

6th Rembrandt Symposium 2015



Rembrandt Institute for Cardiovascular Science

**NH Conference Centre Leeuwenhorst, Noordwijkerhout
November 20, 2015**



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Symposium Venue

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Abstract no. 97

Vascular Biology

Continuous vital signs monitoring using the VitalConnect MD Healthpatch

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Background

The field of mobile sensor technology is rapidly developing and tools enabling simultaneous monitoring of multiple physiological parameters are emerging. Hence, wearable sensors might be used for quantification of general cardiac condition or for purposes of telemonitoring. To explore the usability of VitalConnect MD Healthpatch (HP) as a potential tool for remote patient monitoring, we verified signal data quality of monolead ECG, heart rate (HR) and respiratory frequency (RF). Furthermore first experience and signal acquisition during monitoring was performed in monitoring in patients .

Methods and results

Five healthy subjects were monitored by the HP during various activities including rest, metronome breathing, cycling and daily life activities. The ECG morphology, HR and RF were validated using 6-lead reference ECG and respiratory flow. Visibility of P-waves and artifacts was scored by 3 investigators independently. Additionally, HP recordings were made in 3 patients undergoing transfemoral TAVI peri-procedurally. The ECG showed good correspondence with the reference ECG during most tasks and involved a mean maximal correlation of 0.9 in rest. P-waves were visible in 72-100% of the time, but could not be distinguished for all recommended patch locations. Artifacts were seen during arm movement and sensor disturbances. The HR and RF parameters were associated with a mean Pearson's coefficient of 0.94 and 0.64 respectively, and were able to represent the trends in the data with a minimal delay. ECG abnormalities appearing in the patients, including atrial fibrillation, (premature) ventricular complexes and AV- or bundle branch blocks, could be identified in the HP recordings.

Conclusion

The HP provides accurate monolead ECG and reflects global HR and RF changes during most activities if placed in specific chest position. The Healthpatch might particularly be suitable for identification of ECG abnormalities and trends in HR and RF, and hence be valuable for purposes of remote monitoring.

