

Electrocardiography II

Experiment II:

- a) Monitor and record an ECG from 12 leads of your schoolmate.
- b) Observe rate and rhythm changes in the ECG associated with the body position and breathing.

Instrumentation: Electrocardiograph SEIVA PRAKTIK, ECG gel.

Procedure IIb:

1. Make and save consequently the 10-second records of ECG of the volunteer in four conditions (proceed as in the Procedure Ia):
 - **lying down,**
 - **after sitting:** have the subject quickly get up and sit in a chair, with arms relaxed. In order to capture the heart rate variation, it is important that you resume the recording as quickly as possible after the student sits, but avoid capturing motion artefacts,
 - **breathing deeply:** the student is seated (40-60 seconds). After the recording begins, the student should start a series of slow, prolonged breaths, continuing for five cycles,
 - **after exercise:** have the student perform an exercise to elevate heart rate. To capture the heart rate variation, it is important that you resume the recording as quickly as possible after the student has performed exercise, but avoid capturing motion artefacts.
2. Make a printout of the electrocardiograms.
3. Complete Report's Tables with the lesson data indicated.

BPM Results

Calculate the heart rate from the reciprocal (inverse) of the period of the heartbeat for each condition. Convert the heart rate from beats per second to beats per minute:

– Evaluate the time interval between two R waves in two successive QRS complexes. At a chart speed of 25 mm per second, the time interval of 1 mm distance on the graph represents 0.04 second.

– For example, suppose that the time interval from one R wave to the next is exactly 0.8 second. Then the cardiac rate in beats per minute:

$$\frac{1 \text{ beat}}{0.8 \text{ sec}} = \frac{x \text{ beats}}{60 \text{ sec}}$$

$$x = \frac{1 \cdot 60}{0.8} = 75 \text{ beats per min}$$

Note: QT interval corresponds to ventricular systole; the end of T wave to subsequent R wave corresponds to ventricular diastole.