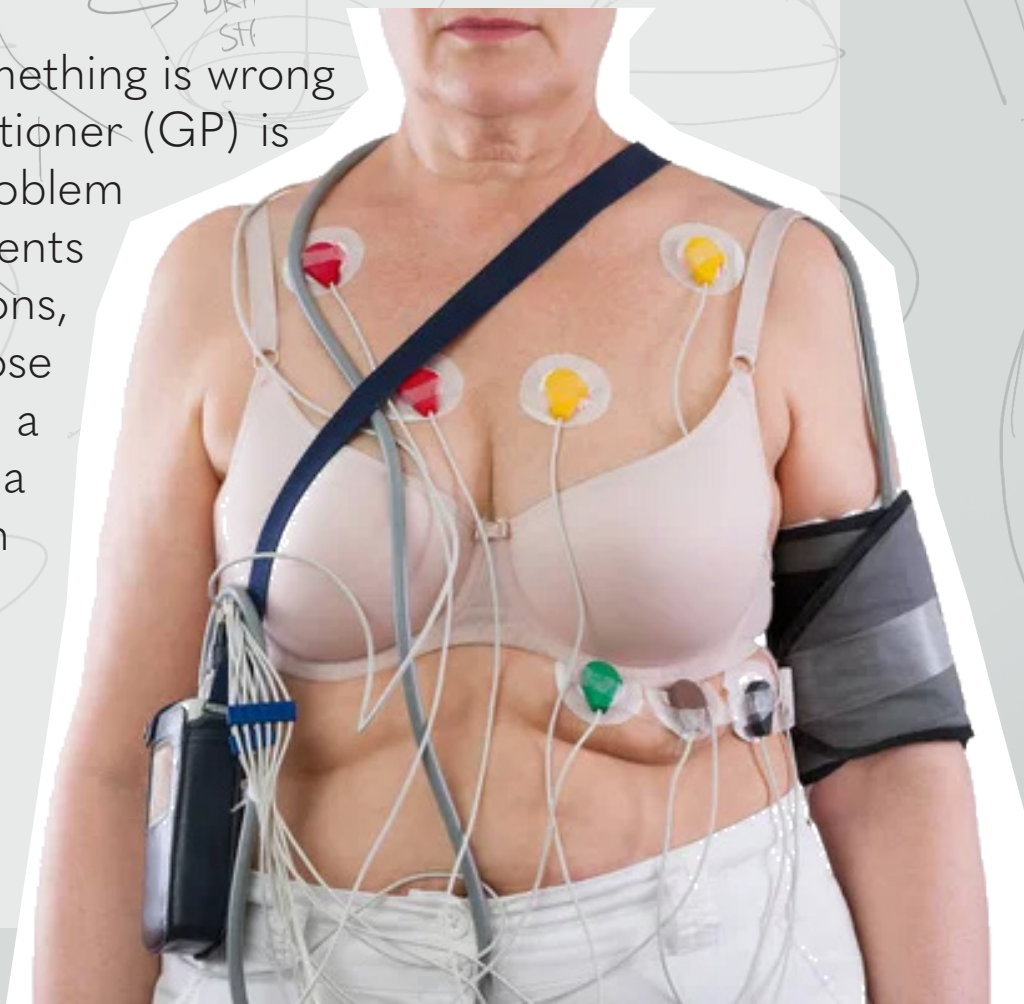


# THE PROBLEM

Cardiovascular diseases (CVDs) are the leading cause of death globally with 33% (Dattani et al., 2023). Unfortunately, cardiovascular **research has been primarily performed on men** over the centuries (Wittekoek, 2017). Something else that doesn't help is that cardiac analysis and -monitoring systems are **predominantly designed with male physiology** in mind (Market Analysis, 2024). This gap in care calls for **a solution that is inclusive, user-friendly, and effective for all users, regardless of gender.**

Whenever someone suspects something is wrong with their heart, a general practitioner (GP) is consulted. Yet here, another problem arises. GPs often encounter patients with symptoms like palpitations, dizziness, or fatigue. To disclose whether the patient could have a suspected intermittent arrhythmia **long-term ECG tracking** is often needed. However, as traditional ECG Holters are typically worn for only 24 to 72 hours, most of the conditions mentioned may not be detectable with such short-term ECG monitoring.



# THE SOLUTION

The company Diplora B.V. aims to address this need by developing an intelligent **AI-driven ECG system** where a sensor continuously collects 3-lead ECG input and reconstructs a 12-lead ECG for deeper clinical insights. By **streamlining arrhythmia detection** and providing actionable, real-time insights, the system empowers GPs and intermediate care providers to make confident, informed decisions regarding treatment or specialist referral. This innovation improves diagnostic accuracy, enhances early intervention, and contributes to better patient outcomes. To **embody this AI system**, and to **redesign the traditional ECG Holter**, the project focused on three goals:

Redesigning a wearable ECG device, prioritising user confidence, optimised for a reusable, two-week wearing period

DESIGN GOAL

Optimise the overall interaction of the app & process of application of the device and patch.

SIDE OBJECTIVE 1

Explore strategies for repair, reuse and recycling and incorporate these findings in the main objective.

SIDE OBJECTIVE 2

# THE EMBODIMENT

The final design integrates all these insights into a solution combined of three main components: **the device, the patch, and the app / manual.** The device features a **durable and waterproof casing**, designed for **comfort and effective placement**. The patch is made from a **Mepitel One-inspired material**, ensuring secure attachment and user comfort. The app provides **intuitive guidance** for the device setup and monitoring, emphasising on confidence and usability. Together, these elements form a system that **addresses both functional and emotional needs.**

See also the physical showcase for the final result.



Megan Seker  
Redesigning Diplora's ECG wearable  
14 March 2025  
DFI

**Committee** Dr. Ir. R.H.M. (Richard) Goossens  
C.P.J.M. (Caroline) Kroon  
**Company** Diplora B.V.  
A.M. (Auke) de Leeuw  
T. (Taco) Kind

