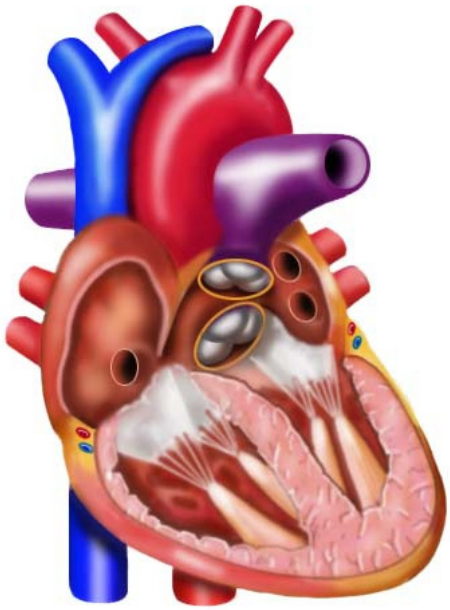
GE Healthcare

Educational Techniques

Fetal Heart Imaging: A guide to understanding the normal fetal cardiac anatomy and standard sonographic views

The 4-Chamber view



Situs

- Stomach and cardiac apex on the fetal left side. Always confirm fetal left and right

Cardiac Axis

- The fetal heart should be pointing 45 degrees toward the fetal left, +/- 20 degrees

Cardiac size

- The fetal heart occupies about 1/3 of the fetal chest. CC/TC ratio ~ 50%

4 Chambers

- Both atria should be same size
- Both ventricles should be similar size, but RV can be slightly larger than LV

Chamber morphology

- RV – Should be closest to the chest wall and the moderator band should be seen in the RV
- LA – Foramen ovale should be see opening into LA. The LA should be closest to the descending aorta
- Four pulmonary veins enter the LA
- IVC and SVC enter the RA

Ventricular wall thickness and contractility

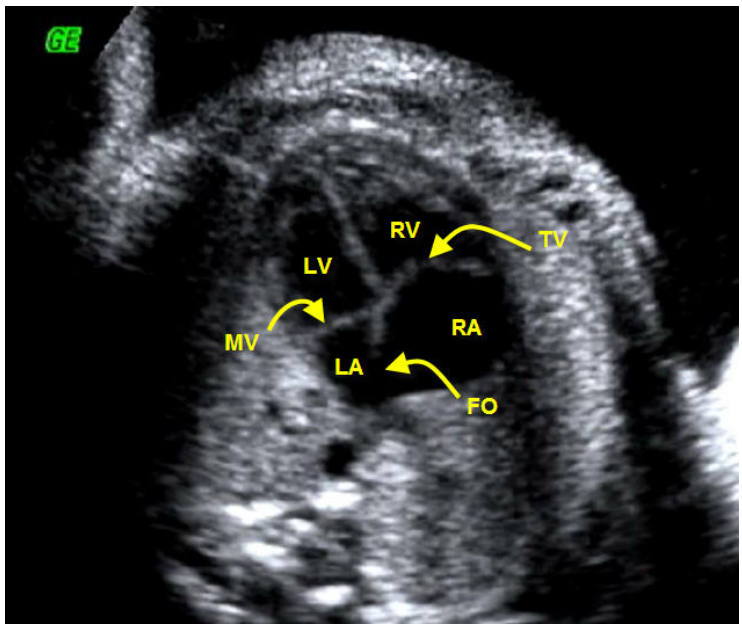
- LV and RV should contract evenly
- Evaluate for any echogenic areas

Ventricular and atrial septum intact

- Look for septal defects
- IVS should be continuous with LVOT

Atrio-Ventricular valves

- MV on left, TV on right
- TV should insert slightly closer to apex than MV



Abbreviations

LV = Left Ventricle, **RV** = Right Ventricle, **LA** = Left Atrium, **RA** = Right Atrium, **MV** = Mitral Valve, **TV** = Tricuspid Valve, **LVOT** = Left Ventricular Outflow Tract, **RVOT** = Right Ventricular Outflow Tract, **AV** = Aortic Valve, **PV** = Pulmonary Valve, **IVC** = Inferior Vena Cava, **SVC** = Superior Vena Cava, **CC** = Cardiac Circumference, **TC** = Thoracic Circumference, **IVS** = InterVentricular Septum, **FO** = Foramen Ovale, **Dao** = Descending Aorta

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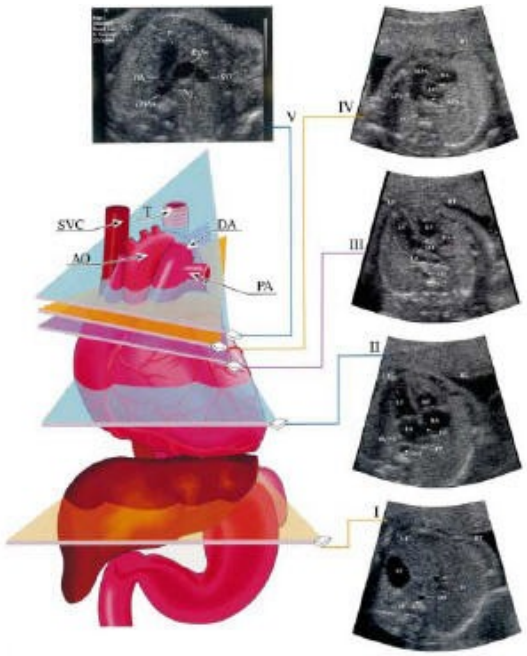


I = Stomach, II = 4 Chamber View, III = LVOT
IV = RVOT, V = 3 Vessel View

AIUM statement

AIUM guidelines for cardiac exam states:

"Basic cardiac examination includes a 4 chamber view of fetal heart.

If technically feasible, an extended basic cardiac examination can also be attempted to evaluate both outflow tracts."

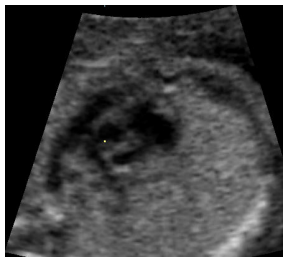
AIUM Practice Guidelines – Obstetric Ultrasound

October 1 2007

LVOT

•Arises from the left ventricle in the center of the heart. It angles anterior and points toward the fetal right shoulder. The IVS in continuous along the LVOT.

RVOT



•Arises from the right ventricle. It crosses anteriorly over the aorta and points toward the fetal left shoulder. The main pulmonary artery dips posterior and divides into the right and left pulmonary arteries and ductus arteriosus.

Aortic Arch

•Arises from the center of the heart in a sagittal plane. Has a "candy cane" shape and the head and neck vessels can be seen arising from the arch (innominate, left common carotid, left subclavian).

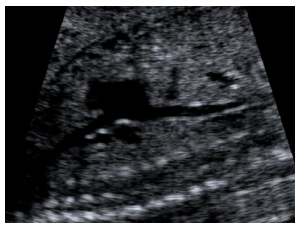
Ductal Arch

•The ductus arteriosus is a small communication between the pulmonary artery and the aorta in fetal circulation. It arises from the most anterior chamber and has a "hockey stick" shape.

3 vessel view

•A transverse image very high in the thorax. The order should be - from anterior to posterior - pulmonary artery, aorta and SVC.

IVC/SVC



•A sagittal plane in the midline demonstrates the venous return to the heart. The IVC enters the right atrium from the abdomen and the SVC enters from the head.

GE imagination at work

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Fetal Heart/MK