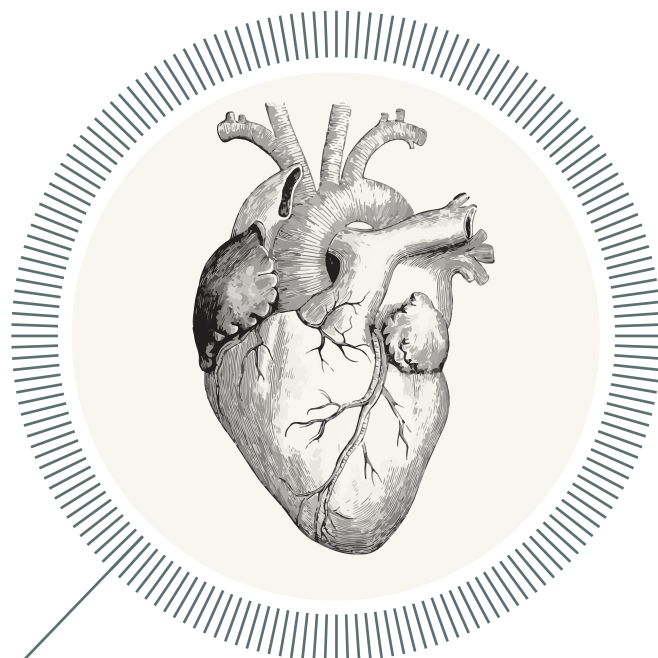


# Gyrocardiography for Heart Disease Detection

Enabling novel digital cardiac biomarkers  
– accessible through a smartphone.



## CLINICAL APPLICATION

Atrial  
Fibrillation

sen% **95**

spe% **96**

Heart  
Failure\*

Soon available

## PERFORMANCE DATA AVAILABLE LATER IN 2023

Coronary Artery Disease\*  
Pulmonary Hypertension\*  
Aortic Stenosis

\* Multi-center studies in USA (Stanford University) and Finland (University Hospitals)

## Why it works

## Measuring the Heart Directly

Measuring heart motion is well established in cardiology. The majority of human heart diseases affect cardiac motion and measuring it can be used to detect signs of several types of heart disease.

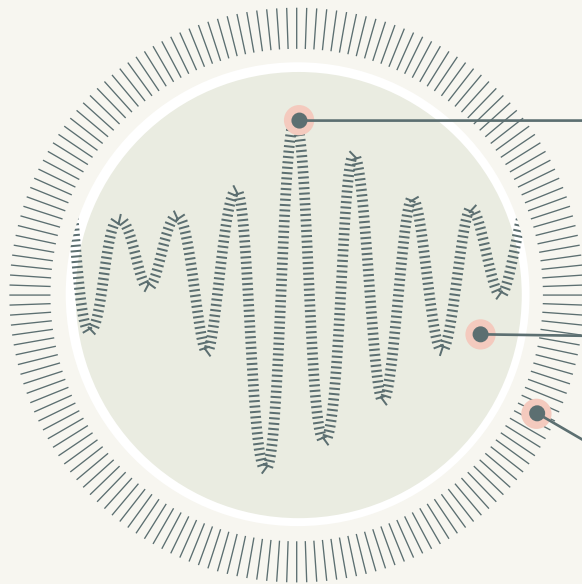


>50%  
of heart motion  
is rotational

### Motion sensors in smartphones

The technology utilizes two sensitive motion sensors – a gyroscope and an accelerometer – which are found in most modern smartphones.

# Software as a Medical Device



## A comprehensive view

A gyroscope and an accelerometer provide 6-channel data. This covers both linear and rotational dimensions and gives a comprehensive view of heart motion.

## Reliability in different populations

Clinical studies include a wide range of body characteristics – BMI, skin color and gender do not affect the signal interpretation.

## Clinically validated

Gyrocardiography has been researched for over a decade and validated in clinical studies in collaboration with academic institutions. The first clinical application available on the market, detecting signs of atrial fibrillation, has been used by more than 150,000 individuals in both clinical and self-monitoring setup.

## WHAT WE CAN SEE

Gyrocardiography combined with a powerful algorithm can provide proven precision on heart assessment.

Irregular rhythm

Abnormal mechanical performance of the myocardium

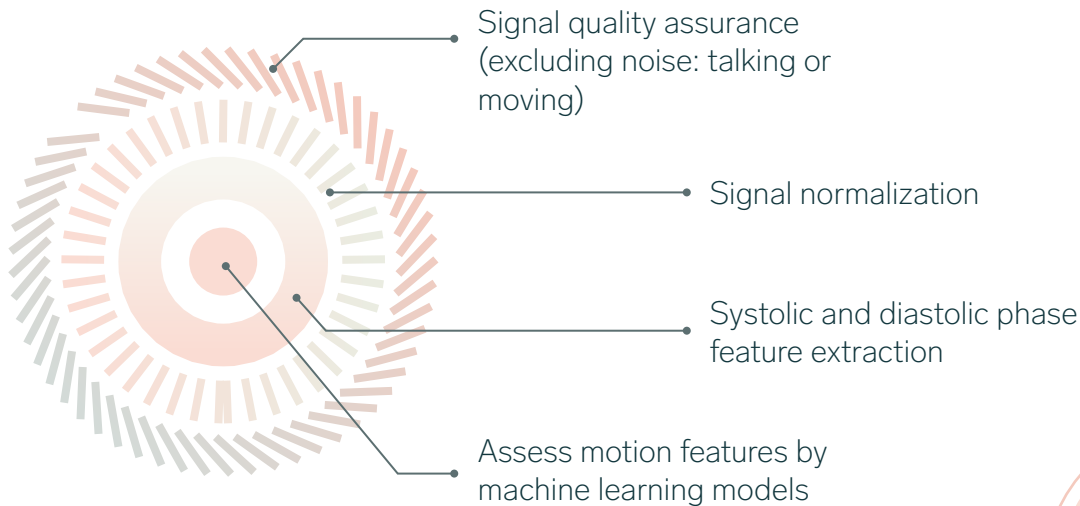
Impaired cardiac function

Abnormal valve operation

Cardiac cycle time intervals (QT time)

20+

peer-reviewed publications\*  
(\*circulation, Scientific Reports, IEEE)



10+  
years of research  
& algorithm  
development

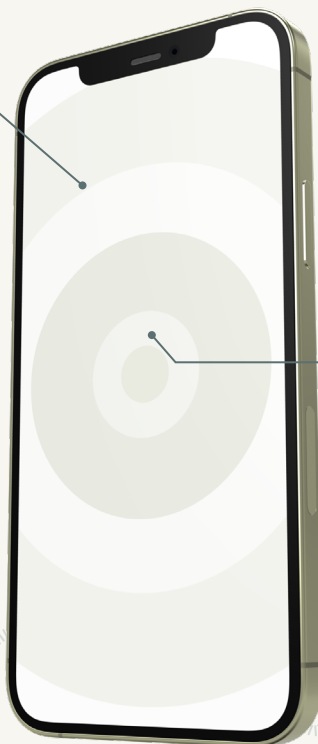
#### What it enables

## Accessible With a Smartphone

Software as a medical device that can be run in any device with the right motion sensors.

- Atrial fibrillation
- Aortic stenosis\*
- Heart failure\*
- Coronary artery disease\*
- Pulmonary hypertension\*
- QT time\*

\* Phase III development



### + Physiology metrics

- ✓ Respiratory rate
- ✓ Heart rate
- ✓ Heart rate variability
- ✓ VO2 max\*

#### RESULTS

Technology accessible to billions of smartphone users – or any device with the right motion sensors.

#### Key literature:

Jafari Tadi, et al. Gyrocardiography: A New Non-invasive Monitoring Method for the Assessment of Cardiac Mechanics and the Estimation of Hemodynamic Variables. Sci Rep 7, 6823 (2017).

Jaakkola et al. Mobile Phone Detection of Atrial Fibrillation Using Mechanocardiography — the MODE-AF Study, Circulation, 2018.

Koivisto T, Lahdenoja O, Hurnanen T, et al. Mobile Phone Mechanocardiography-Based Measurement System Indicating Changes in Heart Failure Patients during Hospital Admission and Discharge, 2022.

Occhetta E, Corbucci G, Bortnik M, et al. Do electrical parameters of the cardiac cycle reflect the corresponding mechanical intervals as the heart rate changes?. Europace. 2010;12(6):830-834.