

Top on patient safety list: Do not turn off that beep

Patients in intensive care units (ICUs) are constantly connected to bedside monitors for close monitoring of physiologic functions. These monitors are equipped with alarms to notify the healthcare team of changes in the patient medical condition or technical problems with the monitors.



Fig. 1.

Alarms from ICU bedside monitors are known to be the highest; research shows that they may reach more than 700 alarms per bed per day. However, although many of these alarms alert the healthcare team and save patients' lives, not all alarms are true or reflect actual changes in the patient medical condition. Usually, bedside monitors are set with high sensitivity level in that alarm limits of physiologic parameters (e.g., heart rate, respiration) are tight and signal very frequently when minimal/transient changes in medical condition that do not require treatment or medical actions occur. These monitors also alarm in cases the patient moves or the electrodes (plastic patches applied to the skin) of the ECG (or electrocardiogram) or pulse oximetry are detached from the patient skin. In these cases, alarms are false. For example, we may have an asystole alarm (straight line of ECG with no heart waves) that results from disconnected ECG electrodes.

The rate of false alarms may reach up to 99% of all alarms. This very high rate of false alarms in ICUs results in a phenomenon called alarm fatigue, where nurses and clinicians ignore alarms because they think they are false, set alarm limits to inaudible, or change the limits of physiologic parameters to unsafe zone in order to decrease the number of false alarms. Alarm fatigue is a major safety concern. According to previous reports of the US Food and Drug Administration, bedside monitors were the medical devices associated with the highest number of alarms and alarm fatigue resulted in many death cases because alarms are missed or ignored. As a result, the

Joint Commission, a US organization for Hospitals' Accreditation, issued Alarm Systems Safety as a National Patient Safety Goal in 2014 to decrease alarm fatigue.

In our study, we implemented two strategies to decrease the number of false alarms, and therefore alarm fatigue in ICUs. These were (1) educating nurses on the use of bedside monitors and (2) changing the default alarm settings of the physiologic parameters.

Our results showed that we achieved a significant reduction in alarm number; however, this was not associated with improving alarm fatigue or nurses' attitudes toward alarms. Nurses still believe that false alarms are very frequent, disrupt patient care, and reduce nurses' trust in alarms causing nurses to inappropriately turn them off. We also found that there is no standardized practice among nurses in the way they manage alarms. Additionally, our ICU nurses spoke to the poor usability and complexity of the monitors, lack of unit policies and procedures to guide nurses on alarm management, and that they need more training on navigating the complex monitors. Poor usability of the monitors was manifested by things like difficulties in using the monitors and the look alike and sound alike alarms for different crisis and false alarming conditions.

In conclusion, alarm management in ICUs is very complex and requires multiple interventions to improve alarm safety. There is a need for (1) standardized alarm management practices by nurses, (2) unit policies and procedures on alarm management, (3) easy to use monitoring devices, and (4) adequate training on monitors' use.

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[Changes in Default Alarm Settings and Standard In-Service are Insufficient to Improve Alarm Fatigue in an Intensive Care Unit: A Pilot Project.](#)

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