

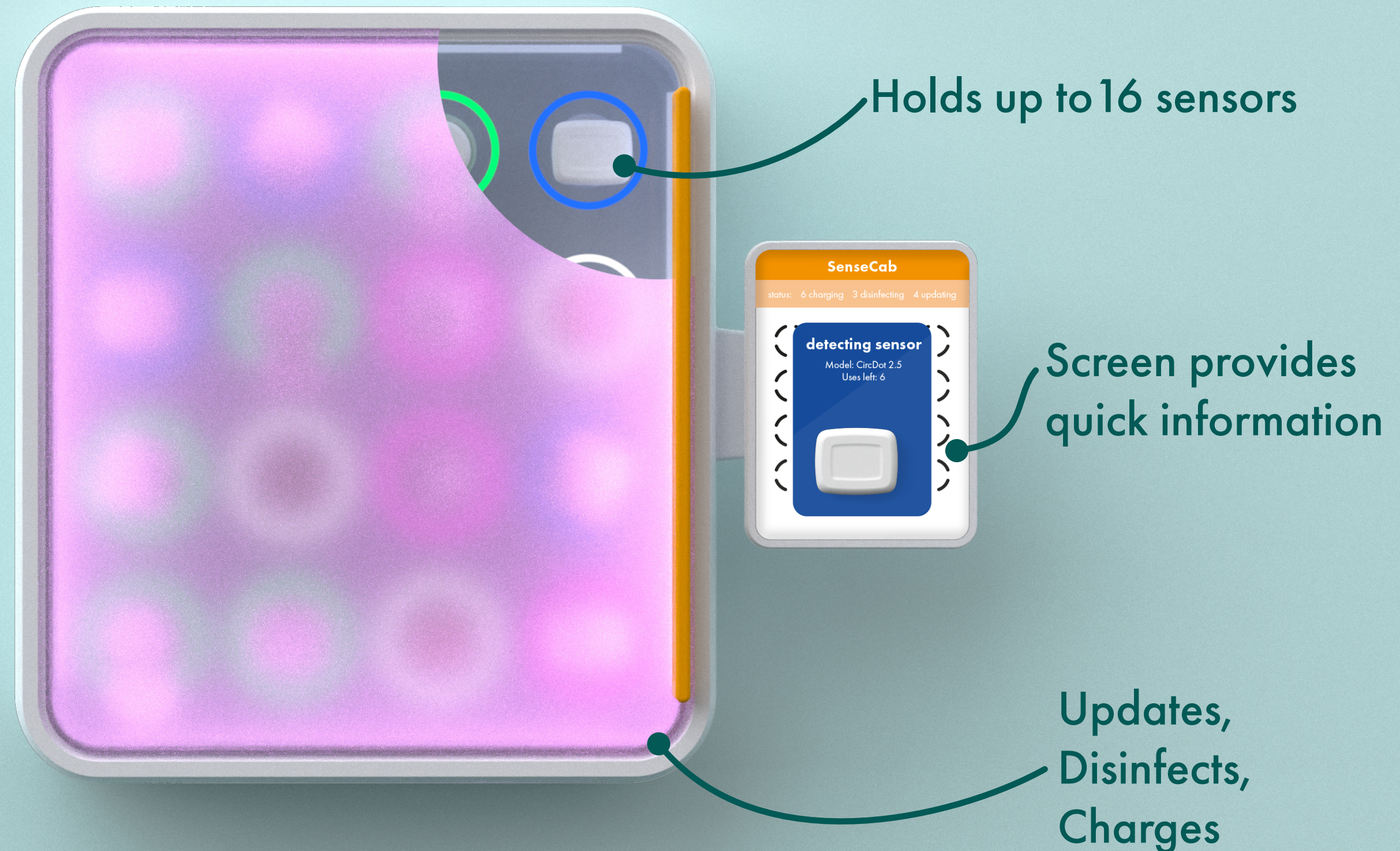
SecondSense

a proposed solution for reprocessing worn medical sensors

Medical wearable sensors are devices used to wirelessly capture bio measurements and transmit them to hospitals. However, many of these devices are still single-use, meaning they are disposed of after use. This thesis proposes a solution, SecondSense, which is a concept product-service-system which allows these sensors to be reused.

SenseCab

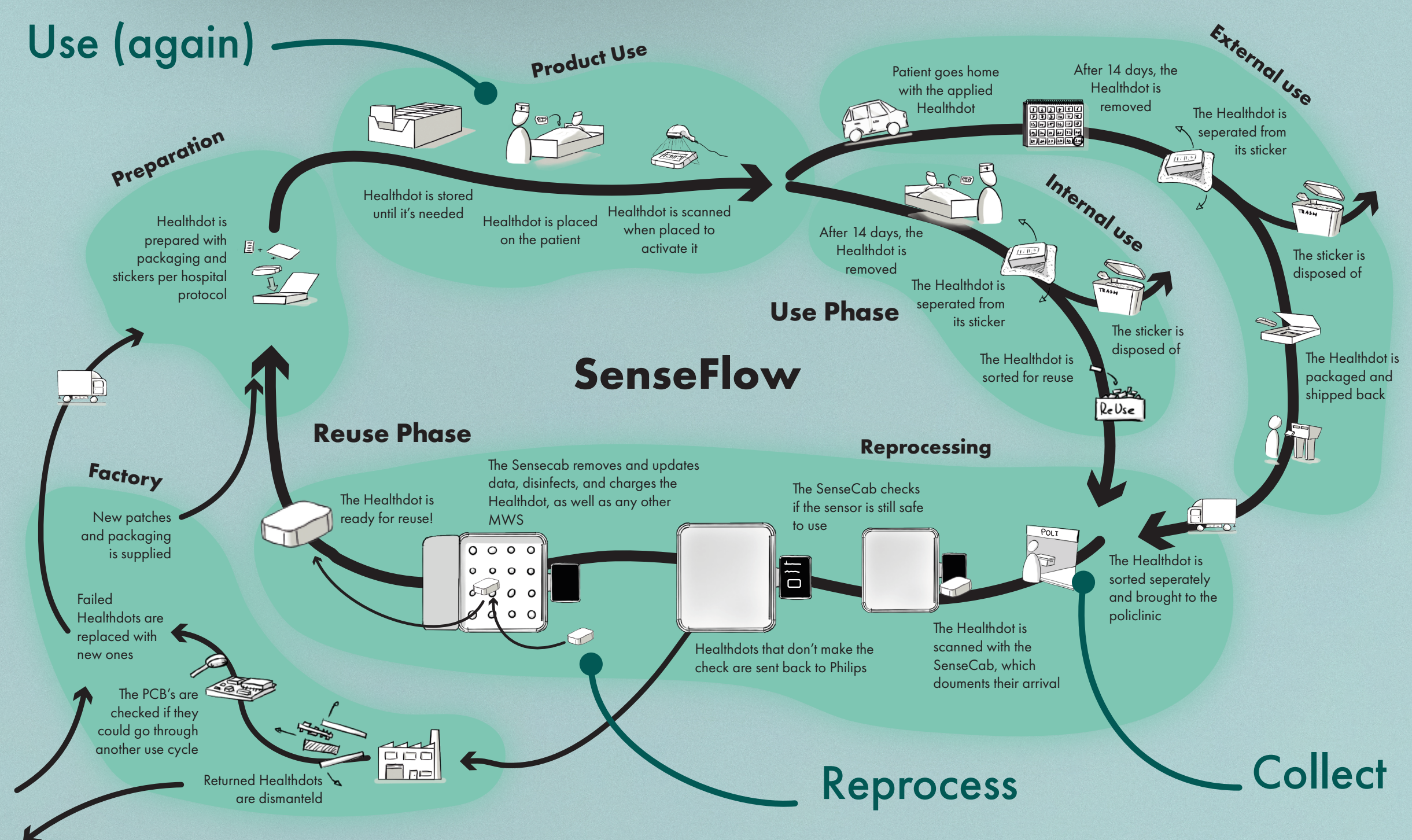
The SenseCab allows easy reprocessing of the sensors. When a sensor returns from a patient, it is placed inside the SenseCab. Here, any personal data is removed from the sensor and it is UV-disinfected and charged. The touchscreen provides information on the sensors inside. The frosted glass door protects the nurses from the UV-rays, and automatically defrosts when the SenseCab is used.



SenseFlow

SenseFlow describes how the sensors are collected and reprocessed after they are used.

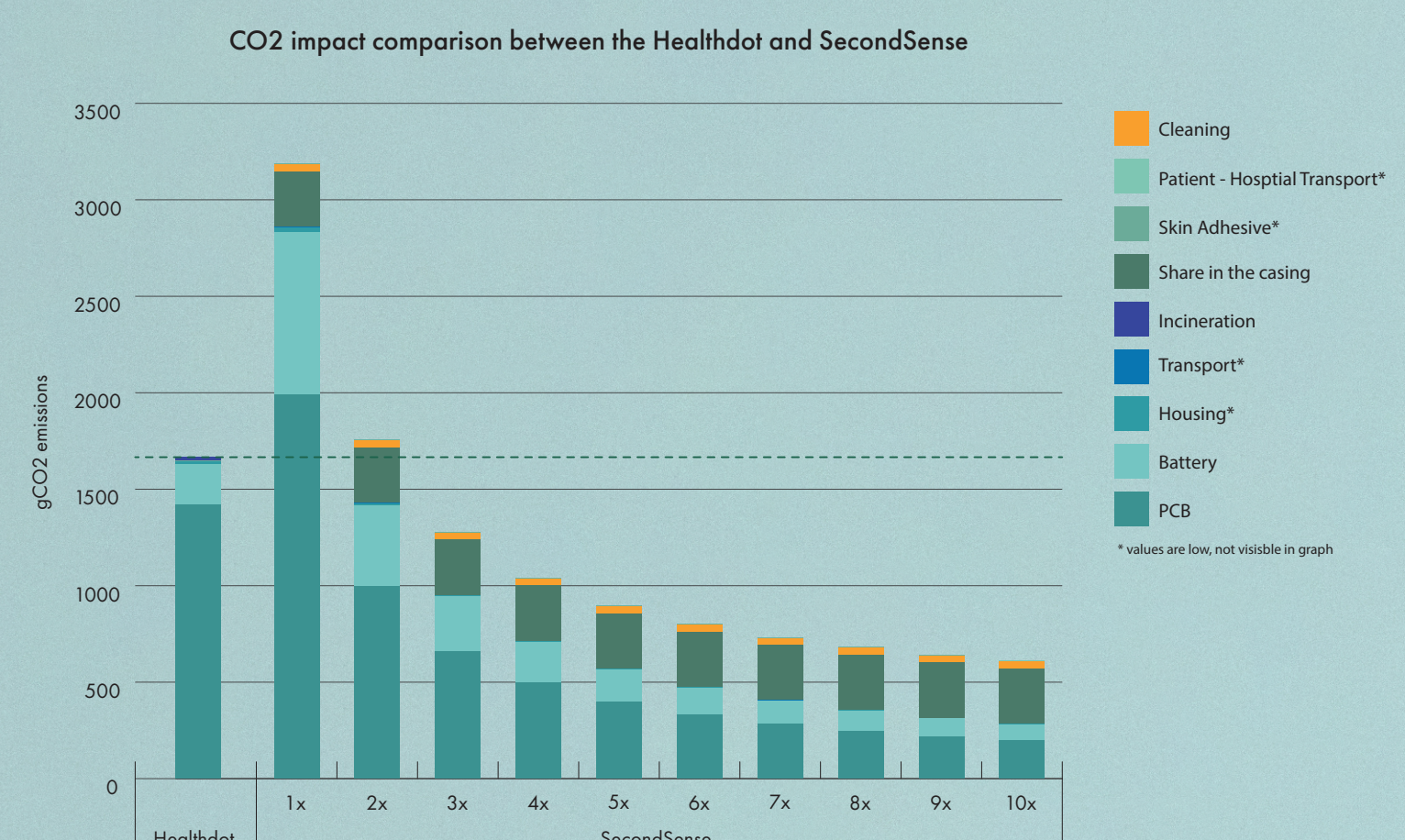
After use, they are collected at the polyclinic. Here, a nurse cleans any dirt and debris of the sensor, after which it is placed in the SenseCab. When the sensor is needed, it is simply taken out of the SenseCab, and applied to the patient.



Life Cycle Analysis

SenseCab was designed based on a case study of the Philips Healthdot, a medical wearable sensor. They are compared in an Life Cycle Analysis, which shows that SecondSense reduces CO2 emissions to 45% after five uses and 60% after ten. The analysis considered a worst-case scenario, with a best-case scenario showing CO2 reductions upwards of 80% after 10 uses.

upwards of
80%
reduction in
CO2



Matthijs Bult

Insights into the circular (re)design

of medical wearable sensors

31-08-2023

MSc Integrated Product Design

Comittee

Ruud van Heur

Tamara Hoveling

**TU Delft**

Faculty of Industrial Design Engineering

Delft University of Technology