PHILIPS

Clinical Evidence Series

A model-based cost-utility analysis of an automated notification system for deteriorating patients on general wards

What's different

Automated monitoring replaces intermittent manual observation with continuous data capture, automated EWS scoring, and real-time notification of clinical deterioration.

Interpretation

Automated notification was associated with improved detection of deterioration and fewer adverse events while maintaining similar or lower overall costs.

Key takeaways

Automated monitoring reduced adverse events, generated cost savings, and increased health outcomes with an 81% probability of cost-effectiveness at standard NHS thresholds.

Background

- Delays in recognizing patient deterioration contribute to preventable adverse events and "failure to rescue" in hospital wards
- Conventional monitoring relies on intermittent measurement and clinician recognition, which may delay escalation
- Automated monitoring and notification systems aim to improve early detection but require health economic evaluation

Objectives

Evaluate the cost-effectiveness of an automated monitoring and notification system compared with standard care.

Study design and methods

- Model-based economic evaluation comparing automated notification system vs standard vital sign monitoring in a UK hospital
- Evaluation was based on 3,787 adult inpatients from the VITAL II study
- Intervention: automated monitoring and notification system (IntelliVue Guardian solution* with cableless sensors and spot-check monitors) vs. routine spot-check monitoring
- Decision analytic model estimated short-term cost per event avoided and lifetime cost per QAYL gained from the NHS perspective

*Product no longer in active support.

Results

Clinical effectiveness: Automated monitoring was associated with a reduction in serious adverse events (-0.027 events per patient)

Short-term costs: Total hospital costs were slightly lower with the intervention (£2047 vs. £2059 per patient; –£12.17) despite higher device cost

Lifetime value: The automated notification system demonstrated a positive incremental QALY gain (0.0287 QALYs, equivalent to ~10 days of perfect health) and a cost saving of £55.35 over 17.74 years.

Cost-effectiveness probability: 81% likelihood of being cost-effective at £20,000/QALY threshold

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Holmes E, Lloyd Williams H, Hughes D, Naujokat E, Duller B, Subbe CP. A model-based cost-utility analysis of an automated notification system for deteriorating patients on general wards. PLoS One. 2024;19(5):e0301643. doi:10.1371/journal.pone.0301643