

FEATURE

Surge Capacity Management and Patient Identification in Disaster Preparedness

By Martha Carlton, RN, BS

Real-time information and the ability to communicate it effectively are two of the most valuable resources for managing the aftermath of a natural disaster or terrorism event. After September 11 and Hurricane Katrina revealed massive communication breakdowns with first responders, this problem received top priority and a significant percentage of federal grant money was dedicated to purchase new equipment.

Now, health officials are acknowledging that much more needs to be done.

Among the top issues:

- Reduced surge capacity following two decades of hospital closings.
- A need to find a more efficient method for tagging and tracking disaster victims.
- Potential shortages of medication in a crisis due to the move to just-in-time inventory.
- A shift from local to regional disaster preparedness to cope with the potential volume of mass casualties.
- A competitive healthcare marketplace which makes cooperation between hospitals and systems difficult.

One of the greatest challenges will be coordinating a whole spectrum of regional health assets, including blood supply, medication, equipment, beds, tracking victims shuttled from one care site to another and providing community information to avoid further casualties. Because disaster events are so fluid, the more “live” information that’s available, the better.

Overcoming that challenge will require a central command center, ideally one that receives as much information as possible in real time.

One key tool currently under development is the digital “community dashboard.” This display device will be linked to multiple information feeds from scores of sources throughout a

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Receiving “live” information is another story. Hospitals with automated patient tracking, robot pharmacies and other online assets should be able to feed their information electronically to the command center in streaming fashion, provided the technologies are interoperable. Hospitals which continue to perform most information processes manually must call, fax or e-mail data periodically, most likely at the prompting of command center callers.

regional network. Ultimately, it will provide status reports on capacity, inventory, staffing, blood supply, lab availability and other vital data from several regional institutions simultaneously.

The University of Pittsburgh Medical Center (UPMC) and Pennsylvania Region 13 are partnering to develop such a network. Known as the Strategic Bio-defense System (SBS), it will connect key civilian and military agencies to coordinate regional response to a disaster. This system, being developed with the Pennsylvania National Guard and funded by the Pennsylvania Department of Military and Veterans Affairs, will be offered to more than 30 hospitals, plus

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Surge Capacity Management and Patient Identification in Disaster Preparedness *(continued)*

responding agencies and Emergency Operations Centers (EOCs) throughout western Pennsylvania.

The system's goal is to enable electronic sharing of critical public health and medical information during emergencies, including hospital capacity and needs information (e.g., assets, staffing, beds, etc.). It also will initiate mass alerts, deliver emergency instructions and guidelines to the public, and facilitate bi-directional communication with thousands of medical and public health first responders during public health emergencies and disasters.

Managing the effort for UPMC is William Smith, senior director of Emergency Preparedness for the 19-hospital health system. The UPMC team is designing the community dashboard that the SBS will rely upon. The information available on the digital dashboard can be accessed instantaneously by any authorized agency or individual.

Keeping information timely is an important component of the initiative. Currently, phone calls are the most common means of getting updates from hospitals. Those calls, of course, require other calls to internal hospital staff in order to get answers. The process of polling hospitals to mobilize a few hundred beds can be very time consuming. A gnawing question remains: how relevant will that information be after a first round of calls is completed?

Some of the technology needed to make that happen is available now. For instance, most of the UPMC Health System hospitals use automated patient flow software from TeleTracking Technologies, which provides real-time data for assessing current and projected bed status, and has the added benefits of improving flow, matching like-infected patients and converting traditional time lags in the flow process into additional capacity.

The TeleTracking solutions have placed the entire patient flow process online, with prompts and reports which keep capacity status constantly up to date.

"We got rid of faxing sheets, discharge sheets and a million pieces of paper," said Deborah Kaczynski, MS, administrative director, Ancillary Services and Capacity Management, UPMC Shadyside. "In a disaster, it's hard enough to keep things running smoothly. We wouldn't want to change to a process we aren't familiar with."

"Interoperability is going to be a key factor," Kaczynski said. "Whatever products the region is using, we don't want to have to jump to another system. It's important to be business as usual in a disaster."

Currently, the SBS must take into account the reality that providers have disparate systems. Going forward, both hospitals and vendors should recognize the increasing importance of interoperability in disaster preparedness.

Hospital preparedness must be sustainable and funded accordingly because the problems aren't going away.

Universal Disaster Victim ID

One of the biggest problems in hospital surge capacity management is tagging patients and getting them into the hospital ADT system. In a disaster situation, this becomes even more chaotic. Handwritten wristbands and intake sheets slow the process of registration and therefore acquiring beds. Tags written in the field generally are cut from the victim's wrist and thrown away, and the registration process has to be repeated.

"The pre-hospital folks say their work ends when they get to hospital," says

UPMC's Kaczynski. "But in a disaster, tracking must go from the field to the hospital to discharge. If we can eliminate the 'hand off' and keep reporting on a constant basis, it will not only reduce confusion, but save more lives."

Most hospitals are reluctant to accept pre-printed labels because of experience with generic wristbands. However, wristbands and labels created within the hospital ADT system would automatically generate a second HL7 facility code which serves as a second point of identification. This type of bar-coded wristband would allow field tagging and eliminate re-identifying patients upon arrival at hospitals.

For that reason, disaster preparedness networks should be moving to a universal standardized system for tagging/identifying and tracking disaster victims. The goal should be to provide a simple ID solution which minimizes cost to the facility, meets the standards of regulatory agencies, and helps provide safe, quality patient care during traumas and disasters.

It would employ pre-printed, patient wristband with matching intake sheet and labels, bar coded with a "trauma patient" ID number (universal ID) and HL7 identification number included. These would be printed with universal coding and coding for specific EMS agencies. First responders tagging in the field would have an HL7 code on the wristband, so when a disaster victim arrives at a hospital, the bar code is scanned immediately, eliminating the need to re-register and saving vital time needed to administer care. The hospital now has two points of ID and handheld bar code scanners with registration

Surge Capacity Management and Patient Identification in Disaster Preparedness *(continued)*

capabilities, which would be used from that point to track patients. This standard could be established either voluntarily or by regulation. What is required is universal agreement that it is necessary.

Bar-coded, pre-programmed/pre-printed wristbands with intelligent attributes not only could upload patient information to ADT systems, but aid in triage and treatment and report victim information to government agencies and regional disaster management command centers. This becomes vitally important when disaster patients must be moved to another hospital in a given system, to another hospital system or to an “alternative care” site.

With first responders universally equipped to apply wristband tags, patient transport vehicles and all emergency departments should be equipped with bar code readers.

One system which seems well along the path toward universal ID is Raytheon’s Electronic Patient Tracking System (e.PTS). It was developed for multiple-casualty emergency response for states and large municipalities. The system has three primary components: Electronic Patient Tracking System field units, a central server and Web pages. The field units collect information at the scene and transmit it back to the central database. Dedicated, redundant servers host a database where the incident and patient data reside. The servers also provide the Web content available to trusted users over the Internet. The system uses bar codes with the patient’s location, medical status and personal records. PDAs wirelessly transfer the information to Web-enabled secure databases, such as central command centers, allowing authorities to “balance” resources so hundreds of casualties aren’t heading to the same place. As patients are evacuated and treated by EMS medics, they receive a bar-coded armband. The Emergency

Command Center logs into the secure Web site and determines how many casualties are at each scene and their condition. They then make informed decisions on how to dispatch emergency response units and which hospitals will receive the patients.

When they arrive at a triage site, emergency personnel scan the bar codes, which instantly sends information to the command center’s watch officer. Dispatch personnel use the data to determine proper medical facility destinations. Those destinations can track patients in transit to prepare for their treatment, and monitor e.PTS to know how many patients are being transported to their hospital. Additional patient information is collected until the patient is released, admitted or transferred to another hospital.

Universal disaster victim ID numbers would close the loop on this vital communications component by eliminating a redundant and time-consuming step at the hospital. Universal ID has other far-reaching benefits. Total casualty figures can be updated automatically. Standardized tagging makes ED to ED transfer simple and efficient, and protects government agencies against fraudulent claims by victims. Finding faster ways to register high numbers of victims also is important to keep the network capacity snapshot up to date.

The technology is available in most facilities to adopt pre-printed wristband tags, and it requires little training. For those facilities that lack the technology, government disaster grants may be available. Admitting hospital departments would designate a group of “trauma” numbers in the ADT registration system, such as “999000-123456.” Wristbands, labels and intake sheet would be kept in the ED. At arrival, trauma patient John Doe 123456 would receive a wristband coded for trauma with

an HL7 code as a second point of reference. After initial triage data is recorded on an intake sheet, a color-coded snap or dot can be placed on the wristband and intake sheet to indicate triage level of care. Handheld barcode scanners would upload information into the patient registration system and patient identifiers may be added as obtained. Rapid registration speeds care at every point, from admission to bed request to resource acquisition, such as the blood bank, pharmacy, diagnostics, X-ray, CT scan, stat labs and dietary.

Current Status

Regional coordinating groups can be an effective vehicle for implementing interoperability standards for communications, equipment, training and staff. Several major problems stand in the way of this capability:

- Rival hospitals must be willing to share more information.
- Hospitals must invest in technology that gives them actual rather than perceived capacity information.
- The success of the regional planning effort requires a neutral entity to bring together organizations that historically are competitors.
- Regions must be clearly defined with minimal overlap of health agencies and emergency management.
- Regions that cross state lines require the collaboration of state and local authorities from both sides of the state boundaries.
- Governors and mayors must support the creation of so-called regional hospital coordinating groups.
- Skepticism on the part of all stakeholders must be overcome by basing the organization on guidelines established by HRSA and CDC.
- Government officials at all levels must support employment of qualified hospital staff dedicated to

Surge Capacity Management and Patient Identification in Disaster Preparedness *(continued)*

regional preparedness that have direct access to the CEO.

- Communities need qualified full-time planners as well, with backgrounds in public health, healthcare preparedness and emergency response.
- Neutrality is key to the success of the regional organization. Hospital leaders must take the goal seriously and commit funds and staff.
- The regional group should serve as a central information hub to receive and analyze information about medical needs, medical assets, patients and staff. The group should be a joint decision-making body on local medical care delivery and alteration of standards of care.
- Hospital preparedness must be sustainable and funded accordingly because the problems aren't going away.

HRSA grants, distributed through government agencies, are sometimes used as an incentive for cooperation between rival providers. Other grants are available from The Agency for Healthcare Research and Quality (AHRQ) to find ways to augment hospital bed capacity during public health emergencies. AHRQ grants helped develop the National Hospital Available Beds for Emergencies and Disasters System (HAVBED) to collect and report bed availability data to federal, state, and local medical emergency planners and responders.

In New York City, where almost every hospital is part of a larger network, financial incentives were awarded to encourage hospitals to work with institutions outside their system. For example, additional HRSA funds went to hospitals participating in a Center for Bioterrorism Preparedness Planning (CBPP). Four such CBPPs were created to encourage planning between hospital networks and to create models for surge capacity. In Central Brooklyn, a private

hospital, a public hospital, a long-term nursing facility and a psychiatric facility serve as one of the four CBPPs.

The Unified Health Command (UHC) of New York City includes representatives from the NYC DOHMH, the GNYHA, the Health and Hospital Corporation (HHC), the NYC Office of Emergency Management and the New York State Department of Health. The UHC will coordinate and prioritize requests for resource and asset reallocation from information received via HERDS.

Coalitions or networks also exist in Seattle, San Antonio, Pittsburgh, Palm Beach, Florida, and regions in Alabama, Minnesota and Ohio. The King County Health Care Coalition in Seattle, Washington, is a voluntary coalition launched in 2005 with 23 hospital CEOs and COOs. The Palm Beach County Medical Society serves as that area's neutral coordinating entity for hospital preparedness and response. In Alabama, the Patient Transfer Center was created by Alabama's Department of Public Health (ADPH), the Alabama Hospital Association, and the University of South Alabama's College of Medicine to manage surge capacity and regional medical assets during emergencies. In southwest Ohio, HRSA funds and regional hospital preparedness activities are coordinated by the Greater Cincinnati Health Council. The San Antonio STRAC is implementing Web EOC, a Web-based Crisis Information Management System (CIMS) to integrate hospitals, EMS, and other healthcare providers. In Minnesota, one regional hospital is designated as the Regional Hospital Resource Center (RHRC) to administer the HRSA grant for all hospitals in the region, coordinate regional hospital preparedness activities, and serve as an information clearinghouse for hospitals.

Of course, the ultimate key to developing plans that work is cooperation, perhaps at a higher level than ever before, considering the times in which we live.