

**LEFT VENTRICULAR SYSTOLIC FUNCTION**

Normal	> 55%
Low normal	50 - 55%
Mildly depressed LVEF	40 - 55%
Moderately depressed LVEF	30 - 40%
Severely depressed LVEF	< 30%

**LEFT VENTRICULAR HYPERTROPHY**

Mild left ventricular hypertrophy	1.2 - 1.4 cm
Moderate LVH	1.5 - 1.7cm
Severe LVH	> 1.7 cm

**LEFT VENTRICULAR DILATION**

Mild left ventricular enlargement	5.6 - 5.9 cm
Moderate LVE	6.0 - 6.9 cm
Severe LVE	> 6.9 cm

**RIGHT VENTRICULAR HYPERTROPHY**

Free wall thickness	> 0.8 cm
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**LEFT ATRIAL ENLARGEMENT**

Parasternal Long Axis Dimension	
Mild left atrial enlargement	4.0 - 4.9 cm
Moderate left atrial enlargement	5.0 - 5.9 cm
Severe left atrial enlargement	> 5.9 cm
Four Chamber Left Atrial Length	
Mild left atrial enlargement	5.2 - 5.9 cm
Moderate left atrial enlargement	6.0 - 6.9 cm
Severe left atrial enlargement	> 6.9 cm

**RIGHT ATRIAL ENLARGEMENT**

Four Chamber Right Atrial Length	
Mild right atrial enlargement	5.0 - 5.9 cm
Moderate right atrial enlargement	6.0 - 6.9 cm
Severe right atrial enlargement	> 6.9 cm

**AORTIC STENOSIS**

Mild AS (jet velocity < 3.0 m/s)	> 1.5 cm2
Moderate AS (velocity 3.0 - 4.0)	1.0 - 1.5 cm2
Severe AS (velocity > 4.0)	< 1.0 cm2

**AORTIC REGURGITATION**

Mild aortic regurgitation	$t_{1/2} > 550$ msec
Moderate aortic regurgitation	$t_{1/2} 550 - 300$
Severe aortic regurgitation	$t_{1/2} < 300$

**MITRAL STENOSIS**

Mild (mean gradient < 5 mmHg)	> 1.5 cm <sup>2</sup>
Moderate (gradient 5 - 10)	1.0 - 1.5 cm <sup>2</sup>
Severe (gradient > 10 mmHg)	< 1.0 cm <sup>2</sup>

**PULMONIC STENOSIS**

Mild (pk gradient < 36 mmHg)	< 3 m/s
Moderate (peak gradient 36-60)	3-4 m/s
Severe (pk gradient > 60 mmHg)	> 4 m/s

**PULMONARY HYPERTENSION**

Normal PA pressure (v < 2.2)	< 30 mmHg
Borderline pHTN (v < 2.5)	30 - 35 mmHg
Mild pHTN (v < 3.0)	35 - 45 mmHg
Moderate pHTN (v < 4.0)	45 - 75 mmHg
Severe pHTN (v => 4.0)	> 75 mmHg

**AORTIC ROOT DILATION**

Mild aortic root dilation	3.7 - 3.9 cm
Moderate aortic root dilation	4.0 - 4.9 cm
Severe aortic root dilation	> 4.9 cm

**PERICARDIAL EFFUSION**

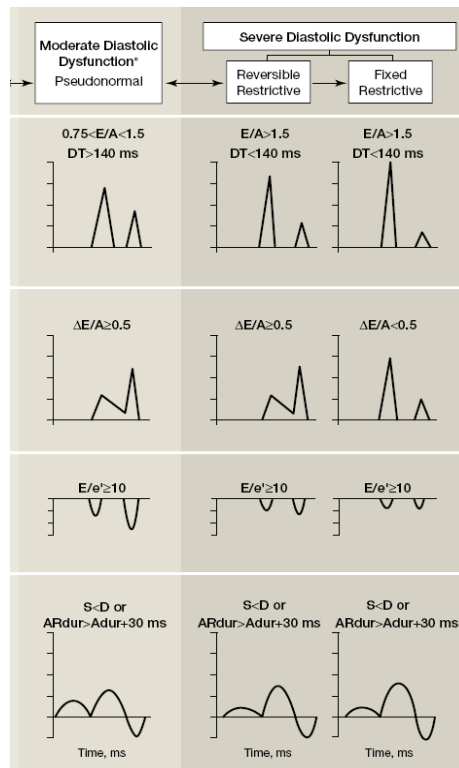
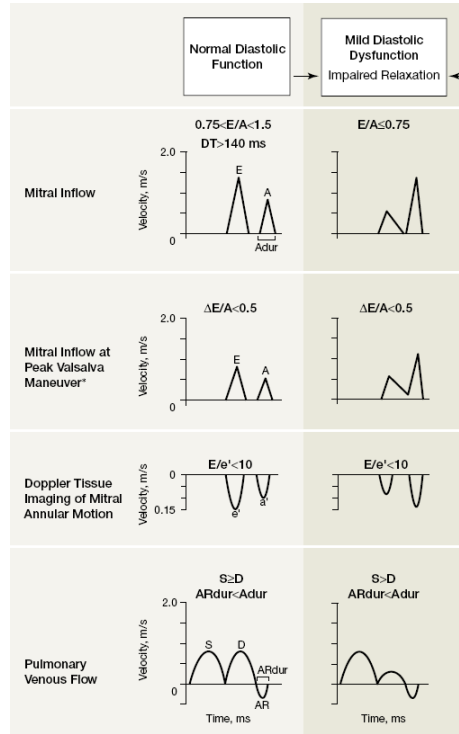
Small effusion	< 1.0 cm
Moderate effusion	1.0 - 2.0 cm
Severe effusion	> 2.0 cm

**RIGHT SIDED VALVE DISEASE**

Severe tricuspid stenosis	AVA < 1.0 cm2
Severe pulmonic stenosis	
Jet velocity > 4 m/s	
Maximum gradient > 60 mmHg	

**ECHO FORMULAS**

Peak gradient (mmHg) = 4 x (peak velocity)<sup>2</sup>  
 Mitral valve area = 220 / (pressure half-time)



**PROSTHETIC AORTIC VALVE**

Rosenhek et al J Am Soc Echocardiogr 2003;16:1116-27.

Size (mm)	Peak (mmHg)	Mean (mmHg)	Peak (m/s)
<b>Bjork-Shiley Tilting Disc</b>			
19	27		3.8
21	39+/-12	22+/-3	2.9+/-0.9
23	34+/-11	17+/-7	2.4+/-0.4
25	20+/-7	12+/-5	2.1+/-0.3
27	19+/-8	11+/-4	1.8+/-0.1
29	21+/-7		1.9+/-0.2
<b>Carbomedics Bileaflet</b>			
17	33+/-13	20+/-7	
19	33+/-11	12+/-5	3.1+/-0.4
21	26+/-10	13+/-4	2.6+/-0.5
23	25+/-7	11+/-4	2.4+/-0.4
25	20+/-9	9+/-5	2.3+/-0.3
27	19+/-7	8+/-3	2.2+/-0.4
29	13+/-5	6+/-3	1.9+/-0.3
<b>Carpentier-Edwards Stented Bioprosthesis</b>			
19	43+/-13	26+/-8	
21	28+/-8	17+/-6	2.4+/-0.5
23	29+/-7	16+/-6	2.8+/-0.4
25	24+/-7	13+/-4	2.4+/-0.5
27	22+/-8	12+/-6	2.3+/-0.4
<b>Medtronic-Hall Tilting Disc</b>			
20	34+/-13	17+/-5	2.9+/-0.4
21	27+/-10	14+/-6	2.4+/-0.4
23	27+/-9	14+/-5	2.4+/-0.6
25	17+/-7	10+/-4	2.3+/-0.5
27	19+/-10	9+/-6	2.1+/-0.5
<b>St. Jude's Medical Bileaflet</b>			
19	35+/-11	19+/-6	2.9+/-0.5
21	28+/-10	16+/-6	2.6+/-0.5
23	25+/-8	14+/-5	2.6+/-0.4
25	23+/-8	13+/-5	2.4+/-0.5
27	20+/-8	11+/-5	2.2+/-0.4
29	17+/-6	10+/-3	2.0+/-0.1
<b>Starr-Edwards Ball &amp; Cage</b>			
		24+/-4	3.1+/-0.5
<b>Toronto Stentless</b>			
20	11	5	
21	19+/-12	8+/-4	
23	14+/-7	7+/-4	
25	12+/-6	6+/-3	
27	10+/-5	5+/-2	
29	8+/-4	4+/-2	
<b>On-X Mechanical Valve</b>			
19		8.7	
21		8.1	
23		6.6	
25		4.2	

**PROSTHETIC MITRAL VALVE**

Otto, Textbook of Clinical Cardiology, 2000, page 310.

Vmax (m/s)	Gradient (mmHg)	T 1/2 (mm/s)
<b>Mechanical Bileaflet (St. Jude)</b>		
1.6 +/- 0.3	4 +/- 1	77 +/- 17
<b>Mechanical Tilting Disk (Bjork-Shiley)</b>		
1.6 +/- 0.3	3 +/- 2	90 +/- 22
<b>Mechanical Ball Cage (Starr-Edwards)</b>		
1.9 +/- 0.5	5 +/- 2	110 +/- 27
<b>Porcine Tissue Ionescu-Shiley</b>		
1.5 +/- 0.3	3 +/- 1	93 +/- 25
<b>Porcine Tissue Carpentier-Edwards</b>		
1.8 +/- 0.2	6 +/- 2	90 +/- 25
<b>Porcine Tissue Hancock</b>		
1.5 +/- 0.3	4 +/- 2	129 +/- 31