

The Normal ECG – mind your P's and Q's

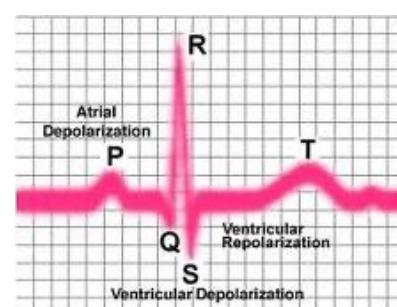


— B E L M A T T —
HEALTHCARE TRAINING

1

Assess the ecg morphology

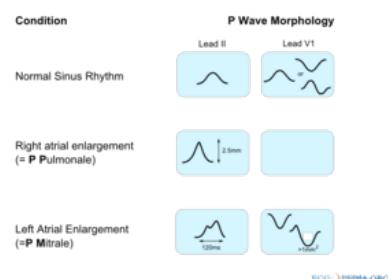
- P waves
- QRS complexes
- Is the R wave dominant in V1 ?
- ST segments
- T waves
- Any extras?



2

P waves

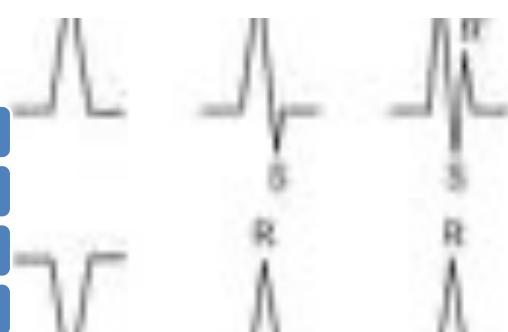
- Normal P wave is positive in 2, 3 and aVF. Negative in aVR
- Prolonged P wave >0.12 secs– left atrial enlargement
- Tall P wave > 2.5mm– right atrial enlargement



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QRS complex

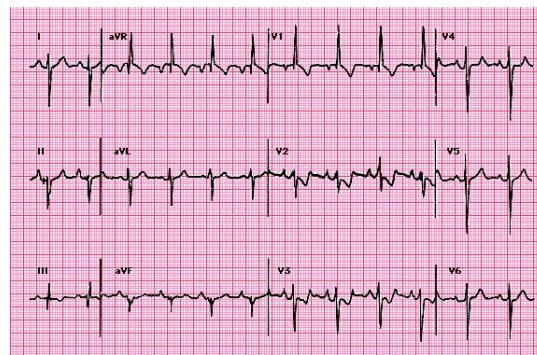
- Ventricular contraction
- Variable morphology
- Width <0.12 secs
- Height variable
- Q <0.04 secs, <25% of R wave height



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Causes of dominant R waves in V1

- True posterior myocardial infarction
- RV hypertrophy
- RBBB
- WPW (left sided pathway)
- Dextrocardia
- Muscular dystrophy



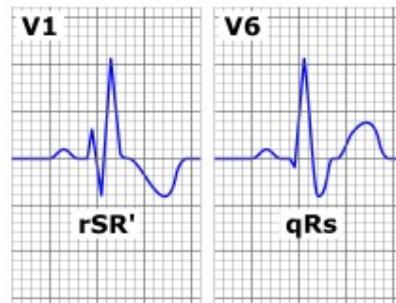
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Right bundle branch block

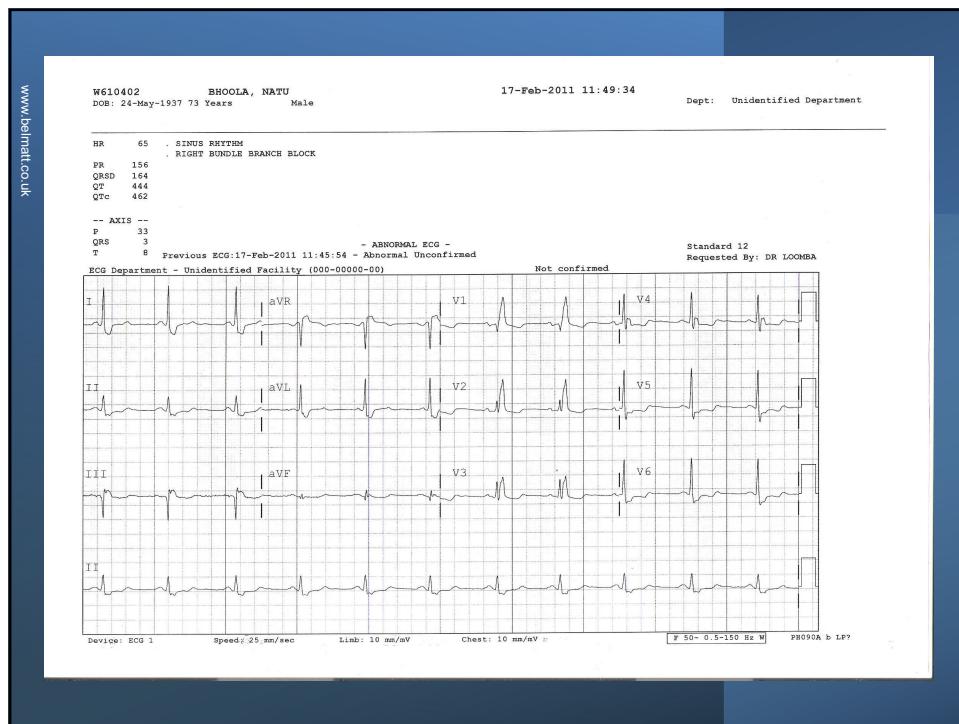
- Can be normal variant
- May indicate cardiac / respiratory pathology
- QRS duration >3 small squares
- T wave changes particularly in the septal leads

Right bundle branch block characteristics



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Left bundle branch block

Always pathological

50 % 10 year mortality

Common causes IHD, aortic valve disease, hypertension

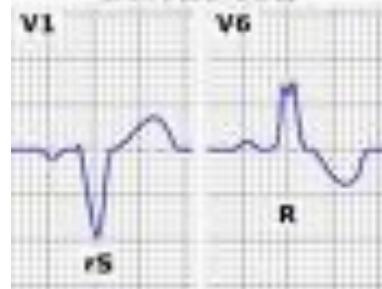
ECG features duration >0.12 secs

Broad R wave V5-V6

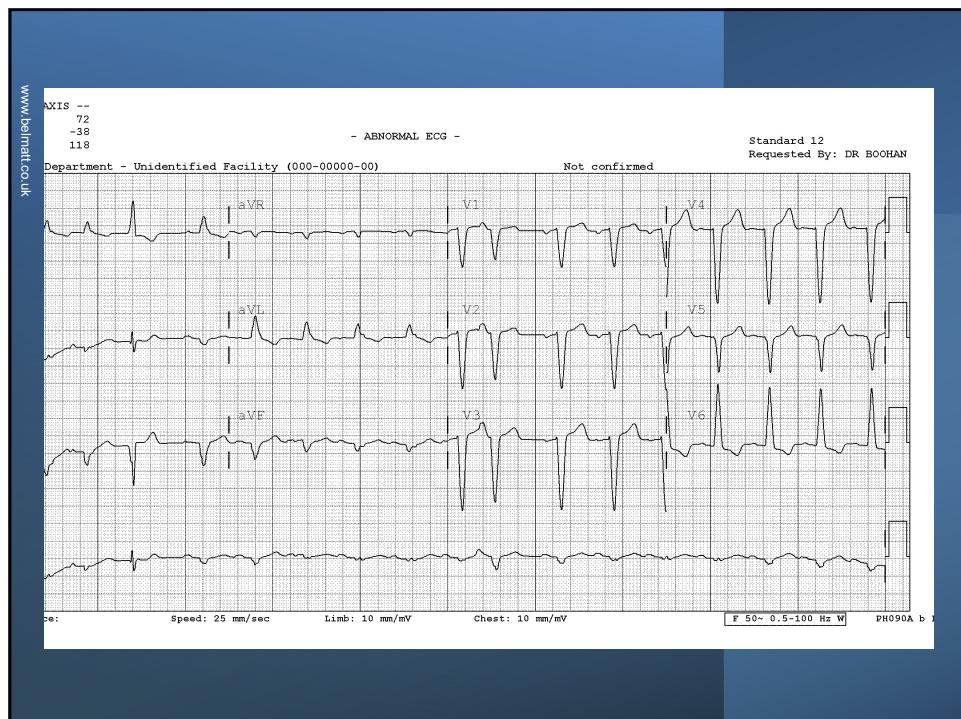
Absent septal Q's

ST segment changes

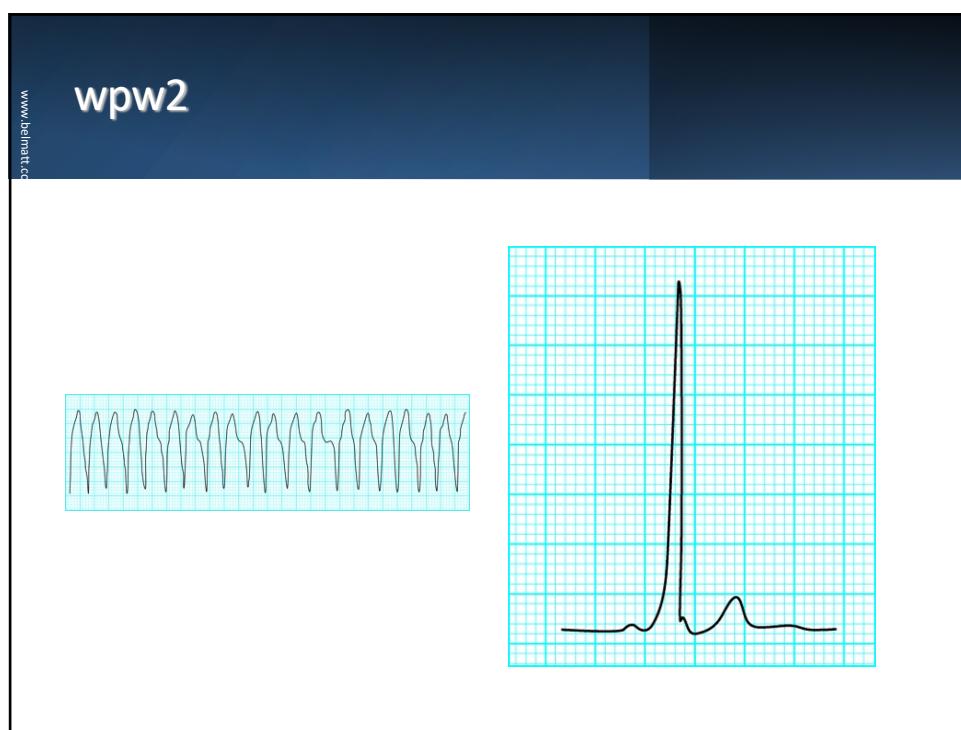
Left bundle branch block characteristics



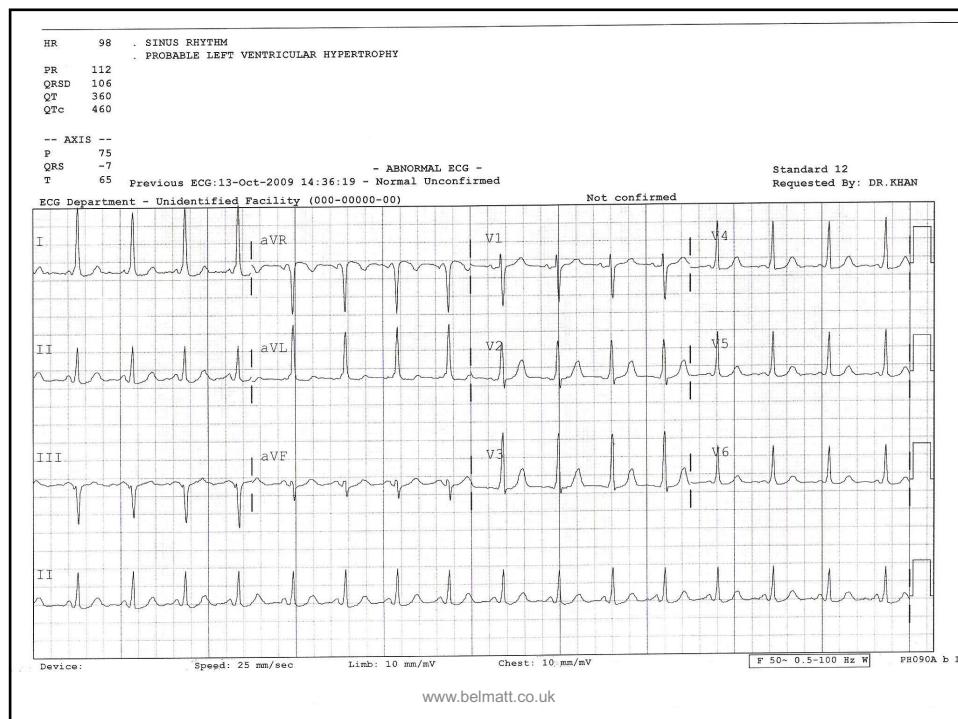
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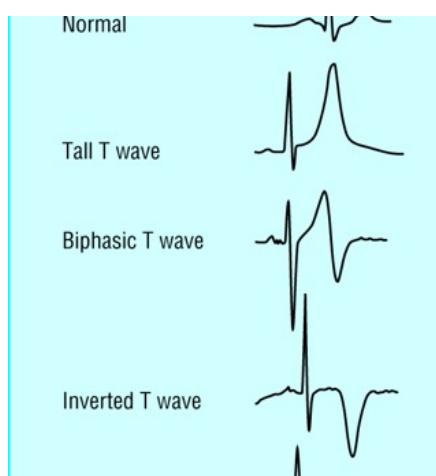
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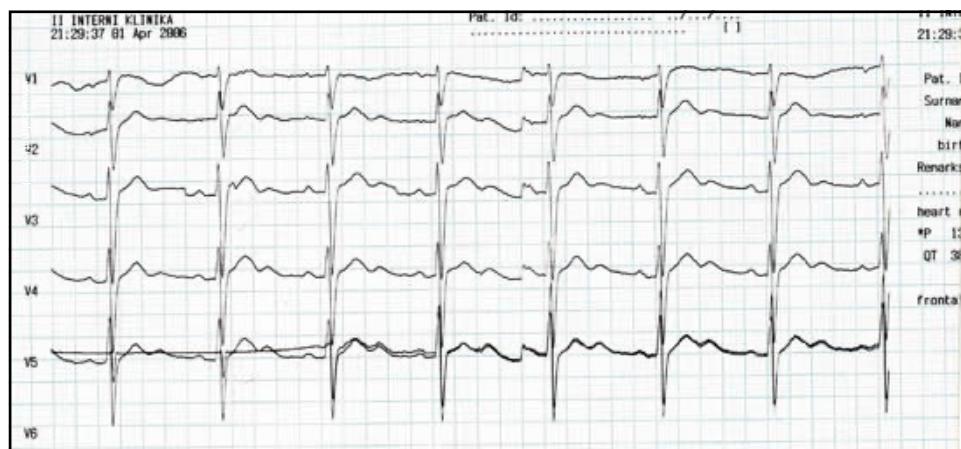
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The T wave

- T wave changes are nonspecific
- Commonest cause ischaemia

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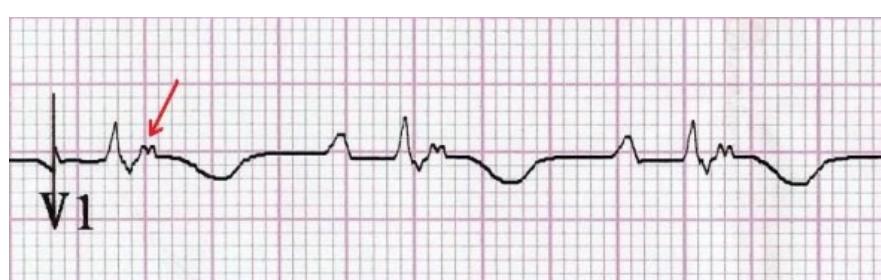
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The 'extras'

- Causes of u waves
- Bradycardia
- Hypokalaemia
- Hypothermia
- Drugs

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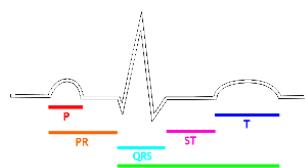
Epsilon waves

- Post-excitation of the right ventricle
- Commonest cause ARVC

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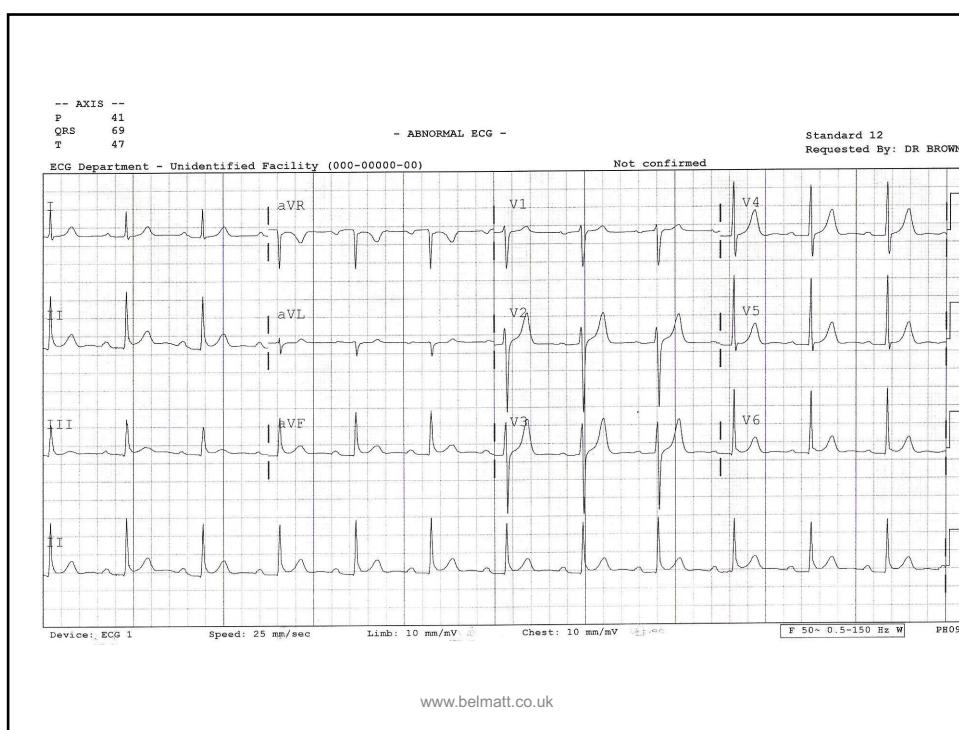
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The intervals



- Measure the PR interval, QRS duration and the QT interval
- Remember QT interval needs to be corrected for heart rate!

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ST segment

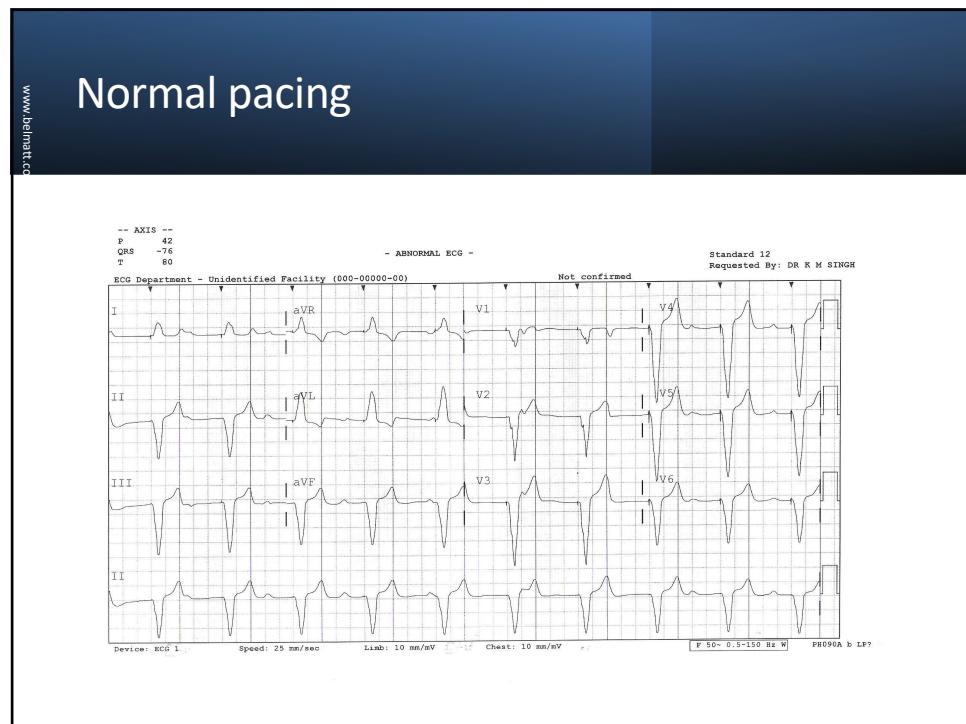
- Normal ST segment is isoelectric
- Commonest cause of change is ischaemia

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Normal pacing

- 5 letter code
 - Chamber paced A,V,D
 - Chamber sensed A,V,D, O
 - Action T,I,D,O
 - Rate response R, O
 - Extra function A,V,D,O

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