PHILIPS

# Clinical Evidence Series

## Mitigating Alarm Fatigue and Improving the Bedside Experience by Reducing Nonactionable Alarms

### What's different

Conventional fixed-threshold alarms were replaced with conditional alarm logic incorporating hierarchical time delays and context-specific thresholds, prioritizing persistent and clinically meaningful abnormalities, while suppressing transient, nonactionable signals.

### Interpretation

Conditional alarm logic was associated with a substantial and sustained reduction in alarm burden without increased care escalation events, suggesting that smarter alarm prioritization may improve signal-to-noise ratio while maintaining patient safety.

### Key takeaways

Median alarms per patient day decreased by 75% in PICU and 82% in ACCU with a sustained 74% reduction at 2 years.

### Background

- High volumes of nonactionable alarms contribute to alarm fatigue, delayed response, and clinician dissatisfaction
- Prior studies show the majority of ICU and acute care alarms are nonactionable, highlighting the need for safer alarm reduction strategies

### Objectives

Evaluate whether conditional alarm logic reduces nonactionable alarms while maintain patient safety and care experience.

### Study design and methods

- Single-center quality improvement initiative conducted in a 36-bed PICU and ACCU at a pediatric quaternary care hospital
- Intervention: bedside monitors reprogrammed with hierarchical time delays and conditional alarm triggers for $SpO_2$, alongside modified RR and PVC thresholds
- Alarms measured as median alarms per monitored patient day; safety outcomes included rapid response events, ICU transfers, and code events
- Nurse and family surveys assessed perceived alarm burden and care experience pre- and post-intervention

## Results

**Alarm burden:** Median alarms per monitored day decreased **75%** in PICU and 82% in ACCU (p<0.001, with a **74%** sustained reduction at 2 years

**Safety:** No increase in code blue events, emergent ICU transfers, or mortality following implementation

**Clinician experience:** Nurses reported fewer nonactionable alarms and improved ability to respond to clinically meaningful alerts



Yang JK, Su F, Graber-Naidich A, Hedlin H, Madsen N, DeSousa C, Feehan S, Graves A, Palmquist A, Cable R, Kipps AK. Mitigating Alarm Fatigue and Improving the Bedside Experience by Reducing Nonactionable Alarms. J Pediatr. 2025;276:114278. doi:10.1016/j.jpeds.2024.114278.