Examination of the normal heart
Common cardiac defects

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Basic examination of the normal heart
Heart: double-system of 3 connections
Complex tridimensional structure in movement
Need to use 2-D sections
Five planes which include 4 2-D sections of the heart:

- 4-chamber
- Aorta
- Pulmonary a.
- 3-vessels
Check-list in the examination of the fetal heart

4 chamber
1. FHR + Size + Axis
2. Chambers symmetric
   - morphology left/right
3. Septa
   - septum primum + AV
   - IV septum
4. Valves
   - opening/closure
   - disposition (T lower)
5. Pulm. veins to LA

outflow Aorta
1. Originates from LV
   - crosses with pulmonary A
   - origin in center of the heart
   - direction left to right
2. Continuity:
   - with IV septum
   - aorto-mitral
3. Size in relation with pulmonary A
4. Valve opens normally

outflow PA
1. Originates from RV
   - crosses with Ao
   - direction Ant to Post
2. Size: Ø PA > Aorta > Cava
3. Valve opens
4. Right pulmonary branch

3 vessels
1. Position
   - Left to right: P, Ao y VCS
2. Size decreasing: P>Ao>VCS
3. Coverge in “V” shape
4. Color: Anterograde flow
Screening heart: 5 sections (Yagel 2001)

4-chambers + valves: 1 plane
Vascular connections: multiple planes
Basic sections

1. Situs
2. 4 chambers
3. Outflow aorta (5-chamber view)
4. Outflow pulmonary
5. 3 vessel + trachea (‘V’)
Basic sections

1. Situs
2. 4 chambers
3. Outflow aorta (5-chamber view)
4. Outflow pulmonary
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1: Situs

1. Establish left/ right
2. Stomach + aorta: L
3. Inferior Vena cava: R
4. Heart apex towards left
Basic sections

1. Situs

2. 4 chambers

3. Outflow aorta (5-chamber view)

4. Outflow pulmonary

5. 3 vessel + trachea
4 chamber apical
Axis: 45° +/- 20°
Deviation axis

- Independent GA
  - Dextrocardia: $< 20^\circ$
  - Levocardia: $> 70^\circ$
- Indirect sign CHD
RA=LA, RV=LV
Left = Right
Crux + septa
Insertion valves
Pulmonary venous return
Lateral views
Basic sections

1. Situs

2. 4 chambers

3. Outflow aorta (5-chamber view)

4. Outflow pulmonary

5. 3 vessel + trachea
Outflow aorta
Outflow aorta
Basic sections

1. Situs
2. 4 chambers
3. Outflow aorta (5-chamber)
4. Outflow pulmonary a.
5. 3 vessel + trachea (‘V’)

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Outflow pulmonary a.
Cross aorta-pulmonary a.
Basic sections

1. Situs
2. 4 chambers
3. Outflow aorta (5-chamber view)
4. Outflow pulmonary a.
5. 3 vessel + trachea (‘V’)
3 vessel + trachea (spine posterior)
3 vessel + trachea (spine anterior)
3 V + T: normal
Screening echo 20-22 w
Main congenital heart defects (CHD)
IVSD small - muscular: 1/300 newborns
Low risk other defects
IVSD perimembranous + large: 1/1000
25-30% risk defects (genetic, other defects)
AV canal: 1/2000
isolated: 25-30% / T21: 40-50% / isomerism: 25-30%
Fallot: 1/1500-2000
30% associated defects (22q11p-)
HLHS: 1/5000-10000
< 25-30% survival
TGV: 1/1500-2000
NORMALLY ISOLATED

4 chamber N

arteries parallel
HLHS

mitral atresia

aorta atresia
Hypoplastic right heart: ↓ %
High risk hydrops
Coarctation aorta: 1/1500-2000