



# Nurses' Ultimate Guide to Alarm Fatigue Interventions

Prevent Burnout With  
Smarter Workflows



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## What is alarm fatigue?

Between overhead call systems, pages, texts, phone calls, and the constant beeps of patient monitors, the hospital environment is a noisy place. Clinical alarms are a major contributor. While telemetry monitoring, ventilator monitoring, nurse call systems, and other key physiological monitors are vital for notifying caregivers of a change in patient status, these technologies are far from perfect.

A recent study on alarm management in an intensive care unit found over 60%<sup>1</sup> of alarms were false alarms, and another source found this range to be much higher, between 72%-99%.<sup>2</sup> In fact, most of the alarms nurses receive are non-actionable (only 5-13% of alarms require timely intervention) and many may not even be relevant to a nurse's specific job function.<sup>3</sup> For example, nurses aren't typically responsible for bedside care and service, which is facilitated by nursing assistants, housekeeping, and dietary services. Yet patient requests get filtered through nurses because patients only have one call button they can push for help. When nurses are the recipients for all alerts, it contributes to burnout, slows productivity, and can lead to delays in care.

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<sup>1</sup> [www.ncbi.nlm.nih.gov/pmc/articles/PMC4756058/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4756058/)

<sup>2</sup> [www.researchgate.net/publication/274511324\\_Alarm\\_Fatigue\\_A\\_Concept\\_Analysis](http://www.researchgate.net/publication/274511324_Alarm_Fatigue_A_Concept_Analysis)

<sup>3</sup> [pubmed.ncbi.nlm.nih.gov/26893950/](http://pubmed.ncbi.nlm.nih.gov/26893950/)

Alarm fatigue in nursing is the phenomenon that occurs when clinicians are exposed to multiple alarms of mixed significance and become desensitized to safety alarms due to the sheer number of alarm signals and notifications they receive. Alarm fatigue can lead to missed alarms or delayed responses to critical alarms that put patient safety at risk.<sup>4</sup> In 2023, the ECRI found the overuse of cardiac telemetry monitoring to be among the top ten current technology health hazards in the healthcare community and alarm hazards have regularly appeared at or near the top of this list since it was first published in 2007.<sup>5</sup>

When nurses become overloaded by non-actionable alarms, they are more likely to miss critical alarms for patient events that need their immediate attention, such as when a patient falls. A missed critical event can lead to a decline in the patient's status, set them back in their recovery, and increase their length of stay.<sup>6</sup> There's a financial impact, too. Missed clinical alarms cost hospitals an average \$8,168 for each event that causes serious harm to the patient.<sup>7</sup> Therefore, reducing the number of alarms is not just important for supporting nurse well-being, it can also be a cost-avoidance strategy for hospitals.

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<sup>4</sup> [aacnjournals.org/ccnonline/article-abstract/41/4/29/31513/An-Evidence-Based-Initiative-to-Reduce-Alarm](https://aacnjournals.org/ccnonline/article-abstract/41/4/29/31513/An-Evidence-Based-Initiative-to-Reduce-Alarm)

<sup>5</sup> [assets.ecri.org/PDF/ECRI\\_2023\\_Top\\_10\\_Hazards\\_Executive\\_Brief.pdf](https://assets.ecri.org/PDF/ECRI_2023_Top_10_Hazards_Executive_Brief.pdf)

<sup>6</sup> [ncbi.nlm.nih.gov/pmc/articles/PMC3928208/](https://ncbi.nlm.nih.gov/pmc/articles/PMC3928208/)

<sup>7</sup> [pubmed.ncbi.nlm.nih.gov/25803176/](https://pubmed.ncbi.nlm.nih.gov/25803176/)





# Alarm fatigue contributes to nurse burnout

A recent survey from the [American Nurses Foundation](#) and the [American Nurses Association](#) found that 60% of acute care nurses are experiencing burnout, and 75% report feeling stressed, frustrated, and exhausted.<sup>8</sup> Alarms add to the strain – nurses who are experiencing alarm fatigue have been found to be at greater risk for burnout and compassion fatigue (a reduced ability to nurture and empathize with patients).<sup>9</sup>

## 60% of acute care nurses are experiencing burnout

Another risk is cognitive overload, which happens when a nurse's attention becomes so overwhelmed that they are unable to maintain the situational awareness they need in order to appropriately respond to their patients. Unsurprisingly, this has implications for patient safety; cognitive overload affects nurses' mental, physical, and emotional wellbeing and can lead to mistakes and oversights that hurt patient care.<sup>10</sup> In a recent survey conducted by TigerConnect and *Becker's Hospital Review* of 53 nursing leaders, cognitive overload was found to be the second highest perceived risk of communication challenges that negatively impact patient care.<sup>11</sup>

When burnout gets bad enough, it can cause nurses to leave the workforce entirely. Over one-third of the nursing workforce is expected to retire in the next 10 to 15 years, at a rate that nursing schools are not projected to keep up with.<sup>12</sup> Turnover rates among nursing professionals are also high, ranging between 8.8% to 37% depending on geographic location and nursing specialty.<sup>13</sup>

8 [www.aacnnursing.org/news-information/fact-sheets/nursing-shortage](http://www.aacnnursing.org/news-information/fact-sheets/nursing-shortage)

9 [pubmed.ncbi.nlm.nih.gov/33174282/](https://pubmed.ncbi.nlm.nih.gov/33174282/)

10 [psnet.ahrq.gov/web-mm/cognitive-overload-icu](https://psnet.ahrq.gov/web-mm/cognitive-overload-icu)

11 TigerConnect & Becker's Hospital Review Survey, 2023

12 [www.ncbi.nlm.nih.gov/books/NBK493175/](https://www.ncbi.nlm.nih.gov/books/NBK493175/)

13 [www.ncbi.nlm.nih.gov/books/NBK493175/](https://www.ncbi.nlm.nih.gov/books/NBK493175/)

[Nursing shortages](#) create a dangerous cycle: with fewer nurses on the floor at any given time, on-call nurses must take on larger patient loads, thereby increasing burnout and risking patient safety. High nurse-to-patient ratios, greater than 1:4, are associated with an increase in hospital mortality, as well as an increased likelihood that patients will acquire infections or become injured.<sup>14</sup>

Healthcare leaders looking to curb nurse burnout within their organizations must address alarm fatigue as an underlying cause negatively impacting job satisfaction and nurses' mental health.

### **National standards to reduce alarm fatigue**

Alarm fatigue has long been recognized as a national patient safety issue that puts patients at risk of medical mistakes or even death. Since as early as 2004, The Joint Commission, which accredits and certifies more than 22,000 healthcare organizations and programs in the United States, has put in place National Patient Safety Goals (NPGS) focusing on the effectiveness of clinical alarm safety.

In 2014, the [Joint Commission](#) made improving the safety of clinical alarms an official National Patient Safety Goal (NPSG 06.01.01), calling on hospitals to establish alarm safety as a top priority. Leaders at your organization should identify which alarm signals are most important, establish policies and procedures for managing those alarms, and educate staff and licensed independent practitioners about the purpose and proper operation of alarm systems for which they are responsible.<sup>15</sup> Most recently in 2023 the Joint Commission included NPSG 06.01.01 in its *2023 National Patient Safety Goals for Critical Access Hospitals*, highlighting the continued need to reduce patient harm associated with clinical alarm systems.

While universal solutions have not yet been identified, as hospital system alarms are often customized to their specific clinical units and patients, the Joint Commission stresses the importance of critical access hospitals understanding their own unique situation to develop a "systematic, coordinated approach to clinical alarm system management."<sup>16</sup>

<sup>14</sup> [mds.marshall.edu/mgmt\\_faculty/196/](https://mds.marshall.edu/mgmt_faculty/196/)

<sup>15</sup> [www.jointcommission.org/-/media/tjc/documents/standards/r3-reports/r3\\_report\\_issue\\_5\\_12\\_2\\_13\\_final.pdf](https://www.jointcommission.org/-/media/tjc/documents/standards/r3-reports/r3_report_issue_5_12_2_13_final.pdf)

<sup>16</sup> [www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2023/npsg\\_chapter\\_cah\\_jul2023.pdf](https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2023/npsg_chapter_cah_jul2023.pdf)





## Alarm fatigue interventions to reduce nurse burnout

Every hospital's approach to reducing alarm fatigue will need to be multifaceted and customized to the unique needs of its patients and care teams, but there are a few strategies we recommend starting with. Research from the American Association of Critical Care Nurses has shown that quality improvement projects, such as daily electrocardiogram electrode changes, proper skin preparation, education, and customization of alarm parameters have been able to decrease the number of false alarms that contribute to alarm fatigue in nursing.<sup>17</sup>

When managed appropriately, clinical alarm management has the power to be a vital tool for nurses that supports them in monitoring the care and health of their patients – without being overwhelming. Below are several strategies hospitals are using to reduce alarm fatigue and make nurses' jobs easier.

### **Ensure electrodes are regularly replaced and skin is prepared**

Replacing single-use electrodes and sensors daily is an important first step toward reducing false alarms caused by dirty equipment or technical malfunctions. Electrodes need to be replaced regularly and after certain situations, such as bathing, to prevent false alarms and inaccurate ECG patterns or "artifacts." Poor contact with the patient's skin is another simple reason a false alarm can be triggered. A recent study featured in the *American Journal of Critical Care* found that washing the patient's skin with soap and water prior to applying new electrodes significantly reduced the number of alarms associated with a patient, compared to those who did not receive proper skin preparation.<sup>18</sup>

<sup>17</sup> [pubmed.ncbi.nlm.nih.gov/24153215/](https://pubmed.ncbi.nlm.nih.gov/24153215/)

<sup>18</sup> [pubmed.ncbi.nlm.nih.gov/32869068/](https://pubmed.ncbi.nlm.nih.gov/32869068/)

## Tailor alarm settings to individual patient needs

The ECRI recommends hospitals put policies in place that promote tailoring alarms to each individual patient's needs, whether it be bedside/telemetry patient

monitoring or ventilator monitoring.<sup>19</sup> By tailoring alerts to a patient's specific condition and needs, healthcare providers can focus on ranges that need immediate attention (such as a life-threatening heart rhythm change for a cardiac patient) and filter out nuisance alerts that may only add stress to the patient and inundate the provider. A less noisy hospital environment not only helps reduce alarm fatigue for nurses, but it also creates a better environment for the patient to recover faster.

## Educate patients

Alarms can also cause stress for patients and their families, who may pass this stress onto their care teams by repeatedly calling on nurses when an alarm goes off. Make sure patients understand why an alarm may signal and what the alarm means so that they are not disturbed by routine noises.

## Power nursing workflows with a cloud-based alarm management and event notification system

Cloud-native [alarm management and event notification solutions](#) interface with nurse call systems, physiological monitors, EHR, smart beds, and more to acquire alarms, events, and values in real-time and triage alerts to the right care providers. Unactionable alarms are automatically filtered out by the software and alarm delays can also be put in place to allow for patients to self-correct. Via configurable workflows, only actionable alarms are routed to the right caregivers as context-rich notifications. If a caregiver is unable to respond in a timely fashion, the software can automatically escalate the alarm to an appropriate team member as defined by the workflow.

This strategy is preferable because it increases nurse productivity by giving care teams access to the right information at the right times. In the following section, we'll cover how optimizing your clinical workflows with an alarm management and event notification system reduces alarm fatigue.

<sup>19</sup> [www.ecri.org/components/HRCAlerts/Pages/HRCAlerts041013\\_Joint.aspx](http://www.ecri.org/components/HRCAlerts/Pages/HRCAlerts041013_Joint.aspx)





## Smarter workflows prevent alarm fatigue

Healthcare technology should make nurses' jobs easier, not harder. While intended as an aide to care delivery, many alarm and patient monitoring systems have become a burden for nurses.

In a survey conducted by TigerConnect and *Becker's Hospital Review*, nurses expressed difficulty in accessing contextual information for alerts and alarms more than any other type of critical data.<sup>20</sup> But when technology provides context-rich alerts to nurses, hospitals can reduce alarm fatigue and remove obstacles to care delivery.

Hospitals need alarm management technology that can filter out the non-actionable alerts, while simultaneously enriching actionable alerts with contextual information and routing them to the right care team member. By reducing alarm clutter and distributing the responsibility for following up on alerts, nurses can work with fewer interruptions and focus on patient care.

TigerConnect streamlines nurse workflows by delivering actionable notifications at the point of care, speeding up responsiveness and reducing alarm fatigue. Together, the [TigerConnect Clinical Collaboration Platform](#) and [TigerConnect Alarm Management and Event Notification](#) enable nurses to easily respond to alarms and communicate with other on-call providers in real-time to support better care delivery.

<sup>20</sup> TigerConnect & Becker's Hospital Review Survey, 2023

# 5 ways you can optimize nurse workflows with TigerConnect

## 1. Reduce noise from non-actionable alarms

**A typical hospital:** Many of the alerts nurses receive from telemetry and ventilator monitoring are not actionable and lack patient context, such as those caused by technical errors in the system and self-correcting fluctuations in patient vitals. Alerts also occur locally in the patient room or at a central monitor – which may or may not always be monitored by a person who can triage false positive or actionable alarms.

**With TigerConnect:** Only actionable alerts are passed through, following escalation paths that alert the right caregiver in near real-time. Using delay/suspend logic, TigerConnect acts as a secondary filter, removing non-actionable alerts from staff attention. For example, if patients are being monitored for extreme tachycardia (heart rates above 160 beats/min), a delay of 15 seconds can be applied so that only alerts for patients with a sustained elevated heart rate would be sent to the appropriate care team member. Alerts for self-correcting patients would not disrupt nurse workflows.

Widening default alarm limits per hospital policy to exclude alerts within non-actionable ranges has been shown to be a highly reliable intervention to mitigate alarm burden without risking patient safety.





## 2. Route code activation alerts directly to specific code teams' mobile devices

**A typical hospital:** When a patient codes, the responding care team member must dial down to the operator and provide details of the code in progress. The operator then pages the code overhead and relies on the speaker system to engage the right resources. This process can waste precious time and put patients at risk. Many times, overhead pages are not even heard given the presence of where speakers and staff are located inside the hospital.

**With TigerConnect:** Nurse call code activation can be optimized in two ways. If code calls are integrated with the nurse call system, codes (such as [code blue](#)) can be activated at the patient's bedside, and an alert will be sent in near real-time to the code blue members mobile devices via TigerConnect. Code teams are made up of specific users or roles designated in TigerConnect. Alternatively, the operator can activate the code blue team via TigerConnect and send an audible priority alert out to the appropriate code team members.

Hospitals using TigerConnect have been able to speed [code blue response time](#) by up to 2.5 minutes.

## 3. Route alerts to the right staff at the right time with integrated workflows for clinical applications

**A typical hospital:** When events are triggered by clinical systems, such as infant security systems, alerts are triggered locally via the security hardware on the unit. Caregivers, security personnel, or other critical staff members must be manually notified via a phone call or page. Manual notification processes waste time and risk patient safety. In worst-case scenarios, a security alert may not be immediately heard depending on the location of staff near the device.

**With TigerConnect:** If a baby is taken off the unit, the infant security tag will trigger an alert through TigerConnect Alarm Management and Event

Notification that will be sent directly to appropriate caregivers. This same workflow can be applied to any product or application that requires an alert to be sent out to staff. By eliminating manual notification processes with alarm and alert integration, caregivers can respond quickly to keep patients safe.

#### 4. Save nurses' time with mobile call backs to assess patient needs

**A typical hospital:** When a nurse receives a call from a patient (e.g., the patient is in pain), the nurse has to physically walk to the patient's room to address the call before they can assess the patient's issue.

**With TigerConnect:** The nurse has the option to talk to the patient on the phone when they receive an alert on their mobile device. Using mobile callbacks, the nurse can gather information about the request without needing to walk back to the patient's room. For example, when a nurse receives an alert for pain, they can call the patient's room directly to conduct a pain assessment. After assessing the patient's pain level, the nurse can determine the appropriate course of action and move onto intervention. Hospitals using TigerConnect for mobile callbacks are able to save their nursing staff an estimated 22.8 minutes per caregiver every day of walking back and forth to and from patients' rooms.<sup>21</sup>

Save up to 22.8 minutes per nurse every day with mobile callbacks

<sup>21</sup> Based on internal client data.





## 5. Route nurse call alerts and escalations only to relevant caregivers, giving nurses back valuable time to focus on patient care.

**A typical hospital:** Nurse call events are sent to the console at the nurses' station and must be picked up by a unit secretary or similar role in order to be triaged. Once the request is identified, the unit secretary must either physically track down the appropriate clinical resource or dial the provider's phone extension to share information on the patient's needs. Oftentimes, patient monitor alarms are sent out to all caregivers, instead of only those assigned to the patient. This deluge of alarms requires nurses to cognitively shift their attention hundreds of times a day, even if the alarm is irrelevant or non-actionable. Excessive cognitive shifting may override a nurse's ability to appropriately attend to a given patient's priorities and can lead to medical errors.<sup>22</sup>

**With TigerConnect:** Hospitals and healthcare organizations can reduce nurse fatigue and burnout by significantly reducing the number of alerts nurses receive. TigerConnect reduces the amount of irrelevant and distracting alarms nurses encounter by intelligently routing alerts and escalations directly to appropriate team members, improving response times and ensuring better patient safety. Hospitals using TigerConnect are able to save an estimated 18.7 minutes per caregiver every day by eliminating irrelevant alarms and preventing unnecessary cognitive shifting.<sup>23</sup>

Save up to 18.7 minutes per nurse every day by eliminating irrelevant alarms

<sup>22</sup> [www.ncbi.nlm.nih.gov/books/NBK20475](http://www.ncbi.nlm.nih.gov/books/NBK20475)

<sup>23</sup> Based on internal client data.

## Take a closer look: nurse call workflow using TigerConnect

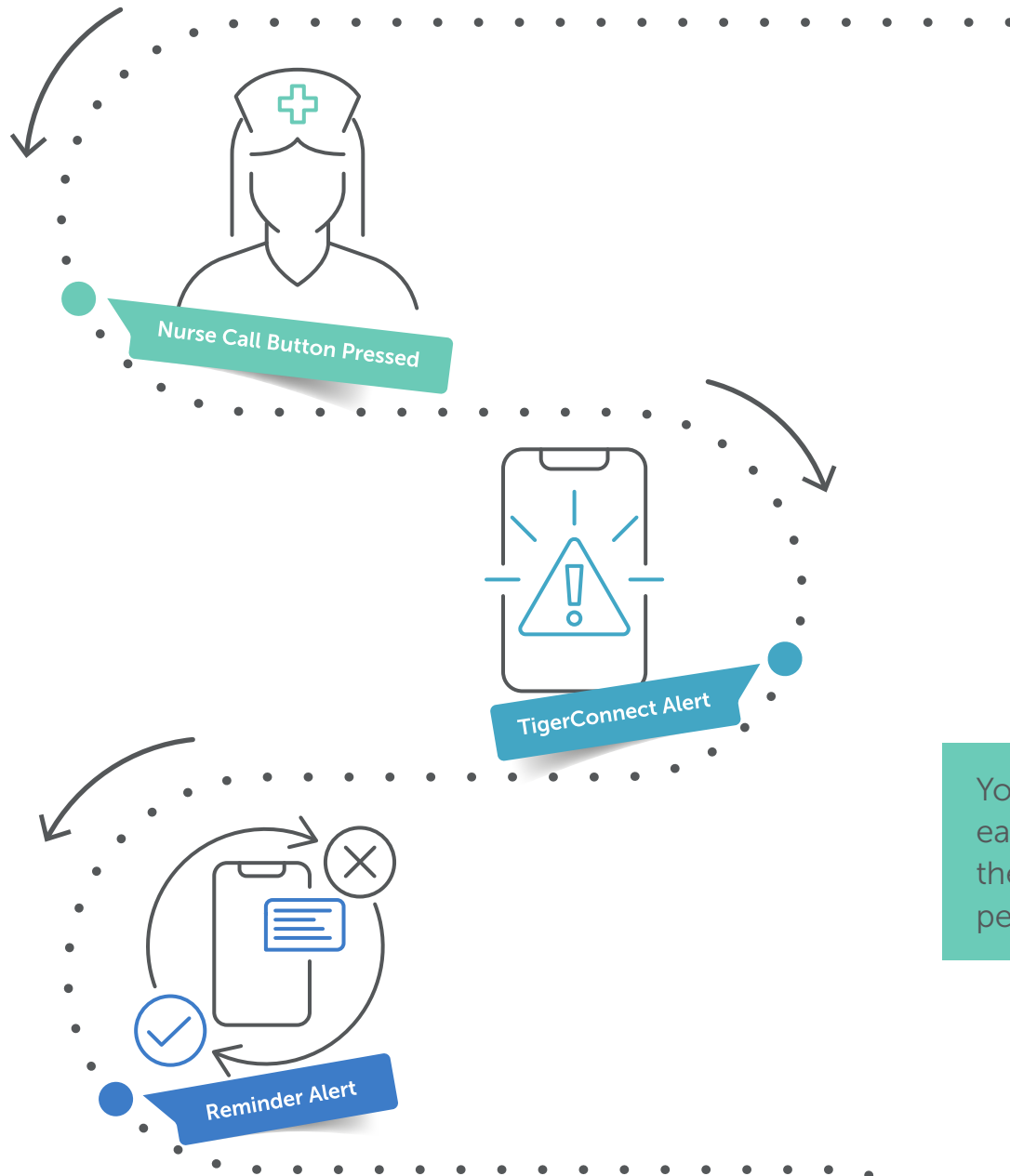
A typical nurse call workflow for a normal (medium priority) alert can take as long as 14 minutes to complete and can involve a long and frustrating game of phone tag between the unit secretary and the nurse. A workflow supported by TigerConnect eliminates manual notification processes to dramatically speed up response times and improve the overall patient and provider experience.



## A smarter, faster, safer nurse call workflow with TigerConnect

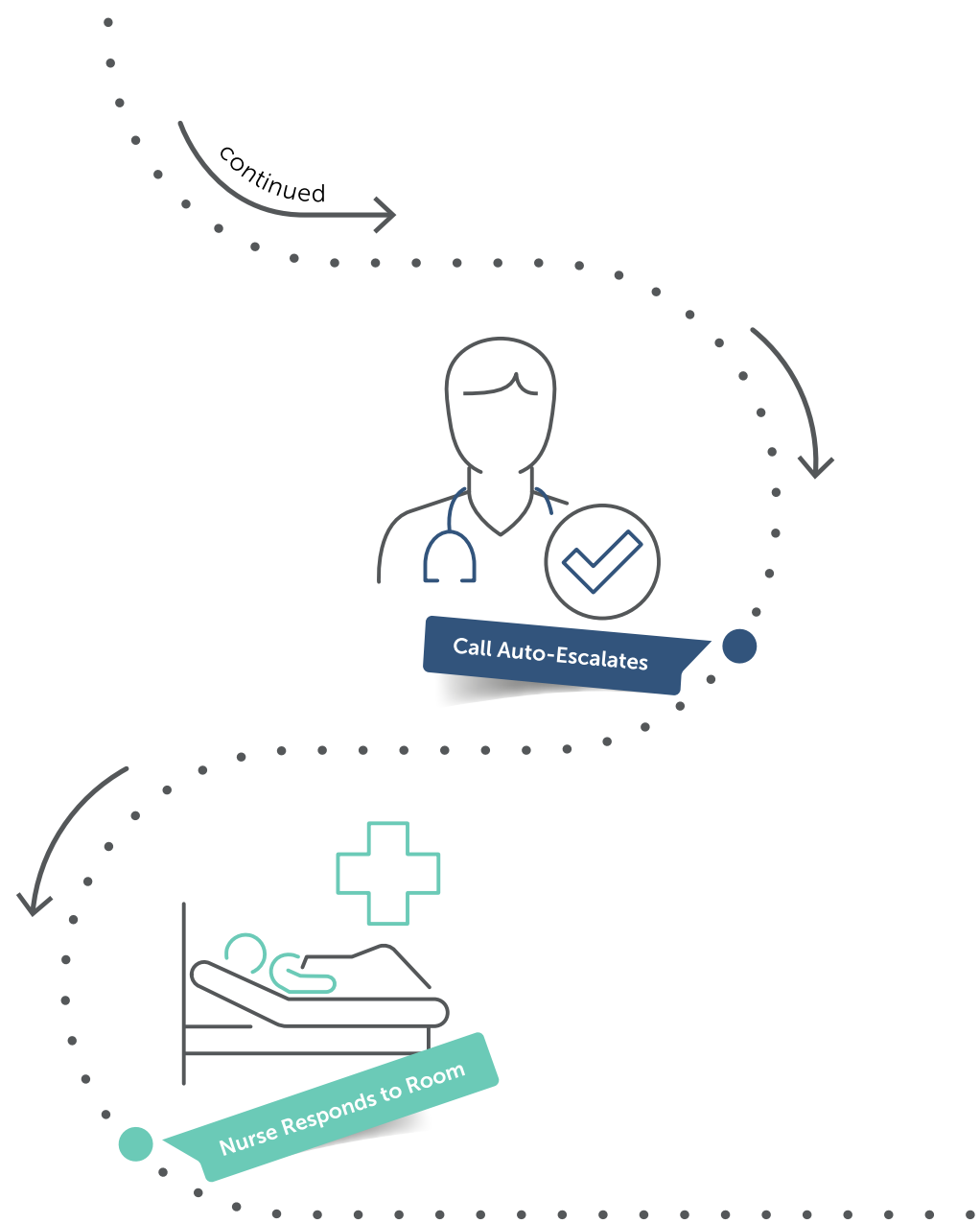
1. A patient needs assistance going to the bathroom, so she presses the nurse call button on her bed for help.
2. The call is sent directly to the patient care technician's (PCT) wireless device via a TigerConnect alert card, which includes the patient's name, room, location, precautions, and other important information.
3. The PCT receives the notification but is busy with another patient and is unable to respond immediately.
4. The PCT receives a reminder alert after two minutes.

You can customize escalation times based on each patient's unique needs. Providers also have the option to reject a call to escalate it to the next person quicker.



5. If the call has not been responded to after two minutes, it is automatically escalated to an appropriate RN.
6. The RN still has not responded to the reminder alert after two minutes, so the call is escalated to the charge nurse.
7. The charge nurse accepts the call via the TigerConnect alert card, which includes all relevant patient information they need to respond.
8. The charge nurse responds to the patient's room and cancels the call.

**Total time from call to response is as little as a few seconds,** and no more than a few minutes (response time will be faster if the call is accepted before being auto-escalated).







## Better nurse workflows require fewer interruptions

The healthcare ecosystem simply could not run without the skilled care nurses provide. Nurses manage patient intake, monitor vitals, administer medication, maintain records, coordinate care, and make life-saving decisions when every second counts. As the front lines of our hospitals, they deserve tools that improve their work environment and support them in delivering the best care possible.

TigerConnect mitigates alarm fatigue by quieting unnecessary interruptions to deliver actionable notifications from the patient ecosystem directly to caregivers.

### **When your nursing workflows are optimized by TigerConnect:**

- Alerts, alarms, and events from multiple sources (physiological monitors, critical labs, smart beds, and other clinical systems) are ingested into a single FDA-cleared, cloud-native user interface.
- Context-rich notifications are intelligently routed to appropriate caregivers - not entire care teams, reducing alarm fatigue and caregiver burnout while enhancing patient safety.
- Caregivers can take advantage of a single interface to reach out to colleagues by role or team to get help when they need it and improve operational efficiencies.

- Healthcare providers can maximize investments in existing clinical systems with a software-only approach that layers on an improved user experience while modernizing communication and collaboration capabilities.
- Healthcare leaders have access to multi-faceted reporting that supports better insights and continuous process improvement around alarm fatigue, clinical workflows, patient safety, and operations.
- Hospital IT teams have peace of mind knowing that their organization has invested in a solution that meets stringent cybersecurity standards set by the FDA and is HITRUST CSF-certified for protecting and securing sensitive healthcare information.

Effective alarm fatigue interventions start and end with better communication and collaboration. TigerConnect empowers hospital leaders and nurse teams to realize time savings and productivity gains through intelligently routed nurse call alerts, as well as instant access to physicians, specialists, allied health professionals, and even patients for better care collaboration.

[Visit TigerConnect.com](https://www.tigerconnect.com)

# About TigerConnect

TigerConnect transforms healthcare with the industry's most widely adopted clinical collaboration platform – uniquely modernizing how doctors, nurses, care teams, patients, and data connect. With solutions spanning care communication, patient engagement, scheduling, alarm notifications, nurse call, and more, TigerConnect accelerates productivity, reduces costs, and improves patient outcomes, safely and securely. Trusted by more than 7,000 healthcare entities for user-friendly yet enterprise-ready solutions, TigerConnect delivers 99.995% verifiable uptime for more than 10 million messages each day.



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