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Clinical alarm management solutions: will they reduce alarm fatigue?

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Dr. Mark Holger-Konrad, Medical Leader, Hospital Patient Monitoring, Philips "Alarm fatigue has significant implications for patient safety, and if not managed well, can overwhelm healthcare professionals. To achieve effective alarm management, Asian industry stakeholders must work closely together to improve patient-centricity"



A routine hospital environment includes constant beeping, dose meters, electronic devices, telemetry, ventilators, monitoring machines, and many more automated digital devices. This can result in alarm fatigue, which is a sensory overload caused by too many alarms, which can lead to desensitized clinicians and missed alarms. The constant exposure to these medical device alarms can eventualy resulting in alarm fatigue in Clinicians or they may experience alarm de-sensitization.

Healthcare practices are increasingly recognizing alarm fatigue as an important patient safety issue due to the increasing number of alarms. Research indicates that 72% to 99% of all alarms are false which has led to alarm fatigue. In this context, alarm management has become an important part of digital transformation in acute care and also boosting the demand for clinical alarm management solutions.

The growing prevalence of alarm fatigue and healthcare facilities adopting clinical alarm management solutions has driven the growth of the clinical alarm management market. In a recent report by Grandviewresearch the global clinical alarm management market size was valued at $1.05 billion in 2021 and is expected to expand at a CAGR of 20.8% from 2022 to 2030. During the forecast period, the Asia Pacific market is expected to grow at the highest CAGR of 24.4% especially in major markets such as Australia, China, India, and Japan. b.Among the key leading players operating in the clinical alarm management market include Koninklijke Philips. **Dr. Mark Holger-Konrad, Medical Leader, for Hospital Patient Monitoring at Philips** shares more insights on significance of alarma fatigue and its evolving trends in healthcare practices.

- **What is alarm fatigue and what causes it?**

To increase safety throughout hospital care units, electronic medical devices play a crucial role in patient care by providing essential physiologic monitoring and life support. These devices create alarms and warnings that are designed to notify doctors and caregivers of any physiological parameter deviation from its normal range before a patient is put at risk. Alarms are also used by life support systems to notify medical personnel of potential life-threatening malfunctions. However, with over hundreds of alarms sounding out in intensive care units every day, this can result in what we know as alarm fatigue.

Due to this sound and cognitive overload, healthcare professionals may not always respond adequately to an alarm. In fact, a lot of the time, these alarms aren't critical, with up to 85% of alarms being non-actionable. In many instances, healthcare professions choose to silence the alarm, and in some instances, turn it off altogether.

- **How can healthcare organizations in Asia implement an effective alarm management program?**

Physicians have a saying that goes: 'Diagnosis before treatment'. As such, the first step is diagnosing the issue at hand. In the context of alarm management, this can include issues in the organizational setup, architecture, processes as well as flaws in devices.

The second step is assessing the situation to identify what causes the issue and how it can be effectively changed. Navigating alarm fatigue is a very complex issue, so healthcare organizations in Asia can consider engaging external expertise for this. They can also refer to resources and recommendations from societies like the American Association of Critical-Care Nurses.

The third step is identifying whether the issue – or the diagnosis – can be tackled effectively with technology or with education and training for staff. When it comes to alarm management programs, it is critical to have the right technology, processes, and people in place. Healthcare organizations in Asia should not only ensure that staff know how to use the equipment, but they should also look to nourish a culture of speaking up and reporting incidents. This helps to raise awareness and the sharing of experiences, which reduces the likelihood of the error occurring again.

- **To combat alarm fatigue, what are some of Phillips' initiatives?**

As a health technology organization, Philips is committed to improving lives and enhancing patient care. Our devices have alarm management systems built to help address alarm fatigue, and we ensure they are interoperable and seamlessly integrated within any hospital system. For example, one such tool is the Philips Alarm Advisor, which helps enable clinicians to cut through the din of non-actionable alarms and alerts healthcare professionals when the set thresholds for a patient may be too sensitive and setting off unnecessary alarms. This management tool provides a notification on the screen of the device, prompting the clinician to evaluate the patient's condition and either take action or customize the patient's alarm limits.

We also have tools in place to identify technical errors of devices, such as our continuous patient monitoring systems which ensure that there is a good signal transduction from the patient to devices. To support with decision making, tools such as our ST map help provide visual decision support by organizing data into horizontal trends, time, and targets to enable early intervention and prevent alarms.

Taking a step back to also leverage on our smart hospital expertise, we also work closely with third party organizations, such as clinical services that perform on-site assessment, to identify if there are workflow, process or technical issues at the care delivery site specifically, and then work with the facility on a holistic solution to improve these issues.

- **In terms of clinical alarm management solutions, what role has Philips played in the market and what are the anticipations?**

We are in a good position to work with industry players to move forward with end-to-end digital transformation that will help, not only in the development of technologically advanced clinical alarm management solutions, but also transform cultures, mindsets, organizational structures, and governance towards smarter eco-systems of patient care. Our big picture priority is to focus on interoperability and digital transformation: seamlessly connecting and embedding innovative technologies in every aspect of care delivery to improve operational efficiencies, deliver clinical excellence, and provide a seamless end-to-end patient and staff experience.

As a market player in alarm management solutions, we are continuously working towards improving how our solutions can flexibly adapt to evolving needs. This includes always keeping abreast of the latest best practices in alarm management, regularly consulting with clinical services and other experts, as well as having enablers on hand who will help set the standards for how devices can communicate.

Some well-established solutions that Philips currently offer includes:

- CareEvent – a mobile application which sends informative alerts directly to one's smartphone so that informed decisions can be made, and fast action can be taken. The app brings alarms and information to caregivers on the go, offering reporting and analysis tools, as well as consulting and clinical education services, allowing for the ability to gain control over clinical alarms in critical care environments.
- Philips Excel Alarm Management Program – provides consultative services and education to support healthcare facilities in providing better care and increasing value to patients.
- The Excel Alarm Management program – a collaborative approach based on the DMAIC (Define, Measure, Analyze, Improve, Control) methodology.
- Philips Alarm Advisor – helps physicians to identify ineffective alarms and warns them when monitoring thresholds could be excessively sensitive.

- **How will alarm management solutions evolve in the future?**

Alarm fatigue has a clear impact on patient safety, and if not managed well, can overwhelm healthcare professionals. The industry must work together with careful scrutiny on improving the patient-centricity of these solutions moving forward, and it's encouraging to already see effective alarm management in some countries and facilities in Asia. While there are effective alarm management solutions in place already, they can be further enhanced through digitalization. For example, for efficiency, alarms should be going off near where the nurses and doctors are, and not just next to the patient's bed. Solutions can be designed, and some already exist, so that alarm notifications and related information are sent directly and immediately to the devices of caregivers, regardless of where they are, in addition to sounding on the equipment itself. For example, I saw some best practices when I visited Singapore in August this year. The successes can be attributed to the infrastructure in place, as well as the general awareness around alarm management and fatigue as industry players are discussing it amongst each other

At the end of the day, no patient wants to end up in hospital. But when they do, they want their experience to be as frictionless, comfortable, and reassuring as possible, with minimal delays. Physicians and hospital staff, for their part, want to focus on delivering the best possible patient care, without getting bogged down in administrative duties and a cacophony of alarms. The way forward must lie in optimizing workflows and driving out waste (such as unnecessary alarms) from processes. Only then can we ensure that every patient gets the right care, in the right place, at the right time.

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