50	<0.50	<0.50	<0.50

Valve disease				
Valve	Parameter	Mild	Moderate	Severe
Ao Regurgitation	Jet/LVOT (%)	<25	25 - 65	>65
	PHT (ms)	>500	500 - 200	<200
	Vena contracta (mm)	<3	3 - 6	>6
	Desc ao flow (cm/s)			>20
	Mean (mmHg)	<20	20 - 40	>40
Ao Stenosis	AVA (cm ²)	>1.5	1.5 - 1.0	<1.0
	Flow ratio (DVI)	> 0.50	0.25 - 0.50	<0.25
	Vmax (m/s)	<3	3 - 4	>4
	AccT (ms)	<100		>100
	AVA BSA (cm ² /m ²)	>0.85	0.85 - 0.60	<0.60
Mitral Regurgitation	Jet area/LA (%)	<20	20 - 40	>40
	Jet area (cm ²)	<4	4 - 10	>10
	ERO (mm ²)	<20	20 - 40	>40
	Vena contracta (mm)	<3	3 - 7	>7
	VTI ratio (MV/Lvot)			>1.4
Mitral Stenosis	E/A			> 1.2
	Pulm. vein flow	Syst. dominant	Syst. decreased	Syst. reversal
	MVA (cm ²)	>1.5	1.5 - 1.0	<1.0
	Mean (mmHg)	<5	5 - 10	>10
	PHT (ms)	<90	90 - 150	>150
Tricus. Regurgitation	RV/RA/IVC	Normal	Norm./dilated	Dilated
	Hepatic vein flow	Syst. dominant	Syst. blunting	Syst. reversal
	Vena contracta (mm)		<7	>7
	PISA (cm ²)	<0.6	0.6 - 0.9	>0.9
	Density	Soft + Blunt	Dense	Dense
Tricus. Stenosis	Contour	Parabolic	Variable	Triangular
	TVA (cm ²)			<1.0
	PHT (ms)			>190
	Mean (mmHg)			>5
	VTI (cm)			>60
Pulm. Regurgitation	RV	Normal	Norm./Dilated	Dilated
	Density + contour	Soft + Blunt	Dense + Variable	Dense + Steep
	Pulm. Syst. Flow	Slightly decreased	Slightly decreased	Decreased
	Color	Thin, narrow	Intermediate	Large, wide
	Pulm. Stenosis	PGmax (mmHg)	<36	36 - 64
	Vmax (m/s)	<3	3 - 4	>4

Pulmonary hypertension				
Parameter	Unlikely	Possible	Probable	
SPAP (mmHg)	<36	36 - 50	>50	
TR Vmax (m/s)	<2.8	2.9 - 3.4	>3.4	
RIMP tissue doppler	<0.54		>0.54	
Contour pulsed wave doppler signal	Parabolic	Variable	Triangular	
AccT (ms)	>120	120 - 60	<60	

LA volume								
Parameter	Normal		Mild		Moderate		Severe	
	♂	♀	♂	♀	♂	♀	♂	♀
LA diameter (cm)	3.0-4.0	2.7-3.8	4.1-4.6	3.9-4.2	4.7-5.2	4.3-4.6	≥5.2	≥4.7
LA diam./BSA (cm/m ²)	1.5-2.3	1.5-2.3	2.4-2.6	2.4-2.6	2.7-2.9	2.7-2.9	≥3.0	≥3.0
LA minor-axis (cm)	2.9-4.5	2.9-4.5	4.6-4.9	4.6-4.9	5.0-5.4	5.0-5.4	≥5.5	≥5.5
LA minor-axis/BSA (cm/m ²)	1.7-2.5	1.7-2.5	2.6-2.8	2.6-2.8	2.9-3.1	2.9-3.1	≥3.2	≥3.2
LA area (cm ²)	≤20	≤20	20-30	20-30	30-40	30-40	>40	>40
LA volume (mL)	18-58	22-52	59-68	53-62	69-78	63-72	≥79	≥73
LA volume/BSA (mL/m ²)	16-34	16-34	35-41	35-41	42-48	42-48	≥48	≥48

RA pressure				
Parameter	Normal	Intermediate	High	
Pressure (mmHg)	3 (0 - 5)	8 (5 - 10)	15	
VCI diameter (mm)	≤21	≤21 ; >21	>21	
Collaps with sniff (%)	>50	>50 ; <50	<50	
Secondary indices of elevated RA pressure				Restrictive filling; Tricuspid E/e' > 6; Diastolic flow predominance in hepatic veins (systolic filling fraction < 55%)

LV dimensions		
Parameter	♂	♀
LVED diameter (mm)	42.0 - 58.4	37.8 - 52.2
LVES diameter (mm)	25.0 - 39.8	21.6 - 34.8
LVED Volume (biplane, mL)	62 - 150	46 - 106
LVES Volume (biplane, mL)	21 - 61	14 - 42
LVED Volume BSA (mL/m ²)	34 - 74	29 - 61
LVES Volume BSA (mL/m ²)	11 - 31	8 - 24

RV function	
Parameter	Abnormality threshold
TAPSE (mm)	< 17
PW Doppler S wave (cm/s)	< 9.5
Color Doppler S wave (cm/s)	< 6.0
RV FAC (%)	< 35
RV Freewall strain (%)	> -20
RV 3D EF (%)	< 45
RIMP PW Doppler	> 0.43
RIMP Tissue Doppler	> 54
DecT (ms)	< 119 or > 242
E/A (m/s)	< 0.8 or > 2.0
é/á	< 0.52
é (m/s)	< 7.8
E/é	> 6.0

RV dimensions		
Parameter	♂	♀
RV basal diam. (mm)	25 - 41	25 - 41
RV mid diam. (mm)	19 - 35	19 - 35
RV longitudinal diam. (mm)	59 - 83	59 - 83
RVOT PLAX diam. (mm)	20 - 30	20 - 30
RVOT proximal diam. (mm)	21 - 35	21 - 35
RVOT distal diam. (mm)	17 - 27	17 - 27
RV Wall thickness (mm)	1 - 5	1 - 5
RVOT EDA (cm ²)	10 - 24	8 - 20
RV EDA BSA (cm ² /m ²)	5 - 12.6	4.5 - 11.5
RV ESA (cm ² /m ²)	3 - 15	3 - 11
RV ESA BSA (cm ² /m ²)	2.0 - 7.4	1.6 - 6.4
RV EDV BSA (mL /m ²)	35 - 87	32 - 74
RV ESV BSA (mL /m ²)	10 - 44	8 - 36

Aortic dimensions		
Parameter	♂	♀
Ao annulus (mm)	26±3	23±2
Ao annulus BSA (mm/m ²)	13±1	13±1
Sinus of Valsalva (mm)	34±3	30±3
Sin.of.Valsalva BSA (mm/m ²)	17±2	18±2
Sinotubular junction (mm)	29±3	26±3
Sin.tub. Junc. BSA (mm/m ²)	15±2	15±2
Ascending Aorta (mm)	30±4	27±3
Asc. Aorta BSA (mm/m ²)	15±2	16±3
Aortic arch (mm)	<35	<35
Descending Aorta (mm)	<30	<30
Abdominal Aorta (mm)	<30	<30

RA dimensions		
Parameter	♂	♀
Width BSA (mm/m ²)	19±3	19±3
Length BSA (mm/m ²)	25±5	24±3
RA volume BSA (mL/m ²)	21±6	25±7
Length BSA (mm/m ²)	25±5	24±3
RA volume BSA (mL/m ²)	21±6	25±7

Constriction vs. Restriction		
Parameter	Constriction	Restriction
Septal motion	Resp. shift	Normal
Mitral E/A ratio	>1.5	>1.5
Mitral DecT (ms)	<160	<160
Mitral inflow resp. variation	Present	Absent
Hepatic vein diast.flow reversal	Expiratory	Inspiratory
Mitral septal é (cm/s)	>7	<7
Mitral lateral é	< Septal é	> Septal é
Ventricular septal strain	Normal	Reduced

References

- Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging, 2015 (JASE 2015 Jan;28(1):1-39.e14).
- Recommendations for the Evaluation of Left Ventricular Diastolic Function by Echocardiography: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging (JASE 2016;29:277-314).
- 2017 ESC/EACTS Guidelines for the management of valvular heart disease (European Heart Journal (2017)00, 1-53).
- 2014 ESC Guidelines on the diagnosis and treatment of aortic diseases (Eur Heart Journal (2014) 35, 2873-2926).
- Comparison of new Doppler echocardiographic methods to differentiate constrictive pericardial heart disease and restrictive cardiomyopathy (Am J Cardiol. 2001 Jan 1;87(1):86-94).