Fetal Cardiac Handbook

Everylittleheartmatters.org

Simon Meagher
dr.meagher@gmail.com

Introduction

This 20-page handbook has been designed as a practical guide for obstetricians, gynecologists, maternal–fetal medicine subspecialists and trainees, radiologists, sonographers, and midwives who are learning to image the fetal heart at all stages of pregnancy. Screening for and diagnosing cardiac abnormalities in utero presents considerable challenges, often requiring many years of training before one can reliably recognise the most effective approaches to detection and management. Although numerous resources exist in textbooks and online modules, these are often extensive and, while comprehensive, can be overwhelming for those at the beginning of their learning journey. This creates a gap between the needs of trainees and the vast technical resources available.

This handbook aims to bridge that gap by providing a simplified, systematic framework for fetal cardiac screening and diagnosis. It aligns with ISUOG's Global Initiative Every Little Heart Matters (ELHM), launched in 2025, which seeks to improve the prenatal detection of congenital heart defects worldwide. By distilling the complexity of the fetal heart into a clear, step-by-step approach, ELHM aspires to empower every probe handler to recognise when a heart appears abnormal and ensure timely referral.

Through diagrams, high-quality ultrasound images, and concise explanatory text, the handbook highlights the key normal anatomical landmarks encountered in a systematic cardiac examination. It begins with guidance on preparing and optimally configuring the ultrasound machine before scanning, then moves through a section-by-section analysis of the fetal heart based on ISUOG guidelines. Each of the five standard ISUOG screening views is described in detail, along with the anomalies that may be detected within them. The content is presented in an accessible style, supported by tables and illustrations designed to simplify complex concepts, and concludes with a curated collection of ultrasound images illustrating both common and rare cardiac abnormalities.

Acknowledgements

The author gratefully acknowledges Professor Reem S. Abu-Rustum, President of the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG), for her expert review of this handbook. Her careful evaluation, insightful editorial suggestions, and meticulous attention to detail have significantly strengthened the accuracy, clarity, and overall quality of the text.

Professor Simon Meagher

Consultant Obstetrician, Gynecologist, Sonologist
Director, Monash Ultrasound for Women
Consultant Obstetrician, Mercy Hospital for Women, Melbourne, Australia
Trustee, International Society of Ultrasound in Obstetrics and Gynecology

Abbreviations:

- **AA** — Aortic Arch
- **ADV** — Absent Ductus Venosus
- **Ao** — Aorta
- **AoA** — Aortic Atresia
- **ARSA** — Aberrant Right Subclavian Artery
- **ARLA** — Aberrant Left Subclavian Artery
- **AS** — Aortic Stenosis
- **ASD** — Atrial Septal Defect
- **AVSD** — Atrio-Ventricular Septal Defect
- **APVS** — Absent Pulmonary Valve Syndrome
- **CAS** — Critical Aortic Stenosis
- **cCTGA** — Congenital Corrected Transposition of the Great Arteries
- **CTR** — Cardio-Thoracic Ratio
- **DA** — Ductus Arteriosus
- **DAA** — Double Aortic Arch
- **DAo** — Descending Aorta
- **DILV** — Double Inlet Left Ventricle
- **FGR** — Fetal Growth Restriction
- **FO** — Foramen Ovale
- **FOA** — Foramen Ovale Aneurysm
- **HLHS** — Hypoplastic Left Heart Syndrome
- **IAA** — Interrupted Aortic Arch
- **IEF** — intracardiac Echogenic Focus
- **IVS** — Interventricular Septum
- **Int-IVC + Az-Cont** — interrupted IVC with azygous Continuation
- **LA** — Left Atrium
- **LAI** — Left Atrial Isomerism
- **LBCV** — Left Brachiocephalic Vein
- **LCC** — Left Common Carotid
- **LSA** — Left Subclavian Artery
- **LV** — Left Ventricle
- **MA with VSD** — Mitral Atresia with Ventricular Septal Defect
- **PA with IVS** — Pulmonary Atresia with Intact Ventricular Septum
- **PLSVC** — Persistent Left Superior Vena Cava
- **PRUV** — Persistent Right Umbilical Vein
- **PV** — Pulmonary Valves
- **RA** — Right Atrium
- **RAI** — Right Atrial Isomerism
- **RAA & RAD** — Right Aortic Arch & Right Arterial Duct
- **RAD** — Right Arterial Duct
- **RV** — Right Ventricle
- **TAPVR** — Total Anomalous Pulmonary Venus Return
- **T1** — First Trimester
- **T2** — Second Trimester
- **T3** — Third Trimester
- **TAo** — Transverse Aortic Arch
- **TGA** — Transposition of the Great Arteries
- **TOF** — Tetralogy of Fallot
- **TR & MR** — Tricuspid /Mitral Regurgitation
- **SCT** — Sacrococcygeal Teratoma
- **TTTS** — Twin-Twin transfusion syndrome
- **TV Dysplasia** — Tricuspid Valve Dysplasia
- **UV** — Umbilical Vein
- **VOG** — Vein of Galen
- **VS** — Vessel

Machines Settings

Setup

- Highest frequency transducer possible
- Harmonics on (especially with high BMI)
- Compound resolution (all angles acquired → 1 image)
- Speckle reduction (smoothing effect)
- Narrow sector width (this increases frame rate aim >25Hz)
- Magnification
- Increase dynamic range (contrast)
- Low persistence and single focal zone
- CINE loop review
- Transvaginal examination (up to 14 weeks)

Colour Doppler Settings

- Optimize grey scale first
- Colour Doppler second trimester
- Power Doppler first trimester
- PRF – (T1) **25-35 cm/sec** and (T2) **55-65 cm/sec**

  (T3) **65-75cms/sec**
- Lower PRF for pulmonary & systemic veins (DV) and neck vessels, e.g., RT subclavian artery
- Smallest Colour Doppler box possible
- Set Balance and colour gain correctly
- To obtain good colour 'fill' of any chamber

  or vessel follow this setup order :

  1) **Always** set PRF first, then

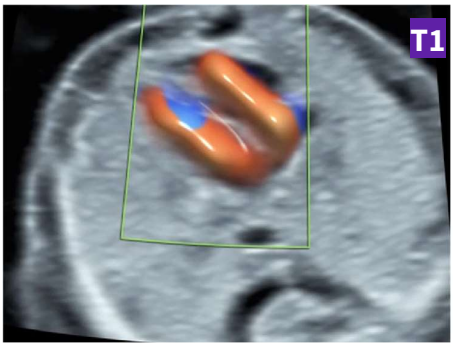
  2) Power output (increase/reduce)

  3) Colour gain and balance (increase/reduce) Adjust wall motion filter (low in T1, mid in T2)

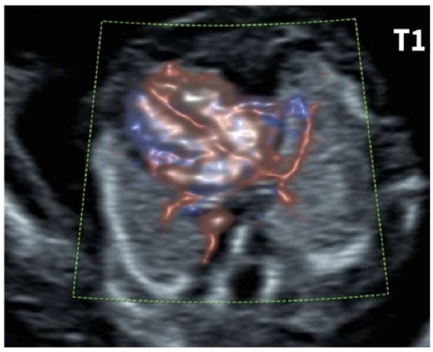
2D

Colour Doppler

Power Doppler



Slow*flow*

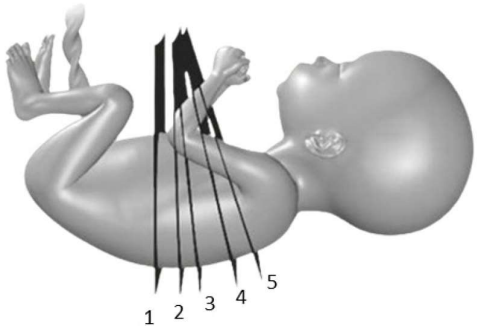


How to Image the Heart

Image Technique

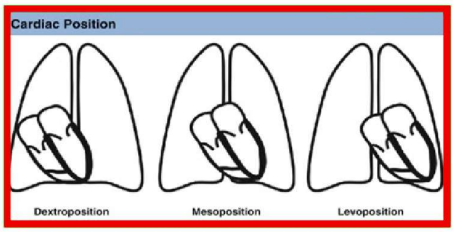
- Commence at the abdominal circumference plane
- Slide up cephalad to a transverse section through fetal thorax
- Aim to have the spine in a posterior position (~6 o'clock)
- Obtain only one complete rib on each side to get the 'perfect' transverse section
- NB: **Avoid** oblique section through thorax (i.e. multiple ribs in view on either side)
- Ideally cardiac apex at ~11 o'clock (when cephalic) or at ~2 o'clock (when breech) – especially for Colour Doppler assessment of IVS
- Narrow sector width
- Reduce depth
- Magnify the image so it occupies most of the screen using high definition zoom if possible

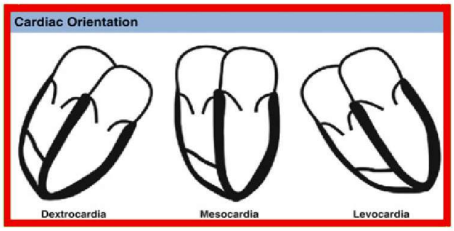
Cardiac sections 1 – 5
ISUOG Cardiac Guidelines 2023



General (SARRS: Size. Axis. Rate. Rhythm. Situs.)

- Start by establishing fetal situs . Confirm stomach on left side
- Save/store a split image showing stomach and heart on the same side
- Heart occupies 1/3-1/2 of thorax. Usually can fit 3 hearts in the chest
- 2/3 of the heart in the LT hemithorax and 1/3 in the RT hemithorax
- Cardiac axis should be 45 ±20˚.
- A vertical line from the fetal spine to the anterior chest wall should roughly pass through the tricuspid valve
- Change in position is usually due to a problem extrinsic to the heart
- Change in Axis is usually due to a cardiac abnormality
- Rate 120 – 160 bpm and rhythm should be regular
- CTR<60%
- Occasional ectopic beats are a normal variant and seen most commonly at the mid trimester

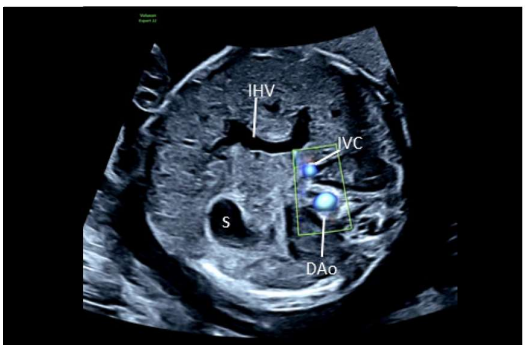




Observe the following in order:
1) Stomach 2) IHV 3) Gallbladder

Section 1: Abdomen

- Check stomach in normal position on LT side
- Note intra-hepatic vein sweeps away from stomach to the right i.e. 'J-Hook' configuration
- Gallbladder to the right of the umbilical vein and lies slightly inferiorly
- Descending aorta to the left of the spine
- IVC anterior and to the right of the spine



NB. Gallbladder not in view as it lies slightly inferiorly

4-Chamber View

Section 2

Left Ventricle (LV)

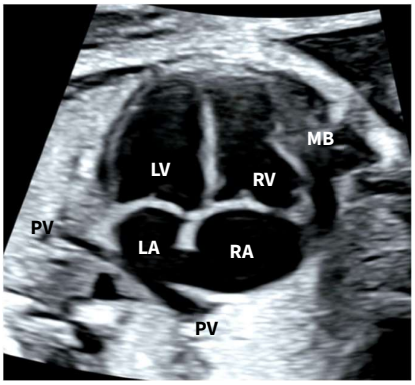
- LV is posterior
- Forms the apex
- LV smooth septum
- Longer than RV

Mitral Valve

- Two valve leaflets, best visualised on short axis view
- Leaflets have no attachment to the IVS NB Mitral valve leaflet
- NB Mitral valve leaflet closer to base of heart

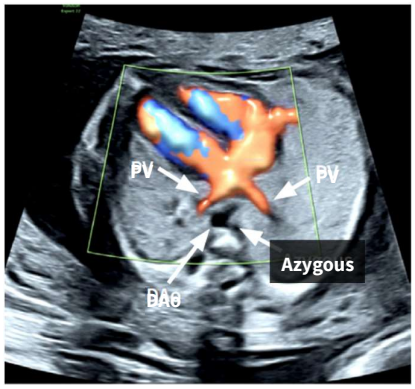
Left Atrium

- Central chamber in the chest
- Most posterior cardiac chamber
- Closest to the aorta and spine
- Identify pulmonary veins (while there are four PV's, generally only the two seen at a time on 2D)
- At 4CV, it is the 2 inferior PV seen
- Foramen ovale should bulge into LA (i.e. Right → Left shunt)



Interventricular Septum

- Separate RV and LV
- Wide at apex and thin at AV valves. Proximal portion adjacent to AV valve is membranous
- The IVS is 1/3 membranous and 2/3 muscular
- Muscular and inlet VSD's can be seen on 4-chamber view: Best assessed with apex at 2, 5, 7, 11 o'clock, i.e., 30° to the beam on 4-chamber view



Area Behind the Heart

- Lower PRF 10-15 cm/sec to see PV's. If you see at least one PV entering LA, this excludes TAPVR
- To confirm it is the PV use pulse-wave Doppler
- Azygous lies to RT of DAo and is smaller and frequently not visible (1/3 size of DAo)
- Oesophagus lies anterior to DAo

Right Ventricle (RV)

- RV is anterior
- Lies behind the sternum
- Triangular
- Trabeculated
- Irregular cavity
- Moderator band is a distinguishing feature from LV

Tricuspid Valve

- Three valve leaflets, but cannot count on 4-chamber view (but can count leaflets on short axis view). Septal valve attached to IVS.
- NB septal leaflet of the tricuspid valve inserts more apically, i.e., 'offset'

Right Atrium

- Receives the SVC and IVC. May see eustachian valve
- Foramen ovale (size highly variable and thus diagnosis of Secundum ASD is very challenging!
- Right atrial appendage is pyramidal in shape with a broad base

4-Chamber View – Anomalies

Defects seen on 4-Chamber view

- Hypoplastic Left Heart Syndrome (MA+AoA)
- Hypoplastic Right Heart Syndrome (PA &IVS)

Small Left Ventricle:

- Coarctation / Interruption
- Mitral atresia with VSD
- Critical aortic stenosis (LV maybe also be dilated)
- TAPVR
- FOA
- Epstein's Anomaly

Small Right Ventricle:

- PA with IVS
- Tricuspid atresia with VSD
- Critical pulmonary stenosis

Atrioventricular Septum/AV Valves:

- Ventricular Septal Defect (VSD)
- Atrial Septal Defect (ASD)
- AVSD
- Ebstein's Anomaly
- Tricuspid / Mitral valve dysplasia
- Tricuspid / Mitral atresia

Others

- Right Aortic Arch (DAo to RT of spine)
- Dilated Coronary Sinus - commonly secondary to PLSVC or rarely TAPVR
- Absent Ductus Venosus
- Systemic Venous drainage directly to right atrium
- 2 vessels -same size – Int-IVC + Az-Cont
- Cardiomegaly / Cardiomyopathy: most commonly CMV and Parvovirus

Rare Anomalies:

- TAPVR (RV>LV)
- APVS with intact interventricular septum (Dilated RV)
- Ectopia Cordis
- Restrictive FO
- Cardiac tumours, e.g., Rhabdomyomas
- Ventricular Aneurysm - LT sided more common
- Ventriculo-coronary arterial circulation

Cardiac Anomalies with a Normal 4-Chamber View

- Tetralogy of Fallot
- Common arterial trunk
- Transposition of great vessels
- Aortic coarctation / interruption
- Aortic stenosis (when not critical)
- Pulmonary stenosis

4-Chamber Soft Signs/ Minor Anomalies

- Intracardiac echogenic focus
- Cardiac axis deviation
- Mesocardia
- Pericardial effusion
- Dilated coronary sinus
- Discordant ventricles: especially third trimester T3, i.e., **LV<RV** (check for coarctation and TAPVR)
- Discordant great arteries: especially third trimester, i.e., most often **MPA>Ao** (need to exclude pulmonary stenosis)

LVOT/5-Chamber View

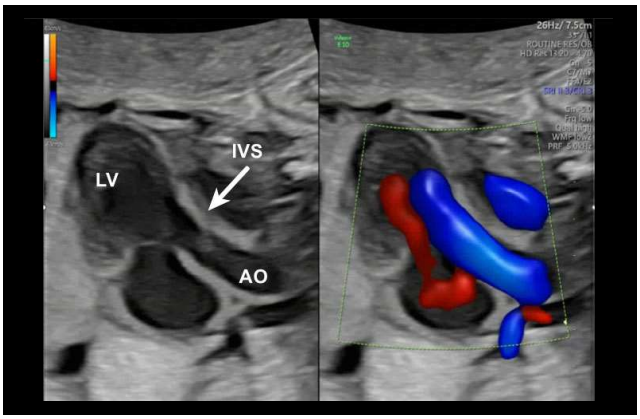
Section 3

Imaging

- From 4-chamber, rotate probe until aortic outflow tract (5th chamber) comes into view
- Anterior wall of Ao should be continuous with the IVS
- Check calibre of aorta (calculate Z-score of Ao valve annulus if it subjectively looks abnormal)
- Check central location of the Ao valve leaflets when closed
- Check aortic valve leaflets disappear completely when valves open during ventricular systole
- Check aorta and MPA are not parallel, i.e. MPA crosses the Ao during caudal to cephalic sweep
- To confirm the identity of the outflow tracts make sure that the PA exiting from the anterior morphologic RV bifurcates
- Exclude straight course of ascending Aorta, i.e., anterior Ao wall parallel with the IVS e.g. TOF IAA
- Check for laminar flow across the Ao Valve on colour Doppler

Observe the following:

1) Continuity of the anterior wall of the Ao with IVS. 2) Normal Aortic valve. 3) check calibre of ascending aorta. 4) check curvature of Aorta 5) check Laminar flow



LVOT. Note Mitral valve and superior pulmonary veins also come into view in this section

Abnormalities Seen in the LVOT (5-Chamber View):

Tetralogy of Fallot Double outright right ventricle Common arterial Trunk	»	Dilated Aorta. High volume flow (sometimes seen on B-Mode) Dextroposition of the Ao
Coarctation Aortic interruption	»	Narrow Ao. Ao valve eccentric (bicuspid)
Aortic Stenosis	»	Dilated Ao. Turbulent flow on colour doppler
Perimembraneous VSD (anterior malaligned) Perimembraneous VSD (posterior malaligned)	»	1. Dropout 2. Edge enhancement 3. Wash of color across the defect
Transposition of the great arteries	»	Vessel arising from the LV (MPA) Bifurcates and may be dilated

RVOT (3-Vessel View)

Section 4

Imaging

From 4-chamber, 'Fan' the probe cephalad and three possible views are seen to arise:

1. (MPA + RPA) + Ao & SVC
2. (MPA + RPA + LPA) + Ao & SVC
3. (MPA + Duct) + Ao & SVC

In this section must demonstrate:

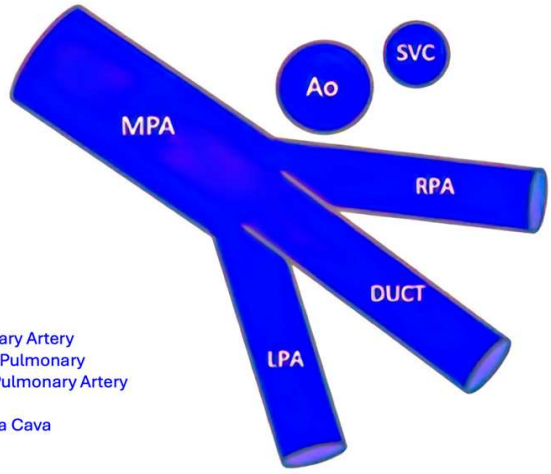
MPA > Ao > SVC

At this level, MPA is larger than the Ao which is larger than the SVC. The caliber of these vessels and flow pattern disturbance, including increased peak systolic velocities (PSV's) are key clues to outflow tract anomaly detection. Ensure PV disappears completely when valve opens during ventricular systole. Check for Laminar flow across the pulmonary valve. At this level the RPA should always be smaller than the Ao.

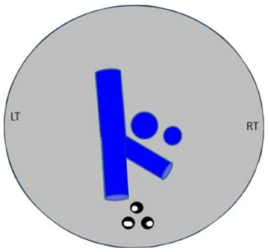
MPA crosses Ao and is anterior and superior to the Ao (NB. Reversed in TGA) and MPA must be followed to ensure it bifurcates.

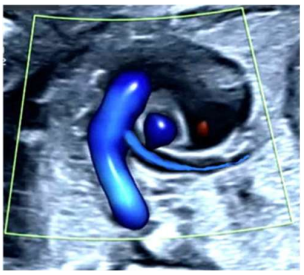
Branches of main pulmonary artery

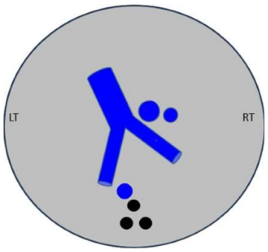
NB: When obtaining the RVOT keep the RV wall in view → facilitates visualisation of the PV

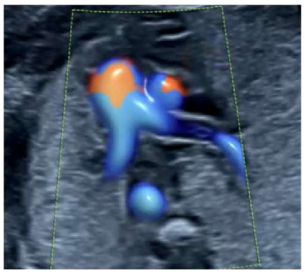


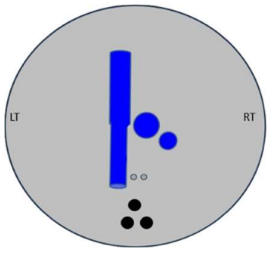
MPA - Main Pulmonary Artery
RPA - Right Branch Pulmonary
LPA - Left Branch Pulmonary Artery
Ao - Aorta
SVC - Superior Vena Cava

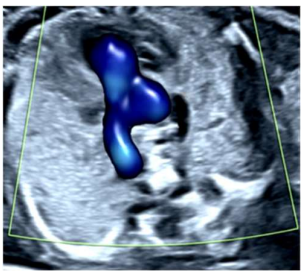












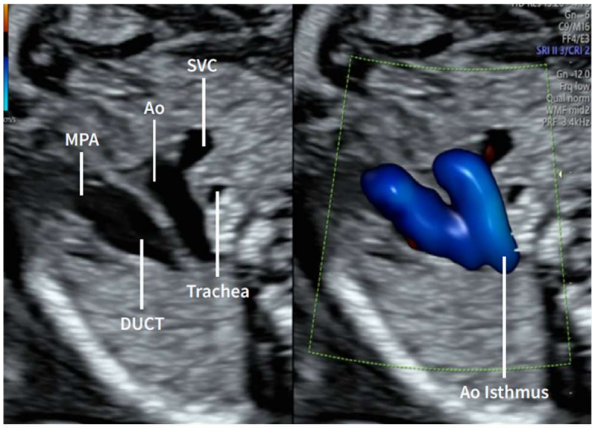
Three Vessel & Tracheal View (3VST)

Section 5

Imaging

- Sweep from the 3VV cephalad to get the3VST view. Duct is just slightly larger than the Ao which is larger than the SVC
- Duct and Ao should be to the left of the trachea and SVC to the RT. Other vessels and structures seen in this view, or slightly more cephalad, include:
  - Left brachiocephalic vein (LT → RT flow), Internal thoracic (or internal mammary) vessels, subclavian vessels, azygous vein (PRF 10-25 cms/sec) and thymus gland
- Reversal of flow in either of the great arteries appreciated in this section
- Aorta is continuous with the duct. If there is loss of continuity then suspect Aortic interruption

NOTE: The vessel closest to the trachea is almost always the aorta



Abnormalities seen on 3VST view:

In cases of suspected vessel discordance, Z-scores assist in determining whether a vessel is diminutive or prominent relative to gestational age.

Narrow/Absent TAo
HLHS
Coarctation
Aortic Interruption
Mitral Stenosis with VSD
Critical AS

Reversal of Flow Along Aorta
Hypoplastic Left Heart Syndrome
Critical Aortic Stenosis
Hypoplastic Left Heart, e.g., Severe Coarctation

Other Causes
Polyvalvular Dysplasia, etc.
Fetal Breathing (intermittent)

Dilated TAo
Aortic Stenosis with Post Stenotic Dilatation
TOF
DORV (Sub-Aortic VSD)

Narrow or Absent Duct
Pulmonary Atresia with IVS
Critical Pulmonary Stenosis
Absent Pulmonary Valve Syndrome
Tetralogy of Fallot
Ebstein Anomaly
Tricuspid Valve Dysplasia
Double Outlet Right Ventricle
Tricuspid Atresia with VSD
TTTS
FGR

Reversal of Flow in the Duct
Pulmonary Atresia with Conotruncal anomalies Ebstein Anomaly
Tricuspid Valve Dysplasia
Polyvalvular Dysplasia

Dilated Duct
Pulmonary stenosis + Post Stenotic Dilatation
Ductal Aneurysm
Tortuous Duct – Normal Variant in T3

Single Vessel (Not Dilated)
TGA
TOF with PA .DORV
IAA

Single Vessel (Dilated)
CAT

Rearrangement Anomalies
RAA / DAA
RAD with RAA
Absent RT SVC + PLSVC (3 Vessel)
'Y' Configuration (Tetralogy of Fallot)

4 Vessels
Persistent LT SVC / Bilateral SVC
Ascending Vein in Supra-Cardiac
TAPVR

Dilated SVC and or Dilated LBCV
Vein of Galen Aneurysm
Severe FGR
Supra-Cardiac TAPVR

Absent/Abnormal Course LBCV
Absent LBCV (Frequently Seen in PLSVC)
Intra-Thymic Left Brachiocephalic Vein

Aortic and Ductal Arches

(Targeted Fetal Echocardiogram)

Section 6 – Sagittal Imaging

Imaging Aortic Arch

Technique No. 1

- Ideally with spine posterior
- Go to AC bring one full rib into view on both sides Rotate on the descending aorta. Angle probe so descending aorta angulated, i.e., at 45°

Technique No. 2

- Go to 3VST view and rotate the probe 90°, keeping the aortic isthmus in view
- Left parasagittal AA is seen as a candy cane shaped
- Arises from the centre of the chest
- AA gives three branches: Innominate, LCC and LSA
- 15% of cases Bovine Arch (Innominate and LCC have a common origin). So, normal arch branching 74 – 89%
- Above Desc Ao lies LA and RPA side by side and RA more anteriorly
- Aortic isthmus lies between left common carotid and the ductus arteriosus

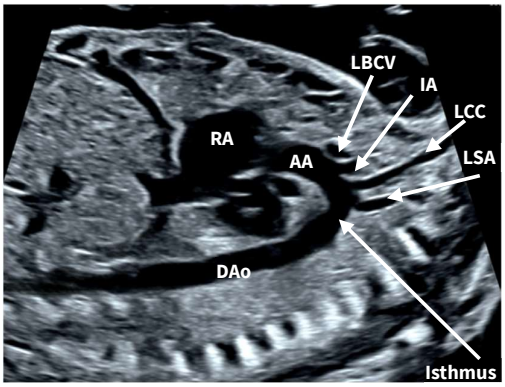
Importance of Aortic Arch View:

- Coarctation/Interruption
- TGA (anterior arch gives off neck vessels)
- Reversal of flow in the Duct (PA with IVS and Co-truncal anomalies)
- Identification of collaterals (Pulmonary atresia)

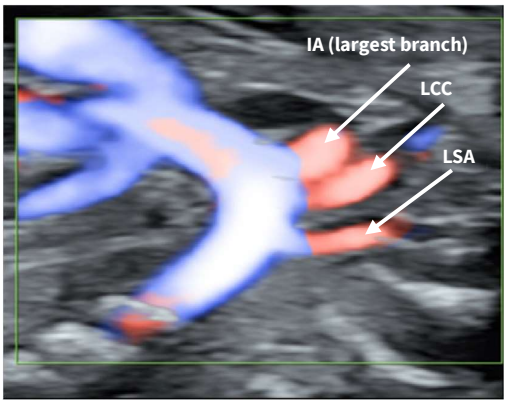
Imaging of the Ductal Arch

- Located to the left of AA
- Exits from the anterior chamber behind the sternum
- Sagittal imaging shows point of Y-configuration of ductus arteriosus joining the aortic arch
- Parasagittal imaging shows RA RV TV MPA wrapping around transverse aortic valve
- DA higher velocities than Ao and thus aliasing in this vessel may represent a normal variant

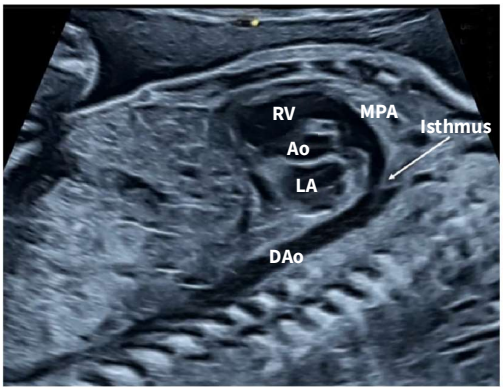
Aorta characteristics:
1) Circular 2) Central superior & 3) Branches



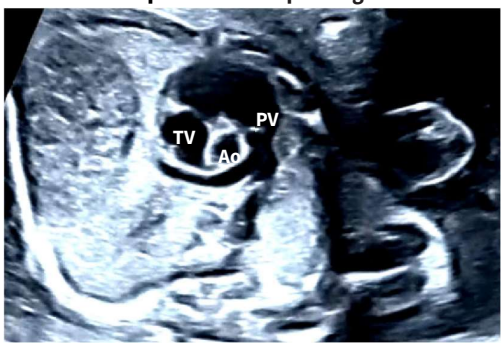
Colour Doppler aortic arch



Sagittal ductal arch



Outlet septum view → parasagittal arch



IVC, SVC & Ductus Venosus

(Targeted Fetal Echocardiogram /Detailed Scan)

Section 7 – Sagittal Imaging

Imaging the SVC and IVC

- Obtain a 4-chamber heart
- Identify right atrium
- Rotate 90 degrees to bring IVC and SVC into view
- Referred to as 'Bull's Horns' view / or 'seagull view'

On sagittal image, note IVC 'dives' anteriorly though the liver to join DV and LHV whereas aorta continues strictly posteriorly along spine superiorly to enter the thorax.

Aorta and IVC lie side by side in the pelvis but IVC lies anterior and to the RT of the Ao in the upper abdomen.

If there are 2 side by side vessels, then it is most likely interrupted IVC with azygous continuation

IVC DV and LHV join below the diaphragm to form the subdiaphragmatic vestibulum which then crosses the diaphragm and enters the right atrium.

Eustachian valve may be seen in this plane (EV).

Imaging DV

Either axial or parasagittal plane.
Axial: go to AC and angle the probe slightly cephalad.

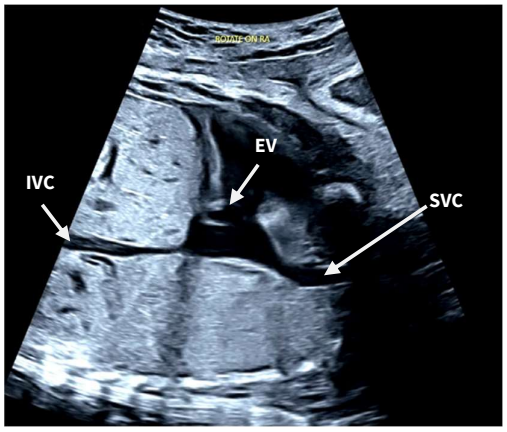
Sagittal imaging of the DV is more reliable (because it avoids accidental sampling of the hepatic veins [i.e., reverse A-wave; false positive], and also avoids accidental sampling of the IHV [gate too wide], which may mask reduced/absent/reversed DV 'A-wave' – false negative).

In the first trimester, sagittal imaging of the DV is always preferable. Place the sample gate over the point of aliasing.

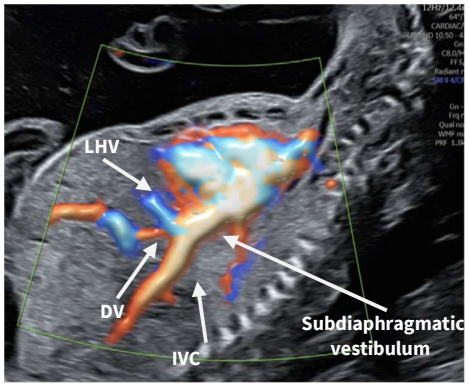
On the spectral Doppler trace, take note of the proximity of the 'A-wave' to the baseline.

For the first trimester, in identifying the DV, use Power Doppler and Slow-flow Doppler in preference to Colour Doppler.

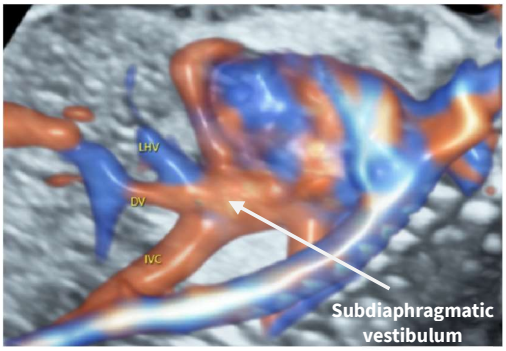
Sagittal SVC & IVC 'Bull's Horns' View Eustachian Valve



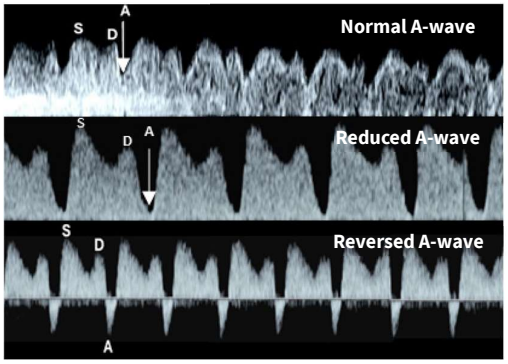
Confluence of the ductus venosus left hepatic vein and inferior vena



4D facilitates visualisation of IVC and Ao in the same image



Different A-wave appearances



Cardiac Malformations Made Easy

Left Heart and Aorta

- Hypoplastic Left Heart syndrome (MA+AA)
- Critical Aortic Stenosis
- Mitral Atresia with VSD
- Coarctation of the Aorta
- Interrupted Aortic Arch
- Aortic Stenosis/Bicuspid Aortic Valve
- Right Aortic Arch/Double Aortic Arch
- Aberrant Right Subclavian Artery
- Interrupted IVC and azygous continuation

Right Heart and Pulmonary Artery

- Pulmonary Atresia with intact IVS (HRHS)
- Tricuspid Atresia with VSD
- Ebstein's Anomaly
- Tricuspid Valve dysplasia
- Pulmonary Stenosis
- Unguarded Tricuspid Valve
- Absent Pulmonary Valve syndrome
- Aberrant Arterial Duct/Constriction
- Right Arterial Duct

Override Anomalies

- Tetralogy of Fallot/APVS
- Double Outlet Right Ventricle
- Common Arterial Trunk

Venous Anomalies

- Persistent RT Umbilical Vein
- Absent Ductus Venosus
- Interrupted IVC
- Umbilical Vein Varix
- Persistent left SVC
- Absent right SVC
- Anomalous Pulmonary Venous Return
- Scimitar Syndrome
- Portosystemic Shunt
- Umbilical Vein into the RA

Septal Defects

- Atrial Septal Defect
- Ventricular Septal Defect
- Atrio-Ventricular Septal Defect

Spatial Arrangement Anomalies

- Transposition Great Arteries
- Congenitally Corrected TGA

Rare

- Cardiac Tumours/cardiomyopathy
- Aneurysm/Diverticulum/Uhls
- Exstrophy (Pentalogy of Cantrell)
- Univentricular Heart: DILV/DIRV
- Cor-Triatriatum

Heterotaxy Syndromes

- Left Atrial Isomerism
- Right Atrial Isomerism
- Situs Inversus Totalis

Soft Markers of Aneuploidy

- Intra-Cardiac Echogenic Focus
- Tricuspid Regurgitation
- DV-Abnormal Waveform
- Pericardial Effusion
- Two Vessel Cord

Borderline Findings & Variations

- Ventricular Asymmetry
- Great Vessel Asymmetry
- Cardiomegaly
- Axis Deviation
- Tricuspid regurgitation
- Mesocardia
- Prominent Eustachian Valve
- Intra-Thymic Left BCV
- Foramen Ovale Aneurysm
- Redundant Foramen Ovale

Possible Scan Findings Section by Section

Abdomen – Section 1

- Heterotaxy:
  - Stomach on RT (LAI or RAI)
  - Stomach Posterior (RAI)
  - Stomach Anterior/Central (LAI)
- Interrupted IVC:
  1) Dilated Azygous (side-by-side with Ao)
  2) Dilated Hemiazygous (LT posterior to Ao)
- PRUV, ADV
- UV Varix (intrahepatic or extrahepatic)
- Absent DV
- Hepatic Vein to RA

4-Chamber SARRS – Section 2

- Mesocardia, Dextrocardia, Dextroposition
- TR. MR. FO
- VSD. ASD. AVSD. IEF
- 2 or 3VS Behind the Heart

- **LV Small** → HLHS, CAS, CoA, IAA
  MS with VSD, TAPVR, FOA
- **LV Large** → CAS
- **RV Small** → PA with IVS, T Atresia with VSD, PS
  RV Large → Coarctation, TAPVR, Duct constriction, PA/IVS, Aneurysm, Uhls
- **RA-Large** → Ebsteins /TV dysplasia, Aneuyrsm
- **LA-Large** → CAS. Cor triatriatum

- Cardiac Tumours eg. Rhabdomyomas
- Cardiac Diverticulum. Ventricular Aneurysm
  Moderator band in Sonographic LV (cCTGA)
  Pericardial Effusion
- Ectopia Cordis
- Cardiomegaly → VOG, SCT, Placental Chorioangioma
- Cardiomyopathy

5-Chamber – Section 3

- TOF DORV CAT
- AS, CAS, Coart, IAA VSD
- TGA → LVOT Divides

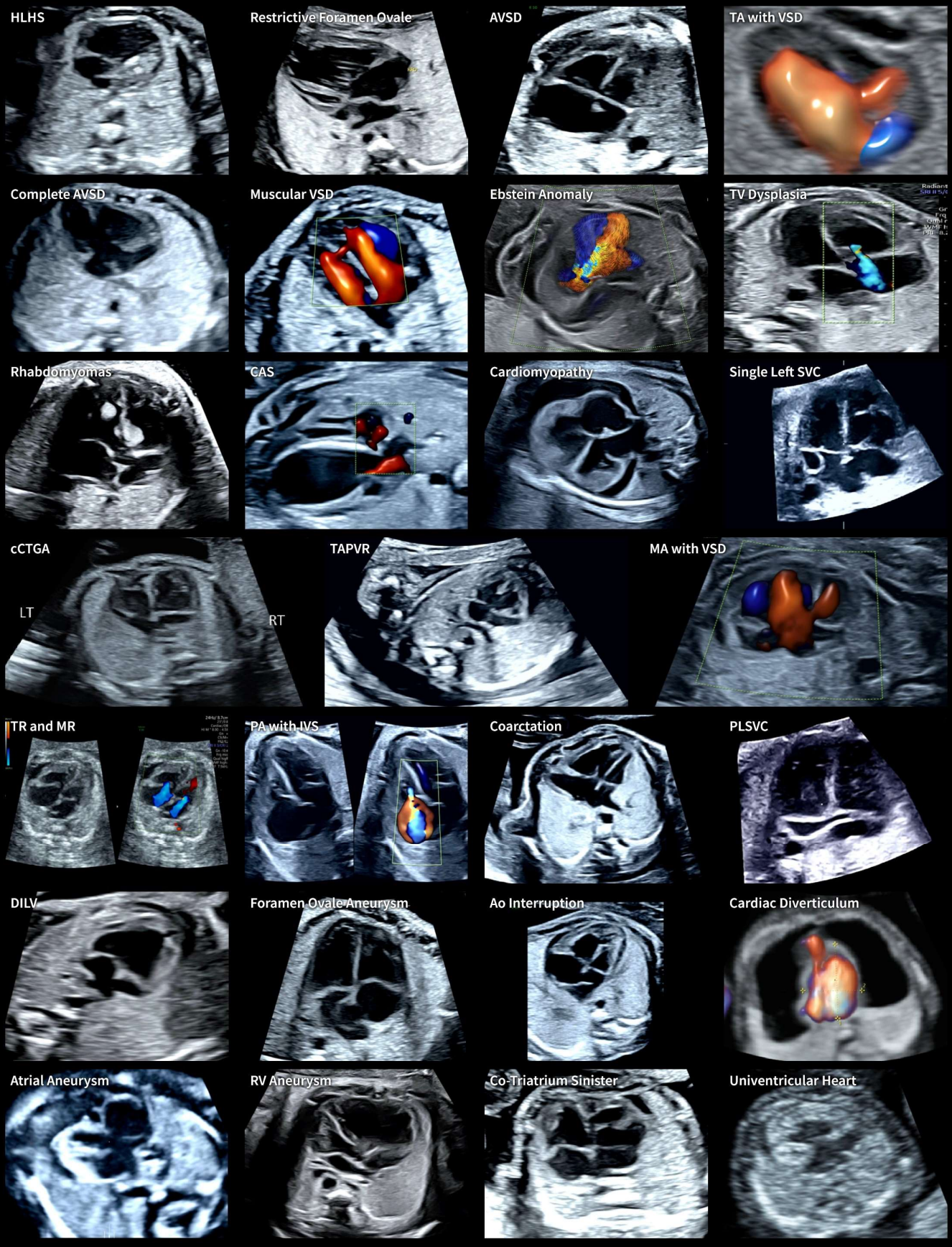
3 Vessel – Section 4

- Small PA TOF, PS, PA + IVS
- Big PA – PS, APVS
- Small Ao – HLHS, Coarctation
- IAA, CAS, MA + VSD
- Big Ao – TOF, CAT, DORV, AS
- 2Vessels – HLHS/Pa with IVS/TGA
- 4VS – BLSVC. TAPVR

3VST view – Section 5

- RAA/DAA/ARSA/ALSA
- Reversal of flow – Duct
- Reversal of Flow – TAo
- **Only 2 Vessels:**
  - Pulmonary Atresia/Aortic Atresia
  - Absent/Tiny Ao = LT heart obstruction
  - Absent/Small Duct = RT heart obstruction
  - Absent Duct Arteriosus
  - TGA, cCTGA
- **4 Vessels:**
  - BLSVC
  - TAPVR (supra-cardiac)
- Intrathymic LBCV
- Absent Thymus
- Absent RT SVC with Persistent LT SVC

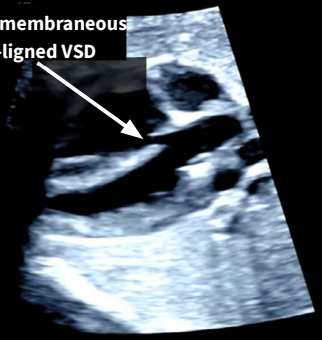
4-chamber abnormalities



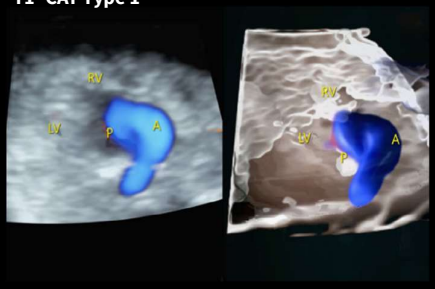
5-chamber view anomalies

Perimembraneous VSD-Aligned

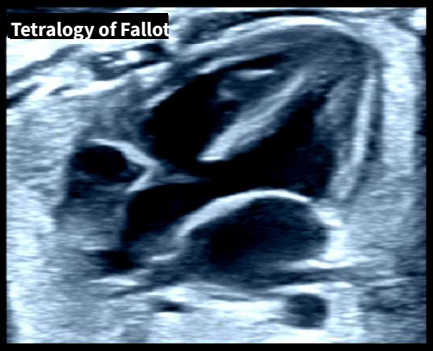
Perimembraneous Mal-ligned VSD



T1- CAT Type 1

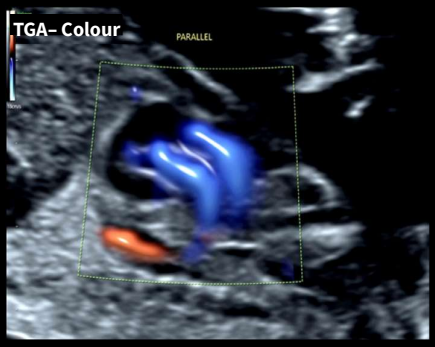


Tetralogy of Fallot

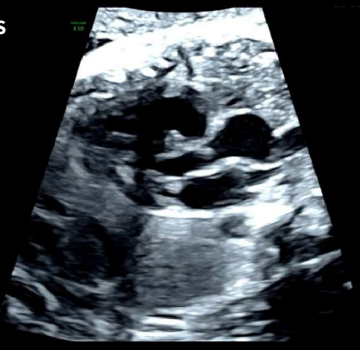


DORV (subaortic VSD)

TGA– Colour



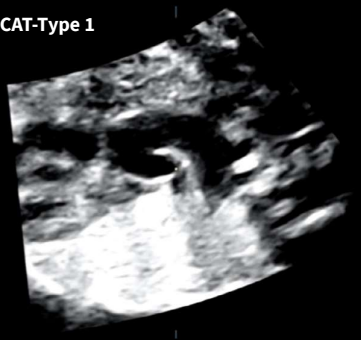
AS



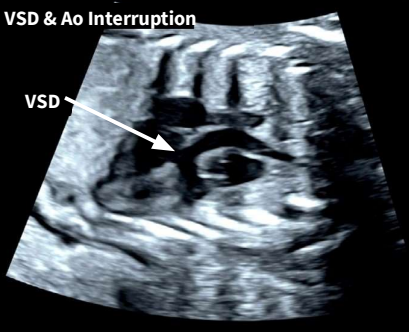
AS Colour

TGA

T2- CAT-Type 1

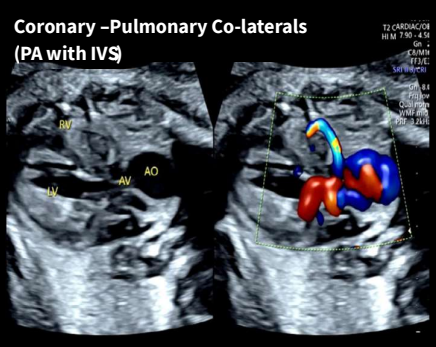


VSD & Ao Interruption

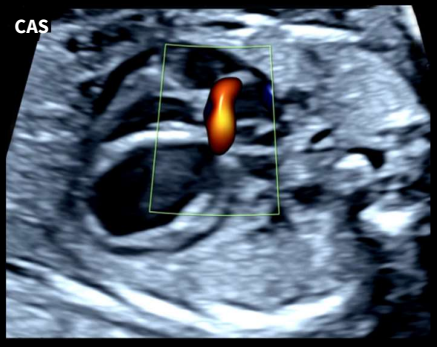


BCAV

Coronary –Pulmonary Co-laterals (PA with IVS)

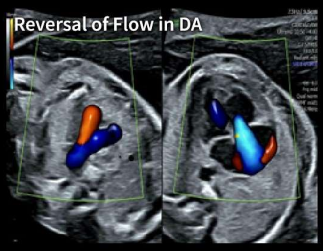


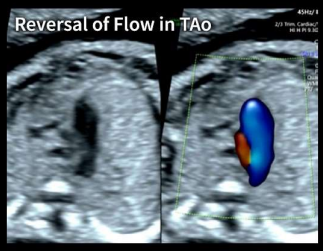
CAS

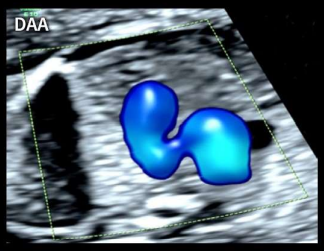


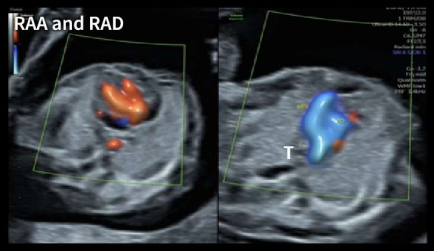
T1- LVOT RVOT -3D VCI

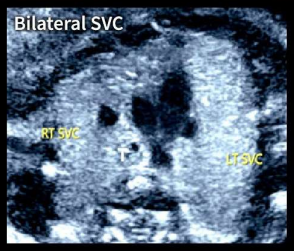
Abnormalities seen on the 3VST view

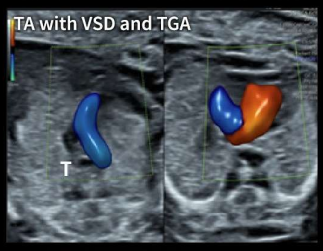


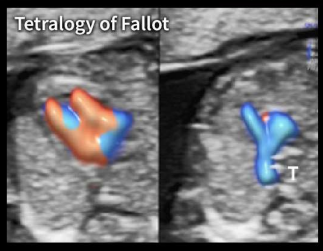


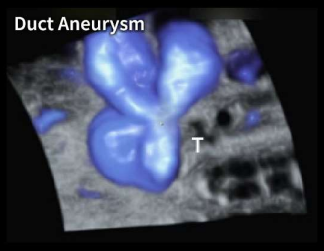


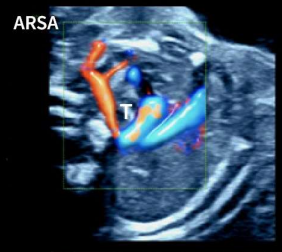


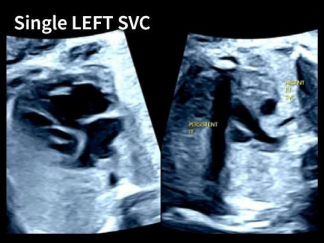


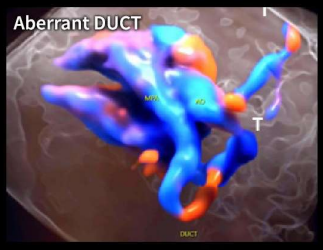


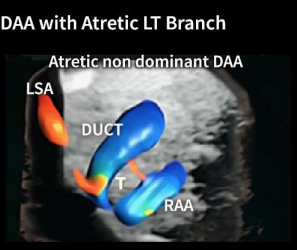


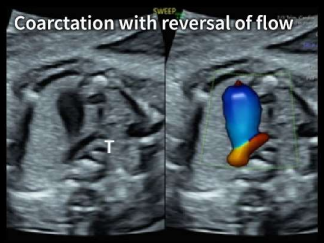


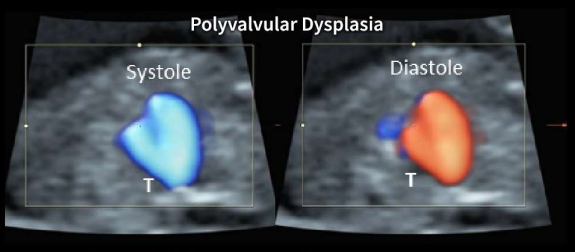


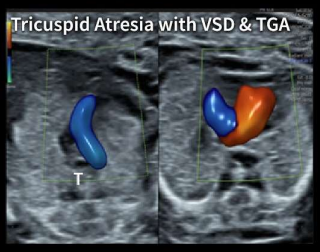


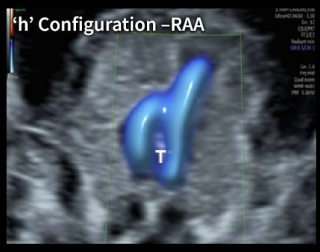


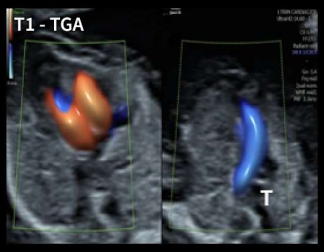












Summary

ISUOG Checklist For Cardiac Screening

ISUOG Cardiac Guidelines 2023

Upper abdomen			
	Stomach on left	☐ Yes	☐ No
Four-chamber view			
General	Heart on left, axis -45°	☐ Yes	☐ No
	Heart area ≤ 1/3 chest area	☐ Yes	☐ No
	Regular rhythm, rate 120–160 bpm	☐ Yes	☐ No
Atria	Approximately equal in size	☐ Yes	☐ No
	Patent foramen ovale; foramen ovale flap valve in left atrium	☐ Yes	☐ No
	At least one pulmonary vein entering left atrium	☐ Yes	☐ No
Atrioventricular junction	Two separate valves that open and close freely	☐ Yes	☐ No
	Tricuspid valve more apical than mitral valve (normal valve offset)	☐ Yes	☐ No
Ventricles	Approximately equal in size	☐ Yes	☐ No
	Moderator band at apex of right ventricle	☐ Yes	☐ No
	Septum appears intact	☐ Yes	☐ No
Left ventricular outflow-tract view			
	Vessel in continuity with ventricular septum and does not bifurcate	☐ Yes	☐ No
	Aortic valve leaflets not thickened, open and close freely	☐ Yes	☐ No
Right ventricular outflow-tract view/three-vessel view			
	Vessel arising from right ventricle is anterior to aorta and bifurcates	☐ Yes	☐ No
	Great arteries crossover	☐ Yes	☐ No
	Pulmonary valve leaflets are not thickened, open and close freely	☐ Yes	☐ No
Three-vessel and trachea view			
	V-sign (ductal and aortic arches to left of trachea)	☐ Yes	☐ No
	Ductal and aortic arches similar in size	☐ Yes	☐ No

Notes