

# Fetal Heart Imaging

A guide to understanding normal fetal cardiac anatomy and standard sonographic views



## THE 4-CHAMBER VIEW

### Cardiac Axis

- The fetal heart should be pointing toward the fetal left at 45 degrees,  $\pm 20$  degrees

### Cardiac Size

- The fetal heart occupies about  $\frac{1}{3}$  of the fetal chest
- CC/TC ratio  $\sim 50\%$

### 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 seen 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

### Atrioventricular Valves

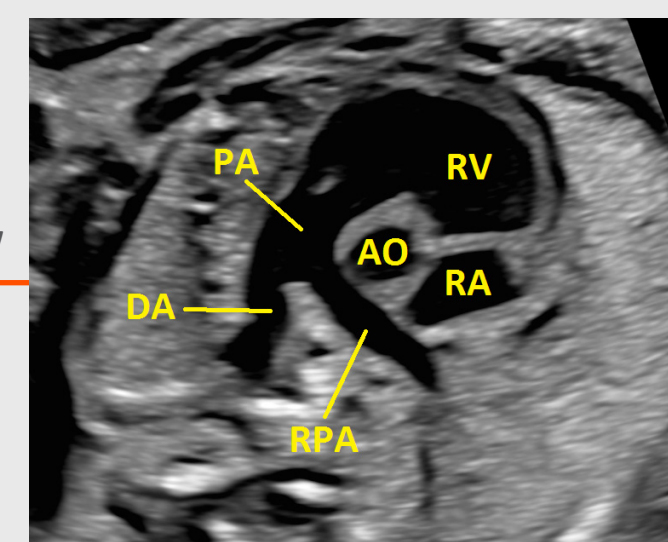
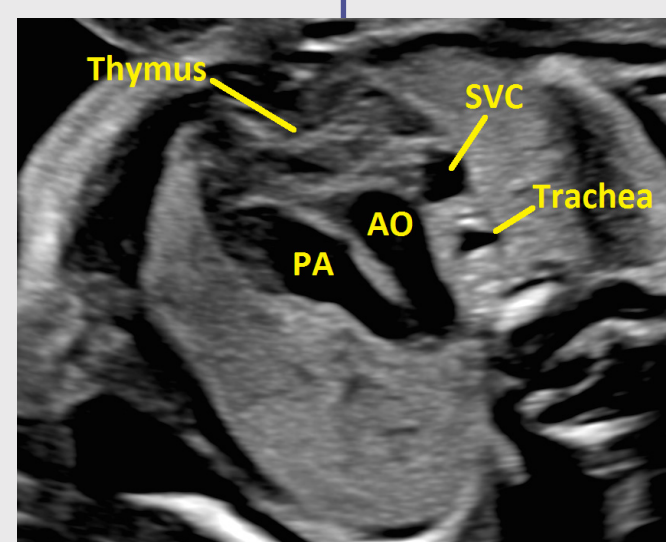
- MV on left, TV on right
- TV should insert slightly closer to apex than MV

#### 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

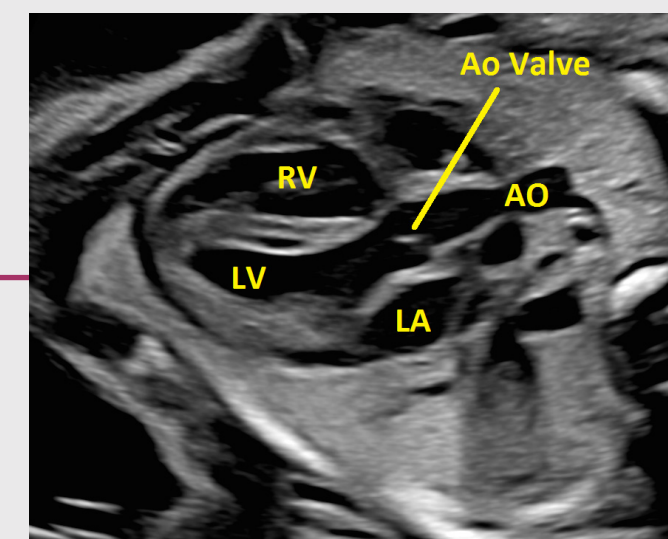
### 3 VESSELS AND TRACHEA VIEW (3VT)

Aortic and ductal arches form a "V" as they combine into the descending aorta. Both are similar size and to the left of the trachea. The third vessel is the SVC. The trachea is identified by an echogenic ring.



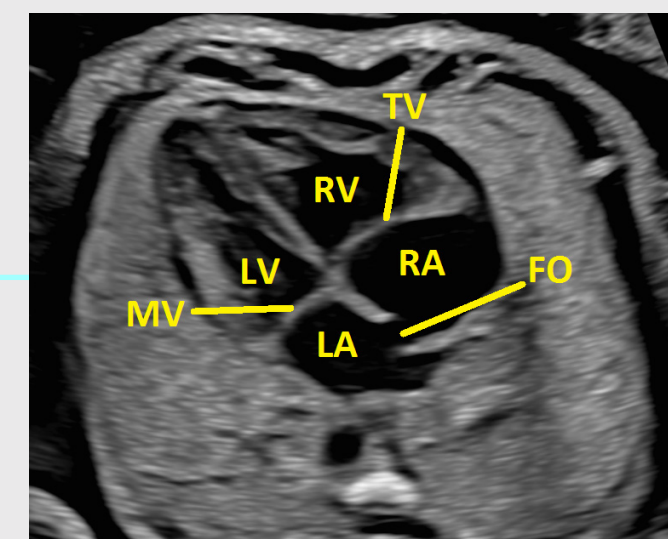
### RVOT

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.



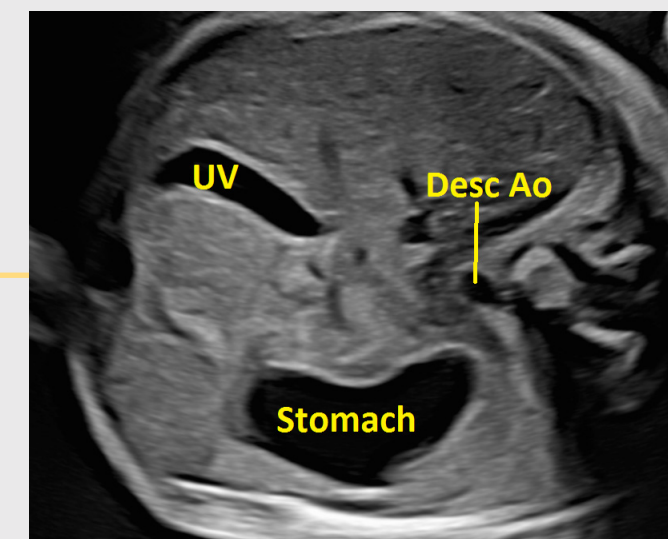
### LVOT

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



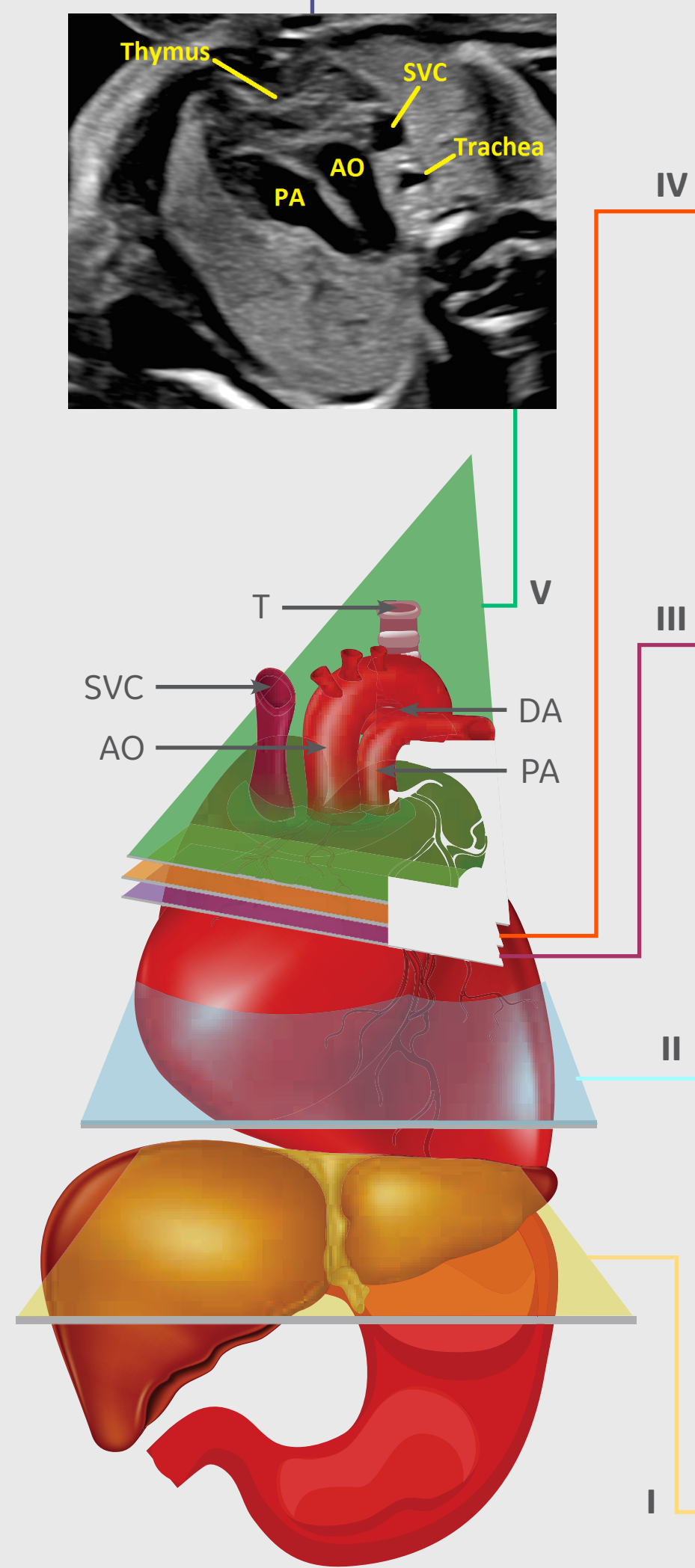
### 4 CHAMBERS

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

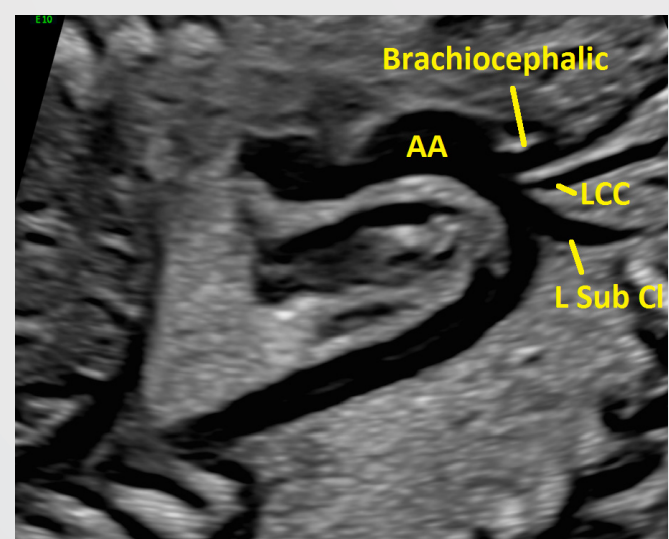


### SITUS

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

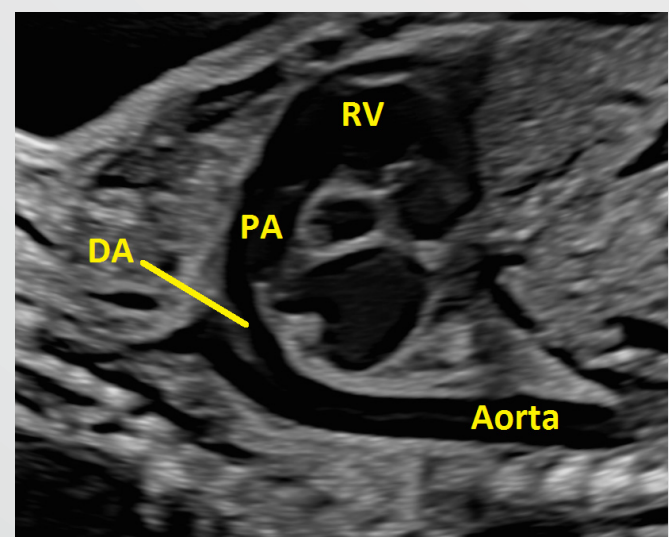


## ADDITIONAL VIEWS



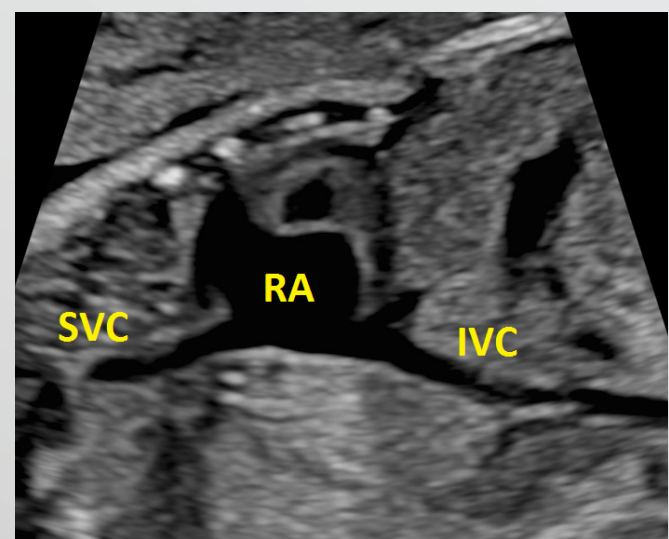
### AORTIC ARCH

The Aortic Arch (or Aorta) 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 (brachiocephalic, left common carotid, left subclavian).



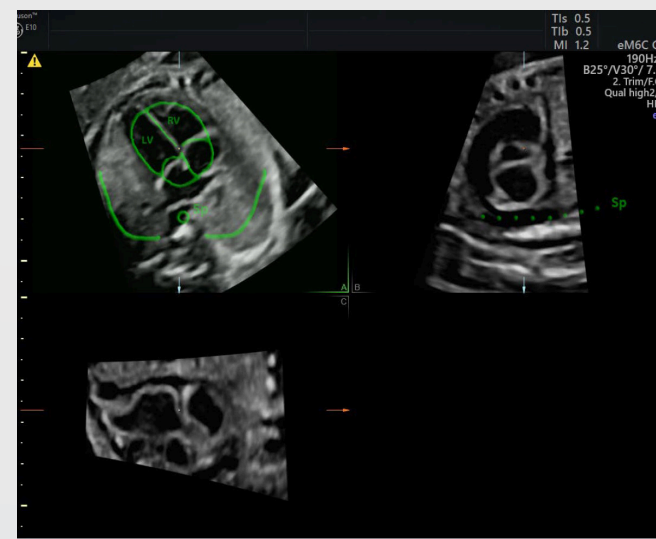
### DUCTAL ARCH

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.



### SVC/IVC

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.



#### ISUOG STATEMENT

"Visualization of the 3V view and 3VT view is desirable and should be attempted as part of the routine cardiac screening examination, although it may not be technically feasible to obtain them in all patients."

2013 ISUOG Practice Guidelines (updated): sonographic screening examination of the fetal heart. *Ultrasound Obstet Gynecol* 2013; 41: 348-359

### SonoVCAD™ heart

(Sonography-based Volume Computer Aided Display heart)

Enhanced volume automation to help standardize orientation of the fetal heart by providing 8 recommended views obtained from a single volume, STIC or eSTIC acquisition; 4CH, LVOT, RVOT, Stomach, SVC/IVC, Ductal Arch, Aortic Arch and 3VT.

For more information, please visit:

<http://www.gehealthcare.com/ultrasound>  
[www.volusonclub.net](http://www.volusonclub.net)

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