Effect of Continuous Wireless Vital Sign Monitoring on Unplanned ICU Admissions and Rapid Response Team Calls: A Before-and-After Study

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"Vital sign derangements usually precede adverse events on hospital wards. Some may be preventable if appropriate actions are taken after vital sign deterioration…The value of continuous vital sign monitoring in general ward patients compared with intermittent monitoring with EWS calculations is a topic of ongoing debate."

Study Objectives & Methods

A before-and-after cohort study was conducted on all adult patients aged >= 18 years old admitted to two general medical and surgical wards over a 2 year period to determine "the impact of continuous wireless vital sign monitoring on the incidence of unplanned admissions to an ICU and rapid response team calls, and proxies for changes in clinician's awareness of clinical deterioration."

Notable Highlights

- The proportion of MEWS scores ≥6 was 4.6% in the baseline period compared with 6.6% in the implementation period
- The mean MEWS during the 24 h preceding an unplanned ICU admission or rapid response team call was 5.3 (2.9) during the baseline period compared with 5.7 (3.0) during the intervention period.
- Unplanned ICU transfers were preceded by a heart rate alarm in 23% of cases, respiratory frequency alarm in 38%, oxygen saturation alarm in 27%, systolic blood pressure alarm in 21%, and mean arterial pressure alarm in 10% of cases.
- Rapid response team calls were preceded by a heart rate alarm in 19% of cases, ventilatory frequency alarm in 42%, oxygen saturation alarm in 22%, systolic blood pressure alarm in 18%, and mean arterial pressure alarm in 11% of cases.

Results & Assessment

The total number of hospital admissions with an unplanned ICU admission was higher in the baseline period compared with the intervention period **(Baseline: 84 ICU admissions vs Intervention: 54 ICU admissions; 32% reduction, P=0.03).**

The number of admissions with a rapid response team call was also higher in the baseline period compared with the intervention period **(Baseline: 107 calls vs Intervention 71 calls; 28% reduction, P=0.02)**

"The principal finding of this study was that continuous monitoring of patient vital signs using wearable monitoring technology linked wirelessly to hospital systems was associated with a reduction in unplanned ICU admissions and rapid response team calls. The continuous monitoring intervention was also associated with a reduction in the number of rapid response team calls which resulted in admission to ICU. Although this wireless continuous monitoring system provided significantly more single channel alarms near the time of adverse events, the overall number of alarms was low. These findings suggest that implementation of continuous vital sign monitoring may have enabled clinicians to more rapidly detect and intervene in cases of clinical deterioration"

Link to Full Article: https://www.bjanaesthesia.org/article/S0007-0912(22)00073-3/fulltext