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Fig1. Senior patient self-care with the help of a Smartphone.

SmartBEAT

SMART SYSTEM FOR THE MANAGEMENT OF HEART FAILURE IN OLDER ADULTS

SmartBEAT addresses the needs of senior Heart Failure patients and their formal and informal caregivers by offering an integrated solution to leverage patient self-care through autonomous condition monitoring and real-time feedback to their carers.

Context

Heart Failure (HF) is a chronic condition associated with high mortality, morbidity, healthcare costs, and recurrent hospitalizations (which may be as high as 40% within the first 3 months after a hospitalization). Despite recent advances in therapy, patients with HF still suffer from repeated hospitalizations due to the progression of their disease, poor adherence to diet and medical therapy, and limited support.

Hence, HF remains a major public medical and epidemiological problem which carries a heavy economic burden. New strategies to prevent and early detect decompensation and HF related hospitalizations are thus needed. Clinical decompensation can be preceded by changes on several physiological parameters such as heart rate and rhythm, body weight, crackles, and blood pressure.

Monitoring these vital signs may allow an early detection of decompensation episodes, providing a window of opportunity for timely interventions to prevent hospitalization. This can be done through telemonitoring, a tool to improve patient adherence which encompasses the use of recent communication technologies to

Contact

Rua Alfredo Allen, 455
4200-135 Porto, Portugal

+351 220 430 300
info@fraunhofer.pt
www.fraunhofer.pt

Partners

- Fraunhofer Portugal (Coordinator)
 - Portugal
- Centro Hospitalar São João – Portugal
- Faculdade de Medicina da Universidade do Porto – Portugal
- Remedus – Belgium
- Verhaert New Products & Services NV – Belgium
- Seniornett Norge – Norway
- LifeonKey – Israel
- VigiSense S.A.
 - Switzerland
- KempenLIFE – The Netherlands
- Stichting Smart Homes – The Netherlands

monitor patient's physiologic parameters, latter transmitted to the health care provider.

Objectives

The SmartBEAT solution will be a mobile HF telemonitoring kit, which uses communication technologies and sensing devices to remotely monitor several clinical variables of HF patients considered essential by expert cardiologists, such as physical activity levels, weight, blood pressure, pulmonary congestion (identification of crackles), heart rate and rhythm, and therapeutic compliance.

The main aim is to create a user centred, integrated mobile solution to leverage patient self-care. Since many older adults do not recognize the value of self-care and daily condition monitoring, SmartBEAT will also motivate the user through integrated condition validation, tailored interfaces and health status questionnaires.

Another focus of this project is to include support applications for the communication between the patients and both their formal and informal carers. A system intelligence component will be capable of an overall approach where patients and caregivers can define their interests and receive valuable information from several information resources.

Components

The solution will be based on 4 main components:

- Vital Signs System (VSS):
 - encompasses the devices required

for acquiring the user's physiologic data and securely deliver it to the correct endpoint;

- Companion: provides a bridge between the VSS and the remaining components, and acts as a gateway and primary user interface for the patients;
- Inference Unit: is responsible for storing and processing the data obtained with the VSS component – this component contains the system intelligence;
- Caregivers Portal: is a web application serving as the front-end for the formal and informal caregivers, each with different access permissions.

Impact & Benefits

This project is focused on developing useful and realistic services that encourage early discharge and reduce hospital admissions and institutional care. This will optimize quality of HF care, as well as provide an enhanced quality of life for senior HF patients.



Fig2. SmartBEAT logo.

