**What is an ECG?**

An ECG is a test in which the cardiac cycle, the so-called heartbeat, is measured. The heartbeat is triggered by an electrical excitation that is formed and spreads in the heart itself. This weak electric current in the ECG is measured via electrodes on the limbs or the chest. Depending on how the ECG electrodes are polarized, a distinction is made between bipolar and unipolar leads: A unipolar lead is a positive electrode with a neutral reference point. In contrast, electrodes with opposite polarity represent the bipolar lead.

The classic ECG is performed on a lying, relaxed patient and is therefore referred to as resting ECG. This is in contrast to the exercise stress test, where the ECG lead is recorded on the patient during physical exertion - for example on a treadmill.

**Impulse formation and conduction within the heart**

The heartbeat comes about through a special stimulus generation and control system: It begins with an electrical impulse in the so-called sinoatrial node, an area in the right atrium of the heart, which sets the pace, so to say. That is why the sinoatrial node is also called the pacemaker of the heart. The impulse from the sinoatrial node is transmitted to the entire muscle tissue of the two atria, which contract and press the blood into the ventricles.

Then the electrical impulse reaches the so-called AV node, which transmits the electrical stimulus from the atria to the heart chambers. These then contract and transport the blood into the large vessels of the body. As the stimulus spreads in the ventricles, the impulse in the atria recedes, the muscle tissue relaxes and the atria refill with blood. After the ventricles have been completely stimulated, the stimulus is completely reduced again and the heartbeat starts all over again.

**ECG leads**

In a limb ECG, the doctor places three electrodes to the patient's body, which is why it is also referred to as 3-lead ECG. The limb leads include the Einthoven's Triangle and the Augmented leads. In contrast to the chest lead, where the doctor uses six different electrodes. This is also known as 6-lead ECG.

In the classic ECG test, the ECG leads of the chest wall and both limbs are combined so that a total of twelve electrodes record the electrical stimuli. Therefore, the standard ECG is called 12-lead ECG.