

## MyHeart

### Fighting Cardiovascular Diseases by Prevention and Early Diagnosis



**Robert is 70 years old. He suffered from two severe heart attacks**, which damaged his heart irrecoverably and **turned him into a chronic heart failure patient**. Last year he started to retain fluid in his body without noticing it, because his heart was too weak to maintain the fluid equilibrium in the body. His shortness of breath and general weakness became so serious that he had to be hospitalised. **After this experience, Robert is very interested in monitoring his disease more closely**. The MyHeart system will enable a physician to **monitor Robert's vital parameters on a daily basis**. Signals will be taken while Robert is sleeping in the bed as well as by letting Robert wear a sensor-equipped shirt during part of the day. The physician can act accordingly and e.g. adapt the medication dose that Robert has to take. This will significantly increase Robert's quality and duration of life and avoid unpleasant and costly hospitalisations.

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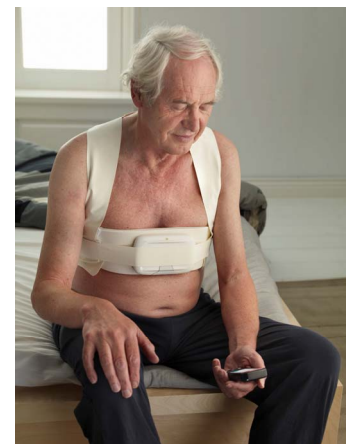
MyHeart has been an FP6 Integrated Project, which developed intelligent systems for the prevention and monitoring of cardiovascular diseases. **The project developed smart electronic and textile systems and appropriate services that empower the users to take control of their own health**. This work is being continued in FP7 in the IP **HeartCycle**<sup>1</sup>.

#### Project description

Cardio-vascular diseases (CVD) are the leading cause of death in developed countries. Roughly 45% of all deaths in the EU are due to cardio-vascular diseases. More than 20% of all European citizens

suffer from a chronic cardio-vascular disease. Europe spends annually several hundred billion Euro on CVD. With the ageing population, it is a challenge to provide the citizens with healthcare at affordable costs.

It has been the aim of the MyHeart project to fight CVD by prevention and early diagnosis. A healthy and preventive lifestyle as well as early diagnosis of heart diseases could save millions of life years annually, reduce the morbidity significantly and,



simultaneously, improve the quality of life of the European citizen. Prevention offers the opportunity to systematically fight the origin of cardio-vascular diseases as well as to improve the medical outcome

after an event. Prevention is therefore believed to be the solution for improving the quality of care for cardio-vascular diseases.

MyHeart has taken a very innovative approach in ensuring the applicability of the project results in the real world. The consortium has started with a set of application ideas and only afterwards investigated the necessary technologies in order to serve these applications. The project started with 16 application ideas at the end of 2003, defined and investigated these concepts in detail, and then carried out a test and interview phase with users as well as medical and business professionals. This process led to a concept selection in mid-2005, during which 4 out

<sup>1</sup> <http://heartcycle.med.auth.gr/>

of the 16 application concepts have been selected for further research and development in the remainder of the project.

The four product concepts have been defined in a way that they cover four different user segments:

- Healthy people
- People at risk
- People after a medical event
- Chronically ill people

The four product concepts that have been defined for these four groups have been:

- "Activity Coach": Making the most of your exercise both in terms of pleasure and health impact, anywhere, anytime.
- "Take Care": Assessing and lowering your risk factors for cardiovascular diseases by vital signs monitoring as well as coaching and motivation.
- "Neuro Rehab": Improving and shortening of the rehabilitation process (motor and cognitive exercises) in the rehabilitation ward and in the patient's home.
- "Heart Failure Management": Improving quality of life and life expectancy of heart failure patients by early prediction and improved patient (self-) management.

In early 2007 the prototypes for the four product concepts have been completed. For three product concepts user validation campaigns have been carried out with 20-40 users each. These real-life studies have given important insights into the usability of the concepts and demonstrated the effectiveness of the solutions.

The system components of the fourth concept, Heart Failure Management, have been CE certified as medical devices in the course of the years 2007 and 2008. With these devices a medical study has been carried out in the years 2008-2010. The objective of the study has been to assess, whether the monitored human vital signs indicated a worsening of the patient's health status prior to a hospitalisation. First study results are promising in this respect. 150 patients have been included in the study at 6 European university hospitals.

For each of the four product concepts, the commercialisation of the results has been started very successfully. Several partners of the "Activity Coach" concept have created the company WearTech, which is commercialising the sensor-equipped garments that have been developed in the

project. The leader of the "Activity Coach", ITACA, has started the company "Soluciones TSB" offering solutions for disease management and healthy lifestyle.

The leader of the "Take Care" concept, Philips, has started a new unit and launched the product "DirectLife", which is exploiting the health coaching concept of MyHeart in the field of daily activity management. The new unit is already employing in the order of 50 people. A similar venture in the field of sleep management is currently under investigation.

The company Dr.Hein is commercialising "Neuro Rehabilitation" modules as part of its Evocare platform in Italy. The partner CEA LETI has created a start-up company MOVEA for the commercialisation of motion detection sensors, which is employing ~50 people.

Philips has recently launched several commercial installations of its MOTIVA disease management solution, in which the results of the "Heart Failure Management" concept are being integrated.

In conclusion, the MyHeart project has been seminal in the e-health development in Europe fostering the creation of a scientific e-health community as well as first, very successful commercial activities.

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**@ a glance:**

- **Partners:** Philips, Medtronic, Vodafone Foundation, Milior, Smartex, Dr.Hein, Medgate, CSEM, CEA-LETI, ETH Zürich, Univ. Pisa, Univ. Madrid, ITACA, CBIM, Politecnico Milano, Univ. Padova, Univ. Firenze, Univ. Clinic Aachen, Hospital Clinico Madrid, FCSR, Fondazione Salvatore Maugeri, Univ. Coimbra, Hospital Coimbra, Univ. Valencia, Lineapiu, Zimmermann, Univ. Clinic Heidelberg, Hospital Murcia, Herz- und Diabeteszentrum Bad-Oeynhausen, Hospital Malaga
- **Duration:** 01/04-12/09
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