LOUROE ELECTRONICS®

World Leader in Audio Monitoring Technology Since 1979

A Sound Solution in Healthcare Safety and Security

white paper

Executive Summary

Though video surveillance and access control are considered the "bread and butter" of security installations, a conventional system comprised of one or both often experience gaps in situational awareness. When it comes to designing end-to-end safety and security systems, the ability to hear can prove just as important as the ability to see. For this reason, integrators are folding audio monitoring technology into their systems as a fundamental tool to systems of all shapes and sizes. In a security setting, sound that accompanies video gives responders so much more information and creates better situational awareness. Consider a guard who is monitoring video cameras. What that guard sees may not comport with the situation on the ground. For example, watching someone running tells you only so much. But if that person is screaming in fear as they run, the guard knows how best to respond.

Because of this, an increasing number of systems integrators are utilizing audio to optimize video surveillance systems for their customers. A proven asset to security, monitoring, and surveillance systems, the audio monitoring technology market has seen steady growth over the past decade, as new applications for the technology have demonstrated that deploying audio streamlines both security and day-to-day business operations. Much like video surveillance, audio monitoring devices offer security personnel and integrators many advantages—from critical evidence capture to alarm verification and improved real-time response.

Beyond security, audio also offers industries like retail, education and healthcare improved situational awareness, remote communication, and real-time analytics insights. This white paper explores audio monitoring technology's extended benefits in the healthcare industry, including its utility in bolstering the efficacy of existing security solutions and equipping healthcare workers for two-way communication and patient monitoring, as well as best practices for adding audio to surveillance systems.

Challenges Unique to Healthcare

Healthcare facilities face an array of safety and security challenges, including workplace violence, patient monitoring, ER perimeter security, and many more. Especially in light of the COVID-19 pandemic, issues related to epidemic outbreaks, overwhelming patient intake, and medical supply shortages have put a serious burden on healthcare workers, creating a pressing need for innovative solutions.

- 75 percent of the nearly 25,000 nonfatal workplace assaults that occur in the United States every year happen in healthcare settings, according to the American Journal of Managed Care.

- An investigative report in San Francisco, CA, found that most violent incidents went unreported because there was "no continuing threat," according to the American Association of Critical-Care Nurses.

- The average cost of turnover for a bedside RN is $40,038, costing hospitals between $3.6 and $6.5 million each year, according to the 2021 National Healthcare Retention and RN Staffing Report.

The problem of physical violence against healthcare workers has deep roots. Despite increased awareness around this issue, data from the U.S. Bureau of Labor Statistics has noted that the problem has increased over time. From 2011 to 2018, incidents per 10,000 nearly doubled from 6.4 to 10.4. In 2021, 31 percent of hospital nurses across the U.S. reported a small or significant increase in workplace violence.

Many surveillance systems are equipped to address perimeter security and access control. Going forward, however, one of the most critical lessons learned from the pandemic is the importance of investing in security technologies that also enable workplace safety and public health procedures.

The Shortcomings of Traditional Security Systems

On the security side of the equation, traditional video surveillance systems alone cannot keep up with the high demands healthcare facilities require of their security systems today. In response to the death of a patient who was unable to enter an Emergency room, because of a locked door, in 2021, Massachusetts passed new legislation called "Laura's Law," intended to set new standards to improve ER access, including the requirement of signage, lighting, security monitoring, and panic buttons outside locked hospital doors. This law serves two functions—ensure the right people have access and the wrong people don't. Audio monitoring devices directly address both of these critical functions.

Access control protects patients, staff, and visitors by securing main entrances along with many other alternative entry sites. Surveillance cameras enable security personnel to visually secure every conceivable public space, so that no event goes unseen. On their own, however, neither technology can detect or alert first responders to audible events, such as rising verbal conflicts, gunshots, or breaking glass. Nor can either allow staff and security personnel the ability to communicate with or deter potential intruders.

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Video-only security systems also have a long history of generating false alarms, specifically when it comes to perimeter security. These are not only extremely costly for security personnel, who often have to pay sizable fines because of false alarms; they also take first responders away from true alarm events. False alarms cost U.S. police departments an estimated $1.8 billion and 63,952 hours wasted, annually, according to a study by the Center for Problem-Oriented Policing and Security Sales & Integration respectively. In the event of a dangerous event, people often hear them occur before they see them—thus, sound drives the initial response.

The Power of Audio for Security

In an effort to directly address this problem, security managers for healthcare facilities are deploying IP-based microphones outfitted with advanced audio analytics to analyze the decibel (dB) patterns of different alarm events and identify sounds such as aggression in people's voices, gunshots, and breaking glass. In healthcare settings, these devices can detect medical device tones, fits of coughing, and even snoring.

In security settings, audio information that accompanies video offers responders significantly more information for more reactive and better-informed incident response. They also act as a second-source verification tool, ensuring every alarm event is verified and all alarm notifications are elevated to a higher priority level, shortening response times and saving resources. For this reason, the audio technology market within the security sector has seen significant growth. This year, it is estimated that sales of smart audio devices will amount to $10 billion, according to Juniper Research.

To summarize, IP-based microphones serve three critical functions for security deployments:

1. Adding detail to traditional surveillance data for enhanced situational awareness, crime deterrence, and false alarm mitigation.

2. Delivering advanced and informed warning of alarm events.

3. Enabling false alarm reduction.

Powerful Benefits in Healthcare

On the health and safety side of the equation, the benefits of audio monitoring technology extend far beyond false alarm verification. Though improved situational awareness, operational efficiency, mass notification, and false alarm minimization are powerful advantages for any facility, the return on investment for healthcare operations is even greater. In a world where masks, social distancing, and infectious diseases have seemingly irrevocably changed the ways healthcare spaces operate—audio represents a critical solution for patient monitoring and communications.

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Remote Communication

Integrating audio and video in security settings has proven its value many times over, especially when the two technologies are integrated under one video management system (VMS). In the event a perimeter alarm is sounded, a VMS will leverage analytics to review any perimeter breach and issue an appropriate audio message. In other words, once a camera detects motion at a remote site, the VMS can send a pre-vetted, prestored "voice down" warning to potential intruders using devices such as intercoms, speaker microphones, or talk-listen outdoor monitors to notify individuals that authorities have been dispatched to their location.

For hospitals, this same technology has been reimagined as a two-way communications method for nurses and patients who are quarantined with a highly-infectious disease. Donning personal protective equipment (PPE) for healthcare staff is a time-consuming task, when caring for patients who might infect them with a disease. Any tool that allows them to communicate with a patient or respond to an alarm not only saves nurses money but also enables them to take care of more patients in less time. For hospitals whose ICUs are at capacity, this functionality is critical.

Using the power of two-way audio devices, staff can seamlessly communicate with patients at the touch of a button from a nursing station; and patients are able to communicate right back using hands-free response options. Those same audio devices are also able to use audio analytics to analyze medical device alarm tones, sending alerts to nursing staff when something is not right—saving time, money, and even lives.

For example, hospital bed exit alarms are tripped if a patient who has an elevated risk of falling tries to leave the bed. The average cost of a hospital fall with injury is approximately $14,056, according to the Joint Commission Center for Transforming Healthcare. A nurse responding to such an alert can not only save the patient from harm but also save the facility from potential monetary liability.

Workplace Violence

Regarding the issue of workplace violence, safety and security systems outfitted with audio monitoring analytics can use audio monitoring technology strategically placed throughout a hospital or clinic to detect aggression in people's voices, ensuring security staff on site can intervene and even prevent an instance of workplace violence.

This capability has been proven to reduce instances of violence across numerous verticals. In schools, for example, audio monitoring technology built to detect shouting reduced on-site officer response time to fights by 75 percent. In hospitals, where the same kinds of alarms can indicate serious events, this reduction in response time is vital.

Incorporating audio can also provide critical context when investigating an incident, extending peace of mind to a population of employees who have gone too long without it. If a verbal dispute were to break out between patients or an accusation of abuse be leveled against a staff member, audio monitoring technology would not only elucidate what actually happen in the moment but also equip and inform security staff to navigate and even anticipate those kinds of situations in the future.

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Tips for Installation

When it comes to the nuts and bolts of integrating audio, there are a few considerations a healthcare facility must take into account. The first is what kind of device makes the most sense for their facility.

Speakers – Speakers can be used in a number of ways for both security and health and safety protocols. From crime deterrence to two-way communication using speaker-microphones, these powerful tools enable security personnel and healthcare workers alike to do their jobs effectively, without having to be in multiple places at once.

Microphones – Outfitted with audio analytics, industry-leading microphones are one of the most innovative technologies a healthcare facility could employ. Whether they be used for alarm verification, incident review, real-time response, or patient monitoring—these are the bread and butter of audio technology.

Emergency Call Boxes – These most directly address the legislation passed in Mass., as emergency call boxes enable individuals, patients or not, to alert medical or security staff of a situation using a call button. Staff monitoring a bank of cameras are alerting, through the VMS, and can hear and see exactly what's going on to determine the fastest and most appropriate response.

Intercoms – These devices make more sense to install now than ever. Whether issuing COVID-19 protocols at entrances, scheduling automatic entry for deliveries and cleaning crews, or integrating into video camera and access control systems, these devices allow healthcare facility staff to communicate with visitors, patients, and employees alike, all while maintaining COVID-19 protocols.

When integrating audio into healthcare facility operations, it is also wise to ensure you install them in the most strategic locations. High traffic spaces such as perimeters, waiting areas, and entrances make the most sense for microphones and audio analytics, while patient rooms and high-risk departments make the most sense for two-way communications and patient monitoring devices. Below are suggested placements that add efficiency and value to healthcare operations:

- Patient Rooms
- Reception Areas
- Hospital Hallways
- Isolation Wards
- Entrances, Exits, and Restricted Areas
- X-Ray Imaging Patient Communications
- Sleep Study Wards
- Chemotherapy Treatment Wards
- Virtual Patient Observation
- Waiting Areas

About Louroe Electronics®

Located in Van Nuys, California, Louroe Electronics® has been the world leader in audio monitoring technology since its inception in 1979. Recognized globally, Louroe Electronics' products are used in over 60 countries and are utilized by both the private sector and government.

The company's Digifact™ and Verifact® line of microphones, complementing base stations, and communication accessories, provide mic and line level output to interface with various digital electronics. For over four decades, Louroe Electronics® has maintained rigorous standards to ensure their products provide reliability, durability, and excellent performance for its customers' needs.

For more information about Louroe's audio solutions, visit www.louroe.com or call (888) 273-8578.

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