ANATOMY AND ELECTROPHYSIOLOGY REVIEW
The ECG device detects and amplifies the tiny electrical changes on the skin that are caused when the heart muscle depolarizes during each heartbeat. This is detected as tiny rises and falls in the voltage between two electrodes placed either side of the heart. An ECG Lead refers to the tracing of the voltage difference between two of the electrodes and is what is actually produced by the ECG recorder. The normal progression of a wave of depolarization begins with an automatic impulse generated by the cells in the Sinoatrial Node, spreads out through the Atria (P-wave), passes through the Atrioventricular Node, Purkinje Fibers and Bundle Branches (P-R Interval) and then spreads all over the Ventricular Myocardium (QRS). Both the atria and ventricles repolarize to return to resting state (T wave). Therefore, ECG gives us valuable information regarding the direction of the voltage (magnitude of tracing) and how it propagates over time (heart rhythm/impulse propagation).

SYSTEMATIC APPROACH TO ECG INTERPRETATION
1) What is the heart rate?
   - Calculate heart rate based on paper speed
   - Is it normal, bradycardic or tachycardic?
2) Is the rhythm regular or irregular?
   - Generally, a difference of < 10% between successive beats is considered normal.
3) Is the rhythm Sinus in origin?
   - Does it follow the proper conduction pathway from start to finish in an appropriate amount of time?
   - Is there a P for every QRS and vice versa?
4) If an irregularity or arrhythmia is identified, is it supraventricular or ventricular in origin?

COMMON ECG FINDINGS
Examples will be provided and therapeutic recommendations (when indicated) will be discussed for the following:
Normal Sinus Rhythm, Respiratory Sinus Arrhythmia, Wandering Sinus Pacemaker
Atrioventricular Blocks (1°, 2°, 3°)
Sinus Pause with Ventricular escapes
Supraventricular Premature Complexes, Supraventricular Tachycardia, Atrial Fibrillation
Ventricular Premature Complexes - differentiate Escape beats and VPC’s
Ventricular Tachycardia

This lecture will focus on simple, specific approach to evaluating electrocardiograms.

REFERENCES