



# Hospital Disaster Preparedness: Worker Safety

*October 2014*

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***“Protecting the health and safety of staff is the highest priority during any emergency response.”***

- Hospital Incident Command System Guidebook, California EMSA<sup>1</sup>

***“Take care of your staff first.”***

- Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011, Missouri Hospital Association<sup>2</sup>

## Introduction

Hospitals exist to protect the health and well-being of the people in their communities. They have a responsibility to be prepared to deal with extreme events. Some are much better prepared than others, but nearly every hospital now plans for disasters, whether a natural catastrophe, a terrorism incident or a pandemic. A 2009 survey of hospital directors found that 94 percent of hospitals hold mass casualty training exercises.<sup>3</sup>

Hospitals also have a responsibility to their employees to provide a safe work environment. In the midst of a catastrophe, however, health care professionals are likely to be working under stressful and sometimes dangerous conditions. In order for a hospital to fulfill both its obligations to its employees and its mission to its community, staff health, safety and emotional well-being must be prime considerations when planning and preparing for a catastrophe.

Safety and well-being has a number of dimensions. Hospital employees need to be protected from bodily injury, whether the result of shattered windows, radioactive contamination or a dangerous patient. They also need to be protected from exhaustion, burnout and emotional breakdown as they operate under highly stressful circumstances. “The hospital staff working when the disaster occurs are victims who must respond,” warns an insightful report from the Missouri Hospital Association on lessons learned from the Joplin tornado. “Resiliency will be diminished. Consider their immediate needs, including emotional support, personal loss and basic housing and supplies.”<sup>4</sup>

Being prepared for natural catastrophes and other major events begins with the design of a facility and extends through disaster planning, education, and training. Many of the processes and procedures that benefit the community during an event also contribute to the safety and well-being of staff, but hospitals need to go further to assure that employee needs are understood and are being addressed. In addition to its obligations as an employer, safe and healthy employees who are willing to work under adverse and dangerous conditions are critical to every other aspect of a hospital being able to deliver quality care in a crisis.

<sup>1</sup> Hospital Incident Command System Guidebook, Fifth Edition, 2014, California Emergency Medical Services Authority p. 83 [http://www.emsa.ca.gov/media/default/HICS/HICS\\_Guidebook\\_2014\\_7.pdf](http://www.emsa.ca.gov/media/default/HICS/HICS_Guidebook_2014_7.pdf)

<sup>2</sup> Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011, Missouri Hospital Association p. 26 [http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012\\_preparedness\\_lessons\\_learned.pdf](http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012_preparedness_lessons_learned.pdf)

<sup>3</sup> “A state survey of emergency department preparedness for the care of children in a mass casualty event,” in U.S. National Library of Medicine, National Institutes of Health <http://www.ncbi.nlm.nih.gov/pubmed/19860165>

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Preparedness is a key focus of regulatory and accrediting agencies. The Joint Commission, for example, requires health care providers to have strong emergency management protocols and to practice them through drills, exercises and scenario based training. State licensing provisions typically require creating and maintaining a disaster plan. Hospitals, however, should not need to be pressured by outside agencies to allocate resources to disaster preparedness.<sup>5</sup> Incidents ranging from the Northridge Earthquake to the 9/11 terrorist attack to Hurricane Katrina to the Joplin tornado to Superstorm Sandy have repeatedly highlighted hospital vulnerabilities and the need for effective planning. Hospitals have an obligation to the communities they serve to be prepared for a disaster, and they especially have an obligation to provide for the safety and well-being of those employees they expect to show up for work and to perform at high levels under extraordinarily challenging conditions.

## The legacy of Katrina<sup>6</sup>

Nearly a decade later, the horrific circumstances during and after Hurricane Katrina at New Orleans' Memorial Medical Center remain an especially grim but vivid reminder of how badly things can go wrong for an inadequately prepared hospital in the midst of a major catastrophe. When the levees protecting New Orleans gave way, Memorial quickly descended into chaos. Floodwaters marooned hundreds of people with no power or running water in the stifling building. Communications with the outside world were severed. Doctors were faced with agonizing life-and-death choices for the most critical patients. The hospital chapel became a makeshift morgue for the 45 patients who died. It took four days for rescuers to arrive.

The situation was hardly better at other New Orleans hospitals. Charity Hospital and Lindy Boggs Medical Center also had no power or running water, and dwindling supplies. At Charity, critically ill patients were carried up and down dark stairwells to the ICU unit on the 12th floor. Some stairwells were pressed into service as morgues since the morgue in the basement was inaccessible. At Boggs, nurses alternated 30-minute shifts to hand operate ventilators. Blood for transfusions ran out, as did many medications.

The New Orleans hospitals had disaster plans, but most proved inadequate for the circumstances. Officials at one hospital claimed that portions of their plan fell apart because they did not contemplate a near complete failure of communication systems. Some hospitals, in hindsight, were remarkably poorly designed for withstanding a flood below sea level in New Orleans. In some cases, power generators were located in basements, and were quickly rendered inoperable by rising water. In others, the hospitals were not easily accessible by helicopters.

The legacy of Katrina has been a rethinking of disaster planning. The magnitude of the catastrophe prompted medical professionals, hospital administrators and governments to reconsider how they prepare for, and respond to, disasters. Compliance regulations and accreditation requirements now reflect lessons learned from Katrina and other disasters. Based on feedback from hospitals affected by Katrina, The Joint Commission identified six

<sup>4</sup> Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011, Missouri Hospital Association p. 4 [http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012\\_preparedness\\_lessons\\_learned.pdf](http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012_preparedness_lessons_learned.pdf)

<sup>5</sup> "Requirements for Emergency Management Oversight," The Joint Commission [http://www.jointcommission.org/assets/1/18/JCP0713\\_Emergency\\_Mgmt\\_Oversight.pdf](http://www.jointcommission.org/assets/1/18/JCP0713_Emergency_Mgmt_Oversight.pdf)

<sup>6</sup> Unless otherwise indicated, descriptions and statistics about hospitals during Hurricane Katrina rely upon Bradford H. Gray and Kathy Herbert, After Katrina: Hospitals in Hurricane Katrina – Challenges Facing Custodial Institutions in a Disaster, The Urban Institute 2006

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critical areas of emergency management: communication, resources and assets, safety and security, staff responsibilities, utilities management, and patient clinical and support activities.<sup>7</sup> These six areas remain the backbone of The Joint Commission's emergency preparedness criteria for accreditation.

Katrina also highlighted health and safety issues of hospital staff during a crisis. In some cases, health care professionals toiled for days in oppressive heat with little rest, no relief, and with no idea when help would arrive. Generators failed and toilets were inoperable. Patients had to be carried up and down stairs to ICUs and evacuation points.<sup>8</sup> At one hospital, 12 staff members struggled for nearly two hours to carry one morbidly obese patient down a stairwell.<sup>9</sup>

Both the physical and mental stress was enormous. In a study of one Louisiana hospital during Katrina, researchers noted that a number of staff members experienced significant personal losses, but continued to perform "in spite of the severe psychological trauma they were experiencing."<sup>10</sup> A subsequent study published by the National Institute of health found that 20 percent of nurses working in New Orleans emergency departments during Katrina displayed symptoms of post-traumatic stress disorder.<sup>11</sup>

In the post-Katrina world, hospital disaster planning increasingly has focused on staff health and safety issues. Disaster planning addresses the physical health and safety of employees, but also focuses on the types of mental and emotional health issues that were clearly evident during and after the storm and the subsequent flooding.

Katrina was a wake-up call, and sparked a reassessment of hospital disaster preparedness, but things do not change overnight, or in some cases, even in nearly a decade. Many hospitals still struggle to achieve adequate preparedness, as was highlighted in Superstorm Sandy in 2012. Nearly 90 percent of hospitals in declared disaster areas reported experiencing substantial challenges in responding to the storm, according to a recent report from the Department of Health and Human Services' Office of the Inspector General. Echoing many of the issues faced in Hurricane Katrina, the authors note: "These challenges represented a range of interrelated problems from infrastructure breakdowns, such as electrical and communication failures, to community collaboration issues over resources, such as fuel, transportation, hospital beds, and public shelters." The authors observed that, prior to the storm, most of the affected hospitals had received emergency-related deficiency citations, some of which were related to the challenges faced during and after the storm.<sup>12</sup>

7 Holly Houk Cullen, An Evaluation of Post-Katrina Emergency Preparedness Strategies in Hospitals on the U.S. Gulf of Mexico Coastline, Doctoral Dissertation, Louisiana State University December 2011 p. 24

8 Gray and Herbert

9 "Special Needs Population: Emergency Management of Bariatric Patient," National Association of County & City Health Officials <http://www.naccho.org/topics/emergency/AHPIP/loader.cfm?csModule=security/getfile&pageid=150910>

10 Ijlal Barbar and Ronald Rinker, "Direct patient care during an acute disaster: chasing the will-o'-the-wisp," Critical Care. 2006; 10(1) 206 <http://ccforum.com/content/10/1/206>

11 "An exploration of post-traumatic stress disorder in emergency nurses following Hurricane Katrina," National Institute of Health, 2007 [http://www.ncbi.nlm.nih.gov/pubmed/?term=Battles%20ED\[Author\]&cauthor=true&cauthor\\_uid=17643790](http://www.ncbi.nlm.nih.gov/pubmed/?term=Battles%20ED[Author]&cauthor=true&cauthor_uid=17643790)

12 Hospital Emergency Preparedness and Response During Superstorm Sandy, Office of the Inspector General, Department of Health and Human Services 2014 "Executive Summary" <https://oig.hhs.gov/oei/reports/oei-06-13-00260.pdf>

*Hospital employee health and safety under extreme conditions begins with the design and construction of the facility itself.*

## Design and construction: Planning for resiliency, self-sufficiency and employee safety

Hospital employee health and safety under extreme conditions begins with the design and construction of the facility itself. Hospitals in areas prone to natural catastrophes should be designed and constructed with resiliency as a priority. Additionally, hospitals should be designed to accommodate surges during mass casualty incidents, and be prepared to address the specific requirements of biological, chemical or radiological events. Well designed hospitals not only better serve their communities, they are also safer and healthier for employees.

Employees in catastrophe-prone regions understand that coming to work could mean putting their lives in danger with little hope of evacuation. A safer building contributes to emotional well-being and a higher level of job performance. It may even make a difference in the willingness of staff to show up for work at all.<sup>13</sup>

For a new hospital, resiliency and self-sufficiency should be part of the planning and design process from the very beginning. Risk evaluation is a critical first step. Categorizing the types of events the hospital might encounter, the probability of occurrence and the potential consequences of such an event are fundamental to understanding where to focus design and prioritize the allocation of capital.

Choosing the site to build a new hospital should take into account vulnerabilities to natural catastrophes, balanced against the need to be accessible to the community. It also should take into consideration infrastructure dependencies, principally for utilities and transportation.

The Spaulding Rehabilitation Hospital, located on Boston Harbor, is an example of a hospital built to be highly resilient to weather events, especially flood. Goals for the facility that guided the design process included:

- To protect patients and employees from the effects of extreme weather and long-term climate change.
- To maintain basic building systems and services for a period of at least four days from the onset of an emergency.
- To integrate into the building systems a measure of redundancy whereby in the event of system failure an alternative or backup would provide a substitute.
- To maintain this degree of resiliency over the lifetime of the building (approximately 80 years).<sup>14</sup>

The types of catastrophes likely to be experienced in a region will significantly influence the design of a hospital. Since flooding was the principal concern for Spaulding's designers, they moved as many critical functions and infrastructure above the 100-year flood level. Plans for Mercy Hospital in Joplin, Missouri take a very different approach. After being nearly destroyed by an EF-5 tornado, designers concluded that incident command posts should be located underground. The new Mercy Hospital also will include hurricane-rated pre-cast concrete exterior walls and impact-rated laminated window and frame systems.<sup>15</sup>

<sup>13</sup> French et al, op cit

<sup>14</sup> "Partners HealthCare Redefines Resilience and Restoration in Innovative Waterfront Hospital 4/14 Patient rooms," Healthier Hospitals Initiative, Practice Greenhealth / Greenhealth magazine, <http://healthierhospitals.org/get-inspired/case-studies/partners-healthcare-redefines-resilience-and-restoration-innovative>

<sup>15</sup> "A Prescription for Disaster Resilience: The Importance of Mitigation for Healthcare Facilities," Insurance Institute for Business & Home Safety [https://www.disastersafety.org/commercial\\_maintenance/prescription-disaster-resilience/](https://www.disastersafety.org/commercial_maintenance/prescription-disaster-resilience/)

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Emergency Departments should be designed for surges resulting from mass casualty incidents. They also need to be prepared for chemical, biological and radiological events where patients may need to be decontaminated or quarantined. Emergency Department design criteria developed in Project ER One, sponsored by the Office of Homeland Security, and directed by Mark S. Smith, M.D., Washington Hospital Center are used as a reference for ED design by architects. Even before 9/11 the hospital had received federal funding to design a futuristic emergency care center capable of responding to a major terrorism event, with particular attention to capability, capacity and protection.<sup>16</sup>

Tampa (Florida) General Hospital was one of the first to incorporate ER One design criteria. Its Emergency and Trauma Center is designed to double its capacity when needed. Decontamination showers are located at the ambulance entrance and in the parking area, where mass decontamination can take place. Treatment sections are designed to quickly be isolated to contain contaminated or contagious patients without affecting the rest of the department.<sup>17</sup>

Existing hospitals have less flexibility in terms of building design and the choice of building materials, but can be retrofitted to improve resiliency. Miami Children's Hospital in Miami, Florida, for example, was built in the mid-1980s, and was found to be unsafe at wind speeds equal to a Category 2 storm. Beginning in 2001, the building underwent a state-of-the-art retrofit to enable it to withstand a Category 4 hurricane. The solution essentially was to wrap it in a hurricane-resistant shell – encapsulating the structure in pre-molded panels of concrete reinforced with glass fibers, which was supplemented with impact-resistant windows and a strengthened roof. Hospital administrators note that staff safety was a prime consideration, and that the strengthened building has enhanced the ability of the facility to recruit staff to serve during hurricanes.”<sup>18</sup>

Hospital design also should take into consideration that, despite best efforts to harden buildings against disaster, health care workers may be functioning in damaged facilities and will benefit from safety features such as slip resistant flooring. Reliable power is essential, but battery powered lighting in stairwells is an important backup. An alternative water source should be considered in disaster planning.

## Emergency preparedness: Planning for employee health and safety

Hospital emergency preparedness is a priority for government at all levels, and is an important focus of regulatory and accrediting agencies. Every hospital should have a written plan that serves as a road map for incident preparation, response, and recovery. Preparedness planning is a factor evaluated by the Joint Commission for accreditation, and the organization has identified six critical areas for hospitals to demonstrate they have proper plans and response mechanisms to a disaster: communication, resources and assets, safety and security, staff responsibilities, utilities management, and patient clinical and support activities.<sup>19</sup>

<sup>16</sup> "ER ONE: Emergency Preparedness at the Highest Level," Center Focus, MedStar Washington Hospital Center, Oct./Nov 2013 [https://www.medstarhealth.org/washington/Documents/CenterFocus/CenterFocus\\_OctNov13.pdf](https://www.medstarhealth.org/washington/Documents/CenterFocus/CenterFocus_OctNov13.pdf)

<sup>17</sup> "Patient Privacy, Comfort, and Convenience Built Into New ER Design," New Building Update, Tampa General Hospital March 2004 [https://www.tgh.org/PDFs/2004-03\\_TGH\\_new-building\\_72dpi.pdf](https://www.tgh.org/PDFs/2004-03_TGH_new-building_72dpi.pdf)

<sup>18</sup> "Hospital Haven: Facelift Provides Safe Hurricane Refuge for Young Patients," U.S. Department of Homeland Security <https://www.ilis.dhs.gov/content/hospital-haven-facelift-provides-safe-hurricane-refuge-young-patients>

<sup>19</sup> "Requirements for Emergency Management Oversight," The Joint Commission [http://www.jointcommission.org/assets/1/18/JCP0713\\_Emergency\\_Mgmt\\_Oversight.pdf](http://www.jointcommission.org/assets/1/18/JCP0713_Emergency_Mgmt_Oversight.pdf)

*The first step towards comprehensive disaster preparedness is to identify shortcomings in a facility's operations, resources and emergency planning processes.*

Both the value and the shortcomings of emergency planning were highlighted by Superstorm Sandy in 2012. Nearly 90 percent of hospitals in the affected area experienced challenges during the storm, but a subsequent study found that the hospitals that did not report any substantial challenges attributed their lack of problems to successful emergency planning. Many of the hospitals that did experience problems would have fared worse without planning, according to administrators interviewed for the study. All but one of the 172 hospitals in the study reported that their emergency plans were useful during and after the storm.<sup>20</sup>

Almost everything in an emergency plan at least indirectly contributes to staff welfare and safety. Plans to keep the power on, the water flowing, and the phones operating clearly benefit everyone in the facility, and help assure that the hospital is a safe and healthy place to work during extreme events. Other aspects of a plan more directly address staff health and safety issues. These include issues such as staff rotation, personal protective equipment, and hospital security.

## Conducting an assessment

The first step towards comprehensive disaster preparedness is to identify shortcomings in a facility's operations, resources and emergency planning processes. Various assessment tools and checklists are available such as the Hospital All-Hazards Self-Assessment developed by the Centers for Disease Control in conjunction with the Oak Ridge Institute for Science and Education<sup>21</sup>, and the Hospital Disaster Preparedness Self-Assessment Tool from the American College of Emergency Physicians (ACEP).<sup>22</sup>

A good assessment tool addresses virtually all aspects of hospital operations and emergency planning. It can be used to revise an existing disaster plan or, if the facility does not yet have a plan, it provides a framework to assure every aspect of disaster planning is addressed.

Using the ACEP tool as a reference, the employee health and safety aspects of an assessment include:

- Adequacy of hospital safety and security.
- Availability of emergency power, water, fuel and food.
- Availability of Personal Protective Equipment.
- Mutual aid Memoranda of Understanding in place.
- Arrangements for surge staffing.
- Procedures for on-duty and off-duty staff notifications.
- Care for staff families.
- Procedures for monitoring employee absenteeism and plans for staff backfill.
- Availability of mental health services, and a plan for assessing staff well-being.
- Plans for immunization and chemoprophylaxis for staff.
- Staff disaster response training.<sup>2</sup>

An assessment is not a one-time exercise. Assuring emergency preparedness requires an annual reassessment of the emergency plan.

<sup>20</sup> Hospital Emergency Preparedness and Response During Superstorm Sandy, Office of the Inspector General, Department of Health and Human Services 2014 p. 19 <https://oig.hhs.gov/oei/reports/oei-06-13-00260.pdf>

<sup>21</sup> "ORISE partners with CDC to develop Hospital All-Hazards Self-Assessment to identify gaps in planning efforts," ORISE <http://orise.orau.gov/health-communication-technical-training/resources/hospital-all-hazards-self-assessment.aspx>

<sup>22</sup> Hospital Disaster Preparedness Self-Assessment Tool, American College of Emergency Physicians [www.acep.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=91205](http://www.acep.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=91205)



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## Preparedness planning: Employee health and safety considerations

Employee safety and welfare issues need to be fully integrated into all phases of planning and preparation for a disaster. Keeping the staff safe and physically, mentally and emotionally healthy is not only a moral imperative, it is fundamental to achieving every other objective. Reflecting on lessons learned from the Joplin tornado, the authors of the Missouri Hospital Association report concluded: "Perhaps the single most important planning consideration is how to manage and support hospital staff during a response and throughout the recovery. Take care of your staff."<sup>24</sup>

The employee health and safety aspects of a response plan largely mirror those identified in the assessment. The U.S. Department of Health & Human Services identifies six factors planners should consider to ensure the protection of health care providers:

- Training specific to provider responsibilities and to the nature of the event.
- Adequate rotation of staff to prevent burnout and errors due to fatigue.
- Personal protective equipment, prophylaxis, and other protections that enable them to work safely.
- Freedom from threats of malpractice.
- Mental health support during and following stressful situations.
- Care and support for health care providers' families.<sup>25</sup>

**Training.** Planners should not assume that individual providers will know how to deliver appropriate care in a mass casualty event. Training programs can help ensure a systematic, coordinated response effort while assuring that health care providers are performing their duties in ways that protect their own health and well-being.

Training should be provided to all responders, including nonmedical personnel and potential community volunteer responders, and should be specific to the role a person is likely to play in a mass casualty event.<sup>26</sup> Disaster drills that provide a realistic approximation to situations likely to occur in a geographical area should be conducted regularly. Training should cover a range of potential situations such as natural catastrophes, a toxic chemical spill, radiation contamination or a pandemic.

Training should specifically incorporate injury prevention, and should address the possibility that employees will perform essential functions in a severely compromised facility.<sup>27</sup> Evacuation training should assume that lifting aids will not be available and that elevators are inoperable. "Training for emergency preparedness tends to focus on level of care, and not so much on employee health and safety," according to Christopher Skipper, loss control accounts manager for The Hartford. "Clinical aspects are important, but safety aspects are as well."

<sup>23</sup> Hospital Disaster Preparedness Self-Assessment Tool

<sup>24</sup> *Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011*, Missouri Hospital Association p. 4 [http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012\\_preparedness\\_lessons\\_learned.pdf](http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012_preparedness_lessons_learned.pdf)

<sup>25</sup> Bioterrorism and Other Public Health Emergencies, U.S. Department of Health & Human Services <http://archive.ahrq.gov/research/altstand/altstand4.htm#Protection>

<sup>26</sup> Ibid



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**Adequate staff rotation.** Response operations may continue for days or weeks. The plan should provide for reasonable work periods and periodic days off. Rotation and rest should be assured for all staff. Hospitals should consider forming several incident management teams with rotating schedules to assure 24-hour coverage.

The plan also should account for the reality that the hospital is likely to be short-staffed due to employees unable or unwilling to make it to work, sick or injured employees, or employees lost accompanying patients during evacuations. Preparations should be made for assistance from retired or part-time health care professionals in the community, or from other health care professionals not affiliated with the hospital.

Strategies for addressing nursing shortages during a public health emergency, as identified by the National Institutes of Health, include “invoking mutual aid agreements, temporary nurses, volunteer nurses, American Red Cross, and other relief agency nurses, retired nurses, National Disaster Medical Assistance Teams (DMAT) or National Nurse Response Teams, Medical Reserve Corps, [and] other Federal resources of the National Disaster Medical System.”<sup>28</sup> The Department of Health & Human Services further recommends augmenting staff through “an expanded group of providers, such as veterinarians, dentists and dental auxiliary providers, pharmacists, and health professional students,” and “creating and training a pool of nonmedical responders to support health and medical care operations.”<sup>29</sup>

**Freedom from threats of malpractice.** Standards of care are likely to change in a crisis situation. Rather than doing everything possible to save every life, it may be necessary to allocate scarce resources in order to save as many lives as possible in a mass casualty incident. A 2005 Department of Health & Human Resources report concludes, “Many health system preparedness efforts do not provide sufficient planning and guidance concerning the altered standards of care that would be required to respond to a mass casualty event.”<sup>30</sup>

Fair and clinically sound standards and procedures for allocating health and medical resources in a mass casualty event must be communicated through the hospital disaster response plan. This will help assure the best outcome to a very bad situation, and can help relieve physicians and other health care providers of an enormous emotional and psychological burden as the standard of care shifts as a crisis deepens. Clear criteria and procedures for transitioning to an altered standard of care also can help shield physicians and others from malpractice suits, and can strengthen a defense in the event a suit is filed. The Institute of Medicine has published guidance for crisis standards of care that should apply in disaster situations under scarce resource conditions.<sup>31</sup>

27 Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011, Missouri Hospital Association p. 27 [http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012\\_preparedness\\_lessons\\_learned.pdf](http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012_preparedness_lessons_learned.pdf)

28 “Hospital Nurse Staffing and Public Health Emergency Preparedness: Implications for Policy,” National Center for Biotechnology Information, National Library of Medicine, National Institute of Health 2010 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2998349/#R39>

29 Bioterrorism and Other Public Health Emergencies, U.S. Department of Health & Human Services <http://archive.ahrq.gov/research/altstand/altstand4.htm#Protection>

30 Altered Standards of Care in Mass Casualty Events, Agency for Healthcare Research and Quality, U.S. Department of Health and Human Services 2005 p.2 <http://archive.ahrq.gov/research/altstand/altstand.pdf>

31 Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations, Institute of Medicine <http://www.iom.edu/reports/2009/disastercaresstandards>

*Hospitals may do a good job of planning for PPE for their own employees, but they may find that they also are supplying equipment for other responders during an emergency, and need to plan accordingly.*

**Personal protective equipment, prophylaxis, and other protections.** Chemical, biological and radiological events, as well as epidemics, will require hospital workers to take appropriate actions to protect themselves. Making realistic estimates of the types and amounts of personal protective equipment (PPE) and antiviral medication and other prophylaxis required for hospital health care workers is a vital part of the planning process.

PPE should be available in appropriate quantities and in various sizes. Employees should be trained in its use, and should be monitored for fatigue and distress while using it. OSHA offers detailed guidelines for PPE usage for first receivers, including guidance for customizing hospital emergency plans for PPE requirements.<sup>32</sup>

Hospitals may do a good job of planning for PPE for their own employees, but they may find that they also are supplying equipment for other responders during an emergency, and need to plan accordingly. "Responders from outside agencies may show up to help and need equipment," according to Skipper. "Consider all users, not just hospital employees."

A prophylaxis/immunization cache must be maintained for hospital workers with plans to distribute to both on-duty and off-duty staff (and, as appropriate, their families). Additionally, the staff needs to be informed about any other protective measures necessary for a specific contagious biological event.

**Mental health support.** Mass casualty incidents can place health workers under enormous stress and pressure. Effective response by these workers requires that they have the necessary supportive services, including adequate rest and relief, as well as mental health counseling. Staff should be monitored for signs of fatigue and psychological stress.

Planning should take into account that many facilities have limited mental health staff and are not equipped to manage a surge situation. It may be necessary to supplemental a facility's mental health staff with outside mental health professionals, who should be incorporated into the planning process. Also clinical staff will likely need special training to address large scale events such as a terrorist attack.<sup>33</sup>

Subsequent to an event, employees should be monitored for symptoms of PTSD and offered Critical Incident Stress Management as appropriate.<sup>34</sup>

<sup>32</sup> OSHA Best Practices for HOSPITAL-BASED FIRST RECEIVERS OF VICTIMS from Mass Casualty Incidents Involving the Release of Hazardous Substances, OSHA 2005 [https://www.osha.gov/dts/osta/bestpractices/html/hospital\\_firstreceivers.html#appa11](https://www.osha.gov/dts/osta/bestpractices/html/hospital_firstreceivers.html#appa11)

<sup>33</sup> "From Readiness to Recovery," California Hospital Association [http://www.calhospital.org/sites/main/files/file-attachments/Integrating\\_Disaster\\_Mental\\_Health\\_Shields.pdf](http://www.calhospital.org/sites/main/files/file-attachments/Integrating_Disaster_Mental_Health_Shields.pdf)

<sup>34</sup> "An exploration of post-traumatic stress disorder in emergency nurses following Hurricane Katrina," National Institute of Health, 2007 [http://www.ncbi.nlm.nih.gov/pubmed?term=Battles%20ED\[Author\]&cauthor=true&cauthor\\_uid=17643790](http://www.ncbi.nlm.nih.gov/pubmed?term=Battles%20ED[Author]&cauthor=true&cauthor_uid=17643790)

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Related to mental health issues is morale, and the willingness of staff members to give their all under extreme and often dangerous circumstances. Concern about family members and pets is a major consideration, and will be addressed separately below. Visible management support, fair treatment of nurses and other staff member relative to physicians and hospital administrators, and adequate compensation for long hours worked under stressful conditions were identified by nurses as factors that influenced their willingness to work under dangerous and demanding circumstances.<sup>35</sup>

*Care and support for health care providers' families.* Worrying about and arranging for the needs of family members and pets can be an enormous distraction for hospital staff during a catastrophe. A study of nurses who performed under highly stressful conditions during Hurricane Floyd in 2002 found that concerns about family safety and pet care were more pressing than concerns about basic needs such as food, water, sleep, shelter, and rest. According to one nurse interviewed for the study, "My commitment to work depends on how safe I feel my family is."<sup>36</sup>

"This is an especially important issue for single parents, and for families where both parents are employed in jobs that are deemed critical in a crisis," notes Skipper. "That happens fairly often – people who are inclined to help others frequently have similarly-inclined spouses."

Although not common, some hospitals offer shelter to staff families. Miami Children's Hospital, which has been retrofitted to withstand a Category 4 storm, provides on-campus shelter for family members of storm-duty staff.<sup>37</sup> "It could be very helpful if hospitals provided secure care for the staff's children during a crisis," according to Skipper. "This is an opportunity for more hospitals should explore."

Some hospitals require employees and their families to prepare a family disaster plan that outlines procedures family members should follow to assure their safety during a catastrophe. Hospital preparedness planning also should consider coordinating with community resources such as schools and churches for pre-arranged supervision, shelter, and feeding for the families of health care providers.<sup>38</sup> The authors of the Hurricane Floyd study recommend that a centralized shelter in the community for family members of emergency responders should be designated.<sup>39</sup>

Provisions for pet care also should be factored into plans. Nurses interviewed after Hurricane Floyd said they would not come to work if they did not have adequate arrangements for their pets.<sup>40</sup>

35 Emily D. French, Mary Lou Sole and Jacqueline Fowler Byers, "A comparison of nurses' needs/concerns and hospital disaster plans following Florida's Hurricane Floyd," *Journal of Emergency Nursing* Volume 28, Issue 2, April 2002 <http://www.jenonline.org/article/S0099-1767%2802%2940431-X/fulltext>

36 Emily D. French, Mary Lou Sole and Jacqueline Fowler Byers, "A comparison of nurses' needs/concerns and hospital disaster plans following Florida's Hurricane Floyd," *Journal of Emergency Nursing* Volume 28, Issue 2, April 2002 <http://www.jenonline.org/article/S0099-1767%2802%2940431-X/fulltext>

37 "Hospital Haven: Facelift Provides Safe Hurricane Refuge for Young Patients," U.S. Department of Homeland Security <https://www.ilis.dhs.gov/content/hospital-haven-facelift-provides-safe-hurricane-refuge-young-patients>

38 Hospital Preparedness for Mass Casualties, Office of Emergency Preparedness, U.S. Department of Health and Human Services and the American Hospital Association, 2000 p. 27 <http://www.aha.org/content/00-10/2000forumreport.pdf>

39 French et, op cit

40 French et, op cit

*Hospitals may utilize temporary security procedures, such as lockdowns, to enforce safety, and security personnel and other staff should be trained for such a contingency.*

**Security.** While not specifically identified in its list of factors for the protection of health care providers, HHS notes that security of health care providers is a significant related concern.<sup>41</sup> Other sources place a high priority on security issues. The Joint Commission, for example, identifies “Safety and Security” as one of the six critical areas of emergency management.<sup>42</sup> The authors of the MHA study on the Joplin tornado and other 2011 events were clear: “the safety of staff, patients and visitors and securing critical resources were urgent needs requiring immediate action.”<sup>43</sup>

The likelihood of an assault on staff members can increase during a catastrophe as emotions run high and hospital security may be compromised. OSHA identifies the inability to obtain needed services promptly, and an increase number of trauma patients or distraught family members as factors contributing to increased risk of violence.<sup>44</sup> These are obvious characteristics of a catastrophe with mass casualties. Staff members also may be at risk of being assaulted for their PPE during a biological or radiological event.

Security issues also can result from the curious and the concerned. Based on experience of the 2011 Joplin tornado and other Missouri tornadoes, the Missouri Hospital Association warns that “Incidents that are of immediate community interest will likely be shared on social networking forums, and people may begin arriving at the hospital in droves.” The report also warns against “imposters and opportunists,” and advises hospitals to have triggers for the immediate activation of security measures.<sup>45</sup>

Hospital security must be a component of disaster planning. Employee training for crowd control and violent threat scenarios is essential. Hospitals may utilize temporary security procedures, such as lockdowns, to enforce safety, and security personnel and other staff should be trained for such a contingency.

Security planning should extend to the community and should include public safety and security support. Hospitals also should consider contracting for supplemental security services during extreme events from a private security guard company. Skipper suggests that hospitals consider contracting with vendors outside the immediate area since other hospitals may be relying on the same vendors who, in turn, may be contending with their own crisis-related issues.

41 Bioterrorism and Other Public Health Emergencies, U.S. Department of Health & Human Services  
<http://archive.ahrq.gov/research/altstand/altstand4.htm#Protection>

42 “Requirements for Emergency Management Oversight,” The Joint Commission  
[http://www.jointcommission.org/assets/1/18/JCP0713\\_Emergency\\_Mgmt\\_Oversight.pdf](http://www.jointcommission.org/assets/1/18/JCP0713_Emergency_Mgmt_Oversight.pdf)

43 Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011, Missouri Hospital Association p. 4  
[http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012\\_preparedness\\_lessons\\_learned.pdf](http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012_preparedness_lessons_learned.pdf)

44 Guidelines for Preventing Workplace Violence for Health Care & Social Service Workers, OSHA  
<https://www.osha.gov/Publications/OSHA3148/osha3148.html>

45 Preparedness and Partnerships: Lessons Learned from the Missouri Disasters of 2011, Missouri Hospital Association p. 26  
[http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012\\_preparedness\\_lessons\\_learned.pdf](http://www.calhospitalprepare.org/sites/main/files/file-attachments/2012_preparedness_lessons_learned.pdf)

*The planning process must assure that a team with the necessary skills and training is in place, and that authority and responsibility have been appropriately distributed within that team.*

## Other considerations

Other staff health and safety factors that should be incorporated in planning and preparing for a disaster include:

*Incident command structure.* An incident management team overseeing the execution of the emergency response plan is essential to successfully managing a crisis. The planning process must assure that a team with the necessary skills and training is in place, and that authority and responsibility have been appropriately distributed within that team. California's Hospital Incident Command System Guidebook, for example, defines a Hospital Incident Management Team as being comprised of five primary management components (Command, Operations, Planning, Logistics, and Finance/Administration) and associated branches, units and technical specialists.<sup>46</sup> "Having a clearly defined incident command structure facilitates communication as well as timely and appropriate decision making while enabling hospital management to be part of the unified command system," said Skipper.

A Safety Officer should be designated as part of the incident command structure. According to the National Incident Management System (NIMS), a framework for the management of major incidents promulgated by the Department of Homeland Security:

"The Safety Officer monitors incident operations and advises Incident Command on all matters relating to operational safety, including the health and safety of emergency responder personnel. ... [T]he Safety Officer is responsible for developing the Incident Safety Plan — the set of systems and procedures necessary to ensure ongoing assessment of hazardous environments, coordination of multiagency safety efforts, and implementation of measures to promote emergency management/incident personnel safety, as well as the general safety of incident operations. The Safety Officer has emergency authority to stop and/or prevent unsafe acts during incident operations."

NIMS further specifies that "the Safety Officer must also ensure the coordination of safety management functions and issues across jurisdictions, across functional agencies, and with NGOs and the private sector."<sup>47</sup>

The Safety Officer may be supported by Assistant Safety Officers. Additionally, planners may wish to designate an Employee Family Care Unit Leader to assist health care staff and clinicians by providing support for their families.

NIMS defines protocols for agencies involved in a disaster response. Since outside agencies that interact with a hospital will be utilizing NIMS command structure and communication protocols, it is imperative that hospitals do the same so they are speaking the same language as other response agencies. The NIMS framework is described in the Department of Homeland Security publication, National Incident Management System (December, 2008).<sup>48</sup>

<sup>46</sup> Hospital Incident Command System Guidebook, p. 43

<sup>47</sup> National Incident Management System, U.S. Department of Homeland Security (December, 2008) p. 93  
[https://www.fema.gov/pdf/emergency/nims/NIMS\\_core.pdf](https://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf)

<sup>48</sup> [https://www.fema.gov/pdf/emergency/nims/NIMS\\_core.pdf](https://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf)

*Being prepared for a disaster is essential for a hospital to fulfill its mission to its community.*

**Post-event follow-up.** The impact of a catastrophic event on hospital staff does not end with the winding down of the event. Continued medical monitoring, including psychological monitoring, is critical. Counseling should be made available as appropriate.

A debrief and critique following an event is essential to identify health and safety gaps and failures, and to modify plans with lessons learned.

## Conclusion: Best practices for a prepared hospital

Being prepared for a disaster is essential for a hospital to fulfill its mission to its community. It is a requirement for Joint Commission accreditation and necessary for licensing in many states. It may even become a federal requirement: in December 2013, the Centers for Medicare and Medicaid Services proposed a rule “to establish consistent emergency preparedness requirements for health care providers participating in Medicare and Medicaid, increase patient safety during emergencies, and establish a more coordinated response to natural and man-made disasters.”<sup>49</sup>

Being prepared for a natural catastrophe, a terrorist event or a pandemic means having a plan in place to deliver quality medical care under challenging conditions. Increasingly, planners have come to realize an essential part of preparedness is ensuring that hospital personnel are safe and healthy. Not only do employers have an obligation to protect their employees, the success of every other part of the emergency plan depends on having healthy and motivated employees in all essential roles. Lessons learned from Hurricane Katrina, the Joplin tornado and other events are clear: keeping employees safe and healthy is one of – it not the – highest priority when responding to a major incident.

While there is no universally accepted set of best practices, there is a general consensus among preparedness experts as to the essential priorities:

- The design of the hospital itself is fundamental to both patient and employee well-being. Specific design features will vary according to the function of the facility and where it is located. Understanding the types of events the facility is most likely to experience, the probability of their occurrence, and the potential consequences of each type of event is an essential first step in establishing design priorities.
- The emergency response plan should reflect – both implicitly and explicitly – employee health and safety issues in almost every detail. An assessment is an essential first step in identifying gaps and deficiencies in the employee health and safety elements of the plan.

<sup>49</sup> “Fact sheets: Emergency Preparedness Standards for Medicare and Medicaid Participating Providers and Suppliers,” CMS <https://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-sheets/2013-Fact-sheets-items/2013-12-20.html>

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- Mental and emotional health issues cannot be neglected, and in fact are essential to the ability of hospital staff to function effectively under highly stressful conditions.
- A plan is only as good as its implementation. Training and practice are essential not only to the successful execution of the written plan, but also to the ability of hospital staff to perform their responsibilities safely under extreme conditions.

Hurricane Katrina was a wake-up call for governments and the health care industry, but Superstorm Sandy made it clear that there is still a long way to go before most hospitals are truly prepared to function at a high level during a major disaster. Nonetheless, signs are encouraging that progress is being made, including increased recognition of the importance of policies, procedures and processes to ensure the safety and health of employees.