

WKS_ECHO_DEFAULT	Default Echo Worksheet – Software Requirements Specification		
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Approved by:			

1 Overview

This document defines software design specifications for Default Echo worksheet.

This worksheet is based on Default Base Worksheet, defined in WKS_BASE_DEFAULT.

2 Software Requirements Specification

2.1 Requirements

2.1.1 Protocols

Protocols shall be supported:

- Transthoracic (default)
- Pediatric
- Transesophageal

2.1.1.1 Transthoracic (TTE) (SR-3449)

Worksheet shall allow the user to comment on the following components of the heart for TTE protocol:

- Left Ventricle
- Left Atrium
- Right Atrium
- Right Ventricle
- Aortic Valve
- Mitral Valve
- Pulmonic Valve
- Tricuspid Valve
- Pericardium
- Aorta
- Pulmonary Artery
- IVC & Pulmonic Vein
- Rhythm (in the Patient info section)

2.1.1.2 Pediatric (SR-3450)

Worksheet shall allow the user to comment on the following areas for Pediatric protocol:

- Segmental Anatomy
- Venous Return
- Atria
- Atrioventricular Valves
- Ventricles
- Semilunar Valves
- Great Vessels
- Ductus Arteriosus
- Coronary Arteries
- Pericardium

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Worksheet shall allow the user to comment on Segmental Anatomy observations. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Venous Return observations and measurements. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Atria observations and measurements. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Atrioventricular Valves observations and measurements. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Ventricles observations and measurements. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Semilunar Valves observations and measurements. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Great Vessels observations and measurements. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Ductus Arteriosus observations and measurements. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Coronary Arteries observations. Findings shall generate based on observations.

Worksheet shall allow the user to comment on Pericardium observations and measurements. Findings shall generate based on observations.

Pediatric Protocol shall not include the SWM diagram.

Pediatric Protocol shall provide Z-scores functionality. A Z-Score Source may be selected to be used for the fields where more than one source is available.

Worksheet shall generate Conclusions for Pediatric Protocol as follows:

- Include Segmental Anatomy Findings
- Include Findings (generated and manually entered) from any other tab which has at least one abnormal dropdown selection, minus any generated 'visualized' statements

2.1.1.3 Transesophageal (TEE) (SR-3451)

Worksheet shall allow the user to comment on the following components of the heart for TEE protocol:

- Left Ventricle
- Left Atrium
- Right Atrium
- Right Ventricle
- LAA
- IS

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- Aortic Valve
- Mitral Valve
- Pulmonic Valve
- Tricuspid Valve
- Pericardium
- Aorta
- IVC & Pulmonic Vein
- Rhythm (in the Patient info section)

2.1.1.4 Common for TTE and TEE (SR-4835)

Worksheet shall allow user to comment on contrast agent used, and the amount of the contrast agent.

TEE shall also allow user to comment on ease of probe insertion.

This information shall appear in the form of a protocol statement on the study report.

Worksheet shall allow the user to report on Left Ventricle measurements in the following collapsible groups:

- LV EF
- LV Mass
- LV Other
- LV Area
- Length

Worksheet shall allow the user to report on Left Ventricle observations in the following groups:

- LV Morphology/Other
- LV Function
- LV Shape
- LV Structural Details
- LV Thrombus
- LV Wall Motion Diagram

Worksheet shall allow the user to designate the motion of each of 17 walls of the heart via an interactive ASE TTE heart diagram. (16 walls for echo2 diagram.)

The interactive TTE heart diagram shall be customizable on a client/division level.

Worksheet shall generate Findings for the Left Ventricle based on observations selected on the tab.

Certain LV observations may be driven by selections in other fields on the worksheet.

Worksheet shall allow the user to report on Left Atrium measurements in the following collapsible groupss:

- LA Dimensions
- LA Volume
- LA Area

Worksheet shall allow the user to report on Left Atrium observations in the following groups:

- LA Morphology
- LA Structural Details
- LA Thrombus
- LA Mass

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Certain LA observations may be driven by a set of other observations on the worksheet.
Worksheet shall generate Findings for the Left Atrium based on observations selected on the tab.

Worksheet shall allow the user to report on Right Atrium measurements in the following collapsible groups:

- RA Dimensions
- RA Volume/Area

Worksheet shall allow the user to report on Right Atrium observations in the following groups:

- RA Morphology
- RA Thrombus
- RA Mass

Worksheet shall generate Findings for the Right Atrium based on observations selected on the tab.

Worksheet shall allow the user to report on Right Ventricle measurements in the following collapsible groups:

- RV Dimensions
- RV Area
- RV Other

Worksheet shall allow the user to report on Right Ventricle observations in the following groups:

- RV Morphology
- RV Function
- RV Thrombus
- RV Mass

Worksheet shall generate Findings for the Right Ventricle based on observations selected on the tab.

Worksheet shall allow the user to report on Aortic Valve measurements in the following collapsible groups:

- LVOT
- AV
- Aortic Regurg

Worksheet shall allow the user to report on Aortic Valve observations in the following groups:

- AV Structure
- AV Function
- AV Vegetation

Worksheet shall generate Findings for the Aortic Valve based on observations selected on the tab.

Worksheet shall allow the user to report on Mitral Valve measurements in the following collapsible groups:

- MV
- MV Annulus
- MV Regurg

Worksheet shall allow the user to report on Mitral Valve observations in the following groups:

- MV Structure
- MV Function
- MV Vegetation

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Worksheet shall generate Findings for the Mitral Valve based on observations selected on the tab.

Worksheet shall allow the user to report on Tricuspid Valve measurements in the following collapsible groups:

- TV
- TV Annulus
- TV Regurg

Worksheet shall allow the user to report on Tricuspid Valve observations in the following groups:

- TV Structure
- TV Function
- TV Vegetation

Worksheet shall generate Findings for the Tricuspid Valve based on observations selected on the tab.

Worksheet shall allow the user to report on Pulmonic Valve measurements. This measurements section shall be collapsible.

Worksheet shall allow the user to report on Pulmonic Valve observations in the following groups:

- PV Structure
- PV Function
- PV Vegetation

Worksheet shall generate Findings for the Pulmonic Valve based on observations selected on the tab.

Worksheet shall allow the user to report on Pericardium measurements. This measurements section shall be collapsible.

Worksheet shall allow the user to report on Pericardium observations in the following groups:

- Pericardium
- Pericardium Effusion

Worksheet shall generate Findings for the Pericardium based on observations selected on the tab.

Worksheet shall allow the user to report on Aorta measurements. This measurements section shall be collapsible.

Worksheet shall allow the user to report on Aorta observations in the following groups:

- Aorta
- Aorta Dissection

Worksheet shall generate Findings for the Aorta based on observations selected on the tab.

Worksheet shall allow the user to report on Pulmonary Artery measurements. This measurements section shall be collapsible.

Worksheet shall allow the user to report on Pulmonary Artery observations.

Worksheet shall generate Findings for the Pulmonary Artery based on observations selected on the tab.

Worksheet shall allow the user to report on the following IVC & Pulmonary Vein measurements. These measurements sections shall be collapsible.

Worksheet shall allow the user to report on IVC & Pulmonary Vein observations.

Worksheet shall generate Findings for the IVC & Pulmonary Vein based on observations selected on the tab.

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Worksheet shall calculate BSA values where appropriate when the corresponding value is not empty, AND BSA is available.

Worksheet shall generate Conclusions for TTE and TEE as follows:

- Include LV Findings minus any 'visualized' statements
- Worksheet options: Include RV Findings or LA Findings
- Include Findings (generated and manually entered) from any other tab which has at least one abnormal dropdown selection, minus any generated 'visualized' statements

2.1.2 Measurements and Observations

Worksheet shall allow the user to comment on measurements and observations.

2.1.2.1 Group: LV (SR-3452)

LV Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
LV Morphology/Other				
Internal Dimension	Normal		Select: LV_IntDim	lv_int_dim
Cardiomyopathy	<blank>		Select: Cardio	lv_cardio
LV Function				
Global Wall Motion	Normal	If anything abnormal is selected on the SWM diagram, this dropdown is to be blanked out and disabled Exception: dropdown is linked to diagram AND diagram is globally set	Select:LV_GlobWall	lv_glob_wall
Visual EF	<blank>	Disabled if value entered in corresponding measurement field	Select:LV_VisEF	lv_vis_ef
(measurement field)	<blank>	Disabled if corresponding dropdown has non-blank selection	text	lv_vis_ef_meas
Septal Wall Motion	<blank>	When a non-default selection is made, blank out Global Wall Motion on this tab. Exception: If Global Wall Motion is linked to diagram, its selection is not affected.	Select:LV_Sept_Wall	lv_sept_wall
Diastolic Filling/ Dysfunction	<blank>		Select: LV_Dia_Dysfun	lv_dia_disfun
LAP	<blank>		select: LV_LAP	lv_lap
The following 4 are TTE only				
Mid Ventricular Obstruction			select: Abs_Pres	lv_obstruction
Apical Aneurysm			select: Abs_Pres	lv_apical_aneurysm
False Tendon			select: Abs_Pres	lv_false_tendon
GLS			select: Bord_Abn	lv_gls
LV Shape				
LV Shape	<blank>		Select:LV_Shape	lv_shape

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LV Shape Size	<blank>	LV shape Size shall only be editable IF LV Shape not blank and not Normal	Select:Severity	lv_shape_size
LV Shape Location	<blank>	LV shape location shall only be editable IF 'asymmetric hypertrophy' is chosen for LV Shape	Select:LV_Shape_Loc	lv_shape_loc
LV Structural Details				
VSD Location	<blank>	If 'Multiple' is chosen, gray out Size and Shunt.	Select:LV_VSD_Loc	lv_vsd_loc
VSD Size	<blank>		Select:Size	lv_vsd_size
VSD Shunt	<blank>		Select:Shunt	lv_vsd_shunt
Thrombus				
Thrombus	<blank>		Select: ThromMass	lv_throm
Thrombus L x W	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' or 'multiple' is chosen	text	lv_throm_len lv_throm_wid
Thrombus Location	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' or 'multiple' is chosen	Select: LV_ThromLoc	lv_throm_loc
Thrombus Mobility	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' or 'multiple' is chosen	Select: ThromMass_Mob	lv_throm_mob
LV Wall Motion Diagram				
(17 segment wall motion diagram)	All Normal			idiagramStatus
(16 segment wall motion diagram)	All Normal	echo2 diagram		idiagramStatus
Add iDiagram to report	<unchecked>	Overrides the default setting for the presence of the iDiagram on the report	checkbox	report_idiagram

Left Ventricle Measurements (TTE & TEE)

Label	DB field name root	Units
LV EF		
LVEDV (A4C)	lvedv_a4c	ml
LVEDV (A4C) / BSA	lvedv_a4c_idx	ml/m2
LVESV (A4C)	lvesv_a4c	ml
LVESV (A4C) / BSA	lvesv_a4c_idx	ml/m2
LVEDV (A2C)	lvedv_a2c	ml
LVEDV (A2C) / BSA	lvedv_a2c_idx	ml/m2
LVESV (A2C)	lvesv_a2c	ml
LVESV (A2C) / BSA	lvesv_a2c_idx	ml/m2
LV EF (second)		
LVEDV (BIPLANE)	lvedv_biplane	ml
LVESV (BIPLANE)	lvesv_biplane	ml
LVEDV	lvedv	ml
LVESV	lvesv	ml
EF	ef	%
3D EF	ef_3d	%
-(EF method text)	Hidden field	--- * See calculated fields
LV SV	lv_sv	ml
LV SV / BSA	lv_sv_idx	ml/m2
LV CO	lv_co	l/min

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Label	DB field name root	Units
LV CI	lv_ci	l/(min*m2)
LV Mass		
IVSd	ivsd_2d	cm
IVSd (Mm)	ivsd	cm
LVIDd	lvidd_2d	cm
LVIDd / BSA	lvidd_idx	cm/m2
LVPWd	lvpwd_2d	cm
LVPWd (Mm)	lvpwd	cm
LV Mass	lv_mass_2d	g
LV Mass / BSA	lv_mass_2d_idx	g/m2
LV Mass (Mm)	lv_mass	g
LV Mass (Mm)/BSA	lv_mass_idx	g/m2
LVFS (midwall)	lvfs	%
LV Other		
IVSs	ivss	cm
LVIDs	lvids_2d	cm
LVIDs (Mmode)	lvids	cm
LVIDd (Mmode)	lvidd	cm
LVPWs	lvpws	cm
IVST	ivst	%
LVPWT	lvpwt	%
LV IVRT	ivrt	ms
MAPSE (Mmode)	mapse	mm
LVRWT - r/o field	lv_rwt	--
The following 2 are TTE only		
Mid Vent Pk Grad Rest	lv_mid_vent_pk_grad_rest	mmHg
Mid Vent Pk Grad Provocation	lv_mid_vent_pk_grad_prov	mmHg
LV Area-Length		
LV Area Endo D	lv_area_endo_d	cm2
LV Area Endo S	lv_area_endo_s	cm2
LV Area Epi D	lv_area_epi_d	cm2
LV Area Epi S	lv_area_epi_s	cm2
LV Length D	lv_len_d	cm
LV Length S	lv_len_s	cm
LV Mass (AL)	lv_m_al	g
LV Mass (AL) / BSA	lv_m_al_idx	g/m2
LV Mass (TE)	lv_m_te	g
LV Mass (TE) / BSA	lv_m_te_idx	g/m2
Strain		
Global Longitudinal Strain	lv_glob_long_strain	%
Global Circumferential Strain	lv_glob_circ_strain	%
Global Radial Strain	lv_glob_rad_strain	%

LV Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Left ventricle tab	text	lv_find

2.1.2.2 Group: LA (SR-3434)

Left Atrium Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
LA Morphology				
LA Cavity Size	Normal		Select: Cavity	la_cavity_size
LA Structural Details				
Atrial Septal Wall	<blank>		Select: AS Wall	la_sept_wall
Atrial Septal Defect Size	<blank>	shall only be editable if the following were chosen for Atrial	Select:Size	la_sept_def_size

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		Septal Wall: [Aneurysm with PFO PFO w/out aneurysm Primum Secundum Sinus Venosus Patent PFO]		
Atrial Septal Defect Shunt	<blank>	shall only be editable if the following were chosen for Atrial Septal Wall: [Aneurysm with PFO PFO w/out aneurysm Primum Secundum Sinus Venosus Patent PFO]	Select:Shunt	la_sept_def_shunt
LA Thrombus				
Thrombus	<blank>		Select:ThromMass	la_throm
Thrombus L x W	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	text	la_throm_len la_throm_wid
Thrombus Location	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	Select: LA_ThromMassLoc	la_throm_loc
Thrombus Mobility	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	Select: ThromMass_Mob	la_throm_mob
LA Mass				
Mass	<blank>		Select:ThromMass	la_mass
Mass L x W	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	text	la_mass_len la_mass_wid
Mass Location	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	Select: LA_ThromMassLoc	la_mass_loc
Mass Mobility	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	Select: ThromMass_Mob	la_mass_mob

Left Atrium Measurements (TTE & TEE)

Label	DB field name root	Units
LA Dimensions		
LA	la_2d	cm
LA /BSA	la_2d_idx	cm/m2
LAs (A4C)	la_major	cm
LAs (A2C)	la_minor	cm
LA (Mmode)	la	cm
LA Volume		
LA Volume	la_volume	ml
LA Volume /BSA	la_vol_idx	ml/m2
LA Area		
LA Area	la_area	cm2
LA Area ES (A4C)	la_area_es_a4c	cm2
LA Area ES (A2C)	la_area_es_a2c	cm2

LA Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Left Atrium tab	text	la_find

2.1.2.3 Group: RA (SR-3435)

Right Atrium Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
RA Morphology				

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RA Cavity Size	Normal		Select:Cavity	ra_cavity_size
Visualized	<blank>		Select: RA_Visual	ra_visual
RA Thrombus				
Thrombus	<blank>		Select:ThromMass	ra_throm
Thrombus L x W	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	text	ra_throm_len ra_throm_wid
Thrombus Location	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	Select: RA_ThromMassLoc	ra_throm_loc
Thrombus Mobility	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	Select: ThromMass_Mob	ra_throm_mob
RA Mass				
Mass	<blank>		Select:ThromMass	ra_mass
Mass L x W	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	text	ra_mass_len ra_mass_wid
Mass Location	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	Select: RA_ThromMassLoc	ra_mass_loc
Mass Mobility	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	Select: ThromMass_Mob	ra_mass_mob

Right Atrium Measurements (TTE & TEE)

Label	DB field name root	Units
RA Dimensions		
RA	ra	cm
RA (4ch) Major	ra_major	cm
RA (4ch) Minor	ra_minor	cm
RA (4ch) Minor /BSA	ra_minor_idx	cm/m2
RA Volume/Area		
RA Volume	ra_volume	ml
RA Volume / BSA	ra_vol_idx	ml/m2
RA Area	ra_area	cm2

RA Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Right Atrium tab	text	ra_find

2.1.2.4 Group: RV (SR-3436)

Right Ventricle Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
RV Morphology				
RV Cavity Size	Normal		Select:Cavity	rv_cavity_size
Visualized	<blank>		Select: RV_Visual	rv_visual
Cardiomyopathy	<blank>		Select: Cardio	rv_cardio
Concentric Hypertrophy	<blank>		Select:Severity_mult	rv_hyp_conc
RV Function				
Global Systolic Function	Normal		Select:RV_GlobSys	rv_glob_wall
TAPSE (TTE only)	<blank>		Select: RV_TAPSE	rv_tapse_obs
RV Thrombus				
Thrombus	<blank>		Select:ThromMass	rv_throm

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Thrombus L x W	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	text	rv_throm_len rv_throm_wid
Thrombus Location	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	Select: RV_ThromLoc	rv_throm_loc
Thrombus Mobility	<blank>	Shall only be editable if an option for Thrombus other than 'blank' or 'none' is chosen	Select: ThromMass_Mob	rv_throm_mob
RV Mass				
Mass	<blank>		Select:ThromMass	rv_mass
Mass L x W	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	text	rv_mass_len rv_mass_wid
Mass Location	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	Select: RV_ThromLoc	rv_mass_loc
Mass Mobility	<blank>	Shall only be editable if an option for Mass other than 'blank' or 'none' is chosen	Select: ThromMass_Mob	rv_mass_mob

Right Ventricle Measurements (TTE & TEE)

Label	DB field name root	Units
RV Dimensions		
RV	rvidd_2d	cm
RV Basal	rv_basal	cm
RVOT	rv_ot	cm
RVOT VTI	rvot_vti	cm
RVIDd (Mmode)	rv	cm
RV Area		
RV Area ED	rv_rva_ed	cm2
RV Area ES	rv_rva_es	cm2
RV Other		
TAPSE (Mmode)	rv_tapse	mm
RV IVRT	rv_ivrt	ms
RV IVCT	rv_ivct	ms
RV MPI	rv_mpi	---
RV FAC	rv_fac	%
TDI s'	tdi_s_prime	cm/s

RV Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Right Ventricle tab	text	rv_find

2.1.2.5 Group: LAA

Left Atrial Appendage Observations (TEE)

Label	Default Value	Notes	Input Type	DB Field
LA Appendage	<normal>		Select: Normal	laa
Lobes	<blank>		Select: Lobes	laa_lobes
Mass	<blank>		Select: Size_plus_None_Med	laa_mass
Thrombus	<blank>		Select: Size_plus_None_Med	laa_throm

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Label	Default Value	Notes	Input Type	DB Field
Thrombus mobility	<blank>	shall only be editable if an option for thrombus other than blank or none is chosen	Select: ThromMass_Mob	laa_throm_mob
Mass mobility	<blank>	shall only be editable if an option for mass other than blank or none is chosen	Select: ThromMass_Mob	laa_mass_mob

Left Atrial Appendage Measurements (TEE)

Label	DB field name root	Units
LAA Measurements		
LA Orifice Size	laa_orifice_size	cm
LAA Width	laa_width	cm
LAA Length	laa_length	cm

Left Atrial Appendage Findings (TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Left Atrial Appendage tab	text	laa_find

2.1.2.6 Group: IS

Interatrial Septum Observations (TEE)

Label	Default Value	Notes	Input Type	DB Field
Interatrial Septum	<normal>		Select: Normal	Inter_septum
Aneurysmal motion of the interatrial septum	<blank>		Select: Severity	is_aneur_mot
Septal Wall	<blank>		Select: IS_Sept_Wall	is_sept_wall

Interatrial Septum Findings (TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Interatrial Septum tab	text	is_find

2.1.2.7 Group: AV (SR-3437)

Aortic Valve Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
AV Structure - If Morphology="Normal" - any abnormal selection in these observations shall set Morphology=""				
Morphology	Normal		Select:Morph	av_morph
TAVR (TTE only)	<blank>	Only enabled for Morphology = 'Prosthetic', 'Bioprosthetic', or 'Mechanical'	Select: Yes	av_tavr
Annulus	<blank>		Select:Annulus	av_ann
Cusps	Trileaflet		Select:Cusps	av_cusp
Leaflet Thickening	<blank>		Select:Severity	av_leaf_thick
Leaflet Calcification	<blank>		Select:Severity_plus_Scler	av_leaf_calc
Leaflet Mobility	<blank>		Select:LeafMob	av_leaf_mob
Leaflet Prolapse	<blank>		Select:Severity_plus_Border	av_leaf_pro

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Label	Default Value	Notes	Input Type	DB Field
(no label)	<blank>	Only enabled if Leaflet Prolapse is non-blank	select: AV_ProlapseQual	av_leaf_pro_qual
TTE only				
Prolapsing leaflet	<blank>	Only enabled if Leaflet Prolapse is non-blank	Select: LCC_RCC_NCC	av_prolapsing_leaf
AV Function				
Stenosis	<blank>	Pediatric default is 'None'	Select:Sten	av_sten
Regurgitation	None		Select:Regurg	av_reg
Etiology of AV Disease	<blank>		Select:AV_Etiology	av_etiology
Desc Ao Diast flow reversal	<blank>		Desc_Ao_FlowRev	av_desc_ao_diast_flow
Visualized	<blank>	If Not Seen is selected, disable all other observations on this tab	Select:Visual	av_visual
The next 2 are TTE only				
LVOT Obstruction	<blank>		select:Abs_Pres	av_lvot_obstruction
Systolic Anterior Motion (SAM)	<blank>		select:Abs_Pres	av_sam
AV Vegetation				
Vegetation	<blank>		Select:Size_plus_Pres_Abs	av_veg
Vegetation Location	<blank>	shall only be editable if an option for Vegetation other than blank is chosen	Select:AV_Veg_Loc	av_veg_loc
Vegetation Mobility	<blank>		Select:Veg_Mob	av_veg_mob
Doppler				
Jet width in LVOT	<blank>		select: AR_JetWidth	ar_jet_wid_lvot
Flow Convergence	<blank>		select: AR_flow_converg	ar_flow_converg
Jet Density	<blank>		select: AR_JetDens	ar_jet_dens

Aortic Valve Measurements (TTE & TEE)

Label	DB field name root	Units
LVOT		
LVOT diameter	lvot_diam	cm
LVOT Pk Vel	lvot_pk_vel	m/s
LVOT Pk Grad	lvot_pk_grad	mmHg
The next 2 are TTE only – replace the single LVOT Pk Grad		
LVOT Pk Grad Rest	lvot_pk_grad	mmHg
LVOT Pk Grad Provocation	lvot_pk_grad_prov	mmHg
LVOT VTI	lvot_vti	cm
Qp/Qs	av_qp_over_qs	-
LVOT SV	lvot_sv	ml
LVOT CO	lvot_co	l/min
AV		
AV Pk Vel	av_pk_vel	m/s
AV Pk Grad	av_pk_grad	mmHg
AV Mn Grad	av_mn_grad	mmHg
AV VTI	ao_vti	cm
AVA (Vmax)	ava	cm ²
AVA (VTI)	ava_vti	cm ²
AVA /BSA	ava_idx	cm ² /m ²
AVA Planimetry	ava_plan	cm ²

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Label	DB field name root	Units
AV PHT	av_pht	ms
AV index	av_vel_idx	--
AV Decel Time	av_dt	ms
AV Accel Time	av_at	ms
Aortic Regurg		
AV Reg Vol	av_r_vol	ml/beat
AV Reg Fract	av_rf	%
AI PHT	ai_pht	ms
AV EROA	av_eroa	cm2
VCW	ar_vcw	cm
AR Vel	ar_vel	m/s
AR Pk Grad	ar_pk_grad	mmHg

AV Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Aortic Valve tab	text	av_find

2.1.2.8 Group: MV (SR-3438)

Mitral Valve Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Structure				
Morphology	Normal	If Morphology="Normal" - any abnormal selection in these observations shall set Morphology=""	select:Morph	mv_morph
Annulus	<blank>		select:Annulus	mv_ann
Leaflet Thickening	<blank>		select:Severity	mv_leaf_thick
Leaflet Calcification	<blank>		select:Severity	mv_leaf_calc
Leaflet Mobility	<blank>		select:LeafMob	mv_leaf_mob
Leaflet Prolapse	<blank>	Only enabled if Leaflet Prolapse is non-blank	select:Severity_plus Border	mv_leaf_pro
(no label)	<blank>		select: MV_ProlapseQual	mv_leaf_pro_qual
TTE only				
Prolapsing leaflet	<blank>	Only enabled if Leaflet Prolapse is non-blank	Select: Ant_Post	mv_prolapsing_leaf
Function				
Stenosis	<blank>	for Pediatric: default is None	select:Sten	mv_sten
Regurgitation	None		select:AVMVRegurg	mv_reg
Etiology of MV Disease	<blank>		select:MV_Etiology	mv_etiology
Carpentier's Class	<blank>		select:Carpentier	carpentier_class
Visualized	<blank>	If Not Seen is selected, disable all other observations on this tab	select:Visual	mv_visual
Vegetation				
Vegetation	<blank>		select:Size_plus_Pres_Abs	mv_veg
Vegetation Location	<blank>	shall only be editable if an option for vegetation other than blank is chosen	select:MV_Veg_Loc	mv_veg_loc
Vegetation Mobility	<blank>	shall only be editable if an option for vegetation other than blank is chosen	select:Veg_Mob	mv_veg_mob
Doppler				
Color Flow Jet Area	<blank>		select: MR_CF_JetArea	mr_cf_jet_area
Flow Convergence	<blank>		select: MR_flow_converg	mr_flow_converg
CWD Jet	<blank>		select: MRTR_CWD_Jet	mr_cwd_jet
Pulmonary Vein Flow	<blank>		select: Vein_Flow	mr_pulm_vein_flow
Mitral Inflow	<blank>		select: Inflow	mv_inflow

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Mitral Valve Measurements (TTE & TEE)

Label	DB field name root	Units
MV		
MV EF Slope	mv_ef_slope	m/s
EPSS	epss	cm
MV Excur	mv_excur	cm
MV Mx Vel	mv_mx_vel	m/s
MV Mn Grad	mv_mn_grad	mmHg
MV Pk Grad	mv_pk_grad	mmHg
MV VTI	m_vti	cm
MVA	mva	cm2
MVA Planimetry	mva_plan	cm2
MV Pk E Vel	mv_e_vel	m/s
MV Pk A Vel	mv_a_vel	m/s
MV E/A Ratio	e_ovr_a	----
MV PHT	m_pht	ms
MV Decel Time	mv_dt	ms
MV A Duration	mv_a_dur	ms
MV Annulus		
Septal e'	mv_e_septal	cm/s
Septal a'	mv_a_septal	cm/s
Septal S'	mv_s_septal	cm/s
Septal E/e'	e_over_e_prime	-----
Lateral e'	mv_e_lateral	cm/s
Lateral a'	mv_a_lateral	cm/s
Lateral S'	mv_s_lateral	cm/s
Lateral E/e'	e_over_e_prime_lat	-----
MV E/e'	mv_e_over_e_prime	-----
MV Regurg		
MR Vel	mr_vel	m/s
MR PISA radius	mr_pisa_rad	cm
MV Reg Vol	mv_r_vol	ml/beat
MV Reg Fract	mv_rf	%
MV EROA	mv_eroa	cm2
MV Reg Pressure Gr	mv_reg_press	mmHg
VCW	mr_vcw	cm

MV Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Mitral Valve tab	text	mv_find

2.1.2.9 Group: TV (SR-3439)

Tricuspid Valve Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
TV Structure				
Morphology	Normal		Select:Morph	tv_morph
Annulus	<blank>	If Morphology="Normal" - any abnormal selection in these observations shall set Morphology=""	Select:Annulus_plus_Dil	tv_ann
Leaflet Thickening	<blank>		Select:Severity	tv_leaf_thick
Leaflet Calcification	<blank>		Select:Severity	tv_leaf_calc

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Leaflet Mobility	<blank>		Select:LeafMob	tv_leaf_mob
Leaflet Prolapse	<blank>		Select: Severity_plus_Border	tv_leaf_pro
(no label)	<blank>	Only enabled if Leaflet Prolapse is non-blank	select: TV_ProlapseQual	tv_leaf_pro_qual
TTE only				
Prolapsing leaflet	<blank>	Only enabled if Leaflet Prolapse is non-blank	Select: Ant_Sept_Post	tv_prolapsing_leaf
TV Function				
Stenosis	<blank> None for Pediatric		Select:Sten	tv_sten
Regurgitation	None		Select:Regurg	tv_reg
Etiology of TV Disease	<blank>		Select:TV_Etiology	tv_etiology
Visualized	<blank>	If Not Seen is selected, disable all other observations on this tab	Select:Visual	tv_visual
Pulmonary Hypertension	<blank>		Select:PulmHyp	tv_pul_hyp
TV Vegetation				
Vegetation	<blank>		Select:Size_plus Pres_Abs	tv_veg
Vegetation Location	<blank>	shall only be editable if an option for vegetation other than blank is chosen	Select:TV_Veg_Loc	tv_veg_loc
Vegetation Mobility	<blank>	shall only be editable if an option for vegetation other than blank is chosen	Select:Veg_Mob	tv_veg_mob
Doppler				
Color Flow Jet Area	<blank>		select: TR_CF_JetArea	tr_cf_jet_area
Flow Convergence	<blank>		select: TR_flow_converg	tr_flow_converg
CWD Jet	<blank>		select: MRTR_CWD_Jet	tr_cwd_jet
Hepatic Vein Flow	<blank>		select: Vein Flow	tr_hep_vein_flow
Tricuspid Inflow	<blank>		select: Inflow	tv_inflow (existing field)

Tricuspid Valve Measurements (TTE & TEE)

Label	DB field name root	Units
TV		
TV Pk E Vel	tv_e_vel	m/s
TV Pk A Vel	tv_a_vel	m/s
TV E/A	tv_ea_ratio	-----
TV TVI	tv_vti	cm
TV Mean Grad	tv_mn_grad	mmHg
TV Annulus		
TV Annulus	tv_ann_meas	cm
TV e'	tv_e_prime	cm/s
TV a'	tv_a_prime	cm/s
TV S'	tv_s_prime	cm/s
TV E/e'	tv_e_over_e_prime	-----
TV Regurg		
TV PISA radius	tv_pisa_radius	cm
TR Jet Area	tv_jet_area	cm2
TR Pk Vel	tv_pk_vel	m/s
TR Pk Grad	tv_pk_grad	mmHg
TR Mean Grad	tv_tr_mn_grad	mmHg
RVSP	rvsp	mmHg
RAP	rap	mmHg
VCW	tr_vcw	cm
EROA	tv_eroa	cm2
TV Reg Vol	tv_r_vol	ml

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TV Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Tricuspid Valve tab	text	tv_find

2.1.2.10 Group: PV (SR-3440)

Pulmonic Valve Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
PV Structure				
Morphology	Native		Select:Morph	pv_morph
Annulus	<blank>	If Morphology = "Normal" - any abnormal selection in these observations shall set Morphology=""	Select:Annulus	pv_ann
Leaflet Thickening	<blank>		Select:Severity	pv_leaf_thick
Leaflet Calcification	<blank>		Select:Severity	pv_leaf_calc
Leaflet Mobility	<blank>		Select:LeafMob	pv_leaf_mob
Leaflet Prolapse	<blank>		Select: Severity_plus Border	pv_leaf_pro
TTE only				
Prolapsing leaflet	<blank>	Only enabled if Leaflet Prolapse is non-blank	Select: Ant_LR	pv_prolapsing_leaf
PV Function				
Stenosis	<blank>		Select:Sten	pv_sten
Regurgitation	<blank>		Select:Regurg	pv_reg
Etiology of PV Disease	<blank>		Select:PV_Etiology	pv_etiology
Visualized	<blank>	If Not Seen is selected, disable all other observations on this tab	Select:Visual	pv_visual
PV Vegetation				
Vegetation	<blank>		Select:Size_plus_Pres_Abs	pv_veg
Vegetation Location	<blank>	shall only be editable if an option for vegetation other than blank is chosen	Select:PV_Veg_Loc	pv_veg_loc
Vegetation Mobility	<blank>	shall only be editable if an option for vegetation other than blank is chosen	Select:Veg_Mob	pv_veg_mob
Doppler				
Color Flow Jet Size	<blank>		Select: PR_CF_JetSize	pr_cf_jet_size
Jet density and contour	<blank>		Select: PR_JetDens	pr_jet_dens

Pulmonic Valve Measurements (TTE & TEE)

Label	DB field name root	Units
PV		
PV Pk Vel	pv_pk_vel	m/s
PV Mn Vel	pv_mn_vel	m/s
PV Pk Grad	pv_pk_grad	mmHg
PV Mn Grad	pv_mn_grad	mmHg
PV VTI	pv_vti	cm
PV Accel Time	pv_accel_time	ms
PV Decel Time	pv_dt	ms
PV PHT	pv_pht	ms
Regurg		
PV Reg Fract	pv_rf	%
PR Vel	pr_vel	m/s
PR Pk Grad	pr_pk_grad	mmHg

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PV Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Pulmonic Valve tab	text	pv_find

2.1.2.11 Group: Pericardium (SR-3443)

Pericardium Observations (TTE, TEE)

Label	Default Value	Notes	Input Type	DB Field
Pericardium				
Pericardium	<blank>		Select:Pericardium	pc_peri
Visualized	<blank>		Select:Visual	pc_visual
Pericardium Effusion				
Pericardial Effusion	None		Select:Size_plus_None_Insig Alternate list: Size_plus_None_Trace	pc_eff
Fluid	<blank>	Fluid shall only be editable if Pericardial Effusion is not blank or none	Select: Fluid	pc_fluid
Pleural Effusion	<blank>		Select: Size_plus_None	pl_eff
Hemodynamic Compromise	<blank>		Select:HemoComp	pc_hemo_comp

Pericardium Observations (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Pericardium				
Pericardium	Normal		select:Pericardium w Norm	pc_peri
Pericardium Effusion (there are 4) if first row blank, the next 3 are disabled				
Pericardial Effusion Visualized	None		select: PedPeriVisual	pc_eff_vis{1 2 3 4}
Location			select: PeriLoc	pc_eff_loc{1 2 3 4}
Fluid	<blank>		select: PedPeriFluid	pc_eff_fluid{1 2 3 4}
(only one each)				
Pleural Effusion	<blank>		select: Size_plus_None	pl_eff
Hemodynamic Compromise	<blank>		select: PedHemoComp	pc_hemo_comp

Pericardium Measurements (TTE, TEE & Pediatric)

Label	DB field name root	Units
Pericardium		
Peri. Eff. Diam	pc_per_eff_diameter	cm

Pericardium Additional Measurements (Pediatric)

Label	DB field name root	Units
Anterior Effusion Diam	per_ant_eff_diameter	cm
Apical Effusion Diam	per_api_eff_diameter	cm
Posterior Effusion Diam	peri_post_eff_diameter	cm

Pericardium Findings (TTE, TEE & Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Pericardium tab	text	pc_find

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2.1.2.12 Group: Aorta

Aorta Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Aorta				
Aortic Root	<blank>		Select:AoRoot	ao_root
Aortic Atherosclerotic Changes	<blank>		Select:Severity	ao_athero
Asc. Dilation Degree	<blank>		Select:Severity	ao_ascend
Arch Dilation Degree	<blank>		Select:Severity	ao_arch
Desc. Thoracic Ao Dilation Degree	<blank>		Select:Severity	ao_descend
Aneurysm Location	<blank>		Select:Aneurysm_Loc	ao_aneurysm_loc
Coarctation Location	<blank>		Select:Coarct_Loc	ao_coarct_loc
Visualized	<blank>		Select:Visual	ao_visual
Aorta Dissection				
Dissection	<blank>		Select:PresAbs	ao_diss
Dissection Classification	<blank>	shall only be editable if dissection is selected as Present.	Select:Diss_Class	ao_diss_class

Aorta Measurements (TTE & TEE)

Label	DB field name root	Units
Aorta		
AoD	aod_2d	cm
AoD (Mm)	aod	cm
AoD CS	aocs	cm
AoD Annulus	aod_ann	cm
AoD Annulus / BSA	aod_ann_idx	cm/m2
AoD Root	aod_root	cm
AoD SOV	aod_sinus	cm
AoD SOV / BSA	aod_sinus_idx	cm/m2
SOV Height	sov_height	cm
AoD ST Junction	aod_st_junc	cm
AoD St Junction /BSA	aod_st_junc_idx	cm/m2
AoD Ascending (Prox)	aod_asc	cm
AoD Asc. (Prox) / BSA	aod_asc_idx	cm/m2
AoD Arch	aod_arch	cm
AoD Descending	aod_desc	cm

Aorta Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Aorta tab	text	aorta_find

2.1.2.13 Group: PA (SR-3445)

Pulmonary Artery Observations (TTE)

Label	Default Value	Notes	Input Type	DB Field
PA				
Pulmonary Artery	Normal		select:pa_pulm_artery	pa_pulm_artery
Stenosis	<blank>	All but blank and None options disable "Pulmonary Artery" observation (also see Embolism)	select:sten_no_Border	pa_sten
Embolism	<blank>	"Present" disables "Pulmonary Artery" observation (also see Stenosis)	select:Pres_Abs	pa_embolism
Visualized	<blank>		select:Visual	pa_visual
Diastolic flow reversal PA branches	<blank>		select: PA_Prominent	pa_diast_flow_revers

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Pulmonary Artery Measurements (TTE)

Label	DB field name root	Units
PA		
PA Diameter	pa_diam	cm
Pk PA Sys Press	pa_est_pk_sys_press	mmHg
LA/Ao	la_ovr_ao	-----

Pulmonary Artery Findings (TTE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Pulmonary Artery tab	text	pa_find

2.1.2.14 Group: IVC & Pulm. vein (SR-3446)

IVC & Pulm Vein Observations (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
IVC & Pulm. Vein				
IVC Morphology	Normal		Select:IVC_Morph	ivc_morph
IVC Resp. Response	<blank>		Select:IVC_Resp	ivc_resp
IVC Visualized	<blank>		Select:Visual	ivc_visual
Pulm. Vein Predominance	<blank>		Select:Sys_Dia	pvein_predom
Pulm. Vein Visualized	<blank>		Select:Visual	pvein_visual

IVC & Pulm Vein Measurements (TTE & TEE)

Label	DB field name root	Units
IVC		
IVC dim	ivc_dim	cm
Pulm. Vein		
Pulm. Vein Ar Vel	pv_a_vel	m/s
Pulm. Vein Ar Dur	pv_a_dur	ms
Pulm Vein D Vel	pv_d_vel	m/s
Pulm Vein S Vel	pv_s_vel	m/s

IVC & Pulm Vein Findings (TTE & TEE)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	IVC & Pulm Vein tab	text	pa_find

2.1.2.15 Group: Seg Anat (SR-4457)

Segmental Anatomy Observations (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Position	Levocardia		select: LMD	sa_pos
Abdominal Situs	Solitus		select: Situs	sa_abd_sit
Atrial Situs	Solitus		select: Situs	sa_atr_sit
Ventricular loop	<blank>		select: VentLoop	sa_vent_loop
AV Alignment	<blank>		select:AV Align	sa_av_align
VA Alignment	<blank>		select:VA Align	sa_va_align
Great Vessels	<blank>		select:Grt Ves Pos	sa_grt_ves

Segmental Anatomy tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Segmental Anatomy tab	text	sa_find

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2.1.2.16 Group: V Return (SR-4458)

Venous Return Observations (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Systemic veins	Normal sys-hep venous conn		select: Sys Veins	vr_sys_veins
Hepatic veins	Normal drainage		select: Hep Veins	vr_hep_veins
Pulm.Veins Visualized	Blank		select: SeenOrNot	vr_pvein_visual_ru vr_pvein_visual_rl vr_pvein_visual_lu vr_pvein_visual_ll
RU, RL, LU, LL				
IVC Morphology	<blank>		select: IVC_Morph_plus_Abs	same as on TEE: ivc_morph
***Also include the Observations from IVC & Pulm Vein tab, minus Pulm. Vein Predominance (and IVC Morphology behaves as stated above)				

Venous Return Measurements (Pediatric)

Label	DB field name root	Units
Use all IVC & Pulm Vein measurements		
Add: SVC	vr_svc	cm

Venous Return tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Venous Return tab	text	vr_find

2.1.2.17 Group: Atria (SR-4459)

Atria Observations /Measurements (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
This tab is to have 3 subtabs, LA, RA, IAS				
LA subtab is TTE/TEE LA tab minus the LA Structural Details Observations section				
RA subtab is TTE/TEE RA tab				
IAS subtab is the LA Structural Details Observation section pulled from the LA tab - the label at the top of the Observations shall read: IAS Details				

IAS Measurements (Pediatric)

Label	DB field name root	Units	* shall only be editable if the following were chosen for Atrial Septal Wall:
ASD size	at_asd_size	mm	[blank Aneurysm with PFO PFO w/out aneurysm Patent PFO Primum Secundum Sinus Venosus]

Left Atrium Z-Scores NOTE: PEDIATRIC PROTOCOL ONLY

Label	DB field name root	Units
LA (Mm) Z-Score	model.worksheet.la_zscore	--
Mean	model.worksheet.la_mean	cm
Range	model.worksheet.la_range	cm
%tile	model.worksheet.la_perc	%
LAs (A4C) Z-Score	model.worksheet.la_major_zscore	--
Mean	model.worksheet.la_major_mean	cm
Range	model.worksheet.la_major_range	cm
%tile	model.worksheet.la_major_perc	%
LAs (A2C) Z-Score	model.worksheet.la_minor_zscore	--
Mean	model.worksheet.la_minor_mean	cm

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Label	DB field name root	Units
Range	model.worksheet.la_minor_range	cm
%tile	model.worksheet.la_minor_perc	%

Atria tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Atria tab	text	atria_find

2.1.2.18 Group: AV Valve (SR-4460)

Atrioventricular Observations (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
All observations from MV tab in one band				
All observations from TV tab in next band				
3rd band is to be Common AV - If any dropdown in this section is selected, then the above 2 sections are to be collapsed				
All observations from MV tab (exceptions/additions follow)	All blank			avv_replaces mv_
Morphology	blank	This replaces the Morphology dropdown from the MV tab	select: CommAVMorph	avv_morph
Balance	blank	Set Inactive if Morphology is blank or 'Balanced'	select:Balance	avv_balance
Etiology of AV Valve disease	blank	This replaces the Etiology of MV disease	select: MV_Etiology	avv_etiology
Leaflet Mobility	blank	This replaces the Leaflet Mobility dropdown from the MV tab	select:CommAV_LeafMob	avv_leaf_mob

Atrioventricular Measurements (Pediatric)

All measurements from MV in the left columns, plus additional field in MV Annulus section	All measurements from TV in the right columns
MV Annulus mv_ann_meas units: cm	

Atrioventricular Z-Scores NOTE: PEDIATRIC PROTOCOL ONLY

Label	DB field name root	Units
MV Annulus Z-Score	model.worksheet.mv_ann_meas_zscore	--
Mean	model.worksheet.mv_ann_meas_mean	cm
Range	model.worksheet.mv_ann_meas_range	cm
%tile	model.worksheet.mv_ann_meas_perc	%
TV Annulus Z-Score	model.worksheet.tv_ann_meas_zscore	--
Mean	model.worksheet.tv_ann_meas_mean	cm
Range	model.worksheet.tv_ann_meas_range	cm
%tile	model.worksheet.tv_ann_meas_perc	%

Atrioventricular tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Atrioventricular tab	text	avv_find

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2.1.2.19 Group: Vents (SR-4461)

Ventricles Observations/Measurements (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
This tab is to have 3 subtabs: LV subtab is TTE/TEE LV tab minus the LV Structural Details Observations section and minus the Septal Wall Motion dropdown RV subtab is TTE/TEE RV tab IVS subtab is the LV Structural Details Observation section pulled from the LV tab, plus the Septal Wall Motion dropdown (with a modified list) pulled from the LV Function section of the LV tab. The label at the top of the Observations shall read: IVS Details. One additional IVS dropdown:				
IVS Shape	blank		Select: IVS Shape	ivs_shape

IVS Measurements (Pediatric)

Label	DB field name root	Units
VSD size	ve_vsd_size	mm

Left Ventricle Z-Scores(Pediatric)

Label	DB field name root	Units
IVSd Z-Score	model.worksheet.ivsd_2d_zscore	--
Mean	model.worksheet.ivsd_2d_mean	cm
Range	model.worksheet.ivsd_2d_range	cm
%tile	model.worksheet.ivsd_2d_perc	%
IVSd (Mm) Z-Score	model.worksheet.ivsd_zscore	--
Mean	model.worksheet.ivsd_mean	cm
Range	model.worksheet.ivsd_range	cm
%tile	model.worksheet.ivsd_perc	%
LVIDd Z-Score	model.worksheet.lvidd_2d_zscore	--
Mean	model.worksheet.lvidd_2d_mean	cm
Range	model.worksheet.lvidd_2d_range	cm
%tile	model.worksheet.lvidd_2d_perc	%
LVIDd (Mm) Z-Score	model.worksheet.lvidd_zscore	--
Mean	model.worksheet.lvidd_mean	cm
Range	model.worksheet.lvidd_range	cm
%tile	model.worksheet.lvidd_perc	%
LVIDs Z-Score	model.worksheet.lvids_2d_zscore	--
Mean	model.worksheet.lvids_2d_mean	cm
Range	model.worksheet.lvids_2d_range	cm
%tile	model.worksheet.lvids_2d_perc	%
LVIDs (Mm) Z-Score	model.worksheet.lvids_zscore	--
Mean	model.worksheet.lvids_mean	cm
Range	model.worksheet.lvids_range	cm
%tile	model.worksheet.lvids_perc	%
LVPWd Z-Score	model.worksheet.lvpwd_2d_zscore	--
Mean	model.worksheet.lvpwd_2d_mean	cm
Range	model.worksheet.lvpwd_2d_range	cm
%tile	model.worksheet.lvpwd_2d_perc	%

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Label	DB field name root	Units
LVPWd (Mm) Z-Score	model.worksheet.lvpwd_zscore	--
Mean	model.worksheet.lvpwd_mean	cm
Range	model.worksheet.lvpwd_range	cm
%tile	model.worksheet.lvpwd_perc	%
LV Mass (Mm) Z-Score	model.worksheet.lv_mass_zscore	--
Mean	model.worksheet.lv_mass_mean	cm
Range	model.worksheet.lv_mass_range	cm
%tile	model.worksheet.lv_mass_perc	%

Right Ventricle Z-Scores(Pediatric)

Label	DB field name root	Units
RV (Mm) Z-Score	model.worksheet.rv_zscore	--
Mean	model.worksheet.rv_mean	cm
Range	model.worksheet.rv_range	cm
%tile	model.worksheet.rv_perc	%

Ventricles tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Ventricles tab	text	vent_find

2.1.2.20 Group: SL Valves (SR-4462)

Semilunar Valves Observations (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
All observations from AV tab in one band				
All observations from PV tab in next band				
3 rd band is to be Truncal Valve - If any dropdown in this section is selected, then the above 2 sections are to be collapsed				
All observations from AV tab (exceptions/additions follow)	All blank			sv_replaces av_
Morphology	blank	This replaces the Morphology from the AV tab	select:Trunc_Morph	sv_morph
Do not include Etiology of Truncal Valve disease in this section				

Semilunar Valves Measurements (Pediatric)

All measurements from AV in the left columns, plus additional field in AV Annulus section	All measurements from PV in the right column, plus additional field in PV Annulus section
AV Annulus av_ann_meas units: cm	PV Annulus pv_ann_meas units: cm

Semilunar Valves Z-Score NOTE: PEDIATRIC PROTOCOL ONLY

Label	DB field name root	Units
PV Annulus Z-Score	model.worksheet.pv_ann_meas_zscore	--
Mean	model.worksheet.pv_ann_meas_mean	cm
Range	model.worksheet.pv_ann_meas_range	cm
%tile	model.worksheet.pv_ann_meas_perc	%

Semilunar Valves tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Semilunar Valves tab	text	sv_find

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2.1.2.21 Group: Grt Ves (SR-4463)

Great Vessels Observations (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
First band contains the following from the Aorta tab:				
Aortic Root	<blank>		select:AoRoot	ao_root
Aneurysm Location	<blank>		select:Aneurysm_Loc	ao_aneurysm_loc
Visualized	<blank>		select:Visual	ao_visual
The next 2 are new				
Sidedness	<blank>		select: Sidedness	gv_sidedness
Branching	<blank>	Disabled if Sidedness is blank	select: Branching	gv_branching
All observations from PA tab in next band				
3 rd band is to be Common Great Vessels -				
Band contains 4 Aorta sections: AAo, Trans Ao, Isthmus, DAo; ao_pref = [aao, tao, isth, dao]				
{Ao section}				
Velocity increase	<blank>		select: Severity	gv_{ao_pref}_vel_incr
Dilation	<blank>		select: Severity	gv_{ao_pref}_dilat
Narrowing	<blank>		select: Severity_plus_Discreet	gv_{ao_pref}_narrow
Hypoplasia	<blank>		select: Severity	gv_{ao_pref}_hypo
Coarctation				
CoA	<blank>		select:GrtVesCoarct	ao_coarct
Severity	<blank>		select: Severity	ao_coarct_sev
Location	<blank>		select:GrtVesCoarctLoc	ao_coarct_loc

Great Vessels Measurements (Pediatric)

All measurements from Aorta in the left column, plus additional, minus AoD Arch	All measurements from PA in the right column, plus additional
---	---

Additional Aorta Measurements (Pediatric)

Label	DB field name root	Units
Prox AoD Arch	aod_arch_prox	cm
Dist AoD Arch	aod_arch_dist	cm
AoD Isthmus	aod_isthmus	cm
Ao Desc Pk Vel	aod_desc_pk_vel	m/s
Ao Desc Pk Grad	aod_desc_pk_grad	mmHg

Aorta Z-Scores NOTE: PEDIATRIC PROTOCOL ONLY

Label	DB field name root	Units
AoD Annulus Z-Score	model.worksheet.aod_ann_zscore	--
Mean	model.worksheet.aod_ann_mean	cm
Range	model.worksheet.aod_ann_range	cm
%tile	model.worksheet.aod_ann_perc	%
AoD SOV Z-Score	model.worksheet.aod_sinus_zscore	--
Mean	model.worksheet.aod_sinus_mean	cm
Range	model.worksheet.aod_sinus_range	cm
%tile	model.worksheet.aod_sinus_perc	%
AoD ST Junc Z-Score	model.worksheet.aod_st_junc_zscore	--
Mean	model.worksheet.aod_st_junc_mean	cm

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Label	DB field name root	Units
Range	model.worksheet.aod_st_junc_range	cm
%tile	model.worksheet.aod_st_junc_perc	%
AoD Asc(Prox) Z-Score	model.worksheet.aod_asc_zscore	--
Mean	model.worksheet.aod_asc_mean	cm
Range	model.worksheet.aod_asc_range	cm
%tile	model.worksheet.aod_asc_perc	%
Dist AoD Arch Z-Score	model.worksheet.aod_arch_dist_zscore	--
Mean	model.worksheet.aod_arch_dist_mean	cm
Range	model.worksheet.aod_arch_dist_range	cm
%tile	model.worksheet.aod_arch_dist_perc	%
AoD Isthmus Z-Score	model.worksheet.aod_isthmus_zscore	--
Mean	model.worksheet.aod_isthmus_mean	cm
Range	model.worksheet.aod_isthmus_range	cm
%tile	model.worksheet.aod_isthmus_perc	%
AoD Desc Z-Score	model.worksheet.aod_desc_zscore	--
Mean	model.worksheet.aod_desc_mean	cm
Range	model.worksheet.aod_desc_range	cm
%tile	model.worksheet.aod_desc_perc	%

Additional PA Measurements (Pediatric)

Label	DB field name root	Units
PA Pk Vel	pa_pk_vel	m/s
PA Pk Grad	pa_pk_grad	mmHg
RPA Diameter	rpa_diam	cm
RPA Pk Vel	rpa_pk_vel	m/s
RPA Pk Grad	rpa_pk_grad	mmHg
LPA Diameter	lpa_diam	cm
LPA Pk Vel	lpa_pk_vel	m/s
LPA Pk Grad	lpa_pk_grad	mmHg

PA Z-Scores NOTE: PEDIATRIC PROTOCOL ONLY

Label	DB field name root	Units
PA Diameter Z-Score	model.worksheet.pa_diam_zscore	--
Mean	model.worksheet.pa_diam_mean	cm
Range	model.worksheet.pa_diam_range	cm
%tile	model.worksheet.pa_diam_perc	%
RPA Diameter Z-Score	model.worksheet.rpa_diam_zscore	--
Mean	model.worksheet.rpa_diam_mean	cm
Range	model.worksheet.rpa_diam_range	cm
%tile	model.worksheet.rpa_diam_perc	%
LPA Diameter Z-Score	model.worksheet.lpa_diam_zscore	--
Mean	model.worksheet.lpa_diam_mean	cm
Range	model.worksheet.lpa_diam_range	cm
%tile	model.worksheet.lpa_diam_perc	%

Great Vessels tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Great Vessels tab	text	grt_ves_find

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2.1.2.22 Group: Duct Art (SR-4464)

Ductus Arteriosus Observations (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
PDA	blank		select:PDA	da_pda
Flow	blank	Only enabled if PDA not blank	Select:Flow	da_flow

Ductus Arteriosus Measurements (Pediatric)

Label	DB field name root	Units
PDA Diam	da_pda_diam	cm
SysFlow Mx Vel	da_sys_flow_mx_vel	m/s
Dias Flow Mx Vel	da_dia_flow_mx_vel	m/s

Ductus Arteriosus tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Ductus Arteriosus tab	text	da_find

2.1.2.23 Group: Cor Art (SR-4465)

Coronary Arteries Observations (Pediatric)

Iterate over areas: LMCA, LAD, CX, RCA, PD

Prefixes = {'lmca', 'lad', 'cx', 'rca', 'pd'}

Label	Default Value	Notes	Input Type	DB Field
Area				
Origin	<blank>	Normal for LMCA and RCA	select: Origin	ca_{pref}_origin
Caliber	<blank>	disabled if Origin is Not well visualized	select: Caliber	ca_{pref}_caliber

Coronary Arteries Measurements (Pediatric)

Label	DB field name root	Units
LMCA	ca_lmca	mm
LAD	ca_lad	mm
CX	ca_cx	mm
RCA	ca_rca	mm
PD	ca_pd	mm

Coronary Artery Z-Scores NOTE: PEDIATRIC PROTOCOL ONLY

Label	DB field name root	Units
LMCA Z-Score	model.worksheet.ca_lmca_zscore	--
Mean	model.worksheet.ca_lmca_mean	cm
Range	model.worksheet.ca_lmca_range	cm
%tile	model.worksheet.ca_lmca_perc	%
LAD Diameter Z-Score	model.worksheet.ca_lad_zscore	--
Mean	model.worksheet.ca_lad_mean	cm
Range	model.worksheet.ca_lad_range	cm
%tile	model.worksheet.ca_lad_perc	%
CX Z-Score	model.worksheet.ca_cx_zscore	--
Mean	model.worksheet.ca_cx_mean	cm
Range	model.worksheet.ca_cx_range	cm
%tile	model.worksheet.ca_cx_perc	%
RCA Diameter Z-Score	model.worksheet.ca_rca_zscore	--
Mean	model.worksheet.ca_rca_mean	cm

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Label	DB field name root	Units
Range	model.worksheet.ca_rca_range	cm
%tile	model.worksheet.ca_rca_perc	%

Coronary Arteries tab (Pediatric)

Label	Default Value	Notes	Input Type	DB Field
Findings	<blank>	Coronary Artery tab	text	ca_find

2.1.2.24 Protocol Specific (SR-11145)

Protocol Statement (TEE and TTE only)

Label	Default Value	Notes	Input Type	DB Field
Contrast agent 1 Contrast agent 2	<blank>	{blank None Definity Optison Lumason Agitated saline Other } 'None' only available for Contrast agent 1. Contrast agent 2 only enabled if Contrast agent 1 other than blank or None.	Select	cont_agent, cont_agent2
	<blank>	only enabled if corresponding Contrast agent is enabled and not set at None.	text	cont_level, cont_level2
Insertion (TEE only)	<blank>	TEE protocol only {blank easy difficult failed}	Select	tr_insertion

Protocol statement shall read, following the Procedure statement, if any:

Contrast agent [cont_agent] [cont_level] ml given I.V. Probe insertion [easy | difficult | failed]. (Repeat for second.)

None: No contrast agent given.

Other: Contrast agent [cont_level] ml given I.V.

Pediatric Tabless section additional fields:

Label	Default Value	Notes	Input Type	DB Field
Sedation Used	<blank>		select: YesNo	sedation

2.1.3 Observation options

Worksheet shall provide options to select on observations.

2.1.3.1 Aneurysm_Loc (SR-4474)

ID	List	Notes
Aneurysm_Loc	{', 'Ascending Aorta', 'Transverse Aorta', 'Descending Aorta', 'Ascending and Transverse Aorta', 'Ascending and Descending Aorta', 'Transverse and Descending Aorta', 'Ascending, Transverse, and Descending Aorta', 'Aortic Sinus'} default:'blank'	Aneurysm Location all abnormal

2.1.3.2 Annulus (SR-4475)

ID	List	Notes
Annulus	{', 'Mild calcification', 'Moderate calcification', 'Severe calcification', 'Valvular annuloplasty', 'Annuloplasty (ring)', 'Annuloplasty (clip)'} Default: blank	AV Annulus, MV Annulus, PV Annulus - all abnormal
Annulus_plus_Dil	{', 'Mild calcification', 'Moderate calcification', 'Severe calcification', 'Dilation', 'Valvular annuloplasty', 'Annuloplasty (ring)', 'Annuloplasty (clip)'} Default: blank	TV Annulus all abnormal

2.1.3.3 AoRoot (SR-4477)

ID	List	Notes
AoRoot	{', 'Normal', 'Dilated', 'Mildly Dilated', 'Moderately Dilated', 'Severely Dilated', 'Not well seen'} default:'Normal'	Aortic Root - blank and Normal are the only Normals

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2.1.3.4 Septal Walls

ID	List	Notes
AS_Wall (TTE/TEE)	{', 'Normal', 'Aneurysm with PFO', 'Aneurysm w/out PFO', 'PFO w/out aneurysm', 'Primum', 'Secundum', 'Sinus Venosus', 'Lipomatous', 'Hyperlipomatous', 'Mobile Septum'} Default: blank	LA Atrial Septal Wall -all abnormal
AS_Wall (Pediatric)	{', 'Normal', 'Intact', 'Aneurysm with PFO', 'Aneurysm w/out PFO', 'PFO w/out aneurysm', 'Patent PFO', 'Primum', 'Secundum', 'Sinus Venosus', 'Lipomatous', 'Hyperlipomatous', 'Mobile Septum'} Default: - 'Intact' when ASD size is empty, - blank when ASD size is populated	LA Atrial Septal Wall - Intact is normal
IS_Sept_Wall	{', 'Lipomatous', 'Aneurysmal', 'PFO'} Default: blank	IS Septal Wall, TEE only field, All abnormal

2.1.3.5 AV_Etiology (SR-4479)

ID	List	Notes
AV_Etiology	{', 'Rheumatic', 'Myxomatous degeneration', 'Coronary artery', 'LV Dysfunction', 'Senile degeneration', 'Congenital valvular', 'Aortic root dilation', 'Rocking', 'Dehiscence', 'Abscess', 'Pannus', 'Fistula', 'Fracture/Perforation', 'Redundant', 'Non specific', 'Unknown'} Default: blank	Etiology of AV Disease all abnormal

2.1.3.6 AV Doppler (SR-14212)

ID	List	Notes
AR_JetWidth	{', 'Small in central', 'Intermediate', 'Large in central', 'Variable in eccentric'} Default: blank	AR Jet Width in LVOT all abnormal
AR_flow_converg	{', 'None', 'Very small', 'Intermediate', 'Large'} Default: blank	AR Flow Convergence Blank and None are normal
AR_JetDens	{', 'Incomplete/faint', 'Dense'} Default: blank	AR Jet Density all abnormal

2.1.3.7 Borderline/Abnormal

ID	List	Notes
Bord_Abn	{', 'Normal', 'Borderline', 'Abnormal'} Default: blank	Blank and 'Normal' are normal

2.1.3.8 BSAForm (SR-4481)

ID	List	Notes
BSAForm	{'Boyd', 'DuBois', 'Gehan', 'Haycock', 'Mosteller', 'Dreyer'} Default: Boyd	All normal

2.1.3.9 Cardio (SR-4482)

ID	List	Notes
Cardio	{', 'Dilated', 'Hypertrophic', 'Restrictive'} Default: blank	LV Cardiomyopathy, RV Cardiomyopathy All abnormal

2.1.3.10 Carpentier (SR-4483)

ID	List	Notes
Carpentier	{', 'Type I', 'Type II', 'Type IIIa', 'Type IIIb'} Default: blank	MV Carpentier's class, all abnormal

2.1.3.11 Cavity (SR-4484)

ID	List	Notes
Cavity	{', 'Normal', 'Slightly Dilated', 'Mildly Dilated', 'Mild-Mod', 'Moderately Dilated', 'Mod-Sev', 'Severely Dilated', 'Abnormally Small', 'Borderline'} Default: Normal	LA Cavity Size, RA Cavity Size, RV Cavity Size "Normal" is normal

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2.1.3.12 Coarctation (SR-4486)

ID	List	Notes
GrtVesCoarct	{', 'No', 'NWV', 'PDA', 'Present'} Default: blank	Great Vessels Coarctation - 'No' is normal
Coarct_Loc (TTE/TEE)	{', 'Present', 'Proximal to the left subclavian artery', 'Distal to the left subclavian artery'} default:'blank'	Coarctation Location all abnormal
GrtVesCoarctLoc (Pediatric)	{', 'Proximal to the left subclavian artery', 'Distal to the left subclavian artery', 'Juxtaductal'} Default: blank	Great Vessels Coarctation Location all abnormal

2.1.3.13 Cusps (SR-4487)

ID	List	Notes
Cusps	{', 'Trileaflet', 'Bicuspid', 'Unicuspid', 'Quadricuspid'} Default: Trileaflet	AV Cusps 'Trileaflet' is normal

2.1.3.14 Desc_Ao_FlowRev (SR-14205)

ID	List	Notes
Desc_Ao_FlowRev	{', 'Brief, early', 'Intermediate', 'Prominent holodiastolic'} Default: blank	Desc Aorta Diast Flow Reversal all abnormal

2.1.3.15 Diss_Class (SR-4488)

ID	List	Notes
Diss_Class	{', 'Stanford A (proximal)', 'Stanford B (Distal)', 'DeBakey Type I', 'DeBakey Type II', 'DeBakey Type III'} default:'blank'	Aorta Dissection Classification- all abnormal

2.1.3.16 Fluid (SR-4490)

ID	List	Notes
Fluid	{', 'Clear', 'Echogenic (blood/coag)', 'Focal Strands', 'Exudate/fibrous'} default:'blank'	Pericardial Fluid - all abnormal

2.1.3.17 HemoComp (SR-4491)

ID	List	Notes
HemoComp	{', 'Tamponade', 'Constriction', 'None'} default:'blank'	Pericardium Hemodynamic Compromise None is normal, the rest abnormal
PedHemoComp	{', 'None', 'Tamponade RAC', 'Tamponade IFV', 'Tamponade RVC',} default:'blank'	Pediatric Pericardium Hemodynamic Compromise None is normal, the rest abnormal

2.1.3.18 IVC_Morph (SR-4492)

ID	List	Notes
IVC_Morph (TTE/TEE)	{', 'Normal', 'Dilated', 'Small'} default: 'Normal'	IVC Morphology 'Normal' is normal
IVC_Morph_plus_Abs (Pediatric)	{', 'Normal', 'Dilated', 'Small', 'Absent'} default: ''	IVC Morphology 'Normal' is normal

2.1.3.19 IVC_Resp (SR-4493)

ID	List	Notes
IVC_Resp	{', 'Yes', '>50%', '<50%', 'Blunted', 'Poor'} default:'Yes'	IVC Respiratory Response- 'Yes' and '>50%' are normal

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2.1.3.20 LA_ThromMassLoc (SR-4494)

ID	List	Notes
LA_ThromMassLoc	{',', 'LA Appendage', 'LA Body', 'Atrial Septum', 'LA Catheter' } Default: blank	LA Thrombus Location, LA Mass Location - all abnormal

2.1.3.21 LeafMob

ID	List	Notes
LeafMob	{',', 'Normal', 'Doming', 'Mildly restricted', 'Moderately restricted', 'Severely restricted', 'Redundant'} Default: blank	AV Leaflet Mobility, MV Leaflet Mobility, TV Leaflet Mobility, PV Leaflet Mobility- 'Normal' is normal

2.1.3.22 LeafProlapse

ID	List	Notes
Ant_Post	{',', 'Anterior', 'Posterior'} Default: blank	MV Prolapsing Leaflet All abnormal
Ant_Sept_Post	{',', 'Anterior', 'Septal', 'Posterior'} Default: blank	TV Prolapsing Leaflet All abnormal
Ant_LR	{',', 'Anterior', 'Left', 'Right'} Default: blank	PV Prolapsing Leaflet All abnormal
LCC_RCC_NCC	{',', 'Left coronary', 'Right coronary', 'Non-coronary'} Default: blank	AV Prolapsing Leaflet All abnormal

2.1.3.23 LV Diastolic Dysfunction (SR-4496)

ID	List	Notes
LV_Dia_Dysfun	{',', 'Normal', 'Indeterminate', 'Grade I (impaired)', 'Grade II (pseudonormal)', 'Grade III (restrictive)'} Default: blank	LV Diastolic Filling/Dysfunction "Normal" is normal

2.1.3.24 LV_LAP (SR-17354)

ID	List	Notes
LV_LAP	{',', 'Normal', 'Indeterminate', 'Elevated'} Default: blank	LV LAP "Normal" is normal

2.1.3.25 LV_IntDim (SR-4497)

ID	List	Notes
LV_IntDim	{'Normal', ', Dilated', 'Minimally Dilated', 'Mildly Dilated', 'Mild-Mod dilated', 'Moderately Dilated', 'Mod-Severe dilated', 'Severely Dilated', 'Decreased', 'Borderline dilated', 'Small'} default: 'normal'	LV Int Dim 'Normal' is normal

2.1.3.26 LV_GlobWall (SR-4498)

ID	List	Notes
LV_GlobWall (dropdown not linked to diagram)	{',', 'Normal', 'Borderline', 'Low normal', 'Mild', 'Moderate', 'Severe', 'Hypokinetic', 'Global hypo w/minor var'} Default: Normal	LV Global Wall Motion Normal is normal
dropdown linked to diagram, Diagram state 0	[Normal Hypokinesis Akinesis Dyskinesis Aneurysm] Default: Normal	Normal is the only normal
dropdown linked to diagram, Diagram state 1	[Hyperkinetic Normal Global hypokinetic w/minor var Hypokinetic Akinetic Dyskinetic Aneurysmal Akinetic w/scar Dyskinetic w/scar] Default: Normal	– Hyperkinetic and Normal are normal. - Global hypokinetic w/minor var selects Hypokinetic
dropdown linked to diagram, Diagram state 2	[Normal Global hypokinesis w/minor var Hypokinesis Akinesis Dyskinesis Aneurysm Pseudoaneurysm Akinetic w/scar Dyskinetic w/scar] Default: Normal	– normal is the only normal. - Global hypokinesis w/minor var selects Hypokinesis.
dropdown linked to diagram, Diagram state 3	[Hyperdynamic Normal Mildly hypokinetic Moderate hypokinetic Severely hypokinetic Akinetic Dyskinetic Aneurysmal] Default: Normal	– Hyperdynamic and Normal are normal

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2.1.3.27 LV_RegWall (SR-4499)

ID	List	Notes
LV_RegWall	{'Normal', 'Hypokinesis', 'Akinesis', 'Dyskinesis', 'Aneurysm', 'Not seen'} default: 'normal'	Regional wall motion diagram option 0
	{'Hyperkinetic', 'Normal', 'Hypokinetic', 'Akinetic', 'Dyskinetic', 'Aneurysmal', 'Akinetic w/scar', 'Dyskinetic w/scar', 'Cannot interpret'} default: 'normal'	Regional wall motion diagram option 1
	{'Normal', 'Hypokinesis', 'Akinesis', 'Dyskinesis', 'Aneurysm', 'Not seen', 'Pseudoaneurysm', 'Akinetic w/scar', 'Dyskinetic w/scar'} default: 'normal'	Regional wall motion diagram option 2
	{'Hyperdynamic', 'Normal', 'Mildly hypokinetic', 'Moderate hypokinetic', 'Severely hypokinetic', 'Akinetic', 'Dyskinetic', 'Aneurysmal', 'Not well visualized'} default: 'normal'	Regional wall motion diagram option 3

2.1.3.28 LV_SeptWall (SR-4500)

ID	List	Notes
LV_SeptWall	{',', 'Post-op valve', 'Post-op CABG', 'Post-op Septum', 'RV volume overload', 'LBBS', 'RBBB', 'RV pacemaker'} Default: blank	Septal Wall Motion
Pediatric list:	{',', 'Post-op valve', 'Post-op Septum', 'RV volume overload', 'LBBS', 'RBBB', 'RV pacemaker', 'Paradoxical motion', 'Hypokinesis', 'Dyskinesis'} Default: blank	All abnormal

2.1.3.29 LV_Shape (SR-4501)

ID	List	Notes
LV_Shape	{',', 'Normal', 'Concentric remodeling', 'Concentric hypertrophy', 'Asymmetric hypertrophy', 'Eccentric hypertrophy'} Default: blank	LV Shape 'Normal' and blank are normal
LV_Shape_Loc	{',', 'Anterior', 'Posterior', 'Septal', 'Lateral', 'Apical', 'Inferior', 'Basal'} Default: blank	LV Shape Location All abnormal

2.1.3.30 LV_ThromLoc (SR-4503)

ID	List	Notes
LV_ThromLoc	{',', 'LVAD', 'Present', 'Anterior wall', 'Apical wall', 'Basal wall', 'Posterior wall', 'Septal wall', 'Inferior wall', 'Lateral wall', 'catheter'} Default: blank	LV Thrombus Location All abnormal

2.1.3.31 LV_VisEF (SR-4504)

ID	List	Notes
LV_VisEF	{',', '<20%', '20-25%', '25-30%', '30-35%', '35-40%', '40-45%', '45-50%', '50-55%', '55-60%', '60-65%', '65-70%', '>70%'} Default: blank	LV Visual EF 50-70% is Normal

2.1.3.32 LV_VSD_Loc (SR-4505)

ID	List	Notes
LV_VSD_Loc	{',', 'Membranous (infracristal)', 'Inlet', 'Muscular', 'Infundibular (supracristal)', 'Multiple'} Default: blank	LV VSD all abnormal

2.1.3.33 Morph (SR-4506)

ID	List	Notes
Morph	{',', 'Normal', 'Native', 'Prosthetic', 'Bioprosthetic', 'Mechanical', 'Valvuloplasty'} Default: Normal	AV Morphology, TV Morphology, PV Morphology, MV Morphology - 'Normal' and 'Native' are normal

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2.1.3.34 MV_Etiology (SR-4507)

ID	List	Notes
MV_Etiology	{',', 'Rheumatic', 'Myxomatous degeneration', 'Coronary artery', 'LV Dysfunction', 'Senile degeneration', 'Congenital valvular', 'Aortic root dilation', 'Rocking', 'Dehiscence', 'Abscess', 'Pannus', 'Fistula', 'Fracture/Perforation', 'Flail', 'Ruptured chordae', 'Cleft', 'Redundant', 'Non specific', 'Unknown'} Default: blank	Etiology of MV Disease all abnormal

2.1.3.35 MV Doppler (SR-14199)

ID	List	Notes
MR_CF_JetArea	{',', 'Small central', 'Moderate central', 'Large central', 'Wall-impinging'} Default: blank	MR Color Flow Jet Area all abnormal
MR_flow_converg	{',', 'Not visible', 'Very small', 'Intermediate', 'Large throughout systole'} Default: blank	MR Jet Flow Convergence all abnormal
MRTR_CWD_Jet	{',', 'Partial/faint', 'Dense/triangular'} Default: blank	MR CWD Jet, TR CWD Jet all abnormal
Vein_Flow	{',', 'Systolic dominance', 'Systolic blunting', 'Systolic flow reversal'} Default: blank	MR Pulm Vein Flow TR Hepatic Vein Flow all abnormal

2.1.3.36 Inflow (SR-14203)

ID	List	Notes
Inflow	{',', 'A-wave dominant', 'Variable', 'E-wave dominant'} Default: blank	Mitral Inflow, Tricuspid Inflow all abnormal

2.1.3.37 PA Pulm Artery (SR-4489)

ID	List	Notes
pa_pulm_artery	{',', 'Normal', 'Dilated'} default: 'Normal'	Pulmonary Artery Dilated is abnormal

2.1.3.38 Pericardium (SR-4510)

ID	List	Notes
Pericardium	{',', 'Normal', 'Mildly thickened', 'Mildly thickened w/calcification', 'Moderately thickened', 'Moderately thickened w/calcification', 'Severely thickened', 'Severely thickened w/calcification', 'Irregular'} Default: blank	Pericardium all abnormal
PedPeriVisual	{',', 'Echobright', 'Post surgical', 'Not well'} Default: ""	Pediatric Pericardium Visualized all abnormal
PedPeriFluid	{',', 'Insignificant', 'Small', 'Moderate', 'Large'} default: 'blank'	Pediatric Pericardial Fluid all abnormal
PeriLoc	{',', 'Anterior', 'Posterior', 'Apical', 'Circumferential', 'Multiple'} default: ""	all are abnormal

2.1.3.39 Pres_Abs

ID	List	Notes
Pres_Abs	{',', 'Present', 'Absent'} default: blank	Aorta Dissection, PA Embolism - 'Absent' is Normal

2.1.3.40 Abs_Pres

ID	List	Notes
Abs_Pres	{',', 'Absent', 'Present'} default: blank	LVOT Obstruction, SAM - 'Absent' is Normal

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2.1.3.41 Prolapse Qualifier

ID	List	Notes
AV_ProlapseQual	{', 'Flail', 'Wide coaptation'} Default: blank	AV Leaflet Prolapse qualifier all abnormal
MV_ProlapseQual	{', 'Symmetric', 'Flail', 'Non-flail asymmetric'} Default: blank	MV Leaflet Prolapse qualifier all abnormal
TV_ProlapseQual	{', 'Flail', 'Severe retraction', 'Large perforation'} Default: blank	TV Leaflet Prolapse qualifier all abnormal

2.1.3.42 PulmHyp (SR-4512)

ID	List	Notes
PulmHyp	{', 'Absent', 'Mild', 'Mild-mod', 'Moderate', 'Mod-severe', 'Severe'} default:'blank'	TV Pulmonary Hypertension 'Absent' is normal

2.1.3.43 PV_Etiology (SR-4513)

ID	List	Notes
PV_Etiology	{', 'Rheumatic', 'Myxomatous degeneration', 'Senile degeneration', 'Congenital valvular', 'Rocking', 'Dehiscence', 'Abscess', 'Pannus', 'Fistula', 'Fracture/Perforation', 'RV dysfunction', 'Coronary artery', 'Redundant', 'Aortic root dilation', 'Non specific', 'Unknown'} Default: blank	Etiology of PV Disease all abnormal

2.1.3.44 PV Doppler (SR-14222)

ID	List	Notes
PR_CF_JetSize	{', 'Thin', 'Intermediate', 'Broad origin'} Default: blank	PR Color Flow Jet Size all abnormal
PR_JetDems	{', 'Soft', 'Dense', 'Dense; early term of diastolic flow'} Default: blank	PR Jet Density and Contour all abnormal

2.1.3.45 RA_ThromMassLoc (SR-4515)

ID	List	Notes
RA_ThromMassLoc	{', 'RA Appendage', 'RA Body', 'Atrial Septum', 'RA Catheter', 'IVC', 'SVC', 'Multiple'} Default: blank	RA Thrombus Location, RA Mass Location all abnormal

2.1.3.46 RA_Visual

ID	List	Notes
RA_Visual	{', 'Not well visualized', 'RA pacemaker', 'RA pacemaker lead wires'} Default: blank	All are normal

2.1.3.47 Regurg (SR-4516)

ID	List	Notes
Regurg	{', 'None', 'Trace', 'Mild', 'Mild-mod', 'Moderate', 'Mod-severe', 'Severe'} Default: None	TV Regurgitation, PV Regurgitation 'None' is normal
AVMVRegurg	{', 'None', 'Trace', 'Mild (Grade I)', 'Mild-mod', 'Moderate (Grade II)', 'Moderate (Grade III)', 'Mod-severe', 'Severe (Grade III)', 'Severe (Grade IV)'} Default: None	AV Regurgitation, MV Regurgitation, 'None' is normal
	For both lists:	WS options can define Trace and Mild as normal

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2.1.3.48 RV_GlobSys (SR-4517)

ID	List	Notes
RV_GlobSys	{', 'Normal', 'Hyperdynamic', 'Low normal', 'Mildly reduced', 'Moderately reduced', 'Severely reduced' Default: Normal	RV Systolic Global Function 'Normal' is normal

2.1.3.49 RV_ThromLoc (SR-4518)

ID	List	Notes
RV_ThromLoc	{', 'RV free wall', 'RV Apex', 'Moderator band', 'RV Catheter', 'Septum'} Default: blank	RV Thrombus Location all abnormal

2.1.3.50 RV_Visual

ID	List	Notes
RV_Visual	{', 'Not well visualized', 'RV pacemaker', 'RV pacemaker lead wires'} Default: blank	All are normal

2.1.3.51 RV_TAPSE

ID	List	Notes
RV_TAPSE	{', 'Normal', 'Reduced'} Default: blank	Normal is normal

2.1.3.52 Severity (SR-4519)

ID	List	Notes
Severity	{', 'mild', 'moderate', 'severe'} Default: blank	LV Shape Size, AV Leaflet Thickening, MV Leaflet Thickening, MV Leaflet Calcification, TV Leaflet Thickening, TV Leaflet Calcification, PV Leaflet Thickening, PV Leaflet Calcification, Aortic Atherosclerotic Changes All abnormal
Severity_mult	{', 'mild', 'mild-mod', 'moderate', 'mod-severe', 'severe'} Default: blank	RV Concentric Hypertrophy- all abnormal
Severity_plus_Border	{', 'Mild', 'Moderate', 'Severe', 'Borderline'} Default: blank	AV Leaflet Prolapse, MV Leaflet Prolapse, TV Leaflet Prolapse, PV Leaflet Prolapse- all abnormal
Severity_plus_Scler	{', 'Mild', 'Moderate', 'Severe', 'Sclerotic'} Default: blank	AV Leaflet Calcification all abnormal
Severity_plus_Discreet	{', 'Discreet', 'Mild', 'Moderate', 'Severe'} Default: blank	Great Vessels tab-Narrowing dorpdowns- All abnormal
NormMMS	{', 'Normal', 'Mild', 'Moderate', 'Severe'} default: "	Normal is Normal
Normal	{', 'Normal'} default: "	LA Appendage, Interatrial Septum Normal is Normal

2.1.3.53 Shunt (SR-4523)

ID	List	Notes
Shunt	{', 'left-to-right', 'right-to-left', 'bidirectional'} Default: blank	LV VSD Shunt, LA ASD Shunt All abnormal

2.1.3.54 Size

ID	List	Notes
Size	{', 'small', 'moderate', 'large'} Default: blank	LV VSD Size, LA ASD Size All abnormal

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ID	List	Notes
Size_plus_None_Med	{',', 'None', 'Small', 'Medium', 'Large'} default:blank	LAA Thrombus/Mass 'None' is normal
Size_plus_None	{',', 'None', 'Small', 'Moderate', 'Large'} default:blank	Pleural Effusion 'None' is normal
Size_plus_None_Insig	{',', 'None', 'Insignificant', 'Small', 'Moderate', 'Large'} default:'None'	Pericardial Effusion 'None' is normal
Size_plus_None_Trace	{',', 'None', 'Trace', 'Small', 'Moderate', 'Large'} default:'None'	Pericardial Effusion (alternate list) 'None' is normal
Size_plus_Pres_Abs	{',', 'Present', 'small', 'moderate', 'large', 'Absent'} Default: blank	AV Vegetation, MV Vegetation, TV Vegetation, PV Vegetation- Absent is normal, the rest abnormal

2.1.3.55 Sten (SR-4529)

ID	List	Notes
Sten	{',', 'None', 'Trace', 'Mild', 'Mild-mod', 'Moderate', 'Mod-severe', 'Severe', 'Critical', 'borderline'} Default: blank Default is None for Pediatric	AV Stenosis, MV Stenosis, TV Stenosis, PV Stenosis- 'None' is normal
Sten_no_Border	{',', 'None', 'Trace', 'Mild', 'Mild-mod', 'Moderate', 'Mod-severe', 'Severe', 'Critical'} Default: blank	PA Stenosis- 'None' is normal

2.1.3.56 Sys_Dia (SR-4531)

ID	List	Notes
Sys_Dia	{',', 'Systolic', 'Diastolic'} default:blank	Pulm. Vein Predominance- all abnormal

2.1.3.57 ThromMass (SR-4532)

ID	List	Notes
ThromMass	{',', 'none', 'present', 'small', 'medium', 'large', 'diffuse', 'multiple'} Default: blank	LA Thrombus, LA Mass, RA Thrombus, RA Mass, RV Thrombus 'None' is normal

2.1.3.58 ThromMass_Mob

ID	List	Notes
ThromMass_Mob	{',', 'Mobile', 'Non-mobile'} Default: blank	LV Thrombus Mobility, RV Thrombus Mobility, LA Thrombus Mobility, LA Mass Mobility, RA Thrombus Mobility, RA Mass Mobility, LAA Thrombus Mobility, LAA Mass Mobility All abnormal

2.1.3.59 TV_Etiology (SR-4534)

ID	List	Notes
TV_Etiology	{',', 'Rheumatic', 'Myxomatous degeneration', 'Coronary artery', 'RV dysfunction', 'Senile degeneration', 'Congenital valvular', 'Aortic root dilation', 'Rocking', 'Dehiscence', 'Abscess', 'Pannus', 'Fistula', 'Fracture/Perforation', 'Flail', 'Ruptured chordae', 'Ebstein's Anomaly', 'Redundant', 'Non specific', 'Unknown'} Default: blank	Etiology of TV Disease all abnormal

2.1.3.60 TV Doppler (SR-14218)

ID	List	Notes
TR_CF_JetArea	{',', 'Small central', 'Moderate central', 'Large central', 'Eccentric wall-impinging'} Default: blank	TR Color Flow Jet Area all abnormal
TR_flow_converg	{',', 'Not visible', 'Small/transient', 'Intermediate in size and dur', 'Large throughout systole'} Default: blank	MR Jet Flow Convergence all abnormal

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2.1.3.61 Veg_Loc (SR-4535)

ID	List	Notes
TV_Veg_Loc	{',', 'Anterior (Infundibular) cusp', 'Posterior (Marginal) cusp', 'Septal (Medial) cusp'} Default: blank	TV Vegetation Location all abnormal
MV_Veg_Loc	{',', 'Anterior(infundibular)', 'Posterior (Marginal)', 'Septal (Medial)'} Default: blank	MV Vegetation Location all abnormal
PV_Veg_Loc	{',', 'Anterior cusp', 'Right cusp', 'Left cusp'} Default: blank	PV Vegetation Location all abnormal
AV_Veg_Loc	{',', 'Right Coronary Cusp', 'Left Coronary Cusp', 'Non Coronary Cusp'} Default: blank	AV Vegetation Location all abnormal

2.1.3.62 Veg_Mob (SR-4536)

ID	List	Notes
Veg_Mob	{',', 'Mobile', 'Non-mobile', 'Pedunculated and mobile'} Default: blank	AV Vegetation Mobility, MV Vegetation Mobility, TV Vegetation Mobility, PV Vegetation Mobility- all abnormal

2.1.3.63 Visual (SR-4537)

ID	List	Notes
Visual	{',', 'Well', 'Adequate', 'Not well', 'Not seen'} default:blank	AV Visualized, MV Visualized, TV Visualized, PV Visualized, Pericardium Visualized, Aorta visualized, PA Visualized, IVC Visualized, Pulm Vein Visualized- all normal

2.1.3.64 YesNo

ID	List	Notes
YesNo	{',', 'Yes', 'No'} default:blank	Sedation No abnormal

2.1.3.65 Yes

ID	List	Notes
Yes	{',', 'Yes'} default:blank	TAVR Abnormal

2.1.3.66 Situs (SR-4539)

ID	List	Notes
Situs	{',', 'Solitus', 'Inversus', 'Ambiguous', '.' } default: Solitus	Solitus is the only normal

2.1.3.67 LMD (SR-4540)

ID	List	Notes
LMD	{',', 'Levocardia', 'Mesocardia', 'Dextrocardia', '.' } default: Levocardia	Levocardia is the only normal

2.1.3.68 VentLoop (SR-4541)

ID	List	Notes
VentLoop	{',', 'D-vent', 'L-vent'} default: "	D-vent is normal

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2.1.3.69 AV/VA Align (SR-4542)

ID	List	Notes
AV Align	{', 'Concordance', 'Discordance', '2-inlet ventricle' } default: "	Concordance is normal
VA Align	{', 'Concordance', 'Discordance', '2-outlet RV', '2-outlet LV', 'Pulm atresia', 'Aortic atresia', 'Trunc arteriosus' } default: "	Concordance is normal

2.1.3.70 Grt Ves Pos (SR-4544)

ID	List	Notes
Grt Ves Pos	{', 'S normal-PGV', 'N normal-PGV', 'D-TGV', 'L-TGV', 'D-MA', 'L-MA', 'L-TGA', 'D-TGA', 'Complete subAo conus', 'Bilat conus', 'Bilat absent conus' } default: "	S normal-PGV and N normal-PGV are the only normal

2.1.3.71 Sys Veins (SR-4545)

ID	List	Notes
Sys Veins	{', 'Normal sys-hep venous conn.', 'SVC enters RA', 'IVC enters RA', 'No SVC-RA entrance', 'No IVC-RA entrance', 'SVC enters RA, no sten', 'IVC enters RA, no sten', 'No SVC-atria conn.', 'No IVC-atria conn.', 'Persistent left SVC drain', 'No bridge vein L-R SVC' } default: Normal sys-hep venous conn.	Normal sys-hep venous conn. is normal

2.1.3.72 SeenOrNot (SR-4546)

ID	List	Notes
SeenOrNot	{', 'Seen', 'Not seen' } default: "	All normal

2.1.3.73 Hep Veins (SR-4547)

ID	List	Notes
Hep Veins	{', 'Normal drainage', 'Not well seen' } default: Normal drainage	'Normal drainage' is the only normal

2.1.3.74 PDA (SR-4551)

ID	List	Notes
PDA	{', 'None', 'Small', 'Small-Mod', 'Moderate', 'Mod-Large', 'Large' }	

2.1.3.75 Flow (SR-4552)

ID	List	Notes
Flow	{', 'L-R', 'R-L', 'Bidi' } default: "	

2.1.3.76 CommAVMorph (SR-4857)

ID	List	Notes
CommAVMorph	{', 'Balanced', 'LV-dominant', 'RV-dominant' } Default: "	Blank and 'Balanced' are normal

2.1.3.77 Balance (SR-4858)

ID	List	Notes
Balance	{', 'Mild', 'Moderate', 'Severe' } Default: "	blank is the only normal

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2.1.3.78 CommAV_LeafMob (SR-4886)

ID	List	Notes
CommAV_LeafMob	{',', 'Normal', 'Doming', 'Mildly restricted', 'Moderately restricted', 'Severely restricted', 'Redundant', 'to IVS', 'to RV', 'Free floating'} Default: blank	Common AV Leaflet Mobility 'Normal' is normal

2.1.3.79 Trunc_Morph (SR-4896)

ID	List	Notes
Trunc_Morph	{',', 'Presaeant', 'Type I', 'Type II', 'Type III', 'Type IV'} Default: blank	Truncal Valve Morphohology all abnormal

2.1.3.80 Sidedness (SR-4910)

ID	List	Notes
Sidedness	{',', 'Left aortic arch', 'Right aortic arch'} Default: blank	Great Vessels Sidedness All abnormal

2.1.3.81 Branching (SR-4912)

ID	List	Notes
Branching	{',', 'Normal arch', 'Mirror image', 'LCC from BCT', 'Right sub from left sub', 'Right sub from DAo', 'Aberrant left'} Default: blank	Great Vessels Branching 'Normal arch' is normal

2.1.3.82 Origin (SR-4995)

ID	List	Notes
Origin	{',', 'Normal', 'Not well visualized', 'Anomalous'} default: "	Coronary Arteries Only Anomalous is abnormal

2.1.3.83 Caliber (SR-4996)

ID	List	Notes
Caliber	{',', 'Stenotic', 'Dilated', 'Hypoplastic', 'Aneurysmal', 'Ectatic'} default:"	Coronary Arteries all abnormal

2.1.3.84 IVS Shape (Pediatric only)

ID	List	Notes
IVS Shape	{',', "Normal", "Flattening during systole", "Flattening during diastole", "Flattening during systole and diastole", "Systolic bowing into the LV chamber"} default:'blank'	Vents tab, IVS Details section: Normal is only normal

2.1.3.85 Rhythm (SR-11141)

ID	List	Notes
Rhythm	{',', "NSR", "SB", "ST", "SA", "AT", "MAT", "AF", "AFL", "AFRR", "AFLRR", "JR", "AJR", "IV R", "VT", "VBIG", "VTRI", "SRSV", "SRSA", "RRO", "SVT", "SSS", "PVC", "NPAC", "PACEFC", "PA CEF", "NR"} default:'blank'	Rhythm shown in patient info section. Selection appears on report in same section.

2.1.3.86 PA Prominent

ID	List	Notes
PA Prominent	{',', 'Prominent'} default:blank	PA Diastolic Flow Reversal PA branches - prominent is abnormal

2.1.3.87 Lobes

ID	List	Notes
Lobes	{',', '1', '2', '3', '4', ' ', 'None'} default:blank	LAA Lobes – 'None' is normal

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2.1.4 Dependencies/Calculated values

Worksheet shall support certain triggers and calculated values.

2.1.4.1 WMSI (SR-23530)

WMSI calculation (based on iDiagram option)

Option 0: normal = 1, hypokinesis = 2, akinesis = 3, dyskinesis = 4, aneurysm = 5

Option 1: normal or hyperkinesis = 1, hypokinesis = 2, akinesis (w or w/o scar)= 3, dyskinesis (w or w/o scar) = 4, and aneurysmal = 5.

Option 2: normal = 1, hypokinesis = 2, akinesis (w or w/o scar)= 3, dyskinesis (w or w/o scar)= 4, aneurysm or pseudoaneurysm = 5

Option 3: hyperdynamic = 1, normal = 1, mildly hypokinetic = 1.5, moderate hypokinetic = 2, severely hypokinetic = 2.5, akinetic = 3, dyskinetic = 4, aneurysmal = 5.

WMSI is derived as the sum of all scores divided by the number of segments visualized.

This means that segments selected at **Not seen**, **Not well visualized** or **Cannot interpret**, are removed from the equation altogether.

2.1.4.2 Triggered observations

Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
Triggers				
LV Cardiomyopathy	MV E/A ratio AND MV Decel Time AND septal e' AND lateral e'	Others not captured on wksht are mitral inflow resp var AND hepatic vein Doppler AND ventricular septal strain		Selection 'Restrictive' <u>Restrictive cardiomyopathy</u> MV E/A >1.5 MV Decel Time (ms) <160 Septal e' <7 cm/s Lateral e' higher than septal e'
LV Internal Dimension	LVIDd/BSA			WOMEN: Mild 3.3-3.4 Moderate 3.5-3.7 Severe ≥3.8 MEN: Mild 3.2-3.4 Moderate 3.5-3.6 Severe ≥3.7
LV Global Wall Motion	LV EF		Chamber Quantification 2015 p. 10 Table 4 Note: This trigger is disabled if dropdown is linked to the SWM diagram	Male: Normal 52-72 Mild 41-51 Mod 30-40 Severe <30 Female: Normal: 54-74 Mild: 41-53 Mod: 30-40 Severe: <30
LA Cavity Size	LA Vol Idx (if avail) else LA (if a valid number) else LA (Mmode)			LA vol Idx: (gender independent) Normal 16-34 Mild 35-41 Moderate 42-48 Severe >48 LA: Women: Normal: 2.7-3.8 3.9-4.2 (mild) 4.3-4.6 (mod) ≥4.7(severe) Men: Normal: 3.0-4.0 4.1-4.6 (mild) 4.7-5.2 (mod) ≥5.3(severe)
Mitral Inflow	MV Pk E Vel	≥1.2 <1.2 or change to blank		Selection 'E-wave dominant' Set to blank

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Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
Hemodynamic compromise (Pericardium tab)	MV E/A ratio AND MV Decel Time AND septal e' AND lateral e'	Others not captured on wksht are mitral inflow resp var AND hepatic vein Doppler AND ventricular septal strain		Selection 'Constriction' <u>Constrictive pericarditis</u> MV E/A >1.5 MV Decel Time (ms) <160 Septal e' > 7 cm/s Lateral e' lower than septal e'
IVC Morphology	IVC dim	>=2.1		Selection 'Dilated'

2.1.4.3 Calculated fields

Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
Calculation				
LV RWT	LVPWd and LVIDd	both 2D versions have a value, OR both M-mode versions have a value	ASE COMMITTEE RECOMMENDATIONS Recommendations for Chamber Quantification: Roberto M. Lang, MD, FASE et al. 2005	$RWT = (2 \times LVPWd) / LVIDd$
RVSP rvsp	TR Pk Vel, RAP tr_pk_vel rap	CF On first load, do not calculate if field populates.	http://www.csecho.ca/wp-content/themes/twentyeleven-csecho/cardiomath/?eqnHD=echo&eqnDisp=rvspttr RVSP estimation by Tricuspid Regurgitation Jet	(V= TR Pk Vel) in units m/s $RVSP = 4(V)^2 + RAP$
AVA(VTI) ava_vti	LVOT Diam, LVOT VTI, AV VTI lvot_diam lvot_vti ao_vti	CF On first load, do not calculate if field populates.	http://www.csecho.ca/wp-content/themes/twentyeleven-csecho/cardiomath/?eqnHD=echo&eqnDisp=avavti Aortic Valve Area (Continuity Equation using VTI)	LVOT = lvot_diam VTI1 = lvot_vti VTI2 = ao_vti All in units cm AVA(VTI) = $(\pi * (LVOT/2)^2 * VTI1) / VTI2$
AVA(Vmax) ava	LVOT Diam, LVOT Pk Vel, AV Pk Vel lvot_diam, lvot_pk_vel, av_pk_vel	CF On first load, do not calculate if field populates.	http://www.csecho.ca/wp-content/themes/twentyeleven-csecho/cardiomath/?eqnHD=echo&eqnDisp=avavmax Aortic Valve Area (Continuity Equation using V_{Max})	LVOT = lvot_diam cm VEL1 = lvot_pk_vel m/s VEL2 = av_pk_vel m/s AVA(VMax) = $(\pi * (LVOT/2)^2 * VEL1) / VEL2$
AV index av_vel_idx	LVOT Pk Vel, AV Pk Vel lvot_pk_vel, av_pk_vel	CF On first load, do not calculate if field populates	http://www.csecho.ca/wp-content/themes/twentyeleven-csecho/cardiomath/?eqnHD=echo&eqnDisp=avdi Aortic Valve Velocity Ratio/Dimensionless Index	AV index = $(LVOT \text{ Pk Vel}) / (AV \text{ Pk Vel})$
EF ef	Priority sets: LVEDV(BIPLANE) LVEDV(BIPLANE) lvedv_biplane, lvesv_biplane Or LVEDV, LVEDV lvedv, lvesv Or LVIDd, LVIDs lvidd_2d, lvids_2d Or LVIDd(Mm), LVIDs(Mm) lvidd, lvids	CF On first load, do not calculate if field populates. On change, calculate only if both fields in a priority set have valid values.	https://www.asecho.org/wp-content/uploads/2018/08/WFTF-Chamber-Quantification-Summary-Doc-Final-July-18.pdf The American Society of Echocardiography Recommendations for Cardiac Chamber Quantification in Adults	First 2 priority sets: $EF = ((EDV - ESV) / EDV) * 100$ Last 2 priority sets: Convert dimensions to Volumes: $EDV = (7 / (2.4 + LVIDd)) * LVIDd^3$ $ESV = (7 / (2.4 + LVIDs)) * LVIDs^3$

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Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
LVSV lv_sv	Priority sets: LVEDV(BIPLANE) LVSV(BIPLANE) lvedv_biplane, lvesv_biplane Or LVEDV, LVESV lvedv, lvesv	CF On first load, do not calculate if field populates. On change, calculate only if both fields in a priority set have valid values.	http://www.sandersdata.com/QLVATech.htm#Left-Ventricular%20Measurements https://www.tandfonline.com/doi/abs/10.1080/10976640600572889	LVSV=LVEDV (BIPLANE) - LVESV (BIPLANE) OR LVSV=LVEDV-LVESV
LVCO lv_co	LVSV, HR lv_sv pt_heart_rate	CF On first load, do not calculate if field populates.		LVCO=(LVSVxHR)/1000
LVCI lv_ci	LVCO, BSA lv_co, pt_bsa	CF On first load, do not calculate if field populates.		LVCI = LVCO/BSA
LVOT SV lvot_sv	LVOT Diam, LVOT VTI lvot_diam, lvot_vti	CF On first load, do not calculate if field populates.	http://www.csecho.ca/wp-content/themes/twentyeleven-csecho/cardiomath/?eqnHD=echo&eqnDisp=svecho Stroke Volume, Cardiac Output	LVOT SV = $\text{PI} * (\text{LVOT Diam}/2)^2 * (\text{LVOT VTI})$
LVOT CO lvot_co	LVOT SV, HR lvot_sv pt_heart_rate	CF On first load, do not calculate if field populates.		LVOT CO= (LVOT SV X HR)/1000
LV Mass (Mm) lv_mass	LVIDd (Mm), LVPWd (Mm), IVSd (Mm) lvidd, lvpwd, ivsd	CF On first load, do not calculate if field populates. On change, calculate only if both fields in a priority set have valid values.	https://www.asecho.org/wp-content/uploads/2018/08/WFTF-Chamber-Quantification-Summary-Doc-Final-July-18.pdf The American Society of Echocardiography Recommendations for Cardiac Chamber Quantification in Adults	$(0.8 \times (1.04 \times ((\text{LVIDd} + \text{LVPWd} + \text{IVSd})^3 - \text{LVIDd}^3)) + 0.6$
LV Mass lv_mass_2d	LVIDd, LVPWd, IVSd lvidd_2d, lvpwd_2d, ivsd_2d			
LV Mass (AL) lv_m_al	lv_area_endo_d lv_area_epi_d lv_len_d		Myerson SG et al., Left Ventricular Mass Reliability of M-Mode and 2-Dimensional Echocardiogram Formulas. Hypertension. 2002; Nov;40(5): pp. 673-8. http://www.parameterz.com/tools/lvmass	$1.05 \times \{5/6(\text{A}_{\text{Epi}} \times \text{L}_{\text{Epi}}) - (\text{A}_{\text{Endo}} \times \text{L}_{\text{Endo}})\}$ With Length _{Endo} = LV Len D and Length _{Epi} estimated by: Length _{Epi} = Area _{Epi} * (Length _{Endo} + SQRT(Area _{Epi} /Pi) – SQRT(Area _{Endo} /Pi))
LVFS (midwall) lvfs	Priority sets: LVIDd, LVIDs lvidd_2d, lvids_2d Or LVIDd(Mm), LVIDs(Mm) lvidd, lvids	CF On first load, do not calculate if field populates. On change, calculate only if both fields in a priority set have valid values.	https://www.asecho.org/wp-content/uploads/2018/08/WFTF-Chamber-Quantification-Summary-Doc-Final-July-18.pdf The American Society of Echocardiography Recommendations for Cardiac Chamber Quantification in Adults	LVFS = ((LVIDd – LVIDs) / LVIDd) *100
RV FAC rv_fac	RV Area ED, RV Area ES rv_rva_ed rv_rva_es	CF On first load, do not calculate if field populates.	https://www.onlinejase.com/article/S0894-7317(10)00434-7/pdf Guidelines for the Echocardiographic Assessment of the Right Heart in Adults: A Report from the American Society of Echocardiography	RV FAC = 100 * (RV Area ED - RV Area ES) / RV Area ED

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Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
LA/Ao la_ovr_ao	Priority sets: LA, AoD la_2d, aod_2d Or LA(Mm), AoD (Mm) la, aod	CF On first load, do not calculate if field populates. On change, calculate only if both fields in a priority set have valid values.		$LA/Ao = LA / AoD$
MVA Mva	MV PHT m_pht	CF On first load, do not calculate if field populates.	https://www.mdapp.co/mitral-valve-area-mva-calculator-513/ Mitral Valve Area (MVA) Calculator	$MVA = 220 / (MV \text{ PHT})$
MV E/A Ratio e_ovr_a	MV Pk E Vel MV Pk A Vel mv_e_vel, mv_a_vel	CF On first load, do not calculate if field populates	Simple ratio	$\frac{MV \text{ Pk } E \text{ Vel}}{MV \text{ Pk } A \text{ Vel}}$
Septal E/e' e_over_e_prime	MV Pk E Vel Septal e' mv_e_vel. mv_e_septal	CF On first load, do not calculate if field populates	Simple ratio	$\frac{MV \text{ Pk } E \text{ Vel}}{Septal \text{ } e'}$
Lateral E/e' e_over_e_prime_lat	MV Pk E Vel Lateral e' mv_e_vel. mv_e_lateral	CF On first load, do not calculate if field populates	Simple ratio	$\frac{MV \text{ Pk } E \text{ Vel}}{Lateral \text{ } e'}$
MV E/e' mv_e_over_e_prime	MV Pk E Vel Septal e' Lateral e' mv_e_vel. mv_e_septal mv_e_lateral	CF On first load, do not calculate if field populates	http://www.csecho.ca/wp-content/themes/twentyeleven-csecho/cardiomath/?eqnHD=echo	$\frac{2 \times MV \text{ Pk } E \text{ Vel}}{Septal \text{ } e' + Lateral \text{ } e'}$

2.1.4.4 EF method

Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
EF method	Displays the source of the current EF value: 1. ultrasound machine 2. calculation method used by worksheet 3. sent from the viewer Blanks out if EF is manually entered	CF		1. ultrasound machine options -Simpson BP, Simpson 1P, Teichholz – set when the reader path for the EF value contains unambiguous information about the method. 2. calculation method – - LVEDV (BIPLANE) and LVESV (BIPLANE) → Simpson BP - LVEDV and LVESV → Simpson 1P - LVIDd and LVIDs → Teichholz - LVIDd (M-mode) and LVIDs (M-mode) → Teichholz 3. sent from viewer - Simpson BP mod, Simpson BP, Simpson 1P, Teichholz

2.1.4.5 Z-Scores

Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
LA Mm Z-Score	LA (Mmode), BSA			http://parameterz.blogspot.com/2008/09/m-mode-z-scores.html
LA Z-Score Percentile	LA Z-Score			http://www.statisticshowto.com/percentile-z-score/
LA 2D Z-Scores	LA (A4C), BSA LA (A2C), BSA			http://zscore.chboston.org/
AV Valve 2D Z-Scores	MV Annulus, BSA TV Annulus, BSA			http://zscore.chboston.org/

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Calculated Field	Input Field(s)	Cond.	Reference	Formula/Description
SL Valves 2D Z-Score	PV Annulus, BSA			http://zscore.chboston.org/
LV Mm Z-Scores	IVSd (Mm), LVPWd (Mm), LVIDd(Mm), LVIDs(Mm), LV Mass (Mm), BSA			http://parameterz.blogspot.com/2008/09/m-mode-z-scores.html http://zscore.chboston.org/
LV 2D Z-Scores	IVSd, LVPWd, LVIDd, LVIDs, BSA			http://zscore.chboston.org/
RV Z-Score	RVIDd (Mm), BSA			http://parameterz.blogspot.com/2008/09/m-mode-z-scores.html
Z-Score percentiles	any Vents Z-Score			http://www.statisticshowto.com/percentile-z-score/
AoD Annulus Z-Score	AoD Annulus, BSA			http://parameterz.blogspot.com/2008/09/aortic-root-z-scores.html http://zscore.chboston.org/
AoD SOV Z-Score	AoD SOV, BSA			http://parameterz.blogspot.com/2008/09/aortic-root-z-scores.html
Z-Score Percentile	AoD Annulus Z-Score AoD SOV Z-Score			http://www.statisticshowto.com/percentile-z-score/
Ao 2D Z-Scores	AoD Asc(Prox), AoD ST Junc, Dist AoD Arch, AoD Isthmus BSA			http://zscore.chboston.org/
AoD Desc Z-Score	AoD Descending, BSA			Detroit References: http://www.parameterz.com/refs/pettersen-jase-2008
PA 2D Z-Scores	PA Diam, RPA Diam, LPA Diam, BSA			http://zscore.chboston.org/
Cor Art 2D Z-Scores	LMCA, LAD, RCA, BSA			http://zscore.chboston.org/
Cor Art CX Z-Score	CX, BSA			Dallaire Dahdah Parameter Z CA CX Calculator: http://www.parameterz.com/refs/dallaire-jase-2011

2.1.5 Normal/Acceptable values

Worksheet shall support normal/acceptable ranges/values.

2.1.5.1 LV Normal/Acceptable values (SR-4557)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
LVEDV (A4C) AND (A2C) lvedv_a4c AND lvedv_a2c	ml	<blank> Women and Men Mild to severe	WOMEN: Normal 76 ± 15 2-SD range 46-106 MEN: Normal 106 ± 22 2-SD range 62-150	ACCEPTABLE RANGES 30-400
LVEDV / BSA (A4C) AND (A2C) lvedv_a4c_idx lvedv_a2c_idx	ml/m ²	<blank> Women and Men Mild to severe	WOMEN: Normal 45 ± 8 2-SD range 29-61 MEN: Normal 54 ± 10 2-SD range 34-74	ACCEPTABLE RANGES 20-200
LVESV (A4C) AND (A2C) lvesv_a4c AND lvesv_a2c	ml	<blank> Women and Men Mild to severe	WOMEN: Normal 28 ± 7 2-SD range 14-42 MEN: Normal 41 ± 10 2-Sd range 21-61	ACCEPTABLE RANGES 5.0-200
LVESV / BSA (A4C) AND (A2C) lvesv_a4c_idx lvesv_a2c_idx	ml/m ²	<blank> Women and Men Mild to severe	WOMEN: Normal 16 ± 4 2-SD range 8-24 MEN: Normal 21 ± 4 2-SD range 13-29	ACCEPTABLE RANGES 5.0-150

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Field	Units	Observation values	Normal	Notes
LVEF Ef	%	<blank> Women and Men Mild to severe	WOMEN: Normal 64 ± 5 2-SD range 54-74 MEN: Normal 62 ± 5 2-SD range 52-72	WOMEN: Mild 41-53 Mod: 30-40 Severe: <30 ACCEPTABLE RANGES 5.0-99 MEN: Mild 41-51 Mod 30-40 Severe <30
LV Visual EF measurement lv_vis_ef_meas	%	<blank>	50-70%	This corresponds the the normal selections for the Visual EF dropdown.
LV SV lv_sv	ml	<blank>	95±14 1-SD range 81-109	ACCEPTABLE RANGES 15-250
LV SV / BSA lv_sv_idx	ml/m ²	<blank>	32±7 2-SD range 18-46	ACCEPTABLE RANGES 5-200
LV CO lv_co	l/min	<blank>	4-8	ACCEPTABLE RANGES 2.0-8.0
LV CI lv_ci	l/(min*m ²)	<blank>	2.2±0.5 2-SD range 1.2-3.2	ACCEPTABLE RANGES 0.1-9.9
IVSd lvsd	cm	<blank> Women and Men Mild to severe	Women Reference Range 0.6-0.9 Men Reference Range 0.6-1.0	WOMEN: Mild 1.0-1.2 Moderate 1.3-1.5 Severe ≥1.6 ACCEPTABLE RANGES 0.2-9.9 MEN: Mild 1.1-1.3 Moderate 1.4-1.6 Severe ≥1.7
LVIDd AND LVIDd (Mmode) lvidd_2d AND lvidd	cm	<blank> Women and Men Mild to severe	WOMEN: Normal 4.5 ± .36 2-SD range 3.78 – 5.22 MEN: Normal 5.02 ± .41 2-SD range 4.2-5.84	ACCEPTABLE RANGES 0.2-12.0
LVIDd /BSA lvidd_idx	cm/m ²	<blank> Women and Men Mild to severe	Women Reference Range 2.4-3.2 Men Reference Range 2.2-3.1	WOMEN: Mild 3.3-3.4 Moderate 3.5-3.7 Severe ≥3.8 ACCEPTABLE RANGES 0.2-10.0 MEN: Mild 3.2-3.4 Moderate 3.5-3.6 Severe ≥3.7
LVPWd lvpwd	cm	<blank> Women and Men Mild to severe	Women Reference Range 0.6-0.9 Men Reference Range 0.6-1.0	WOMEN: Mild 1.0-1.2 Moderate 1.3-1.5 Severe ≥1.6 ACCEPTABLE RANGES 0.2-9.9 MEN: Mild 1.1-1.3 Moderate 1.4-1.6 Severe ≥1.7
LV Mass (Mm) lv_mass LV Mass lv_mass_2d	g	<blank> Women and Men Mild to severe	Women Normal 67-162 Men Normal 88-224	WOMEN: Mild 163-186 Moderate 187-210 Severe ≥211 ACCEPTABLE RANGES 30-400 MEN: Mild 225-258 Moderate 259-292 Severe ≥293
LV Mass (Mm) / BSA lv_mass_idx LV Mass / BSA lv_mass_2d_idx	g/m ²	<blank> Women and Men Mild to severe	Women Normal 43-95 Men Normal 49-115	WOMEN: Mild 96-108 Moderate 109-121 Severe ≥122 ACCEPTABLE RANGES 20-350 MEN: Mild 116-131 Moderate 132-148 Severe ≥149
LV Mass (AL) AND (TE) lv_m_al AND lv_m_te	g	<blank>	Women Normal 66-150 Men Normal 96-200	ACCEPTABLE RANGES 30-400
LV Mass (AL) AND (TE) / BSA lv_m_al_idx AND lv_m_te_idx	g/m ²	<blank>	Women Normal 44-88 Men Normal 50-102	WOMEN: Mild 89-100 Moderate 101-112 Severe ≥113 ACCEPTABLE RANGES 30-400 MEN: Mild 103-116 Moderate 117-130 Severe ≥131
LVFS (endocardial) N/A (no field)	%	<blank> Women and Men Mild to severe	Women Reference Range 27-45 Men Reference Range 25-43	WOMEN: Mild 22-26 Moderate 17-21 Severe ≤16 ACCEPTABLE RANGES 2.0-99 MEN: Mild 20-24 Moderate 15-19 Severe ≤14

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Field	Units	Observation values	Normal	Notes
LV FS (midwall) Lvfs	%	<blank> Women and Men Mild to severe	Women Reference Range 15-23 Men Reference Range 14-22	WOMEN: Mild 13-14 Moderate 11-12 Severe <11 ACCEPTABLE RANGES 2.0-99
IVSs lvss	cm	<blank>	0.8-1.0	ACCEPTABLE RANGES 0.2-9.9 *data from unreferenced source
LVIDs AND LVIDs (Mmode) lvlds_2d AND lvlds	cm	<blank>	WOMEN: Normal 2.82 ± .33 2-SD range 2.16-3.48 MEN: Normal 3.24 ± .37 2-SD range 2.5-3.98	ACCEPTABLE RANGES 0.2-12.0
LVPWs lvpws	cm	<blank>	0.9-1.8	ACCEPTABLE RANGES 0.2-9.9 *data from unreferenced source
IVST lvst	%	<blank>	27-70	ACCEPTABLE RANGES 5.0-100 *data from unreferenced source
LVPWT lvpwt	%	<blank>	25-80	ACCEPTABLE RANGES 5.0-100 *data from unreferenced source
LV IVRT lvrt	ms	<blank> Age Normal to severe	NORMAL FOR AGE 16-20 years 50±9 (2-SD range 32-68) 21-40 years 67±8 (2-SD range 51-83) 41-60 years 74±7 (60-88) >60 years 87±7 (73-101)	ACCEPTABLE RANGES 10-150 Data are expressed as mean ± SD (95% confidence interval)
LV Area Endo D lv_area_endo_d	cm2	<blank>		*no data available
LV Area Endo S lv_area_endo_s	cm2	<blank>		*no data available
LV Area Epi D lv_area_epi_d	cm2	<blank>		*no data available
LV Area Epi S lv_area_epi_s	cm2	<blank>		*no data available
LV Length D lv_len_d	cm	<blank>		*no data available
LV Length S lv_len_s	cm	<blank>		*no data available
Mid Vent Pk Grad Rest	mmHg	<blank>	<30	
Mid Vent Pk Grad Provocation	mmHg	<blank>	<50	

2.1.5.2 LA Normal/Acceptable values (SR-4558)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
LA: la_2d and la	cm	<blank> Women and Men Mild to severe	Women Reference Range 2.7-3.8 Men Reference Range 3.0-4.0	WOMEN: Mild 3.9-4.2 Moderate 4.3-4.6 Severe ≥4.7 ACCEPTABLE RANGES 0.2-15.0
LA / BSA: la_2d_idx	cm/m ²	<blank> Women and Men Mild to severe	Women Reference Range 1.5-2.3 Men Reference Range 1.5-2.3	WOMEN: Mild 2.4-2.6 Moderate 2.7-2.9 Severe ≥3.0 ACCEPTABLE RANGES 0.2-7.0

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Field	Units	Observation values	Normal	Notes
LAs (A4C): las_a4c LAs (A2C): las_a2c	cm			
LA volume: la_volume	ml	<blank> Women and Men Mild to severe	Women Reference Range 22-52 Men Reference Range 18-58	WOMEN: Mild 53-62 Moderate 63-72 Severe ≥73 ACCEPTABLE RANGES 2.0-300 MEN: Mild 59-68 Moderate 69-78 Severe ≥79
LA Volume Index (BSA): la_vol_idx	ml/m ²	<blank> Women and Men Mild to severe	Normal 16-34	Mild 35-41 Moderate 42-48 Severe >48 ACCEPTABLE RANGES 2.0-300
LA Area: la_area	cm ²	<blank> Women and Men Mild to severe	Women Reference Range ≤20 Men Reference Range ≤20	WOMEN: Mild 20-30 Moderate 30-40 Severe >40 ACCEPTABLE RANGES 2.0-300 MEN: Mild 20-30 Moderate 30-40 Severe >40

2.1.5.3 RA Normal/Acceptable values (SR-4559)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
RA ra	cm	<blank>		
RA Major (4ch) ra_major	cm	<blank>	Normal: ≤5.3	Abnormal >5.3
RA Minor (4ch) ra_minor	cm	<blank> Women and Men Mild to severe	Reference Range 2.9-4.5	WOMEN/MEN: Mild 4.6-4.9 Moderate 5.0-5.4 Severe ≥5.5 ACCEPTABLE RANGES 0.2-10
RA Minor (4ch) / BSA ra_minor_idx	cm/m ²	<blank> Women and Men Mild to severe	Reference Range 1.9 ± 0.3 (use 2-SD) (1.3-2.5)	WOMEN/MEN: Mild 2.6-2.8 Moderate 2.9-3.1 Severe ≥3.2 ACCEPTABLE RANGES 0.2-10
RA Volume/BSA	mL/m ²	<blank>	WOMEN: 21 ± 6 2SD range (9-33) MEN: 25 ± 7 2SD range (11-39)	Outside of 2SD Normal range is abnormal
RA Area ra_area	cm ²	<blank>		Abnormal >18

2.1.5.4 RV Normal/Acceptable values (SR-4560)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
RV rvidd_2d	cm	<blank>		
RV Basal rv_basal	cm	<blank>	Mean ± SD (use 2SD) 3.3 ± .4 (2.5-4.1)	ACCEPTABLE RANGES: 0.5-10
RVOT rv_ot	cm	<blank>	Use RVOT distal diam range 22 ± 2.5 mm 2SD range 17-27 (mm) or 1.7-2.7 (cm)	Abnormal: ≥2.8 ACCEPTABLE RANGES: 0.5-10
RV area ED rv_rva_ed	cm ²	<blank>	WOMEN: 14 ± 3 2SD range (8-20)	WOMEN: "mild": 21-32 MEN: "mild": 25-32 BOTH:

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Field	Units	Observation values	Normal	Notes
			MEN: 17 ± 3.5 2SD range (10-24)	"moderate": 33-37 "severe": ≥38 ACCEPTABLE RANGES: 5.0-75
RV area ES rv_rva_es	cm ²	<blank>	WOMEN: 7 ± 2 2SD range (3-11) MEN: 9 ± 3 2SD range (3-15)	WOMEN: Mild 12-19 MEN: Mild: 16-19 BOTH: Moderate 20-22 Severe ≥23 ACCEPTABLE RANGES: 2.0-50
RVIDd (Mmode)	cm	<blank>		
TAPSE (Mmode) rv_tapse	mm	<blank>	Mean ± SD (use 2SD) 24 ± 3.5 (17-31)	Abnormal <17 ACCEPTABLE RANGES: 1-50
RV IVRT rv_ivrt	ms	<blank>		
RV IVCT rv_ivct	ms	<blank>		
RV MPI rv_mpi		<blank>		
RV FAC rv_fac	%	<blank>	Mean ± SD (use 2SD) 49 ± 7 (35-63)	Abnormal < 35 ACCEPTABLE RANGES: 5.0-99

2.1.5.5 AV Normal/Acceptable values (SR-4561)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
LVOT Diameter lvot_diam	cm	<blank>	1.8-2.2	ACCEPTABLE RANGES 1.0-5.0
LVOT Pk Vel lvot_pk_vel	m/s	<blank>		ACCEPTABLE RANGES 1.0-30.0
LVOT Pk Grad lvot_pk_grad	mmHg	<blank>		
LVOT Pk Grad Rest	mmHg	<blank>	<30	
LVOT Pk Grad Provocation	mmHg	<blank>	<50	
LVOT VTI lvot_vti	cm	<blank>	18-22	ACCEPTABLE RANGES 5.0-99.0
LVOT SV lvot_sv	ml	<blank>	60-100	
LVOT CO lvot_co	l/min	<blank>	4-8	
AV Pk Vel av_pk_vel	m/s	<blank>		Mild 2.6-3.0 Moderate 3.0-4.0 Severe >4.0 ACCEPTABLE RANGES 0.5-9.0
AV Pk Grad av_pk_grad	mmHg	<blank>	<10	Mild <36 Moderate 36-80 Severe >80 ACCEPTABLE RANGES 5.0-200
AV Mean Grad av_mn_grad	mmHg	<blank>	<=40 *can be customized w/ worksheetoption	Mild <20 Moderate 20-40 Severe >40 ACCEPTABLE RANGES 5.0-200
AV VTI ao_vti	cm	<blank>	18-22	ACCEPTABLE RANGES 5.0-99.0
AVA (Vmax) Ava	cm ²	<blank>	3.0-4.0	Mild >1.5000000001 Moderate 1.0-1.5 Severe <1.0 ACCEPTABLE RANGES 0.2-6.0
AVA(VTI) ava_vti	cm ²	<blank>	>1.0 *can be customized w/ worksheetoption	<=1.0 will place statement in findings or conclusions when wsoption included with value 2
AVA /BSA	cm ² /m ²	<blank>	>0.6	Mild >0.85

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Field	Units	Observation values	Normal	Notes
ava_idx			*can be customized w/ worksheetoption	Moderate 0.6-0.85 Severe <0.6 ACCEPTABLE RANGES 0.2-6.0 <=0.6 will place statement in findings or conclusions when wsoption included with value 2
AV PHT av_pht	msec	<blank>		Mild >400 Moderate 200-400 Severe <200 ACCEPTABLE RANGES 50-999
AV Accel Time av_at	ms	<blank>	>0.3ms	
AV Regurg Volume av_r_vol	ml/beat	<blank>		Mild <30 Mild-Moderate 30-44 Moderate-Severe 45-59 Severe ≥60 ACCEPTABLE RANGES 5.0-200
AV Regurg Fraction av_rf	%	<blank>		Mild <30 Mild-Moderate 30-39 Moderate-Severe 40-49 Severe ≥50 ACCEPTABLE RANGES 5.0-150
AI PHT ai_pht	ms	<blank>		Mild ≥550 Moderate 300-550 Severe ≤300 ACCEPTABLE RANGES 50-999
AV EROA av_eroa	cm²	<blank>		Mild <0.10 Mild-Moderate 0.10-0.19 Moderate-Severe 0.20-0.29 Severe ≥0.30 ACCEPTABLE RANGES 0.01-2.0

2.1.5.6 MV Normal/Acceptable values (SR-4562)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
MV EF Slope mv_ef_slope	m/s	<blank>	7.0-15.0	ACCEPTABLE RANGES 1.00-30.0
MV EPSS Epss	cm	<blank>	.20-1.20	ACCEPTABLE RANGES 0.1-25
MV Excur mv_excur	cm	<blank>		
MV Max Vel mv_mx_vel	m/s	<blank>	0.9	ACCEPTABLE RANGES 0.1-9.9
MV Mean Grad mv_mn_grad	mmHg	<blank>		Mild <5 Moderate 5.0-10 Severe >10 ACCEPTABLE RANGES 0-30
MV Pk Grad mv_pk_grad	mmHg	<blank>	0-2	Mild 2.0-6.0 Moderate 7.0-12 Severe >12 ACCEPTABLE RANGES 0-50
MV (VTI) m_vti	cm	<blank>	10.0-12.0	ACCEPTABLE RANGES 1.0-50
MVA Mva	cm²	<blank>	4.0-5.0	Mild ≥= 1.5000000001 Moderate 1.0-1.5 Severe <1.0 ACCEPTABLE RANGES 0.01-5.0
MV Pk E Vel mv_e_vel	m/s	<blank>	0.7-1.2	ACCEPTABLE RANGES 0.1-25.0
MV Pk A Vel mv_a_vel	m/s	<blank>	0.4-0.7	ACCEPTABLE RANGES 0.1-25.0
MV E/A Ratio e_ovr_a		<blank>	For AGE 16-20 yrs 0.98-2.78 21-40 yrs 0.73-2.33	ACCEPTABLE RANGES 0.5-15

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Field	Units	Observation values	Normal	Notes
			41-60 yrs 0.78-1.78 >60 yrs 0.6-1.32	
MV PHT m_pht	ms	<blank>	30-60	Gray Area 60-90 Mild 90-150 Moderate 150-219 Severe ≥220 ACCEPTABLE RANGES 10.0-500
MV Decel Time mv_dt	ms	<blank>	For AGE: 16-20 yrs 104-180 21-40 yrs 138-194 41-60 yrs 143-219 >60 yrs 142-258	ACCEPTABLE RANGES 5.0-999
Septal e' mv_e_septal	cm/s	<blank>	For AGE (use 2SD) 16-20 yrs 14.9±2.4 (10.1-19.7) 21-40 yrs 15.5±2.7 (10.1-20.9) 41-60 yrs 12.2±2.3 (7.6-16.8) >60 yrs 10.4±2.1 (6.2-14.6)	ACCEPTABLE RANGES 1.0-20
Septal a' mv_a_septal	cm/s	<blank>		
Septal S' mv_s_septal	cm/s	<blank>		
Lateral e' mv_e_lateral	cm/s	<blank>	For AGE (use 2SD) 16-20 yrs 20.6±3.8 (13.0-28.2) 21-40 yrs 19.8±2.9 (14.0-25.6) 41-60 yrs 16.1±2.3 (11.5-20.7) >60 yrs 12.9±3.5 (5.9-19.9)	ACCEPTABLE RANGES 1.0-40
Lateral a' mv_a_lateral	cm/s	<blank>		
Lateral S' mv_s_lateral	cm/s	<blank>		
Septal E/e' e_over_e_prime	--	<blank>	≤15	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 Naguch et al. (J Am Soc Echocardiography 2016;29:277-314.) p. 281
Lateral E/e' e_over_e_prime_lat	--	<blank>	≤13	
MV E/e' mv_e_over_e_prime	--	<blank>	≤14	
MR Vel mr_vel	m/s	<blank>		

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Field	Units	Observation values	Normal	Notes
MR PISA Radius mr_pisa_rad	cm	<blank>		
MV Regurg Vol mv_r_vol	ml/beat	<blank>		Mild <30 Mild-Moderate 30-44 Moderate-Severe 45-49 Severe ≥60 ACCEPTABLE RANGES 5.0-200
MV Regurg Fraction mv_rf	%	<blank>		Mild <30 Mild-Moderate 30-39 Moderate-Severe 40-49 Severe ≥50 ACCEPTABLE RANGES 5.0-150
MV EROA mv_eroa	cm ²	<blank>		Mild <0.20 Mild-Moderate 0.20-0.29 Moderate-Severe 0.30-0.39 Severe ≥0.40 ACCEPTABLE RANGES 0.01-2.0

2.1.5.7 TV Normal/Acceptable values (SR-4563)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
TV Pk E Vel tv_e_vel	m/s	<blank>	FOR AGE (use 2SD) <50 yrs 5.1±0.7 (3.7-6.5) ≥50 yrs 4.1±0.8 (2.5-5.7)	ACCEPTABLE RANGES 1.0-25.0
TV Pk A Vel tv_a_vel	m/s	<blank>	FOR AGE (use 2SD) <50 yrs 2.7±0.8 (1.1-4.3) ≥50 yrs 3.3±0.8 (1.7-4.9)	ACCEPTABLE RANGES 1.0-25.0
TV E/A ratio tv_ea_ratio	unitless	<blank>	0.5-2.1	Abnormal <0.5 or >2.1 ACCEPTABLE RANGES 0.1-25
TV TVI tv_vti	cm	<blank>		Significant TS >60 ACCEPTABLE RANGES 5.0-150
TV Mean Grad tv_mn_grad	mmHg	<blank>		Significant TS ≥5 ACCEPTABLE RANGES 0.5-10.0
TV Annulus tv_ann_meas	cm	<blank>		
TV e' tv_e_prime	cm/s	<blank>		
TV a' tv_a_prime	cm/s	<blank>		
TV S' tv_s_prime	cm/s	<blank>		
TV E/e' tv_e_over_e_prime	Unitless	<blank>	≤6	Abnormal >6 ACCEPTABLE RANGES 0.1-25
TV PISA radius tv_pisa_radius	cm	<blank>	≤0.5	Mild 0.6-0.9 Moderate >0.9 ACCEPTABLE RANGES 0.01-5.0
TR Jet Area tv_jet_area	cm ²	<blank>	<5	Mild 5.0-10 Moderate >10 ACCEPTABLE RANGES 0.5-40
TR Pk Vel tv_pk_vel	m/s	<blank>		Abnormal > 0 ACCEPTABLE RANGES 0.5-40.0
TR Pk Grad tv_pk_grad	mmHg	<blank>		
TR Mean Grad tv_tr_mn_grad	mmHg	<blank>		
RVSP Rvsp	mmHg	<blank>	18-25	Mild 30-40 Moderate 40-70 Severe >70 ACCEPTABLE RANGES 5.0-150

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Field	Units	Observation values	Normal	Notes
RAP Rap	mmHg	<blank>	< 5	Intermediate 5.0-10.0 High 10.0-20.0 ACCEPTABLE RANGES 0.1-50

2.1.5.8 PV Normal/Acceptable values (SR-4564)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
PV Pk Vel pv_pk_vel	m/s	<blank>		Mild <3 Moderate 3.0-4.0 Severe >4 ACCEPTABLE RANGES: 10.0-250.0
PV Mean Vel pv_mn_vel	m/s	<blank>		
PV Pk Grad pv_pk_grad	mmHg	<blank>		Mild <36 Moderate 36-64 Severe >64 ACCEPTABLE RANGES: 10.0-250.0
PV Mean Grad pv_mn_grad	mmHg	<blank>		
PV Accel Time pv_accel_time	ms	<blank>	>130	https://123sonography.com/ebook/pulmonary-acceleration-time-to-estimate-pulmonary-pressure

2.1.5.9 Pericardium Normal/Acceptable values (SR-4565)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
Peri. Eff. Diameter	cm	<blank>		ACCEPTABLE RANGES

2.1.5.10 Aorta Normal/Acceptable values (SR-4566)

Field	Units	Observation values	Normal	Notes
AoD aod_2d	AoD (Mmode) aod	cm	<blank>	ACCEPTABLE RANGES
AoD CS aocs	cm	<blank>	1.5-2.6	ACCEPTABLE RANGES: 0.5-9.9
AoD Annulus aod_ann aod_ann_idx	cm	<blank>	Absolute Values Normal: WOMEN: 2.3 ± 0.2 2SD range (1.9-2.7) MEN: 2.6 ± 0.3 2SD range (2.0-3.2) Indexed Values Normal: WOMEN/MEN: 1.3 ± 0.1 2SD range (1.1-1.5)	ACCEPTABLE RANGES: 0.5-9.9 Outside of 2SD Normal range is abnormal
AoD Root aod_root	cm	<blank>	Sinuses of Valsalva ranges: WOMEN: 3.0 ± 0.3 2SD range (2.4-3.6) MEN: 3.4 ± 0.3 2SD range (2.8-4.0)	ACCEPTABLE RANGES: 0.5-9.9 Outside of 2SD Normal range is abnormal
AoD Sinus of Valsalva aod_sinus aod_sinus_idx	cm	<blank>	Absolute Values Normal: WOMEN: 3.0 ± 0.3 2SD range (2.4-3.6) MEN: 3.4 ± 0.3 2SD range (2.8-4.0) Indexed Values Normal: WOMEN: 1.8 ± 0.2	Outside of 2SD Normal range is abnormal

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Field	Units	Observation values	Normal	Notes
			2SD range (1.4-2.2) MEN: 1.7 ± 0.2 2SD range (1.3-2.1)	
AoD ST Junction aod_st_junc aod_st_junc_idx	cm	<blank>	Absolute Values Normal: WOMEN: 2.6 ± 0.3 2SD range (2.0-3.2) MEN: 2.9 ± 0.3 2SD range (2.3-3.5) Indexed Values Normal: WOMEN/MEN: 1.5 ± 0.2 2SD range (1.1-1.9)	ACCEPTABLE RANGES: 0.5-9.9 Outside of 2SD Normal range is abnormal
AoD Ascending (Proximal) aod_asc aod_asc_idx	cm	<blank>	Absolute Values Normal: WOMEN: 2.7 ± 0.4 2SD range (1.9-3.5) MEN: 3.0 ± 0.4 2SD range (2.2-3.8) Indexed Values Normal: WOMEN: 1.6 ± 0.3 2SD range (1.0-2.2) MEN: 1.5 ± 0.2 2SD range (1.1-1.9)	ACCEPTABLE RANGES: 0.5-9.9 Outside of 2SD Normal range is abnormal
AoD Arch aod_arch	cm	<blank>		ACCEPTABLE RANGES: 0.5-9.9
AoD Descending aod_desc	cm	<blank>	2.0-3.0	ACCEPTABLE RANGES: 5-100

2.1.5.11 PA Normal/Acceptable values (SR-4567)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
PA Diameter pa_diam	cm	<blank>	1.5-2.1	Mild 2.2-2.5 Moderate 2.6-2.9 Severe ≥3.0 ACCEPTABLE RANGES: 1.0-10
Pk. PA SysPress pa_est_pk_sys_press	mmHg	<blank>	35-40	ACCEPTABLE RANGES: 5.0-150
LA/Ao la_ovr_ao		<blank>		

2.1.5.12 IVC and Pulmonary veins Normal/Acceptable values (SR-4568)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
IVC Dim ivc_dim	cm	<blank>	<2.1	High ≥2.1 ACCEPTABLE RANGES: 1.0-10
Pulm. Vein Ar Vel pv_a_vel	m/s	<blank>	For AGE 16-20 yrs 0.1-3.6 21-40 yrs 0.5-3.7 41-60 yrs 1.7-2.9 >60 yrs 1.1-3.9	ACCEPTABLE RANGES: 0.2-15.0
Pulm. Vein Ar Dur pv_a_dur	ms	<blank>	For AGE 16-20 yrs 1-144 21-40 yrs 30-162 41-60 yrs 82-142 >60 yrs 53-173	ACCEPTABLE RANGES: 5.0-200
Pulm. Vein D vel pv_d_vel	m/s	<blank>	For AGE (2SD range) 20-29 yrs 0.57±0.10 (0.37-0.77) 30-39 yrs 0.54±0.10 (0.34-0.74) 40-49 yrs 0.49±0.08 (0.33-0.65)	ACCEPTABLE RANGES: 0.1-15

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Field	Units	Observation values	Normal	Notes
			50-59 yrs 0.41±0.07 (0.27-0.55) 60-69 yrs 0.37±0.09 (0.19-0.55) 70-80 yrs 0.35±0.08 (0.19-0.51)	
Pulm. Vein S vel pv_s_vel	m/s	<blank>	For AGE (2SD range) 20-29 yrs 0.42±0.08 (0.26-0.58) 30-39 yrs 0.47±0.08 (0.31-0.63) 40-49 yrs 0.51±0.08 (0.35-0.67) 50-59 yrs 0.53±0.08 (0.37-0.69) 60-69 yrs 0.54±0.08 (0.38-0.70) 70-80 yrs 0.51±0.08 (0.35-0.67)	ACCEPTABLE RANGES: 0.1-25

2.1.5.13 ZScores (SR-15236)

Worksheet shall use following normal/acceptable ranges/values:

Field	Units	Observation values	Normal	Notes
any Z-Score absolute value	--	<blank>	< 1.96	Confidence interval 95%

2.1.6 Findings

Worksheet shall allow the user to generate and comment on findings.

2.1.6.1 LV

2.1.6.1.1 Default statement: (SR-4587)

ID	List	Notes
Default statement:	Left ventricle cavity is normal in size. Normal global wall motion.	

2.1.6.1.2 Internal Dimension (SR-4591)

ID	List	Notes
Internal Dimension	1. Left ventricle cavity is [normal] in size. 2. Left ventricle cavity is [minimally mildly mild to moderately moderately moderate to severely severely borderline] dilated. 3. Left ventricle cavity is [small]. 4. Left ventricle size is [decreased].	

2.1.6.1.3 Cardiomyopathy

ID	List	Notes
Cardiomyopathy	[Dilated Hypertrophic Restrictive] cardiomyopathy.	

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2.1.6.1.4 Thrombus

ID	List	Notes
Thrombus	<p>If Thrombus None is selected: No evidence of thrombus is seen in the left ventricle during this exam</p> <p>If Thrombus not None nor blank: [THROMBUS] [SIZE] [MOBILITY] thrombus is present [LOCATION]. [Multiple] thrombi are present in the left ventricle. THROMBUS: A [small medium large diffuse] MOBILITY: [mobile non-mobile] SIZE: [L] x [W] cm [L] cm [W] cm LOCATION: Blank: in the left ventricle. LVAD: on the left ventricular assist device. Apical Wall: in the apex of the left ventricle. Other walls: on the [anterior basal posterior septal lateral inferior] wall of the left ventricle. Catheter: on the catheter in the left ventricle.</p>	

2.1.6.1.5 LV Shape, size, and location (SR-4594)

ID	List	Notes
LV Shape, size, and location	<p>Normal left ventricular wall thickness. [SIZE] [LOCATION] asymmetric hypertrophy of the left ventricle. [SIZE] [concentric eccentric] hypertrophy of the left ventricle. [SIZE] concentric remodeling of the left ventricle. SIZE: [Mild Moderate Severe] LOCATION: [anterior posterior septal lateral apical inferior basal]</p>	

2.1.6.1.6 VSD Location, size, shunt (SR-4595)

ID	List	Notes
VSD Location, size, shunt	<p>[SIZE] [xx mm] [LOCATION] ventricular septal defect is present [with a {shunt} shunt.]. Multiple ventricular septal defects are present. Examples: Small muscular ventricular septal defect is present. 1.2 mm ventricular septal defect is present with a bidirectional shunt.</p>	

2.1.6.1.7 Global Wall Motion (SR-4596)

ID	List	Notes
Global Wall Motion	[Borderline Low normal Mild Moderate Severe] decrease in global wall motion.	
- dropdown not linked to diagram	[Normal Hypokinetic] global wall motion.] [Global hypokinesis with minor variance.]	
- dropdown linked to diagram and dropdown not blank	[observation] global wall motion. If observation is Global Hyponetic w/minor var or Global Hypokinesis w/minor var, then the statement reads: Global [hypokinetic hypokinesis] with minor variance.	

2.1.6.1.8 Visual EF

ID	List	Notes
Visual EF	Visual EF is [<20% 20-25% 25-30% 30-35% 35-40% 40-45% 45-50% 50-55% 55-60% 60-65% 65-70% >70%] [xx] %.	Driven by dropdown OR corresponding measurement field find_incl_ef statement replaces this statement

2.1.6.1.9 Septal Wall Motion (SR-4598)

ID	List	Notes
Septal Wall Motion	Abnormal septal wall motion due to [post-operative valve post-operative coronary artery bypass graft post-operative septum right ventricular volume overload left bundle branch block right bundle branch block right ventricle pacemaker].	

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2.1.6.1.10 Diastolic Filling/ Dysfunction (SR-4600)

ID	List	Notes
Diastolic Filling/ Dysfunction not blank	[Normal Indeterminate] diastolic filling pattern Doppler evidence of [grade I (impaired) grade II (psuedonormal) grade III (restrictive)] diastolic dysfunction	
LAP dropdown is blank	End the Diastolic Filling/Dysfunction statement with a period.	
LAP dropdown is not blank	Append the Diastolic Filling/Dysfunction statement with: , [normal indeterminate elevated] LAP.	
Diastolic Filling/Dysfunction is blank but LAP is not blank	[Normal Indeterminate Elevated] LAP.	

2.1.6.1.11 Regional Wall Motion (SR-4601)

ID	List	Notes
Regional Wall Motion	Diagram all Normal , print this statement <u>only if Global Wall Motion is not selected at Normal</u> : Left ventricle regional wall motion findings: No wall motion abnormalities. Diagram not all normal - Left ventricle regional wall motion findings: Then, per each abnormality: "[segment] (strung together with commas) {abnormality}" Example: "Left ventricle regional wall motion findings: Basal anteroseptal, basal anterior and basal anterolateral hypokinesis. Basal inferolateral and basal inferior akinesis."	If diagram is linked to dropdown, AND diagram is globally set AND dropdown is set to corresponding value, then this statement does not print.

2.1.6.1.12 Mid Ventricular Obstruction

ID	List	Notes
Mid Ventricular Obstruction	Absent: No mid ventricular obstruction noted. Present: Mid ventricular obstruction noted.	TTE only

2.1.6.1.13 Apical Aneurysm

ID	List	Notes
Apical Aneurysm	Absent: No left ventricular apical aneurysm noted. Present: Left ventricular apical aneurysm noted.	TTE only

2.1.6.1.14 False Tendon

ID	List	Notes
False Tendon	Absent: No left ventricular false tendon noted. Present: Left ventricular false tendon noted.	TTE only

2.1.6.1.15 GLS

ID	List	Notes
GLS	[selection] global longitudinal strain[.] <u>If GLS measurement is not empty, append with:</u> is [GLS] %. Note: ignore find_incl_gls ws option if this statement prints.	TTE only

2.1.6.2 LA

2.1.6.2.1 Default statement

ID	List	Notes
Default statement	Left atrial cavity is normal in size.	

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2.1.6.2.2 LA Cavity Size

ID	List	Notes
LA Cavity Size	1. Left atrial cavity is normal in size. 2. Left atrial cavity is [slightly mildly mild to moderately moderately moderate to severely severely borderline] dilated. 3. Left atrial cavity is [abnormally small].	

2.1.6.2.3 Atrial Septal Wall and Atrial Septal Defect Size and Shunt

(TTE/TEE)

ID	List	Notes
Atrial Septal Wall and Atrial Septal Defect Size and Shunt	Normal: 'Normal interatrial septum.' 1. A/An [size] [atrial septal aneurysm with a patent foramen ovale patent foramen ovale without aneurysmal septum] [is present has a {shunt} shunt.] 2. An atrial septal aneurysm without a patent foramen ovale is present 3. A [size] [primum secundum sinus venosus] atrial septal defect [is present has a {shunt} shunt.]. 4. A [lipomatous hyperlipomatous] septum is present. 5. The interatrial septum is thin and mobile but appears to be intact by 2D and CF Doppler interrogation.	

(Pediatric)

ID	List	Notes
Atrial Septal Wall and Atrial Septal Defect Size and Shunt	Normal: 'Normal interatrial septum.' 1. Interatrial septum is intact. 2. A/An [size] [(xx mm)] [atrial septal aneurysm with a patent foramen ovale patent foramen ovale without aneurysmal septum patent foramen ovale] [is present has a {shunt} shunt.] 3. An atrial septal aneurysm without a patent foramen ovale is present 4. A [size] [(xx mm)] [primum secundum sinus venosus] atrial septal defect [is present has a {shunt} shunt.]. 5. A hyperlipomatous septum is present. 6. The interatrial septum is thin and mobile but appears to be intact by 2D and CF Doppler interrogation.	

2.1.6.2.4 Thrombus

ID	List	Notes
Thrombus	If Thrombus None is selected: No evidence of thrombus is seen in the left atrium during this exam. If Thrombus not None or blank: [THROMBUS] [SIZE] [MOBILITY] thrombus is present [LOCATION]. [Multiple] thrombi are present in the left atrium. THROMBUS: A [small medium large diffuse] MOBILITY: [mobile non-mobile] SIZE: [L] x [W] cm [L] cm [W] cm LOCATION: Blank: in the left atrium. LA Appendage: in the left atrial appendage. LA Body: in the left atrial body. Atrial Septum: on the atrial septum. LA Catheter: on the left atrial catheter.	

2.1.6.2.5 Mass

ID	List	Notes
Mass	If Mass None is selected: No evidence of mass is seen in the left atrium during this exam. If Mass not None or blank: [MASS] [SIZE] [MOBILITY] mass is present [LOCATION]. [Multiple] masses are present in the left atrium. MASS: A [small medium large diffuse] MOBILITY: [mobile non-mobile] SIZE: [L] x [W] cm [L] cm [W] cm LOCATION: Blank: in the left atrium. LA Appendage: in the left atrial appendage. LA Body: in the left atrial body. Atrial Septum: on the atrial septum. LA Catheter: on the left atrial catheter.	

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2.1.6.3 RA

2.1.6.3.1 Default statement (SR-4611)

ID	List	Notes
Default statement	Right atrial cavity is normal in size.	

2.1.6.3.2 RA Cavity Size (SR-4612)

ID	List	Notes
RA Cavity Size	1. Right atrial cavity is [normal] in size 2. Right atrial cavity is [slightly mildly mild to moderately moderately moderate to severely severely borderline] dilated. 3. Right atrial cavity is [abnormally small].	

2.1.6.3.3 Visualized

ID	List	Notes
Visualized	1. Right atrium is not well visualized. 2. Right atrium pacemaker visualized. 3. Right atrium pacemaker lead wires visualized.	

2.1.6.3.4 Thrombus (SR-4613)

ID	List	Notes
Thrombus	If Thrombus None is selected: No evidence of thrombus is seen in the right atrium during this exam. If Thrombus not None or blank: [THROMBUS] [SIZE] [MOBILITY] thrombus is present [LOCATION]. [Multiple] thrombi are present in the right atrium. THROMBUS: A [small medium large diffuse] MOBILITY: [mobile non-mobile] SIZE: [L] x [W] cm [L] cm [W] cm LOCATION: Blank: in the right atrium. RA Appendage: in the right atrial appendage. RA Body: in the right atrial body. Atrial Septum: on the atrial septum. RA Catheter: on the right atrial catheter. IVC: in the inferior vena cava. SVC: in the superior vena cava.	

2.1.6.3.5 Mass (SR-4614)

ID	List	Notes
Mass	If Mass None is selected: No evidence of mass is seen in the right atrium during this exam. If Mass not None or blank: [MASS] [SIZE] [MOBILITY] mass is present [LOCATION]. [Multiple] masses are present in the right atrium. MASS: A [small medium large diffuse] MOBILITY: [mobile non-mobile] SIZE: [L] x [W] cm [L] cm [W] cm LOCATION: Blank: in the right atrium. RA Appendage: in the right atrial appendage. RA Body: in the right atrial body. Atrial Septum: on the atrial septum. RA Catheter: on the right atrial catheter. IVC: in the inferior vena cava. SVC: in the superior vena cava.	

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2.1.6.4 RV

2.1.6.4.1 Default statement (SR-4615)

ID	List	Notes
Default statement	Right ventricle cavity is normal in size. Normal right ventricular function.	

2.1.6.4.2 RV Cavity Size (SR-4617)

ID	List	Notes
RV Cavity Size	1. Right ventricular cavity is [normal] in size. 2. Right ventricular cavity is [slightly mildly mild to moderately moderately moderate to severely severely borderline] dilated. 3. Right ventricular cavity is [abnormally small].	

2.1.6.4.3 Visualized

ID	List	Notes
Visualized	1. Right ventricle is not well visualized. 2. Right ventricle pacemaker visualized. 3. Right ventricle pacemaker lead wires visualized.	

2.1.6.4.4 Cardiomyopathy (SR-4618)

ID	List	Notes
Cardiomyopathy	[Dilated Hypertrophic Restrictive] cardiomyopathy	

2.1.6.4.5 Concentric Hypertrophy (SR-4619)

ID	List	Notes
Concentric Hypertrophy	[Mild Mild to moderate Moderate Moderate to severe Severe] concentric hypertrophy of the right ventricle.	

2.1.6.4.6 Thrombus/Mass (SR-4620)

ID	List	Notes
Thrombus/Mass	If Thrombus None or Mass None is selected: No evidence of {thrombus mass} is seen in the right ventricle during this exam. If Thrombus or Mass not None or blank: [THROMBUS MASS] [SIZE] [MOBILITY] {thrombus mass} is present [LOCATION]. [Multiple] {thrombi masses} are present in the right ventricle. THROMBUS MASS: A [small medium large diffuse] MOBILITY: [mobile non-mobile] SIZE: [L] x [W] cm [L] cm [W] cm LOCATION: Blank: in the right ventricle. RV free wall: on the right ventricle free wall RV apex: in the right ventricle apex Moderator band: on the moderator band RV Catheter: on the right ventricle catheter Septum: on the septum	

2.1.6.4.7 Global Systolic Function

ID	List	Notes
Global Systolic Function	1. [Normal Low normal Mildly reduced Moderately reduced Severely reduced] right ventricular function. 2. [Hyperdynamic] right ventricle.	

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2.1.6.4.8 TAPSE

ID	List	Notes
TAPSE	[Selection] TAPSE[.] If TAPSE measurement is not empty, append with: _ls [] mm.	TTE only

2.1.6.5 LAA

2.1.6.5.1 Default statement (SR-4623)

ID	List	Notes
Default statement	Left Atrial Appendage is normal. No lobes seen.	

2.1.6.5.2 LAA (SR-4624)

ID	List	Notes
LAA	Left Atrial Appendage is [normal]. Set to blank if other observations selected. [blank] no statement.	

2.1.6.5.3 Thrombus (SR-4625)

ID	List	Notes
Thrombus	If blank is selected, no thrombus statement. 1. If none is selected: No LAA thrombus seen during this exam. 2. If Small, medium or large are selected: A [small medium large] size [mobile non-mobile] LAA thrombus present.	

2.1.6.5.4 Mass (SR-4626)

ID	List	Notes
Mass	If blank is selected, no mass statement. 1. If 'None' is selected: No LAA mass seen during this exam. 2. If Small, medium or large are selected: A [small medium large] size [mobile non-mobile] LAA mass present.	

2.1.6.5.5 Lobes

ID	List	Notes
Lobes	If blank is selected, no lobes statement. If 'None' is selected, No lobes seen. If 1, 2, 3 or 4 is selected: [Single- bi multi four-] lobed appendage.	

2.1.6.6 IS

2.1.6.6.1 Default statement (SR-4628)

ID	List	Notes
Default statement	Normal interatrial septum.	

2.1.6.6.2 Interatrial Septum (SR-4630)

ID	List	Notes
Interatrial Septum	[Normal] interatrial septum.	Set to blank if other options selected

2.1.6.6.3 Aneurysmal Motion of Interatrial Septum (SR-4631)

ID	List	Notes
Aneurysmal Motion of Interatrial Septum	If blank is selected, no statement. [Mild Moderate Severe]aneurysmal motion of the interatrial septum.	

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2.1.6.6.4 Septal Wall

ID	List	Notes
Septal Wall	Lipomatous hypertrophy of the interatrial septum. Aneurysmal septal wall. Patent Foramen Ovale present.	

2.1.6.7 AV

2.1.6.7.1 Default statement (SR-4635)

ID	List	Notes
Default statement	Structurally normal trileaflet aortic valve with no regurgitation.	
Pediatric	Structurally normal trileaflet aortic valve with no stenosis or regurgitation.	

2.1.6.7.2 Morphology Cusps and Regurgitation (SR-4634)

ID	List	Notes
Morphology Cusps and Regurgitation	General sentence: {morphology} {(TAVR)} {cusps} aortic valve {with [regurgitation] regurgitation}. Valvuloplasty of the {cusps} aortic valve [with [regurgitation] regurgitation]. If Regurgitation is "None": Append the sentence with: " with no regurgitation". If Regurgitation is not blank nor "None": Append the sentence with: "with {regurgitation} regurgitation". If Morphology and Cusps are blank: If Regurgitation=None: No aortic valve regurgitation. Else if not blank: {regurgitation} aortic regurgitation.	
Note: normal => Structurally normal mild-mod => mild to moderate mod-sev => moderate to severe		
Note: 'Grade' is hidden from Regurgitation portion if wsoption in place to hide grade		
Note: TAVR available only for TTE. Include if 'Yes'.		
If worksheet option find_split_structure_function is in place and either Morphology or Regurgitation is abnormal:	{morphology} {TAVR} {cusps} aortic valve. [{regurgitation} aortic regurgitation. No aortic valve regurgitation.]	

2.1.6.7.3 Annulus (SR-4636)

ID	List	Notes
Annulus	[Mild Moderate Severe] calcification of the aortic valve annulus. Aortic valve [ring repair/clip repair/repair] of the aortic annulus.	Use simply 'repair' when Valvular Annuloplasty selected.

2.1.6.7.4 Leaflets

ID	List	Notes
Leaflet Thickening and Leaflet Calcification	1. If leaflet calcification is blank but leaflet thickening is answered [Mild Moderate Severe] aortic valve leaflet thickening 2. If leaflet thickening is blank but leaflet calcification is answered [Mild Moderate Severe] aortic valve leaflet calcification [Sclerosis] of the aortic valve. 3. if leaflet calcification and leaflet thickening are both answered [Mild Moderate Severe] aortic valve leaflet thickening with [mild moderate severe] calcification. [Mild Moderate Severe] aortic valve leaflet thickening with [sclerosis]..	
Leaflet Mobility	[Normal] aortic valve leaflet mobility. [Doming] of the aortic valve leaflets. [Mildly Moderately Severely] restricted aortic valve leaflets. [Redundant] aortic valve leaflets.	
Leaflet Prolapse (if secondary dropdown is blank)	[Mild Moderate Severe Borderline] prolapse of the aortic valve [leaflets {prolapsing leaflet} leaflet].	
If secondary dropdown is not blank	[Mild Moderate Severe Borderline] aortic valve [{prolapsing leaflet} leaflet] prolapse with [flail leaflets wide coaptation defect].	

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2.1.6.7.5 Stenosis

ID	List	Notes
Stenosis	1. If none is chosen: No evidence of aortic stenosis. 2. [Trace Mild Mild to moderate Moderate Moderate to severe Severe Critical Borderline] aortic stenosis.	

2.1.6.7.6 Etiology of AV Disease (SR-4641)

ID	List	Notes
Etiology of AV Disease	1. [Rheumatic Non specific Unknown] aortic valve disease. 2. Aortic valve disease due to [myxomatous degeneration senile degeneration Congenital valvular disease coronary artery disease left ventricular dysfunction aortic root dilation]. 3. [Rocking Dehiscence Fistula Fracture/perforation] of the aortic valve. 4. Aortic valve [abscess]. 5. [Pannus] formation of the aortic valve. 6. [Redundant] aortic valve cusps.	

2.1.6.7.7 Vegetation (SR-4642)

ID	List	Notes
Vegetation	If Vegetation not blank or Absent: [VEGETATION] [MOBILITY] vegetation is present [LOCATION]. VEGETATION: A [small moderate large] MOBILITY: [mobile non-mobile pedunculated and mobile] LOCATION: Blank: on the aortic valve. Else: on the [right left non] coronary cusp of the aortic valve. If 'Absent' is selected: 'No vegetation present on the aortic valve.'	

2.1.6.7.8 Visualized (SR-4643)

ID	List	Notes
Visualized	1. The Aortic valve is [Well Adequately Not Well] Visualized 2. The Aortic valve is [Not Seen]	

2.1.6.7.9 Color Flow/Jets (SR-14214)

ID	List	Notes
Jet Width in LVOT	Jet width in LVOT is [small in central jets intermediate large in central jets variable in eccentric jets].	
Flow convergence	No AR flow convergence. [Very small Intermediate Large] AR flow convergence.	
Jet Density	[option] AR jet density.	These 3 statements are to form one paragraph.

2.1.6.7.10 Desc Aorta Diastolic Flow Reversal

ID	List	Notes
Desc Aorta Diastolic Flow Reversal	[Brief/early Intermediate] diastolic reversal. Prominent holodiastolic reversal.	

2.1.6.7.11 LVOT Obstruction

ID	List	Notes
LVOT Obstruction	Absent: No LVOT obstruction noted. Present: LVOT obstruction noted.	TEE only

2.1.6.7.12 Systolic Anterior Motion (SAM)

ID	List	Notes
Systolic Anterior Motion (SAM)	Absent: No systolic anterior motion noted. Present: Systolic anterior motion noted.	TEE only

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2.1.6.8 MV

2.1.6.8.1 Default statement (SR-4644)

ID	List	Notes
Default statement	Structurally normal mitral valve with no regurgitation.	
Pediatric	Structurally normal mitral valve with no stenosis or regurgitation	

2.1.6.8.2 Morphology and Regurgitation (SR-4646)

ID	List	Notes
Morphology and Regurgitation	General sentence: {morphology} mitral valve {with [regurgitation] regurgitation}. Valvuloplasty of the mitral valve [with [regurgitation] regurgitation]. If Regurgitation is "None": Append the sentence with: " with no regurgitation". If Regurgitation is not blank nor "None": Append the sentence with: "with {regurgitation} regurgitation". If Morphology is blank: If Regurgitation=None: No mitral valve regurgitation. else if not blank: {regurgitation} mitral regurgitation.	
Note: normal => Structurally normal mild-mod => mild to moderate mod-sev => moderate to severe		
Note: 'Grade' is hidden from Regurgitation portion if wsoption in place to hide grade		
if worksheet option find_split_structure_function is in place and either Morphology or Regurgitation is abnormal	{morphology} mitral valve. [{regurgitation} mitral regurgitation. No mitral valve regurgitation.]	

2.1.6.8.3 Annulus (SR-4647)

ID	List	Notes
Annulus	[Mild Moderate Severe] calcification of the mitral valve annulus. Mitral valve [ring repair/clip repair/repair] of the mitral annulus.	Use simply 'repair' when Valvular Annuloplasty selected.

2.1.6.8.4 Leaflets (SR-4648)

ID	List	Notes
Leaflet Thickening and Leaflet Calcification	1. If leaflet calcification is blank but leaflet thickening is answered [Mild Moderate Severe] mitral valve leaflet thickening. 2. If leaflet thickening is blank but leaflet calcification is answered [Mild Moderate Severe] mitral valve leaflet calcification. [Sclerosis] of the mitral valve. 3. if leaflet calcification and leaflet thickening are both answered [Mild Moderate Severe] mitral valve leaflet thickening with [mild moderate severe] calcification. [Mild Moderate Severe] mitral valve leaflet thickening with [sclerosis].	
Leaflet Mobility	[Normal] mitral valve leaflet mobility. [Doming] of the mitral valve leaflets. [Mildly Moderately Severely] restricted mitral valve leaflets. [Redundant] mitral valve leaflets.	
Leaflet Prolapse (if secondary dropdown is blank)	[Mild Moderate Severe Borderline] prolapse of the mitral valve [leaflets {prolapsing leaflet} leaflet].	
If secondary dropdown is not blank	[Mild Moderate Severe Borderline] mitral valve [{prolapsing leaflet} leaflet] prolapse with [symmetric flail non-flail asymmetric] leaflets.	

2.1.6.8.5 Stenosis (SR-4651)

ID	List	Notes
Stenosis	1. If none is chosen: No evidence of mitral stenosis. 2. [Trace Mild Mild-moderate Moderate Moderate-severe Severe Critical Borderline] mitral stenosis.	

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2.1.6.8.6 Etiology of MV Disease

ID	List	Notes
Etiology of MV Disease	<ol style="list-style-type: none"> 1. [Rheumatic Non specific Unknown] mitral valve disease 2. Mitral valve disease due to [myxomatous degeneration senile degeneration congenital valvular disease coronary artery disease left ventricular dysfunction aortic root dilation]. 3. [Rocking Dehiscence Fistula Fracture/perforation Ruptured chordae] of the mitral valve. 4. Mitral valve [abscess]. 5. [Pannus] formation of the mitral valve. 6. [Redundant] mitral valve leaflets. 7. [Flail Cleft] mitral valve leaflet. 	

2.1.6.8.7 Carpentier's Class (SR-4653)

ID	List	Notes
Carpentier's Class	<ol style="list-style-type: none"> 1. [Type I] dysfunction with normal mitral valve leaflet motion and pure annular dilatation. 2. [Type II] dysfunction with excess motion of the margin of the mitral valve leaflet in relation to the annular plane. 3. [Type IIIa] dysfunction with restricted mitral valve leaflet motion during diastole and systole. 4. [Type IIIb] dysfunction with restricted mitral valve leaflet motion predominantly during systole. 	

2.1.6.8.8 Vegetation (SR-4654)

ID	List	Notes
Vegetation	<p>If Vegetation not blank or 'Absent': [VEGETATION] [MOBILITY] vegetation is present [LOCATION]. VEGETATION: A [small moderate large] MOBILITY: [mobile non-mobile pedunculated and mobile] LOCATION: Blank: on the mitral valve. Else: on the [anterior posterior septal] mitral valve leaflet. If 'Absent' is selected: No vegetation present on the mitral valve.</p>	

2.1.6.8.9 Visualized (SR-14213)

ID	List	Notes
Visualized	<ol style="list-style-type: none"> 1. The mitral valve is [Well Adequately Not Well] Visualized 2. The mitral valve is [Not Seen] 	

2.1.6.8.10 Color Flow/Jets (SR-14209)

ID	List	Notes
Color Flow Jet Area	[option] MR jet color flow area.	
Flow convergence	MR jet flow convergence is [option].	
CWD Jet	[option] CWD jet.	These 3 statements are to form one paragraph.

2.1.6.8.11 Pulmonary Vein Flow (SR-14210)

ID	List	Notes
Pulmonary Vein Flow	[[Systolic dominant Systolic blunted] pulmonary vein flow. Systolic pulmonary vein flow reversal.]	

2.1.6.8.12 Mitral Inflow (SR-14211)

ID	List	Notes
Mitral Inflow	[A-wave dominant Variable E-wave dominant] mitral inflow.	

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2.1.6.9 TV

2.1.6.9.1 Default statement (SR-4721)

ID	List	Notes
Default statement	Structurally normal tricuspid valve with no regurgitation.	
Pediatric	Structurally normal tricuspid valve with no stenosis or regurgitation.	

2.1.6.9.2 Morphology and Regurgitation (SR-4722)

ID	List	Notes
Morphology and Regurgitation	General sentence: {morphology} tricuspid valve {with [regurgitation] regurgitation}. Valvuloplasty of the tricuspid valve [with [regurgitation] regurgitation]. If Regurgitation is "None": Append the sentence with: " with no regurgitation". If Regurgitation is not blank nor "None": Append the sentence with: "with {regurgitation} regurgitation". If Morphology is blank: If Regurgitation=None: No tricuspid valve regurgitation. else if not blank: {regurgitation} tricuspid regurgitation.	
Note: normal => Structurally normal mild-mod => mild to moderate mod-sev => moderate to severe		
if worksheet option find_split_structure_function is in place and either Morphology or Regurgitation is abnormal	{morphology} tricuspid valve. [{regurgitation} tricuspid regurgitation.] No tricuspid valve regurgitation.]	

2.1.6.9.3 Annulus (SR-4723)

ID	List	Notes
Annulus	[Mild Moderate Severe] calcification of the tricuspid valve annulus. [Dilation] of the tricuspid valve annulus. Tricuspid valve [ring repair/clip repair/repair] of the tricuspid annulus.	Use simply 'repair' when Valvular Annuloplasty selected.

2.1.6.9.4 Leaflets

ID	List	Notes
Leaflet Thickening and Leaflet Calcification	1. If leaflet calcification is blank but leaflet thickening is answered [Mild Moderate Severe] tricuspid valve leaflet thickening. 2. If leaflet thickening is blank but leaflet calcification is answered [Mild Moderate Severe] tricuspid valve leaflet calcification. [Sclerosis] of the tricuspid valve. 3. if leaflet calcification and leaflet thickening are both answered [Mild Moderate Severe] tricuspid valve leaflet thickening with [mild moderate severe] calcification. [Mild Moderate Severe] tricuspid valve leaflet thickening with [sclerosis].	
Leaflet Mobility	[Normal] tricuspid valve leaflet mobility. [Doming] of the tricuspid valve leaflets. [Mildly Moderately Severely] restricted tricuspid valve leaflets. [Redundant] tricuspid valve leaflets.	
Leaflet Prolapse (if secondary dropdown is blank)	[Mild Moderate Severe Borderline] prolapse of the tricuspid valve [leaflets {prolapsing leaflet} leaflet].	
If secondary dropdown is not blank	[Mild Moderate Severe Borderline] tricuspid valve [{prolapsing leaflet} leaflet] prolapse with [flail leaflets severe retraction large perforation].	

2.1.6.9.5 Stenosis

ID	List	Notes
Stenosis	1. If none is chosen: No evidence of tricuspid stenosis. 2. [Trace Mild Mild to moderate Moderate Moderate to severe Severe Critical Borderline] tricuspid stenosis	

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2.1.6.9.6 Etiology of TV Disease (SR-4728)

ID	List	Notes
Etiology of TV Disease	1. [Rheumatic Non specific Unknown] tricuspid valve disease 2. Tricuspid valve disease due to [myxomatous degeneration senile degeneration congenital valvular disease coronary artery disease right ventricular dysfunction aortic root dilation Ebstein's Anomaly]. 3. [Rocking Dehiscence Fistula Fracture/perforation Ruptured chordae] of the tricuspid valve. 4. Tricuspid valve [abscess]. 6. [Redundant] tricuspid valve leaflets.	5. [Pannus] formation of the tricuspid valve. 7. [Flail] tricuspid valve leaflet.

2.1.6.9.7 Vegetation (SR-4729)

ID	List	Notes
Vegetation	If Vegetation not blank or 'Absent': [VEGETATION] [MOBILITY] vegetation is present [LOCATION]. VEGETATION: A [small moderate large] MOBILITY: [mobile non-mobile pedunculated and mobile] LOCATION: Blank: on the tricuspid valve. Else: on the [anterior posterior septal] tricuspid valve cusp. If 'Absent' is selected: No vegetation present on the tricuspid valve.	

2.1.6.9.8 Pulmonary Hypertension (SR-4730)

ID	List	Notes
Pulmonary Hypertension	1. If pulmonary hypertension 'Absent' is chosen: No evidence of pulmonary hypertension. 2. If pulmonary hypertension is chosen other than blank or absent. [Mild Mild to moderate Moderate Moderate to severe Severe] pulmonary hypertension.	

2.1.6.9.9 Visualized (SR-4731)

ID	List	Notes
Visualized	1. The Tricuspid valve is [well adequately not well] visualized 2. The Tricuspid valve is [not seen]	

2.1.6.9.10 Color Flow/Jets (SR-14219)

ID	List	Notes
Color Flow Jet Area	[option] TR jet color flow area.	
Flow convergence	TR jet flow convergence is [not visible small/transient intermediate in size and duration large throughout systole].	
CWD Jet	[option] CWD jet.	These 3 statements are to form one paragraph.

2.1.6.9.11 Hepatic Vein Flow (SR-14220)

ID	List	Notes
Hepatic Vein Flow	[[Systolic dominant Systolic blunted] hepatic vein flow. Systolic hepatic vein flow reversal.]	

2.1.6.9.12 Tricuspid Inflow (SR-14221)

ID	List	Notes
Tricuspid Inflow	[A-wave dominant Variable E-wave dominant] tricuspid inflow.	

2.1.6.9.13 Inadequate TR jet

ID	List	Notes
TR Pk Vel has value <1.8 m/s and worksheetoption find_incl_tv_pk_vel in place	Unable to assess RVSP due to inadequate TR jet.	Considered abnormal, therefore appears in Conclusions.

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2.1.6.10 PV

2.1.6.10.1 Default statement (SR-4733)

ID	List	Notes
Default statement	Structurally normal pulmonic valve with no regurgitation.	
Pediatric	Structurally normal pulmonic valve with no stenosis or regurgitation.	

2.1.6.10.2 Morphology and Regurgitation (SR-4734)

ID	List	Notes
Morphology and Regurgitation	<p>General sentence: {morphology} pulmonic valve {with [regurgitation] regurgitation}. Valvuloplasty of the pulmonic valve [with [regurgitation] regurgitation]. If Regurgitation is "None": Append the sentence with: " with no regurgitation". If Regurgitation is not blank nor "None": Append the sentence with: "with {regurgitation} regurgitation". If Morphology is blank: If Regurgitation=None: No pulmonic valve regurgitation. else if not blank: {regurgitation} pulmonic regurgitation.</p>	
Note: normal => Structurally normal mild-mod => mild to moderate mod-sev => moderate to severe		
if worksheet option find_split_structure_function is in place and either Morphology or Regurgitation is abnormal	{morphology} pulmonic valve. [{regurgitation} pulmonic regurgitation. No pulmonic valve regurgitation.]	

2.1.6.10.3 Annulus (SR-4735)

ID	List	Notes
Annulus	[Mild Moderate Severe] calcification of the pulmonic valve annulus. Pulmonic valve [ring repair/clip repair/repair] of the pulmonic annulus.	Use simply 'repair' when Valvular Annuloplasty selected.

2.1.6.10.4 Leaflets

ID	List	Notes
Leaflet Thickening and Leaflet calcification	<p>1. If leaflet calcification is blank but leaflet thickening is answered [Mild Moderate Severe] pulmonic valve leaflet thickening. 2. If leaflet thickening is blank but leaflet calcification is answered [Mild Moderate Severe] pulmonic valve leaflet calcification. [Sclerosis] of the pulmonic valve. 3. if leaflet calcification and leaflet thickening are both answered [Mild Moderate Severe] pulmonic valve leaflet thickening with [mild moderate severe] calcification. [Mild Moderate Severe] pulmonic valve leaflet thickening with sclerosis.</p>	
Leaflet Mobility	<p>[Normal] pulmonic valve leaflet mobility. [Doming] of the pulmonic valve leaflets. [Mildly Moderately Severely] restricted pulmonic valve leaflets. [Redundant] pulmonic valve leaflets.</p>	
Leaflet Prolapse	[Mild Moderate Severe Borderline] prolapse of the pulmonic valve [leaflets {prolapsing leaflet} leaflet]..	

2.1.6.10.5 Stenosis (SR-4739)

ID	List	Notes
Stenosis	<p>1. If none is chosen No evidence of pulmonic stenosis. 2. [Trace Mild Mild to moderate Moderate Moderate to severe Severe Critical Borderline] pulmonic stenosis.</p>	

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2.1.6.10.6 Etiology of PV Disease (SR-4740)

ID	List	Notes
Etiology of PV Disease	1. [Rheumatic Non specific Unknown] pulmonic valve disease. 2. Pulmonic valve disease due to [myxomatous degeneration senile degeneration congenital valvular disease coronary artery disease right ventricular dysfunction aortic root dilation]. 3. [Rocking Dehiscence Fistula Fracture/perforation] of the pulmonic valve. 4. Pulmonic valve [abscess]. 5. [Pannus] formation of the pulmonic valve. 6. [Redundant] pulmonic valve leaflets.	

2.1.6.10.7 Vegetation (SR-4741)

ID	List	Notes
Vegetation	If Vegetation not blank or 'Absent': [VEGETATION] [MOBILITY] vegetation is present [LOCATION]. VEGETATION: A [small moderate large] MOBILITY: [mobile non-mobile pedunculated and mobile] LOCATION: Blank: on the pulmonic valve. Else: on the [anterior right left] pulmonic valve cusp. If 'Absent' is selected: No vegetation present on the pulmonic valve.	

2.1.6.10.8 Visualized (SR-4742)

ID	List	Notes
Visualized	1. The pulmonic valve is [well adequately not well] visualized. 2. The pulmonic valve is [not seen].	

2.1.6.10.9 Color Flow/Jets (SR-14223)

ID	List	Notes
Color Flow Jet Size	[option] PR jet color flow.	
Jet density and contour	[Soft Dense] PR jet. [Dense PR jet with early termination of diastolic flow.]	

2.1.6.11 Pericardium

2.1.6.11.1 Default statement (SR-4743)

ID	List	Notes
Default statement (TTE/TEE)	No evidence of significant pericardial effusion.	
Default statement (Pediatric)	Pericardium is normal.	

2.1.6.11.2 Pericardium (SR-4745)

ID	List	Notes
Pericardium abnormal	Pericardium is [mildly thickened mildly thickened with calcification moderately thickened moderately thickened with calcification severely thickened severely thickened with calcification irregular].	
Pericardium Normal	Pericardium is normal. * For Pediatric Protocol: The normal statement combines with the first pericardial effusion statement, if present. For example, Normal pericardium with [echobright posterior] pericardial effusion. This replaces the 'Pericardium is normal.' statement.	

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2.1.6.11.3 Pericardial Effusion and Fluid (SR-4746)

(TTE/TEE)

ID	List	Notes
Pericardial Effusion and Fluid	1. if 'None' is chosen: No evidence of significant pericardial effusion. 2. [Insignificant Small Moderate Large] pericardial effusion. Alternate list: [Trace] pericardial effusion.	Fluid shall only be editable if Pericardial Effusion is not blank or 'None'
	Append the Pericardial effusion statement with the Fluids selection: with [clear] fluids. that is [echogenic (blood/coag). with [focal strands]. that is [exudates/fibrous].	

(Pediatric)

ID	List	Notes
Pericardial Effusion Visualized, Location and Fluid	[Not well visualized Echobright Post surgical] {location} pericardial effusion [with {fluid} fluid] . The first row combines with the Normal Pericardium statement. Ex. Normal pericardium with post surgical anterior pericardial effusion with insignificant fluid.	There are 4 rows. If the first row is blank, the other 3 rows are disabled.

2.1.6.11.4 Pleural Effusion

ID	List	Notes
Pleural Effusion	1. if None is chosen: No evidence of pleural effusion. 2. [Small Moderate Large] pleural effusion.	

2.1.6.11.5 Hemodynamic Compromise (SR-4748)

(TTE/TEE)

ID	List	Notes
Hemodynamic Compromise	[None]: There is no hemodynamic significance. Else: Hemodynamic compromise is consistent with [tamponade constriction].	

(Pediatric)

ID	List	Notes
Hemodynamic Compromise	[None]: No hemodynamic compromise. [RAC]: Tamponade suggested by right atrial collapse. [IFV]: Tamponade suggested by respiratory changes present in intracardiac flow velocities. [RVC]: Tamponade suggested by right ventricular collapse.	

2.1.6.11.6 Visualized (SR-5009)

ID	List	Notes
Visualized	1. The pericardium is [well adequately not well] visualized. 2. The pericardium is [not seen].	

2.1.6.12 Aorta

2.1.6.12.1 Default statement (SR-4708)

ID	List	Notes
Default statement	The aortic root is normal.	

2.1.6.12.2 Aortic Root (SR-4709)

ID	List	Notes
Aortic Root	The aortic root is [normal dilated mildly dilated moderately dilated severely dilated not well seen].	

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2.1.6.12.3 Aortic Atherosclerotic (SR-4710)

ID	List	Notes
Aortic Atherosclerotic Changes	[Mild Moderate Severe] atherosclerotic changes in the aorta.	

2.1.6.12.4 Dissection and Dissection Classification (SR-4711)

ID	List	Notes
Dissection and Dissection Classification	1. Dissection is [Absent]. 2. Dissection is [Present]. (if Dissection Classification is blank). 3. A [Stanford A (proximal) Stanford B (distal) DeBakey Type I DeBakey Type II DeBakey Type III] aortic dissection is [present].	Dissection Classification shall only be editable if the option for Dissection is "Present".

2.1.6.12.5 Dilation Degree

ID	List	Notes
Asc. Dilation Degree	if only Ascending dilation degree is chosen. [Mildly Moderately Severely] dilated ascending aorta.	
Arch Dilation Degree	if only Arch dilation degree is chosen. [Mildly Moderately Severely] dilated aortic arch.	
Desc. Thoracic Ao Dilation Degree	if only Descending dilation degree is chosen. [Mildly Moderately Severely] dilated descending aorta.	
Asc. Dilation Degree, Arch dilation degree, and descending thoracic AO dilation degree	1. If ONLY Ascending and Arch chosen [Mildly Moderately Severely] dilated ascending aorta with [mildly moderately severely] dilated aortic arch. 2. If ONLY Ascending and Descending are chosen [Mildly Moderately Severely] dilated ascending aorta with [mildly moderately severely] dilated descending aorta. 3. If ONLY Arch and Descending are chosen [Mildly Moderately Severely] dilated aortic arch with [mildly moderately severely] dilated descending aorta. 4. If ALL are chosen [Mildly Moderately Severely] dilated ascending aorta with [mildly moderately severely] dilated aortic arch and [mildly moderately severely] dilated descending aorta.	

2.1.6.12.6 Aneurysm Location (SR-4716)

ID	List	Notes
Aneurysm Location	[Ascending aortic Transverse aortic Descending aortic Ascending and transverse aortic Ascending and descending aortic Transverse and Descending aortic Ascending, Transverse, and Descending aortic] aneurysm. If 'Aortic sinus' is selected: Sinus of Valsalva aneurysm.	

2.1.6.12.7 Coarctation Location (SR-4717)

ID	List	Notes
Coarctation Location	A coarctation of the aorta is [present]. [Proximal to the left subclavian artery Distal to the left subclavian artery] coarctation of the aorta.	

2.1.6.12.8 Visualized (SR-4718)

ID	List	Notes
Visualized	1. The aorta is [well adequately not well] visualized. 2. The aorta is [not seen].	

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2.1.6.13 Pulmonary Artery

2.1.6.13.1 Default statement (SR-4703)

ID	List	Notes
Default statement	Normal pulmonary artery	

2.1.6.13.2 Pulmonary Artery

ID	List	Notes
Pulmonary Artery	[option] pulmonary artery.	

2.1.6.13.3 Stenosis (SR-4704)

ID	List	Notes
Stenosis	1. No evidence of stenosis of the pulmonary artery. If stenosis is [none] 2. [Trace Mild Mild to Moderate Moderate Moderate to Severe Severe Critical] stenosis of the pulmonary artery.	

2.1.6.13.4 Embolism (SR-4705)

ID	List	Notes
Embolism	"Present": An embolism is present. "Absent": No embolism is present.	

2.1.6.13.5 Visualized (SR-4706)

ID	List	Notes
Visualized	1. The pulmonary artery is [well adequately not well] visualized. 2. The pulmonary artery is [not seen].	

2.1.6.13.6 Diastolic Flow Reversal (SR-14225)

ID	List	Notes
PA Diastolic Flow Reversal	PA branches Prominent diastolic flow reversal in PA branches.	

2.1.6.14 IVC & Pulmonary Vein

2.1.6.14.1 Default statement (SR-4697)

ID	List	Notes
Default statement	IVC is normal with respiratory variation.	

2.1.6.14.2 IVC (SR-4698)

ID	List	Notes
IVC Morphology and Resp. Response	if Respiratory Response is Blank: IVC is [normal dilated small]. [Absent]: Absent intrahepatic segment. if Respiratory Response is other than Blank: IVC is [normal dilated small] with: [Yes]: respiratory variation. [>50% <50%]: a respiratory response of [>50% <50%]. [blunted]:with blunted respiratory response. [poor]: poor inspiration collapse consistent with elevated right atrial pressure.	
IVC Visualized	1. The IVC is [well adequately not well] Visualized 2. The IVC is [not seen]	

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2.1.6.14.3 Pulm. Vein (SR-4700)

ID	List	Notes
Pulm. Vein Predominance	1. [Systolic Diastolic] pulmonary predominance.	
Pulm. Vein Visualized	1. The pulmonary vein is [well adequately not well] visualized. 2. The pulmonary vein is [not seen].	

2.1.6.15 Segmental Anatomy

2.1.6.15.1 Default statement (SR-4682)

ID	List	Notes
Default statement	Levocardia. Abdominal situs solitus. Atrial situs solitus.	

2.1.6.15.2 Position (SR-4683)

ID	List	Notes
Position not blank	[option].	

2.1.6.15.3 Situs (SR-4684)

Finding Options

ID	List	Notes
Abdominal Situs not blank	Abdominal situs [option].	
Atrial Situs not blank	Atrial situs [option].	

2.1.6.15.4 Ventricular Loop (SR-4686)

ID	List	Notes
Ventricular Loop not blank	[D L] ventricular loop.	

2.1.6.15.5 AV/VA Alignment (SR-4687)

ID	List	Notes
AV Alignment not blank	If Concordance is selected, and VA Alignment is also selected at Concordance Atrioventricular and ventriculoarterial relationships are normal (concordant) Else Atrioventricular [concordance discordance]. OR Double inlet ventricle.	
VA Alignment not blank and both AV and VA not selected at Concordance	Ventriculoarterial [concordance discordance]. OR Double outlet [right left] ventricle. OR [Pulmonary Aortic] atresia. OR Truncus arteriosus (single outlet).	

2.1.6.15.6 Great Vessels

ID	List	Notes
Great Vessels not blank	[selection] : statement [S normal-PGV]: S normal position of the great vessels. [N normal-PGV]: N normal position of the great vessels. [D-TGV]: Dextro-transposition of the great vessels. [L-TGV]: Levo- transposition of great vessels. [D-MA]: Dextro- malposition of the aorta. [L-MA]: Levo- malposition of the aorta. [D-TGA]: Dextro-transposition of the great arteries. [L-TGA]: Levo-transposition of the great arteries. [Complete SubAo conus]: Complete subaortic conus. [Bilat conus]: Bilateral conus. [Bilat absent conus]: Bilaterally absent conus.	

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2.1.6.16 Venous Return

2.1.6.16.1 Default Statement (SR-4691)

ID	List	Notes
Default statement	Systemic and hepatic venous connections appear normal. Hepatic veins drain normally into the inferior vena cava.	

2.1.6.16.2 Systemic Veins

ID	List	Notes
Systemic Veins not blank	[selection] : statement [Normal sys-hep venous conn.]: Systemic and hepatic venous connections appear normal. [SVC enters RA]: Superior vena cava enters the right atrium. [IVC enters RA]: Inferior vena cava enters the right atrium. [No SVC-RA entrance]: Superior vena cava entrance to the right atrium not demonstrated. [No IVC-RA entrance]: Inferior vena cava entrance to the right atrium not demonstrated. [SVC enters RA, no sten]: Superior vena cava enters the right atrium without apparent stenosis. [IVC enters, RA, no sten]: Inferior vena cava enters the right atrium without apparent stenosis. [No SVC-atria conn.]: Superior vena cava connection to atria not demonstrated. [No IVC-atria conn.]: Inferior vena cava connection to atria not demonstrated. [Persistent left SVC drain]: Persistent left superior vena cava draining into the coronary Sinus. [No bridge vein L-R SVC]: No apparent bridging vein between right and left superior vena cava.	

2.1.6.16.3 Pulmonary Veins

ID	List	Notes
Pulmonary Veins Visualized	Look at all 4 together: RL = right lower, RU = right upper, LL = Left lower, LU = Left Upper Count the number that are 'Seen': Total =4: Four pulmonary veins enter the left atrium. Total = 1 or 2 or 3: [One Two Three] of four pulmonary veins seen entering the left atrium[. For any that are 'Not seen': the [right lower, right upper, left lower, and left upper] pulmonary vein[s] not demonstrated. Total = 0, count the number that are 'Not seen': Total = 4: Pulmonary veins not visualized. Total = 1 or 2 or 3: The [[right lower, right upper, left lower, and left upper] pulmonary vein[s] not demonstrated.	

2.1.6.16.4 Hepatic Veins (SR-4694)

ID	List	Notes
Hepatic Veins not blank	Hepatic veins drain normally into the inferior vena cava. Hepatic veins not well seen.	

2.1.6.17 Atria

2.1.6.17.1 Existing statements from current LA and RA tabs (SR-4678)

ID	List	Notes
	Use existing findings from LA and RA tabs. To default statement, add: Interatrial septum is intact.	

2.1.6.18 Antrioventricular Valve

2.1.6.18.1 Existing statements from current MV and TV (SR-4676)

ID	List	Notes
	Use existing findings from current M V and TV tabs.	

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2.1.6.18.2 Common AV (SR-4677)

ID	List	Notes
For all dropdowns which are identical to the MV tab:	Use the same statement, replacing 'mitral valve' with 'atrioventricular valve'	
Morphology is 'Balanced', Balanced is disabled	The common atrioventricular valve is balanced over the right and left ventricles.	
Morphology is other than blank or 'Balanced' - pull Balanced selection into statement if it is not blank.	[Mildly Moderately Severely] [LV RV]-dominant atrioventricular canal.	
Additional Leaflet Mobility statements	[to IVS]: Chordal attachments to the crest of the interventricular septum. [to RV]: Chordal attachments to an anomalous papillary muscle in the right ventricle. [Free floating]: Free floating leaflet with attachments to papillary muscles on both sides of the interventricular septum.	

2.1.6.19 Ventricles

2.1.6.19.1 Existing statements from current LV and RV (SR-4674)

ID	List	Notes
	Use existing findings from current LV and RV tabs. <u>Septal Wall Motion statements for the additional Pediatric options:</u> [Paradoxical Hypokinetic Dyskinetic] septal wall motion.	

2.1.6.19.2 IVS Shape

ID	List	Notes
IVS Shape	Interventricular septal flattening during [systole diastole systole and diastole]. Systolic bowing of the interventricular septum into the LV chamber.	

2.1.6.20 Semilunar Valves

2.1.6.20.1 Existing statements from current PV and AV tabs (SR-4671)

ID	List	Notes
	Use existing statements from current PV and AV tabs	

2.1.6.20.2 Trunc Valve (SR-4672)

ID	List	Notes
For all dropdowns which are identical to the AV tab	For all dropdowns which are identical to the AV tab, replace 'aortic valve' with 'truncal valve'	
Morphology	[Present]: Truncal valve present. [Type I]: Main pulmonary artery arises from the truncal root. [Type II]: Each pulmonary artery arises directly from the posterior portion of the truncal root as separate vessels with separate orifices. [Type III]: Each pulmonary artery arises directly from the lateral aspects of the truncal root as separate vessels with separate orifices. [Type IV]: Truncal valve arises without pulmonary arteries, with bronchial arteries arising from the descending aorta.	

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2.1.6.21 Great Vessels

2.1.6.21.1 Existing Aorta and PA (SR-4664)

ID	List	Notes
	Use existing findings from current Aorta and PA tabs	
Sidedness, plus optional Branching	[Sidedness] [with [branching verbage]]. [Normal arch]: normal arch branching. [Mirror image]: mirror image branching. [LCC from BCT]: left common carotid artery arising from brachiocephalic trunk, which is a normal variant. [Right Sub from left Sub]: anomalous right subclavian artery arising from left subclavian artery. [Right Sub from DAO]: anomalous right subclavian artery arising from descending aorta. [Aberrant]: aberrant left subclavian artery.	

2.1.6.21.2 Common Great Vessels (SR-4666)

ID	List	Notes
AAo Trans Isthmus DAo Velocity increase	Mild = Velocity in the [ascending aorta trans aorta isthmus descending aorta] is mildly increased. Moderate = Moderately increased velocity in the []. Severe = Severely increased velocity in the [].	
AAo Trans Isthmus DAo Dilation	The [ascending aorta transverse aorta isthmus descending aorta] is [mildly moderately severely] dilated.	
AAo Trans Isthmus DAo Narrowing	There is {narrowing} narrowing of the [ascending aorta transverse aorta isthmus descending aorta].	
AAo Trans Isthmus DAo Hypoplasia	There is {hypoplasia} hypoplasia of the [ascending aorta transverse aorta isthmus descending aorta].	

2.1.6.21.3 Coarctation (SR-4667)

ID	List	Notes
CoA with Location and Severity	[No]: No evidence of coarctation of the aorta. [NWV]: Aortic arch not well visualized; cannot rule out coarctation of the aorta. [PDA]: Coarctation cannot be excluded in the presence of a patent ductus arteriosus. [Present]: - severity and/or location not blank: [severity] coarctation [location]. - severity and location are blank: A coarctation of the aorta is present.	

2.1.6.22 Ductus Arteriosus

2.1.6.22.1 Default statement (SR-4661)

ID	List	Notes
Default statement	blank	

2.1.6.22.2 PDA and Flow (SR-4662)

ID	List	Notes
PDA not blank	None=> No patent ductus arteriosus. Else: [PDA spelled out] ductus arteriosus	
Flow not blank	with [flow spelled out] flow.	

2.1.6.23 Coronary Arteries

2.1.6.23.1 Default statement (SR-4997)

ID	List	Notes
Default statement	Left main coronary artery and right coronary artery arise normally.	

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2.1.6.23.2 Caliber and Origin (SR-4998)

ID	List	Notes
Caliber and Origin	Origin=Normal AND Caliber is blank: combine all into one statement [sections list] arise(s) normally. Other combinations: [caliber] [section] [of [normal anomalous] origin]. [section] not well visualized.	

2.1.7 Conclusions

Worksheet shall allow the user to generate and comment on conclusions.

2.1.7.1 LV findings minus any 'visualized' (SR-4777)

Include LV findings minus any 'visualized' statements.
(UNLESS worksheetoption concl_only_abnormal is set).

If worksheetoption concl_only_abnormal is set, then only the abnormal statements will come through, as well as the EF statement generated from worksheetoption find_incl_ef, regardless of it being normal or abnormal).

2.1.7.2 RV Findings

See Worksheet option: Include RV findings concl_incl_rv

2.1.7.3 LA Findings

See Worksheet option: Include LA findings concl_incl_la

2.1.7.4 Abnormality from findings minus 'visualized' (SR-4776)

Include findings (generated and manually entered) from any other tab which has at least one abnormal dropdown selection, minus any generated 'visualized' statements
If worksheetoption concl_only_abnormal is set, then only the abnormal statements will come through.

2.1.7.5 Worksheetoptions statements

Include statements from worksheetoptions whose purpose is to print a Conclusions statement based on worksheet values. General form: concl_incl_[xx], but others of custom type also.

Note: worksheetoptions of form find_incl_[xx] do NOT print a statement in Conclusions unless specifically stated in the description of the option.

2.1.7.6 Sedation (SR-4773)

PEDIATRIC PROTOCOL ONLY:

ID	List	Notes
Sedation Used	Blank: No statement Yes: Sedation used. No: No Sedation used.	

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2.1.8 Worksheet options

Worksheet shall support worksheet options to allow user customize worksheet.

2.1.8.1 Worksheet options (SR-4779)

Worksheet options

Purpose	name	settings
Include EF in findings	find_incl_ef Can be paired with: concl_ef_remove_visual	0: never include 1: always include 2: only include when abnormal Note: Visual EF looked at first, then EF in measurements section. Statement depends upon value: (see next section)
Do not include the word 'visual' in Conclusions when referring to Visual EF	concl_ef_remove_visual	1 – omit the word 'visual' for standard Visual EF statement, or when paired with find_incl_ef
Include LA dimension in findings	find_incl_la_dimension (default 0)	0: never include 1: always include 2: only include when abnormal Print with LA Cavity size statement: LA Vol Idx (if avail) else LA (if a valid number) else LA (Mmode)
Include RA dimension in findings	find_incl_ra_dimension (default 0) Note: Option 2 will never print RA as it has no abnormals defined.	0: never include 1: always include 2: only include when abnormal Print with RA Cavity size statement: RA Vol Idx (if avail) else RA (if a valid number)
Include LVSV/BSA in Findings	find_incl_lvsv_idx	0: never include 1: always include 2: only include when abnormal
Include MV E/A Ratio in Findings	find_incl_mv_ea_ratio	0: never include 1: always include 2: only include when abnormal
Include MV E/e' in Findings	find_incl_mv_ee	0: never include 1: always include 2: only include when abnormal
Include AV Pk Grad and/or AV Mn Grad in findings	find_incl_av_pk_grad (default 0) find_incl_av_mn_grad (default 0)	0: never include 1: always include 2: only include when abnormal
Include AVA (VTI) and/or AVA/BSA in findings	find_incl_avavti_non_idx (default 0) find_incl_avavti (default 0)	0: never include 1: always include 2: only include when abnormal
Spell out AVA as Aortic valve area when the above option(s) is in place	find_ava_print_full_text	1 (integer) – spell out
Include WMSI in findings	find_incl_wmsi_stat (default 0)	0: never include 1: always include
Include GLS (Strain) value in findings	find_incl_gls (default 0) Global longitudinal strain is [] %.	0: never include 1: always include
Print an inadequate TR jet statement in both Findings and Conclusions	find_incl_tv_pk_vel	0: never include 1: include if TR Pk Vel < 1.8 m/s
Split Valve structure and function into 2 sentences when either one is abnormal	find_split_structure_function	1 (integer)
Exclude grade scoring from valvular regurgitation statements	find_hide_regurg_grade	1 (integer)
Include full Findings from any section with abnormal dropdown selection, after pulling out:	concl_only_abnormal EXCEPTIONS:	1 (integer)

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Purpose	name	settings
normal generated statements, and statements from find_incl_[xx]. Notes: concl_incl_xx statements are appended. Recommend using this option in conjunction with find_split_structure function.	Always print EF statement if find_incl_ef = 1. Print entire RV Findings if concl_incl_rv = 1. Print entire LA Findings if concl_incl_la = 1.	Note the LV findings do not come through in full when this option is set.
Include LA findings in conclusions	concl_incl_la (default 2) When = 1, ignore concl_only_abnormal	0: never include 1: always include 2: only include when abnormal
Include RV findings in conclusions	concl_incl_rv (default 2) When = 1, ignore concl_only_abnormal	0: never include 1: always include 2: only include when abnormal
Include EF statement noting LVEF value in conclusion	concl_incl_ef (default 1) Statement: Calculated EF [xx]%. concl_incl_rvsp (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting RVSP value in conclusions	concl_incl_rvsp (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting TR Pk Grad value in conclusions	concl_incl_tr_peak_grad (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting Qp/Qs in conclusions	concl_incl_qp_qs (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting MV Reg Vol in conclusions	concl_incl_mv_r_vol (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting MV EROA in conclusions	concl_incl_mv_eroa (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting LVSV/BSA in conclusions	concl_incl_lvsv_idx (default 0)	0: never include 1: always include 2: only include when abnormal
Note: the following 4 are mutually exclusive		
Include a statement noting AVA (VTI) (or its BSA pair, if present) value in conclusions	concl_incl_avavti (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting AVA (VTI) non-indexed value in conclusions	concl_incl_avavti_non_idx (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting AVA (Vmax) non-indexed value in conclusions	concl_incl_avavmax (default 0)	0: never include 1: always include 2: only include when abnormal
Include a statement noting AVA (Planimetry) non-indexed value in conclusions	concl_incl_avaplan (default 0)	0: never include 1: always include 2: only include when abnormal
Spell out AVA as Aortic valve area when one of the above options is in place	concl_ava_print_full_text	1 (integer) spell out
Trigger MV Stenosis	mv_stenosis_trigger_enabled (default 0)	0: disabled 1: enabled
Trigger Valve Regurgitation	valveregurg_trigger_enabled (default 0)	0: disabled 1: enabled
Treat Regurgitation Trace or Mild as 'normal'	<ul style="list-style-type: none"> av_trace_regurg_abnormal mv_trace_regurg_abnormal tv_trace_regurg_abnormal pv_trace_regurg_abnormal 	0 (integer) - treat as normal default (1) abnormal

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Purpose	name	settings
	<ul style="list-style-type: none"> av_mild_regurg_abnormal mv_mild_regurg_abnormal tv_mild_regurg_abnormal pv_mild_regurg_abnormal 	Note: If setting Mild normal, need to also set Trace as normal.
Treat AV Leaflet Calcification Mild as 'normal'	av_leaf_calc_mild_normal	1 (integer)— treat as normal Default is 0
Custom SWM diagram	custom_idiagram_mode (default 0)	0: 6 select options 1: 9 select options (color) 2: 9 select options (black/white) 3: 9 select options, 16 segment, number displayed is legend selection
To control the grouping of conclusions statements	concl_st_paragraph (default = 0)	0: one line per single statement 1: one paragraph per tab
custom Z-Score source	custom_zscore_sources See table (Z-Score Sources) below in this section for details on default and alternate selections.	type is json Example: '{"aod_ann": "aorta", "ivsd": "mmode"}' <u>Options available:</u> aod_ann: { aorta boston_aorta }, aod_sinus: { aorta }, aod_st_junc: { boston_calc }, aod_asc: { boston_calc }, aod_arch_dist: { boston_calc }, aod_isthmus: { boston_calc }, aod_desc: { detroit_petterson }, rv: { mmode }, ivsd: { mmode boston_mmode }, ivsd_2d: { boston_2d }, lvids: { mmode boston_mmode:}, lvids_2d: { boston_calc }, lvidd: { mmode boston_mmode }, lvidd_2d: { boston_calc }, lvpwd: { mmode boston_mmode }, lvpwd_2d: { boston_2d },

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Purpose	name	settings
		<pre>lv_mass: { boston_calc }, la: { mmode }, la_major: { boston_calc_long_axis boston_calc_transverse }, la_minor: { boston_calc_long_axis boston_calc_ant_post }, tv_ann_meas: { boston_calc_4ch boston_calc_2ch }, mv_ann_meas: { boston_calc_4ch boston_calc_2ch }, pv_ann_meas: { boston_calc }, pa_diam: { boston_calc }, rpa_diam: { boston_calc }, lpa_diam: { boston_calc }, ca_lmca: { boston_calc }, ca_lad: { boston_calc }, ca_rca: { boston_calc }, ca_cx: { dallaire_dahdah }</pre>
custom field definitions Note: when specifying units, always specify precision as well	custom_field_definitions	Can be for any individual field, or common { "common": {"precision": 2, "add_trailing_zeros": false} }
Link diagram to Global Wall motion. Drop down list matches diagram legend.	link_diagram_glob_wall	1 (integer)
set custom abnormal threshold for: AV Mean Grad, AVA(VTI), AVA/BSA	<ul style="list-style-type: none"> - av_mn_grad_abnormal_threshold - ava_vti_abnormal_threshold - ava_idx_abnormal_threshold 	any decimal value (type is float)
Special case: print AV Pk Vel, AV Mean Grad, and AVA (VTI) (non-indexed) in findings/conclusions ONLY IF AV Mean Grad value > 20 mmHg	custom_ava_find_statements custom_ava_concl_statements Note: When the Conclusions option is set to 1, any other concl_incl_ava... options are ignored	1 (integer) – print the fields Note: When the Findings option is set to 1, the following options are ignored: find_incl_av_mn_grad, find_incl_avavti_non_idx
To hide normalized reference source data from the worksheet and report	hide_meas_source_tags	Integer: 0 – default – false, do not hide 1 – hide source data

2.1.8.2 EF Statement to generate (when find_incl_ef is present)

2.1.8.3 Z-Score Sources

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Field on Echo Worksheet	Tab	Default source	Other source available
		<u>Regression</u> 2D LV End-diastolic Dimension vs BSA	
LVIDd (Mm)		Boston: <u>Group</u> M-mode LVdimensions <u>Regression</u> MM LV End-diastolic Dimension vs BSA	M-mode Z-Scores (C Kampmann, C Wiethoff, A Wenzel, et. al.)
LV Mass (Mm)		Boston: <u>Group</u> M-mode LVdimensions <u>Regression</u> MM LV Mass (Devereux) vs BSA	None
RVIDd (Mm)	Vents, subtab RV	M-mode Z-Scores (C Kampmann, C Wiethoff, A Wenzel, et. al.)	None
AoD Annulus	Grt Ves, Aorta section	Boston: <u>Group</u> Aorta <u>Regression</u> Aortic annulus diameter vs BSA	Aortic Root Z-Scores (Colan SD, McElhinney DB, Crawford EC, et. al.)
AoD SOV		Aortic Root Z-Scores (Colan SD, McElhinney DB, Crawford EC, et. al.)	None
AoD Asc(Prox)		Boston: <u>Group</u> Aorta <u>Regression</u> Ascending aorta diameter vs BSA	None
Dist AoD Arch		Boston: <u>Group</u> Aorta <u>Regression</u> Distal transverse aortic arch diameter vs BSA	None
AoD Isthmus		Boston: <u>Group</u> Aorta <u>Regression</u> Aortic isthmus diameter vs BSA	None
AoD Desc		Detroit Pettersen: Descending Aorta	None
AoD ST Junc		Boston: <u>Group</u> Aorta <u>Regression</u> Aortic sinotubular junction vs BSA	None
PA Diameter		Boston: <u>Group</u> Pulmonary valve and arteries <u>Regression</u> Main pulmonary artery diameter vs BSA	None
RPA Diameter		Boston: <u>Group</u> Pulmonary valve and arteries <u>Regression</u> Right pulmonary artery diameter vs BSA	None
LPA Diameter		Boston: <u>Group</u> Pulmonary valve and arteries <u>Regression</u> Left pulmonary artery diameter vs BSA	None
LMCA	Cor Art	Boston: <u>Group</u> Coronary artery <u>Regression</u> Left main coronary diameter vs BSA	None
LAD		Boston: <u>Group</u> Coronary artery <u>Regression</u> Proximal left anterior descending diameter vs BSA	None
RCA		Boston: <u>Group</u> Coronary artery <u>Regression</u> Proximal right coronary diameter vs BSA	None

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Field on Echo Worksheet	Tab	Default source	Other source available
CX		Dallaire Dahdah – Circumflex Coronary Artery	None
MV Annulus	AV Valve	Boston: <u>Group</u> Mitral valve <u>Regression</u> Mitral annulus diameter (4 chamber) vs BSA	Boston: <u>Group</u> Mitral valve <u>Regression</u> Mitral annulus diameter (2 chamber) vs BSA
TV Annulus		Boston: <u>Group</u> Tricuspid valve <u>Regression</u> Tricuspid annulus diameter (4 chamber) vs BSA	Boston: <u>Group</u> Tricuspid valve <u>Regression</u> Tricuspid annulus diameter (2 chamber) vs BSA
PV Annulus	SL Valves	Boston: <u>Group</u> Pulmonary valve and arteries <u>Regression</u> Pulmonary annulus diameter vs BSA	None

2.1.9 Report Options

Worksheet shall support report options to allow user customize report.

2.1.9.1 Report Options

Report option variable name	Valid values	Default value	Brief explanation of functionality
column_layout	twocolumn, fullwidth	twocolumn	This option governs the appearance of the findings, conclusions and iDiagrams on report. "twocolumn" separates the information into two columns. "fullwidth" gives the full width of the page to each successive section (e.g. findings, conclusions, etc.)
The following are recognized for 'twocolumn' layout only			
echo_findings_labeling_format	Anatomical	Numeric	If 'Anatomical' is entered, the findings will be output corresponding to each part of the anatomy (e.g. Left Ventricle, Left Atrium, Right Atrium, Right Ventricle, etc.). If no findings are recorded pertaining to a given anatomical section, no findings will be output, nor will the name of that anatomical section be output. If anything other than 'Anatomical' is entered, the findings will be output in a numbered list.
two_col_layout_SWM_above_finding_concl	1	0	Displays the SWM diagram fullwidth above the side-by-side Findings and Conclusions.
two_col_layout_combined_finding_concl_only	1	0	Displays the SWM diagram fullwidth above the side-by-side Findings and Conclusions.
The following are recognized for "fullwidth" layout only			
fullwidth_echo_findings_labeling_format	Numerical	Anatomical	If 'Numerical' is entered, the fullwidth findings will be output in a numbered list. If no findings are recorded pertaining to a given anatomical section, no findings will be output, and the numerals will adjust accordingly. If either set to 'Anatomical' or simply not present, the findings will be output with anatomical labels.
section_header_alignment	'left', 'center', or 'default'	"default"	"left" moves all section headers to the left "center" moves all section headers to the center "default" sets them where they are as implemented per template. (implemented for Echo and Echo Vet only)
diagramImageSizeIncreased	1	0	Enalrges the size of the diagram on the report

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Report option variable name	Valid values	Default value	Brief explanation of functionality
fullwidth_finding_display_label	'String of text'	FINDINGS	This variable governs what is displayed in the label box above the findings list on the report. The string that is entered will be displayed.
The Echo Full-width report is broken into 5 rows (or blocks) R1, R2, R3, R4, R5. The following allow for the order of the rows to be configured differently.			
fullwidth_finding_statement_location	R1, R2, R3, R4, R5	R4	This variable governs the order of appearance of the findings statements when the "fullwidth" option is used. The default is for findings to appear fourth (numbering from top to bottom).
fullwidth_conclusion_statement_location	R1, R2, R3, R4, R5	R5	This variable governs the order of appearance of the conclusions statements when the "fullwidth" option is used. The default is for conclusions to appear fifth (numbering from top to bottom).
fullwidth_measurement_location	R1, R2, R3, R4, R5	R1	This variable governs the order of appearance of the measurements when the "fullwidth" option is used. The default is for measurements to appear first (numbering from top to bottom).
fullwidth_swm_location	R1, R2, R3, R4, R5	R3	This variable governs the order of appearance of the segmental wall motion diagram when the "fullwidth" option is used. The default is for the segmental wall motion diagram to appear third (numbering from top to bottom).
fullwidth_procedure_statement_location	R1, R2, R3, R4, R5	R2	This variable governs the order of appearance of the procedure statement when the "fullwidth" option is used. The default is for the procedure statement to appear second (numbering from top to bottom).
The following are recognized independent of layout (fullwidth or twocolumn)			
display_approval_date_time_in_concl	1, 0	1	If this option is enabled, the approval date and time will be displayed on the report
displayNormals	1, 0	1	If this option is disabled, normal ranges do not display in the Measurements section of the report.
displayEchoMeasurementsHeader	1, 0	0	If this option is enabled, a small box with the word "MEASUREMENTS" will appear above the measurements on the report.
measDisplayLabel	any string value		Allows customizing the text in the Measurements section header (implemented for Echo and Echo Vet only)
remove_nonnormalized_values	1, 0	0	If this option is enabled, only BSA values will be displayed when BSA values are present (i.e. non-BSA values will not be displayed when BSA values are present).
split_meas_tabs	0,1	1	if "0" tabs will not be split (entire tab will be in one column) if "1" measurements will be evenly distributed across the three columns even if it means splitting an individual tab across multiple columns (implemented for Echo and Echo Vet only)

2.1.10 References

Z-Scores	
Aortic Root	Colan SD, McElhinney DB, Crawford EC, Keane JF, Lock JE. J Am Coll Cardiol. 2006 May 2;47(9):1858-65.
M-mode	C Kampmann, C Wiethoff, A Wenzel, G Stolz, M Betancor, C Wippermann, R Huth, P Habermehl, M Knuf, T Emschermann, and H Stopfkuchen Heart. 2000 June; 83(6): 667–672.
Boston	Version 1.2.3, 2015-2017, Boston Children's Hospital

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Advisors	
Valve Regurgitation	ASE Recommendations for Noninvasive Evaluation of Native Valvular Regurgitation, William A. Zoghbi, MD, FASE et al, 2017
LV Diastolic Filling/Dysfunction	Recommendations for the Evaluation of Left Ventricular Diastolic Function by Echocardiography, Sherif F. Nagueh, Chair, MD, FASE, et. al. 2016
LV Shape	ASE COMMITTEE RECOMMENDATIONS Recommendations for Chamber Quantification: Roberto M. Lang, MD, FASE et al. 2005
Aortic Stenosis	Echocardiographic Assessment of Valve Stenosis: EAE/ASE Recommendations for Clinical Practice, Helmut Baumgartner, MD, et al. Jan. 2009
Echo IQ	2020 ACC/AHA guidelines for valvular heart disease, ASE recommendations on chamber quantification (Roberto Lang et al Journal of the American Society of Echocardiography, January 2015 2022 ESC guidelines on the diagnosis and treatment of pulmonary hypertension and the Zoghbi ASE recommendations on the quantitation of valvular regurgitation in determining whether Progressive or Severe Chronic Mitral Regurgitation is indicated. 2016 ASE Guidelines 2022 AHA/ACC/HFSA Heart Failure Guidelines
TAPSE	Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults, Roberto M. Lang, MD, Lange et al 2015

Other content
ASE Chamber Quantification 2015
https://123sonography.com/ebook/pulmonary-acceleration-time-to-estimate-pulmonary-pressure
https://www.asecho.org/wp-content/uploads/2013/05/Chamber-Quantification.pdf
The next 2 are for LV Mid ventricular Pk Grad, obstruction, Apical aneurysm, False tendon
https://www.asecho.org/wp-content/uploads/2021/09/ASE_HCM_Poster_FINAL.pdf
https://www.asecho.org/wp-content/uploads/2022/06/PIIS0894731722001407.pdf
CSI Clinical Specialist

2.1.11 Advisors

NOTE: These Advisors do not apply to the Pediatric Protocol.

2.1.11.1 Aortic Valve Regurgitation (SR-14228)

	AV EROA		AV Reg Vol		AV Reg Fract		
Mild (Grade I)	< 0.1 (but > 0)	AND	<30 (but > 0)	AND	<30% (but > 0)	OR	4 or more of these criteria are met <input type="checkbox"/> VCW <0.3cm (but > 0) <input type="checkbox"/> PHT>500 ms <input type="checkbox"/> Normal LV (Internal Dimension) or blank <input type="checkbox"/> Flow convergence 'None' or 'Very small' <input type="checkbox"/> Jet width in LVOT 'small in central' <input type="checkbox"/> Jet density 'Incomplete/faint'
Moderate (Grade II)	0.10-0.19	AND	30-44	AND	30-39%		
Moderate (Grade III)	0.20-0.29	AND	45-59	AND	40-49%		
Severe (Grade III)	0.20-0.29	AND	45-59	AND	40-49%	AND	3 of these criteria are met <input type="checkbox"/> Flail Valve <input type="checkbox"/> VCW >0.6cm <input type="checkbox"/> Jet width in LVOT 'Large in central' <input type="checkbox"/> Flow convergence 'Large' <input type="checkbox"/> PHT <200 ms

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	AV EROA		AV Reg Vol		AV Reg Fract		
							<input type="checkbox"/> Desc Ao Diast Flow reversal 'Prominent holodiastolic' <input type="checkbox"/> LV (Internal Dimension) Dilated (any severity) AND Global Wall motion Normal (or blank)
Severe (Grade IV)	>=0.3	AND	>=60	AND	>=50%	OR	4 or more of these criteria are met <input type="checkbox"/> Flail Valve <input type="checkbox"/> VCW >0.6cm <input type="checkbox"/> Jet width in LVOT 'Large in central' <input type="checkbox"/> Flow convergence 'Large' <input type="checkbox"/> PHT <200 ms <input type="checkbox"/> Desc Ao Diast Flow reversal 'Prominent holodiastolic' <input type="checkbox"/> LV (Internal Dimension) Dilated (any severity) AND Global Wall motion Normal (or blank)

2.1.11.2 Mitral Valve Regurgitation (SR-14229)

	MV EROA		MV Reg Vol		MV Reg Fract		
Mild (Grade I)	< 0.2 (but > 0)	AND	<30 (but > 0)	AND	<30% (but > 0)	OR	if 4 or more of these criteria are met <input checked="" type="checkbox"/> 'Small central' Color Flow Jet area <input checked="" type="checkbox"/> VCW <=0.3 cm (but > 0) <input checked="" type="checkbox"/> PISA radius absent or <=0.3 cm <input checked="" type="checkbox"/> Normal or blank LV (Internal Dimension) and LA (Cavity Size) <input checked="" type="checkbox"/> Mitral Inflow 'A-wave dominant' <input checked="" type="checkbox"/> CWD jet 'Partial/faint'
Moderate (Grade II)	0.2-0.29	AND	30-44	AND	30-39%		
Moderate (Grade III)	0.30-0.39	AND	45-59	AND	40-49%		
Severe (Grade III)	0.30-0.39	AND	45-59	AND	40-49%	AND	If 3 or more of these criteria are met <input checked="" type="checkbox"/> Flail leaflet <input checked="" type="checkbox"/> VCW >=0.7cm <input checked="" type="checkbox"/> PISA radius >=1.0cm <input checked="" type="checkbox"/> LV (Internal Dimension) Dilated (any severity) AND LV Global Wall motion Normal (or blank). <input checked="" type="checkbox"/> 'Large central' or 'Wall-impinging' Color flow jet area <input checked="" type="checkbox"/> Pulmonary vein 'Systolic flow reversal'
Severe (Grade IV)	>=0.4	AND	>=60	AND	>=50%	OR	4 or more of these criteria are met <input checked="" type="checkbox"/> Flail leaflet <input checked="" type="checkbox"/> VCW >=0.7cm <input checked="" type="checkbox"/> PISA radius >=1.0cm <input checked="" type="checkbox"/> LV (Internal Dimension) Dilated (any severity) AND LV Global Wall motion Normal (or blank). <input checked="" type="checkbox"/> Color flow jet area 'Large central' or 'Wall-impinging' <input checked="" type="checkbox"/> Pulmonary vein 'Systolic flow reversal'

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2.1.11.3 Tricuspid Valve Regurgitation (SR-14230)

	TV EROA		TV Reg Vol		VCW		
Mild	< 0.20 (but > 0)	AND	<30 (but > 0)	AND	<0.3 (but > 0)	OR	5 or more criteria are met <input type="checkbox"/> VCW <0.3 (but > 0) <input type="checkbox"/> 'Small central' color flow jet area <input type="checkbox"/> PISA radius <0.4cm (but >0) <input type="checkbox"/> 'Partial/faint' CWD jet <input type="checkbox"/> 'Systolic dominant' hepatic vein flow <input type="checkbox"/> Tricuspid inflow 'A- wave dominant' <input type="checkbox"/> Normal RV (Cavity Size) or blank <input type="checkbox"/> Norma RA (Cavity Size) or blank
Moderate	0.20- 0.40	AND	30-44	AND	0.3- 0.69		
Severe	>0.40	AND	>=45	AND	>=0.7	OR	5 or more criteria are met <input type="checkbox"/> TV Annululs dilated <input type="checkbox"/> Leaflet Prolapse blank <input type="checkbox"/> 'Large central' Color flow jet area <input type="checkbox"/> VCW >= 0.7cm <input type="checkbox"/> PISA radius >0.9cm <input type="checkbox"/> 'Dense/triangular' CWD jet <input type="checkbox"/> 'Systolic reversal' of hepatic vein flow <input type="checkbox"/> RV (Cavity Size) dilated (any severity) and Normal RV global systolic function (or blank)

2.1.11.4 Pulmonic Valve Regurgitation (SR-14231)

	Reg Fract		
Mild	< 20% (but >0)	OR	3 or more criteria are met <input type="checkbox"/> 'Thin' color flow jet size <input type="checkbox"/> 'Soft' Jet density <input type="checkbox"/> Normal RV (Cavity Size) or blank <input type="checkbox"/> PV Decel time <260 ms
Moderate	20-40%		
Severe	>40%	OR	3 or more of these criteria are met <input type="checkbox"/> 'Broad origin' color flow jet size <input type="checkbox"/> PHT <100 ms <input type="checkbox"/> Jet density: 'Dense; early term' <input type="checkbox"/> 'Prominent' Diastolic flow reversal in PA branches <input type="checkbox"/> RV (Cavity Size) dilated (any severity) with normal RV Global Systolic Function

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2.1.11.5 LV Diastolic Filling/Dysfunction (SR-17343)

	LV EF		E/e' (septal, lateral or avg.)	MV E septal /lateral (cm/s)	TR Pk Vel (m/s)	LA Vol Idx (ml/m2)	MV E/A	MV E Vel (m/s)
Normal	Normal	AND less than half of the available measurements from the following 4 are positive	>14	E sept < 7 OR E lat < 10	> 2.8	> 34	--	--
Indeterminate	Normal	AND exactly half of the available measurements from the following 4 are positive	>14	E sept < 7 OR E lat < 10	> 2.8	> 34	--	--
Grade I	Normal	AND more than half of the available measurements from the following 4 are positive	>14	E sept < 7 OR E lat < 10	> 2.8	> 34	--	--
Indeterminate	Abnormal	When only 1 of three criteria is present	>14	N/A	>2.8	>34	AND <=0.8	AND >0.5
Indeterminate	Abnormal	When only 1 of three criteria is present	>14	N/A	>2.8	>34	>0.8 AND < 2.0	
Indeterminate	Abnormal	Exactly half of available measurements are positive	>14	N/A	>2.8	>34	AND <=0.8	AND >0.5
Indeterminate	Abnormal	Exactly half of available measurements are positive	>14	N/A	>2.8	>34	>0.8 AND < 2.0	
Grade I	Abnormal	When both conditions are present and true	N/A	N/A	N/A	N/A	<=0.8	AND <= 0.5
Grade I	Abnormal	2 or more are negative	>14	N/A	>2.8	>34	AND <=0.8	AND >0.5
Grade I	Abnormal	2 or more are negative	>14	N/A	>2.8	>34	AND >0.8 AND < 2.0	
Grade II	Abnormal	2 or more are positive	>14	N/A	>2.8	>34	AND <=0.8	AND >0.5
Grade II	Abnormal	2 or more are positive	>14	N/A	>2.8	>34	AND >0.8 AND < 2.0	
Grade III	Abnormal	AND	N/A	N/A	N/A	N/A	>=2.0	N/A

2.1.11.6 LV Shape

	LV Mass/BSA (if has value), else LV Mass (Mm)/BSA (g/m2)	LV RWT
Normal	Normal	<=0.42
Concentric Remodeling	Normal	>0.42

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	LV Mass/BSA (if has value), else LV Mass (Mm)/BSA (g/m2)	LV RWT
Eccentric hypertrophy	Increased	<=0.42
Concentric hypertrophy	Increased	>0.42

2.1.11.7 AV Stenosis

	AV Pk Vel (m/s)	AV Mean Grad (mmHg)	AVA (VTI) (cm^2)
Mild	2.6- <3.0	<20	>1.5
Moderate	3.0-4.0	20-40	1.0-1.5
Severe	>4.0	>40	<1.0

2.1.11.8 RV TAPSE (TTE only)

	RV TAPSE (mm)
Normal	>=17 mm
Reduced	<17mm

2.1.11.9 EchoIQ AV Stenosis Findings statement – Severe AS Guidelines

	Severe AS Guidelines
EchoSolv Outcome: The Echocardiographic measurements are consistent with current severe aortic stenosis guidelines. - Abnormal - include in Conclusions	1
EchoSolv Outcome: The Echocardiographic measurements do not meet current severe aortic stenosis guidelines	0
EchoSolv Outcome: Insufficient data provided for determination of severe aortic stenosis guidelines.	null

2.1.11.10 EchoIQ AV Stenosis Findings statement – Severe AS Phenotype

	Severe AS Phenotype
EchoSolv Outcome: Artificial intelligence is suggestive of a high probability of a severe aortic stenosis phenotype. - Abnormal - include in Conclusions	2
EchoSolv Outcome: The artificial intelligence is suggestive of medium probability of the severe aortic stenosis phenotype. - Abnormal - include in Conclusions	1
EchoSolv Outcome: The artificial intelligence is suggestive of low probability of the severe aortic stenosis phenotype	0
EchoSolv Outcome: Insufficient data provided for artificial intelligence to detect the severe aortic stenosis phenotype.	null

2.1.11.11 EchoIQ MV Regurgitation Findings statement – MR Guidelines

	MR Guidelines
EchoSolv Outcome: The echocardiographic measurements provided are consistent with guideline-defined chronic severe mitral regurgitation. - Abnormal - include in Conclusions	severe

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	<u>MR Guidelines</u>
EchoSolv Outcome: The echocardiographic measurements provided are consistent with guideline-defined chronic progressive mitral regurgitation.	progressive
EchoSolv Outcome: The echocardiographic measurements provided do not indicate guideline-defined chronic progressive or severe mitral regurgitation.	not met
EchoSolv Outcome: Insufficient data provided for determination of guideline-defined chronic progressive or severe mitral regurgitation. - Abnormal - include in Conclusions	inconclusive

2.1.11.12 EchoIQ Diastolic Dysfunction Findings statement

	<u>LVEF</u>
EchoSolv Outcome: Based on echocardiographic measurements provided, the 2016 ASE guidelines for diastolic dysfunction indicate that the following patient fulfills the criteria for Grade 3 diastolic dysfunction with abnormal left ventricular ejection fraction and signs of increased left atrial pressure. - Abnormal - include in Conclusions	abnormal-lvef-grade-3
EchoSolv Outcome: Based on echocardiographic measurements provided, the 2016 ASE guidelines for diastolic dysfunction indicate that the following patient fulfills the criteria for Grade 2 diastolic dysfunction with abnormal left ventricular ejection fraction. Additional echocardiographic measurements identify signs of increased left atrial pressure. - Abnormal - include in Conclusions	abnormal-lvef-grade-2
EchoSolv Outcome: Based on echocardiographic measurements provided, the 2016 ASE guidelines for diastolic dysfunction suggest that the following patient meets the criteria for normal left atrial pressure (grade 1 diastolic dysfunction) with impaired left ventricular ejection fraction. - Abnormal - include in Conclusions	abnormal-lvef-grade-1
EchoSolv Outcome: Based on echocardiographic measurements provided, the 2016 ASE guidelines for diastolic dysfunction suggest that the following patient has met the guidelines for diastolic dysfunction with normal left ventricular ejection fraction. - Abnormal - include in Conclusions	normal-lvef
EchoSolv Outcome: Based on echocardiographic measurements provided, there is no evidence of diastolic dysfunction according to the 2016 ASE guidelines for diastolic dysfunction.	not-met
EchoSolv Outcome: Based on echocardiographic measurements provided, the 2016 ASE guidelines for diastolic dysfunction suggest that the following patient meets the criteria for diastolic dysfunction with abnormal left ventricular ejection fraction although the test cannot determine the grade for Diastolic Dysfunction and determine measures for left atrial pressure. - Abnormal - include in Conclusions	abnormal-lvef-inconclusive
EchoSolv Outcome: Based on echocardiographic measurements provided, the 2016 ASE guidelines for diastolic dysfunction suggests that the result is indeterminate for guideline-defined diastolic dysfunction.	normal-lvef-inconclusive
EchoSolv Outcome: Insufficient data provided for determination of guideline-defined diastolic dysfunction, based on only echocardiographic measurements.	inconclusive

2.1.11.13 EchoIQ Heart Failure Findings statement

	<u>Ejection fraction</u>
EchoSolv Outcome: Based on echocardiographic measurements provided, this individual meets criteria for heart failure due to reduced ejection fraction classified according to left ventricular ejection fraction (LVEF). - Abnormal - include in Conclusions	reduced-ejection-fraction

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	<u>Ejection fraction</u>
EchoSolv Outcome: Based on echocardiographic measurements provided, this individual meets criteria for heart failure due to mildly reduced ejection fraction classified according to left ventricular ejection fraction (LVEF). - Abnormal - include in Conclusions	mildly-reduced-ejection-fraction
EchoSolv Outcome: Based on echocardiographic measurements provided, this individual meets criteria for heart failure due to mildly reduced ejection fraction classified according to left ventricular ejection fraction (LVEF) and echocardiographic indicators of increased left ventricular filling pressure. - Abnormal - include in Conclusions	mildly-reduced-ejection-fraction-increased-lvfp
EchoSolv Outcome: Based on echocardiographic measurements provided, this individual meets criteria for heart failure due to preserved ejection fraction classified according to left ventricular ejection fraction (LVEF) and echocardiographic indicators of increased left ventricular filling pressure. - Abnormal - include in Conclusions	preserved-ejection-fraction-increased-lvfp
EchoSolv Outcome: Based on echocardiographic measurements provided, this individual has evidence for normal left ventricular ejection fraction (LVEF) and left ventricular filling pressure.	not-met
EchoSolv Outcome: Insufficient data provided for determination of guideline-defined heart failure, based on only echocardiographic measurements.	inconclusive

3 Change log

Rev	Date	Author	Comments
A	08/22/2012	GAM	Initial Revision
B	04/07/2015	SD, AS, GAM, VB, MM	Modified for NF to resemble existing Echo AFib worksheet plus more
C	05/13/2015	VB	Section 3.1.1, 3.2: combined Diastolic Filling and Diastolic dysfunction, updated LV shape, Size, Location statement example Section 3.1.2: changed label "LVEF" to "EF" Section 6.1.1: added "RV Mass" observation block Section 6.2: updated Thrombus/Mass statements Section 7.1.1, 8.1.1, 9.1.1, 10.1.1: updated Notes in "XV Structure" sections regarding setting Morphology to "" Section 7.2: combined Morphology, Regurgitation and Cusps statements Section 8.2: corrected "dilatation" spelling, updated Morphology, Regurgitation statement Section 9.2, 10.2: updated Morphology, Regurgitation statements Section 12.2: changed "aorta" to "aortic" for the AO Aneurysm Location findings statement Section 13.1.1: added "Pulmonary Artery" observation Section 13.2: changed default statement, changed "Embolism" statement Section 15: added new options for LV_Shape_Loc and RV_ThromLoc, added "ech_pa_pulm_artery", added "lv_dia_disfun" Section 17: added concl_incl_ef worksheet option Section 14.2: changed wording on selection of [poor] to 'right atrial pressure' Added Additional Comments for PV, PA and IVC & Pulm Vein tabs Scope: Now references Base Worksheet Spec Rev. C
D	06/01/2015	GAM	Scope: Now references Base Worksheet Spec Rev. D Added Items 2.45, 2.46 – Protocol support, and Pediatric Protocol Sec 3.1.1 – added Observations for Pediatric protocol Added Sec 3.1.3 – Left Ventricle Z-Scores Sec. 3.2 – added Findings statements for Visceral situs dropdowns; Updated Thrombosis finding statement Sec 3.3 – Calculated values: added info for calculation of LV Z-scores and BSA Sec 3.3, 11.3 – changed the Trigger values for Constrictive Pericarditis and Restrictive cardiomyopathy to use Septal e' value of 7 cm/s in the logic. Added Sec 4.1.3 – Left Atrium Z-Scores Sec 4.2 – updated LA Mass statement (added "in the left atrium" when mass is None)

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Rev	Date	Author	Comments
			Sec 4.3 – Calculated values: added info for calculation of LA Z-scores and BSA Sec 5.2 – updated RA Mass statement (added “in the right atrium” when mass is None) Added Sec 6.1.3 – Right Ventricle Z-Scores Added Sec 6.3 – Calculated values: added info for calculation of RV Z-scores and BSA Sec. 8.1.2, Sec. 8.3 – changed MV Annulus measurement units to cm/s; adjusted the Normal and Acceptable ranges Sec. 9.1.2, Sec. 9.3 – changed TV Annulus measurement units to cm/s Sec 9.3 – changed Normal range for RVSP Sec 10.2 – updated PV Vegetation statement Added Sec 12.1.3 – Aorta Z-Scores Sec 12.3 – Calculated values: added info for calculation of Aorta Z-scores and BSA Added Sec. 15: General Observations – for Sedation used: field. Sec. 16 – added select options for BSAForm, Visceral situs, and YesNo (for Sedation) and which are normal/abnormal. Sec 17 Conclusions: added description, and statement for Sedation Sec 19 – added to References section for Pediatric Echo references
E	07/09/2015	LAS GAM	Sec 7 & 8 - inserted new sections for TEE Protocol Sec 2 - added protocol differences Sec 2.2 - added TEE protocol support for procedure, contrast agent and probe insertion Sec 3 - added, regarding TEE protocol All instances of 'Rhuematic' corrected to 'Rheumatic' Scope: Now references Base Worksheet Spec Rev. E Secs 10.2, 11.2, 12.2, 13.2 – Added the word 'Structurally' to the valve normal statements.
F	09/10/2015	GAM	Scope – updated to Base Worksheet spec Rev. G Sec. 2 added details on sections on tab, added Transesophageal to item 2.46 Sec. 3 Renamed to Protocol statement, as specified in item 2.2 Sec 4.1.2 Added multiple LVEDV/ESV variables Sec. 4.2 updated LV Findings re: default statement, Regional Wall Motion findings, clarified LVIDd statements Sec 7.1.1, Sec 19 – added select: Cavity_RV, to include 'not well visualized' Sec. 7.2 Updated RV Findings: added statement to cavity for 'not well visualized', and added 2 additional comments Sec. 21 Added worksheet options: concl_st_paragraph, concl_incl_avavti_non_idx, concl_incl_avavmax, concl_incl_avaplan Added Sec 22 Report options
G	10/21/2015	GAM	Scope – updated to Base Spec Rev H Sec. 4.1.1 LV Observations – added report_idiagram checkbox Sec 10.1.1 AV Observations - set default selection for Cusps to Trileaflet Sec 10.2 Aortic valve Findings – replaced the word 'tricuspid' with 'trileaflet' in default statement Sec. 19 Select options – In Cusps, replace 'Tricuspid' with 'Trileaflet' Sec 22 Report options – deleted obsolete ptinfoDisplayReadingGrp, updated displayNormals
H	11/19/2015	MM GAM	Sec. 5.2 LV Findings – added statement for new option “Mobile Septum” of Atrial Septal Wall Sec 4.1.2 LV Measurements – added MAPSE(MMode) Sec 13.1.2 PV Measurements – added PV Accel Time Sec. 21 Worksheet options – concl_incl_tr_peak_grad Scope – updated to reference Base Worksheet Rev I
I	12/09/2015	GAM	Scope - updated to Base Spec Rev J Sec 7.1.2, 7.4 – changed TAPSE units from cm to mm, updated Normal/Abnormal for TAPSE
J	08/04/2016	GAM	Restructured the document Added complete reworking of Pediatric Protocol
K	10/26/2016	GAM, RF	Sec. 2.1.2.6 Added MV Reg Pressure Gr measurement field Sec. 2.1.3.32 Added normal ranges for Visual EF Sec. 2.1.8.1 Added worksheet options to include Qp/Qs, MV Reg Vol, and MV EROA in conclusions Z-Scores sections: removed fields for individual BSA formula and values Sec. 2.1.3.5 Added additional default for AS_Wall Sec. 2.1.3.91 Added Rhythm select option Updated the Z-Score tables to the new format for these fields
L	05/18/2017	GAM	Sec. 2.1.2.7 Added AV Observations and Doppler section and VCW measurement Sec. 2.1.2.8 Added MV Observations and Doppler section and VCW measurement Sec. 2.1.2.9 Added TV Observations and Doppler section and 3 regurg measurements Sec. 2.1.2.10 Added PV Observations and Doppler section and 3 measurements Sec. 2.1.2.13 Added PA Observation 'Diastolic flow reversal in PA branches'

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Rev	Date	Author	Comments
			Sec. 2.1.3 Added options for new fields, modified options for AV/MV Regurg Sec. 2.1.4 Dependencies/Calculated values - cleaned up Z-score section, added trigger of new field Mitral Inflow by MV Pk E Vel Sec. 2.1.6.7 Added AV Findings for new fields Sec. 2.1.6.8 Added MV Findings for new fields Sec. 2.1.6.9 Added TV Findings for new fields Sec. 2.1.6.10 Added PV Findings for new fields Sec. 2.1.6.13 Added PA Findings for the new field Added Reference to Sec. 2.1.10 for Valve Regurg Advisors Added Sec. 2.1.11 Advisors
M	08/08/2017	GAM	Sec. 2.1.1.2 - added that Z-Score source may be selected Sec. 2.1.2.24 - removed Z-Score Severity legend from tabless section Sec. 2.1.2.1 - added 2D fields for IVSd and LVPWd Sec. 2.1.2.19 - added Z-Scores for 2D IVSd and LVPWd Sec. 2.1.4.8, 2.1.4.9, 2.1.4.10 - added 2D Z-Scores on the Vents tab, and Boston as a source, also added Z-Score Percentile source for all Z-Scores Sec. 2.1.5.13 - added Z-Score normal range Sec. 2.1.8 - added worksheet option for Z-Score source Sec. 2.1.10 - added Boston Children's Hospital Z-Score reference Added Sec. 2.1.12 - Z-Score sources section
N	10/19/2017	GAM	Sec. 2.1.1.4 Moved contrast agent to TTE/TEE common section Added measurements: Sec. 2.1.2.3 - RA Vol / BSA, Sec. 2.1.2.4 - RVOT VTI, TDI s', Sec. 2.1.2.8 - MV A dur, MVA Planimetry Sec. 2.1.2.12 - SOV height Sec. 2.1.3.21 - Added observation Indeterminate to LV Diastolic Filling/Dysfunction Sec. 2.1.6.1.10 - added LAP to findings statements for LV Diastolic Filling/Dysfunction Sec. 2.1.10 - added Reference for LV Diastolic Filling/Dysfunction Advisor Sec. 2.1.11.5 - added Advisor for LV Diastolic Filling/Dysfunction
O	11/01/2017	GAM	Sec. 2.1.2.1 - added r/o measurement LV RWT. Added that LV Shape Size disabled when LV Shape Normal. Sec. 2.1.3.26 - Added options to LV Shape observation Sec. 2.1.4.4 - removed LV Shape automatic trigger, added LV RWT calculation Sec. 2.1.6.1.5 - added Findings statements for additional LV Shape options Sec. 2.1.10 - added Reference for LV Shape Advisor Sec. 2.1.11.6 - added Advisor for LV Shape
P	12/06/2017	GAM	Sec. 2.1.2.1 - added observation LAP Added item 2.1.3.22 LV_LAP options Sec. 2.1.6.1.10 - removed assumed LAP comment from Diastolic Filling statement, and added statement for separate dropdown LAP Sec. 2.1.8.1 - added worksheet options to include certain dimensions in Findings
Q	12/19/2018	GAM	Sec. 2.1.8.1 - added worksheet options - custom field definitions, and find_incl_wmsi_stat
R	04/23/2019	GAM	Sec. 2.1.1.4 Added that the new echo2 diagram has 16 segments Sec. 2.1.2.1 - added measurement fields for Visual EF and Strain, and row for 16 segment diagram Sec. 2.1.2.2, 2.1.3.36, 2.1.6.2 - removed Microcavitation field; removed corresponding 'Performed' observation option, and Findings statement.. Sec. 2.1.2.10 - added measurement field PV VTI Sec. 2.1.2.24 - added to Contrast agent list, updated the statement Added to Observation lists: 2.1.3.1 'Aortic Sinus' to Aneurysm_Loc 2.1.3.4 'Lipomatous' to AS_Wall (Pediatric list also) 2.1.3.16 'None' to HemoComp (Pediatric already had) 2.1.3.49 renamed Size_plus_Pres to include 'Absent' Sec. 2.1.3.25 - added options for new alternate wall motion diagram Sec. 2.1.3.78 - added that Rhythm selection appears on report Added Sec. 2.1.4.1 - WMSI calculation based on diagram option Sec. 2.1.5.1 - added a normal range for Visual EF measurement to correspond to the normal selections for Visual EF dropdown Sec. 2.1.5.10 - corrected a typo in AoD ST Junc Normal range for WOMEN per ASE Chamber Quantification 2015 Table 14 Sec. 2.1.6.1.8 - modified Visual EF findings to recognize measurement field Sec. 2.1.6.1.11 - clarified SWM Findings Sec. 2.1.6.2.3 - modified Atrial Septal wall findings to include 'lipomatous'

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			<p>Secs. 2.1.6.7.7, 2.1.6.8.8, 2.1.6.9.7, 2.1.6.10.7 - added 'Absent' statement for Vegetation</p> <p>Sec. 2.1.6.11.5 - added statement for Hemodynamic Compromise 'None'</p> <p>Sec. 2.1.6.12.5 - added statement for Sinus of Valsalva aneurysm.</p> <p>Sec. 2.1.8.1 - added option 3 for custom wall motion diagram; added new worksheetoption find_incl_gls</p> <p>Sec. 2.1.11 - added Note that Advisors do not apply to Pediatric protocol</p>
S	09/11/2019	GAM	<p>Sec. 2.1.2.7 - added LVOT measurements: SV and CO</p> <p>Sec. 2.1.3.24 -added Global Wall Motion lists for when it is linked to diagram</p> <p>Sec. 2.1.3.25 -corrected the legend items for diagram 3</p> <p>Sec. 2.1.3.36 - reduced Pericardium list to one list which contains 'Normal' for all protocols</p> <p>Sec. 2.1.5.5 - added abnormal ranges for AV Mn Grad, AVA(VTI), and AVA/BSA. Indicated that these thresholds can be customized with a worksheetoption.</p> <p>Sec. 2.1.6.1.7 – added Global Wall Motion statement for when dropdown is linked to diagram</p> <p>Sec. 2.1.6.1.11 – specified that Regional wall motion statement does not print when linked to dropdown, and dropdown not blank.</p> <p>Sec. 2.1.6.7.2, 2.1.6.8.2, 2.1.6.9.2, 2.1.6.10.2 – added that Valve Morphology and Regurg statements are to print separately if option is set and at least one of the 2 is abnormal.</p> <p>Sec. 2.1.6.11.2 - mention that Normal pericardium combines with first effusion statement for Pediatric protocol only</p> <p>Sec. 2.1.7.1 , 2.1.7.3 - added the way in which concl_only_abnormal affects what goes through to conclusions</p> <p>Sec. 2.1.8.1 - added worksheetoptions: find_incl_ef, link_diagram_glob_wall, find_split_structure_function, concl_only_abnormal, av_mn_grad_abnormal_threshold, ava_vti_abnormal_threshold, ava_idx_abnormal_threshold</p> <p>Added Sec. 2.1.8.2 - LV EF statement generation determined by EF value</p>
T	03/25/2020	GAM	<p>Sec. 2.1.2.7 – added AV Regurg measurements Vel and Pk Grad</p> <p>Sec. 2.1.2.10 – added PV Regurg measurements Vel and Pk Grad</p> <p>Sec. 2.1.2.12 – added Aorta indexed measurements</p> <p>Item 2.1.3.18 IVC Resp Response >50% is now Normal</p> <p>Item 2.1.3.43 Regurg – added that WS options can define Trace and Mild as normal</p> <p>Sec. 2.1.5.10 – added Aorta index field names, updated the normal range for the Aorta Asc indexed MEN</p> <p>Sec. 2.1.6.1.5 – updated normal LV Shape statement</p> <p>Sec. 2.1.8.1 – added WS options for:</p> <ul style="list-style-type: none"> - Setting valve regurg trace normal - Setting valve regurg mild normal - Spelling out AVA when option is set for it to appear in findings/conclusions
U	05/06/2020	GAM	<p>New observations:</p> <p>Sec. 2.1.2.3- Added RA Visualized</p> <p>Sec. 2.1.2.4- Added RV Visualized</p> <p>Sec. 2.1.2.24- Added a second Contrast agent</p> <p>Observation options:</p> <p>Sec. 2.1.3.10- Removed 'Not well visualized' from Cavity_RV</p> <p>Added Sec. 2.1.3.43 – RA_Visual list</p> <p>Added Sec. 2.1.3.47 – RV_Visual list</p> <p>Findings:</p> <p>Added Sec. 2.1.6.3.3– RA Visualized statements</p> <p>Added Sec. 2.1.6.4.3– RV Visualized statements</p> <p>WS options:</p> <p>Sec. 2.1.8.1 – Added: custom_ava_find_statements, custom_ava_concl_statements, av_leaf_calc_mild_normal, concl_ef_remove_visual</p> <p>Sec. 2.1.8.2 – Referenced: concl_ef_remove_visual</p>
V	07/29/2020	GAM	<p>Added calculated fields:</p> <p>Sec. 2.1.4.13 RVSP Sec. 2.1.4.14 AVA(VTI)</p>

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W	10/12/2020	DM, GAM	Sec. 2.1.3.35 – added ‘Dilated’ option to Pulmonary Artery dropdown Sec. 2.1.6.13.2 – added Findings statement for Pulmonary Artery dropdown Sec. 2.1.9.1 – added Report options measDisplayLabel, section_header_alignment, split_meas_tabs
X	12/09/2020	GAM	Sec. 2.1.3 Observation options - added Valvuloplasty option to all 4 valves Morphology - added Annuloplasty options to all 4 valves Annulus – added Normal option to Atrial septal wall Sec. 2.1.2.7 – added measurement fields AV index and AV Accel Time Sec. 2.1.4 Dependencies/Calculated values – consolidated subsections – added numerous entries to the Calculated fields subsection Sec. 2.1.5 Normal values – updated normal range for LV SV, CO - added normal range for LVOT SV, CO, AV Accel Time Sec. 2.1.6.2.3 Added statement for Normal Atrial Septal Wall Sec. 2.1.6.7.2, 2.1.6.8.2, 2.1.6.9.2, 2.1.6.10.2 - Added Morphology Findings statements for Valvuloplasty - Added note that ‘grade’ is hidden if wsoption in place to hide grade Sec. 2.1.6.7.3, 2.1.6.8.3, 2.1.6.9.3, 2.1.6.10.3 Added Annulus Findings statements for Annuloplasty Added Sec. 2.1.6.9.13 – Inadequate TR jet statement, when wsoption in place and value abnormal Sec. 2.1.8.1 Worksheet options - added find_hide_regurg_grade, find_incl_tv_pk_vel Sec. 2.1.9.1 Report options - added diagramImageSizeIncreased
Y	01/13/2021	GAM	Sec. 2.1.2.1 Added hidden field for EF method Sec. 2.1.2.8 Added field MV E/e’ Sec. 2.1.4.3 Added calculations for MV E ratios Added Sec. 2.1.4.4 EF method determination
Z	03/10/2021	GAM	Findings: Sec. 2.1.2.1 – added field 3D EF Sec. 2.1.6.2.3 – spell out ‘atrial septal aneurysm’ instead of just ‘aneurysm’ Sec. 2.1.6.7.1, 2.1.6.7.2, Sec. 2.1.6.8.1, Sec. 2.1.6.8.2, Sec. 2.1.6.9.1, Sec. 2.1.6.9.2, 2.1.6.10.1, Sec. 2.1.6.10.2 – remove ‘noted’ from valve regurgitation statements
AA	06/15/2022	GAM	Sec. 2.1.4.3 - Reversed priority order of inputs to LV Mass calculation. - Added LV Mass (AL) calculation Sec. 2.1.5.3 – Updated RA Volume Index normal range to 2SD Sec. 2.1.5.4 – Expanded RV Area and RVOT normal ranges Sec. 2.1.5.10 – Updated multiple AoD normal ranges to 2SD
AB	07/06/2022	GAM	Sec. 2.1.5.1, 2.1.5.3, 2.1.5.6, 2.1.5.8 – added/adjusted normal ranges Sec. 2.1.10 – added references
AC	09/14/2023	GAM	Sec. 2.1.2.11, 2.1.3.50, 2.1.6.11.3 – offer an alternate list for Pericardial Effusion: Size_plus_None_Trace Sec. 2.1.8.1 – find_incl_la_dimension updated to look at LA Vol Idx Sec. 2.1.10 – added References for AS and Echo IQ Advisors Added Advisor table 2.1.11.7 – AV Stenosis Added Advisor tables 2.1.11.8-2.1.11.10 – Echo IQ findings statements
AD	11/15/2023	GAM	Sec. 2.1.9.1 Report Options – Rearranged into sections by column layout Added new option fullwidth_echo_findings_labeling_format, Added existing two_col options which are actively in use

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AE	02/14/2024	GAM	<p>Sec. 2.1.2.1</p> <ul style="list-style-type: none"> – added Mid vent measurement fields - added additional Function observations <p>Sec. 2.1.2.4</p> <ul style="list-style-type: none"> – added TAPSE observation <p>Sec. 2.1.2.7</p> <ul style="list-style-type: none"> – converted LVOT Pk Grad to 2 fields - added LVOT observations - added TAVR observation <p>Sec. 2.1.2.7, 2.1.2.8, 2.1.2.9, 2.1.2.10</p> <ul style="list-style-type: none"> - added Prolapsing leaflet observations <p>Select lists:</p> <p>Added Sec. 2.1.3.7 – Borderline/Abnormal list</p> <p>Added Sec. 2.1.3.22 – LeafProlapse lists</p> <p>Added Sec. 2.1.3.40 – Absent, Present list</p> <p>Added Sec. 2.1.3.51 – RV TAPSE</p> <p>Added Sec. 2.1.3.65 – Yes</p> <p>Normal/Acceptable values</p> <p>Sec. 2.1.5.1 – added normal for LV Mid Vent Pk Grad Rest and Prov</p> <p>Sec. 2.1.5.5 – added normal for LV Pk Grad Rest and Prov</p> <p>Findings</p> <p>Added Sec. 2.1.6.1.12-15 –statements for new TEE only observations on LV tab</p> <p>Added Sec. 2.1.6.4.8 –TAPSE statement (TTE only)</p> <p>Sec. 2.1.6.7.2 – added TAVR to existing ‘Morphology Cusps and Regurgitation’ statement</p> <p>Added Sec. 2.1.6.7.11-12 – LVOT Obstruction and SAM (TTE only)</p> <p>Sec. 2.1.6.7.4, 2.1.6.8.4, 2.1.6.9.4, 2.1.6.10.4 – added {prolapsing leaflet} to existing prolapse statement</p> <p>Sec. 2.1.8.1 Worksheet options</p> <ul style="list-style-type: none"> – added find_incl_ra_dimension - added verbiage for find_incl_gls - added existing hide_meas_source_tags <p>Sec. 2.1.10 Added References under Other content</p> <p>Advisor:</p> <ul style="list-style-type: none"> – added Sec. 2.1.11.8 – RV TAPSE
AF	06/19/2024	GAM	<p>Sec. 2.1.1.2 – Added Conclusions format for Pediatric Protocol</p> <p>Sec. 2.1.2.1 – LV tab: Added fields for LV Mass (2D)</p> <p>Sec. 2.1.2.17 – Atria tab: Added Z-Scores for LAs (A4C), (A2C)</p> <p>Sec. 2.1.2.18 – AV Valve tab: Added MV Annulus, and Z-Score section</p> <p>Sec. 2.1.2.19 – Vents tab:</p> <ul style="list-style-type: none"> - added IVS Shape - noted modified list for Septal Wall Motion - added LVIDd, LVIDs 2D Z-Scores <p>Sec. 2.1.2.20 – SL Valves tab: Added AV Annulus, PV Annulus, and Z-Score section</p> <p>Sec. 2.1.2.21 – Grt Ves tab: Added measurement fields and Z-Scores</p> <p>Sec. 2.1.2.23 – Cor Art tab: Added Z-Scores section</p> <p>Lists</p> <ul style="list-style-type: none"> - Sec. 2.1.3.28 – Septal Wall Motion: Added items for Pediatric - Added 2.1.3.84 – IVS Shape <p>Sec. 2.1.4.3 – separated calculation for the 2 LV Mass fields</p>

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			<p>Sec. 2.1.4.5 – added 2D Z-Scores</p> <p>Sec. 2.1.5.1 – added normal for LV Mass 2D fields</p> <p>Findings</p> <ul style="list-style-type: none"> - Sec. 2.1.6.1.8 – made note that find_incl_ef replaces Visual EF statement - Sec. 2.1.6.7.5, 2.1.6.8.5, 2.1.6.9.5, 2.1.6.10.5 – removed the word 'valve' from valve stenosis statements - Sec. 2.1.6.19.1 – added statements for the additional Pediatric Septal Wall Motion options - Added Sec. 2.1.6.19.2 – IVS Shape statements <p>Sec. 2.1.8.1 Worksheet options:</p> <ul style="list-style-type: none"> - added option 2 to find_incl_ra_dimension - added exception for concl_incl_rv to conc_only_abnormal - added statement for conc_incl_ef - added note and new options to custom_zscore_sources <p>New Sec. 2.1.8.3 Z-Score Sources – moved from section 2.1.12 and made to include new Z-Scores</p> <p>Sec. 2.1.11.6 – updated LV Shape Advisor to look at LV Mass ldx as first priority</p>
AG	10/09/2024	GAM	<p>Sec 2.1.2.19 – added LV Mass(Mm) Z-Score fields</p> <p>Sec 2.1.2.21 – added Grt Ves AoD ST Junc and AoD Desc Z-Score fields</p> <p>Sec 2.1.2.23 – added Cor Art Cx Z-Score fields</p> <p>Sec. 2.1.4.5 – added data for the 4 new Z-Scores</p> <p>Sec. 2.1.5.1 – updated LV Mass normal to be same as LV Mass (Mm)</p> <p>Conclusions:</p> <ul style="list-style-type: none"> - Added Sec. 2.1.7.3 –LA Findings - Added Sec. 2.1.7.5 – Worksheetoptions statements <p>Sec. 2.1.8.1 Worksheet options:</p> <ul style="list-style-type: none"> - added new Z-scores to option custom_zscore_sources - added new options find_incl_mv_ea_ratio, find_incl_mv_ee, find_incl_lvsv_idx, concl_incl_la, concl_incl_lvsv_idx - clarified option concl_only_abnormal <p>Sec. 2.1.8.3 Z-Score Sources - added new Z-scores</p> <p>Sec. 2.1.10 – added references to the Advisors section</p> <p>Added Echo IQ Advisor criteria tables-</p> <p>Sec. 2.1.11.12 – Diastolic Dysfunction</p> <p>Sec. 2.1.11.13 – Heart Failure</p>
AH	11/21/2024	GAM	<p>Removed Inc from CoreSound Imaging in header and footer</p> <p>Sec 2.1.2.21 – added AoD Isthmus and Z-Score to Pediatric</p> <p>Sec. 2.1.8.1 Worksheet options:</p> <ul style="list-style-type: none"> - added aod_isthmus Z-score to option custom_zscore_sources <p>Sec. 2.1.8.3 Z-Score Sources - added AoD Isthmus Z-score</p> <p>Sec. 2.1.5.6 Update the normals for MV E/e' incl. septal and lateral</p>
AI	12/31/2024	GAM	<p>Sec. 2.1.2.5, 2.1.2.6 assigned proper list names to LAA and IS fields</p> <p>Sec. 2.1.3.4 renamed the section, added list for IS Septal Wall</p> <p>Sec. 2.1.3.52 added Severity list for LA Appendage and Interatrial Septum</p> <p>Sec. 2.1.3.54 added Size list for LAA Thrombus/Mass</p> <p>Sec. 2.1.3.58 added LAA Thrombus and Mass Mobility to list of fields</p> <p>Added Sec. 2.1.3.87 Lobes list</p> <p>Sec. 2.1.6.2.4, 5 corrected wording in LA Thrombus/Mass statements</p> <p>Sec. 2.1.6.3.3,4 modified RA visualized and Thrombus statements to match worksheet</p> <p>Sec. 2.1.6.4.2,3,5 clarified RV visualized and Concentric hypertrophy statements to match worksheet</p> <p>Sec. 2.1.6.5.3,4,5 clarified LAA statements generation</p>