

161 Biosensor in cardiology. T-care project: a preliminary study on innovative wearable non-invasive telemonitoring system

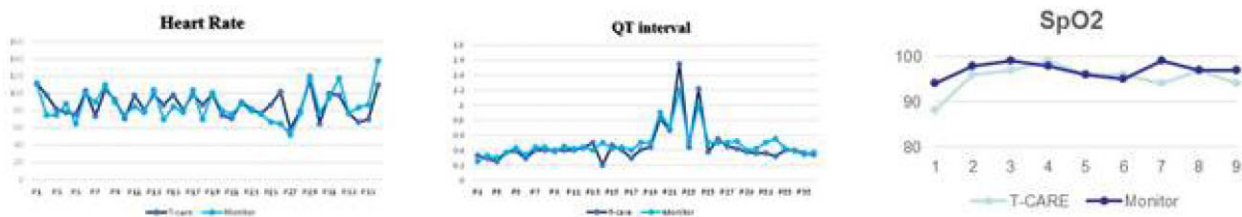
Francesca Amati, Vincenzo Ezio Santobuono, Nicola Bozza, Maria Latorre, Riccardo Memeo, and Stefano Favale
U.O. Cardiologia Universitaria, Policlinico di Bari, Univeristà degli studi di Bari Aldo Moro, Italy

The demographic trend evolution and the modification of health needs highlight the requirement for a novel organization of the healthcare system. Telemedicine is a technological tool that allows a knockdown of geographic barriers being useful in the management of remote patient assistance. Telemedicine is roughly applied in different cardiology’s areas, from telemetric to implantable devices (loop recorders) in order to monitor cardiac rate, cardiac rhythm variations, and the onset of arrhythmic events. The aim of the present study is to assess the validity of wearable devices (T-shirt equipped with biosensors and bands with photoplethimographic system) in monitoring EKG, cardiac rate, and pulse oximetry. We enrolled 38 patients, 25 of whom admitted to the Cardiology Unit, University of Bari. Main characteristics of the sample are listed in Table 1.

The difference between traditional monitoring system and wearable biosensors is not statistically significant as shown in Figure 1; therefore the devices tested in this study show a satisfying level of reliability in monitoring cardiac rate, pulse oximetry, QT interval, QRS complexes, and onset of arrhythmic events. However, alerts produced by arrhythmias different from atrial fibrillation are not completely reliable; moreover, the software and the diagnostic algorithm need to be optimized for motion artefacts. For these reasons, results need to be reproduced on a large cohort of patients.

Table 1 161 Main characteristics of the sample enrolled in T-care project

Mean age	67 years		
Mean EF	45%		
Sexual distribution	71% man	29% woman	
Cardiopathy at the admission to the hospital	47% DCM	38% ischemic	15% other
Dyspnoea	50% NYHA I	29% NYHA II	17% NYHA III 4% NYHA IV



161 Figure 1 Graphic comparison between standard monitoring system and wearable biosensors.