

Clinical Evidence Series

Continuous vital sign monitoring in patients after elective abdominal surgery: a retrospective study on clinical outcomes and costs



What's different

Continuous monitoring replaces intermittent vital sign monitoring with wearable biosensors that stream continuous physiological data and automate generation of EWS scores, supporting real-time detection of patient deterioration.



Interpretation

Continuous monitoring with EWS alerts was associated with fewer ICU admissions and lower costs, suggesting that earlier detection and escalation of deterioration may reduce progression to critical illness in postsurgical patients.



Key takeaways

ICU admission and length of stay decreased while total hospital costs decreased after implementation of continuous patient monitoring.



Background

- Adverse events related to clinical deterioration occur in ~7-9% of hospitalized patients and a major driver of ICU admission, morbidity, and costs
- Intermittent vital sign monitoring on general wards may delay detection of deterioration, creating gaps in patient surveillance
- Continuous monitoring with wearable biosensors allows for real-time detection and automated Early Warning Score (EWS) alerts, potentially supporting earlier intervention



Study design and methods

- Single-center retrospective pre-post study conducted on a 48-bed general surgical ward in the Netherlands
- Patients: 977 postsurgical patients (control: 752; intervention: 225) admitted for intestinal and gynecological procedures
- Intervention: continuous vital sign monitoring with wearable biosensors integrated with the IntelliVue Guardian* solution, allowing continuous data capture and automated EWS alerts to nursing staff

*Product no longer in active support.



Objectives

Evaluate the impact of continuous vital sign monitoring on outcomes and costs in postsurgical patients



Results



Clinical outcomes:

ICU admissions **decreased** (13.2% → 5.9%; $p = 0.004$) and length of stay **decreased** (8.7 → 8.0 days; $p < 0.001$)



Economic impact: Total in-hospital costs **decreased** (€4,855 → €4,064 per patient; $p < 0.001$)



Safety indicators:

No significant differences were observed in readmission, mortality, or resuscitation rates