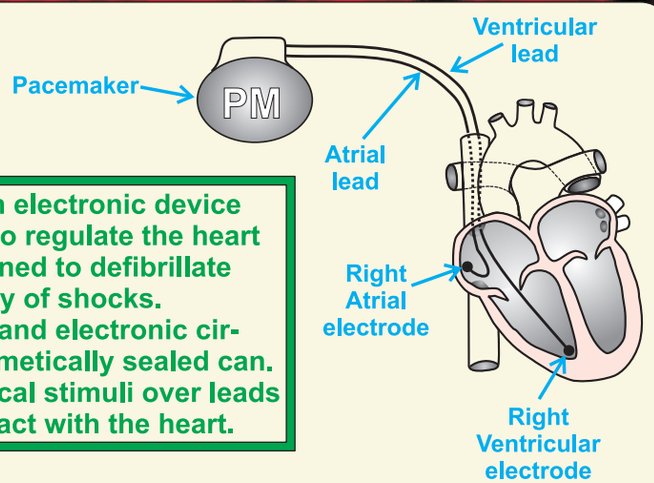
WHAT IS A PACEMAKER ???



A pacemaker (PM) is an electronic device implanted in the body to regulate the heart beat. A PM is not designed to defibrillate the heart by the delivery of shocks.
It consists of a battery and electronic circuits enclosed in a hermetically sealed can. The PM delivers electrical stimuli over leads with electrodes in contact with the heart.

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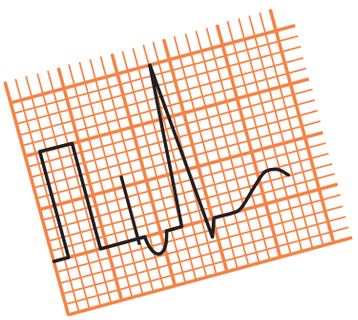
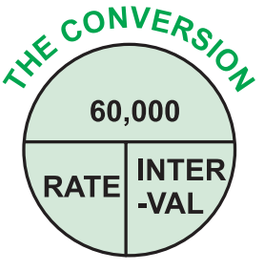
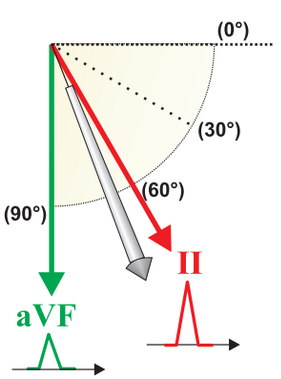
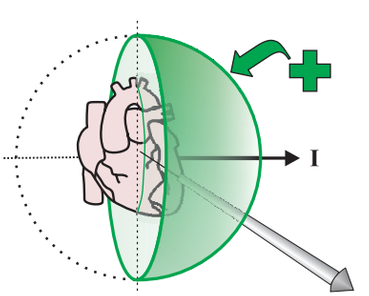




RECORDING PACEMAKER ACTIVITY

* 12-lead ECG during transvenous pacing
* Standard chest electrode positions
* Grid for measuring intervals
* The electrical axis in the frontal plane
* Determination of the mean frontal plane axis 1
* Determination of the mean frontal plane axis 2
* A rule of thumb for the mean frontal plane axis





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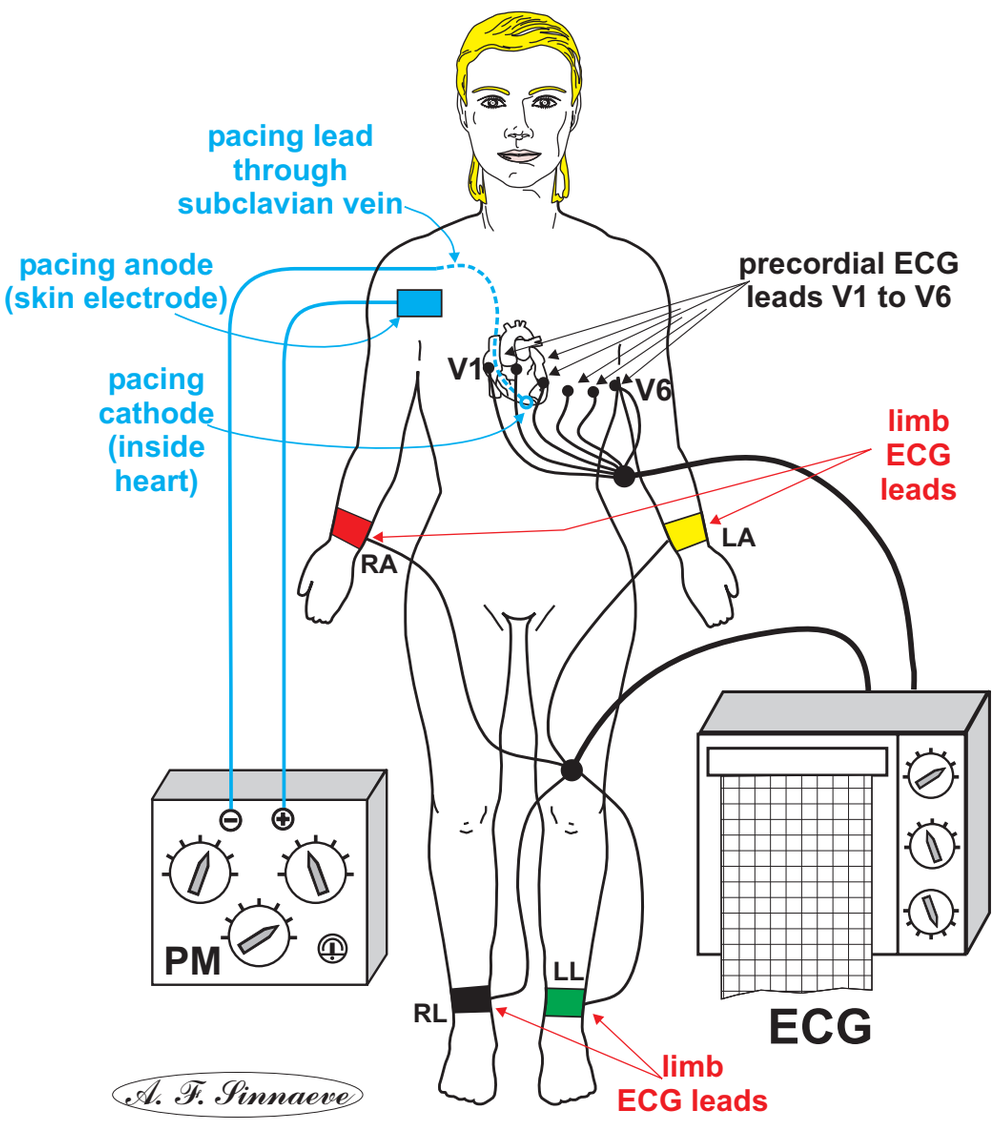
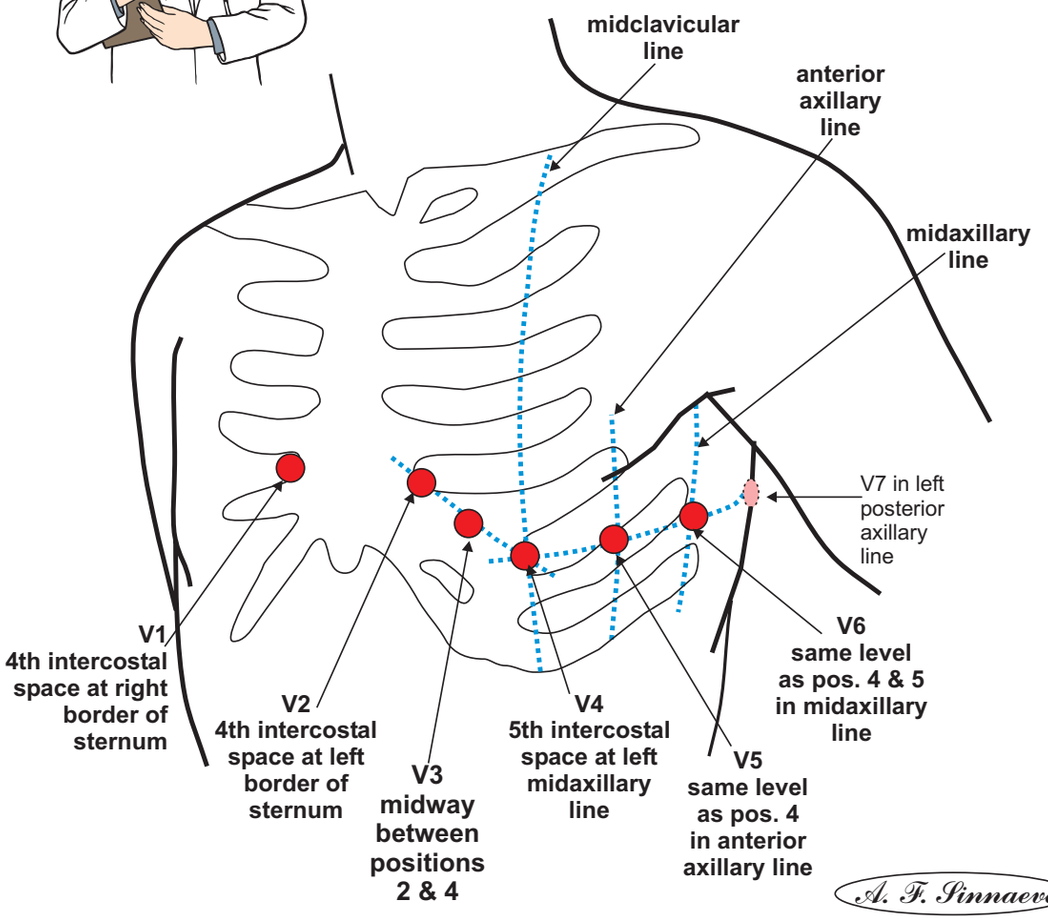
CONFIGURATION OF 12-LEAD ECG DURING TRANSVENOUS PACING



STANDARD CHEST ELECTRODE POSITIONS

The right position of all the electrodes is extremely important !!!



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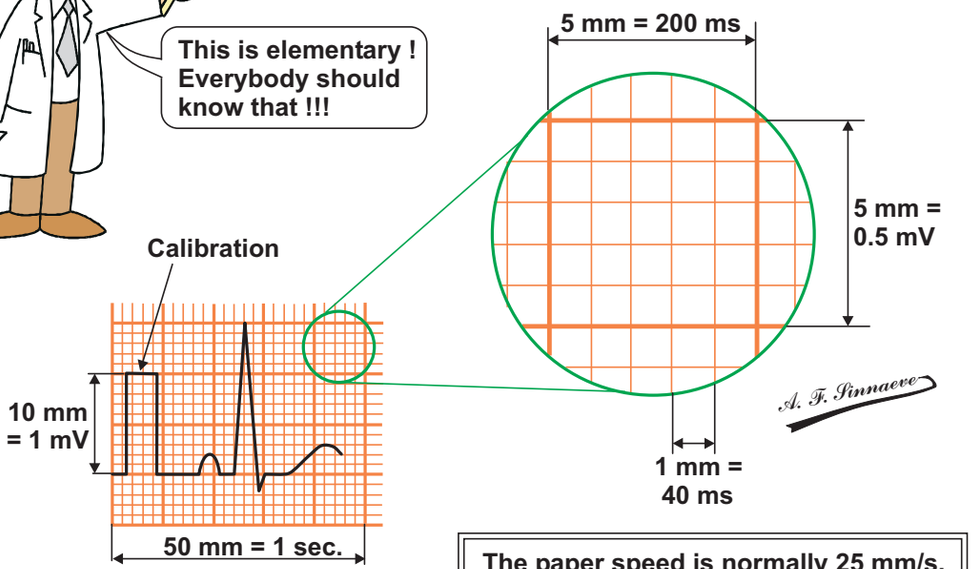
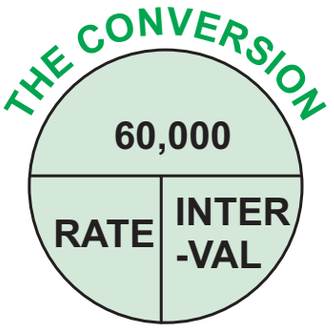
TIMING INTERVALS VERSUS RATE



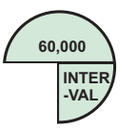
The paper speed is normally 25 mm/s, thus 1 mm on the paper corresponds with 1/25 s = 0.04 s = 40 ms



UNITS OF TIME

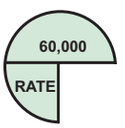
1 minute = 60 seconds
or 1 min = 60 s
1 second = 1,000 milliseconds
or 1 s = 1,000 ms
1 minute = 60,000 milliseconds
or 1 min = 60,000 ms

RATE is expressed in beats per minute or bpm



$$\text{RATE (in bpm)} = \frac{60{,}000}{\text{INTERVAL (in ms)}}$$

The pacemaker rate is the average of several intervals calculated for 1 minute of time



$$\text{INTERVAL (in ms)} = \frac{60{,}000}{\text{RATE (in bpm)}}$$

An interval is the time between two consecutive events, e.g. Vp-Vp or Vs-Vs

Abbreviations : min = minute ; mm = millimeter ; ms = millisecond ; mV = millivolt ; s = second ; Vp = ventricular paced event ; Vs = ventricular sensed event