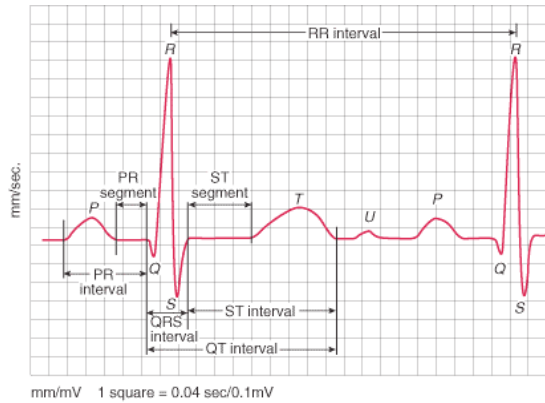


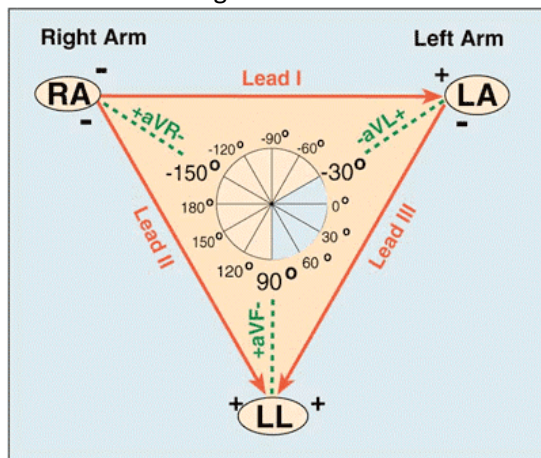
ECG Summary

ECG features:

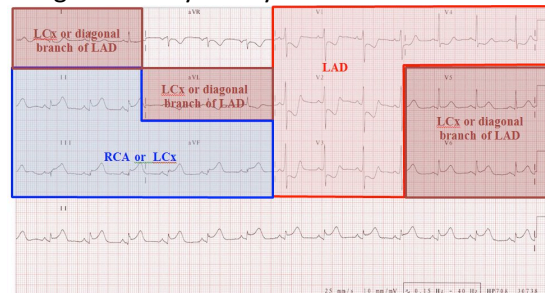


(Segments are shorter than intervals)

Einthoven's Triangle:



Rough coronary artery territories:



Differentiating tachycardias:

	Narrow QRS	Broad QRS
Regular	Supra Ventricular Tachycardia (SVT) Usually can't see P wave Rate >150	Ventricular Tachycardia (VT)
Irregular	Atrial Fibrillation (AF) No P wave – wavy baseline	Ventricular Fibrillation (VF)

Paediatric ECG features:

- R axis deviation
- Peaked P waves
- Anterior T wave inversion
- Tachycardia & sinus arrhythmia

12 lead ECG, Demographics

Paper speed (25mm/s) and calibration (10mm)

Rate (small square 0.04 sec, big square 0.2 sec)

- 300/number of large squares between R waves
- 6 x number of complexes in 10sec strip

Rhythm – regular or irregular (using the card method)

Axis – lies at 90 deg to isoelectric lead or normal if I and II positive

- Left axis – if I and III Leaving each other
- Right axis – if I and III Reaching each other

Baseline – TP segment as reference for ST changes

P waves (0.12 ms wide) – present before every QRS?

- Bifid P – left atrial enlargement (P-mitrale “M”)
- Peaked P – right atrial enlargement (P-pulmonale “P”)
- Absent P – AF, sinoatrial block, ventricular rhythm
 - AF – irregularly irregular QRS with ‘fibrillating’ baseline
 - Atrial flutter – often ‘sawtooth’ 2:1 (150) or 3:1 (100) block

PR interval (0.2 sec wide) – constant or variable?

- 1st degree HB PR interval >0.2 sec
- 2nd degree HB – some dropped QRS’s
 - Mobitz type I – increasing PR intervals (Wenkebach)
 - Mobitz type II – constant PR but dropped QRS
- 3rd degree HB no association between P’s and QRS’s
- WPW type A – upright delta wave in V1 (left accessory path)
- WPW type B – down going delta wave in V1 (right accessory path)

PR segment – depressed in pericarditis, sloping in delta wave (WPW)

Pathological Q waves – >0.04 sec wide, >2mm deep, >25% R wave (AMI)

QRS complex (0.12 ms wide) – narrow or broad?

- Narrow – supraventricular (normal sino-atrial node conduction)
- Broad – ventricular or from aberrant conduction (BBB, WPW, paced)
- Tall – LVH (R in I + S in III >25mm or largest R+S in chest leads >45)
- Short – poor conduction (obesity, pneumothorax, emphysema)
- Alternating – electrical alternans (massive pericardial effusion)

QT interval (440 male, 460 female) – long or short?

- Normal if QT < half preceding RR interval (Bazette’s: $QT_c = QT/\sqrt{RR}$)
- Long QT – risk of Torsades (hypo K/Ca/Mg+, and all the anti- drugs)
- Short QT – risk of sudden cardiac death (congenital, and digoxin)

ST segments – elevation or depression?

- Localised “tombstone” (AMI)
- Widespread “scooped” (Pericarditis)
- Sloping “fish hook” (Benign early repolarisation)
- Mirror QRS “appropriate discordance” (LBBB)

J point – junction of QRS and ST segment

- Raised J point with “Coved” ST’s in V1 (Brugada)
- J wave (present in severe hypothermia)

T waves:

- Flattened (hypokalaemia or AMI)
- Peaked (hyperkalaemia), hyperacute (Prinzmetal angina)
- Inverted (AMI, PE, raised ICP, normal in children & lead III)
- De Winters – peaked T waves in V2/3 (STEMI)
- Wellens – biphasic/inverted T waves in V2/3 (in critical LAD stenosis)

U wave:

- Prominent (hypo K/Ca/Mg+, Digoxin toxicity)
- Inverted (myocardial ischaemia)