**WHY DO A PAEDIATRIC ECG?**

**What are the components of a clinical cardiac assessment?**

You may be clever enough to make an anatomical diagnosis, but no cardiac assessment is complete without a determination of haemodynamic significance, and a ruling out of possible associations.

- **Cardiac assessment**
  - Diagnosis
  - Haemodynamic significance
  - Associations
    - Anatomy
    - Conduction
    - Heart failure
    - Cyanosis
    - Pulmonary hypertension
    - Other dysmorphology
  - Growth & development failure
  - Infective endocarditis

To make a cardio-logical assessment, we use:
- Clinical acumen (including, always, 4-limb blood pressures)
- Chest X-ray
- Electrocardiogram

**What can an ECG be used for?**

The ECG has a defined (and limited) use in assisting with making a diagnosis, and in determining haemodynamic significance.

- **ECG usefulness**
  - Diagnosis
  - Haemodynamic significance
    - Chamber hypertrophy

**What format should be used to read and report on an ECG?**

Before looking at the ECG tracings, write down these headings and then attempt to fill each one in. End with a summary.

1. Rate: on a 10 second strip, count the R waves & multiply by 6
2. Rhythm: ensure a P wave before each QRS
3. PR Interval: each small block is 0.04s (use lead II)
4. Axis: use Leads I and aVf to generate vectors on this diagram → →
5. Right Atrium (lead II)
6. Left Atrium (leads II and V1)
7. Right Ventricle (leads V4R and V1)
8. Left Ventricle (in leads V5&6)
9. Summarise
What diagnoses can be made on a paediatric ECG?

A few diagnoses ARE possible on the ECG. Don't try to work this one out – remember it parrot fashion (it's less difficult than it first appears!)

**ECG Diagnoses**

- **Cardiac**
  - Conduction
    - Extrinsic
      - Long PRI:
        - ARF
    - Intrinsic
      - SA Node:
        - WAP
        - LAR
        - SVT
      - AV Node:
        - WPW
        - Other re-entry tachy's
    - Metabolic:
      - K+ Ca Rx etc
  - ASD Configurations
    - SA Node: WAP
    - AV Node: WPW
    - Other re-entry tachy's
  - Ebstein Anomaly:
    - Massive RAH, no RV waves
  - Q in V1:
    - IRBBB, L-TGA, UVH, PP>SP, AOCA
  - Raised ST Segment
    - Convex: ischaemia
    - Concave: "Peref"
  - Axis
    - Pink
      - Secundum
      - "Primum"= AVSD
    - Blue
      - Common atrium
  - Pink
    - "Peref"

**Non-Cardiac**

- Anatomy
- SMA

**Metabolic:**

- K+ Ca Rx etc

**Abbreviations:**

- ASD=atrial septal defect; AVSD=atrio-ventricular septal defect; SMA=spinal muscular atrophy; ARF=acute rheumatic fever; peref=pericardial effusion; IR/CBBB=complete bundle branch block; L-TGA= l-transposition of the great arteries; AOCA=anomalous origin of the coronary artery; UVH=univentricular heart; PP=pulmonary pressure; SP=systemic pressure; WPW=wandering atrial pacemaker; LAR=low atrial rhythm; SVT=supraventricular tachycardia; TAPVD=total anomalous pulmonary venous drainage

**How can haemodynamic significance be ascertained on a paediatric ECG?**

In paediatric cardiology, irreversible pulmonary hypertension (PHT) renders the underlying cause inoperable. ALWAYS look for right ventricular hypertrophy

**Chamber Hypertrophy**

**Right Ventricle**

- RVH
  - \( V_1 (\frac{1}{2} \text{ standard}) \)
  - R wave >6 small-blocks
  - Upright T wave (1 week-12 years)

- RAH
  - P wave >2.5 small-blocks (high)

- LAH
  - P wave > 3 small-blocks (wide)
  - Bifid/biphasic

- LVH
  - \( V_6 (\frac{1}{2} \text{ standard}) \)
  - B wave >4 big-blocks (high)

**Causes:**

- PHT
  - RVOTO

- Ebstein, TA/TS
  - ASD

- Mitral stenosis
  - Causes: LVOFTO

**The others**

**Causes:**

- PDA

**Abbreviations:**

- TA/TS=tricuspid atresia/stenosis; PHT=pulmonary hypertension; PDA=persistent ductus arteriosus; R/LVOFTO=right/left ventricular outflow tract obstruction; L,RV/AVH=left, right ventricular, atrial hypertrophy

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