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Alarm Management

Alarm fatigue: its significance and ways to address it

In the dynamic landscape of healthcare leadership, one can't ignore the pervasive challenge of alarm fatigue, a silent threat that jeopardizes patient safety and that strains the resilience of our healthcare providers. Statistics reveal an alarming truth: a clinician hears an average of 350 alarms per patient, per day.[1] Of these, 76.9 – 99.4% are false positives or non-actionable, creating an environment where vital alerts can be easily drowned out, leading to delayed responses and a growing alarm fatigue crisis.[2,3,4]

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Addressing the threat to patient safety

The gravity of alarm desensitization and alarm fatigue has been acknowledged by national patient safety-focused organizations for years. A decade ago, the Joint Commission identified the absence or inadequacy of alarm systems, improper settings, inaudible signals and alarms being turned off as contributors to alarm fatigue and patient deaths.[5] The commitment to addressing this issue is evident in its **2023 National Patient Safety Goals**, where hospitals are mandated to make improvements ensuring timely responses to medical equipment alarms.

It's become such a widely recognized issue that the Association for Medical Instrumentation (AAMI), The U.S Food and Drug Administration (FDA), The Joint Commission (TJC), American College of

Clinical Engineering (AACE), and the Emergency Care Research Institute (ECRI) convened a summit for outside experts to come to a consensus on key actions for consideration to manufacturers, clinicians, and researchers to help address alarm fatigue.[6] Additionally, ECRI, which conducts independent medical device evaluations, has named missed alarms and alarm overload as one of the "Top 10 Health Technology Hazards" every year from 2012 to 2020.[7] The need for a comprehensive solution is clear, and at Philips, we understand the urgency of reducing alarm fatigue to help mitigate medical errors, staff turnover and lost productivity, and to help create a more peaceful patient experience.[8]

Who's affected most

Data from a Children's Hospital sheds light on which nurses may be most affected by an inundation of false or non-actionable alarms. A study revealed that nurses responded to alarms faster if they had less than one year of experience.[9] Additional factors associated with longer response times included whether the nurse was in a 1-to-1 assignment or had previously responded to an actionable alarm for the same patient who required intervention. The same study showed that each hour that passed during a nurse's shift (second hour vs. eighth hour) was associated with longer response times to alarms, which the authors suggest may indicate physical and mental fatigue.[9]

An environment teeming with unnecessary alarms can also take a heavy toll on patients. Developing long-term cognitive impairment has many risk factors, including delirium, which is a serious form of brain dysfunction and frequently encountered in the ICU.[11] Delirium also has many risk factors, such as respiratory failure and shock, metabolic disturbances, pain, immobility, prolonged mechanical ventilation, sedatives and sleep. The good news is that sleep deprivation is a potentially modifiable risk factor for delirium.[12,13] Without sleep, patients lose the cognition and emotional regulation needed to process their experience.[9] A loud environment driven by patient monitoring alarms, and slow staff response to alarms, can exacerbate this sleep deprivation.

Interventions to combat alarm fatigue

While there are no universally adopted approaches to combating alarm fatigue, hospitals are taking individual approaches to address it, with positive results. Below are some examples that employ patient monitoring technologies, hands-on support and clinical education.

Reducing alarms with customized alarm parameters

A recent study examined whether **Philips Alarm Advisor, alarm customization software** reduced alarm rates and improved nurses' experience of alarms in an ICU. The software tracks how clinicians are responding to each patient's alarms, to help them adapt alarm limits specifically to that patient, with the goal of reducing non-actionable alarms for patients whose conditions cause vital signs to fall outside of normal parameters, and to increase the ratio of clinically significant alarms. The study found that this software can help reduce the time in alarm for various physiologic alarms, placing a smaller time burden on staff while improving workplace conditions.[14]

Education & strategic support

Nurses are responsible for configuring and customizing clinical alarm parameters to reduce the number of nonactionable or false alarms – a complex process that may be easier for clinicians who have more experience. However, providing education on how to manage this technology can take more manpower than many hospitals are able to commit. The result is a gap in alarm management skills and low confidence among nurses regarding safely navigating these monitoring systems. To mitigate the risks associated with alarm fatigue, as primary end users of physiologic monitors, nurses should have a thorough understanding of physiologic monitor functionality and alarm systems.[15]

Philips **alarm management clinical consultants** work directly with clinicians to learn how to leverage patient monitoring capabilities, including alarm customization software. These services can expand to a partnership that includes a complete assessment of current processes and workflow, capturing and analyzing data, providing recommendations for improvements and helping to implement proposed changes.

The effectiveness of a collaborative partnership is evident in a recent study published by the American Association of Critical Care Nurses. This study, which focused on the use of Philips monitoring systems in an ICU, highlighted the positive outcomes of a quality initiative. Through on-site education and hands-on experience, nurses reported improved alarm management practices, perceptions and attitudes, demonstrating the tangible benefits of strategic collaboration. Of the nurses who attended the training sessions, 95% indicated they felt confident and competent in using the equipment.[16]

Implementing the on-site education as part of its larger strategy improved nurses' alarm management practices, perceptions and attitudes. Several nurse-reported areas improved from baseline, with respondents indicating that setting alarm parameters was less complex, staff were sensitive to alarms and responded quickly. There were also fewer instances of alarms being missed.[16]

Improving alarm insights and creating less disruptive care areas

Philips clinical consultants also work with clinicians to adopt other alarm management tools. One example is **Alarm Insights Manager** software that turns alarm data into actionable insights to support making positive changes. Graphic visualizations of alarms on the patient monitor can shed light on the quality of overall alarm status and allows clinicians to measure whether their alarm improvement initiatives are having the desired effect, over time. This enables users to create a strategy to continuously improve and raise alarm standards.

Another example is Philips partnerships with clinicians to take advantage of mobile notification systems. With **Care Assist**, clinicians can see live patient data and acknowledge alarms – all from their mobile device. Through real-time alerts on their devices, clinicians can be notified of alarms – along with clinical context – and make an informed decision on how to respond.

As leaders, we must foster a culture of innovation and collaboration to tackle the persistent challenge of alarm fatigue. The commitment to continuous improvement and the implementation of clinically proven solutions is paramount. Beyond merely silencing unnecessary alarms, successful alarm management requires a partner who comprehends the complexities of patient monitoring and who is dedicated to delivering tailored solutions.

The fight against alarm fatigue is not just a technological challenge; it's a call for leadership to rise to the occasion. By championing innovation, collaboration and a commitment to patient safety, we can usher in an era where alarms are meaningful, response times are swift and the healthcare environment is conducive to both patient recovery and the well-being of our dedicated healthcare providers. Together, let us lead the charge together against alarm fatigue, ensuring a safer and more resilient future for healthcare.

Read more about **Philips alarm management solutions**.

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