Wireless continuous vital sign monitoring in hospitalized patients in an orthopedic setting – a multi-method study.

Objectives:

The main objective of this study is to investigate the feasibility of AI-supported wireless continuous vital sign monitoring when applied to patients undergoing major spine surgery in an orthopedic ward. Additionally, the study aims to explore the impact of integrating wCVSM into monitoring practices on nurses' workload. Furthermore, the study will investigate whether the intervention of wCVSM will lead to changes in the time required for recording patients' vital signs.

Methods:

Study design: The study will be conducted in three distinct parts: 1) A feasibility study designed as a single-arm prospective clinical cohort study. 2) A qualitative study based on ethnographic participant observations and focus group interviews. 3) A time-and-motion observational study design.

Study context: This study is part of a larger research program, Wireless Assessment of Respiratory and Circulatory Distress (WARD) founded in 2016 at Rigshospitalet, Bispebjerg Hospital and the Daish Technological University. The WARD project integrates data from patient monitoring devices with intelligent algorithms to provide high-quality patient observations, with real-time alarms triggered by deteriorating vital signs.

Intervention: Patients will be continuously monitored using several devices, including the Isansys LifeTouch a single-lead electrocardiogram chest patch that records average heart rate/min and respiration rate/min, Nonin model 3150 WristOx records peripheral arterial oxygen saturation, axillary temperature, and ambulatory blood pressure are monitored using the A&D TM-2441 device. These vital signs are transmitted to the Isansys software system every minute and are displayed on the electronic device Zebra carried by nurses.

Setting: The study will be conducted at the Department of Orthopedic Surgery, Copenhagen University Hospital, Rigshospitalet.

Participants: Included patients are adults with the age $\geq$ eighteen and scheduled for spine surgery with an estimated surgical duration of >2h, and an expected post-operative stay of $\geq$2 days. Registered nurses employed at the orthopedic ward during the study period will be included if they have experience working with wCVSM during the study period.

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