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Drills Aim for Stress – and Solutions

Hopkins med students confer over cardboard "patients" during a pandemic flu drill last year.

When Hopkins Hospital's emergency response team conducted its first hazardous material drill using new decontamination tents and full-body protective suits, the exercise hit some snags.

Instead of erecting the tents within the drill plan's allotted 20 minutes, the team didn't get them up for 40 minutes—partly because not enough hospital facilities staff were there to help. And the medical staff stifled inside their head-to-toe protective suits on what happened to be a warm day. They couldn't stand being encased in the gear for more than 15 or 20 minutes.

The snafus didn't bother CEPAR's drill-planners. Problems are precisely what they want drills to reveal. The most important part of a drill is what comes afterward: the evaluation of how it went.

"If you ever do a drill and sit back and say, That was good, that was easy, then you've planned and done the wrong drill," says Dianne Whyne, director of operations for CEPAR and preparedness coordinator for the Department of Emergency Medicine. "Drills are designed to stress the system."

The difficulties encountered with the decontamination tents were solved by increasing the number of facilities personnel available to erect them and practicing the process more often. The stifling protective-gear problem was countered by purchasing cooling vests for the medical personnel to wear inside the suits and rotating those on the line more frequently, says James Scheu-

(continued on page 2)

FIRST HOPKINS-WIDE PANDEMIC DRILL

The scenario: A previously unknown flu virus is identified in the Far East and quickly spreads by human-to-human contact around the globe. Initial U.S. cases appear in California and sweep across the country. By the 12th week of the pandemic, an estimated 71,000 people are dead in Maryland, 238,000 are hospitalized and 1.6 million outpatient visits swamp the state's facilities.

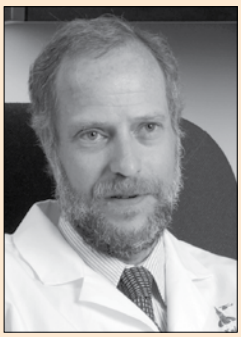
Although The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center and Howard County General Hospital all have detailed plans for responding to a pandemic and periodically have drills to test them, the impact of a pandemic could have a catastrophic effect on every Hopkins entity, from Homewood to Peabody; from the Applied Physics Laboratory to the School for Advanced International Studies in Washington, D.C.

How all of Hopkins might respond to a pandemic was tested dramatically during a statewide drill conducted last summer by the Maryland Department of Health and Mental Hygiene's Office of Preparedness and Response. The three-day exercise was the first in which a large segment of the health system—Hopkins Hospital, Bayview, Howard County General and Johns Hopkins Home Care—participated simultaneously in a drill along with other university entities such as the Office of Student Affairs, the School of Nursing and the Applied Physics Laboratory. Personnel from Johns Hopkins Medicine's and the university's media relations and public affairs staff took part as well. It also was the first time all of them interacted at the same time with city and state agencies in coordinating a response.

"The words *disaster drill* often are greeted with apathy and groans," says Dianne Whyne, CEPAR's director of operations and preparedness coordinator for Hopkins Hospital's Department of Emergency Medicine. "Not this time. All of the institutions' disaster planners were enthusiastic and eager to test their pandemic influenza plans."

(continued on page 2)

INSIDE THIS ISSUE: 2 ETHICS OF DISASTER PLANNING AND RESPONSE 3 GETTING READY FOR THE WORST 4 BATTLING BIOCHEMICAL THREATS



ETHICS OF DISASTER PLANNING AND RESPONSE

Disaster planning and response present several ethical dilemmas. Much attention is now being paid to issues surrounding the distribution of scarce resources, such as antidotes, prophylaxis, hospital beds, etc., when there are insufficient supplies. Health care professionals' time is rarely considered as a scarce resource. However, in many catastrophic scenarios, the time of health care professionals routinely enjoyed by individual patients cannot be maintained, and must either be rationed or differentially applied.

Medical care leaders are just beginning to explore and define what these altered standards of care may be in times of catastrophic stress to the health system.

There also are ethical concerns related to the obligations of institutions to employees, trainees and students. Institutions may have to make decisions regarding which employees merit prophylaxis if supplies are insufficient. Questions of institutional obligations or consideration of "essential" employees' families and their well-being may prove important in successful maintenance of the workforce and the institution's operations. However, there is a reverse ethical obligation of employees who are designated to show up to work during emergencies, including when the hazard could present some level of personal threat despite precautions being available.

It is best for health care institutions to think about these problems long before they occur, as it will prove difficult to make sound ethical and business decisions in the midst of a major crisis.

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Drills Aim for Stress – and Solutions

(continued from page 1)

len, executive director of CEPAR.

"No matter how much you plan and how much you try to assess what the demands on a system are going to be, until you test those plans with people, you don't really know how that flow plays out in real life," says Scheulen, who also is chief administrative officer of the Department of Emergency Medicine.

The Joint Commission requires every hospital to conduct at least two drills a year to test its emergency management. One drill must gauge the effectiveness of the hospital's links to such local agencies as the police and fire departments. The other must test the hospital's capacity to handle a sudden influx of patients, represented in the drill by volunteers who sometimes even wear make-up to simulate wounds.

Devising drill scenarios involves a so-called hazard vulnerability analysis to choose the most likely emergencies that a hospital may have to handle. (In this region, earthquakes rate low; airplane crashes or bridge collapses rate high.) The scenarios can be self-created or adaptations of 15 crisis possibilities conjured up by the Department of Homeland Security, which include a flu pandemic, toxic industrial chemical spill, chlorine tank explosion, food contamination, terrorist bombing or major hurricane.

Planners also determine which aspect of emergency response will be the drill's evaluation focus, such as the evacuation of buildings, handling a patient surge, or the effectiveness of communication between the hospital's departments and divisions.

Evaluating a drill also involves specific guidelines or checklists, one of which was created by Hopkins personnel under a grant provided by the federal Agency for Healthcare Research and Quality. It is available on disk to hospitals nationwide.The checklist helps planners assess the performance of a hospital's emergency response command structure, its decontamination unit, and its triage and treatment of patients.

The evaluation goes through three stages, says Whyne. The first, known as a "hot wash," is an immediate recap with the medical personnel who responded to the scenario. Drill planners ask if they encountered any particular problems, such as an inadequate supply of stretchers or wheelchairs. The second stage is a review of the evaluation checklists by non-participating observers who watched the drill unfold. The final stage is a debriefing to get planners' overall assessment of the drill's success or shortcomings. The goal of the drills and evaluations is constant improvement.

Hopkins Hospital, Johns Hopkins Bayview Medical Center and Howard County General Hospital each conduct more drills than the Joint Commission mandates. At Hopkins, each department also must conduct at least one business-continuity plan exercise annually, says Howard Gwon, director of the Office of Emergency Management for both Hopkins Hospital and the school of medicine.

Robert Marshall, administrator in the Department of Emergency Medicine at Bayview, believes that however valuable drills may be, responders learn even more from actual emergencies. For example, he says, a sudden, complete water outage across the Bayview campus several years ago taught the hospital "a lot about our need for water and changed many of our procedures."

"We recognize—as does everyone else—that doing a drill is difficult and inconvenient," says Scheulen. "But it has been shown over and over again that if people know how to react and where to report and generally what to do if there's an event, then the response is far better than if you have people stumbling all over each other." ■

See a story about a CEPAR–assisted drill in January at Anadolu Medical Center, a Johns Hopkins International affiliate near Istanbul, Turkey: hopkins-cepar.org/news_interest

First Hopkins-Wide Pandemic Drill

(continued from page 1)

CEPAR met its key objectives by establishing an active Emergency Operations Center that ran for 16 hours over the two-day drill period, coordinating the sharing of information and resources between all of Johns Hopkins and the city and state disaster agencies.

Following the drill, about 40 disaster planners from around Hopkins met for three hours to discuss the institution's response and identified some procedural gaps that need to be addressed. ■

Getting Ready for the Worst

If pandemic flu were to besiege Maryland, the intensive care unit at Johns Hopkins Bayview Medical Center might be swamped with more than twice the number of patients it's capable of handling. Demand for ventilators could be double what the hospital possesses.

At Howard County General Hospital, the situation could even be worse. Its ICU might be inundated with three times more patients than it can hold and ventilator demand could be five times its capacity.

How the health system's hospitals could share resources and how ethical questions must be addressed are just a few of the complex, critical issues that CEPAR's Pandemic Influenza Steering Committee has been tackling during several years of study and deliberations. Now, among the committee's guidelines, is that a Hopkins enterprise-wide Pandemic Influenza Ethics Committee will make the tough, potentially controversial decisions regarding allocation of limited resources, including hospital beds, ventilators, antiviral medications and vaccines.

PHOTO COURTESY OF THE NATIONAL MUSEUM OF HEALTH AND MEDICINE.

During the 1918-1919 influenza epidemic, afflicted soldiers were treated in mammoth wards.

A comprehensive overview of the committee's plan now is available on the Hopkins Medicine intranet site at: http://www.insidehopkinsmedicine.org/cepar/recovery_plan/recoveryplan.html.

Representatives from every segment of the Hopkins enterprise were recruited for the 64-member committee, which was divided into seven subgroups that focused on specific concerns, such as how to explain what the avian flu is and describe ways a potential pandemic may occur, as well as the thorny medical ethics issues a pandemic inevitably will raise. "We wanted to arrive at a reasoned balance between safety, health considerations and the viability of the ongoing education, research and health care missions of Hopkins," says Gabe Kelen, head of emergency medicine and CEPAR.

The committee's plan required several years to prepare, in part because the subgroups wished to consult with the Baltimore City Health Department, the Maryland Department of Health and Mental Hygiene, vendors and suppliers of health care materials, and other health care facilities.

The planners also reviewed and incorporated guidelines and recommendations prepared by the Department of Homeland Security, the U.S. Department of Health and Human Services, the Centers for Disease Control (CDC), and the Occupational Safety and Health Administration (OSHA).

"Although the plan explicitly refers to recommendations from such international agencies as the World Health Organization, as well as U.S. entities such as the CDC and OSHA, it is intentionally Hopkins-centric in its perspective and approaches," Kelen says. "The rote adoption of generic policies and procedures would produce inappropriate and inappropriately timed changes to our operations."

Among the guidelines the plan establishes for Hopkins health system affiliates are the need to create the post of coordinator to control access to all of a facility's hospital beds; to determine what level of patient surge would trigger the cancellation of elective surgeries and other medical procedures; to plan for a second wave of flu admissions; and to establish a system to manage an increase in morgue capacity.

Using historical data, the CEPAR committee estimates that a moderate flu pandemic, such as occurred in 1957, would result in 16,000 hospitalizations statewide and a possible 3,900 deaths. A severe pandemic, such as the 1918-1919 flu, might require 183,400 hospitalizations and result in 35,000 deaths. During a severe pandemic's initial eight-week period, combined admissions at Hopkins Hospital, Bayview and Howard County General could soar to more than 4,200.

Kelen believes that the CEPAR pandemic plan may be the only comprehensive, multilayer one of its kind. "This is not a hospital plan, but a broad overview that covers an entire major university composed of multiple schools, centers and programs, plus an entire health system comprising three hospitals, multiple outpatient clinics and other health care delivery operations."

"The ultimate result is a collection of inter-related plans that, together, represent a comprehensive approach to pandemic flu preparedness and response," Kelen explains. ■

Battling Biochemical Threats

"What happens in Vegas stays in Vegas" long has been the catchy slogan of that entertainment mecca in Nevada. Yet when traces of ricin, a deadly poison, were found in a Las Vegas hotel room last year, along with a man in a coma who had an "anarchist's cookbook" containing instructions on how to make it, emergency response personnel across the country knew that what had happened in Vegas could easily happen where they live, too.

Ricin—long viewed as a possible biochemical weapon—is easy to make and extraordinarily lethal. Just a pinhead-size dose, either inhaled or injected, can kill an adult. Should possible victims of ricin—or any biochemical weapon—show up at The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center or Howard County General Hospital, plans are in place to respond quickly, says Gabe Kelen, head of CEPAR and the Department of Emergency Medicine.

The initial response at all three hospitals essentially would be the same. For example, if the attending physician or head nurse in charge of Hopkins Hospital's Emergency Department recognizes that a patient's symptoms could be caused by a chemical agent, the hospital's "Code Yellow Chemical" plan is activated, says Howard Gwon, director of the Office of Emergency Management for both the hospital and school of medicine.

The physician or charge nurse first contacts the hospital's telecommunications operators and the main ED communication system, which then alerts the designated disaster team member on call for such events to take charge. The rest of the hospital will be notified via its speaker system and at Hopkins also through the Web-based Notifind emergency communications system. Alerts via cell phones, pagers, e-mail, office and home telephones and faxes would be simultaneously sent out. The same procedure would be followed for an influx of patients due to radiation exposure or mass trauma, Gwon adds.

If patients have contaminated the main ED, responding staff must don personal protective equipment, such as masks and other protective apparel, before entering the ED. Depending on the number of patients involved, the facilities and patient safety staff may erect decontamination tents outside the hospital and also put on protective gear. Laboratory tests would be ordered to identify the chemical if the physicians are unable to do so by observing the patients. Incident command centers in both the ED and the hospital will be opened to serve as communication hubs.

At Howard County General Hospital, both an internal decontamination room with two showers and external decontamination tents would be used, says Kenneth Shaw, the hospital's emergency response coordinator. Technical support also would be provided by Howard County's fire and rescue department.

Once the patients have been decontaminated, appropriate treatment can begin. ■

When Food Isn't Safe to Eat

Last summer, an outbreak of salmonella—initially linked to Mexican-grown tomatoes, then to jalapeño and serrano peppers—sickened more than 1,400 U.S. consumers. In January, another salmonella outbreak was linked to peanut butter.

These and similar events have prompted the federal government to view the nation's food supply as increasingly vulnerable to either careless contamination or terrorist attack and to step up the scope of its safety monitoring.

Until recently, the U.S. Food and Drug Administration, which is responsible for inspecting both domestic and imported food, only sent inspectors to foreign countries periodically—and managed to inspect less than 1 percent of food destined for the United States. Last summer, with an initiative dubbed "Beyond Our Borders," the FDA began establishing overseas offices to more closely monitor products being exported to this country.

Particularly interested in creating a permanent presence for itself in China—where numerous exports, including seafood, have recently failed to meet safety standards—the FDA has opened offices in Beijing, Shanghai

and Guangzhou. It also has an office in Brussels, Belgium, that will oversee a regulatory collaboration with the European Commission on food, drugs and medical devices.

Now looking south as well, the FDA opened its first Latin American office in San José, Costa Rica, in January and plans to extend its presence to Mexico and South America later this year. The nations of Central America, along with Panama and the Dominican Republic, are the third-largest U.S. export market in Latin America.

The FDA would also like to place permanent inspectors in embassy and consulate offices in India and the Middle East.

Another federal agency involved in safeguarding U.S. food is the Department of Homeland Security's National Center for Food Protection and Defense. Seeing a potential for terrorists to contaminate fruits and vegetables being imported from Mexico, it has given a $263,000 grant to Arizona State University researchers to study the vast produce-exporting operation in Nogales, which handles almost half the produce Mexico ships to the United States. ■