ECG Interpretation in Primary Care

See Over

What is the rhythm?

What is the rate?

What is the axis?

Is the P normal?

What is the PR interval?

Are there delta waves?

Are there pathological Q Waves?

Is the QRS normal?

Is the ST segment normal?

Are the T waves normal?

What is the QTe?

<table>
<thead>
<tr>
<th>Lead</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>RAD</td>
<td>-</td>
<td>+ or -</td>
</tr>
<tr>
<td>LAD</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Should be upright in all except aVr. Tall, broad or bifid (double component) P waves indicate atrial abnormality

Bradycardia <60/min (>5 large squares between each QRS)

Tachycardia >100/min (<3 large squares between each QRS)

> 1 large square ⇒ 1 degree block
< 3 small squares ⇒ ?WPW

Uplurring of start of QRS in several/all leads ⇒ WPW

Definition: 1st deflection of QRS is negative, >1 small square wide & >1/3 amplitude of QRS (normal in aVr) – suggests previous MI

>3 small squares ⇒ bundle branch block. RBBB may be normal, LBBB always abnormal

ST elevation ⇒ consider AMI (some leads will have depression), pericarditis (saddle shape in most leads), “high take off” (usually V2/3)

ST depression ⇒ consider ischaemia/LVH/digoxin

May be tall (high K), small (low K) or inverted (ischaemia, drugs)

>0.44 (440msec) ⇒ long QT (drugs or long QT syndrome)
**Arrhythmias**

**No p waves?**
- Irregular/chaotic baseline – atrial fibrillation
- “Saw tooth” baseline (esp inferior leads) – atrial flutter
- Flat baseline – junctional rhythm

**What is the relationship of p waves with QRS?**
- **1:1**
  - prolonged PR (>1 large square) – 1° block
  - progressive PR prolongation and then dropped QRS – 2° weneckbach
- **≥2:1**
  - regular association – 2° block*

**Dissociated**
- complete heart block (usually broad QRS)*

* - urgent referral required

**Tachycardia**
- P wave before each QRS – sinus tachycardia
- Narrow complex & no obvious P wave – SVT
- Broad complex & no obvious P wave - VT

**Miscellaneous**
- **LVH**
  - large complexes across chest leads, some times associated with ST/T wave changes
  - height (V1 or V2) + (V5 or V6) > 40mm ⇒ LVH [can be normal in young, thin males]
- **Ectopics**
  - same shape as QRS = supraventricular, different shape = ventricular
  - benign in context of structurally normal heart (consider echo)
  - bigeminy (alternating ectopics) is benign if heart normal (echo)
- **Small complexes**
  - low amplitude complexes (particularly over limb leads) maybe indicative of heart failure, hypothyroidism or obesity
- **Heart Failure**
  - the ECG is almost always abnormal in the context of significant heart failure

---

**ECG – Faxback service**

Email or fax your difficult ECG to Heart Rhythm Clinic

We will return a report within 24 hours
Complementary service for your NHS or private patients

Heart Rhythm Clinic
Spire Southampton Hospital
Tremona Road
Southampton. SO16 6UY

Email: ECG@heartrhythmclinic.com
Tel/Fax: 02380 914490

---

ECG Primary Care Algorithm Vers 1.01 May 2009