Hospitals and critical access hospitals have until January 1, 2016, to put into place policies and procedures for managing alarms. What does The Joint Commission mean by “managing alarms”? Specifically, the policies and procedures should address concerns such as conditions in which alarms can be disabled or altered, how and by whom parameters for alarms are established or altered, and ongoing alarm monitoring and maintenance.

By the beginning of 2016, hospitals and critical access hospitals will also need to create an educational component to their alarm management to ensure proper distribution of responsibilities and alarm use.

“The field has known that this has been a priority,” says Jodi Eisenberg, MHA, CPMSM, CPHQ, CSHA, manager of clinical compliance and policy management at Northwestern Memorial Hospital and AHAP chair. This is a topic to stay on top of, says Eisenberg. It has been a known concern in the field prior to the NPSG announcement.

“All organizations should be working through the recommendations that were communicated in Sentinel Event Alert 50,” she says. “Similar to recent NPSG releases, these have an extended timeline for implementation. The expectations seem to be in line with what hospitals should be doing to ensure patient safety.”

Alarm fatigue: The Joint Commission’s stance on prevention

Editor’s note: The following report was authored by AHAP advisor Elizabeth Di Giacomo-Geffers, RN, MPH, CSHA, a healthcare consultant in Trabuco Canyon, Calif., and former Joint Commission surveyor.

Spend a few moments in any hospital and it is likely you’ll encounter them—the endless beeps, sirens, alarms, and call tones that staff face every shift. We as a healthcare community have come to recognize that alarm fatigue is a real danger—everyone knows a story, either in passing or from firsthand experience, of the wrong alarm being silenced or simply missed among the many alerts assaulting our ears.

In April, The Joint Commission stepped up its focus on alarm fatigue by issuing Sentinel Event Alert #50, which specifically addresses medical device alarm safety in hospitals.

(The Sentinel Event Alert can be found on The Joint Commission’s website by visiting the following link: www.jointcommission.org/assets/1/18/SEA_50_alarms_4_5_13_FINAL1.PDF.)

Think about the average number of alerts and alarms a healthcare provider might encounter in the course of a day. They come from sources such as the following:

- Electrocardiogram machines
- Pulse oximetry devices
• Blood pressure monitors
• Bedside telemetry
• Central station monitors
• Infusion pumps and ventilators

These systems are all pivotal for patient care, but they each have the tendency to drown the others out, either through similar sounds or simply just the buildup of noise.

According to The Joint Commission’s alert, depending on the unit, a healthcare provider can hear hundreds of alarms daily. This translates into thousands of alarms in each unit, and an exponentially larger number across the entire hospital.

Studies show that anywhere between 85% and 99% of these alarms do not require critical attention. The Association for the Advancement of Medical Instrumentation (AAMI)’s report on alarms notes that many of these sounds have to do with machine maintenance—dried out electrodes or misplaced sensors, for example—as opposed to patient health. Is it any wonder that, when so few of the alarms indicate an immediate threat to health and safety, staff begin to tune them out?

And yet, it is because of that fatigue that real danger emerges.

Alarm-related events
The Joint Commission’s Sentinel Event database includes 98 alarm-related events from the start of 2009 through June 2012—80 fatal and 13 with permanent injuries.

Perhaps the best way to look at this issue, though, is not with numbers but with specific examples. There is an extensive write-up in the March 2012 issue of FIRST Do No Harm, a newsletter from the Quality and Patient Safety Division of the Massachusetts Board of Registration in Medicine, in which leadership from Massachusetts General Hospital (MGH) frankly and openly discuss a case where alarm fatigue directly led to a sentinel event.

The incident, which garnered significant press coverage, involved an 89-year-old cardiac patient who died after being found without a pulse in his hospital room. It was discovered during the organization’s own investigation that the lethal arrhythmia alarm setting (a default setting) had been turned off at the central station, and that the bedside monitor audible volume alarm had also been turned off.

The details of the incident are well documented in the press, but for our purposes we’ll concentrate on the follow-up actions. MGH found that its monitoring system was incredibly complex, with two different central monitoring systems, seven unique monitor models, and various software versions. It also found that there was a lack of consistency in monitoring practice across the continuum of care.

The MGH incident also brought to light the impact of alarm desensitization on staff, particularly the study “Monitor Alarm Fatigue: Standardizing Use of Physiological Monitors and Decreasing Nuisance Alarms” published in the American Journal of Critical Care. “When alarm frequency is high, nurses are at risk for becoming desensitized to the alarms that are intended to protect their patients. Cardiac monitor algorithms are intentionally set for high sensitivity at the expense of specificity,” according to the study.

MGH then created a multidisciplinary team to develop clinical decision-making tools for monitoring patients as well as key education and communication components for the use of these tools.

It also oversaw the development of practice standards for transporting monitored patients from a patient care unit to a testing site, and lastly worked to build and support a culture of alarm awareness and responsiveness. MGH called this campaign “Every Alarm Warrants Action.”

Who should be involved?
Consider involving all of the following disciplines or related areas when examining alarm fatigue in your organization:

• Medicine
• Emergency department
• Intensive care
• Medical staff
• Nursing
• Biomedical engineering
• Quality personnel
• Clinical engineers
Constant alarms can be a deterrent for recovering patients who are trying to sleep. In fact, studies have shown that electronic sounds designed to alert are among the most powerful disrupters of sleep (though this seems like something you wouldn't need a study to prove!), and can cause issues even when set at the quietest levels.

That lack of sleep has ripple effects on a person's health. Specifically, it can contribute to:

- Obesity
- Hypertension
- Diabetes
- Increased mortality
- Increased morbidity
- Impaired glucose tolerance
- Increased inflammatory markers
- Lower antibody blood levels after immunization

All of these conditions can lessen the patient's ability to heal and recover, requiring longer stays and even creating the potential for readmission for future health issues. Lack of sleep can also lead to impaired performance, such as:

- Slower, less accurate mental states
- Unpredictable emotions
- Feelings of pessimism
- Unreliable memory
- Higher likelihood of risky behavior
- Stress
- Exhaustion
- Weak executive decision-making
- Poorer insights and fewer creative solutions

Perhaps most disturbing: According to the World Health Organization, background noise is doubling every 10 years, and thus, auditory system alarms must grow increasingly louder.

**FMEAs**

As we look for sources of advice for prevention, it is worth examining a report that, although issued back in 2008, has advice that's still applicable today.

The Pennsylvania Patient Safety Authority (PPSA)
addressed prevention in a patient safety advisory supplement entitled “Alarm Interventions During Medical Telemetry Monitoring: A Failure Mode and Effects Analysis.”

The PPSA took and deciphered data on alarm-related incidents from the Pennsylvania Patient Safety Reporting System, then narrowed its focus to responses to telemetry-related alarm interventions so that it could reasonably perform a failure mode and effects analysis (FMEA).

A fringe benefit of this analysis is that it fell into the FMEA format recommended by The Joint Commission. The initial report can be found here: www.patientsafetyolutions.com/docs/April_1_2008_Pennsylvania_PSAs_FMEA_on_Telemetry_Alarm_Interventions.htm.

The organization also provided an FMEA document, which can be viewed at the following link: http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2008/mar5(suppl_rev)/Documents/mar5(supplrev).pdf.

**Tips for improving alarm recognition**
The following tips were suggested by Julian Goldman, director of the CIMIT/MGH (Center for Integration of Medicine & Innovative Technology/Massachusetts General Hospital) Program on Medical Device Interoperability for the AAMI:

- Implement more individually customizable, “smarter” alarm settings at the point of care.
- Install a device/network data log to obtain a complete data set to optimize systems and alarm systems.
- Ensure that the healthcare community is actively participating in the process, whether through a clinician or engineer developing change, or end users evaluating and testing the systems. It’s not just up to the manufacturers to improve alarm settings.
- Use an open “app platform” to enable the efficient development of clinical decision support and alarm system apps.
- Adopt interactive alarms in patient rooms that vary their pitch and speed based on criticality. You can see an example of such an alarm at the following link: www.boston.com/lifestyle/health/specials/alarmsgraphic.