



# Management®

*The monthly update on Emergency Department Management*

Vol. 14, No. 2

## Inside

■ **Joining forces:** Group seeks to improve disaster planning . . . 15

■ **Joint Commission standards:** The questions your staff *must* be ready to answer . . . . . 16

■ **Handheld computers:** You'll be amazed at what they can do for you . . . . . 17

■ **Medicare update:** Reimbursement for observation. . . . . 19

■ **Study results released:** ED diversion rates . . . . . 20

■ **EMTALA Q&A:** Transfers from rural hospitals; sexual assault victims; PAS . . . . . 21

■ **Journal Review:** Acute care units . . . . . 22

**Enclosed in this issue:**

- Excerpt: American Hospital Association Chemical and Bioterrorism Preparedness Checklist
- Bioterrorism Watch

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## Joint Commission zeroes in on disaster plans: Is yours up to par?

As if the events of Sept. 11 weren't enough to convince you to fine-tune your disaster plan, there is now another compelling reason. A new report issued by the Oakbrook Terrace, IL-based Joint Commission on Accreditation of Healthcare Organizations warns that surveyors will be paying "special attention" to your disaster plan.

You also will need to comply with new Environment of Care standards that require a hazard vulnerability analysis, working with community groups, and educating staff. The new standards are EC.1.4: Planning for emergency management, EC.2.4: Implementing the emergency management plan, and EC.2.9: Conducting emergency drills.

"The Joint Commission wants to see disaster plans that address all possible hazards, including terrorist attacks," says **Mary Schmidt Roth, RN, FNP, CCRN**, an ED nurse practitioner at Jamaica (NY) Hospital Center.

"This is new territory for most institutions, and frankly, for America," Roth says. (See story on one group's efforts to improve disaster planning, p. 15.)

Here are ways to comply with the new Joint Commission standards for disaster planning:

• **Ensure that staff can answer surveyors' questions.**

Your staff must be prepared to answer direct questions from surveyors, stresses **Kathryn Perlman, MS, RN**, clinical specialist for the ED at Presbyterian Hospital of Dallas. (See checklist of questions staff must be prepared to answer, p. 16.) For example: "Does the unit participate in emergency

### Executive Summary

The Joint Commission says that surveyors are paying close attention to disaster planning.

- You'll need to demonstrate compliance with many new standards, including performing a hazard vulnerability analysis and working with community organizations.
- All ED staff members must be prepared to answer questions about their role in disaster planning.
- Include individuals from community organizations when developing your disaster plan and holding drills.

preparedness drills regularly? What was your role in the most recent drill?"

Perlman gives the following as an example of an appropriate response: "We have disaster drills twice a year. Our performance during the drill is evaluated afterward. I was responsible for directing family members to the holding area."

• **Address large-scale decontamination.**

You can't get away with telling surveyors you'll call the fire department to decontaminate patients, says **Bettina Stopford**, RN, chair of the national Weapons of Mass Destruction (WMD) work group for the Des Plaines, IL-based Emergency Nurses Association and chief nurse for the Denver-based U.S. Public Health Service's Central U.S. National Medical Response Team for WMD. "Surveyors will ask 'What you will do if the fire department can't come?'" Stopford warns.

She notes that before the terrorist attacks, surveyors had vague expectations for decontamination.

"Usually if you could show them you had a shower room, you were OK," says Stopford. "But now they are looking for something more — they want to know how you would address a large-scale casualty event."

At a bare minimum, show that you can provide patients with an area where they can undress and get rid of their contaminated clothing, she says.

Revamping the decontamination process was a key priority at East Jefferson General Hospital in Metairie, LA, according to **Trudy A. Meehan**, RN, CHE, administrative director of its ED.

"Upon notification of a disaster, security will lock down the hospital, controlling all access to the ED," she says. "The ED ramps will be blocked so patients arriving by private vehicle cannot enter without going through the staging areas."

The ED uses carts that contain everything needed to set up a triage station and decontamination area, says Meehan. "There will be a separate location to decontaminate patients arriving by ambulance," she says. "This entrance will also be used for those triaged as critical or acute who arrive by private vehicle once they have been decontaminated."

The goal is that no patient crosses the ED threshold without decontamination, says Meehan.

A color-coded system is used for triage, using plastic arm bands (red for critical, yellow for acute, and green

for nonurgent). "A change in the patient's condition is a matter of replacing the arm band with one of the appropriate color," says Meehan.

Paper tags were used previously, but patients could have lost them if they became wet during decontamination, Meehan explains.

The ED has requested approximately \$100,000 to obtain additional personal protective equipment and three decontamination tents: one for male patients, one for female patients, and one for emergency medical services (EMS). Rollers allow patients to remain on boards during the decontamination process. Each can handle six patients at a time.

"We need to be ready for larger volumes needing prompt decontamination, and that can only be done with more capability," says Meehan.

• **Integrate with communitywide emergency response agencies.**

Stopford suggests inviting representatives from the following four organizations to your ED during tabletop drills: the office of emergency management, police

## Resources

The Joint Commission on Accreditation of Healthcare Organizations has issued a special report advising health care organizations on ways to prepare for terrorists attacks involving nuclear, biological, or chemical incidents. It also contains lessons learned from hospitals in New York City and Washington, DC, following the Sept. 11 attacks. A copy of the report is available free of charge at [www.jcrinc.com](http://www.jcrinc.com). (Click on "Publications," "Joint Commission Perspectives," "Past Issues," and "December 2001, Volume 21, Number 12 — Special Free Issue.")

The revised language on emergency management for standards EC.1.4 and EC.2.9.1 is included in the Revised Environment of Care Standards for the *Comprehensive Accreditation Manual for Hospitals (CAMH)*.

To order, contact:

- **Joint Commission on Accreditation of Healthcare Organizations**, PO Box 75751, Chicago, IL 60675. Telephone: (630) 792-5800, between 8 a.m. and 5 p.m. Central time on weekdays.

## COMING IN FUTURE MONTHS

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and fire departments, and EMS.

“Those four groups can tell you where the bugs are and whether your plan is realistic, before you bring in your whole staff in,” she says.

Stopford notes that the tabletop exercise won't satisfy the Joint Commission's requirements for two annual disaster drills. “They both have to be live drills involving your staff. For one of those drills, they will potentially accept ‘paper’ patients instead of ‘real’ patients,” she explains. “However, the paper patients must go through the entire system, not just the ED.”

- **Perform a hazard vulnerability analysis.**

The new standards require you to analyze the areas where you are most vulnerable, says Stopford. “You also have to address how you will continue to provide medical care throughout the disaster, for each of these scenarios you identify,” she says.

Your analysis must have a terrorism component, says Stopford. “Many hospitals say they are not vulnerable to this, but this absolutely needs to be addressed,” she adds. “You need to have a plan for personal protective equipment and decontamination ahead of time.”

- **Assess the amount of pharmaceuticals you have available.**

The new standards require that you have enough pharmaceuticals to treat 100 victims and your staff for at least three days, says Stopford. “But people in larger cities probably need to have more. Surveyors realize

that you can't have unlimited drugs in a nonrotating stock, but you have to address this in your plan.”

You also should factor in treatment for the immediate family of staff members, says Stopford. “Your staff will not come to work if they are worried about their family being infected,” she explains.

For bulk atropine needed for chemical agents, Stopford advises obtaining the reconstitution formula that the Department of Health and Human Services uses. “This is very inexpensive but you have to prepare it quite carefully,” she says. “This is something you should already have on hand, because if a nerve agent casualty comes in, you can't wait.” (See excerpt of **American Hospital Association checklist for equipment and supplies/training and personnel, inserted in this issue.**)

- **Establish alternative care sites.**

You'll need to select alternative care sites to care for patients if needed, says **Gregory L. Terrell, MS, CSP, ARN**, director of risk management at Children's Hospital Medical Center of Dallas.

When doing this, consider how you'll handle medical records, patient tracking, communication between the ED and the site, and transportation of patients and equipment to the alternative care site, he adds.

- **Have a plan to isolate patients if needed.**

Meehan's facility is going to use an unused wing of the hospital as an isolation ward if a bioterrorism attack occurs.

“By re-routing the airflow in this area and keeping it isolated from the general public, we hope to keep further contamination from invading the facility,” she says. “It is not unreasonable to assume, for the purposes of disaster planning, that an entire hospital could be quarantined.” ■

## Sources

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## New group targets disaster planning

Would you like to improve your disaster plan and obtain needed equipment? A new coalition was formed to help you do just that, with the goal of making sure that all communities are ready for nuclear, biological, and chemical terrorism and other disasters.

The Partnership for Community Safety: Strengthening America's Readiness is an alliance of national organizations including the Dallas-based American College of Emergency Physicians (ACEP). The group plans to advocate for better preparation for EDs in five key areas: communications infrastructure, community-based planning, surge capacity, disease

## Be ready to answer these questions

Surveyors will want to see evidence that clinical staff members were involved in implementing your disaster plan, emphasizes **Gregory L. Terrell, MS, CSP, ARN**, director of risk management at Children's Medical Center of Dallas. He says all ED staff must be able to describe or demonstrate the following:

- their roles and responsibilities for emergency preparedness;
- their roles and past participation in organization wide drills;
- the backup communication system used during disasters and emergencies;
- how to obtain supplies and equipment during disasters or emergencies.

Here are some specific questions staff may be asked, says Terrell:

- What education have you received about recognizing hazards identified in the emergency management plan?
- What type of orientation, training, and education have you received about your roles and responsibilities in the emergency management plan? What types of emergencies were addressed in the education?
- Has a command center been identified to coordinate community response?
- Does the unit participate in emergency preparedness drills regularly? What was your role in

the most recent drill?

Here are some questions that might be asked of nursing leadership:

- How is clinical leadership involved in developing the emergency management plan, including the command structure and its specific roles? Who from the clinical staff was involved in its development?
- What were the clinical staff's contributions to the development of the emergency management plan, including command structure? Who from the clinical staff is included in the command structure?
- How has the clinical staff planned to rapidly expand the number of physicians and other licensed independent practitioners (LIPs) in the event of a disaster? Has clinical leadership considered how it will quickly credential volunteer physicians and other LIPs?
- How are clinical staff members trained in emergency management?
- What education is provided to clinical staff to recognize symptoms of and/or manage hazards or treat conditions identified in the emergency management plan? When was the training conducted? Who attended?
- What type of orientation and education is provided to clinical staff about their roles and responsibilities in the plan? ■

surveillance and reporting, and training.

"This will translate into more resources for hospital EDs, especially for critical education and training about biologic agents. It will also improve the capacity for sudden increases in patient volume, whether from a flu epidemic or from an act of terrorism," says **Michael L. Carius, MD, FACEP**, current president of ACEP and chairman of the department of emergency medicine at Norwalk (CT) Hospital.

Carius emphasizes that efforts must be coordinated among all the organizations involved in emergency response, at the national, state, and local levels.

"The new challenges of bioterrorism will require new approaches," he says. Although most EDs have policies to respond to hazardous materials incidents, these are inadequate for dealing with nearly every biological agent, he adds.

Carius emphasizes that EDs will be the nation's first responders in a bioterrorism attack, so training staff to quickly recognize and treat biologic agents is essential. "ED managers must provide the leadership in their hospitals for retooling hospital disaster plans," he adds.

Here are key goals of the group:

• **Encouraging EDs to collaborate with other first responders.**

Time is of the essence, especially when dealing with contagious agents such as smallpox, says Carius.

"In our current health care system, which is fragmented and where information is not shared, the challenge to mobilize an effective, large-scale public health response to prevent a public health catastrophe is potentially insurmountable," he says.

Carius notes that EDs around the country already have played a central role in strengthening their communities' response plans to bioterrorism. He gives the example of Harbor UCLA Medical Center in Torrance, CA, where ED physicians have conducted drills with local public health, fire, and police officials based on a mass casualty incident caused by terrorism. Such drills help identify problems in the system and improve coordination, communication, and response time among all first responders, he says.

"This type of community planning needs to be done nationwide," Carius asserts. To achieve this goal, the

## Sources

For more information on the Partnership for Community Safety, contact:

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group is working with first responders to terrorism in several communities. "ACEP would like to see disaster plans in every local community being reviewed, strengthened, and tested in this way," he says.

ED managers should take leadership roles in their communities and hospitals to coordinate collaboration among all first responders, argues Carius. "Work to develop a comprehensive plan connecting the dots between the various roles of the medical, safety, and health responders during a disaster," he says.

- **Spotlighting model programs and best practices.**

EDs at the grassroots level must provide others with "best practices" that have proven effective in their communities, argues Carius.

"Many communities across the country have taken the initiative to be prepared," he says. "Sharing this knowledge will be instrumental in preparing the nation for terrorist attacks." The group will distribute model programs that effectively address acts of terrorism. "This will be helpful to communities as they update their disaster plans to address the new challenges of bioterrorism," says Carius.

He urges ED managers to share their particular knowledge and expertise in disaster medicine. "The partnership will be looking to these medical experts to provide leadership in areas of research and training," he says. ■

## Nine ways to use handheld computers

When a 40-year-old man came to the ED at Tallahassee (FL) Memorial Healthcare in ventricular tachycardia, he was stabilized with anti-arrhythmics. "His wife told me he was on a chemotherapy drug for colon cancer," recalls **Terry Schneider**, RN, BSN, CEN, the ED nurse who cared for the patient.

Immediately, he looked the drug up on a handheld computer and discovered that the drug was associated with cases of sudden death. "We, of course, discontinued

that medication, and in a day or so, he was ready to go home," he says. "The patient's oncologist didn't even know that the drug he prescribed could cause ventricular tachycardia. I'd call that one a save."

Handheld computers will be to emergency medicine what cellular phones have been to the telephone, predicts **Todd B. Taylor**, MD, FACEP, an ED physician at Good Samaritan and Phoenix Children's Hospitals. "For years, we have all been slaves to the computer monitor and keyboard," he says.

Now, handheld computers can give you mobility while you access information, says Taylor. "It is only a matter of time before we will all use them," he adds. "Their essential use in the ED is just around the corner."

Many ED clinical staff members are amazed at what handheld computers can do. "I keep my Handspring Visor [manufactured by Handspring of Mountain View, CA] in my scrub pocket at all times," says Schneider. "The bottom line is that this has saved lives. That's what emergency medicine is all about."

Here are nine ways to use handheld computers in the ED:

- 1. Use as portable reference texts.**

There are a variety of programs available for both the Palm (manufactured by Palm in Santa Clara, CA) and Handheld PC2000 (manufactured by Microsoft in Redmond, WA) operating systems that replace reference texts and provide tools to calculate pregnancy, anion gap, A-a gradient, and osmolar gap, says Taylor. **(For information on two programs, see resource box, p. 18.)**

Schneider's handheld computer contains the complete advanced cardiac life support protocols and an ED database called PEPID RN (manufactured by Pepid in Evanston, IL). "I also use trauma and toxicology data from other sources," he says. (These products can be found at [healthypalmpilot.com](http://healthypalmpilot.com), [handheldmed.com](http://handheldmed.com), and [palmrn.com](http://palmrn.com).)

- 2. Have rapid access to contact information.**

Handheld computers can give you instant access to

## Executive Summary

Handheld computers can be used to make calculations, share articles with colleagues, store contact information, and even save lives.

- Translation software can facilitate communication with non-English-speaking patients.
- You can find out the cost of medications with drug reference software.
- Make the ED schedules accessible, so that staff can volunteer to fill in gaps.

## Sources

For more information about handheld computers, contact:

- **Terry Schneider**, RN, BSN, CEN, Tallahassee Memorial Healthcare, 1300 Miccosukee Road, Tallahassee, FL 32308. Telephone: (850) 431-5411. E-mail: schneid@supernet.net.
- **Todd B. Taylor**, MD, FACEP, 1323 E. El Parqué Drive, Tempe, AZ 85282-2649. Telephone: (480) 731-4665. E-mail: tbt@compuserve.com.

contact information for colleagues and community organizations, says Schneider. “On my handheld, I have access to phone numbers for all the doctors, nursing homes, transport agencies, law enforcement agencies, universities, and hospital departments,” he reports.

Speedy access to this information can be a lifesaver, he adds. “Mostly, I remember those moments when the ED is filled with multicasualties, I’m stuck in the trauma room without enough help — and the main desk doesn’t answer the call light to call anesthesia for me,” he says.

In this hectic scenario when seconds count, the handheld computer enables Schneider to make the call himself.

New devices are now available that combine cellular phones and personal digital assistants, says Taylor. “These will help you order tests at the bedside, retrieve labs and reports, and also keep you from missing important phone calls,” he says.

### 3. Perform calculations.

Schneider uses software on her handheld to calculate arterial blood gas data, drug infusion rates, pediatric drug doses, Glasgow coma scale, fluid replacement for burn victims, and obstetrical calculations.

“I don’t have to search for the IV drug book to calculate a drip. I can look up the drug, make the calculation, set the pump, and read the patient a story from *The New York Times* without ever leaving the room,” she says.

Schneider uses an RSI, a rapid sequence intubation program developed by Spiros Konstas, available at [www.rnpalm.com](http://www.rnpalm.com), to calculate drug dosages in a hurry. “Can you imagine anything more life-saving than rapid sequence intubation in a combative, crashing patient?” he asks. “Every drug that I look up on my handheld, every contraindication found, is a potential lifesaver.”

### 4. Know the actual cost of drugs.

Schneider uses a drug reference called ePocrates (manufactured by San Carlos, CA-based ePocrates, available at [www.epocrates.com](http://www.epocrates.com)) to obtain information

about how much medications cost. “It includes current retail cost of medicines, which doctors never seem to know about,” he says.

He gives the example of Inderal 20 mg and 40 mg costing nearly the same for 30 pills. “So a patient taking Inderal 20 mg twice a day could get the 40 mg instead, cut them in half, and save half the cost,” he suggests.

### 5. Communicate with non-English-speaking patients.

Translate shareware (manufactured by DDH Software in Lake Worth, FL) enables Schneider to easily communicate with Spanish-speaking patients.

“With this software you type in a word or phrase in English and hit the Spanish button, and it converts your word into Spanish,” he says.

American Sign Language for Palm (manufactured by Singapore-based ZOOS Software) facilitates communication with hearing-impaired individuals.

### 6. Provide care from remote locations.

The EKGCard (manufactured by QRS Diagnostics, based in Plymouth, MN) can actually do a 12-lead electrocardiogram, says Schneider.

He gives the example of a person in a restaurant having an acute myocardial infarction. “You could

## Resources

Mobile Micromedex is drug, toxicology, alternative medicine, and acute care information for handheld devices. Micromedex Healthcare Series subscribers can download the system at no charge. For more information, contact:

- **Micromedex**, 6200 S. Syracuse Way, Suite 300, Greenwood Village, CO 80111-4740. Telephone: (800) 525-9083 or (303) 486-6400. Fax: (303) 486-6464. E-mail: [info@mdx.com](mailto:info@mdx.com). Web: [www.micromedex.com/products/mobilemicromedex/](http://www.micromedex.com/products/mobilemicromedex/).

The Mobile PDR is a concise version of the *Physician's Desk Reference* designed for use on a handheld computing device. It includes concise drug information, updated daily as new information becomes available, interaction checks between two or more drugs, and alerts about important changes in the drug information. Free download is available to U.S.-based physicians, nurse practitioners, and physician's assistants in full-time patient practice. For more information, contact:

- **Medical Economics Customer Service** at (888) 632-9998, Monday through Thursday, 8:30 am to 8 p.m., and Friday from 9:30 a.m. to 8 p.m., Eastern time. Web: [www.pdr.net](http://www.pdr.net).

even fax it to the ED so they can mix the Retavase [Centocor in Malvern, PA] and do a 10-minute 'door-to-drug' thrombolytic procedure," he says.

#### 7. Have easy access to digital images.

Schneider suggests having a database of color photos of various dermatological conditions downloaded from the Internet. You can store digital photos of anything using the Eyemodule camera, manufactured by Palo Alto, CA-based Blocks Products, which attaches to a Handspring Visor, he adds.

#### 8. Share information with colleagues.

Schneider uses infrared technology to share data between doctors, nurses, and drug representatives. "I often download emergency nursing articles from the Internet onto my Visor and 'beam' them to fellow ED nurses if I find it useful," he says.

#### 9. Post the staffing schedule.

An ED manager might keep the current schedule on a web server to be viewed at home or downloaded to handhelds, suggests Schneider. "This would enable staff to be aware of short shifts and fill in for some extra cash," he says. ■

## CMS says you'll get paid for observation

Has your observation unit shut its doors in response to lack of reimbursement under ambulatory payment classifications (APCs)? If so, you may want to rethink that decision. The Baltimore-based Centers for Medicare & Medicaid Services (CMS) has added a new APC code for observation services for chest pain centers in EDs.

"CMS corrected their mistake in missing this the first time around," says **Raymond D. Bahr**, MD, FACP, FACC, president of the Society of Chest Pain Centers and Providers and medical director of The Paul Dudley White Coronary Care System at St. Agnes HealthCare, both in Baltimore.

On Aug. 24, 2001, CMS released the proposed rule revising the Medicare hospital outpatient prospective payment system for 2002.

Currently, there is no separate reimbursement for observation. The costs are rolled into the payment rates for other services, says **Candace E. Shaeffer**, RN, MBA, vice president of coding/quality management for Lynx Medical Systems, a Bellevue, WA-based consulting firm specializing in coding and reimbursement for emergency medicine.

CMS now says it will create APC 0339 to provide payment for an observation stay under certain

circumstances, she explains.

According to Shaffer, the new APC code likely will not be implemented until April 1, 2002, since CMS has delayed implementation of the 2002 outpatient prospective payment system (OPPS) changes. (*For more information on this topic, see "APCs have disturbing impact on emergency observation services" in ED Management, May 2001, p. 49.*)

The new APC code was added after much controversy erupted over the lack of reimbursement, resulting in a consensus among groups including the American College of Cardiology, the American Heart Association, and the American College of Emergency Physicians.

"At an early stage, we were able to engage HCFA [Health Care Financing Administration, now CMS] administrators who wrote the previous outpatient regulation," says Bahr. "We made them aware of the medical advances which have taken place in the care of patients with acute coronary syndrome."

These include a system for chest pain evaluation in the ED including an "attack approach" for patients with acute myocardial infarction (AMI), and observation for some chest pain patients over time, Bahr explains.

This approach results in fewer AMI patients mistakenly being sent home and fewer inappropriate admissions to the hospital, with a significant reduction in health care costs, says Bahr.

CMS officials were made aware of the advances in heart attack care through the collaborative efforts of ED physicians and cardiologists, says Bahr. "To put this chest pain center approach into place in the ED, hospital administrators needed to have the proper reimbursement," he says.

There is now separate payment for patients with chest pain, congestive heart failure, and asthma who are observed in the ED. "This will allow EDs to operate chest pain centers with observation services without a financial loss," says Bahr. "In turn, that will allow CEOs and COOs to provide a necessary

### Sources

For more information on getting paid for observation services, contact:

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## Resources

The complete text of *Medicare Program; Proposed Changes to the Hospital Outpatient Prospective Payment Systems and Fiscal Year 2002 Rates* (CMS 1159-P) can be accessed at [www.hcfa.gov/regs/cms1159p.htm](http://www.hcfa.gov/regs/cms1159p.htm).

service for the community.”

However, he adds that there is a stipulation that chest pain centers must be certified to obtain reimbursement under APCs. To be certified, a chest pain center must have the following, he says:

- an attack strategy;
- an observational plan;
- a cardiac outreach plan;
- adequate staffing; and
- a continuous quality improvement plan involving ED physicians, cardiologists, and critical care nurses.

“Only then can they be certified and receive reimbursement for observational services,” says Bahr.

Bahr predicts “exponential growth” of chest pain units as a result of the new APC code. “We are already seeing this growth,” he says. “Within the next two or three years, we expect a chest pain center in almost every hospital in the United States.” ■

## ED diversion rates high throughout the calendar

If you are experiencing all-time high diversion rates, you’re not alone. A new study shows that ED diversions are now a year-round problem.

The Washington, DC-based Center for Studying Health System Change conducted site visits at 12 EDs in Boston; Cleveland; Greenville, SC; Indianapolis; Lansing, MI; Little Rock, AR; Miami; northern New Jersey; Orange City, CA; Phoenix; Seattle; and Syracuse, NY. (See resource box for how to obtain the complete report, at right.)

The key finding was that diversion isn’t just a seasonal problem for EDs anymore. “In fact, it has become a year-round problem in many communities,” reports **Cara S. Lesser**, director of site visits. “The problem stems from changes in both supply and demand.”

According to the study, high diversion rates are a result of more patients and fewer inpatient hospital beds.

On the supply side, the number of EDs has decreased, and hospitals have downsized, which has led to delays in admitting patients, Lesser explains. “Closures of many skilled nursing facilities and home

health services have compounded the problem because there are fewer discharge options,” she adds.

The nursing shortage, which has become severe in many communities, has complicated hospitals’ capacity problems by limiting the ability to staff existing beds, says Lesser.

Meanwhile, there has been increased demand for ED services due to a more strict enforcement of the Emergency Medical Treatment and Labor Act (EMTALA) and a growing number of uninsured patients who rely on the ED as their usual source of care, according to Lesser.

“The implications for ED managers is that there is a real problem that deserves the attention of hospital executives and community leaders,” she stresses. “You need to ensure that there is adequate capacity to meet the emergency needs of the community.”

She adds that at the time of the site visits (June 2000-March 2001), EDs were in the early stages of grappling with the diversion problem. “Many have since developed coordinated diversion programs to ensure that patients maintain reasonable access to care,” she says.

Here are some of the strategies that are being tried:

- improving recruiting and retention of nurses;
- hiring additional nurses (Lesser points to Massachusetts General Hospital’s recent addition of 22 nursing positions and two attending physician positions to increase ED capacity);
- reassigning nurses from outpatient clinics to inpatient units;
- bolstering nursing rosters with temporary staff;
- freeing beds by discharging patients earlier in the day;
- decreasing lengths of stay by moving patients to extended care settings;
- accelerating patient discharge with more reliance on clinical guidelines to standardize the treatment process;
- postponing elective admissions; and

## Resources

A complete copy of *Emergency Room Diversions: A Symptom of Hospitals Under Stress* (Issue Brief No. 38) is available free of charge on the Center for Studying Health System Change web site ([www.hschange.org](http://www.hschange.org)). Click on “Publications,” “Issue Briefs,” and scroll down to “Emergency Room Diversions: A Symptom of Hospitals Under Stress.” Or to obtain a paper copy contact:

- **Center for Studying Health System Change**, 600 Maryland Ave. S.W., Suite 550, Washington, DC 20024. Telephone: (202) 484-5261. Fax: (202) 484-9258. E-mail: [orderpub@hschange.org](mailto:orderpub@hschange.org).

## Sources

For more information about the study, contact:

- **Cara S. Lesser**, Center for Studying Health System Change, 600 Maryland Ave. S.W., Suite 550, Washington, DC 20024. Telephone: (202) 484-4220. Fax: (202) 484-9258. E-mail: clesser@hschange.org.

- increasing inpatient capacity by reopening licensed beds that had been “mothballed” in previous years.

“For example, Massachusetts General and Brigham and Women’s Hospitals reopened about 300 beds,” Lesser says. “This includes most of the beds closed in the mid-1990s to reduce operating costs.” ■

## EMTALA



*[Editor’s Note: This column is part of an ongoing series that will address reader questions about the Emergency Medical Treatment and Labor Act (EMTALA). If you have a question you’d like answered, contact Staci Kusterbeck, Editor, ED Management, 280 Nassau Road, Huntington, NY 11743. Telephone: (631) 425-9760. Fax: (631) 271-1603. E-mail: StaciKusterbeck@aol.com.]*

**Question:** If a rural hospital wants to refer a patient to a larger center, who can accept the physician on behalf of the hospital if the specialist physician refuses?

**Answer:** The first question is whether the rural hospital has the capability of caring for the patient, according to **Mary Kay Boyle**, RN, JD, risk manager at North Penn Hospital in Lansdale, PA. “If they do, the larger hospital is not obligated to accept the patient,” she says.

If the rural hospital does not have the capability and the larger hospital does, then the larger hospital is required under EMTALA to accept the patient, says Boyle. “Transfers may best be accomplished through the ED physician,” she adds.

The problem arises when the specialist then refuses to care for the patient, says Boyle. “This is when hospital administration comes in,” she adds. “The hospital must compel the physician to accept care of the patient.”

The rural hospital should document the acceptance of the patient carefully, cautions **Gloria Frank**, JD, former lead enforcement official on EMTALA for the Centers for Medicaid and Medicare Services (CMS)

and owner of EMTALA Solutions, an Ellicott City, MD-based consulting firm.

Frank presents the following variation on the above question: Suppose that a large hospital repeatedly uses nonphysicians to accept patients from a rural hospital. However, the individual designated to accept patients doesn’t realize that there is actually no room for the patient in question.

The question is: If the rural hospital is aware that its patients are ending up at the larger hospital, but eventually leaving because there’s really no room, then is the rural hospital violating EMTALA by failing to secure acceptance of the patient by the other hospital? “I think it’s a failure to fulfill the requirement, because the rural hospital is on notice,” says Frank.

**Question:** Recently, another ED wanted to send a 30-year-old female to the ED for a medical examination with evidence collection that is performed whenever a patient claims that he or she was sexually assaulted. The sending ED stated that this female already had been deemed suicidal and homicidal and was going to be admitted to their inpatient psychiatric unit. Is a patient who is deemed unstable from a psychiatric standpoint able to give full informed consent for a forensics/pelvic examination? Or should this patient first be evaluated by a psychiatrist to determine if she is capable of giving full informed consent?

**Answer:** Yes, the patient may give or withhold consent for the examination, and a psychiatrist is not necessary to determine whether a patient can give informed consent, according to **Jonathan D. Lawrence**, MD, JD, an ED physician and medical staff risk management liaison at St. Mary Medical Center in Long Beach, CA.

“Patients who are being held involuntarily for mental health reasons do not give up their rights to accept or refuse medical treatment,” he says. “If the patient in this case consents to the exam, it may be done. If she refuses, then it shouldn’t.”

He notes that there is no medical reason to do the exam. “Treatment that might benefit the patient would include STD and pregnancy prophylaxis,” says Lawrence. “For these treatments, the patient must provide consent.”

He adds that if she is unable to understand the nature of the proposed treatment or the consequences of refusing, a judge may order the treatment after an appropriate hearing. “Only in emergency cases could treatment be given against the will of an incompetent patient,” he says.

Under EMTALA, a psychiatric patient is considered stable if they have been chemically or physically restrained so that no further harm could reasonably

## Sources

For more information about EMTALA, contact:

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come to the patient or others, adds Lawrence.

**Question:** If the physician's assistant either admits or discharges the patient, is this legal? The on-call physician may be consulted by phone by the physician's assistant. And is it an EMTALA violation for the "not on call doc" to send his physician's assistant to the ED when a private patient presents?

**Answer:** There is an EMTALA aspect and medical staff aspect to this question, says Lawrence. "As for EMTALA, it is unclear as to whether the physician's

assistant is doing the screening exam or is coming in after the screening exam already has been performed by the ED physician," he says. "If the hospital regulations allow for a physician's assistant to do a screening examination, then it is legal."

Regarding the medical staff issues, if state law and hospital bylaws permit the activities in question, then they are legal, says Lawrence. "State law, supplemented by hospital bylaws, govern the scope of practice of physician assistants," he explains. ■



## JOURNAL REVIEW

Kelen GD, Scheulen JJ, Hill PM. **Effect of an emergency department (ED) managed acute care unit on ED overcrowding and emergency medical services division.** *Acad Emerg Med* 2001; 8:1,095-1,100.

An acute care unit managed by the ED can significantly reduce overcrowding and ambulance diversion, say researchers from the Johns Hopkins University School of Medicine in Baltimore. A 14-bed acute care unit was opened in a remote location

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from the main ED, with 1,589 patients seen in the first 10 weeks of operation, comprising 14% of the ED volume. The number of patients who left without being seen (LWBS) decreased from 10.1% to 5%, and diversion decreased from 6.7 hours per 100 patients to 2.8 hours per 100 patients.

According to the researchers, an acute care unit is an effective way for the ED to control back-end patient flow. They noted significant reductions in patients who LWBS and ED diversion, compared with both a year earlier when ED patient volumes were lower and the immediate two-week period before opening the unit with similar high patient volumes. "By comparison, other local hospitals actually had substantial increases in diversion use," they report.

The researchers add that the patients who can be accepted to the acute care unit include primary patients, patients already evaluated in the ED, those determined to require admission, and patients needing observation or even intensive care unit-level care, and that more than half of the acute care unit patients received extensive diagnostic workups, admission processing, and acute management.

"We believe that increasing active patient care capacity available to the ED in a remotely situated acute care unit, which pushes the boundaries of traditional ED management beyond that conceived for ED-based observations units, stands as a potential solution to ED overcrowding, at least in some settings," conclude the researchers. ■

## CE/CME Objectives

After reading this issue of *ED Management*, the continuing education participant should be able to:

List three requirements of the new Joint Commission standards for disaster planning. (See "Joint Commission zeroes in on disaster plans: Is yours up to par?")

List three goals of the Partnership for Community Safety. (See "New group targets disaster planning.")

Name three benefits of handheld computers in the ED. (See "Nine ways to use handheld computers.")

Explain the status of reimbursement for ED observation under ambulatory payment classifications (See "CMS says you'll get paid for observation.")

Identify the circumstances under which a physician's assistant may conduct a medical screening examination. (See "EMTALA Q&A.")

Name two benefits of an acute care unit. (See "Journal Review.") ■

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### Editorial Questions

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## CE/CME questions

25. Which of the following is required by new disaster planning standards from the Joint Commission on Accreditation of Healthcare Organizations?

- A. performing a hazard vulnerability analysis
- B. having mass decontamination shelters
- C. ability to decontaminate 200 patients
- D. having a separate disaster plan for terrorist attacks

26. Which is an expected outcome of the Partnership for Community Safety, according to Michael L. Carius, MD, FACEP, current president of the American College of Emergency Physicians?

- A. an increase in disaster drills focusing on terrorism
- B. reliance on existing hazardous materials policies
- C. increased diversion rates
- D. a shortage of atropine

27. Which is true regarding use of handheld computers in the ED, according to Terry Schneider, RN, BSN, CEN, an ED nurse at Tallahassee Memorial Healthcare?

- A. Current capabilities don't allow for information to be shared electronically.
- B. Drug costs are often outdated.
- C. Translation software can facilitate communication with non-English speaking patients.
- D. Only text can be accessed, not digital images.

28. Which is true regarding reimbursement for observation services, according to Raymond D. Bahr, MD, FACP, FACC, president of the Society of Chest Pain Centers and Providers?

- A. A new APC code was created for ED observation of chest pain patients.
- B. There is no separate reimbursement for observation under APCs.
- C. The number of chest pain centers is expected to decrease due to lack of reimbursement.
- D. Under APCs, there is only reimbursement for observation of asthma patients.

29. To comply with the Emergency Medical Treatment and Active Labor Act, when may a physician's assistant conduct a medical screening exam, according to Jonathan D. Lawrence, MD, JD, an ED physician and medical staff risk management liaison at St. Mary Medical Center?

- A. under any circumstances
- B. if hospital regulations and state laws allow it
- C. only if the patient requests it in writing
- D. only if the on-call physician is unavailable

30. Which is true regarding the impact of an acute care unit, according to a study published in *Academic Emergency Medicine*?

- A. Overcrowding was not reduced.
- B. Ambulance diversion rates increased.
- C. Both overcrowding and ambulance diversion rates decreased.
- D. The number of patients who left without being seen increased. ■

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# Excerpt: American Hospital Association Chemical and Bioterrorism Preparedness Checklist

**Pharmaceuticals and equipment:**

• Has your facility/system assessed its pharmaceutical inventory to determine whether it could support the treatment of and provide prophylaxis for mass numbers of patients exposed to biological or chemical agents?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

• Has your facility/system identified an emergency pharmaceutical supply system via local pharmacies for pharmaceuticals related to treatment/prophylaxis for biological or chemical agents?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

• Has your facility/system identified an emergency pharmaceutical supply system via pharmaceutical vendors related to the prophylaxis and treatment for exposure to biological or chemical agents?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

• Does your facility/system have protocols for the following medication distribution scenarios for an incident in the event of limited supplies?

Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

Rank order in terms of precedent for care (1 = highest, 5 = lowest)

- \_\_\_ Prophylaxis of patient family members
- \_\_\_ Patients with known exposure/no symptoms
- \_\_\_ Prophylaxis of providers/staff members
- \_\_\_ Symptomatic patients
- \_\_\_ Prophylaxis of staff/provider family members
- \_\_\_ Prophylaxis of community emergency response personnel

• Does your facility/system pharmaceutical and equipment inventory contain the following items? If yes, indicate the approximate average amount on hand:

**Bacterial agents:**

Ciprofloxacin _____	NA _____	Yes _____	No _____	Don't Know _____
Doxycycline _____	NA _____	Yes _____	No _____	Don't Know _____
Penicillin _____	NA _____	Yes _____	No _____	Don't Know _____
Chloramphenicol _____	NA _____	Yes _____	No _____	Don't Know _____
Azithromycin _____	NA _____	Yes _____	No _____	Don't Know _____
Rifampin _____	NA _____	Yes _____	No _____	Don't Know _____
Streptomycin _____	NA _____	Yes _____	No _____	Don't Know _____
Gentamicin _____	NA _____	Yes _____	No _____	Don't Know _____

**Botulism toxin:**

Mechanical respiratory ventilators NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_  
 Other associated supplies NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

**Cyanides:**

Cyanide antidote kits containing amyl nitrite, sodium nitrite, sodium thiosulfate  
 NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

**Lewisite:**

British Anti-Lewisite NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

**Nerve agents:**

Atropine NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_  
Pralidoxime chloride NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_  
Diazepam (or lorazepam) NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

**Pulmonary agents:**

Oxygen ventilators NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_  
Respiratory care supplies NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

**All agents:**

Resuscitation equipment and supplies NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_  
Vasopressors NA \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

- Does your facility/system have access to dosage requirements for antidotes and therapies for patients (adult and pediatric) who are exposed to biological or chemical agents?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_
- Is the necessary drug administering equipment available for the on-hand quantities of antidotes and therapies?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_
- Does your facility/system have a staff member designated to accept deliveries from the National Pharmaceutical Stockpile in the event of a bioterrorism event?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

**Training and personnel:**

- Has your facility/system assessed its work force to determine their level of emergency preparedness and response capabilities within the past year?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_
- When do staff members receive training in emergency/disaster awareness and preparedness? (i.e., initial orientation, periodically, annually) \_\_\_\_\_
- Is there annual refresher training?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_
- What is the annual number of training hours provided in:  
Emergency/disaster preparedness? \_\_\_\_\_  
Biological or chemical terrorism? \_\_\_\_\_
- Does your facility/system have a method for assessing emergency preparedness training and continuing education needs based on the roles/responsibilities of staff members?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_
- Has your facility/system identified internal resources that are capable of providing training in emergency preparedness/awareness?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_
- Has your facility/system identified external organizations that can provide training in emergency preparedness/awareness?  
Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know \_\_\_\_\_

- Have all staff members received training on selection and use of appropriate personal protective equipment (PPE)?  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_

What percentage of the total staff has received this type of training? \_\_\_\_\_

- Have providers trained to provide patient care while wearing full PPE?  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- Has the system/facility implemented activities to educate health care providers and laboratory workers on topics regarding specific procedures for biological and chemical incidents?  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_

If yes, do the training topics include:

- acquisition of laboratory specimens  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- handling of laboratory specimens  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- transportation of laboratory specimens  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- contact telephone numbers for reporting/consultation  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- guidelines for immediate reporting/consultation with public health officials  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- medical management of patients  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- patient decontamination procedures (including those to be used when outside temperatures are extreme)  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- identification of hazardous biological agents  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- identification of hazardous chemical agents  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_
- role of the health care providers in recognizing/suspecting the beginning of an outbreak  
Yes\_\_\_\_\_ No\_\_\_\_\_ Don't Know\_\_\_\_\_

Source: American Hospital Association, Chicago. Web: [www.aha.org/emergency/content/maatchecklistb1003.doc](http://www.aha.org/emergency/content/maatchecklistb1003.doc).

# BIOTERRORISM WATCH

*Preparing for and responding to biological, chemical and nuclear disasters*

## Ease of access to deadly chemicals may be the greatest threat to hospital readiness

*How close is your hospital to a railroad track?*

Though biological agents have dominated recent terrorism discussions, ease of access to deadly chemicals may make them a greater threat to hospital readiness, experts emphasized recently at the University of Georgia in Athens.

“Eighty new chemicals a day are patented in America, and most of them will kill you,” said **Jon W. Watson**, special agent in the FBI’s joint task force on bioterrorism.

Watson joined other experts in a conference on preparing hospital clinicians for mass casualty situations. The underappreciated threat of chemical weapons was a recurrent theme throughout the Dec. 5, 2001 meeting.

“Most people do not realize that the chlorine — the substance we put in our swimming pools — will kill you,” Watson said. “Yet tanker carloads of it are railed through the middle of Atlanta every day. A [munitions] charge placed on the side of that tanker would blow a hole in it, the chlorine would escape, form a flue, and move across the city.”

A potent irritant to the eyes and skin, chlorine can cause severe pulmonary irritation that may result in death. Yet chlorine exposure is difficult to diagnose, and there is no specific antidote.

**(See chemical agents, p. 3.)**

“That is not sexy; that’s not going to make the news,” Watson said. “We would much rather talk about Ebola and anthrax.”

The chemical agent deployed by a terrorist could include an industrial hazardous material or a traditional militarized agent such as nerve gas.

While many nations still have stores of chemical weapons, in 1997, the United States and some 80 other countries signed a treaty banning their use. As a result of that legislation and prior actions, the United States is in the process of destroying its stocks of chemical weapons through incineration. One such storage site is the Noble Training Center in Anniston, AL.

“We are privileged to store 2,100 tons of sarin, mustard [gas], and VX derivation,” said **John Hoyle**, MHA, LFACHE, director of the Noble Training Center and an employee of the U.S. Public Health Service.

A \$1 billion incinerator has been built to destroy the chemical stocks, but people in the surrounding communities have expressed concern about the public health threat of the incineration process, he said at the conference.

“There is a lot of concern in the citizenry about those chemical weapons, but the Army has been storing and handling them for 50 years,” Hoyle said. “I have toured the incinerator three times. I am very convinced they know exactly what they are doing.”

However, while confident in the safety of the incineration program, he expressed concern about the amount of chemicals that are railed through that area and other parts of the country.

“I live but a mile from a train track, and we are the main route between Atlanta and Birmingham,”

This supplement was written by Gary Evans, editor of *Hospital Infection Control*. Telephone: (706) 742-2515. E-mail: [gary.evans@ahcpub.com](mailto:gary.evans@ahcpub.com).

# Triage, decontamination after chemical exposures

## *Have outdoor shower area ready*

To increase preparedness for chemical exposures, clinicians at George Washington University in Washington, DC, have developed triage and decontamination plans that include the use of outdoor showers.<sup>1</sup> Some of the key points of the plan for dealing with chemically contaminated patients include:

### ✓ Initial triage.

Exposed and potentially exposed individuals should receive an initial brief triage, performed by medical personnel in personal protective equipment (PPE), before decontamination. They should then be directed to one of two areas, nonmedical decontamination or medical decontamination. The uninjured, those with minor injuries requiring no medical intervention during decontamination, and the majority of ambulatory patients will be assigned to non-medical decontamination.

A brief sign-in process should record name and date of birth. (Full registration can occur after decontamination and should be consistent with the community patient tracking system.) A number on a log can be assigned to each patient, who would receive two identically numbered plastic bags and a nonpermeable wristband. Clothing would be placed into the larger clear, impervious bag. Valuables should be placed in the second, smaller bag.

### ✓ Patient decontamination.

It is recommended that the facility have partially fixed or preconstructed decontamination areas that can be activated immediately. This area should be designed to occupy little storage space and not disrupt routine operations while in use. The Israeli model, developed during the Gulf War, consists of showers permanently fixed to the ceiling structure of an open-air parking garage or the side of a building. The George Washington University Hospital model

uses fire exit alleyways. Outdoor decontamination, however, must offer protection from inclement weather and have adequate lighting for night operations. Because clothing will be removed before decontamination, privacy must be protected to ensure compliance with full decontamination. The sexes should be separated, with a visual barrier between shower lines.

The water temperature must be adjustable. Excessively warm water should be avoided, as this may promote peripheral vasodilatation and toxin absorption. Stiff brushes or abrasives also should be avoided as they may enhance dermal absorption of the toxin and can produce skin lesions that may be mistaken for chemical injuries. Sponges and disposable towels are affordable and effective alternatives.

Decontamination can be accomplished by using a sequential copious warm water rinse, a hypoallergenic liquid soap wash, another warm water rinse, and then a final rinse after walking past other in-use showers. Promoting patient self-decontamination will significantly decrease the required number of health care workers. Of course, decontamination assistance for some patients in the nonmedical decontamination area and full passive decontamination in the medical decontamination area must still be available.

Decontamination facilities should contain multiple shower stations that are designed to allow patients to progress at various rates without compromising overall flow. Patients whose clinical condition deteriorates in the decontamination line can impede the progress of others. Plans must include means for sidetracking these patients into an area separate from the main decontamination sites, where treatment can be initiated.

## **Reference**

1. Macintyre A, Christopher G, Eitzen E, et al. Weapons of mass destruction events with contaminated casualties. *JAMA* 2000; 283:242-249. ■

Hoyle said. "Chlorine cars, World War I warfare chemicals go through our town all of the time. [But] nobody worries about a rail-car accident, much less terrorism [involving] a rail car," he added.

## **A reality in Tokyo**

As with bioterrorism and anthrax, the threat of chemical attacks on citizens is no longer theoretical. While the use of chemicals is well documented

in warfare, the incident that drove the terrorist threat home was the release of the nerve agent sarin in the subways of Tokyo in 1995. Twelve people were killed and 5,000 injured in the attack by the Aum Shinrykyo cult. It could have been worse. The group reportedly had little problem getting scientific assistance in developing the chemical, but never really came up an adequate delivery system.

*(Continued on page 4)*

# Signs and Symptoms of Chemical Exposures

The following are among the major chemical agents that may be used by a terrorist. As a general rule, health care providers using appropriate personal protective equipment should remove the exposed person from the source immediately, and decontaminate by removing, bagging, and sealing the person's clothing. Flush the skin with water and then wash with soap. Take care to prevent secondary cases from contaminated clothing, ground, vegetation, or equipment.

## NERVE AGENTS

- **Sarin (GB)** is a colorless, odorless liquid that mixes readily in water. Sarin can be ingested, inhaled, or absorbed through the skin. Depending on the dose, onset of clinical manifestations can vary from a few minutes to one hour, although most occur within minutes. Signs and symptoms include visual disturbance, runny nose, chest tightness, nausea, vomiting, convulsions, and death. Treatment includes atropine, pralidoxime chloride, and diazepam.
- **Tabun (GA)** is a colorless-to-brownish liquid. Under average weather conditions, tabun can persist for one to two days. It is primarily released as an aerosol or vapor. Clinical signs and symptoms include visual disturbance, runny nose, chest tightness, nausea, vomiting, convulsions, and death. Treatment includes atropine, pralidoxime chloride, and diazepam.
- **Soman** is a colorless and tasteless liquid that mixes readily with water. After release, it evaporates rapidly, dissipates, and eventually breaks down in the environment. Clinical manifestations include visual disturbance, runny nose, chest tightness, nausea, vomiting, convulsions, and death. Treatment consists of decontamination; drugs such as atropine, pralidoxime chloride, and diazepam; ventilation to support respiratory function; and supportive care.
- **VX** is an amber-colored, oily liquid that will remain in the environment until it has been properly cleaned through decontamination methods. VX can enter the body through ingestion, inhalation, or through the eyes or skin. Health effects include constricted pupils, visual disturbance, runny nose, chest tightness, nausea, vomiting, convulsions, and death. Diagnosis is based on history of exposure, clinical signs and symptoms, and confirmatory laboratory tests. Treatment includes atropine, pralidoxime chloride, and diazepam; ventilation to support respiratory function; and supportive care. Because of VX's persistent characteristics, take special care to prevent secondary cases from contaminated clothing, ground, vegetation, or equipment.

## BLISTER AGENTS

- **Mustard (HD)** causes severe skin, lung, or eye damage. The health effects of exposure can be delayed up to 12 hours. Those exposed might notice the odor of mustard, which is similar to onion or garlic. Hours after exposure, the skin may appear red. Upper respiratory problems such as difficulty breathing, coughing, painful sinuses, or sore throat may occur. Over a period of hours, small blisters appear and gradually combine to form large blisters. Mustard exposure can be confirmed through a urine test. There is no antidote for mustard exposure.
- **Lewisite** is a blister agent that produces immediate effects. Its vapor causes burning or pain in the eyes, nose, and skin. Fresh air can increase the pain. Lewisite also may produce visible tissue damage within several minutes of contact. Later, severe damage to the skin, eyes, or airways may occur. Lewisite is diagnosed by recognizing its clinical manifestations (immediate pain or irritation of skin and mucous membranes). Other signs and symptoms that may occur later are skin flushing, blisters on the skin, and eye and airway damage. Treatment consists of decontamination, the use of the antidote British Anti-Lewisite (BAL), and supportive care.

## PULMONARY AGENTS

- **Phosgene (CG)** has the odor of newly mowed hay. This highly toxic substance immediately irritates the eyes, nose, and skin. It also produces tissue damage within several minutes of contact. Phosgene exposure is diagnosed by recognizing the signs and symptoms (eye and airway irritation, difficulty breathing, chest tightness, and delayed pulmonary edema). There is no specific antidote for phosgene. Decontaminating all exposed areas is the most effective means of decreasing tissue damage.
- **Cyanide** is a colorless liquid that prevents cells from using oxygen, which results in death. Inhalation is the primary mode of exposure. Cyanide in moderate amounts may produce headache, nausea, dizziness, weakness, or anxiety. A large amount of cyanide will produce loss of consciousness within seconds, and death may occur within minutes. Cyanide exposure is diagnosed by the clinical signs and symptoms suggestive of inadequate oxygen. Successful treatment for acute cyanide poisoning depends upon rapid treatment with oxygen and the use of antidotes (amyl nitrite, sodium thiosulfate, and sodium nitrite).
- **Chlorine** is a greenish-yellow gas with an irritating odor. It is a potent irritant to the eyes and skin. Exposure also causes severe pulmonary irritation that may result in death. Chlorine exposure is difficult to diagnose. There is no specific antidote. Remove from the source and provide fresh air. If eyes or skin were exposed, rinse them with plenty of water. Provide oxygen if there is shortness of breath or difficulty in breathing.

Source: Centers for Disease Control and Prevention, Atlanta.

"[Terrorists don't] have to hire a bunch of PhDs and spend millions to try and create some sarin — not when you've got rail cars full of the stuff going through our towns everyday," Hoyle warned.

Lessons learned from the Tokyo sarin attack include the fact that a significant number of exposed individuals may find their own means of transportation to the health care facility after a chemical attack.

"The vast majority of casualties in any disaster will get to your hospital without the benefit of EMS," Hoyle said. "They simply don't wait around for EMS to organize, set up a triage, casualty collecting points, and all that."

In addition, "worried well" patients who have experienced very little or no exposure will go to a hospital. Many may still require decontamination because it may be difficult to rule out exposure. Any real symptoms of a chemical agent will occur in conjunction with anxiety and confusion. All the while, residual chemical agents on those exposed may pose a risk of secondary spread to workers, as evidenced by pesticide patients presenting at emergency rooms.

Indeed, three health care workers — one who was subsequently hospitalized for nine days — fell ill after a patient who had ingested pesticide came into an emergency room in a South Georgia hospital in 2000. As a result of the case, the Centers for Disease Control and Prevention (CDC) recommended staff take personal protection measures beyond standard infection control precautions. Depending on the extent of the contamination, health care workers caring for chemically contaminated patients should use level C protection (i.e., full face mask and powered/nonpowered canister/cartridge filtration respirator) or level B protection (i.e., supplied air respirator or self-contained breathing apparatus). The type of canister/cartridge should be appropriate to the agent. If the agent cannot be identified, use an organic vapor/HEPA filter, the CDC recommended.

### ***Self-reliance a must***

Other practical considerations are the availability of heavier gloves, because thin latex medical gloves are of little protection against many chemicals. In addition to the need for surface decontamination of patients, body fluids also must be contained to prevent skin and inhalation exposure. To limit spread of the contaminant, the emergency room's ventilation exhaust should be

directed away from the hospital's main ventilation system. A less-expensive alternative is to set up an outdoor shower decontamination area. (See related story, p. 2.)

Such preparations may be critical because local officials will be too busy at the scene of exposure to assist hospitals with incoming patients, Hoyle warned. "Hazmat people will not show up at the hospital emergency room and decontaminate patients for you, because they are still going to be in the area of the exposure. You have to think self-containment. You're going to have to direct your own traffic and decon your own patients."

Moreover, it is actually a regulatory requirement that hospitals are prepared to deal with chemically contaminated patients, added **Henry Siegelson**, MD, FACEP, a consultant with Disaster Planning Intentional Inc. in Atlanta. The Occupational Safety and Health Administration (OSHA) requires such preparation as part of its regulations on hazardous wastes, he told conference attendees. "[OSHA] rules require employers — including hospital CEOs — to plan for Hazmat if they expect their employees to handle an emergency involving chemicals," he said.

In complying with OSHA, the preparedness plan will also meet requirements of the Joint Commission on Accreditation of Healthcare Facilities, Siegelson added. Despite the risk of accreditation problems or OSHA fines, the response to the regulations has been historically lackluster, he said. "Prior to Sept. 11, some people said, '[OK] fine me. I don't care.'" he said. "Really, I ran in into that all over the country. Before [the 11th] we were called to train hospitals by safety committees, nurses, security professionals. Now we are being called by hospital CEOs."

In general, the OSHA requirements include that all employees — including affiliated personnel, physicians, and nurses — who may be involved in chemical emergency response must be familiar with the plan. By the same token, facilities must plan for emergency treatment of noncontaminated patients, he noted.

"What are you going to do if someone comes in with a heart attack or a broken hip while you are dealing with this decon event?" Siegelson asked.

### ***Reference***

1. Centers for Disease Control and Prevention. Nosocomial poisoning associated with emergency department treatment of organophosphate toxicity — Georgia, 2000. *MMWR* 2001; 49:1,156-1,158. ■