CONTINUOUS NON-INVASIVE MONITORING OF CARDIORESPIRATORY HOMEOSTASIS IN LOW-ACUITY SETTINGS

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Cardiorespiratory monitoring in hospitalized patients is important since in clinical practice unexpected hemodynamic deteriouration including pulmonary embolism resulting in syncope remains a serious problem and an important cause of death in this high-risk population. Monitoring of these patients in low acuity settings is still based on intermittent uncomfortable cuff ? Blood Pressure (BP) measurements. Besides acceptance and handling issues, cuff-BP measurements are of low value for early detection of critical cardio-vascular processes e.g. regulation failures, which are associated with short time frames in the order of minutes or seconds. Standard pulse oximetrie in low acuity settings is nowadays predominantely used to monitor peripheral oxygen saturation. Of note, there is evidence that additional analysis of pulse wave characteristics might be a valuable source of information to generate additional insights into patient?s cardiorespiratory status. Herein, we present our initial experience using a hemodynamic surrogate measure called pulse arrival time (PAT) derived from standard photoplethysmography (PPG), single-lead electrocardiography (ECG) and context information based on a small body-worn monitoring system for continuous unsupervised monitoring. This paper presents examples of using PPG signals for continous monitoring and discusses PAT and heart rate (HR) responses observed in short-term physical effort tests and posture changes. Our results indicate that hemodynamic adaptatations being detected by PPG and ECG analysis might be useful to monitor high-risk patients in low acuity settings. Context information on posture and physical activity is imperatively needed to interpret PAT monitoring.