Critical Care Alarm Fatigue

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Introduction

PICO Question:

Population: Nursing staff on a critical care unit

Intervention: Recommended methods for reducing alarm fatigue

Comparison: Current practice

Outcome: Identify effective methods for reducing nuisance alarms

Question: What are the best methods to reduce nuisance alarms and prevent alarm fatigue among neuroscience critical care nurses?

Methods:

A literature search was conducted using EbscoHost and PubMed databases.

Blood pressure alarm limits on the Neuroscience Critical Care Unit at Hershey Medical Center were compared to blood pressure parameters ordered for individual patients over a three week period.

Staff were asked what they thought were the most frequent nuisance alarms on our unit.

Keywords for Literature Review:

alarm fatigue, personalized, ICU, critical care, alarm monitoring
Inclusion Criteria for Literature Review:
articles within the last 10 years, adult critical care units
The initial search yielded 173 results. Twelve articles were reviewed, and the four most relevant articles were studied in depth.

Article	Methods	Results
Korniewicz, D. M., Clark, T., & David, Y. (2008)	An anonymous survey was sent nationally to determine effectiveness of alarms. Within 5 months, 1,327 health care professionals responded.	- More than 90% agreed that audible and visual alarms need to be easily differentiated. - 81% agreed false alarms were a problem. -77% agreed alarms disrupted patient care.
Gorges, M., Markewitz, B. A., & Westenskow, D. R. (2009)	22 different patients were observed over a 24 day period. The research observer recorded the health care professionals' actions in the room and if these actions were due to alarms.	-1214 alarms sounded during the observation days, and only 17.7% were effective. -A 19 second delay would decrease the ineffective alarms by 67.1%. -A 14 second delay would reduce the ineffective alarms by 51.3%. -Patient alarms should be silenced before patient care (repositioning, suctioning, ect)
Graham, K. G. & Cvach, M. (2010)	Baseline alarm data were collected over 18 days, and only crisis alarms, warning alarms, and system warning alarms were used. Over one year, personalized alarms were set for each patient within 1 hour of report or as patient's condition changed.	-16,953 alarms over initial 18 days before intervention- 942 alarms per day. -9,674 over 18 days post-intervention- 536 alarms per day. - 43% reduction in alarms - 94% of nurses changing alarms at beginning of shift -94% of nurses changing alarms when patient condition changed.
Sendelbach, S. & Jepsen, S. (2013)	N/A	- 80%-99% of ECG alarms are false - Increase in nurses desensitized to alarms leads to increase in patient mortality

Discussion

Alarm fatigue creates patient safety concerns. When nurses hear alarms ringing constantly, they become desensitized to the sound and can ignore important alarms. The articles included indicate that most alarms are not urgent. Sendelbach and Jespen suggest that as little as 1% of alarms in critical care units may warrant a change in patient care. Nurses on our units reported temporary dips in oxygen saturation and brief changes in arterial blood pressure readings to be among the most common alarms. Other nuisance alarms were caused by EKG leads and pulse oximeters that were not reading correctly.

Conclusions

Blood pressure alarms on our units were generally consistent with orders. When discrepancies existed, the alarm parameters were too wide. These discrepancies did not contribute to alarm fatigue, but do suggest further study of blood pressure management on the unit. Implementing delays in alarms for pulse oximetry and arterial blood pressures would greatly reduce nuisance alarms.

References:
Gorges, G., Markewitz, B. A., & Westenskow D. R. (2009). Improving alarm performance in the medical intensive care unit using delays and clinical context. *International Anesthesia Research Society, 108* (5) 1546-1552.

Graham, K. C. & Cvach, M. (2010). Monitor alarm fatigue: Standardizing use of physiological monitors and decreasing nuisance alarms. *American Journal of Critical Care, 19* (1) 28-34. http://www.aacn.org/WD/CETests/Media/A1019012.pdf

Korniewicz, D. M., Clark, T., & David, Y. (2008). A national online survey of effectiveness of clinical alarms. *American Journal of Critical Care, 17* (1), 36-41.

Sendelbach, S. & Jepsen, S. (2013) Alarm management - AACN practice alert. Retrieved from: http://www.aacn.org/wd/practice/content/practicealerts/alarm-management-practice-alert.pcms