

When Hospitals Respond to Disasters

Emergency Communications Networks

Samuel A. Warren
Duane Mariotti
Anne Newcombe
Chris Martin
Michael K. Copass

Organized communication over distances and to appropriate entities is crucial in responding to an overwhelming emergency in a community. This is not easy when power is lost, telephone circuits are disrupted or overwhelmed, or other hardware problems arise. An emergency is not the time



Dr. Michael Copass in the Harborview Emergency Department radio room.

for physicians and nurses to learn their emergency communications system and back-up communication plan.

From a hospital's perspective, a disaster is an emergency that is locally overwhelming. The additional resources required to provide necessary medical care might come from neighboring hospitals or from other agencies farther away. The hospital designated as Disaster Medical Hospital Control (DMHC) is charged with providing communication and dissemination of field information to involved hospitals and agencies in the brief but important period between the onset of a disaster and when Emergency Operations Centers (EOC) reach full operation. DMHC facilities are identified prior to a crisis (typically on a regional basis) and have equipment installed and staff trained to manage the event. In practice, the activities of Disaster Medical Hospital Control during these first hours often determine how well-coordinated the rest of the response will be.

Emergency communications—no small task

A hospital serving as Disaster Medical Hospital Control in the early hours of a disaster may be operating several lines of communication at once: EMS field triage and allocation of patients, notification to hospitals receiving patients, aero-evacuation control, and communications with agencies with wider scopes of influence, such as the

regional level one Trauma Center, public health authorities, public safety dispatch centers, and the county and state EOCs. In the case of a disaster, upon notification by EMS or the local hospital, the DMHC's role includes initiating contact with the appropriate county EOC and, when necessary, the state Emergency Operations Center (*see box on next page*) to give early notice of any disaster with a potential to overwhelm the hospitals in the region, especially when a disaster has potential to spread geographically.

Harborview Medical Center

Over the past decade, Harborview Medical Center, in Seattle, Washington, has served as Disaster Medical Hospital Control for a number of events, including the 1995 Auburn Boeing plant chemical cloud (150 patients transported), 1996 Christmas winter storm (50 patients transported), 1998 Thanksgiving Day Aurora Bridge metro bus accident (42 patients transported), 1999 power failure at Valley Medical Center (180 patients relocated), and 1999 World Trade Organization protests (75 patients transported).

The heart of the Harborview emergency communication network is the Emergency Department Radio Room, which holds 11 phones, 12 radios, 3 computers, and 2 fax machines. Each of those phones and radios has its own dedicated purpose in the array of communications with Medic One medics, fire, police, aeromedical response, public events staff, public health personnel, and King County EOC. The radios cover almost every frequency from 30 to 900 megahertz. Four separate amateur radios are also installed. The goal is to ensure a redundancy in communications methods and technology.

Hospital emergency communications

When evaluating their hospital's emergency communication plan, hospital staff should consider three basic planning points:

1. Who are you going to call in the case of a locally overwhelming event? This does not have to be a government-declared disaster. It can be a water main break in the basement.
2. Who are you going to call at 2 a.m.?
3. How do you contact Disaster Medical Hospital Control if the phone lines are down?

Who are you going to call?

Staff in local hospitals should know which hospital serves as Disaster Medical Hospital Control for the region and call this hospital first. (If calling DMHC's Emergency

Department, ask for the charge nurse.) This important phone call helps ensure the shift in responsibility for communication and dissemination of field information to the DMHC from the hospital affected by the disaster. Drills of such communications scenarios between prehospital EMS systems, local hospitals, and Disaster Medical Hospital Control help establish orderly communications during a real event.

The axiom “call early, call often” applies here. The disaster literature has many examples in which medical backup support was delayed by local overconfidence that the situation was under control.

Who are you going to call at 2 a.m.?

The local hospital should be able to reach their region’s DMHC 24 hours a day, seven days a week. Of course, local emergency departments should keep a list of all key emergency phone numbers posted and updated regularly.

How do you contact Disaster Medical Hospital Control if the phones are down?

A little local planning can organize back-up radio or satellite phone systems to contact the region’s Disaster Medical Hospital Control or at least make contact with the next town over.

In the 1960s most hospitals had Hospital Emergency and Administrative Radio (HEAR) systems installed. HEAR systems remain the backbone of many local EMS communications systems but, in general, they no longer have the capacity to communicate hospital to hospital. If the local hospital has a HEAR system, hospital staff should seek out those familiar with it and figure out if it can be used to reach the next town’s hospital or the regional DMHC. If other radio systems are in place, hospital staff should get to know their capabilities and limitations. Related information should be posted in the Emergency Department along with the names of local radio experts for each system and their emergency contact information, including their home addresses and phone numbers. A list of all amateur radio operators in the community can be helpful. They have technical skill and enjoy talking on the radio, which frees up clinical staff to provide bedside care during an MCI or disaster response.

Some hospitals, especially those designated as DMHC, have expanded their radio communications to surrounding regions. In King County, for example, a public safety 800 MHz trunked radio system (a radio standard used by police, ambulances, and law enforcement) was approved by voters in 1992, with levy collected in 1993, 1994, and 1995 to total \$57 million. The “800 system” provides emergency radio communications to all police, fire, EMS, public school districts, and hospitals in the county. In the mid-1990s, region-wide talkgroup (a group calling mode) strategies extended King County’s inter-agency communication to much of the emergency response network of Pierce County to the south and Snohomish County to the north. Within this three-county region, hospital-to-hospital communication is ensured via “Hospital Common” talkgroups monitored around the clock by hospital radios having no other functions, channels, or talkgroups. Every

EOC Involvement, in a Disaster

Washington State Emergency Operations Center (EOC) maintains the Incident Command System structure. It is run by the Washington Military Department, Emergency Management Division, around the clock, year-round. Located at Camp Murray, near Tacoma, the state EOC is no small operation. It has a two-story 28,000-square-foot building with a 3600-square-foot operations room that comes alive in the event of a disaster, accommodating some 310 individual responder roles. State employees, designated relief organizations, and professional groups have reserved seating under the three 10 x 12 foot multimedia screens. Phone, radio, satellite, and Internet feeds are piped in, backed up by shortwave radio. A policy room overlooks the EOC operations room. If power goes down at the EOC, it can fall back on three 500 kilowatt emergency power generators each with its own dedicated fuel supply. The EOC also has additional water and food stores.

hospital in the region, along with designated partners such as Public Health-Seattle & King County, Puget Sound Blood Center, and the Washington State Poison Center, monitors one channel at all times, something like a huge intercom. When an announcement is made, everyone hears it and is able to plan and act accordingly.

Coordinated regional radio systems don’t have to be limited to the most populated area of the state. Homeland Security funding has allowed many rural county emergency management agencies to purchase radio equipment previously outside their limited budgets.

A satellite phone is another good backup system. Washington State EOC has a Mitsubishi ST-121 satellite terminal and several transportable terminals positioned strategically around the state. More details about this satellite phone system, including how to request local support from one of the transportable terminals, can be found on the state EOC’s Web site (emd.wa.gov/site-general/end-of-era/eoc-idx.htm). As part of recent federal funding the Washington State Department of Health has provided most hospitals with dedicated satellite phones installed in areas so that they are answered around the clock.

Regardless of the communication systems and plans in place, they will be effective in an emergency only if all staff know how to use them. As Harborview’s disaster preparedness motto says, “Practice how you play.” ■

Authors

Samuel A. Warren, MD, is associate director of Emergency Services; Duane Mariotti, BSEE, is director of Clinical Engineering; Anne Newcombe, RGN, is clinical nurse manager of Emergency Services; Chris Martin, BSN, is administrative director of Emergency Services; and Michael Copass, MD, is medical director of Emergency Services. All are with Harborview Medical Center.

Resources

Briggs SM and Brinsfield KH (eds). *Advanced Disaster Medical Response: Manual for Providers*. Harvard Medical International Trauma and Disaster Institute, Boston. 2003. Harvard Medical International, Inc.

Central Region Trauma Council Communication Plan. Prehospital Committee, Dr. M. Copass, Chair. Interoperability/Mutual Aid Communications Plan and 800 Talkgroup Standards. Approved May, 2005.