Improving (Shared) Understanding with Hart:

Designing a telemonitoing smart care agent to support patient care in transcatheter aortic valve implantation perioperative journey

Hart, a smart digital care assistant, is a PSS for the adoption of Philips wearable biosensor data in TAVI perioperative patient care. Hart initiating communications on helping patients reflect on their own health situation, building shared knowledge by using patient-shared contextual information with long-term monitoring during physical activities or experience of symptoms.
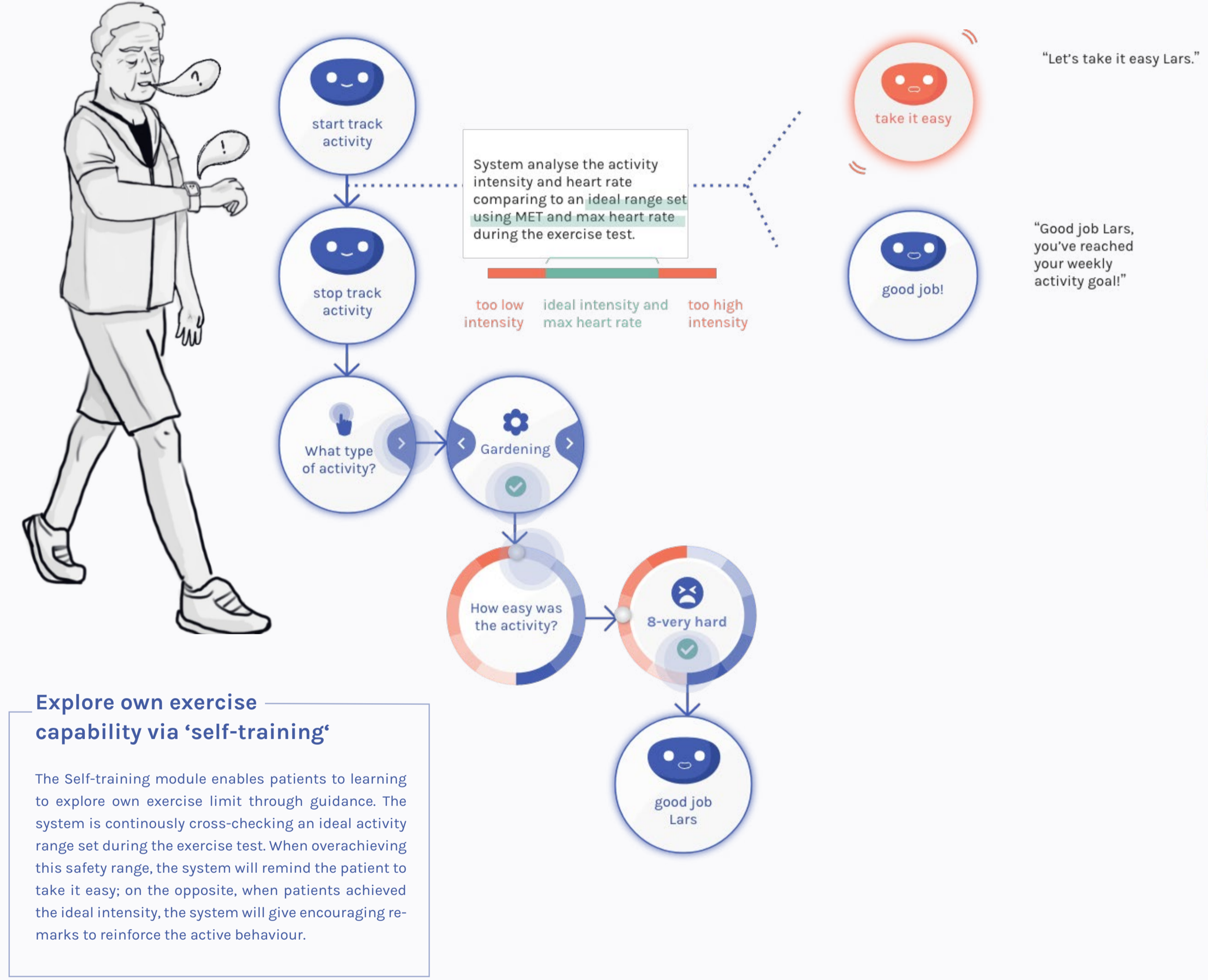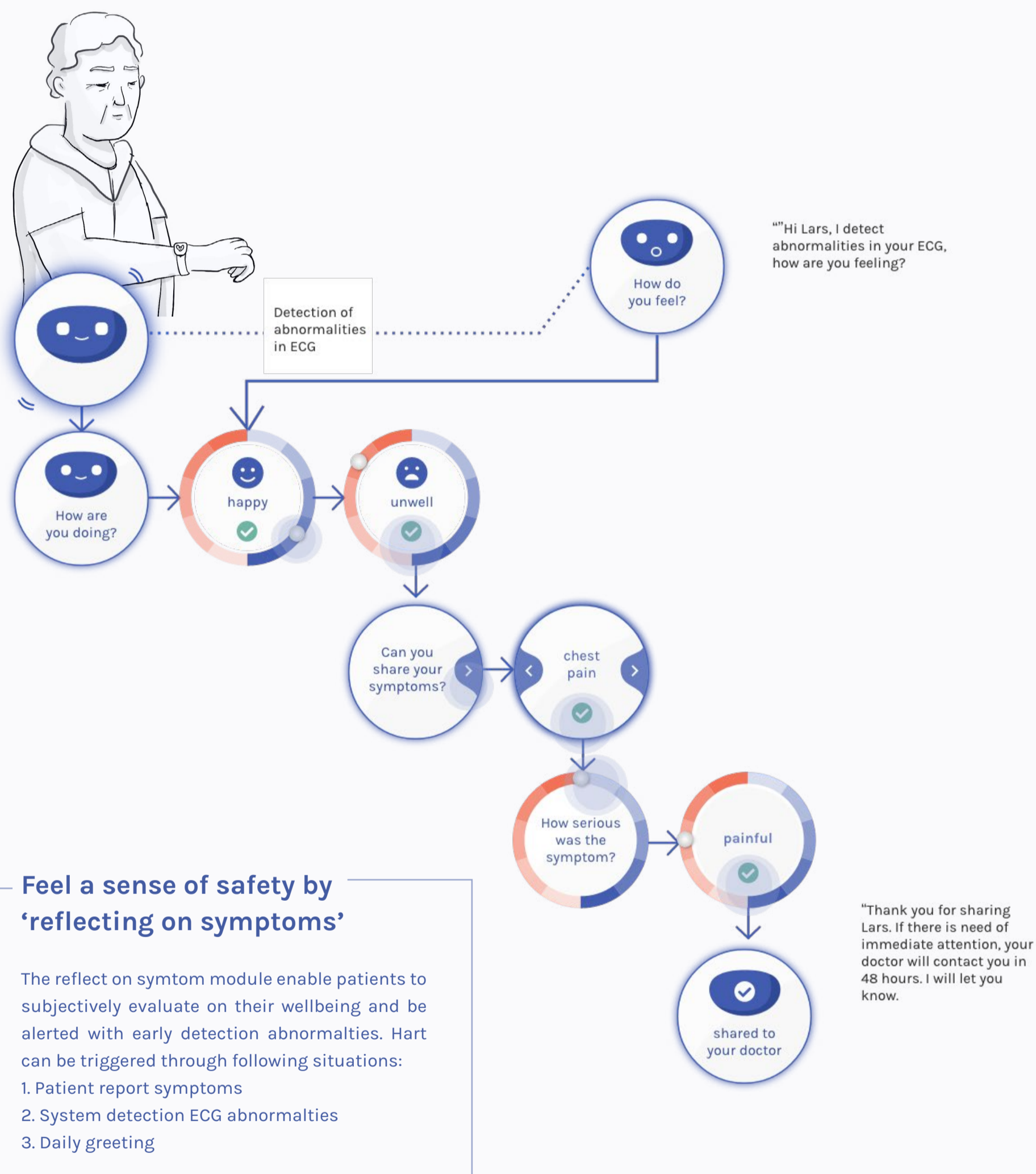
Context

Aortic valve stenosis (AS) is one of the most common and progressive valvular heart diseases in ageing society. According to the European Society of Cardiology (2020), the burden of AS symptoms affects the patient's quality of life and survival. For intermediate or high-risk patients experiencing severe symptoms, they are often suggested TAVI treatment, is a minimally invasive clave replacement surgery. However, TAVI patients are also frailer and with comorbidities, which requires multidisciplinary teams to deliver perioperative patient care.

Problem definition

TAVI patients are also more frail and with comorbidities, which require multidisciplinary teams to deliver perioperative patient care. The problem is defined as when patients step out of hospital, there is a lack of communication in (1) knowing when and what actions to take if complications occur; (2) Knowing how active can and should the patient during home recovering.

Design goal

Improve shared understanding by designing a telemonitoring product-service-system that supports patients and care teams to assess and build a shared knowledge of health conditions out of hospital.

Detection of abnormalities in ECG

"Hi Lars, I detect abnormalities in your ECG, how are you feeling?"

How do you feel?

How are you doing?

happy — unwell

Can you share your symptoms? — chest pain

How serious was the symptom? — painful

"Thank you for sharing Lars. If there is need of immediate attention, your doctor will contact you in 48 hours. I will let you know."

shared to your doctor

Feel a sense of safety by 'reflecting on symptoms'

The reflect on symtom module enable patients to subjectively evaluate on their wellbeing and be alerted with early detection abnormalties. Hart can be triggered through following situations:
1. Patient report symptoms
2. System detection ECG abnormalties
3. Daily greeting

start track activity

stop track activity

System analyse the activity intensity and heart rate comparing to an ideal range set using MET and max heart rate during the exercise test.

too low intensity | ideal intensity and max heart rate | too high intensity

What type of activity? — Gardening

How easy was the activity? — 8-very hard

good job Lars

"Let's take it easy Lars."

take it easy

"Good job Lars, you've reached your weekly activity goal!"

good job!

Explore own exercise capability via 'self-training'

The Self-training module enables patients to learning to explore own exercise limit through guidance. The system is continously cross-checking an ideal activity range set during the exercise test. When overachieving this safety range, the system will remind the patient to take it easy; on the opposite, when patients achieved the ideal intensity, the system will give encouraging remarks to reinforce the active behaviour.

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