Background:
• Alarm fatigue, or sensory overload caused by an exposure to an excessive number of alarms, can cause an individual to become desensitized to the alarms, resulting in a delayed or lack of response (AACN, 2014).
• In addition, studies have indicated that between 80-99% of heart monitor alarms are false (considered nuisance alarms) or clinically insignificant (non-actionable). Patient deaths have even been associated with alarm fatigue. (AACN, 2014)
• This year the Joint Commission (JC) published a new 2014 Patient Safety Goal on Alarm Management and has set elements of performance to meet for alarm system management and a January 2016 deadline to address them.
• Our own facility has also had a recent serious safety event related to alarm management.
• Our KentuckyOne Research and Evidence Based Council members selected to focus on this project for these reasons.

Purpose/Aim:
• The purpose of this Quality Improvement project was to decrease the nuisance of and non-actionable, clinically insignificant alarms on a pilot unit, thereby decreasing alarm fatigue with the staff and increasing patient safety.

Process/Change:
• The Quality Improvement model: FOCUS-PDSA was used for this initiative. In addition, AACN’s Alarm Management Performance Improvement Plan: A Step by Step Guide was used as a primary resource (AACN, 2013).
• Members of the Research and Evidence Based Practice Council assembled an interdisciplinary team that included, leadership, nursing, central monitor staff, BioMed, risk management, and cardiology.
• Pre and Post implementation alarm data was collected from a 16 bed intermediate pilot unit for 14 days. Data was analyzed for type of alarm and number.
• Pre and post implementation surveys were also completed of the nursing staff on the pilot unit as well as for monitor technicians (MT) in the central monitor area. The pre-implementation surveys were used to help guide the implementation stage.
• 23 of 44 nurses (52%) responded to the pre-implementation nursing survey. It indicated a need for education on the frequency of electrode change per policy and how to prep the skin. They also indicated barriers of feeling uncomfortable changing the alarms due to lack of knowledge of what they were allowed to do and how to do it, and that they felt they lacked time to deal with the many alarms.
• 11 of 17 (65%) MTs responded to the pre-implementation MT survey. It indicated that they felt the most time consuming alarms were High and Low HRs and False Asystole and VTach.
• After analyzing the alarm data and the survey results, recommendations were developed by the council team and meetings were scheduled with leadership, education, risk management, and cardiology for approvals.
• Unit alarm defaults were approved and changed. High heart rate alarm was increased from 100/120 to 120/140 and 3 alarms with high frequency that were felt to be non-actionable and clinically non-significant had the audible alarm deactivated: Pair PVC, Irregular HR, and Missed Beat. Other similar alarms captured more significant events and were unchanged.
• In addition, guidelines were established for nurse/MT customization of other high frequency alarms, including High and Low Heart Rates, Afib, and PVC Rate.
• Education was provided to 27 unit staff members on proper use of electrodes by the electrode representative, and education on the new customization guidelines was provided to the nursing/MT staff via e-mail, flyers, and individual inservices.

Outcomes:
• 12 nurses completed the post intervention survey. Nursing alarm fatigue decreased post-implementation from 7.45 to 6.09 (on 10 point scale) and approached statistical significance (p=0.09).
• There was also a statistically significant change noted for pre/post questions: Nuisance alarms occur frequently in my unit (3.57 to 2.75, p=0.001), and telemetry batteries are replaced before they alarm/message for low battery (2.09 to 2.67, p=0.02).
• Total number of alarms decreased by 39% (21,397 to 13,055).
• 9,735 of the remaining 13,055 alarms post implementation (75%) were alarms that the nurses were provided with guidelines to customize.
• The most common false alarms were felt to be Asystole and VTach alarms. The sum of those alarms decreased 49% post implementation from 1,165 to 574.

Discussion/Implications for Practice:
• The most effective results in decreasing alarms was seen in changing unit default settings. Changing nursing practice and culture is more complex, takes longer than the project timeline allowed, and would require more education than what the team was able to provide.
• Additional education should be provided to nurses on how and why to customize the alarm settings. In addition, other alarms, such as HR low, should be reviewed again for possible changes in default settings to decrease the time needed to customizing alarm settings by nursing staff.
• Studies have shown that the reduction of nuisance and non-actionable alarms increases the likelihood of staff response to alarms, in general, and increases patient safety.

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