

Clinical Evidence Series

A novel ECG ward telemetry system with smartphone based alarm escalation



What's different

Instead of requiring staff to continuously monitor a central telemetry station or respond to overhead alarm notifications, the CareEvent system automatically forwards high-priority arrhythmia alarms to smartphones using a multilevel escalation pathway.



Interpretation

Smartphone-based alarm escalation demonstrated reliable alarm transmission, low response times, and workflow efficiencies that may help reduce staff burden associated with conventional telemetry monitoring.



Key takeaways

A smartphone-based telemetry alarm escalation system reliably delivered major arrhythmia alerts with median response times under 10 seconds.



Background

- Telemetry monitoring is widely used to identify clinically significant cardiac rhythm abnormalities in hospitalized patients
- Conventional telemetry systems typically require either continuous observation of a central monitoring station or staff response to audible ward alarms
- Automated vital sign capture and escalation prompts may improve identification and management of deteriorating patients
- Mobile alarm escalation systems may help improve alarm management by delivering actionable alerts directly to clinicians



Study design and methods

- Observational evaluation conducted in a secondary-care hospital in Germany with 60 cardiology beds across two telemetry-equipped wards
- Telemetry infrastructure included 26 monitored beds connected to a centralized monitoring system
- The CareEvent system forwarded predefined major arrhythmia alarms to three smartphones using sequential escalation
- Alarm performance was evaluated over 128 days



Objectives

Evaluate the performance, workflow impact, and clinical use of a smartphone-based telemetry alarm escalation system for major arrhythmia alarms in routine clinical practice.



Results

Alarm reliability: 11,576 major arrhythmia alarms were forwarded with no alarm escalation failures reported

Alarm escalation performance: 69% of alarms were managed at the first smartphone level, 31% were escalated to the second smartphone level, and 13% were escalated to the third smartphone level

Response time: Median alarm response time was 8 seconds during daytime and 9 seconds at night

Workflow impact: An average of 14 minutes of staff moving time could be saved each day through direct notification of clinicians instead of requiring a visit to the central monitoring station