




Vocera Communications:

Wireless Voice Communication in
Hospital Disaster Preparedness and Recovery



Vocera Badge



[Actual Size]

:: Introduction

A somber truth is that disasters can, and do, happen. In the case of natural disasters, there is rarely a chance to truly prepare for the panic, destruction, and subsequent rebuilding efforts. Weather phenomena are a fact of life. Midwesterners face the threat of tornadoes, cyclones, and floods. The West Coast has earthquakes and landslides. Nor'easters experienced by East Coast residents can cripple a community's infrastructure. And, as we know all too well, the Gulf Coast region is still grappling with the devastation left behind by Hurricanes Katrina and Wilma.

From the September 11, 2001 attacks in the United States, to the 2005 subway bombings in London, and the very real threat of the use of biological or "dirty" bombs; the rise in terrorist activity worldwide has opened our eyes to the threat of man made disasters. Then, there are the tragedies that transcend classification. August 1, 2007, a section of Interstate 35 West in Minneapolis suddenly collapsed into the Mississippi River and onto roadways below, claiming the lives of several Minnesotans and injuring hundreds more.

In all of the examples mentioned, the valiant and rapid response of law enforcement, fire departments, and emergency

medical personnel has been effective in analyzing and containing the situation, and getting victims to hospitals for immediate treatment. How, in the midst of a disaster, does a hospital ensure they can properly manage all of the patients in their care? To maintain order and efficient patient flow and response, all hospitals in the U.S. have developed disaster or emergency preparedness plans that outline chains of command, communication procedures, and other important protocols to keep the hospital running in a crisis.



:: Important Factors in Disaster Preparedness Plans

According to Dr. Keith Conover, M.D., surgeon and member of the Hospital Disaster Committee for Mercy Hospital of Pittsburgh, there are several characteristics all preparedness plans must have to be “effective and practical.”¹

- **Completeness:** The disaster plan must anticipate and provide for all aspects of disaster operations and outline procedures for a multitude of emergency medical contingencies.
- **Simplicity:** A simple, well-designed disaster preparedness plan will minimize the potential for mistakes in an actual emergency.
- **Adaptability:** Procedures outlined must be adaptable to a variety of situations and unforeseen circumstances.
- **Compatibility:** Hospitals generally operate independently. However, in the case of a large-scale incident, it is important to have a plan that can be easily coordinated with assisting hospitals and agencies.
- **Delineation of Authority:** Dr. Conover asserts, “An operation involving many people of different backgrounds, capabilities, and training can succeed only if the standards of the disaster plan are enforced by a unified leadership with a well-defined hierarchy.”

:: Disaster Preparedness Regulations and Mandates

Recognizing the importance of these factors and the development of a thorough, efficient disaster preparedness plan, a number of local and national organizations have set forth guidelines, regulations, and mandates on disaster preparedness and response, including:

Health Information Portability and Accountability Act (HIPAA)

Under HIPAA, disaster recovery capabilities are mandatory for all healthcare organizations, and data must remain secure under all circumstances. Hospitals and healthcare organizations must have a disaster preparedness plan on file.

Joint Commission on Accreditation of Healthcare Organizations (JCAHO)

After 9/11, JCAHO modified guidelines to ensure healthcare organizations communicate and coordinate with each other at the time of a disaster. JCAHO’s recommendations state that healthcare organizations should adhere to these guidelines when planning for and dealing with an emergency situation:

- Enlist the community in preparing the local response. This encourages the transition of community healthcare resources from an organization-focused approach to emergency preparedness to one that encompasses the needs of the community.

- Focus on the key aspects of the preparedness system that will preserve the ability of community healthcare resources to care for patients, protect staff, and serve the public. This includes an open communication on patient capacity, appropriate stockpiling of necessary medications and supplies, making direct caregivers the highest priority for training on protective measures and for receipt of protective equipment, supporting the provision of decontamination capabilities in each hospital, and, most importantly, maintaining the ability to provide routine care.

- Establish accountabilities, oversight, leadership, and sustainability of community preparedness systems. Essentially, this encompasses developing and implementing objective evaluation methods for assessing the effectiveness of emergency preparedness plans. Additionally, it calls for funding at the local level for emergency preparedness planning.²

Texas Administrative Code 202.6 (5)

“Each agency shall maintain a written disaster recovery plan for information resources. The disaster recovery plan will:

- (a) contain measures which address the impact and magnitude of loss or harm that will result from an interruption;
- (b) identify recovery resources and a source for each;
- (c) contain step-by-step instructions for implementing the Plan;
- (d) be maintained to ensure currency; and
- (e) be tested at least annually.”³

Wireless Communication in Disaster Preparedness/Response

A study published in 2004 by the Yale-New Haven Center for Emergency Preparedness and Disaster Response reports that wireless technology is poised to play a major role in information sharing in hospitals during a disaster. Wireless communication technology offers several benefits over other land-based or cellular technologies: increased mobility, miniaturization, durability of devices, and overall value.⁴ In fact, U.S. hospitals and healthcare facilities spent a total of \$650 million on wireless local area networks (WLAN) in 2005. By 2010, it is projected that figure will grow to more than \$2 billion according to market research firm Kalorama Information.⁵ With the benefits provided by wireless connectivity, the current and projected levels of spending are justified. WLANs and other forms of

wireless networks allow healthcare facilities to install and integrate a multitude of applications designed to streamline hospital operations, including patient tracking, security, prescription distribution, and, perhaps most important in a disaster, communication.

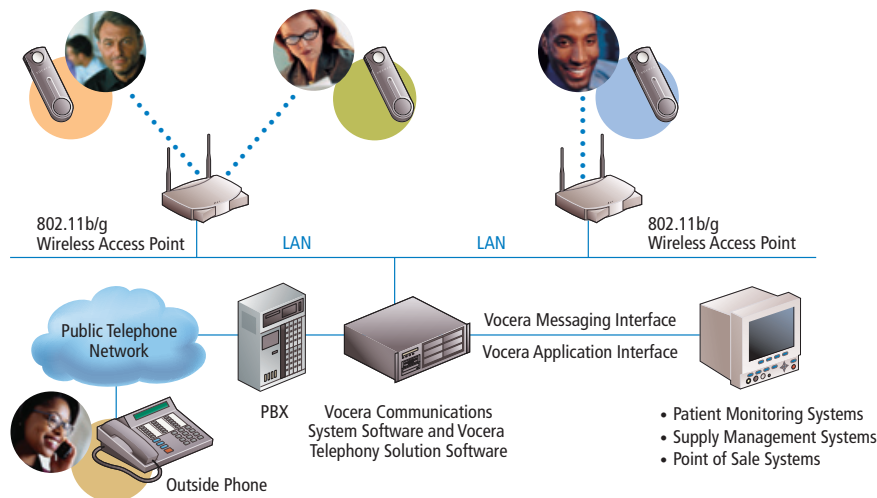
Wireless communication over a WiFi connection allows healthcare professionals who must exchange information in mission-critical situations to bypass overloaded cellular circuits, avoid using overhead paging in a likely noisy setting, and maintain adherence to the disaster preparedness plan put in place. For several hospitals in the United States, communication during disaster drills and disaster situations has become easier than ever with the use of an innovative communication solution.

Vocera Communications System

Enter the Vocera Communications System, a wireless communication system that converges three cutting-edge technologies: WiFi, Voice over IP (VoIP), and speech recognition. The Vocera Communications System has two key components: the Vocera System Software that controls and manages call activity, and the Vocera Communications Badge, a wearable, voice-controlled communication device that operates over a wireless LAN (802.11). Together, the Vocera System Software and Badge, allow users to communicate directly and immediately to obtain the resources they need. Using voice prompts, Vocera instantly connects staff members to their colleagues, thereby reducing phone tag, overhead paging, or the need to physically search for a person. Network design allows the system to provide coverage facility-wide, increasing worker productivity and efficiency.

The instant communication that mobile workers experience with Vocera has been an invaluable tool at hospitals and healthcare facilities in the United States, Canada, Australia/New Zealand, and the United Kingdom. Nursing and clinical staff are able to receive and respond to patient requests more rapidly and can be contacted immediately to exchange mission-critical information.

Vocera Communications Network Diagram





:: Vocera Communications System in Disaster Preparedness Plans/Response

Hennepin County Medical Center

Hennepin County Medical Center (HCMC) in Minneapolis is the regional medical disaster center for the western part of the Twin Cities. In the event of a plane crash, chemical spill, or other disaster, HCMC would serve as the command center. Their expertise in disaster response was put to the test in the aftermath of the Interstate 35 West bridge collapse in Minneapolis. Phillip Gill, IT Manager in charge of the Bioelectronics Department, was key in coordinating logistics of supplies distributed to emergency units at HCMC in the aftermath of the tragedy.

“When the collapse happened, I already had left work and was at home,” said Gill. “I saw the breaking story and immediately called into the hospital through Vocera to give instructions on what needed to be done. It was the easiest way to find people around the hospital in my department.”

Upon his return to HCMC, Gill was asked to take over the responsibilities of the Liaison Officer, who had not yet arrived. Gill was given a list of supplies needed for the ER, and used Vocera to contact employees in his division to let them know what needed to be done, what supplies needed to be picked up, and where they should be delivered. In a matter of minutes, he contacted everyone via Vocera, which provided instantaneous communication for HCMC staff responding to this tragedy.

Although using Vocera during this disaster was not part of the hospital’s disaster plan, Gill simply thought it would be the best way to contact staff and others followed his lead and direction. Now, Gill is in discussions with the hospital’s Director of Disaster Preparedness about officially integrating Vocera into HCMC’s disaster plan. They are also investigating an enhanced use of the system through noise-canceling headphones and developing an “emergency phonebook” that would store names and contact information of emergency response staff in the Vocera System for immediate access in the event of a disaster.

El Camino Hospital

El Camino Hospital in Mountain View, Calif. is a leading hospital in Silicon Valley and has received national recognition for cardiac treatment, radiation oncology, and maternity. Moreover, El Camino has been named one of *U.S. News and World Report’s* “Most Wired” hospitals for five consecutive years. The Vocera Communications System was first installed at El Camino in July 2003, and is used by nurses in all areas of the hospital, as well as by respiratory therapists and select physicians.

El Camino conducts annual countywide disaster drills and has completed four successful drills since Vocera was installed throughout the hospital. Similar to John C. Lincoln and most hospitals in the United States, they also use the HEICS chart when responding to an emergency.

“As Incident Commander, I used to have to go to every charge nurse in every unit and find out how many patients they had, how many people could walk out, etc., if we had to evacuate,” said Chris Tarver, Clinical Manager, El Camino Hospital. “If phones were working, I’d dial each nurse’s station and whoever picked it up would find the charge nurse and ask how many patients they had, etc. During our first drill after Vocera was installed, I called all the charge nurses on Vocera and had my answer in about three minutes—it made a huge difference.”

In February 2005, El Camino actually experienced a real disaster at its facility. A fire broke out in a nursing unit, and the staff moved quickly to evacuate the west side of the building. “We did a horizontal evacuation, meaning we moved all patients from one side of the building to the other. Vocera was our primary communication tool at that point. We were able to deploy staff where needed and find out exactly how many patients needed to be moved,” said Tarver. Fortunately, the fire department is only one block away, which minimized their response time. However, by the time firefighters arrived, patients in areas affected by the fire already had been evacuated. The fire chief complimented Tarver’s staff on their expedience in evacuating patients, which allowed firefighters to focus on extinguishing the fire. Soon after this incident, Vocera was officially added to El Camino’s disaster preparedness plan.

“We try to make sure we have solid communication and the ability to have any possibility covered. During our drills, people are assigned to different roles because when a real disaster happens, you don’t know who’s going to be there or when it’s going to be. Having enough of the right people prepared is important when an emergency happens, so everyone feels comfortable in their roles to help keep patients safe.”

John C. Lincoln Health Network

John C. Lincoln Health Network, located in Phoenix, Ariz., is a not-for-profit health network comprised of two hospitals, 15 physician practices, and three radiology specialty locations. John C. Lincoln has used Vocera since 2003 and has reported an 80 percent reduction in noise levels and a significant improvement in communication between clinical staff since its implementation, resulting in improved patient care.

As with most hospitals, John C. Lincoln relies on the Hospital Emergency Incident Command System (HEICS) when responding to a disaster or emergency situation. The System is defined as “an emergency management system which employs a logical management structure, defined responsibilities, clear reporting channels, and a common nomenclature to help unify hospitals with other emergency responders.”⁵ John C. Lincoln’s HEICS hierarchal/organizational charts usually include an Incident Commander, Public Information Officer, Safety/Security Officer, and Liaison Officer as primary leaders during a disaster. Reporting to these leaders are supervisors for each unit who must not only manage their respective departments, but provide

regular status updates as well. For example, an inpatient area supervisor is responsible for determining and communicating how many rooms are available for incoming patients and making sure staff in their charge properly assign rooms to nurses and doctors, while monitoring and reporting room availability. Disaster drills are an important part of ensuring any disaster plan can be executed to perfection. During one of the first drills conducted after Vocera was installed at John C. Lincoln, staffers realized the importance of immediate and direct communication when responding to critical situations.

“John C. Lincoln actually had some people that didn’t believe Vocera should be used during disasters,” said David Shively, Senior Product Manager, Vocera Communications, who was instrumental in the rollout of Vocera at John C. Lincoln and other hospitals. “For one of the drills, the assigned Incident Commander said ‘Alright, this time we won’t use Vocera.’ They found that staff struggled, so they used Vocera during the next drill — and the non-believers became believers.”

As part of their multi-campus rollout, John C. Lincoln’s Emergency/Disaster Planning utilizes Vocera as a primary disaster communication tool. In mass casualty disasters where hospitals are mobilized, maintaining efficient patient flow becomes even more critical than on a daily basis. Vocera helps streamline processes around patient flow and ensures hospitals properly triage patients and communicate patient history.

Thanks to the integration of emerging wireless technologies, disaster response capabilities have steadily improved. Healthcare leaders developing disaster preparedness plans now have a reliable tool that can be included as part of an overall response strategy. With the Vocera Communications System, healthcare professionals have a practical and efficient solution that allows for a steady and direct flow of information — necessary in an emergency.



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525 Race Street
San Jose : CA 95126
tel :: 408.882.5100
fax :: 408.882.5101
www.vocera.com

