

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Introduction to the ECG

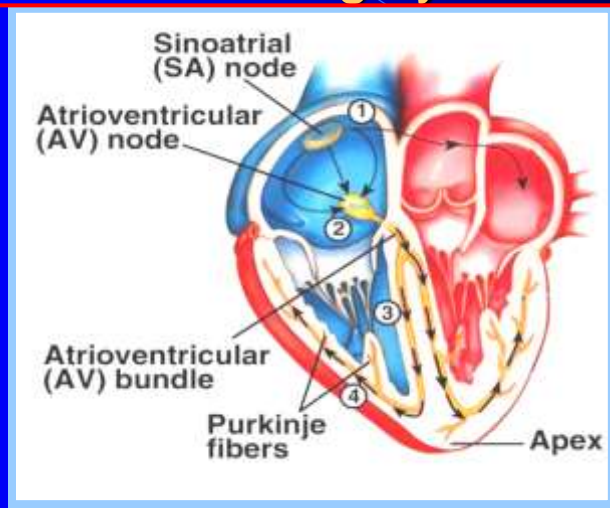
By
Mahmoud Sakr

What is the ECG?

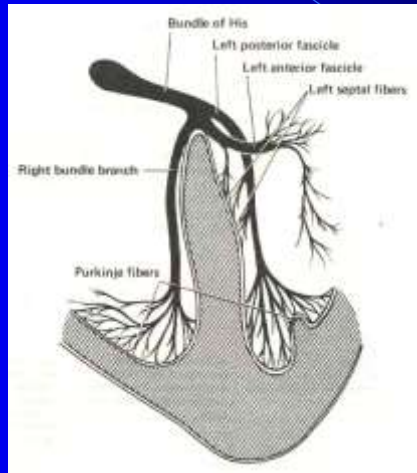
ECG: Electrocardiography •

- The ECG is a record of the electric events (i.e. the potential changes) that occur in the cardiac muscle during the cardiac cycle. •
- The electrocardiograph : Machine •
(Galvanometer and Amplifier).
- The ECG Paper: Boxes (Vertically: Amount of electrical potential, Horizontally: Time) •

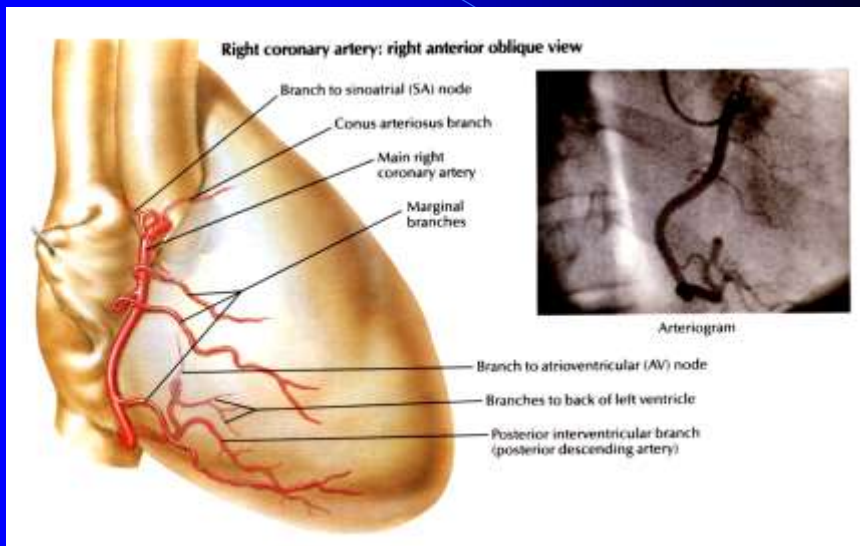
The Conducting system . . .



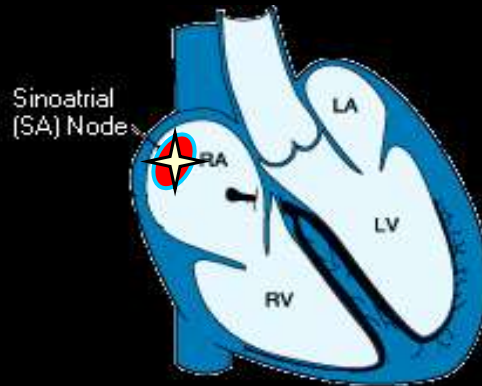
The Conducting System



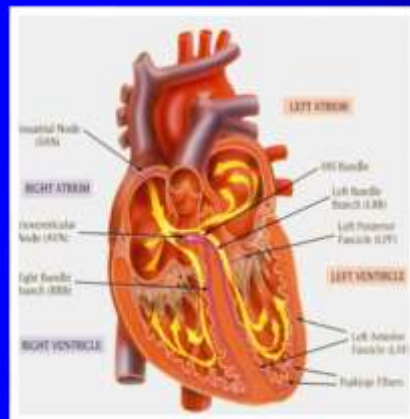
Blood Supply



Normal Sinus Rhythm



Circulatory & conduction system





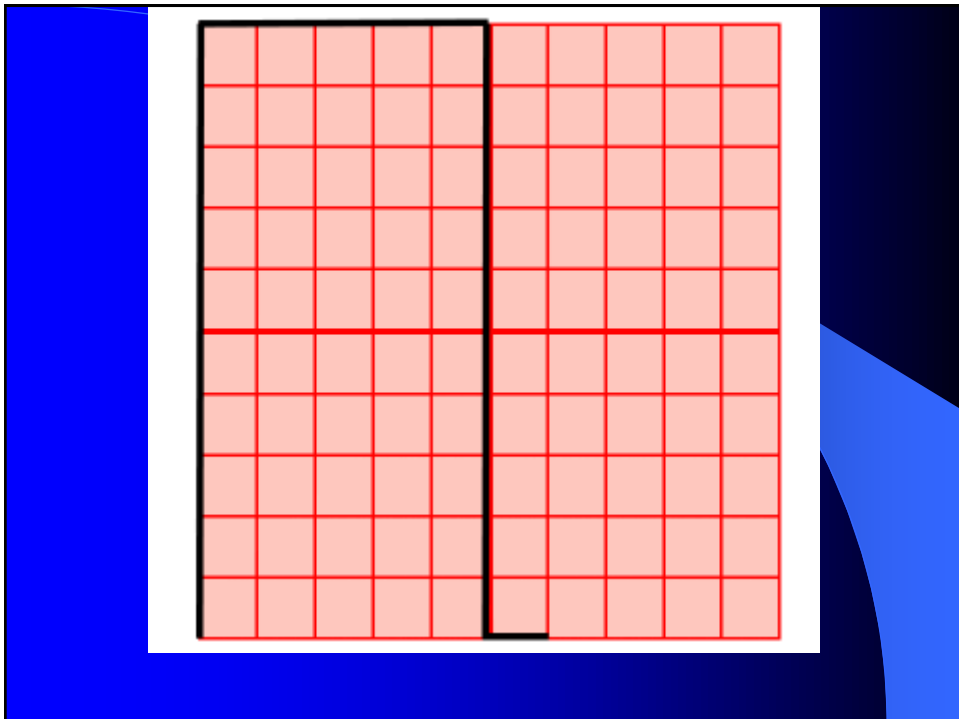
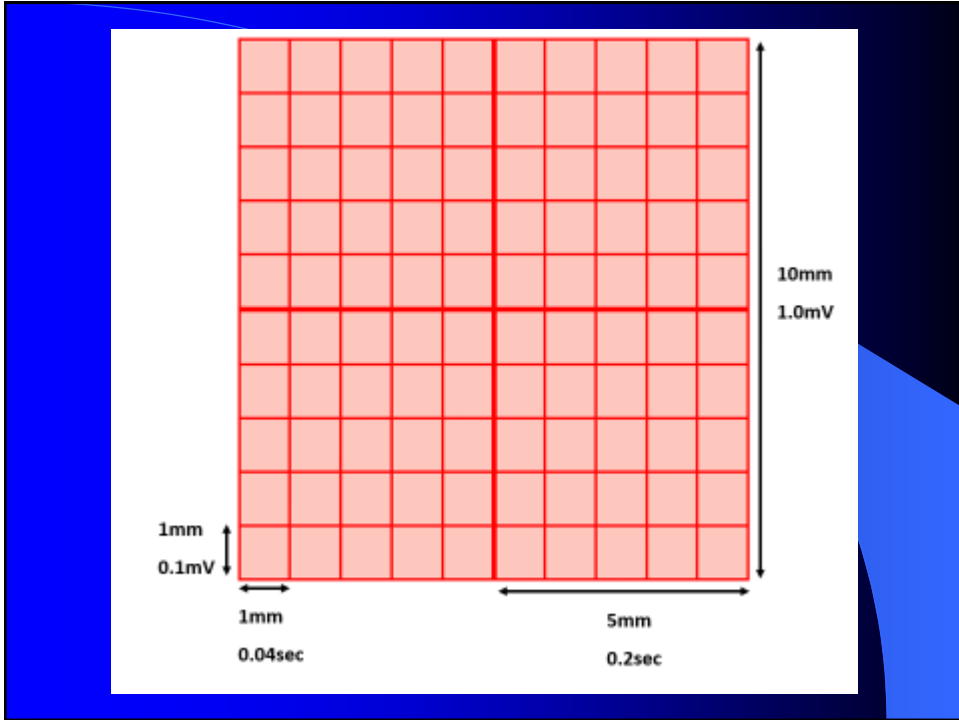
What we need ? (To describe this event adequately).

Calibration of the electrocardiogram: ●

- Timing: The standard recording speed of ●
the paper is 25 mm/sec.

- Voltage (Amplitude): ●

The usual voltage calibration is 1 mV=10 ●
mm



The ECG leads

- Bipolar leads: Standard limb leads. ●

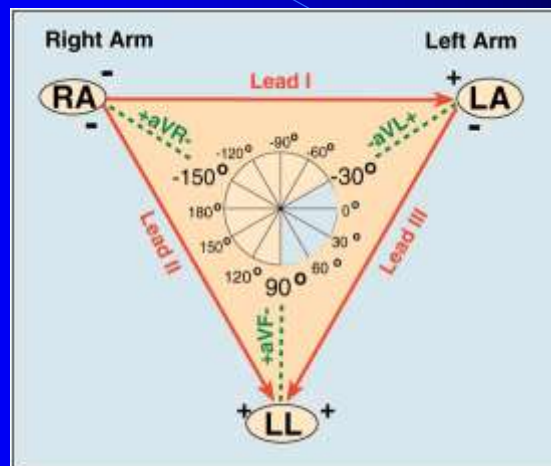
Bipolar: ●

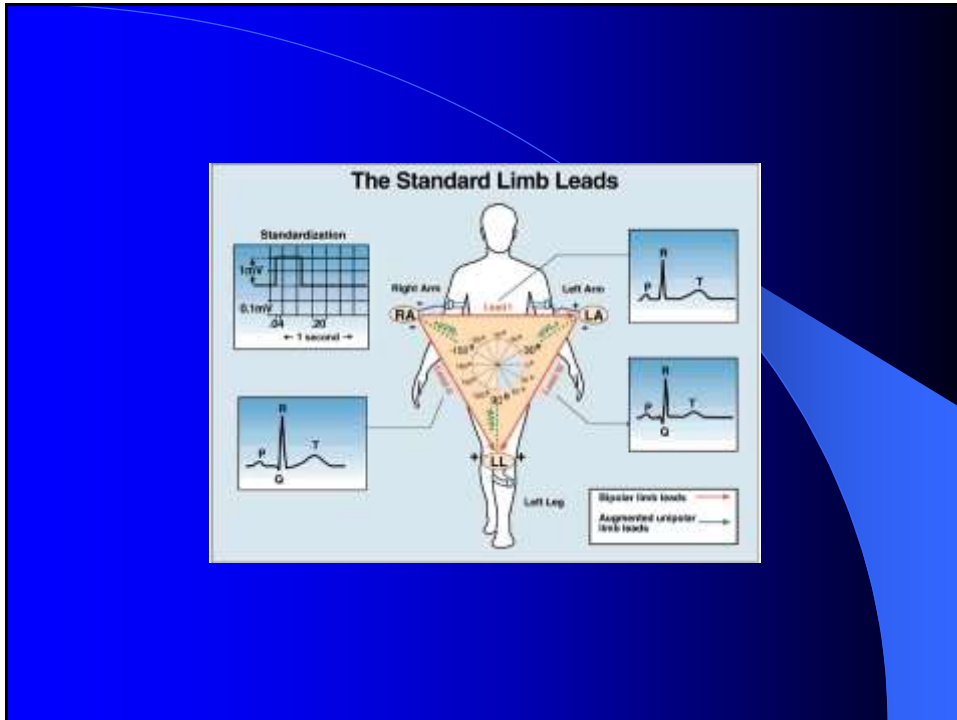
Measure the potential between two points. ●

Lead I: +ve electrode LA, -ve RA ●

Lead II: +ve LL, -ve RA ●

Lead III: +ve LL, -ve LA ●





- Unipolar leads: ●
- Unipolar measure the actual potential at a ●
- certain point.
- 1- Unipolar limb leads: ●
- aVR: +ve electrode RA ●
- aVL: +ve electrode LA ●
- aVF: +ve electrode LL ●

2- Unipolar chest leads: •

V1: The 4th intercostal space to the right of the sternum. •

V2: The 4th intercostal space to the left of the sternum. •

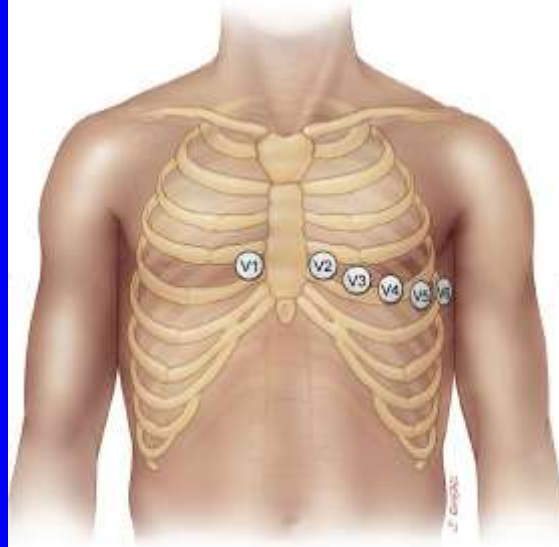
V3: Midway between V2 and V4 •

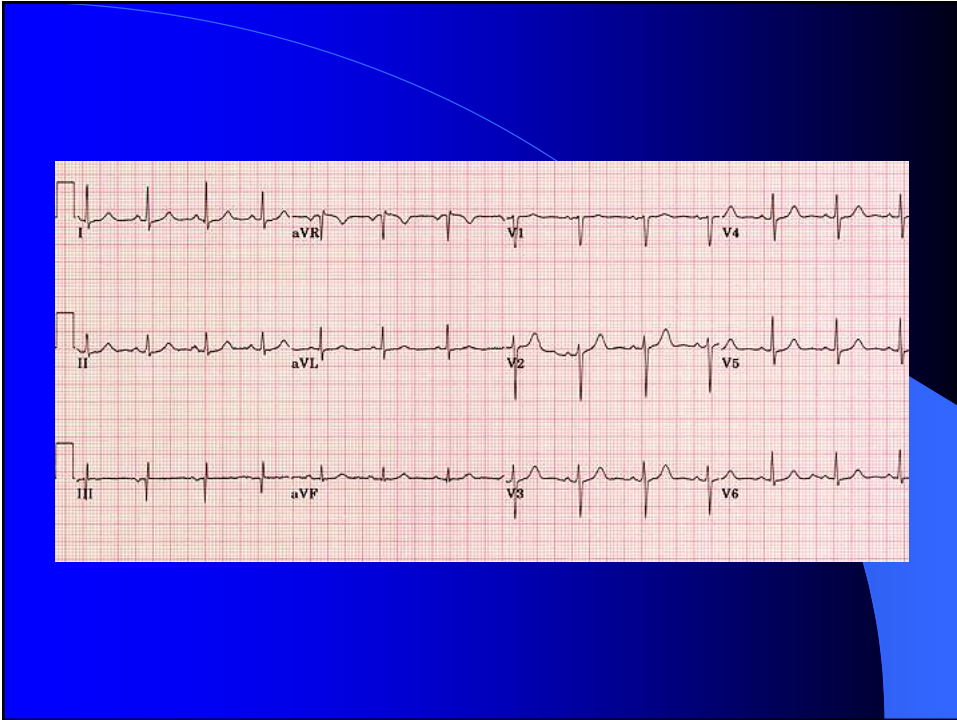
V4: Fifth left intercostal space in the midclavicular line •

V5: Fifth left intercostal space in the anterior axillary line. •

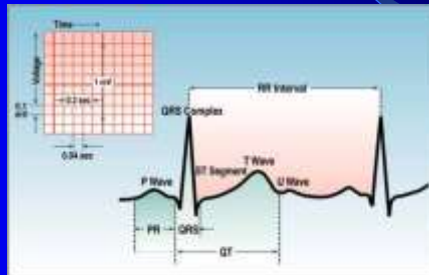
V6: Fifth left intercostal space to the midaxillary line •

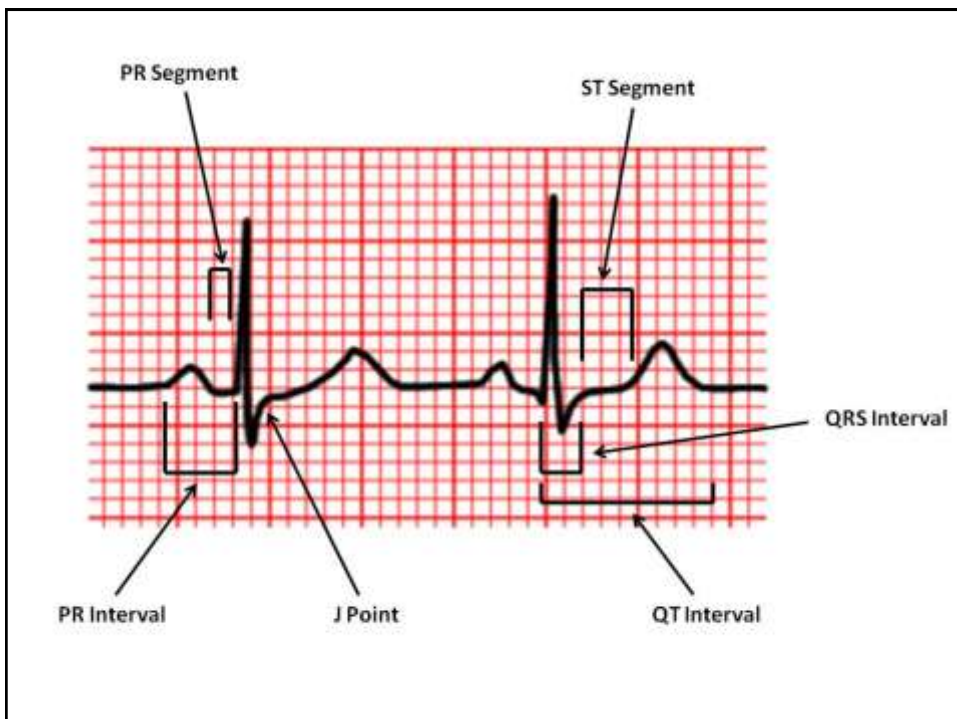
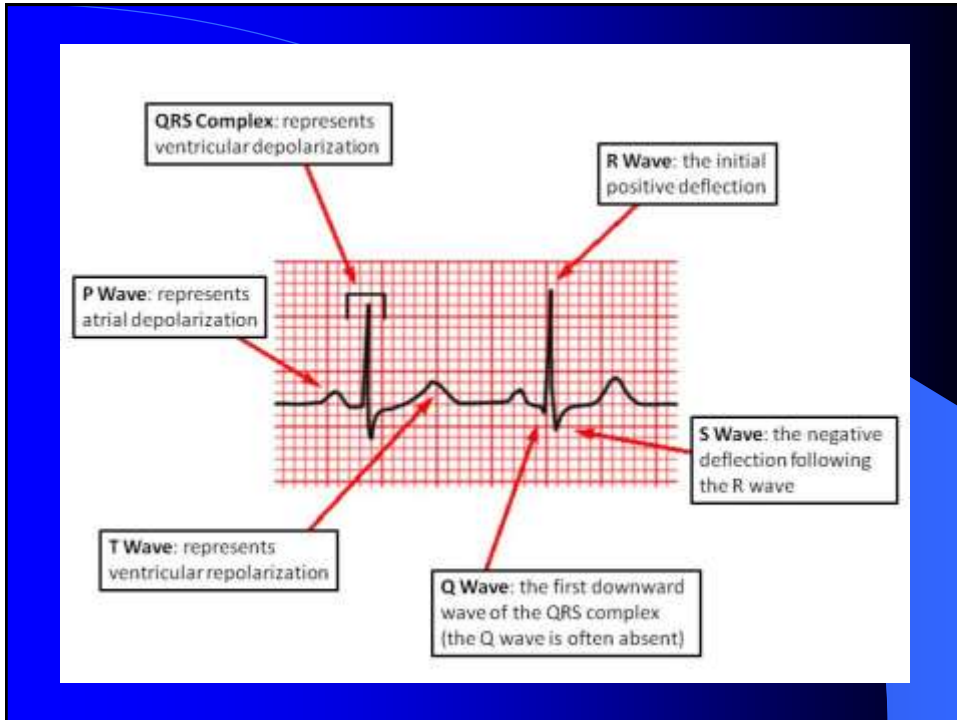
Proper Placement of 6 Chest Leads





How does it appear ?





The normal ECG

- 1- Heart rate ●
- 2- Rhythm (Regular or Irregular) ●
- 3- P wave ●
- 4- PR interval ●
- 5- QRS complex (axis,duration, amplitude) ●
- 6- ST segment ●
- 7- T wave ●
- 8- U wave ●
- 9- QT interval ●

