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BACKGROUND

Postoperative patients that are sent to the ACS unit are placed on respiratory, heart rate, and pulse oximetry monitors to watch for any adverse effects post anesthesia. Each patient is given a set of vital sign parameters that is determined by their age. Currently, Children's Health uses the Harriet-Lane vital sign parameters which are divided into age ranges. In a study completed by a physician on the Plano campus, it was found that the ACS units, made up of 48 beds, experience around **8738** alarms per day. Alarm fatigue among staff and families is growing due to the constant sound of monitor alarms. Reducing the number of false alarms is extremely important to help prevent alarm fatigue.

PICO/CLINICAL QUESTION

In pediatric postoperative patients, does implementing personalized respiratory rate parameters reduce the number of false alarms compared to the current Harriet-Lane parameters?

OBJECTIVES

The goal of this project is to improve:
- Patient/family satisfaction during their inpatient stay
- Patient safety by responding appropriately to monitor alarms
- Staff alarm fatigue by decreasing the amount of total alarms that staff hear each shift

SUMMARY REVIEW OF LITERATURE

TITLE	SUMMARY
Pediatric Parameters and Equipment. Harriet Lane Handbook.	Vital sign parameters that are recommended for different ages of pediatric patients (HR, RR, BP). Based on these numbers that we use currently, we will be able to compare how accurate these are to other parameters, or personalized parameters for each patient.
Strategies for Managing Alarm Fatigue in the PICU	Discussed nurses' perceptions on alarm management and safety. Introduced idea that alarms should be set to patient's conditions. When there are too many alarms, staff develop alarm fatigue which results in a slower reaction/ intervention time. Parameters that are not personalized can be inaccurate which lead to an increase in false alarms. Proper education to nurses on what the alarm means regarding the patient is necessary. Results showed that a nurse's perception affects their reaction time. If majority of alarms are false, then the nurse may not intervene as quickly-false or not. Adjusting settings that are patient personalized showed an increase in response time and decrease auditory stimulus.
Inpatient-derived vital sign parameters implementation: An initiative to decrease alarm burden.	This study used age-based HR and RR parameters derived from inpatient populations. In addition, RR modifications were made that allowed to safely reduce RR alarms. Phase 1 of implementing 10 age-based alarm parameters showed a decrease in HR alarms by 17%, but RR alarms increased by 75%. After widening RR alarm parameters in phase two RR alarms decreased by 53%. Combined HR and RR alarms fell by a mean of 40%.
Addressing vital sign alarm fatigue using personalized alarm thresholds.	Vital sign parameters that are personalized to the patient by identifying the 1st and 99th percentiles of the individual's heart rate within the first day of monitoring can reduce the amount of false alarms and therefore reduce desensitization of true alarms and negative patient outcomes.

BARRIERS

- There must be commitment and compliance from staff in the early stages of admission to ensure the most accurate monitoring of the patient during the remainder of their admission
- Staff participation in pre and post surveys is vital to successfully move forward with this method of parameter establishment and whatever adjustments may be required

PLAN FOR IMPLEMENTATION

1. Audit the amount of respiratory alarms of 100 postoperative patients in ACS from 0700 to 0659.
2. Send out a pre-survey. Gain data on staff's awareness and feeling of alarm fatigue
3. Introduce Change: Changing current Harriet Lane vital sign parameters to personalized respiratory rate parameters in ACS postoperative patients
4. Monitor respiratory rate for two hours to obtain baseline rate. Consider pain control and thermoregulation. Then, consider messaging nurse practitioners to change the respiratory rate parameters.
5. Review data after implementation of 100 postoperative patients in ACS- including the amount of respiratory alarms.
6. Review effectiveness of interventions via staff's response on post survey.
7. Discuss with team leaders, physicians, and staff nurses on further implementation.

Survey QR Code

CLINICAL PRACTICE IMPLICATIONS

- Inappropriate vital sign parameters for pediatric patients contributes to alarm fatigue among ACS nursing staff
- Personalizing vital signs to the patient within the first day of monitoring can reduce the amount of false alarms and therefore reduce desensitization to true alarms and negative patient outcomes
- RR monitor modifications can be made to safely reduce respiratory alarms and as a result reduce the total number of monitor alarms.

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