

# Examples of examination methods

Biosignals, by definition, are all signals that can be measured from biological beings.

## Purpose of the examination of biosignals

1. **Information gathering** – measurement of phenomena to understand the state of the system
2. **Diagnosis** – detection of malfunction, pathology or abnormality
3. **Monitoring** – obtain continuous or temporary information about the system's state
4. **Therapy and control** – modify the behaviour of the system and ensure the wanted result
5. **Evaluation** – objective analysis

The differentiation and exact measurement of biosignals is an essential part of patient diagnostics and treatment. Ranging from specific data for the medical specialist to vital general information like heartrate or neurological activity, which is essential to everybody working in medical care.

The electrocardiogram measure the heart's activity. That is, the frequency of the heart's beat. A normal heartbeat would range from approximately 60 to about 100 beats per minute. In cases of malformation, disease or injury of the heart the frequency of the heart beat's declines or increases, thus alarming the treating physician. Sometimes an ECG-image can look normal inspite of a patient's diseased state, so the image should always be considered alongside the patient's other symptoms.

Through popular media most people are familiar only with the ECG as the most important means of measuring and judging the state of a patient. Yet there is another important means of measuring a patients biosignals, that is frequently neglected within these stereotypes. The electroencephalogram measures the pattern of electronical signals measured by the brain (specifically the encephalon). Although one the of the main afflictions this machine can diagnose is epilepsy, it also can be used to diagnose dementia, head injuries and even brain tumor.

## Sampling of signals

### Example:

EEG shows sine-shaped wavesignals that occur at a rate of 30 per second (--> frequenzies up to 30 Hz)

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