Echo Study Comprehensiveness Metric

Craig E Fleishman, MD, FACC, FASE

Echo Study Comprehensiveness Metric Rationale

- A complete TTE is one that images all cardiac chambers, valves, and vessels from multiple views with integration of 2D/color Doppler/spectral Doppler

Echo Study Comprehensiveness Metric Rationale

- Important Echo elements not identified may result from:
  - Limitations in image quality with a particular patient
  - Incomplete delineation of echo lab's protocol
  - Incomplete training of those obtaining images

Echo Study Comprehensiveness Metric Rationale

- Assessment of the number of required elements identified as outlined in this Metric provides a method to evaluate compliance with standards and may suggest to the Echo lab processes that need revision

Echo Study Comprehensiveness Metric

Measure Description: This metric will assess the average completeness score, as measured by the *Comprehensiveness Exam Assessment* worksheet (Appendix 1), of initial transthoracic echocardiograms designated as complete studies (either inpatient or outpatient) for patients with hearts interpreted as structurally normal	
Numerator	The sum of the *Comprehensiveness Exam Assessment* worksheet (Appendix 1) scores for all transthoracic echocardiograms included in the denominator.
Denominator	The number of initial transthoracic echocardiograms designated as complete studies[1] during the measurement period for patients with structurally normal hearts.
Denominator Exclusions	None
Denominator Exceptions	None
Definitions/Notes	1. **Complete Studies-** Studies that are identified as being focused, limited, or incomplete due to either patient instability or patient agitation will not be included.
Measurement Period	Quarterly
Sources of Data	Prospective flowsheet, retrospective review of stored echocardiographic images
Attribution	This metric will be reported by each echocardiography laboratory performing transthoracic echocardiography. The recommended optimal approach is for data to be assessed quarterly by the laboratory director or their designate and reviewed with the laboratory staff involved in the performance and interpretation of echocardiograms.
Care Setting	Inpatient or outpatient

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Appendix 1.

Comprehensive Exam Assessment WORKSHEET

Each worksheet is for ONE echo evaluation

Patient Name: _____ **Date of Birth:** _____

Sonographer: _____ **Date of Study:** _____

Interpreter: _____ **Location of Study:** _____

Echo Machine: _____

Reviewer: _____ **Date of Review:** _____

Time Spent for Review: _____

Indicate if each item listed is evaluated. Score as 1 for "Yes" response, 0 for "No".

SITUS, VEINS, ATRIA

YES	NO	
☐	☐	Liver and stomach shown (transverse plane)
☐	☐	Cardiac position
☐	☐	IVC and aorta demonstrated in relation to spine (transverse plane)
☐	☐	IVC, and SVC evaluated, imaging and color (in at least one view)(+/- azygous connection to SVC)
☐	☐	IVC connection to atrium documented in at least one view
☐	☐	Two left and two right pulmonary veins evaluated by color Doppler
☐	☐	Coronary sinus visualized
☐	☐	Atrial septum evaluated by imaging and color Doppler (in at least one view)

VENTRICLES

YES	NO	
☐	☐	Ventricular septum is evaluated by color Doppler (in at least two views)
☐	☐	Imaging for qualitative RV function assessment (in at least two views)
☐	☐	Imaging of LV function (in at least two views)
☐	☐	Evaluation adequate for measurement of LV end diastolic internal dimension or volume
☐	☐	Evaluation adequate for measurement of LV end systolic internal dimension or volume
☐	☐	Evaluation adequate for measurement of LV end systolic internal dimension or volume
☐	☐	Evaluation adequate for measurement of LV end diastolic septal and ventricular end diastolic wall thickness or LV mass
☐	☐	LV Outflow evaluated by color Doppler/spectral Doppler (in at least one view)
☐	☐	RV Outflow evaluated by color Doppler/spectral Doppler (in at least one view)

AV VALVES, SEMILUNAR VALVES

YES	NO	
☐	☐	TV imaging (adequate for measurement)/color/spectral Doppler (in at least one view)
☐	☐	TR jet evaluation by Doppler (in two views, if available)
☐	☐	MV imaging (adequate for measurement) /color/spectral Doppler (in at least one view)
☐	☐	MV in short axis (with and without color Doppler)
☐	☐	PV evaluated by imaging (adequate for measurement)/color Doppler/spectral Doppler (in at least two views)
☐	☐	AoV evaluated by imaging/color Doppler/spectral Doppler (in at least one view)
☐	☐	Coronary arteries evaluated by imaging/color Doppler in parasternal short-axis

VESSELS

YES	NO	
☐	☐	Evaluation adequate for measurement of AoV/Ao root/Ao sinotubular junction diameters in parasternal long-axis
☐	☐	Branch PA's evaluated by imaging/color Doppler/spectral Doppler (in at least one view)
☐	☐	Patent ductus arteriosus excluded in at least one view
☐	☐	Ascending Ao evaluated by imaging/color Doppler/spectral Doppler in at least one view
☐	☐	Ao Arch sidedness and branching evaluated by imaging/color Doppler
☐	☐	Ao Arch evaluated by imaging/color Doppler/spectral Doppler in suprasternal long-axis
☐	☐	Abdominal aorta evaluated by color Doppler/PW spectral Doppler in subxiphoid short axis/sagittal plane

TOTAL SCORE (Maximum = 30):

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☐	☐	Coronary sinus visualized
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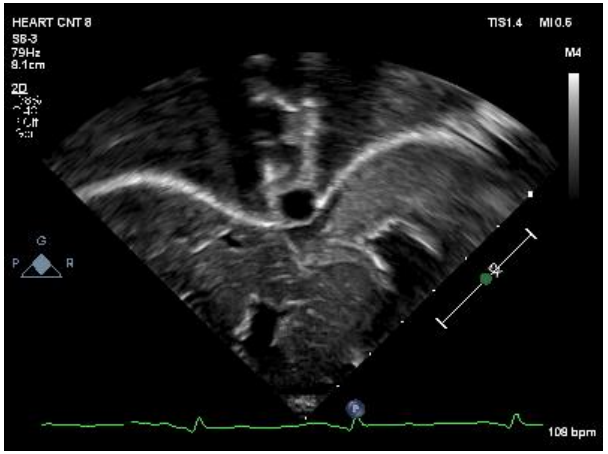
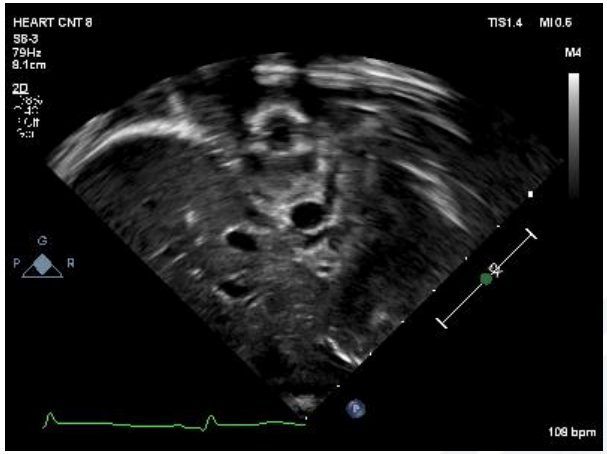
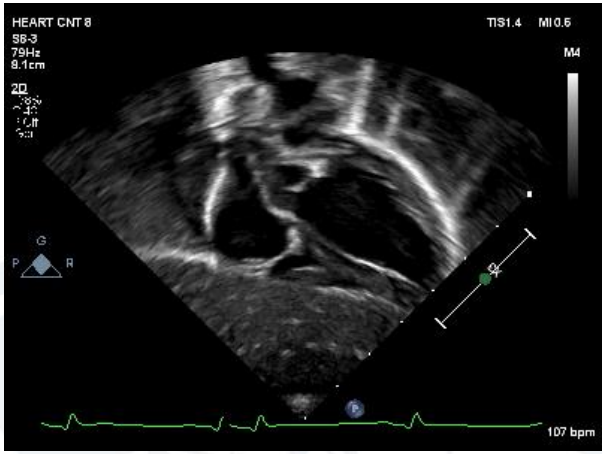
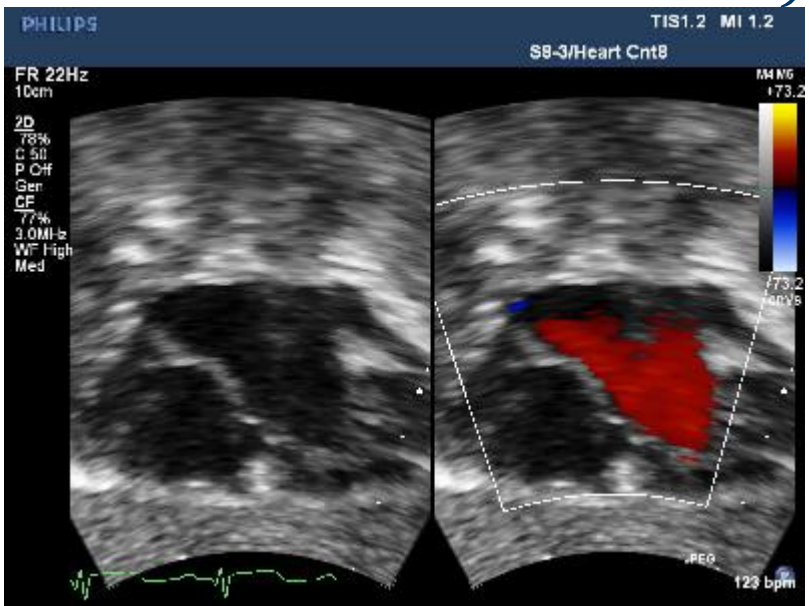
Situs, Veins, Atria

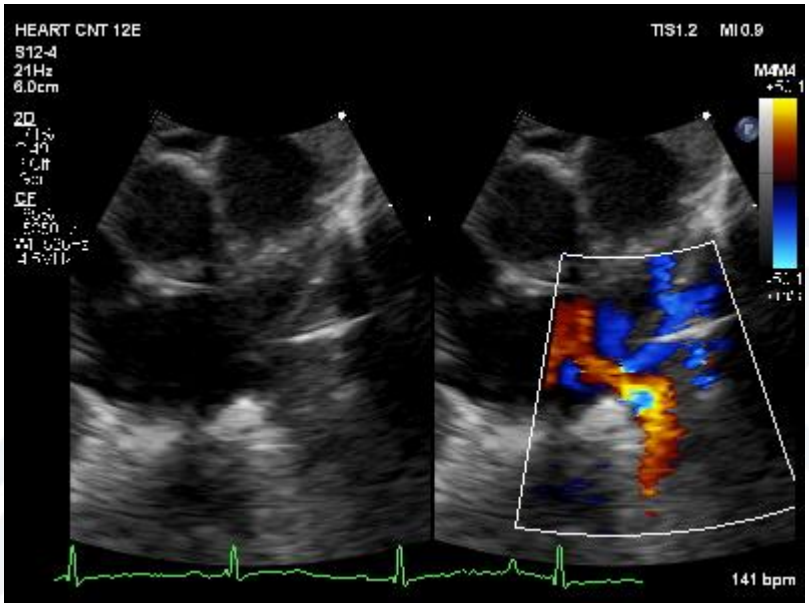


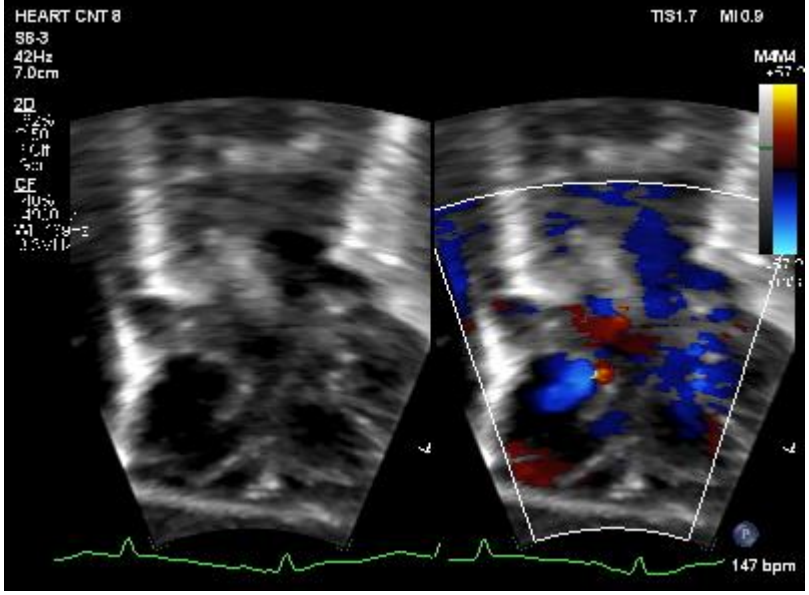


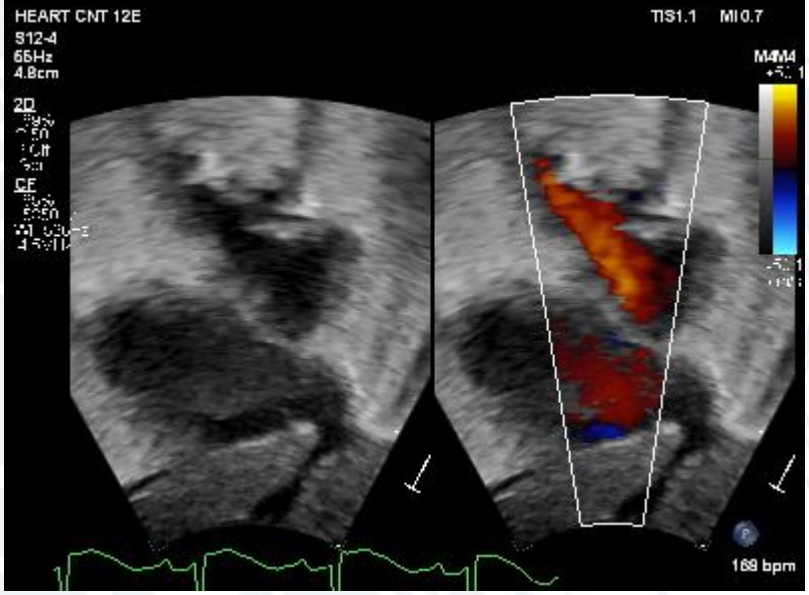


Situs, Veins, Atria









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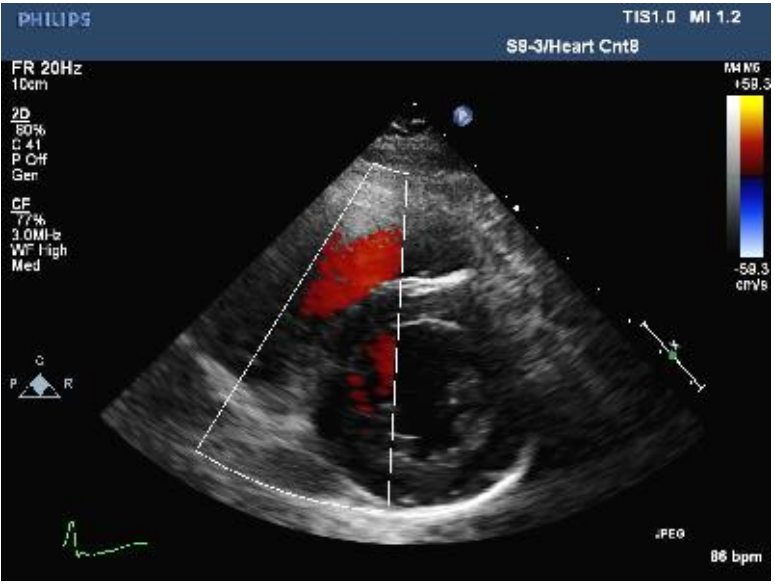
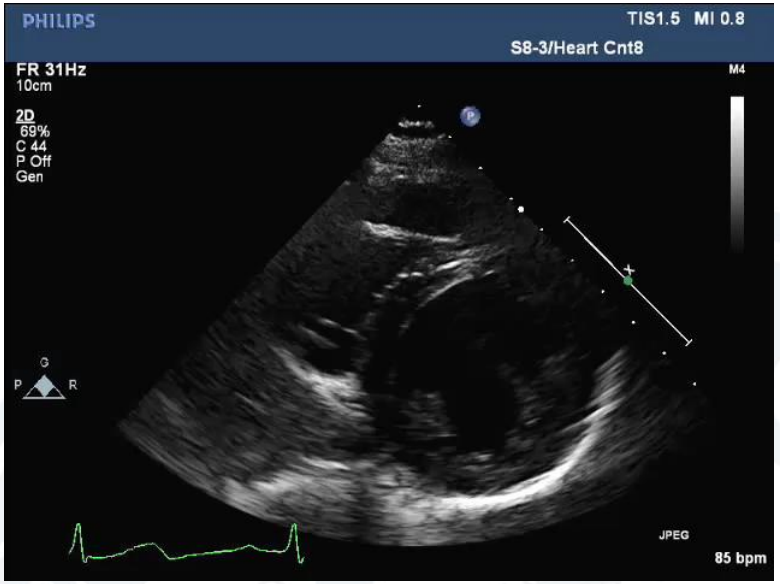
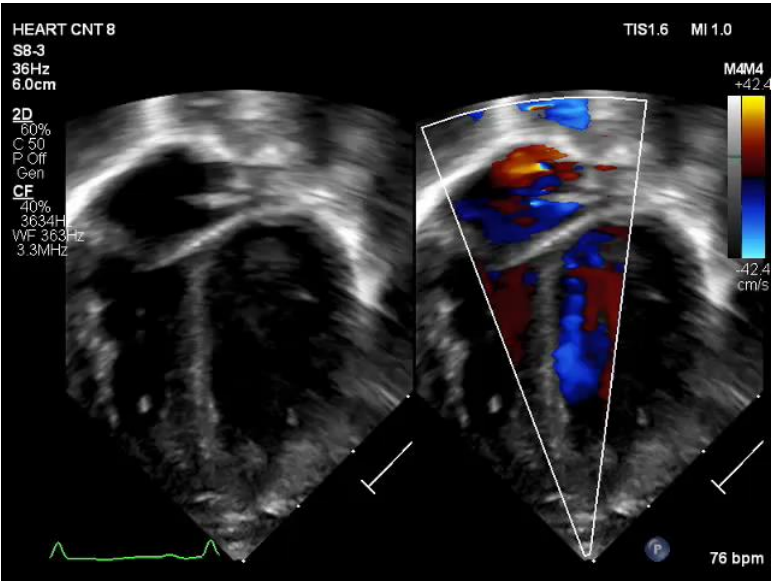
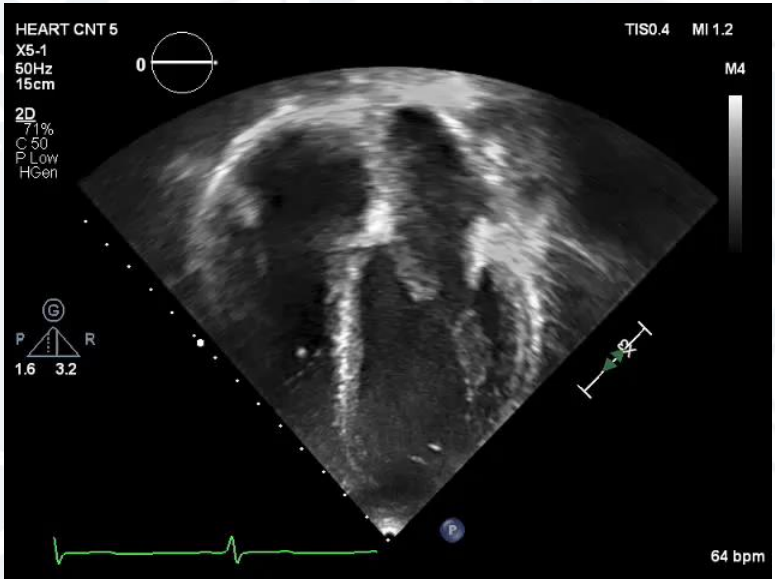
Ventricles

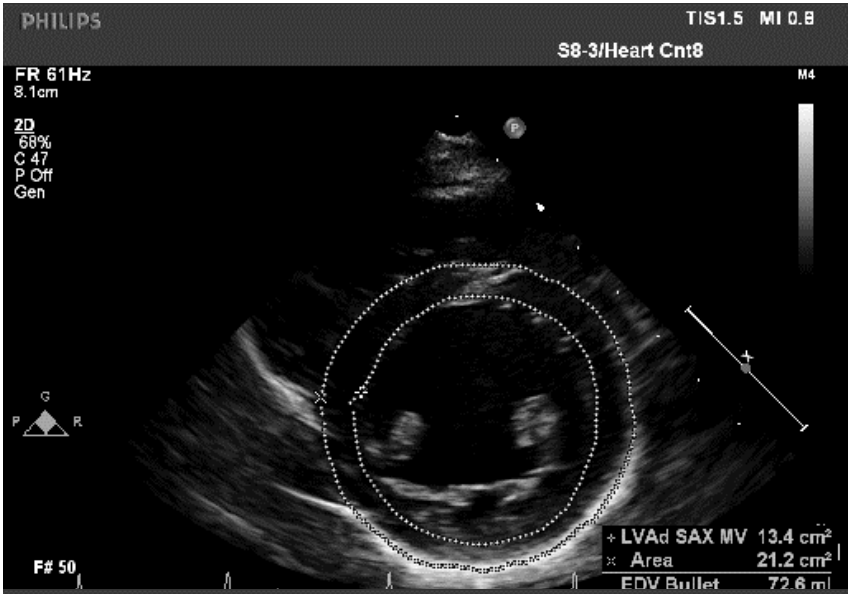

PHILIPS
TIS1.0 MI 1.2
S8-3/Heart Cnt8
FR 20Hz
10cm
2D
80%
C 41
P Off
Gen
CF
77%
3.0MHz
WF High
Med
-59.3
cm/s
JPEG
86 bpm

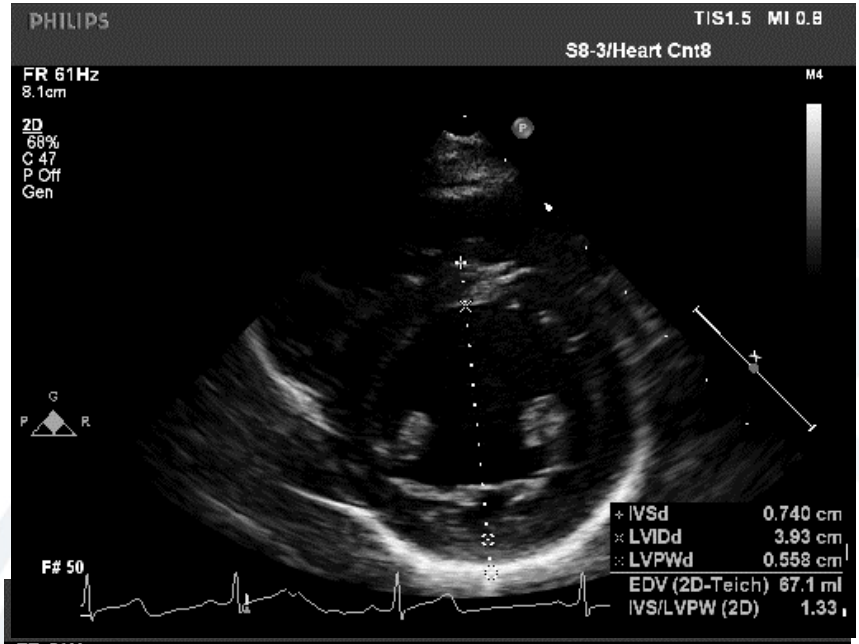

PHILIPS
TIS1.5 MI 0.8
S8-3/Heart Cnt8
FR 31Hz
10cm
M4
2D
69%
C 44
P Off
Gen
JPEG
85 bpm

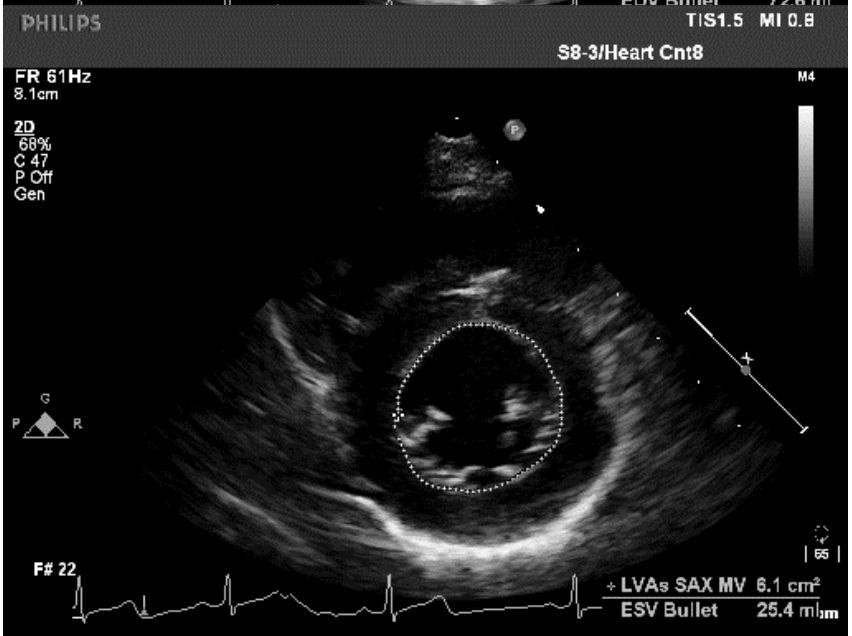

HEART CNT 8
TIS1.6 MI 1.0
S8-3
36Hz
6.0cm
M4M4
2D
60%
C 50
P Off
Gen
CF
40%
3634Hz
WF 363Hz
3.3MHz
-42.4
cm/s
76 bpm

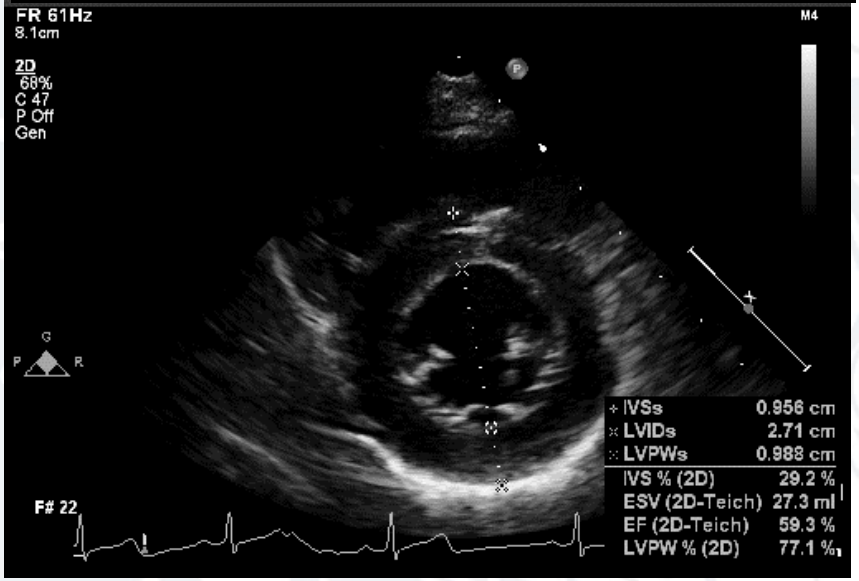

HEART CNT 5
TIS0.4 MI 1.2
X5-1
50Hz
15cm
M4
2D
71%
C 50
P Low
HGen
1.6 3.2
64 bpm

Ventricles

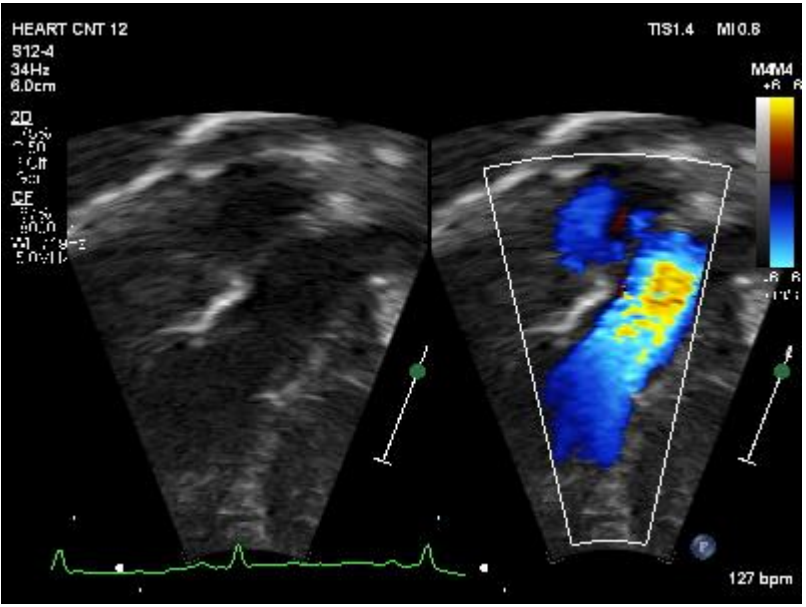

PHILIPS
TIS1.5 MI 0.8
S8-3/Heart Cnt8
FR 61Hz
8.1cm
M4
2D
68%
C 47
P Off
Gen
LVAd SAX MV 13.4 cm²
Area 21.2 cm²
EDV Bullet 72.6 ml
F# 50


PHILIPS
TIS1.5 MI 0.8
S8-3/Heart Cnt8
FR 61Hz
8.1cm
M4
2D
68%
C 47
P Off
Gen
IVSd 0.740 cm
LVIDd 3.93 cm
LVPWd 0.558 cm
EDV (2D-Teich) 67.1 ml
IVS/LVPW (2D) 1.33
F# 50

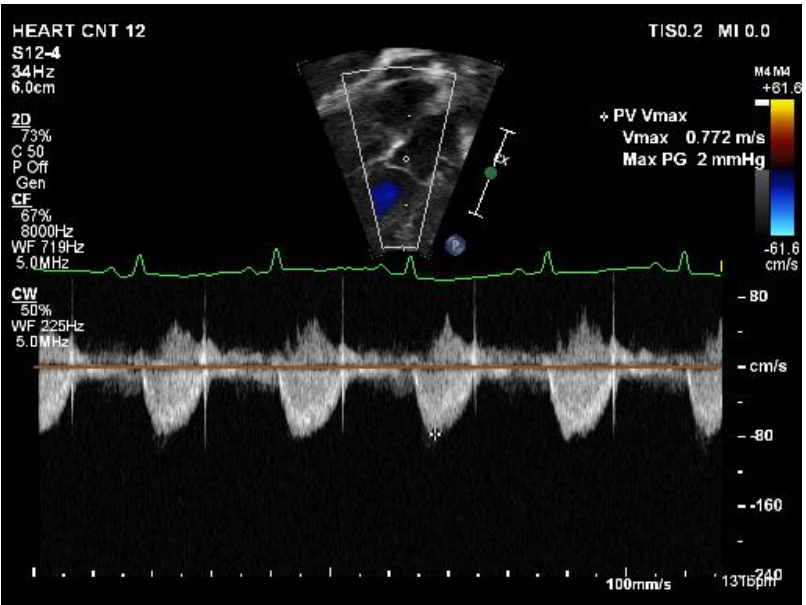

PHILIPS
TIS1.5 MI 0.8
S8-3/Heart Cnt8
FR 61Hz
8.1cm
M4
2D
68%
C 47
P Off
Gen
LVAs SAX MV 6.1 cm²
ESV Bullet 25.4 ml
F# 22

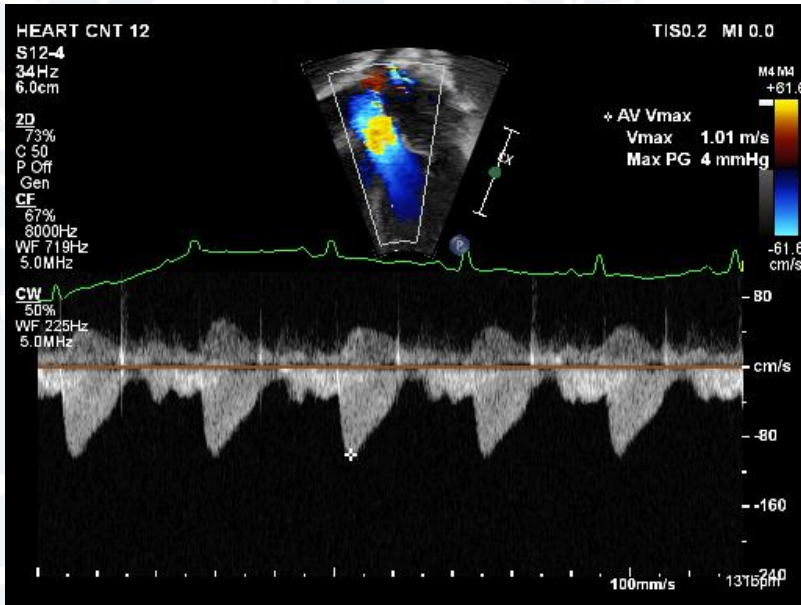

FR 61Hz
8.1cm
M4
2D
68%
C 47
P Off
Gen
IVSs 0.956 cm
LVIDs 2.71 cm
LVPWs 0.988 cm
IVS % (2D) 29.2 %
ESV (2D-Teich) 27.3 ml
EF (2D-Teich) 59.3 %
LVPW % (2D) 77.1 %
F# 22

Ventricles


HEART CNT 12
TIS1.4 MI0.6
S12-4
34Hz
6.0cm
2D
CF
M4M4
127 bpm


HEART CNT 12
TIS1.4 MI0.6
S12-4
34Hz
6.0cm
2D
CF
M4M4
127 bpm


HEART CNT 12
TIS0.2 MI 0.0
S12-4
34Hz
6.0cm
2D
CF
CW
PV Vmax
Vmax 0.772 m/s
Max PG 2 mmHg
80
cm/s
-80
-160
100mm/s


HEART CNT 12
TIS0.2 MI 0.0
S12-4
34Hz
6.0cm
2D
CF
CW
AV Vmax
Vmax 1.01 m/s
Max PG 4 mmHg
80
cm/s
-80
-160
100mm/s

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AV VALVES, SEMILUNAR VALVES

YES	NO	
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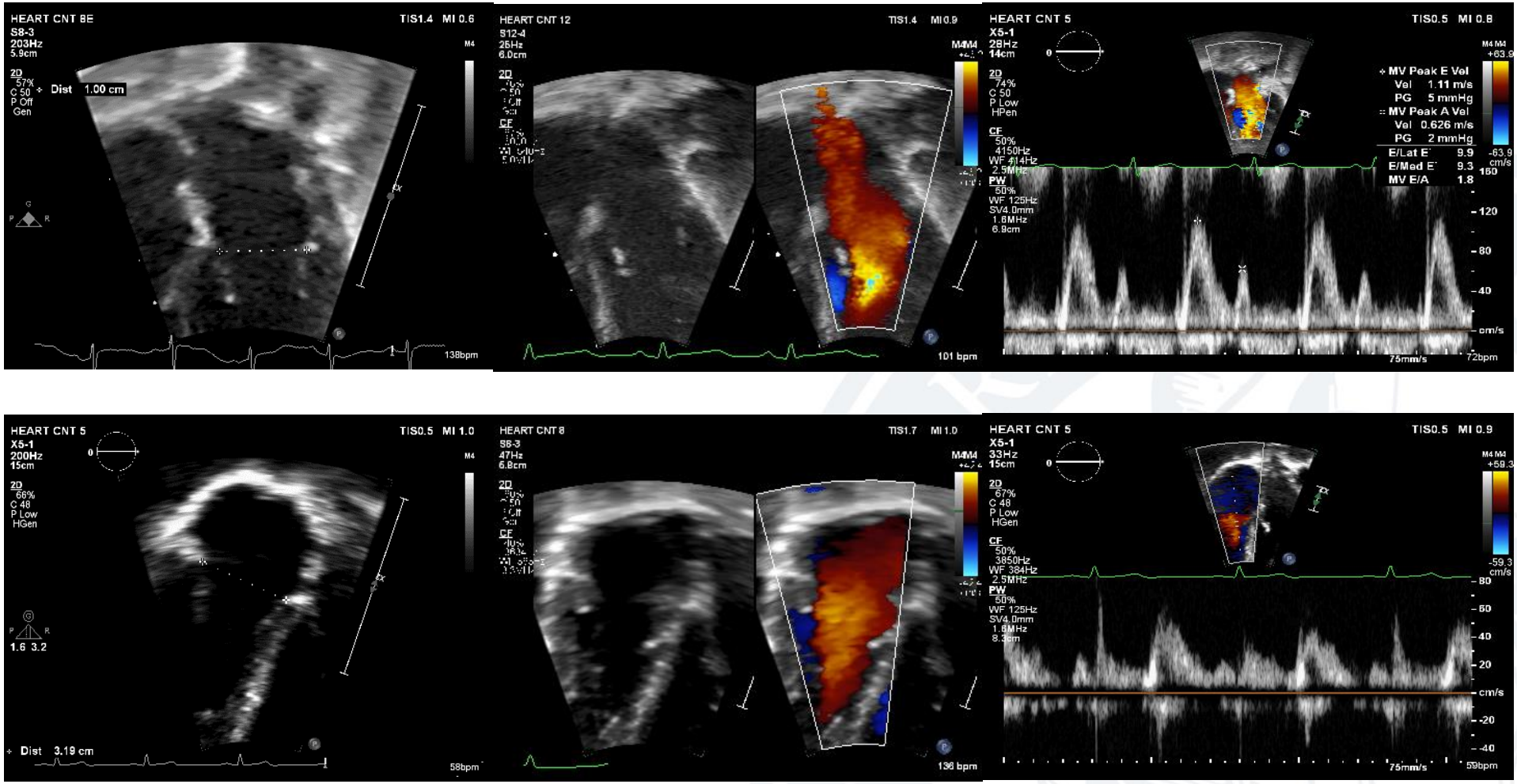
☐	☐	TR jet evaluation by Doppler (in two views, if available)
☐	☐	MV imaging (adequate for measurement) /color/spectral Doppler (in at least one view)
☐	☐	MV in short axis (with and without color Doppler)
☐	☐	PV evaluated by imaging (adequate for measurement)/color Doppler/spectral Doppler (in at least two views)
☐	☐	AoV evaluated by imaging/color Doppler/spectral Doppler (in at least one view)
☐	☐	Coronary arteries evaluated by imaging/color Doppler in parasternal short-axis

AV and Semilunar Valves



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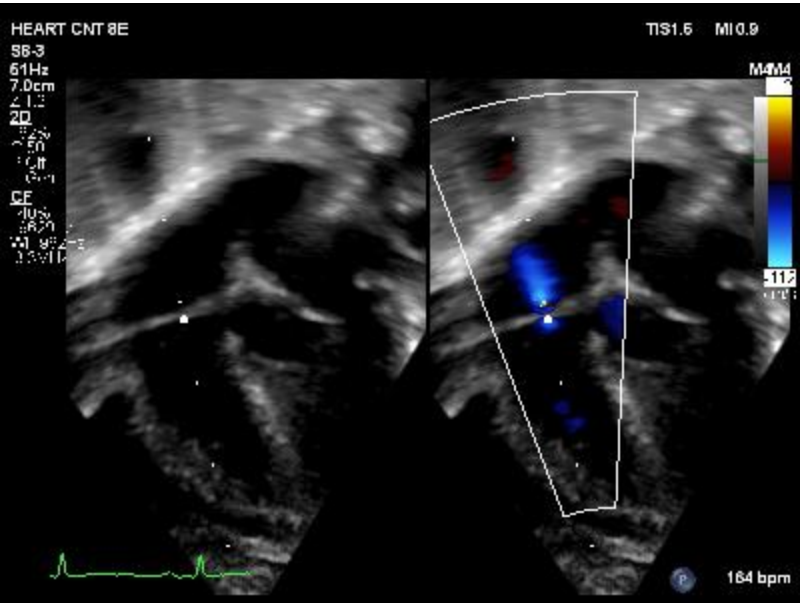
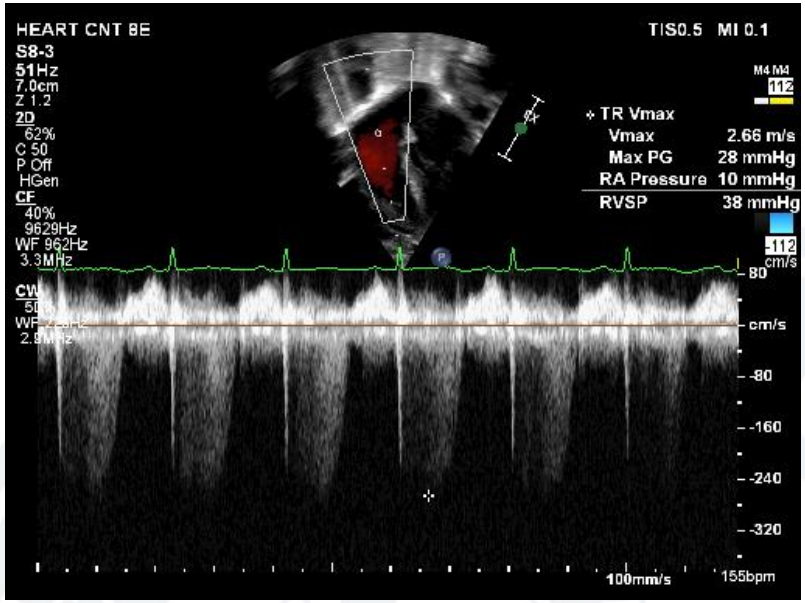
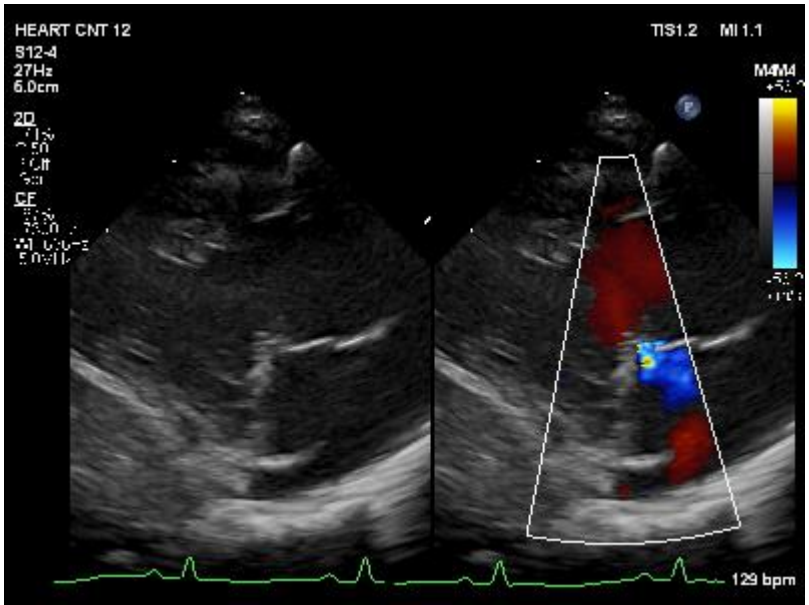
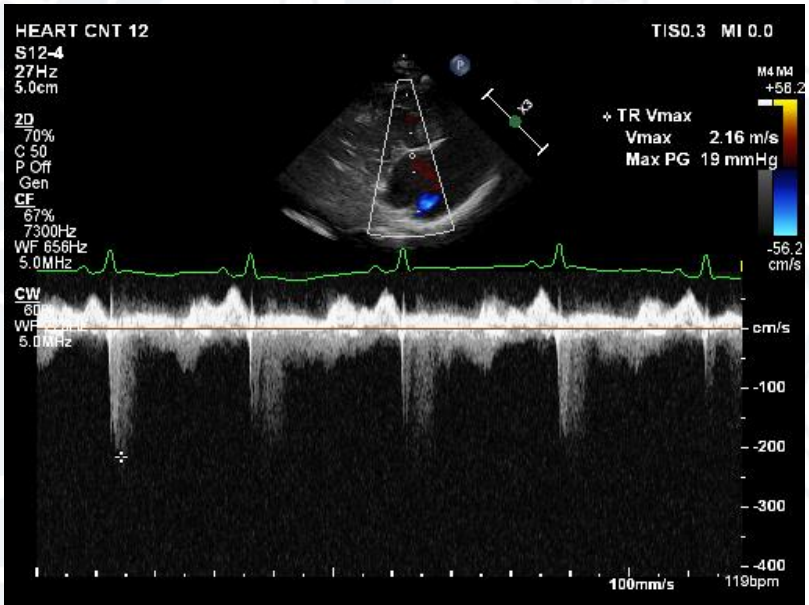
AV and Semilunar Valves

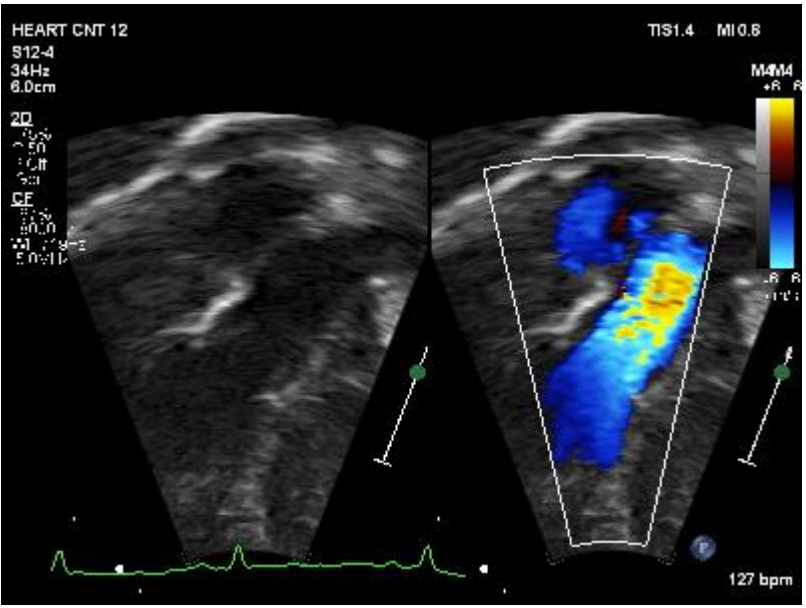


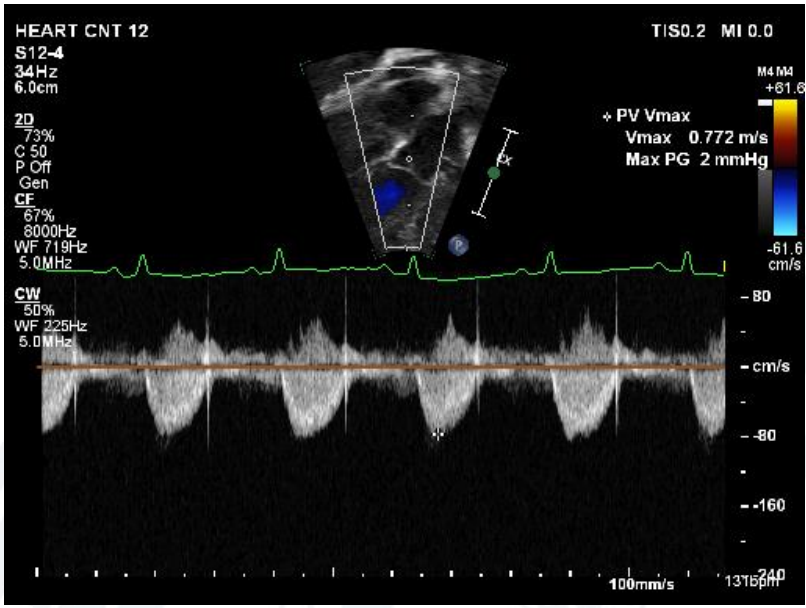


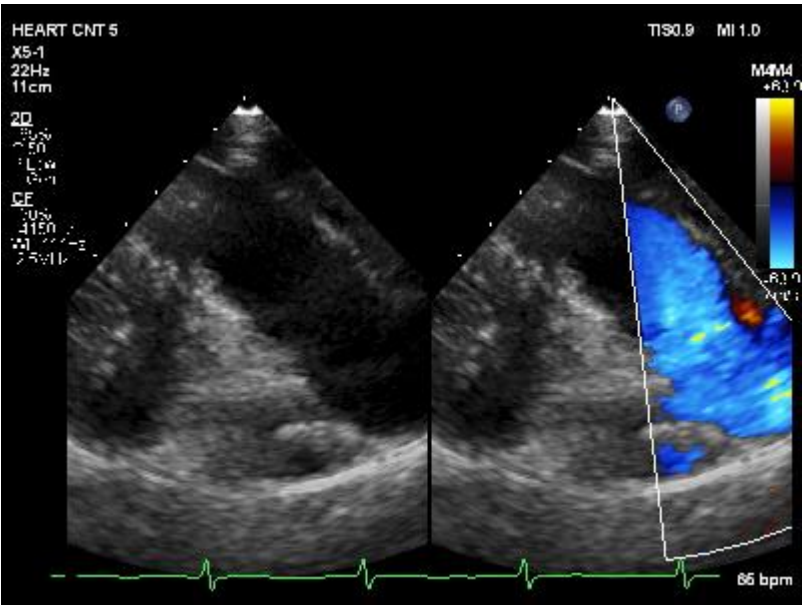


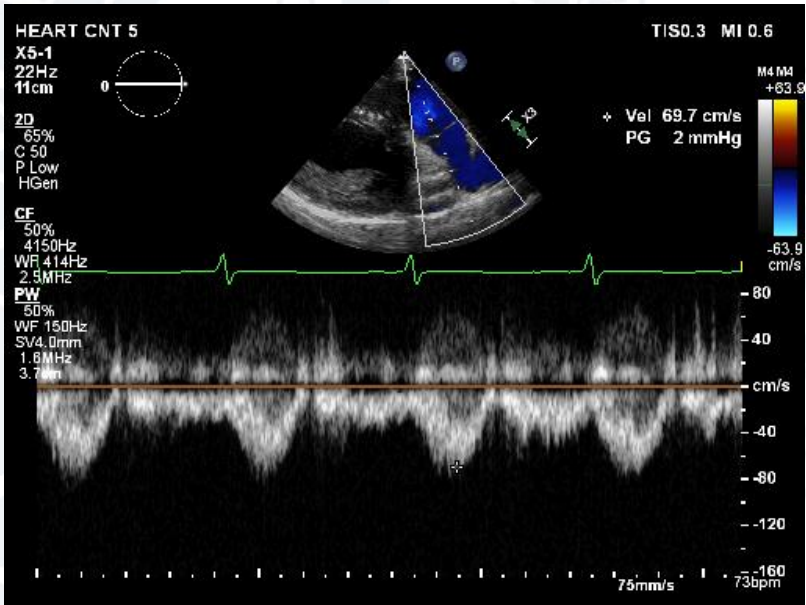


AV and Semilunar Valves









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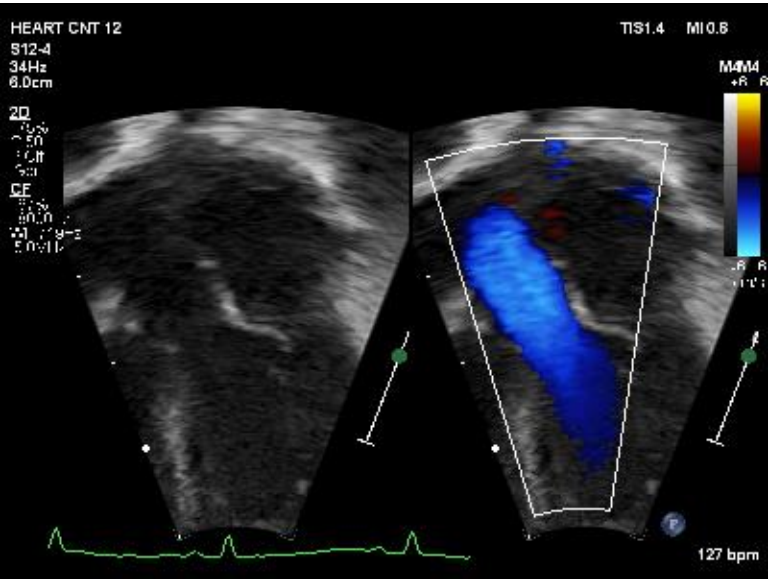

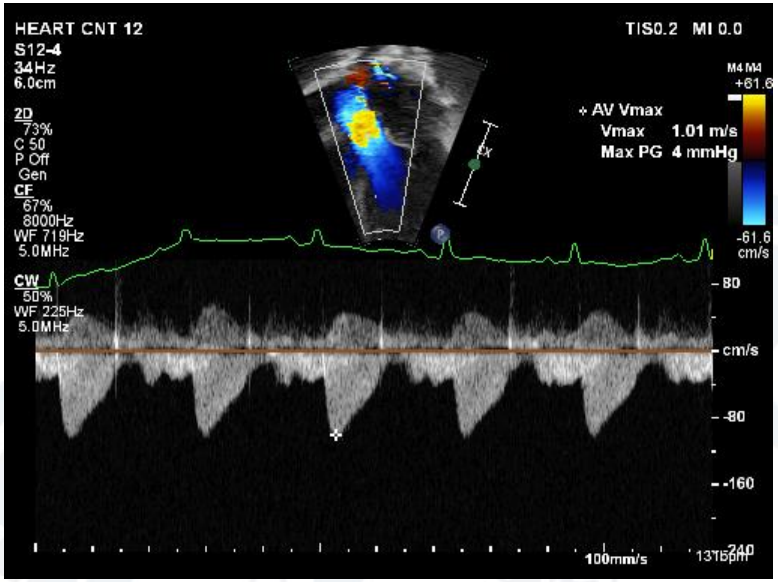

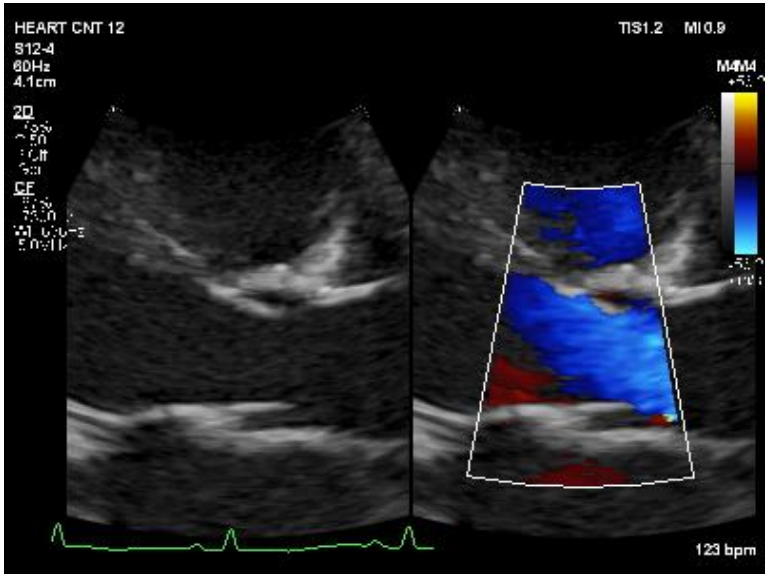

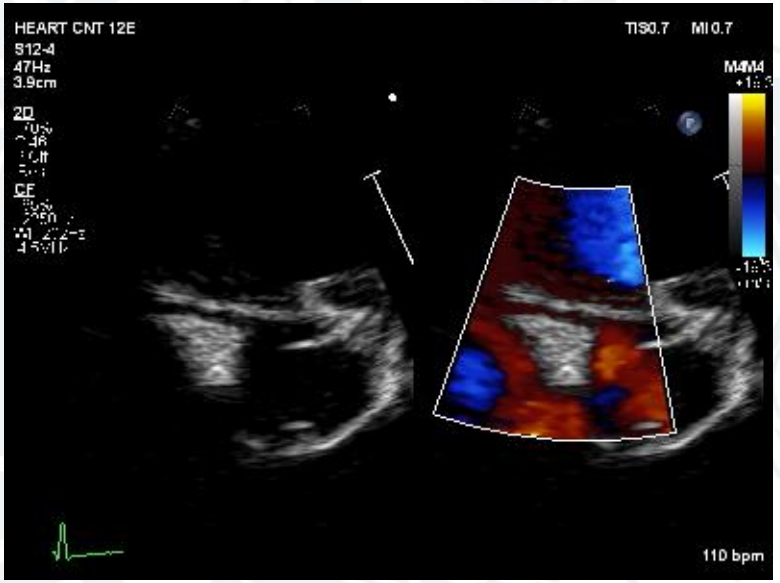

Echo Study Comprehensiveness Metric

AV VALVES, SEMILUNAR VALVES

YES	NO	
☐	☐	TV imaging (adequate for measurement)/color/spectral Doppler (in at least one view)
☐	☐	TR jet evaluation by Doppler (in two views, if available)
☐	☐	MV imaging (adequate for measurement) /color/spectral Doppler (in at least one view)
☐	☐	MV in short axis (with and without color Doppler)
☐	☐	PV evaluated by imaging (adequate for measurement)/color Doppler/spectral Doppler (in at least two views)
☐	☐	AoV evaluated by imaging/color Doppler/spectral Doppler (in at least one view)
☐	☐	Coronary arteries evaluated by imaging/color Doppler in parasternal short-axis

Echo Study Comprehensiveness Metric

VESSELS

YES	NO	
☐	☐	Evaluation adequate for measurement of AoV/Ao root/Ao sinotubular junction diameters in parasternal long-axis
☐	☐	Branch PA's evaluated by imaging/color Doppler/spectral Doppler (in at least one view)
☐	☐	Patent ductus arteriosus excluded in at least one view
☐	☐	Ascending Ao evaluated by imaging/color Doppler/spectral Doppler in at least one view
☐	☐	Ao Arch sidedness and branching evaluated by imaging/color Doppler
☐	☐	Ao Arch evaluated by imaging/color Doppler/spectral Doppler in suprasternal long-axis
☐	☐	Abdominal aorta evaluated by color Doppler/PW spectral Doppler in subxiphoid short axis/sagittal plane

TOTAL SCORE (Maximum = 30):

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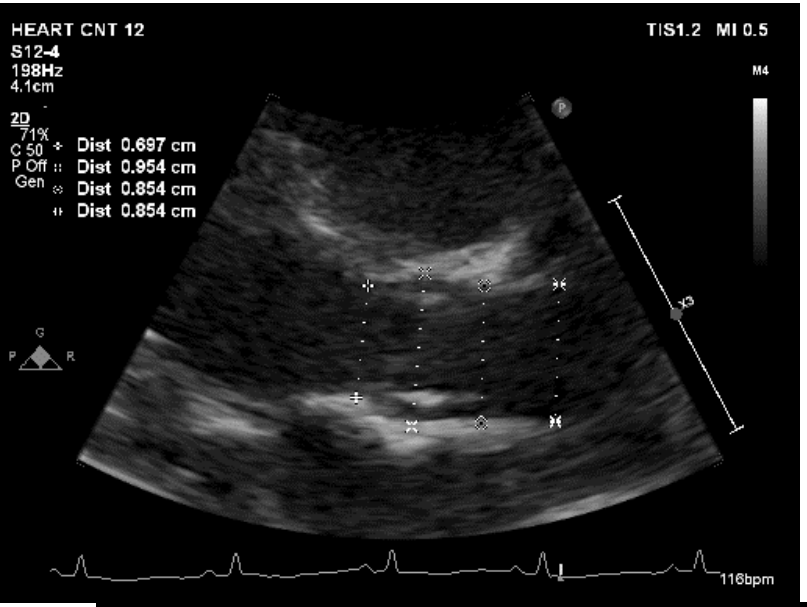
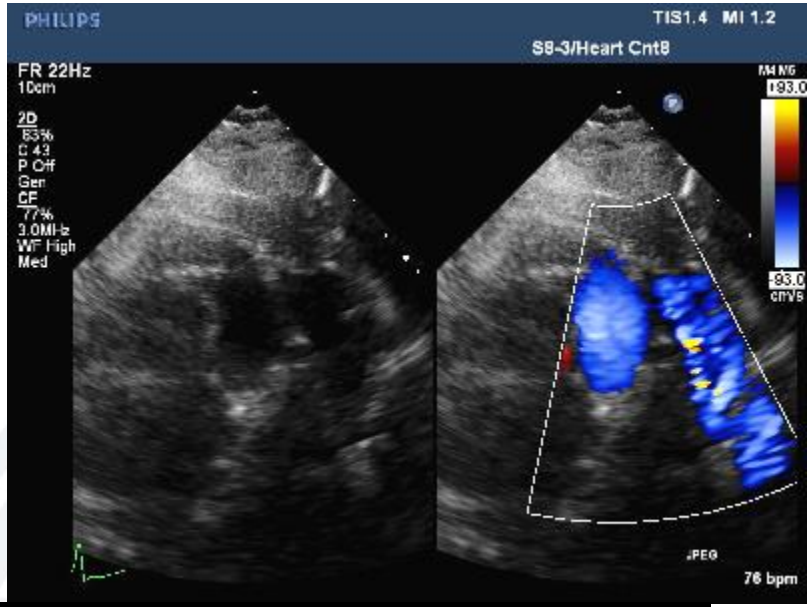
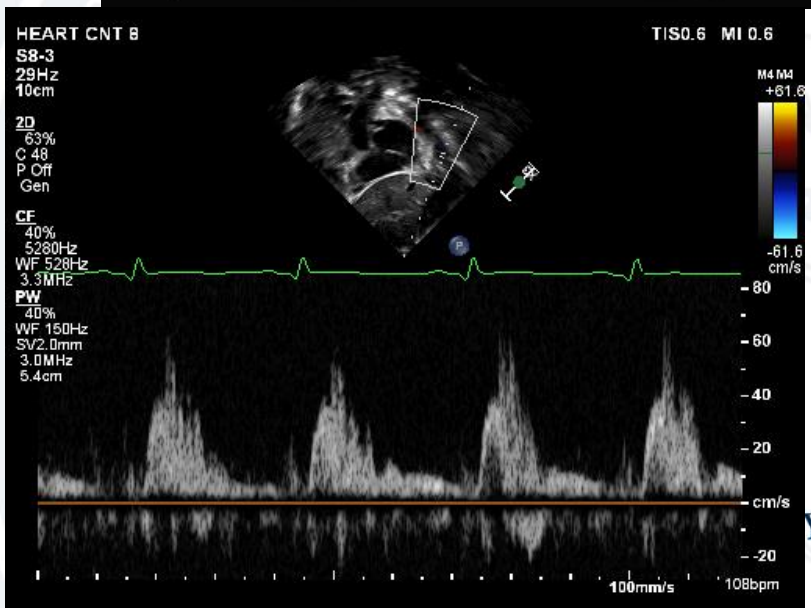
Vessels

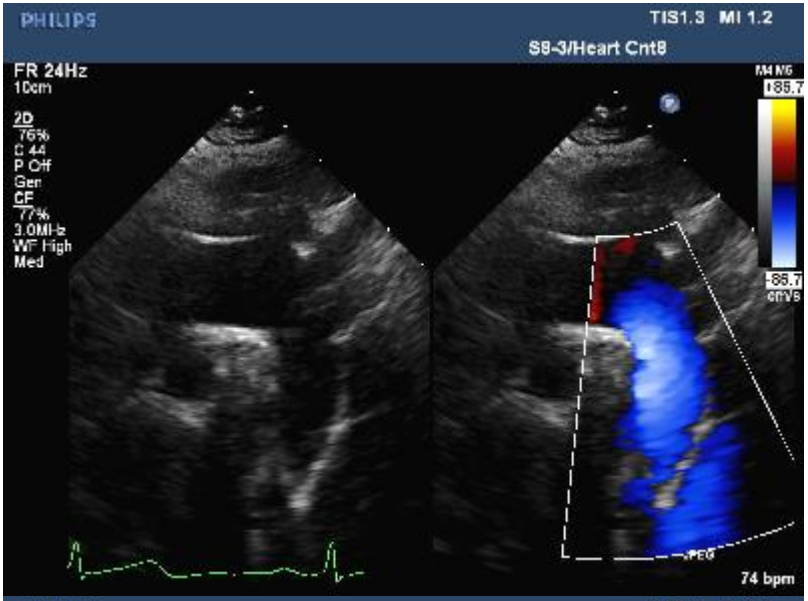

HEART CNT 12
S12-4
198Hz
4.1cm
TIS1.2 MI 0.5
M4
2D
71%
C 50
P Off
Gen
Dist 0.697 cm
Dist 0.954 cm
Dist 0.854 cm
Dist 0.854 cm
116bpm

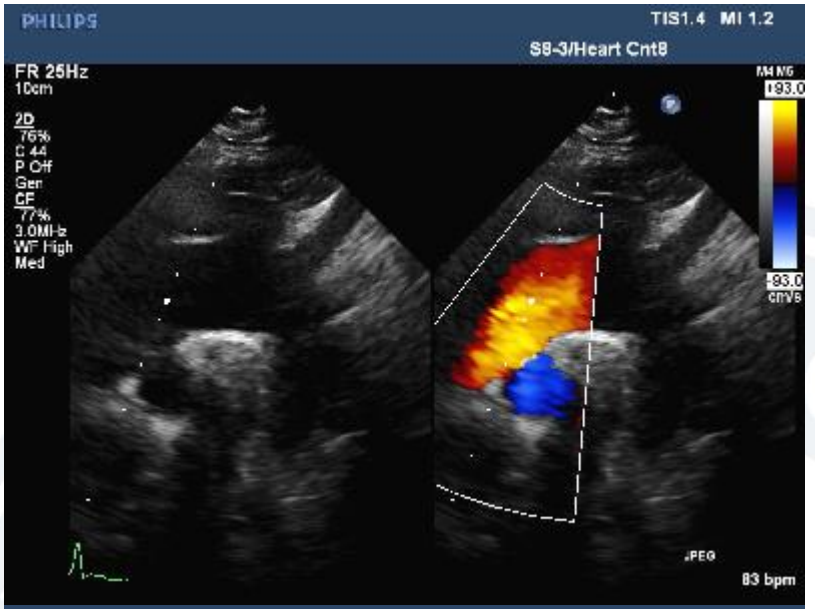

PHILIPS
TIS1.4 MI 1.2
S8-3/Heart Cnt8
FR 22Hz
10cm
2D
83%
C 43
P Off
Gen
CF
77%
3.0MHz
WF High
Med
M4 M6
193.0
-98.0
cm/s
JPEG
76 bpm


HEART CNT 8
S8-3
29Hz
10cm
TIS1.5 MI0.9
M4M4
2D
CF
106 bpm

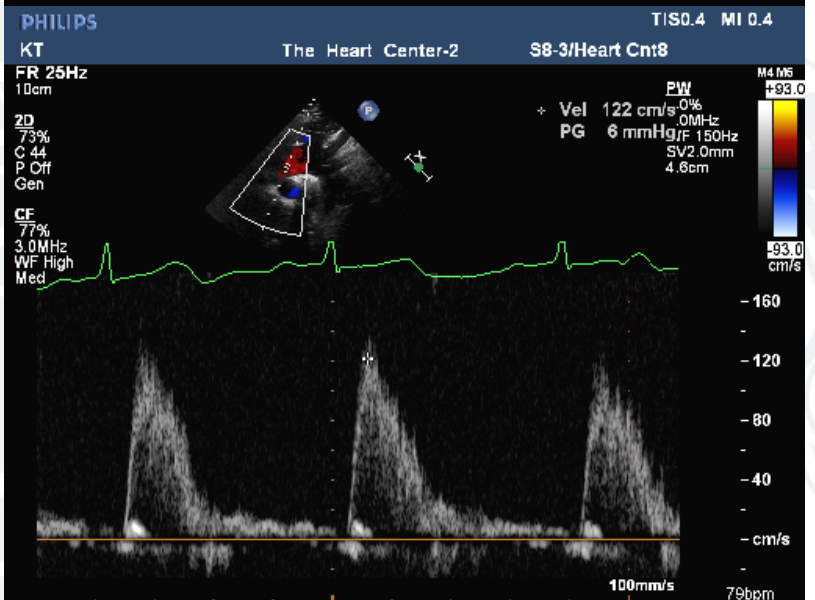

HEART CNT 8
S8-3
29Hz
10cm
TIS0.6 MI 0.6
M4 M4
+61.6
2D
63%
C 48
P Off
Gen
CF
40%
5280Hz
WF 528Hz
3.3MHz
PW
40%
WF 150Hz
SV2.0mm
3.0MHz
5.4cm
-61.6
cm/s
80
60
40
20
cm/s
-20
100mm/s
108bpm

Vessels


PHILIPS
TIS1.3 MI 1.2
S8-3/Heart Cnt8
FR 24Hz
10cm
2D
76%
C 44
P Off
Gen
CF
77%
3.0MHz
WF High
Med
74 bpm


PHILIPS
TIS1.4 MI 1.2
S8-3/Heart Cnt8
FR 25Hz
10cm
2D
76%
C 44
P Off
Gen
CF
77%
3.0MHz
WF High
Med
83 bpm


PHILIPS
TIS0.7 MI 0.1
KT
The Heart Center-2
S8-3/Heart Cnt8
FR 24Hz
10cm
CW
Vel 122 cm/s
PG 6 mmHg
2D
73%
C 44
P Off
Gen
CF
77%
3.0MHz
WF High
Med
cm/s
-40
-80
-120
-160
100mm/s
82bpm


PHILIPS
TIS0.4 MI 0.4
KT
The Heart Center-2
S8-3/Heart Cnt8
FR 25Hz
10cm
PW
Vel 122 cm/s
PG 6 mmHg
SV2.0mm
4.6cm
2D
73%
C 44
P Off
Gen
CF
77%
3.0MHz
WF High
Med
-160
-120
-80
-40
cm/s
100mm/s
79bpm

Echo Study Comprehensiveness Metric

VESSELS

YES	NO	
☐	☐	Evaluation adequate for measurement of AoV/Ao root/Ao sinotubular junction diameters in parasternal long-axis
☐	☐	Branch PA's evaluated by imaging/color Doppler/spectral Doppler (in at least one view)
☐	☐	Patent ductus arteriosus excluded in at least one view
☐	☐	Ascending Ao evaluated by imaging/color Doppler/spectral Doppler in at least one view
☐	☐	Ao Arch sidedness and branching evaluated by imaging/color Doppler
☐	☐	Ao Arch evaluated by imaging/color Doppler/spectral Doppler in suprasternal long-axis
☐	☐	Abdominal aorta evaluated by color Doppler/PW spectral Doppler in subxiphoid short axis/sagittal plane

TOTAL SCORE (Maximum = 30):

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		Case 1	
		Points (enter total pts)	Score out of 1 possible point
Scoring Reported: 1=all parts obtained, 0= all parts not obtained, partial credit for internal lab use only			
SITUS			
1	Liver and stomach shown (transverse plane) - [2]	2	1
	The liver (1 pt), and the stomach (1 pt) are viewed in the transverse plane		
2	Cardiac position - [1]	1	1
3	IVC and aorta demonstrated in relation to spine (transverse plane) - [2]	2	1
	The inferior vena cava (1 pt), and the aorta (1 pt) are viewed in the transverse plane		
4	IVC connection to atrium documented in at least one view - [1]	1	1
VENOUS CONNECTIONS			
5	Two left and two right pulmonary veins evaluated by color flow imaging (CFI) - [4]	3	0
	One point given for each pulmonary vein seen by CFI		
6	IVC, and SVC evaluated, 2D imaging and CFI (in at least one view) -[4]	4	1
	One point given for each of IVC and SVC seen by 2D imaging, and one point for each of IVC and SVC shown with CFI		
7	Coronary sinus visualized (in at least one view) - [1]	1	1
ATRIA			
8	Atrial septum evaluated by imaging and color Doppler (in at least one view) - [2]	2	1
	One point given for view of atrial septum with 2D imaging, one point given for view of atrial septum with CFI		
AV VALVES			
9	TV imaging (adequate for measurement)/CFI/spectral Doppler (in at least one view) - [3]	3	1
	2D clear enough to measure valve annulus (1 point), CFI (1 point), and spectral Doppler (1 point)		
10	TR jet evaluation by CW (in at least two views, if available) - [2]	2	1
	TR jet by CW in 2 views, 1 pt per view		
11	MV imaging (adequate for measurement)/CFI/spectral Doppler (in at least one view) - [3]	3	1
	2D clear enough to measure valve annulus (1 point), CFI (1 point), and spectral Doppler (1 point)		
12	MV in short axis (with and without CFI) - [2]	2	1
	MV in short axis viewed with 2D imaging (1 pt) and CFI (1 pt)		
VENTRICLES			
13	Ventricular septum is evaluated by CFI (in at least two views) - [2]	2	1
	One point for each of 2 views of the ventricular septum with CFI		
14	Imaging for qualitative RV function assessment (in at least two views) - [2]	2	1
	One point for each of 2 views of the right ventricle in which function can be qualitatively assessed		
15	Imaging of LV function (in at least two views) - [2]	2	1
	One point for each of 2 views of the left ventricle in which function can be measured		
16	Evaluation adequate for measurement of LV end diastolic internal dimension or volume - [1]	1	1
	The LVIDd measurement is clipped		
17	Evaluation adequate for measurement of LV end systolic internal dimension or volume - [1]	1	1
	The LVIDs measurement is clipped		
18	Evaluation adequate for measurement of LV end diastolic septal and ventricular end diastolic wall thickness or LV mass - [1]	1	1
	Either of these is clipped: 1) IVSd thickness and LVPWd measurement or 2) LV mass calculation result		
19	LV Outflow evaluated by CFI/spectral Doppler (in at least one view) - [2]	2	1
	LVOT flow evaluated by both CFI (1 pt) and spectral Doppler (1 pt)		
20	RV Outflow evaluated by CFI/spectral Doppler (in at least one view) - [2]	2	1
	RVOT flow evaluated by both CFI (1 pt) and spectral Doppler (1 pt)		
SEMILUNAR VALVES			
21	PV evaluated by imaging (adequate for measurement)/CFI/spectral Doppler (in at least two views) - [6]	3	0
	Two views of the pulmonary valve, each view has three components: 2D clear enough to measure valve annulus (1 point for each of two views), CFI (1 point for each of two views), and spectral Doppler (1 point for each of two views)		
22	AoV evaluated by imaging (adequate for measurement)/color Doppler/spectral Doppler (in at least one view) - [3]	3	1
	Two views of the aortic valve, each view has three components: 2D clear enough to measure valve annulus (1 point for each of two views), CFI (1 point for each of two views), and spectral Doppler (1 point for each of two views)		
23	Coronary arteries evaluated by imaging/CFI in parasternal short-axis - [4]	2	0
	The proximal RCA is seen by 2D imaging (1 pt) and CFI (1 pt) and the proximal LMCA is evaluated by 2D imaging (1 pt) and CFI (1 pt)		
VESSELS			
24	Evaluation adequate for measurement of AoV/Ao root/Ao sinotubular junction diameters measured in parasternal long-axis - [3]	3	1
	One point is given for each dimension measured and clipped: AoV/Ao root/Ao sinotubular junction		
25	Branch PA's evaluated by imaging/color Doppler/spectral Doppler (in at least one view) - [6]	6	1
	The LPA is seen by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt) and the RPA is seen by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt)		
26	Patent ductus arteriosus excluded in at least one view - [1]	1	1
27	Ascending Ao by imaging/CFI/spectral Doppler (in at least one view) - [3]	3	1
	The ascending aorta in SSN view is evaluated by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt)		
28	Ao Arch sidedness and branching evaluated by imaging/color Doppler - [2]	2	1
	The direction of and branching of the first brachiocephalic vessel in SSN view is evaluated by 2D imaging (1 pt) and CFI (1 pt)		
29	Ao Arch evaluated by imaging/CFI/spectral Doppler in suprasternal long-axis - [3]	3	1
	The aortic arch/descending aorta in SSN view is evaluated by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt)		
30	Abdominal aorta evaluated by CFI/PW spectral Doppler in subxiphoid short axis - [2]	2	1
	The abdominal aorta as seen from subxiphoid sagittal view evaluated by CFI (1 pt) and spectral Doppler (1 pt)		
MAX POSSIBLE = 73 (internal); 30 (external)			
TOTAL SCORE		67	27
% Complete			*90*

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		Case 1	
		Points (enter total pts)	Score out of 1 possible point
Scoring Reported: 1=all parts obtained, 0= all parts not obtained, partial credit for internal lab use only			
SITUS			
1	Liver and stomach shown (transverse plane) - [2]	2	1
	The liver (1 pt), and the stomach (1 pt) are viewed in the transverse plane		
2	Cardiac position - [1]	1	1
3	IVC and aorta demonstrated in relation to spine (transverse plane) - [2]	2	1
	The inferior vena cava (1 pt), and the aorta (1 pt) are viewed in the transverse plane		
4	IVC connection to atrium documented in at least one view - [1]	1	1
VENOUS CONNECTIONS			
5	Two left and two right pulmonary veins evaluated by color flow imaging (CFI) - [4]	3	0
	One point given for each pulmonary vein seen by CFI		
6	IVC, and SVC evaluated, 2D imaging and CFI (in at least one view) -[4]	4	1
	One point given for each of IVC and SVC seen by 2D imaging, and one point for each of IVC and SVC shown with CFI		
7	Coronary sinus visualized (in at least one view) - [1]	1	1
ATRIA			
8	Atrial septum evaluated by imaging and color Doppler (in at least one view) - [2]	2	1
	One point given for view of atrial septum with 2D imaging, one point given for view of atrial septum with CFI		

ATRIA			
8	Atrial septum evaluated by imaging and color Doppler (in at least one view) - [2]	2	1
	One point given for view of atrial septum with 2D imaging, one point given for view of atrial septum with CFI		
AV VALVES			
9	TV imaging (adequate for measurement)/CFI/spectral Doppler (in at least one view) - [3]	3	1
	2D clear enough to measure valve annulus (1 point), CFI (1 point), and spectral Doppler (1 point)		
10	TR jet evaluation by CW (in at least two views, if available) - [2]	2	1
	TR jet by CW in 2 views, 1 pt per view		
11	MV imaging (adequate for measurement)/CFI/spectral Doppler (in at least one view) - [3]	3	1
	2D clear enough to measure valve annulus (1 point), CFI (1 point), and spectral Doppler (1 point)		
12	MV in short axis (with and without CFI) - [2]	2	1
	MV in short axis viewed with 2D imaging (1 pt) and CFI (1 pt)		
VENTRICLES			
13	Ventricular septum is evaluated by CFI (in at least two views) - [2]	2	1
	One point for each of 2 views of the ventricular septum with CFI		
14	Imaging for qualitative RV function assessment (in at least two views) - [2]	2	1
	One point for each of 2 views of the right ventricle in which function can be qualitatively assessed		
15	Imaging of LV function (in at least two views) - [2]	2	1
	One point for each of 2 views of the left ventricle in which function can be measured		
16	Evaluation adequate for measurement of LV end diastolic internal dimension or volume - [1]	1	1
	The LVIDd measurement is clipped		
17	Evaluation adequate for measurement of LV end systolic internal dimension or volume - [1]	1	1
	The LVIDs measurement is clipped		
18	Evaluation adequate for measurement of LV end diastolic septal and ventricular end diastolic wall thickness or LV mass - [1]	1	1
	Either of these is clipped: 1) IVSd thickness and LVPWd measurement or 2) LV mass calculation result		
19	LV Outflow evaluated by CFI/spectral Doppler (in at least one view) - [2]	2	1
	LVOT flow evaluated by both CFI (1 pt) and spectral Doppler (1 pt)		
20	RV Outflow evaluated by CFI/spectral Doppler (in at least one view) - [2]	2	1
	RVOT flow evaluated by both CFI (1 pt) and spectral Doppler (1 pt)		

	LVOT flow evaluated by both CFI (1 pt) and spectral Doppler (1 pt)		
20	RV Outflow evaluated by CFI/spectral Doppler (in at least one view) - [2]	2	1
	RVOT flow evaluated by both CFI (1 pt) and spectral Doppler (1 pt)		
SEMILUNAR VALVES			
21	PV evaluated by imaging (adequate for measurement)/CFI/spectral Doppler (in at least two views) - [6]	3	0
	Two views of the pulmonary valve, each view has three components: 2D clear enough to measure valve annulus (1 point for each of two views), CFI (1 point for each of two views), and spectral Doppler (1 point for each of two views)		
22	AoV evaluated by imaging (adequate for measurement)/color Doppler/spectral Doppler (in at least one view) - [3]	3	1
	Two views of the aortic valve, each view has three components: 2D clear enough to measure valve annulus (1 point for each of two views), CFI (1 point for each of two views), and spectral Doppler (1 point for each of two views)		
23	Coronary arteries evaluated by imaging/CFI in parasternal short-axis - [4]	2	0
	The proximal RCA is seen by 2D imaging (1 pt) and CFI (1 pt) and the proximal LMCA is evaluated by 2D imaging (1 pt) and CFI (1 pt)		
VESSELS			
24	Evaluation adequate for measurement of AoV/Ao root/Ao sinotubular junction diameters measured in parasternal long-axis - [3]	3	1
	One point is given for each dimension measured and clipped: AoV/Ao root/Ao sinotubular junction		
25	Branch PA's evaluated by imaging/color Doppler/spectral Doppler (in at least one view) - [6]	6	1
	The LPA is seen by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt) and the RPA is seen by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt)		
26	Patent ductus arteriosus excluded in at least one view - [1]	1	1
27	Ascending Ao by imaging/CFI/spectral Doppler (in at least one view) - [3]	3	1
	The ascending aorta in SSN view is evaluated by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt)		
28	Ao Arch sidedness and branching evaluated by imaging/color Doppler - [2]	2	1
	The direction of and branching of the first brachiocephalic vessel in SSN view is evaluated by 2D imaging (1 pt) and CFI (1 pt)		
29	Ao Arch evaluated by imaging/CFI/spectral Doppler in suprasternal long-axis - [3]	3	1
	The aortic arch/descending aorta in SSN view is evaluated by 2D imaging (1 pt), CFI (1 pt) and spectral Doppler (1 pt)		
30	Abdominal aorta evaluated by CFI/PW spectral Doppler in subxiphoid short axis - [2]	2	1
	The abdominal aorta as seen from subxiphoid sagittal view evaluated by CFI (1 pt) and spectral Doppler (1 pt)		
MAX POSSIBLE = 73 (internal); 30 (external)			
TOTAL SCORE		67	27
% Complete			*90*

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Comprehensive Study Workgroup

- **Puja Banka, M.D., F.A.C.C.**
  - Boston Children's Hospital
- **Ritu Sachdeva, M.B.B.S., F.A.C.C.**
  - Sibley Heart Center Cardiology
- **Mark Fogel, M.D., F.A.C.C**
  - Children's Hospital of Philadelphia
- **M. Eric Ferguson, M.D.**
  - Sibley Heart Center Cardiology
- **Vivek Allada, M.D., F.A.C.C.**
  - Children's Hospital of Pittsburgh
- **Stacey Drant, M.D.**
  - Children's Hospital of Pittsburg
- **Leo Lopez**
  - Nicklaus Children's Hospital

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Arnold Palmer Hospital Echo Lab

- Lori Lampman
- Tammy Chmiko
- Otton Fernandez
- Jaimi Grinstead
- Kayla Tremblay
- Satee Matthews
- Rachel Goettsch

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