



FOLLOWING YOUR HEART

Electrocardiography (ECG) is a measure of your heart. Not what it wants, but what it does - by recording and collecting data about the heart's activity we can understand more about both human physiology and emotional arousal.

THE HEART



About the size of **two hands** held together



Approximately **300g** in weight



Beats around **85,000 -115,000** times a day



The heart is a complex but well-studied organ, that keeps our blood oxygenated and our bodies, well, alive. It pumps blood around our lungs and to the rest of our body.

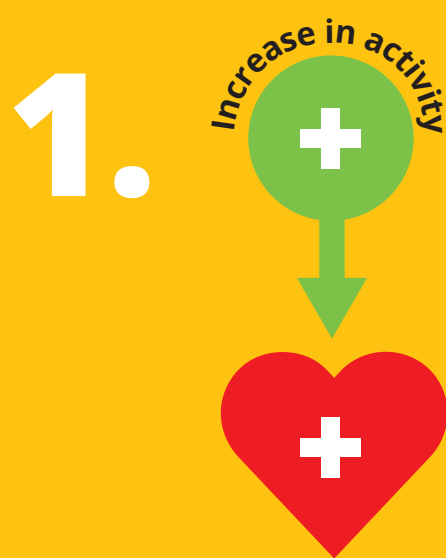
Our heart is intimately tied to how we feel - it influences, and is influenced by, our level of physiological arousal.

2

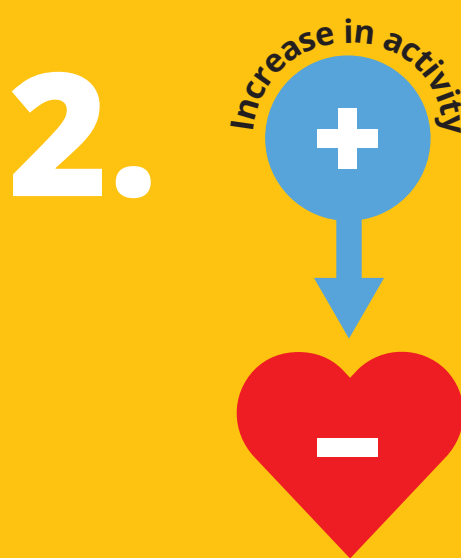
systems work to regulate heart rate:

Sympathetic nervous system

Parasympathetic nervous system



Increases heart rate



Decreases heart rate



The heart's contractions are controlled by the electrical activity of certain nerves.

The increased rate of changes to electrical currents around the heart are reflective of an increased heart rate (and vice versa).



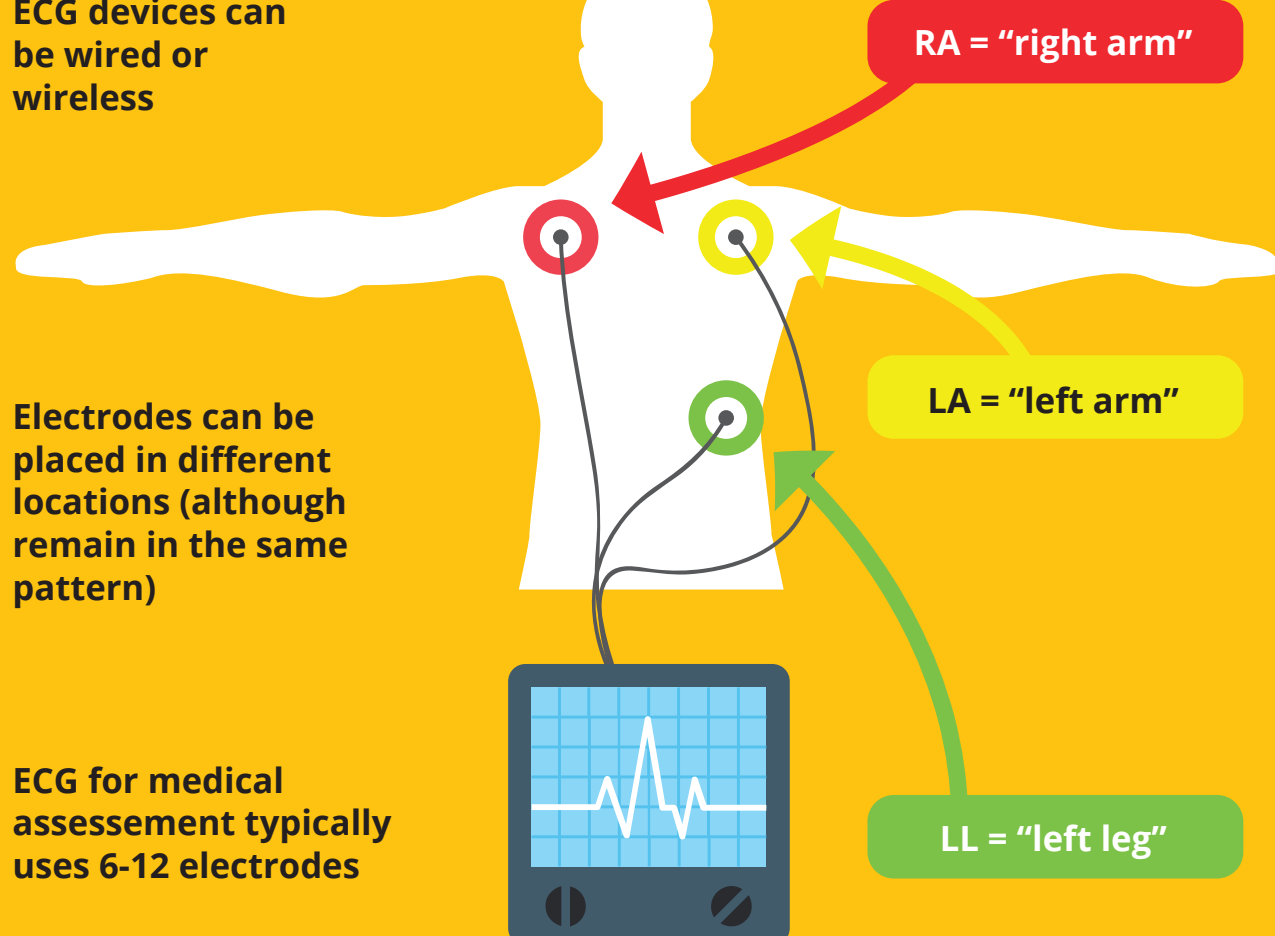
HOW ECG WORKS

Much like other biometric measures, ECG uses electrodes to record internal changes in electrical activity from the surface of the skin.

ECG devices can be wired or wireless

Electrodes can be placed in different locations (although remain in the same pattern)

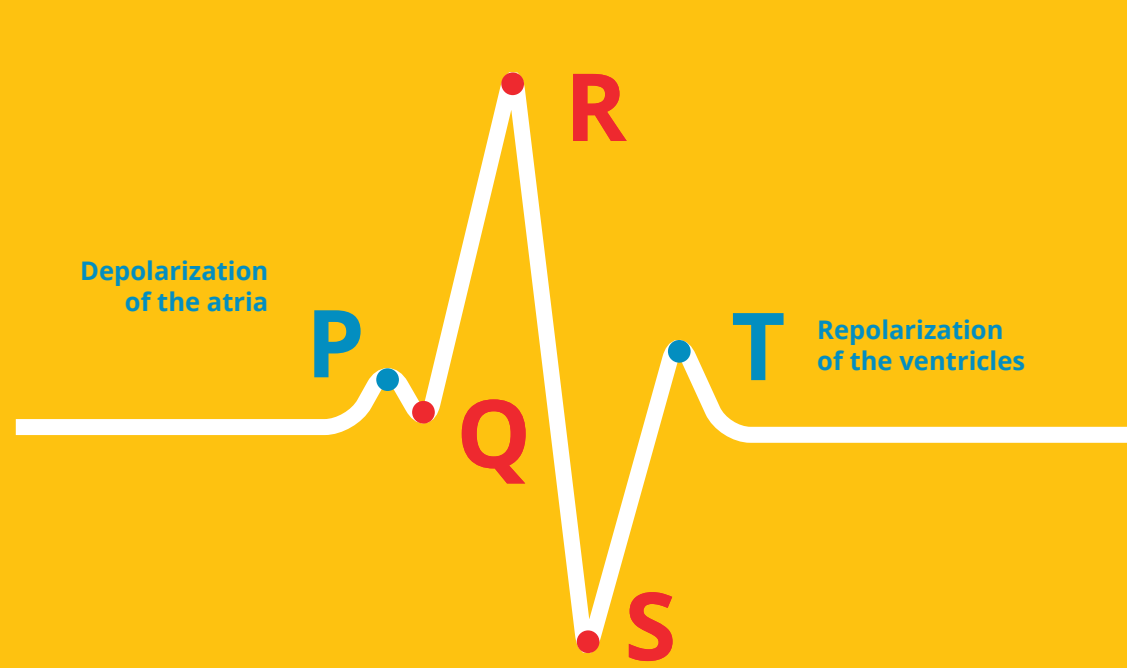
ECG for medical assessment typically uses 6-12 electrodes



The electrical activity tells the story of the heart. Different aspects of the signal mean different things.

WHAT ECG MEASURES

This is a typical ECG signal of a heartbeat. The "QRS" part of the signal shows when the heart ventricles pump the blood outwards.



WHICH ECG DATA TO USE

There are several different ways to measure the activity of the heart. Two of the most common methods are shown below.

HEART RATE (HR)

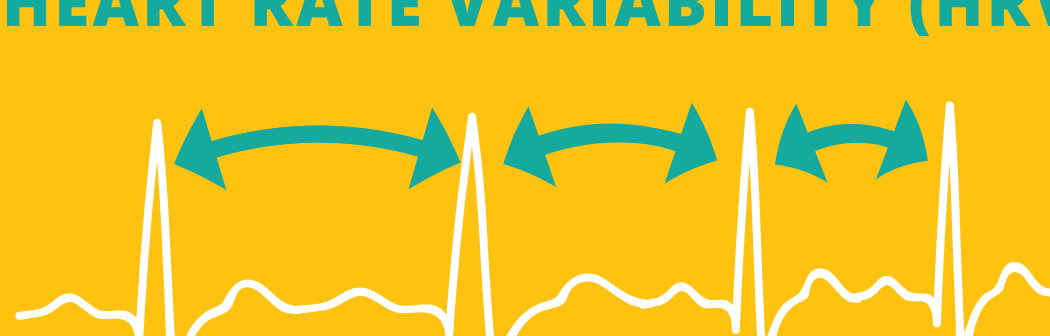


Calculated by the number of heartbeats in a minute.

The heart rate can tell you how physiologically aroused someone is during a task.



HEART RATE VARIABILITY (HRV)



Calculated by how much the time in between heart beats (interbeat-interval) varies.

Decreases in HRV are related to increased physiological arousal.



Increases in HRV can be related to improved stress-coping capabilities, increased self-control, and even better social skills.

TOP APPLICATION AREAS



TIPS FOR GOOD DATA



Don't move the electrode locations



Pretest the setup



Prepare the skin properly



Keep distractions at a minimum



Biometric Research, Simplified



Did this infographic make your heart race?
Get an even closer look at ECG: <https://imotions.com/blog/ecg-emg>