# The Child with a Heart Murmur

## BACKGROUND
- Congenital heart disease (CHD) affects 8 per 1,000 live born infants
- VSD is the commonest congenital heart lesion
- Incidence of CHD increases significantly with positive family history and chromosomal abnormalities
- All newborn infants should have pulse oximetry performed prior to discharge to detect cyanotic CHD

## COMMON DEFECTS
- **VSD**
  - Harsh pansystolic murmur ± thrill
- **ASD**
  - Fixed split of HS 2
- **Aortic stenosis**
  - Harsh ejection systolic murmur radiating to neck ± click
- **Pulmonary stenosis**
  - Ejection murmur ± click
- **PDA**
  - Loud machinery murmur

## DIFFERENTIALS
- Left-to-right shunts (acyanotic)
  - VSD
  - ASD
  - PDA
- **Obstructive lesions**
  - Coarctation of the aorta
  - Hypoplastic left heart
  - Aortic stenosis
  - Pulmonary stenosis
- **Cyanotic CHD**
  - Tetralogy of Fallot
  - Transposition of great arteries
  - Tricuspid atresia
  - Truncus arteriosus

## HISTORY
- **Symptoms in infants**
  - Sweating
  - Poor feeding
  - Recurrent infections
  - Failure to thrive
- **Symptoms is older children**
  - Shortness of breath
  - Decreased exercise tolerance
  - Palpitations
  - Chest pain
- **Birth/maternal history**
- **Family history**

## EXAMINATION
- **Centiles**
- **Measure BP & O₂ saturations**
- **Signs of respiratory distress**
- **Dysmorphic features**
- **Full cardiovascular exam**
  - Pulses
  - Clubbing
  - Surgical scars
  - Murmurs, thrills, heaves
  - Palpate liver

## INVESTIGATIONS
- CXR and ECG are not helpful in distinguishing innocent from pathological murmurs
- Echocardiography is the investigation of choice but requires cardiology referral

## CARDIOLOGY REFERRAL
- If paediatrician or parents are not confident that the murmur is innocent

## REFERRAL
- **Red flags in the history or examination**
- **Cyanosis**
- **Urgent referral of newborn at risk of haemodynamic compromise**
- **Timely referral of children with suspected CHD based on risk of the suspected underlying defect**

## RED FLAGS
- Cyanosis
- Dysmorphic features
- Absent/reduced pulses
- Hepatomegaly
- Respiratory distress
- Clubbing
- Poor perfusion
- Hypertension

## INNOCENT MURMURS
- Soft
- Systolic
- Asymptomatic
- Localised
- Musical/buzzing quality
- Vary with posture/respiration

### Types of innocent murmurs
- Venous hum
  - Best heard above clavicles
  - Pansystolic
  - Increased by sitting forward
  - Decreased by neck pressure or lying supine
- Stills murmur
  - Vibratory murmur along left sternal edge
  - Children aged 3-8 years
  - Decreases with Valsalva and standing
- Pulmonary flow murmur
  - Soft blowing murmur at upper left sternal edge
  - Older children

## TAKE HOME MESSAGES
- Newborns with clinical features suggesting heart disease require urgent referral
- Most murmurs seen in older children are innocent
- Careful cardiovascular exam is key