

4th Asia-Pacific Global Summit & Expo on

Healthcare

July 18-20, 2016 Brisbane, Australia

The “Preventive Care Infrastructure based On Ubiquitous Sensing” (PRECIOUS): A study of heart rate sensors acceptability in the daily life to prevent diabetes II risks

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The “Preventive Care Infrastructure based On Ubiquitous Sensing” (PRECIOUS) project aims to improve motivation to a healthy life by providing the end-users with a lifestyle dashboard. The system collects information about the user from a variety of devices that measure food intake, physical activity, stress levels and sleep patterns. Links between these key lifestyle aspects are important in delivering an overall picture of the users’ health status. Furthermore, the system and its sensors were designed to be user-friendly and to reduce the burden of recording was possible. In the present study we focus on heart rate sensor and compare the acceptability and usability of the various devices candidates to feed the PRECIOUS system. More precisely, smart-watch, chest-belt and 2-points-electrodes have been tested by users from different categories. Here, a sample of 16 participants with cardiovascular disease and 16 healthy participants composed of students, single workers, family units and retired couples used each kind of heart rate sensor during 24 hours. Each device test leads to consult lifestyle reports about stress, sleep and physical activity. During this experimentation, participants completed different acceptability questionnaires. Results interpretation was performed according to the Technological Acceptance Model (Davis *et al.* 1989) where the acceptability is determined as the relation between the perceived usefulness and the perceived ease of use. Eventually, the findings of this study reveal which sensor is the most acceptable and give insight into how the different devices features influences their respective usability in the daily life.

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Risk prediction and management in cardiac surgery

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The short time outcomes from cardiac surgery have changed dramatically during the last decades. Despite an increasing elderly population and more complex surgery the 30-day mortality has in many institutions been halved the last 10 years, but the one-year mortality remains. Risk prediction systems like the EuroSCORE is a valuable tool in control of the quality of cardiac surgery, but the validity of the risk score for the individual patient may be questioned. Further most scoring systems only take the patients preoperative state and the intended surgery into consideration, and hardly handle the procedure and perioperative complicating factors. Thus we have very poor tools to predict the longer term mortality. The presentation is based on cohort studies of more than 25.000 patients handling and evaluating different factors in an attempt to isolate factors with independent impact on postoperative complications and survival. The studies demonstrate that both co-morbidity and age has great impact on 30-day mortality. In longer time outcomes the impact of co-morbidity seems less, while the impact of age increases together with perioperative intervention I.e. use of inotropes and vasoconstrictors, use of haemostatic drugs and blood transfusion. Except that age in elderly people has an important role in survival the unequal developments in short and longer term mortality are not readily explained.

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