Preventing Alarm Fatigue in Critical Care Nursing

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Alarms are important, especially in critical care settings, when a patient has many monitors and devices attached to them. Respirators, injection pumps, vital signs monitors, and many other devices sound alarms. Forty years ago, in intensive care unit (ICU) settings there were six alarms at the most (Lewandowska et al, 2020). Currently, in ICUs there can be up to forty devices that can alarm. Nurses are the ones that most frequently respond to these alarms. Alarm fatigue in nursing is a real threat to patient safety and can be prevented.

Description and Connection to Nursing

Alarm fatigue in nursing is described as nurse becoming desensitized to alarms. In critical care setting, the nurses rely heavily on monitors to care for the sedated and intubated patients. Over a twelve-hour shift, a range of 150-400 alarms per patient can be heard in a critical care setting (Lewandowska et al., 2020). Sometimes alarm fatigue can cause a nurse to totally disregard these alarms (Harding et al., 2020). This can lead to unfavorable, preventable patient circumstances. Nurses responding to alarms in those cases are especially important.

Role of the Critical Care Nurse

Nurses are a patients' safeguard. Nurses monitor the machines that monitor the patients. Nurses use the critical judgement gained to make decisions off the patient's monitors. For patients in critical care units, it is essential that alarms are responded to promptly. Many alarms can reflect a patient's dropping blood pressure or a ventilator leak. Other alarms are false or nonactionable, like a patient readjusting in bed. The Joint Commission of Sentinel Events estimated that 85% to 99% of alarms do not require a nurse to intervene (Lewis & Oster, 2019). Nurses in critical care situations have much to pay attention to. Unnecessary alarms take the nurse's attention away from the true problems of the patients in the critical care situations.

Nursing Interventions

CEASE Bundle

A nursing intervention that can reduce alarm fatigue is implementing the CEASE bundle. CEASE is a monitoring bundle that is implemented by nurses supported by evidence-based practice that focuses on patient-customized parameters (Lewis & Oster, 2019).

The CEASE bundle is an acronym. The C stands for communication. Communication among those working in the critical care settings is important as different patient care activities can trigger nonactionable alarms. Examples would be ambulating or repositioning. The E stands for daily electrode changes. Evidence shows that changing electrocardiogram electrodes everyday may decrease the number of alarms by 46% (Lewis & Oster, 2019). The A stands for the appropriateness of the alarm and its evaluation. Evaluating the how and the why of the alarms sounding can help the nurse to understand what the alarm means. The S stands for setting up alarm parameters that are specific for the patient. Alarms are necessary, helpful tools but it has been found that 85-99% of alarms signals are nonactionable and do not require intervention (Lewis & Oster, 2019). As specific parameters are set for each patient there can be reduced nonactionable alarms. One study found that individualized parameters led to a 43% to 89% reduction in nonactionable alarms (Lewis & Oster, 2019). The E stands for ongoing education. The ongoing education for the nurses would focus on alarm awareness and the nurses' perception of the alarms. Studies show that as a nurse has a positive outlook on alarms, a response is more likely (Lewandowska et al., 2020).

It was found that as the CEASE bundle was implemented, there was a 31% decrease in monitor alarms. During the study, nurses noticed a 44% decrease in unactionable, nuisance alarms. As the CEASE bundle was implemented no adverse patient events occurred (Lewis &

Oster, 2019). The CEASE bundle is a sustainable, easy to apply way for nurses in critical care situations to reduce alarm fatigue.

Patient and Family Education

Education of patient and the patient's family in a critical care setting is very important. There are strange tubes, strange monitors, and strange noises. These things can be upsetting for the patient and family. Patient and family education is the responsibility of the nurses (Harding et al., 2020). As the nurses educate about the tubes, monitors, and noises, the patient and family can feel more comfortable, and the patient will be less stressed. Educating the patient and family about what the specific alarms and noises mean helps the patient and the family to be active in the care of the patient. As the patient and family are aware of what the monitors and the alarms mean they can draw attention to things that are concerning to them. Another set of eyes to help increase patient safety. Bringing those things to the attention of the nurse can make sure that nothing is missed.

New Technology

The Vocera Minibadge is new wearable technology for nurses. It is a small, lightweight device that can be linked with a smartphone or used by itself ("Vocera Minibadge," 2022). It was created with three major goals in mind. One was to incorporate hospital communications in a simple, easy to understand way. The second goal is to improve staff safety. The Vocera Minibadge allows for hands-free communication. This allows for help to be called even when the nurse is wearing personal protective equipment. The third and most important goal of the Vocera Minibadge is to reduce alarm fatigue. It reduces alarm fatigue by sending specific alarm notifications to the Minibadge. The notifications received by the badge are set through specific rules of the facilities where the Minibadges are used. The Vocera Minibadge also provides

Vocera Analytics. The Vocera Analytics provides monitoring of the notification traffic through the Minibadges ("Vocera Minibadge," 2022). The visibility of the notifications can help nursing managers to identify issues of alarm fatigue. As issues are identified, nursing managers can increase training about the unit specific causes of alarm fatigue. Technology such as the Vocera Minibadge can help nurses in critical care units to feel the alarms that they are receiving are important and actionable.

Research Effect on Patient Goals/Outcomes

A study looked at the nurses' perceptions and their reactions to the alarms. The more positive perception a nurse had towards the alarms there was a higher patient safety level. The positive perception stemmed from the nurse knowing the meaning of the alarms and the lack of fear from it sounding. As nurses are more familiar with alarms, they are more likely to have a positive perception of the alarms and are more likely to respond to the alarm. (Lewandowska et al., 2020)

Another study involved thirty nurses given forty tasks to be completed in a simulation environment (Sowan et al., 2021). The tasks were common functions of monitoring equipment such as recording a portion of an electrocardiogram or turning the monitors on. The study found that only two of the forty tasks were successfully completed by all thirty nurses. The study made it clear that nurse-monitor interactions are ineffective and inefficient. Nurses need increased training on monitor use to increase safety. As training is increased, nurses become more confident adjusting monitor parameters to the individual patient. A nurse's confidence in the reliability of their alarms could potentially reduce alarm fatigue (Sowan et al., 2021).

Another study found three conclusions about alarm fatigue. One, alarms cannot be avoided in critical care units. With increasing technology, it is possible that there will be many

more devices in the future. This increases the importance of combatting alarm fatigue now. Two, nurses can feel overloaded by the continual wave of alarms. Reducing the number of nonactionable alarms can decrease the sensory overload that many nurses feel. Third, many nurses do not see a need for education about alarms. Education about alarms, monitors, and parameters for monitors could help increase nurses' confidence in the specific alarms that are heard in the critical care setting and reduce the false alarms (Lewandowska et al., 2020).

As important and actionable alarms are responded to promptly by nurses, patient safety is increased. Patients are more likely to have a positive outcome from the critical care situations.

Conclusion

The main goal in preventing alarm fatigue is to increase patient safety. Decreased alarm fatigue is derived from decreased unnecessary alarms. Decreased unnecessary alarms come from nurses being trained about specific monitors and the ability to set patient specific parameters. As training is increased, nurses will have more confidence with monitors. The increased confidence will lead to more positive perception of the alarms. The implementation of the CEASE bundle along with the Vocera Minibadge can reduce unnecessary alarms. With the Vocera Minibadge there can be increased communication among health care professionals. As the number of unnecessary alarms are decreased, there will be less desensitization and alarm fatigue experienced by critical care nurses. As nurses teach patients and the patient's family about what to expect from alarms and monitors, the nurse can be reminded by family and the patient if an alarm is going off. As alarm fatigue in nursing is reduced there will be increased patient safety. Increased patient safety will lead to better patient outcomes.

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