Assessing Implementation Adherence to Alarm Management Bundle to Reduce Nonactionable Alarm Frequency

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Background

High volumes of nonactionable alarms, or alarms not requiring clinical intervention can lead to alarm fatigue, medical errors, and disruption of the therapeutic milieu.

- In 2013, the Joint Commission issued a Sentinel Event Alert that recognized alarm fatigue as a patient safety issue.

In the pediatric inpatient setting, a unit experienced:

- **14,198** total high heart rate (HR) alarms over 3 months
- **10,580** total low pulse-oximeter alarms over 3 months

Approximately **85%-99%** of alarms are false or nonactionable.

Aim of the Project

The purpose of this project was to reduce the number of nonactionable heart rate pulse oximetry alarms through the implementation of a nurse-driven alarm management bundle.

Process Goals:
- 100% of unit staff will receive education on CEASE bundle intervention
- 100% of monitored patients will be compliant with CEASE bundle components

Outcome Goals:
- 30% reduction in high heart rate & low pulse oximeter alarms pre/post-intervention

Description of the Intervention

- **Setting:** A pediatric inpatient unit at a large urban, academic medical center
- **Population:** Pediatric patients receiving concurrent cardiorespiratory and pulse oximeter monitoring.
- **Intervention:** Applied CEASE bundle interventions and implemented threshold trigger alerts as bundle reminders.
- **Implementation Strategies and Measures:** Champions, education sessions, email reminders, & weekly audits & data review

Kennicklear Cared Audit Tool

C: Communication
- NHO parameters in orders

E: Electrodes
- Electrodes changed daily and documented in Daily Care
- Leads properly placed

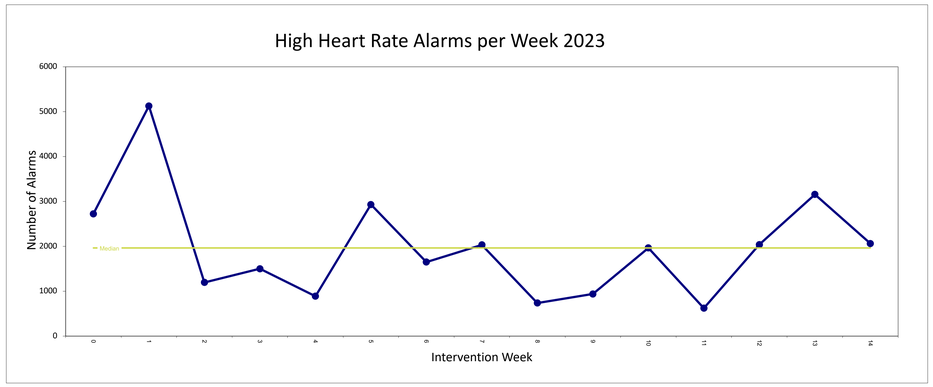
A: Appropriate
- Collaborate with physicians & other care team providers
- Is monitoring clinically indicated for patient?
- Is there an order?

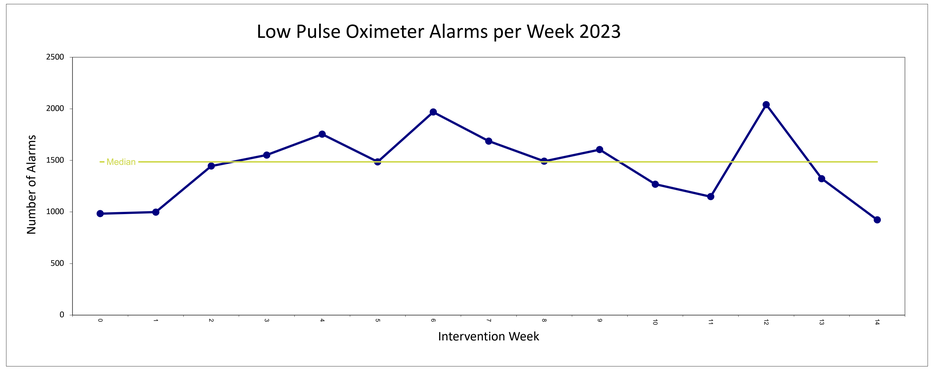
Discontinue monitoring when appropriate.

S: Setup
- Customize parameters for individual patient per policy
- Customize heart rate, blood pressure, respiratory rate, and SpO2
- Set customized alarm to ±10% patient baseline

E: Education
- Have you received CEASE Bundle education?

Figures





Results

Non-actionable heart rate alarms: The project yielded a **6% reduction in non-actionable heart rate alarms**. Comparators are as follows:
- Pre-intervention weekly average: 2,044 alarms
- Post-intervention weekly average: 1,918 alarms

CEASE Bundle Audit Data

Non-actionable pulse oximetry alarms: The goal in observing a 30% reduction in low pulse oximetry alarms was not met
- Low pulse oximeter and trigger threshold alarms fluctuated
- Weeks with higher percentage of bundle compliance yielded lower heart rate alarms

Discussion

- Increase in bundle compliance noted in earlier weeks of intervention implementation
- 3 other DNP projects were implemented on the unit simultaneously
- Respiratory season began mid-intervention within the pediatric population

Results are consistent with the literature that demonstrated a reduction in heart rate alarms when alarm management bundles are utilized in pediatrics.

Limitations:
- Staff burn out with new implementations and high burden of interventions
- Difficulty capturing full scope of implementation adherence
- Short implementation period
- Respiratory illness surge and its impact on monitored patients/ monitor alarms

Lessons Learned

A nurse-driven alarm management bundle added to routine care can decrease the frequency of high heart rate alarms in the pediatric inpatient setting.

Spread and Sustainability: Feasible intervention with most components integrated into the standard of care. Sustainability is highly dependent on continued nursing engagement, as well as sustained improvement in alarm reduction in the pediatric setting.
Implications for Practice: By implementing the CEASE bundle, nurses are empowered to implement evidence-based alarm reduction techniques in one efficient bundle. Adherence to the bundle results in a reduction of heart rate alarms.
Next Steps/ Recommendations: Future CEASE implementations may consider piloting during a time when alarm management is the main unit focus, as well as increased incentive for staff engagement.

References

Please scan QR Code for the complete reference list

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