

3.1 TRICA study

Roadmap and goal

The TRICA (T^Ransitional CA^Re) study 6 has been part of the peri-operative roadmap managed in the cardiovascular DMT. Its goal was to investigate the possibility to dismiss patients, recovering from bariatric and abdominal surgery, earlier and have them recover at home under remote supervision. TRICA used data from wearables for post-operative monitoring of recovery and potential complications. It is one of the world's first studies of its kind that started in 2018, including 350 bariatric and major abdominal surgery patients.

The Philips Healthdot³, a wearable sensor for patients at home, measuring breathing rate, heartbeat, activity and posture has been developed in close collaboration with the Catharina Hospital. TRICA study was a 350 patient validation study, incorporating infrastructure, devices and analytics, that was setup, executed and concluded within 1 year. The commercial launch has followed less than 18 months later, in the midst of the Corona pandemic.

Over 35 professionals have been collaborating on this subject in the e/MTIC ecosystem, including Philips technical teams, multiple clinical experts from the Catharina hospital and TU/e PhDs. This study has led to the market introduction of the Philips Healthdot in 2021, only 2,5 years after the start of TRICA.

Approach

The study has deployed wearable sensing devices (the Healthdot and smart watches) to continuously collect data such as respiration rate, pulse rate and other relevant data to monitor the recovery of surgery patients at home while being able to detect complications earlier.



Figure 3: Impression of the various activities along the TRICA project, involving 35 scientists, professionals and students

The study preparation started in September 2018 with all stakeholders in the value chain represented and many disciplines such as clinicians, researchers, healthcare economists, technicians and data scientists. This team addressed technical aspects, clinical aspects, data management, METC approval and many more subjects considered important not only for the study itself, but also for a 'fast track' to clinical innovation. The study officially started in May 2019 and lasted one year. During the study period, frequent team meetings took place to monitor the study process, resolve issues and establish a rapid and monitored inclusion.

From June 2019, the TRICA data analysis team held weekly multidisciplinary meetings with 10 experts from Catharina Hospital, TU/e and Philips. These meetings facilitated fast decision making on the re-use of established methods, use of clinical and

"With the Healthdot sensor we can monitor patients recover at home. Patients need to undergo less physical measurements at the bedside, reducing nurses' workload. Through the Healthdot, patients at home and caregivers alike feel reassured, because we can continue to follow the patient's health condition in their home situation. Remote monitoring allows us to more quickly intervene in case of problems."

Dr. Arthur Bouwman, Anaesthesiologist,
Catharina Hospital

contextual information for diagnoses and developing a common language, ensuring an increase of accuracy, speed and impact.

Results

The analysis was finalized by the end of 2020. Already in February 2021, Philips received CE marking of the Healthdot sensor⁴. The certification was prioritized because of its relevance to the COVID-19 pandemic. The first clinical implementation was at the Antonius Zorggroep in Sneek, The Netherlands, exactly for

the purpose of home monitoring of COVID-19 patients. Through broad deployment of the Healthdot following the TRICA study, Philips supports the transition of care from the hospital to the home. The patient's vital signs (breathing rate, heartbeat, activity and posture) are measured every 5 minutes, for 14 days in a row. The Philips IntelliVue Guardian or Engage platforms allow health care professionals to monitor their patients inside and outside the hospital. The patient can thus continue to recover at home under supervision of medical professionals in the regional care network, and caregivers can intervene if the vital signals would give rise to do so.



Figure 4: Patient receives Healthdot sensor



Care giver can monitor patient at home



When needed care giver can respond

³ A practical e/MTIC case - TRICA Study (tue.nl)
⁴ Healthdot sensor voor monitoring op afstand van patiënten - nieuws | Healthdot sensor for remote patient monitoring - News | Philips



Arthur-Bouwman

Prof. dr. Arthur Bouwman, newly appointed professor at the TU/e and Anesthesiologist at the Catharina Hospital indicates the potential impact of the use of Healthdot: “the implementation of the Healthdot could lead to a staggering result of saving the hospital 56% of hospitalization nights.” Although this is very promising, he also mentions that 50% of the target population that was asked to wear the Healthdot refused. An important signal that made him realize that much remains to be done on the quest to standardize this working method.

Foundation for clinical decision

In a traditional care environment, a nurse has to visit a patient approximately three to four times a day to measure and monitor heartbeat, physical activity, breathing, blood pressure, saturation and consciousness. Apart from the number of visits, which is quite intense for both the patient and the nurse, also ‘nurse worry’ about the patient that comes along with these visits contributes as a factor to clinical decisions. Therefore, the peri-operative roadmap features several new objectives.

While the Healthdot in its current form is the balance between low-threshold measurement, convenience for the patient and relevant information monitoring, the incorporation of other vital parameters into Healthdot is still a serious goal. In addition, Arthur and his e/MTIC team are working on text mining of nurse notes with promising results. This new feature should recognize characteristic words in the reports of the nurses in order to ‘read’ their concern about the patient more easily.

Arthur concludes: “e/MTIC catalyses knowledge, ambition, and means to launch healthcare into an effective, efficient, and patient-oriented future. Technology is no longer the limiting factor, but legal and organizational issues are. These are addressed in e/MTIC, a creative, professional playing field in which I, as a healthcare professional, can warm up young TU/e researchers for the clinical world. That makes my day.”