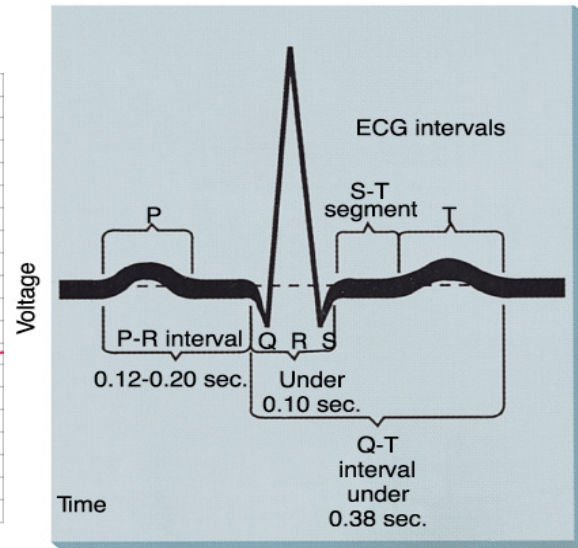
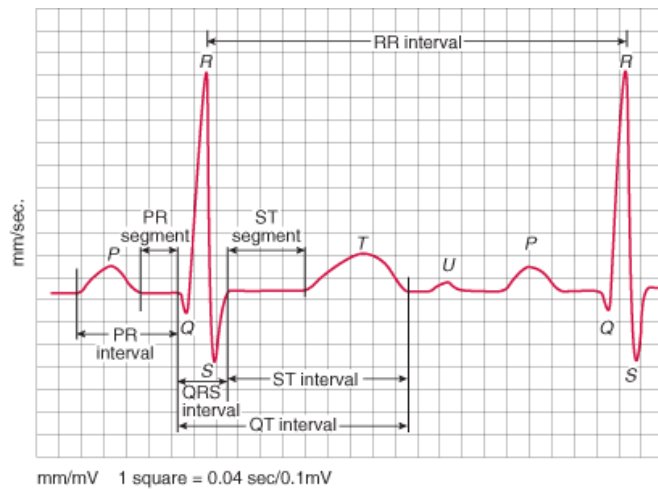


Arrhythmia Study Guide – 1 Normals



Terminology and use of ECG's

A **baseline** is a straight line recorded when electrical activity isn't present.

A **waveform** is movement away from the baseline in either a negative or positive direction.

A **segment** is the baseline between two waveforms (i.e. the P-wave and the QRS waveforms).

An **interval** is a segment + waveform.

A **complex** is several waveforms (QRS Complex).

P-wave: Atrial depolarization and the spread of the electrical impulse through the right and left atria.

QRS Complex: Ventricular depolarization (the spread of the electrical impulse through the ventricles).

T-wave: Ventricular repolarization.

Absolute refractory period (no further response to electrical stimulation is possible) is from the beginning of the QRS complex to the peak of the T-wave.

Relative refractory period (some cells can be stimulated to respond to a strong stimulus) is from the peak of the T-Wave to the downslope. The supernormal period (a weaker than normal stimulus can cause a response) corresponds with the end of the T-Wave.

The **PR segment** is used to determine if the **ST Segment** is elevated or depressed. It serves as a baseline for comparison.

How do you interpret a rhythm (defined as the site of origin of an electrical impulse: sinus, junctional, ventricular)?

It is important to go step by step. The order of the steps may vary dependant on the class taken or personal preference. *ECGs Made Easy* recommends Rhythm – Regularity – Rate – Intervals – Overall Appearance.

Step 1) - Consider your Waveforms. Is there a p-wave? Are the p-waves upright? (rhythm began in the SA node – a sinus rhythm). Inverted? (rhythm started in the AV Junction – a junctional rhythm), or absent (could be junctional, could be ventricular) Is there a QRS complex for every P-wave? Yes – normal conduction, NO – Abnormal conduction/block. Are the T-waves upright? Inverted? (*negative T-waves may be an indicator of myocardial ischemia. Tall, peaked T-waves are commonly seen in hyperkalemia*).

Step 2) - Determine regularity. Is it regular or irregular? Measure P to P for atrial rhythm, R to R for ventricular rhythm across the 6 second strip. Do the p-waves remain consistent (march out)? Do the QRS complexes march out? If yes, the rhythm is regular. If no, the rhythm is irregular.

Step 3) - Determine rate. There are different methods in determining rates. The small-box method is the most accurate (count the number of small boxes between R waves and divide into 1500). The 6-second method which the majority of individuals use is the least accurate and only gives you multiples of 10 (count the number of R waves in a 6 sec strip and multiply by 10).

Is it a normal rate (60 – 100), bradycardic (<60), or tachycardic (>100)

Step 4) - Check your intervals. Is the **PR Interval normal** (.12 to .20 sec)? If it is long (greater than .20 sec): consider a block. If it is short (less than .12 sec) consider a junctional.

Is the **QRS interval** narrow (< .10 seconds, presumed to be supraventricular) or wide (greater than .10 sec to .12 sec – incomplete bundle branch block, greater than .12 – complete bundle branch block, .12 to .16 - ventricular myocardium).

Check the **QT interval**. If the QT interval is greater than 50% of the R-R interval, then it is long. A prolonged QT Interval increases risk for life-threatening dysrhythmias.

Step 5) - Check Overall appearance. Is there ST Depression (ST segment is below the PR segment baseline)? Elevation (the ST segment is above the PR segment baseline)?

Step 6) - Make the interpretation. Write on your test/ekg strips. Document the above steps then piece it together. Even if you can't "name that rhythm" explaining what is happening conveys that you see the changes/concerns.



Interpret the strip above –

Rhythm:

Regularity:

Rate:

Intervals – PR:

QRS:

QT:

Overall Appearance:

Interpretation (name that rhythm):

Below you can find an approved EKG Ruler:

Rates: Line the first R-Wave / P-wave with the “0” on the bottom side of the ruler. From that complex count over 3 more complexes (4 total with the one on 0) and it will give you the Rhythm Rate.

Measurements: The upper left portion of the ruler is in 1 mm increments (the same as ekg paper). Each hash mark represents 0.04 seconds. This upper left portion can be used to measure PR intervals, QRS, Complexes, Etc.

Calipers: The upper right portion of the EKG ruler (cm) can be used as calipers to determine if your R-R or P-P is marching out across the board

