

# Using the Influencer Model to Improve Alarm Management Practices

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## About the Authors



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Decreasing alarm fatigue is an essential initiative for hospitals to improve the quality and safety of patient care. As technology has advanced, the number of alarms per patient per day has rocketed into the hundreds. It was once believed every alarm available needed to be activated for every patient, but this philosophy, along with advances in technology that increase the variety of alarms available, has resulted in overwhelming, insignificant noise. An estimated 85% to 99% of alarms are false,<sup>1</sup> creating a significant patient care distraction. For example, clinical staff may overlook a fatal cardiac dysrhythmia or significant vital sign abnormality because the patient's cardiac monitor produced frequent, nonactionable alarms.

Numerous definitions for alarm fatigue are cited in the literature. This article defines alarm fatigue as “sensory overload when clinicians are exposed to an excessive number of nonactionable alarms, resulting in desensitization to alarms and missed alarms.” A delayed response to excessive alarms may negatively affect patient care, as evidenced by several highly publicized cases of patient deaths attributed to alarm fatigue.<sup>2</sup>

National organizations have identified alarm fatigue as a patient safety concern. The ECRI Institute described “the failure to recognize and respond to actionable clinical alarms . . . in a timely manner” as a top health technology hazard in 2016.<sup>3</sup> The Joint Commission implemented the first phase of the National Patient Safety Goal (NPSG) on Using Alarms Safely (NPSG.06.01.01) in 2014<sup>4</sup>; the second

phase of NPSG.06.01.01, effective in 2016, mandated the establishment of clinical alarm management policies and education as an institutional priority. Professional organizations including the American Association of Critical-Care Nurses<sup>5</sup> and the National Association of Clinical Nurse Specialists<sup>6</sup> have also published alarm management best practices.

Winchester Hospital, a 223-bed acute care community hospital serving the healthcare needs of many communities in northwest suburban Boston, responded to the issue of alarm fatigue through a cardiac dysrhythmia alarm initiative in 2013–2014, with the goal of reducing audible nonactionable alarms.

## Pilot Program

The project began as a pilot on a 24-bed medical-surgical telemetry unit. The pilot interventions included:

- The biomedical department hardwired changes to the cardiac monitor to change multi-formed pre-ventricular contractions (PVCs) and prolonged R-R to a “message only” alarm instead of an auditory alarm. The frequent PVCs and bradycardia alarms remained auditory. However, staff education reinforced the possible need to individualize the parameters on these alarms.
- A pre- and post-survey to assess pilot unit staff's perceptions about the effects of alarm occurrence and alarm management.
- The nurse manager and clinical practice specialist of the pilot unit worked together to

engage staff, initially by posting awareness flyers. One flyer asked staff to guess the number of specific cardiac alarms that occurred in a 2-week period on the unit. Staff expressed surprise at the actual alarm data, which was 143,773 total alarms or 320 alarms per bed per day.

- Additional engagement interventions included unit huddles as informational venues.
- The nurse manager and clinical practice specialist developed an alarm management education script to encourage nurses to customize monitor alarms based on their individual patient's needs.

The pilot program resulted in a 30% reduction in audible alarms and contributed to reducing alarms per bed per day from 330 to 225. The number of nurses who said that they customized alarm settings for their patients rose from 20% pre-intervention to 100% postintervention in self-report surveys. The pilot's success led to the rollout of these initiatives plus additional interventions on three medical-surgical telemetry units. These units include a central cardiac monitoring station and nurses who are responsible for cardiac monitoring surveillance.

### Interventions Using the Influencer Model

Recognizing that education alone does not always change behavior, we created an extensive action plan utilizing the Influencer Model.<sup>7</sup> This change model requires many interventions, which can help ensure a successful and sustainable outcome for this quality improvement initiative. Several action items were implemented using the framework of the “six sources of influence,” which include personal motivation, personal ability, social motivation, social ability, structural motivation, and structural ability (Table 1). Using these sources of influence as a guide to create interventions can improve the likelihood of success when implementing changes in practice. Because our goal was to decrease the number of cardiac alarms without affecting patient safety, the influencing interventions needed to directly relate back to that goal.

The interventions for this initiative followed the framework of six sources of influence, as follows.

**Personal motivation.** This source of influence encourages asking questions to understand the perspective of the end-user,

such as “What’s in it for me?” or “Will it be worth it?” The goal of this source of influence is to generate motivation by making the undesirable, desirable. For this project, we affected the staff’s personal motivation by sharing stories of close calls and actual events from within our hospital and in the media. This affected their emotions and connected the goals of the project to their moral values (e.g., to “do no harm”).

**Personal ability.** A successful rollout requires the nurse to possess the needed education and skills. To affect this source, the staff nurses completed a competency. This created an opportunity for deliberative practice, including a teach-back on how to check cardiac alarms at the start of their shifts, a return demonstration on setting the high and low limits on alarms, and a demonstration of how to adjust premature ventricular contraction alarms. Nurses were educated on the importance of ensuring all audible alarms were actionable. They were also empowered to make independent changes in their alarm settings, especially with tachycardia and bradycardia alarms, contingent on the patient’s clinical condition. They also reviewed the hospital’s clinical alarm policy, which validated their actions.

**Social motivation.** Social motivation includes using peer pressure to do the right thing, and encourages the use of trusted and valued people to deliver educational information, assuming it will be better received than from an outsider. This initiative recruited peer

**This change model requires many interventions, which can help ensure a successful and sustainable outcome for this quality improvement initiative.**

	Motivation	Ability
Personal	1 Make the Undesirable Desirable	2 Over Invest in Skill Building
Social	3 Harness Peer Pressure	4 Find Strength in Numbers
Structural	5 Design Rewards and Demand Accountability	6 Change the Environment

**Table 1.** The six sources of influence

validators (i.e., respected and informal nurse peer leaders) from each unit to provide the education and conduct the competency. Telemetry staff nurses from the Nursing Practice Improvement Council also assisted. Each validator followed a script when performing the competency, which was previously reviewed and practiced with their clinical practice specialist. These peer validators ultimately became cardiac alarm clinical resources for the nurses on their units.

**One indicator of an alarm management culture change was the expanded development of informal, self-proclaimed, peer coaches. This was an example of their individual accountability.**

**Social ability.** In the social ability source of influence, individuals help one another to improve their chances for success. Once the nurses completed the competency, they understood the expectations to eliminate excessive nonactionable audible alarms as part of their alarm management and responsibilities, but supportive help from their peers helped them initially. Peer coaches reminded the nurses using real-time coaching, which encouraged the unit to work together as a team. After the rollout, the peer validators became peer coaches. Their role was to question their peers if alarms were sounding excessively. Successful peer coaching requires tact. Therefore, these nurses received one-on-one education with the clinical practice specialists to teach them effective coaching strategies. The clinical practice specialists also modeled coaching behaviors when rounding on the units. One indicator of an alarm management culture change was the expanded development of informal, self-proclaimed, peer coaches. This

was an example of their individual accountability. Peer coaches appeared to be an important piece of maintaining the ongoing success and sustainability of this initiative.

**Structural motivation.** This source is affected by using rewards and punishments when demonstrating or avoiding the desired behaviors. Structural motivation is a weak source of influence, and it should be used sparingly, because the desired behavior often stops in conjunction with the incentive. However, it can be effective in combination with other sources. To affect this source, the clinical practice specialists and nurse managers held staff accountable through rounding on the units, coaching, or positive feedback.

**Structural ability.** In this source, the environment changes to ensure that staff possess the tools they need to achieve their work goals. We utilized several interventions to affect this source: biomedical department engineers hardwired changes to equipment to eliminate the audible component of some alarms, a state referred to as “message only.” We also provided a job aid as a visual reference at the central monitor with a photo of the alarm management screen.

### Analysis

Data were collected prior to the rollout of this initiative, and then repeated at 1- and 2-month intervals after rollout. Compared to before the rollout, the units reported 85% to 89% fewer audible alarms after 1 month and 81% to 93% fewer alarms after 2 months. These results reflected the hardwired changes as described in the structural ability source, although all of the sources contributed to changes in behavior (e.g., alarm checking and management). Units reported an approximately 50% decrease in tachycardia alarms through the 1- and 2-month

No. Alarms	Pre-intervention	Postintervention (1 Month)	Postintervention (2 Months)
Unit A	214	473	688
Unit B	373	182	154
Unit C	914	290	305
Unit D	1,111	319	399
Total	2,612	1,264	1,546

**Table 2.** Tachycardia alarms recorded at four medical-surgical telemetry units

rollout timeframes (Table 2). Hardwiring the equipment would not affect this outcome, which suggests changes in behavior and alarm customization.

Monitoring of incident reports in the hospital revealed no adverse events or close calls as a result of these interventions. Anecdotally, the units sounded quieter after the rollout. Staff nurses maintain an increased awareness of excessive alarms and continue to question each other about individualizing the alarms for their patients.

### Limitations

Limitations with the telemetry alarm vendor posed a challenge with data collection. We suspect a discrepancy with one unit's data (Unit A), which we were unable to rectify. An inability to download workable data created an issue with collecting additional information to evaluate a longer range of quantitative data. Due to a changeover in the hospital's biomed department, we have been unsuccessful in collecting information in the same manner to create further changes. Once we are able to collect data appropriately, we plan to roll out a similar initiative with the SpO<sub>2</sub> alarms.

### Conclusion

Utilizing the influencer model as a practice change planning tool helped to guide our staff to success with this cardiac alarm performance improvement initiative. By combining the interventions from the influencer model in

Table 3, we were able to create a change in behavior and in the culture of cardiac alarm management, as evidenced by the decrease in the number of cardiac telemetry alarms. In addition, the sustainability of this initiative may have also been affected with the integration of the alarm competency into nursing orientation, in which the preceptor nurse on the floor conducts the competency with the new hire.

The influencer model demonstrated and maintained success in decreasing nonactionable cardiac alarms by over 80% on our four medical surgical telemetry units for 2 months after rollout. The interventions that were created with the guidance of the six sources of influence resulted in an organized and successful performance improvement initiative. ■

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	Motivation	Ability
Personal	1 Share stories of patient harm and close calls due to alarm fatigue	2 Education and deliberative practice opportunities
Social	3 Peer Validators to provide education and competency	4 Peer Coaches to help guide practice after rollout
Structural	5 Holding staff accountable; coaching and positive feedback	6 Hardwire alarm changes to prevent audible alarms; job aids

**Table 3.** Influencer model interventions

# Sterile Processing

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