PREPARING YOUR HOSPITAL FOR A MASS CASUALTY INCIDENT

STRATEGIC WHITEPAPER

Alcatel·Lucent
Enterprise

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EXECUTIVE SUMMARY

In the absence of effective planning, a mass casualty incident (MCI) can quickly overwhelm the available medical resources. This white paper looks at the issues faced by hospitals and medical facilities and the role that communications technology can play in ensuring that they are adequately prepared to cope with extreme circumstances. Opening with an overview of the French White Plans and the response to the 2015 terrorist attacks in Paris, the document considers various technologies, including network infrastructure, notification systems, call routing and collaboration tools, and how they can best be utilized as part of disaster planning.

INTRODUCTION

Any hospital that has an emergency department should have a specific protocol in place to deal with a mass casualty incident (MCI). This may involve calling in staff on short notice, sourcing additional equipment, re-purposing existing equipment, and prioritizing patient treatment so that there is enough physical space available to deal with incoming casualties. Setting up an effective triage system and ensuring that staff members are equipped with the best possible tools to cope with the situation are therefore key elements in the success of any such plan.

What do we mean by an MCI? Also known as a multiple casualty incident or multiple casualty situation, an MCI is defined as any incident in which emergency medical resources, such as personnel and equipment, are overwhelmed by the number and severity of casualties. This could mean anything from a major road traffic accident to a natural disaster or act of terrorism. In short, it's any event that results in a high number of casualties that could stretch existing resources to their breaking point.

In this document, we will look at the role that technology has to play in effectively planning for and dealing with MCIs. How can working in partnership with a telecommunications provider enables hospitals and medical personnel to prepare and act on an emergency plan? What options are available to help ensure that an MCI does not cause a total meltdown? And how can what is a highly stressful situation for all concerned be managed effectively?

The French Situation

On November 13, 2015, the entire world was shocked by the brutal terrorist attacks that took place in Paris, France. 129 people were killed, and more than 350 others wounded as attacks took place at multiple sites across the French capital.

The events that took place in Paris were horrific, but their effects could have been even worse had the French government not already had an effective framework in place to deal with the aftermath. The national Orsan plan means that each region is required to have its own Plan Blanc, or White Plan, that spells out exactly what should be done in the case of an MCI. These White Plans are mandatory, and bring together both public and private healthcare agencies to ensure that sufficient resources are available.

The White Plans set out a series of actions and policies such as:

- Setting up crisis management cells at all affected sites.

- Ensuring that any medical personnel on duty at the time of the incident are briefed and aware that their working hours may be extended in order to deal with the situation.

- Scheduling personnel so that those who are off duty are gradually called back, with reserves ready to take over if the crisis lasts.

- Transferring patients to other facilities as necessary, freeing up space for incoming casualties and sharing the load across multiple sites.

- Immediately cancelling all non-emergency operations.

- Providing instant access to a list of key service providers, categorized as medical-technical services (pharmacy, laboratories, medical imaging) and logistics services (laundry, catering).

- Reserving communications channels specifically for White Plan use.

- Providing a reception area for relatives and the press, complete with multi-faith pastoral care for relatives affected by the incident.

- Organizing triage at the entrance of each hospital, separated from the usual emergency entrance, as well as from the reception for the relatives and the press.

- Routing on-site traffic to prioritize emergency transfers and prevent bottlenecks.

- Providing clear additional signage to direct foot traffic inside the building and ensure that people are quickly able to locate the relevant areas.

- Increasing on-site security as necessary to cope with the volume of people.

- Listing contacts for voluntary associations (first aid or social aid associations) that can provide additional personnel to help with minor tasks and support actions.

The Importance of Communications

The French example illustrates just how vital it is to have a working plan in place to deal with MCIs of any kind. We all hope that such events will not unfold in our local area, but we need to be properly prepared in case they ever do. An effective communications network that is robust enough to deal with increased traffic and flexible enough to adapt to specific requirements can make all the difference in coordinating efforts on a local, national and even international level.

The telecom system is mission critical for hospitals and the emergency services in general. If the communications system were to fail, then chaos would reign, as nobody would be able to effectively pass on information or instructions. There are so many different agencies and individuals to consider, and all need to be supported by a powerful and efficient communications system. For example, lines of communication need to be constantly open between:

- Government officials and hospital management

- Hospital management and hospital staff

- Hospital staff and medical teams

- Medical teams and emergency services

- Emergency services and the general public

- The general public and hospitals

- Hospitals and other medical facilities

- Hospitals and paramedics/ambulances

"Communication is essential during an MCI to convey data and information which supports situational awareness to hospitals and response personnel. Emphasis on sustaining internal and external communication with community partners (EMS, emergency management, public health, law enforcement, other response partners, and the public) supports consistent messaging and information dissemination during, and immediately following, an MCI." – *Hospital Medical Surge Planning for Mass Casualty Incidents*, Florida Department of Health.[1]

Thankfully, technology today offers several options that can be deployed to ensure that there is no communications breakdown. From traditional methods of communication such as telephones and on-site alarms to more modern options like SMS, video conferencing and virtual receptionists, everyone who needs to be kept informed now can be, and all via their medium of choice.

Building in Resilience

When an MCI occurs, you need to know that your communications system is up to the task. The key to ensuring this normally lies with your choice of private automatic branch exchange (PABX), servers and networking solutions. These systems need to have close to 100 percent uptime so that your internal and external communications remain active even in the most extreme circumstances. The platform that you choose must be reliable, flexible and above all, resilient. It must be able to handle not only day-to-day usage, but also the surges in traffic that come with major incidents.

It's not enough, though, to be reactive. You can have all the spare capacity in the world, but there's no point in having it if it's not instantly accessible. A proactive system that is able to anticipate and respond to demand is essential, and this is where a unified network management system comes into play. This type of system makes it easy to manage all of your equipment from a single interface, offering high performance across any device, whether using wired or wireless networks. You can ensure quality of service and security, while automating many of the processes that may otherwise need to be carried out manually.

Figure: Highly resilient & redundant real time communication system
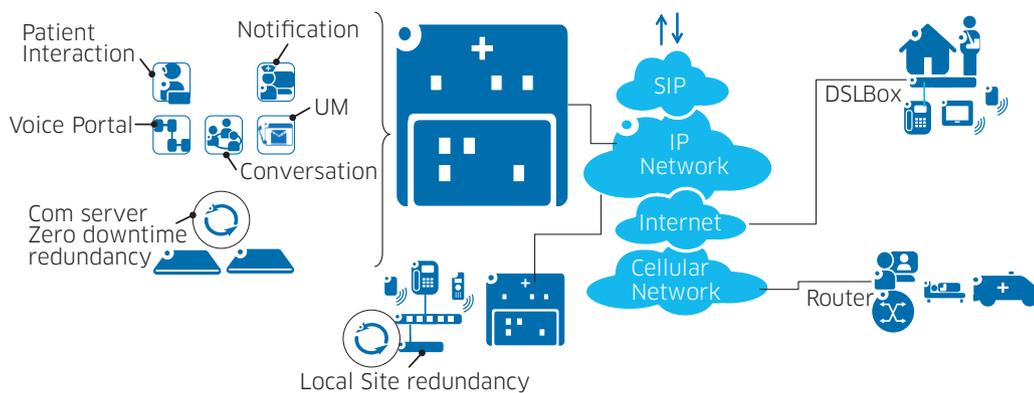
A single management system provides end-to-end visibility, avoids duplication of tasks, and offers better troubleshooting tools. If there is an issue, you can solve it quickly and with the minimum of disruption. You can also prioritize mission-critical applications, ensuring that they are always available and have access to the resources that they require. And once you have the networks in place, you can start to build your essential services on top of them.

Notification Systems

Step one in organizing an emergency response is notification. An efficient notification service is required in order to ensure that the right resources are mobilized based on the type of incident. There must be the capacity to alert personnel in real time, inside or outside the hospital premises. And this means implementing a modern system that can access multiple channels such as voice, SMS, e-mail and social networks. Everyone who needs to be informed of what is happening must be, and in as efficient a manner as possible.
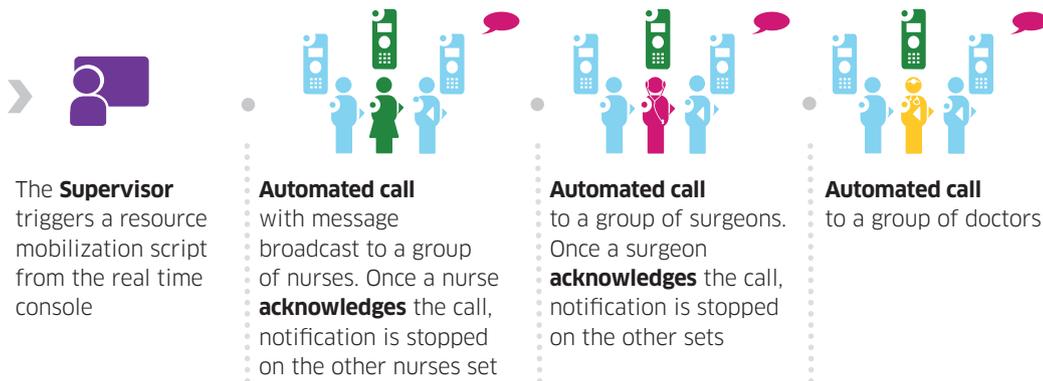
This can be achieved by the integration of several systems into a single notification service. Software-based solutions can be introduced to great effect to deliver the right notification to the right person at the right time. Integrating with existing systems and third-party devices, an all-in-one software solution can bring together:

- Traditional phones and softphones

- DECT handsets

- WLAN Handsets

- Pagers

- Nurse calls

- Fire alerts

- Runaway/wander prevention

- Building management

- Email and SMS

- Social media

- SNMP

Software solutions are generally quick and easy to configure, with interfaces that make it simple to get the message out to those who need to know. They can be used to set up a range of different scenarios in advance, so that when an MCI occurs, the procedure can be activated at the touch of a button. Members of staff can be added to pre-defined groups, so that they are notified as and when necessary, with specific procedures for escalation and real time feedback.

An MCI calls for a multidisciplinary approach, and a quick alert system enables all relevant personnel to be notified, no matter where they may be or what they may be doing. Doctors, nurses and support staff can immediately be informed that they are needed, and the alert system can even be extended to include voluntary organizations if the scale of the incident requires additional support.

The **Supervisor** triggers a resource mobilization script from the real time console

Automated call with message broadcast to a group of nurses. Once a nurse **acknowledges** the call, notification is stopped on the other nurses set

Automated call to a group of surgeons. Once a surgeon **acknowledges** the call, notification is stopped on the other sets

Automated call to a group of doctors

Another function that a notification system can serve is to monitor bed availability. In an MCI, you need to be able to rapidly assess bed availability, free up beds in priority areas and work cooperatively with the local emergency coordinator to direct minor-care casualties to an alternate site as necessary. Your notification service can be integrated with your other systems so that you are constantly updated on bed availability, and this can be done via the standard Health Level-7 or HL7 protocol to ensure compatibility. The system can warn you when you're reaching full capacity, and you can immediately pass this information on to others so that you don't have a flow of incoming patients that you simply can't deal with.

Call Routing

Despite the numerous methods available to us, the majority of communication during an MCI still takes place via telephone, so it's important to have proper call routing systems in place. Whether it's emergency calls, concerned friends and family members or outgoing calls, you need to ensure that the right calls get through to the right people at the right time. You don't want your system to crash under the pressure, or to have your personnel tied up dealing with the same inquiries over and over again.

"Within the first two hours following the bombing, 12 million calls were attempted within the metropolitan area; the majority of the 1,800 '911' (emergency) calls attempted during the first hour alone received busy signals." – *The Oklahoma City Bombing: Lessons Learned by Hospitals*[2]

To get the right calls to the right people, you have several options. The first, and least efficient, is to have a dedicated team of humans answering all incoming calls. This isn't really practical in an emergency situation where every member of staff is needed elsewhere, so we should rule this out unless you already have access to a dedicated off-site call center. The second is to have a call stacking system, whereby calls are answered on a first-come, first-served basis. Again, this isn't really a practical option in an emergency situation, as important calls could end up stuck in the queue, and we're all aware of how frustrating it is to be stuck on hold. A third option, then, is to deploy an automated call routing system, where the calls are prioritized and dealt with accordingly.

Automated systems can add tremendous value in emergency situations, but it's important that you get it right. Simple recorded messages can often cause more problems than they solve, as emotions will be running high, and frustration can often turn to misplaced anger. You need to get the message across clearly, efficiently and in the right way, so it's a good idea to have a system that you have complete control over, and are able to quickly and easily update with new information. In many cases, you will have the

option to set up a dedicated information line that uses separate network capacity and will not interfere with the operation of normal phone lines.

A further advantage of an advanced PBX, unified network management and call routing system is that it enables staff to remain in constant contact with each other and with external agencies. Each person can be assigned a single number that applies to all of their devices, and is routed directly to them no matter where they may be. Calls can easily be transferred from mobile phones to landlines and vice versa so that information can be passed on while on the move. And when each person has a single number, it's not only easier to get in touch with them, but also easier to see who's on the line with inbound calls.

Unified Communications and Collaboration

When an MCI is ongoing, coordinating the response poses a major challenge. Following through on your disaster plan requires all agencies involved to communicate and collaborate effectively, and having the right technologies in place can simplify the process. Disseminating information is much easier if you only have to explain something once, rather than having to explain it several times to several people, and this is where tele and video conferencing facilities can be hugely beneficial.

With the right system in place, you can organize and participate in conferences almost instantly, bringing together key people, no matter where they may be located physically. Modern systems offer the opportunity to share documents and work together to solve a problem as if you were in the same building.

Figure: Unified communications and collaboration
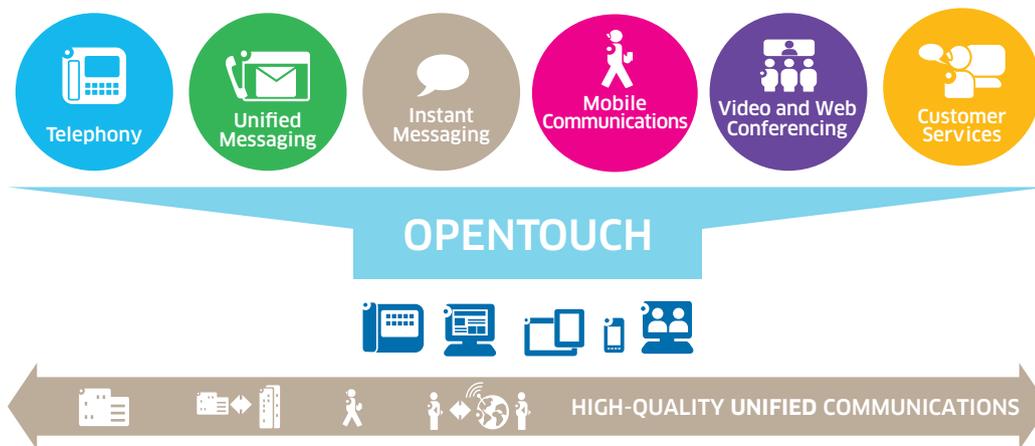
You can build a better overall picture of the situation facing you, rather than being isolated and having to deal with issues on your own. You can contact experts across the globe and directly share their knowledge and insights with all concerned, without having to rely on third parties.

Extending your network to include connected ambulances means that you can even have direct contact with first responders and those at the scene of the events. By setting up a dedicated modem and establishing a secure hospital connection over a 3G/4G data mobile network, the ambulance becomes a direct on-site extension of the hospital. Combine this with GPS positioning, and you can predict exactly when an ambulance will arrive at the hospital, as well as being pre-armed with complete details of each patient's condition.

Testing and Training

The importance of testing can never be understated. Your systems and equipment may be top of the line, but they also need to be easy to work with and ready to go at a moment's notice. An MCI may occur at any time, so you need to be able to launch straight into your emergency procedures. This means that 100 percent uptime is not just a goal, but a requirement, and to ensure that this is the case, you should carry out regular testing. Your notification system, for example, should have built-in test procedures that enable you to check functionality without actually triggering an alert.

You also can't rely on just one or two people knowing how to operate a vital system. What happens when those people aren't there, or despite your best efforts, prove to be unreachable? A simple user interface is a fundamental requirement so that as many people as possible can be trained to put your plans into action. It should also be possible to quickly and easily transfer authority so that staff members aren't locked out from the systems that they need to access.

Training exercises can help to raise your level of preparedness, and ensure that everyone knows what their role should be if an MCI were to occur. To return to the French example, a drill to test the effectiveness of the White Plan had actually taken place on the morning of the attacks. Although nobody can quantify the results, it could be argued that this training exercise helped to ensure that the staff and systems were fully prepared for the event. In fact, an article in *The Lancet* stated that "At the attack sites and in the hospital, the training received by the emergency and medical workers was a key factor in the success of treatment."[3]

CONCLUSION

Communications technology clearly has a huge role to play in the event of an MCI, and should be an integral part of any disaster plan. If you can't communicate effectively, then your chances of adequately responding to the situation are greatly reduced. As the World Health Organization puts it in its guide to Mass Casualty Management Systems, "The most commonly cited problem in disaster management is invariably communications breakdown, with emergency activities and decision-making being seriously affected by vital information being lost or delayed."[4]

The right technology, implemented correctly, can make a huge difference in emergency situations, and particular attention should be paid to three main areas:

• Crisis management

• Notification and mobilization

• Adaptive call routing and integration

The most successful communications technology deployments follow a true team approach that involves all of the stakeholders: in-house IT experts, nurses, doctors and a technology partner. Working closely with a partner that has extensive experience can help you to take advantage of the latest advances in the field. Rather than building a piecemeal solution that only takes into account current needs, you can create a unified infrastructure that enables you to take into account virtually any scenario.

ABOUT US

Our company is a leading provider of enterprise communications solutions and services, from the office to the cloud, and our team has extensive experience of partnering with major healthcare organizations across the globe. Building on a heritage of innovation and entrepreneurial spirit, we operate globally with 2700+ employees in 100+ countries worldwide, and have our headquarters near Paris, France.

We offer a range of solutions designed specifically to meet the needs of healthcare providers, including:

Alcatel-Lucent OpenTouch Suite

The Alcatel-Lucent OpenTouch® Suite delivers a range of communication services on a single platform, from world-class telephony to the most advanced multimedia collaboration and mobility services. The suite is based on a modular architecture, designed to optimize infrastructure while unifying management for improved total cost of ownership. You can choose from a wealth of options to create the system that is right for you, including desk phones, wireless handsets and software clients on smartphones and tablets. Truly unified communications mean that several devices can be associated with the same phone number to keep conversations going on the move, while collaboration options make it simple to share information with people both inside and outside the hospital.

Alcatel-Lucent OpenTouch Notification Service

The Alcatel-Lucent OpenTouch Notification Service provides a flexible, easy-to-install alarm and notification system. It notifies the most appropriate person to respond to the situation in real time, using industry-specific communication systems and taking into account staff mobility, with a choice of wireless handsets (DECT, Wi-Fi, Bluetooth), smartphones, or supervision console with geolocation screen. The OpenTouch Notification Service is software-based, so offers a complete range of applications and integrates with industry-specific tools and systems of key market players, all intelligently connected via a unique web interface. This integration allows for innovative services, such as social media and mobile device notifications.

Alcatel-Lucent Visual Automated Attendant

The Alcatel-Lucent Visual Automated Attendant is a virtual receptionist that offers callers a great service experience, greeting and routing them directly to staff, departments or voicemail. A user-friendly and intuitive interface means that routing can be instantly adapted to evolving emergency situations, and prompts can be easily customized without the need for external technical assistance. The Visual Automated Attendant is flexible and customizable, with up to 12 menu options and support for multiple languages

To find out more about the features and functionality offered by Alcatel-Lucent Enterprise healthcare solutions, please visit http://enterprise.alcatel-lucent.com/healthcare.

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