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INSIDE

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Is it a real sentinel event? Or a mock one? Practice makes perfect in times of crisis

Drills and fast response yield valuable information

Sentinel events of all types should be treated like crises requiring an immediate and well-rehearsed response, say risk managers who have developed innovative strategies to prepare their facilities. A mock sentinel event can help your staff become comfortable with the tasks necessary to respond in a real crisis, they say, and a sentinel event rapid-response team can ensure you get the most out of an investigation.

The Joint Commission on Accreditation of Healthcare Organizations defines a sentinel event as "an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function. The phrase 'or the risk thereof' includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome." Many health care providers interpret that definition broadly, partly because they want to play it safe with the Joint Commission and partly because even a "borderline" sentinel event presents a learning opportunity for risk managers and other staff. **Janice Piazza**, RN, MSN, MBA, director of advance learning workshops for Berwyn, PA-based VHA East, says a mock sentinel event is an excellent way to test your

Stay on top of EMTALA with audio conference

Keep abreast of all the latest changes with *EMTALA Update 2002*, an audio conference sponsored by American Health Consultants. The conference, scheduled for Tuesday, June 4, 2002, from 2:30 to 3:30 p.m. Eastern time, will be presented by Charlotte S. Yeh, MD, FACEP, and Nancy J. Brent, RN, MS, JD. Yeh is medical director for Medicare policy at National Heritage Insurance Company. Brent is a Chicago-based attorney, with extensive experience as a speaker on EMTALA and related health care issues.

(See EMTALA audio conference, page 52)

facility's response and to spot weak areas before the real thing happens.

"We did this in my previous role at a hospital and it was a great way to assess our readiness," she says. "We did like any other kind of mock scenario or drill at the facility, the same way we would do a mock infant abduction or a mock disaster. We alerted the appropriate staff and said, 'This just happened. What do you do?'"

Piazza says a mock sentinel event is particularly useful at the leadership level since much of the activity after a sentinel event is there and not on the staff level. The mock sentinel event can help you recognize many questions that otherwise might not occur to you until the real thing happens, she says. Who needs to be notified? Who takes charge of the response? What information is released to the media and how? Who speaks with the patient's family?

Mock sentinel events should be conducted regularly, just as you conduct disaster drills and other tests for readiness. Piazza offers these suggestions for how to conduct a mock sentinel event:

• **Use a variety of scenarios.**

You can use any type of incident that would qualify as a sentinel event — a gross clinical error such as cutting off the wrong limb, or a patient suicide. It might be useful to use an event that actually has happened at your facility in the past for the drill. Knowing how you responded in the past — and what you could have done better — will help you focus on certain aspects of the response during the drill.

But be sure to mix it up. Don't use the same type of scenario all the time or scenarios from the same general topic, such as surgical errors. Your staff might get good at responding to that type of crisis but not be as good at responding to something very different.

• **Take advantage of other drills.**

Any other in-house drill involving an incident that could be a sentinel event presents the opportunity to test your team's response. One obvious example is infant abductions. If your hospital conducts infant abduction drills in which the staff practices the procedure for notifying security, establishing a perimeter to watch for the abductor, and so forth, you can ride piggyback on that drill. Follow through after the abduction drill by testing how you would respond to the incident as a sentinel event.

Keeping it real

• **Warn some, but not everyone.**

As with most other types of drills, you probably should warn some key players that a mock sentinel event will be conducted. That will help them head off any unnecessary — and potentially counterproductive — actions, such as actually calling the police department. But for most hospital staff, the mock sentinel event should come as a surprise. Just as the real thing would.

"You have to have a few people know what's going on so they can role-play the event. They will need to know the scenario so they can inform others what has happened and answer questions that come up," Piazza says. "But for most people, the most they should know is that you'll conduct a mock sentinel event at some point and they should be ready to respond."

Because a sentinel event response requires the involvement of people in leadership roles, Piazza suggests you consult with administration about picking the day and time. Then you will have to work with the people involved in the scenario you have chosen.

"If you're doing a surgical event, you need to go to the OR [operating room] and enlist some people to help," she says. "Describe the event, give them the details they need to know about what happened and let them know when the drill will be done. Then they should role play the event when people start investigating it."

• **Start from the beginning of the event.**

To make the drill as realistic as possible, start the drill from the very moment that you learn of a sentinel event at the hospital. The people involved in the event — the operating room staff, for instance — should call the risk manager to report the incident, or whatever step your policy calls for at that point. That notification should kick off the drill.

COMING IN FUTURE MONTHS

- Waterborne pathogens create liability
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- Keeping a lawyer's costs down
- The changing role of a risk manager

Of course, if that phone call doesn't prompt your staff to respond to a sentinel event, you've found your first problem.

• Take the scenario to the point of further investigation.

Try to carry the mock sentinel event as far as you can without actually getting into the entire root-cause analysis (RCA). The key points you are looking for are the way your staff reacts and whether everyone knows their role. Take note of what decisions must be made and who must make them. Are tasks being overlooked? Is evidence lost because it wasn't collected quickly?

"There's no end to what you can learn about your response," Piazza says. "Be sure to make it a learning experience in which everyone feels comfortable pointing out ways to make the next one better, and not a punitive situation in which people are just afraid of being tested."

Quick response — valuable information

A quick response is the goal of another strategy employed by **Sherry Martin**, MD, associate vice president for process improvement in the department of quality improvement at the M.D. Anderson Cancer Center at the University of Texas. Martin and her colleagues at the hospital realized that a speedy response to sentinel events, or even *near* sentinel events, could serve two purposes. First, the hospital could gather more and better information if it was gathered quickly. And second, staff were more likely to report incidents if they knew the administration would respond promptly.

"We've always encouraged people to let us do a sentinel event analysis on the near misses, to reach for the low hanging fruit in addition to the situations where the sentinel event is obvious. There's a lot we can learn from those near misses," Martin says. "Well, our phone never rang. When we asked why, they said it takes too long and it was too long before any improvements were implemented."

So M.D. Anderson organized what it calls the Rapid Response RCA. Under this plan, anyone can call Martin's office and report a near miss, or even a situation that just has the potential for leading to a sentinel event, and Martin promises that quality improvement and risk management staff will respond within one hour.

"We'll get there within the hour, and then we'll do a one-hour root-cause analysis, a quick version of what we normally do," she says. "We promise we'll be there right away so people don't have to wait around and take a lot of time out of their day. That was a big deterrent. And it's also good for us because we get good information right after the event or while the thought is still fresh in people's minds."

One-hour analysis can yield quick solutions

The one-hour analysis might lead to a complete, full-scale RCA if necessary. And if the incident qualifies as a sentinel event, the rapid response might be only the first step in a complete sentinel event response. But Martin says the rapid response is used for many situations that never would have been reported because they didn't reach the level of a sentinel event. Recent examples include a unit that missed necessary blood draws twice in one month, and clinicians who complained that the arrangement of telephones made it difficult to receive calls during rounds.

"People see the rapid response almost as a problem-solving opportunity and that's good because everyone benefits," she says. "We get to head off problems that could snowball into something serious and they can solve a problem that's been bothering them. It's good when we get there right away, after people spent the morning complaining or worrying about something and decided to call us. It's still on their

EMTALA audio conference

(Continued from cover)

The conference will outline a new report that puts a national spotlight on inadequate emergency department (ED) on-call coverage. There is a growing trend of specialists refusing to take call for the ED, partly due to increased liability risks for medical malpractice and violations of EMTALA. If you don't take steps to ensure appropriate on-call coverage for your ED, you're at risk for violations and adverse outcomes. This program also will update you on any legislative efforts to compel managed care plans to reimburse hospitals for EMTALA-related services.

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minds and we get a clear understanding."

The rapid analysis might determine that more information is needed, so the team can establish a quick data collection system, with the emphasis on keeping it simple. If the team needs to know how often something happens in a certain unit, for instance, it might give the nurses a sheet of colored stickers and ask them to just put one on the patient's chart when the problem occurs.

"The idea is to be proactive, to handle these relatively minor problems before they lead to a serious adverse event and you have to go into a complete RCA," she says. "Then you're obligated to do a lot of work that requires so many people to drop whatever they're doing. And that process is punitive, no matter how hard we try, so we like to avoid that when possible."

Speedy solutions encourage cooperation

Once the problem is identified, Martin and her staff make it a priority to provide a solution as quickly as possible. When the intensive care unit found that requested blood draws were not always performed, the rapid analysis determined that the way the requests were entered in the computer system did not always indicate to the phlebotomists that the ICU requests were high priority. The solution was to provide pagers to the phlebotomists so that the ICU staff could summon them directly.

For the phone problem, Martin had the phone system in that unit redesigned so that physicians could receive calls while caring for patients. And it was changed quickly.

"That's what matters," Martin says. "When the staff sees something happen that makes their life easier in pretty quick order, they're encouraged. They know it's worth their time. Now the phone rings all the time." ■

Reader Question

Computerized prompts should match the policy

Question: We're computerizing much of our record keeping and clinical pathways, but we're concerned about consistency between the computer and our existing policies, particularly with regard to a function that prompts the clinician to take certain actions. If the computer system's prompts are not exactly the same as what we have in a written policy, does that create a liability risk?

Answer: There is some liability risk if your computer system prompts do not match your official hospital policy, says **Diana J.P. McKenzie**, JD, an attorney specializing in health care information issues with the law firm of Gordon & Glickson in Chicago. But she says the discrepancy would not necessarily be reason to avoid the computerized clinical pathway.

The issue arises when health care providers install sophisticated computer systems that do more than just document or provide factual information. Many of the systems prompt the clinician to take certain actions, such as checking for specific symptoms or monitoring the patient at certain intervals. Ideally, those prompts should exactly match what is already your official policy on those issues. If your hospital policy is to check the patient hourly for pain, the computer system should prompt the clinician to do that — not

every few hours and not more often than hourly.

When there is a discrepancy, it sometimes is the result of just incorrectly programming the computer system, McKenzie says. And in other cases, the problem is that the computer system is incapable of providing the correct prompts, for technical reasons. Those possibilities have led some facilities to shy away from putting clinical pathways on computer systems. At Coney Island Hospital in Brooklyn, NY, director of health information **Terry Deering** says her facility is struggling with the issue because a hospital in the same health care system recently lost a malpractice case related to computer prompts.

The hospital was sued for malpractice, with the plaintiff alleging that the staff did not check vital signs as frequently as required by the computer prompts. But the hospital argued that staff had followed the hospital's official policy on frequency of vital sign checks, and that the policy superseded the computer prompts. The court found that the more stringent schedule on the computer prompts created an obligation.

"We want to include a lot more clinical pathways in our system, but this leaves us in a dilemma," Deering says. "Risk management and legal affairs are very apprehensive, advising us not to put in many prompts at all."

McKenzie says that reaction may be unnecessary. She confirms that there have been a great many cases related to computerized prompts and similar systems, but "when people say they are scared to put in any prompts at all because they didn't do it right the first time, my response is, 'Whoa, wrong answer.'"

The more reminders, the better

Computer prompts are, in general, a very good idea, she says. The more reminders you have for good care, the better. As a rule, prompts will save you far more times than they will get you in trouble, she says.

"The problem is that treatment protocols aren't necessarily consistent with how the software is created," she says. "Some will allow changes to make it consistent with your policy and some won't. But it's almost always possible to put a warning somewhere, usually on the sign-on screen, warning the user that the prompts may not be consistent with policy and that the written policy always stands."

A good plaintiff's attorney will find the more stringent policy — whether it is the computer prompts or the official policy — and claim that it applies. It won't bode well for you if the staff didn't adhere to the stricter of the two options. Do all you can to make the computer system consistent with your hospital policy, but if that is simply impossible, McKenzie says you can rely on a *prominent* warning in the computer system that the prompts are only meant to be helpful and may not be a complete rendition of hospital policy. Clearly state in the system that in any discrepancy the official policy takes precedence over the computer prompts.

Computer dependency

Staff education regarding the computer system should emphasize this point as well. In fact, McKenzie says, the real failing in many cases is that the staff was overdependent on a computer system and saw the prompts as the expected level of care. If they are not, the staff must understand that very clearly.

McKenzie urges risk managers to take a reasoned approach the problem. There have been "tons of computer cases," she says, but that is no reason to avoid a computer function that can improve care on the whole.

"Use the safeguards, and know that if a case is brought against you, you will be held to the more stringent policy," she says. "Just having the prompts on the screen should not be the final word on anything. Make it clear that you are not writing policy with those computer prompts. You still have to follow policy." ■

Unsanitary conditions lead to shakeup in KC

Add another chapter to the book of *Things That Can Keep a Risk Manager Awake at Night*. A hospital in Kansas City, MO, is undergoing an inquiry after a report that maggots were found in the noses of intensive care unit (ICU) patients.

The scenario also raises questions — again — about how a hospital can have such a problem and then breeze through its Joint Commission survey a month later. And it highlights how staff cuts, even in nonclinical areas, can be detrimental to patient care.

The incident happened four years ago but only came to light recently in research published by **Richard Beckendorf**, MD, a physician at the Kansas City Veterans Affairs Medical Center where the incident happened, and **Stephen Klotz**, MD, who was the hospital's chief of infectious disease at the time and now is an infectious disease specialist at the University of Arizona Health Sciences Center. Beckendorf, Klotz, and their colleagues reported on the incident in a recent journal article that drew significant attention because the effect on patients was so disturbing.[1] They report that the Kansas City Veterans Affairs Medical Center "experienced an infestation of mice combated in part by broadcasting poisoned baits. Months later, there was an invasion of flies into the hospital, and two comatose patients in an intensive care unit contracted nasal maggots."

The incident did happen, but some facts are in dispute, according to **Glenna Greer**, a spokeswoman for the hospital. Beckendorf and Klotz report that adult flies were trapped and maggots were removed from the nose of the second patient. Subsequent examination determined that they were green blowflies *(Phaenicia sericata).* The journal report blames the incident on poor housekeeping practices, the result of staff cuts that made it impossible for workers to adequately clean some parts of the facility.

A mouse infestation

"Recent downsizing of hospital personnel had led to the unintended and unrecognized loss of housekeeping services in the canteen food storage areas," they wrote. "A mouse infestation of the hospital occurred, with the epicenter in the canteen area. This was initially addressed by scattering poisoned bait and using rodent glue boards. The result of such treatment was the presence of numerous mouse carcasses scattered throughout the building, attracting the green blowfly. Adult gravid female flies trapped in the new intensive care unit (where mice were not present) laid eggs in the fetid nasal discharge of two comatose patients."

To make matters worse, the problem went on for two months after the first discovery. The first patient was found with maggots on July 22, 1998, and died two days later of unrelated causes. Maggots were found on the second patient on Sept. 30, 1998.

Mice gone, but carcasses still pose problem

Greer confirms that there was a mouse infestation, which in turn led to the fly problem. But she disputes some allegations in the journal study, including anecdotes about mice being so pervasive that they ran over the feet of executives during a boardroom meeting. And she says rumors that nurses kept some mice as pets are false. Greer says the mice initially took up residence in a food storage area serving the employee canteen, but she denies charges that the infestation was made possible by staff cuts that diminished housekeeping. She also suggests that many of the mice were displaced from a construction site next door to the hospital and just fled to the nearest building.

"Recent downsizing of hospital personnel had led to the unintended and unrecognized loss of housekeeping services in the canteen food storage areas."

Beckendorf says the ICU problem was solved with live trapping of mice and removal of carcasses, which eliminated the fly infestation. But that wasn't the end of the nightmare.

"The cause-and-effect nature of the mouse carcasses and flies was underscored a year later when an outbreak of *P sericata* occurred in the operating department and was linked to the presence of mouse carcasses on glue boards not removed the previous fall," he says. "Hence, the disruption or loss of one vital link in hospital organization [in this case, housekeeping support] may lead to an unintended and bizarre outcome."

The Cornell Lab of Ornithology in Ithaca, NY, reports that blowflies are commonly used by forensic investigators studying time and cause of death because they are immediately drawn to dead bodies, and the life cycle of flies yield clues to the time of death. According to Novartis Animal Health at Novartis.com, the adult blowfly lays its eggs in moist areas, especially those soiled with feces, urine, or mucous. After hatching, the larvae feed on the epidermal tissues and skin secretions of the host animal, causing extensive tissue damage. Once the larvae have completed feeding, they drop to the ground where they disperse and burrow into the soil to pupate. Once they become adults, the emerging flies mate and seek a warm, humid place to begin the cycle once again.

One question was asked by many observers

after the Kansas City problem came to light: How could the clinicians not know that flies were laying eggs in their patients? One clue is the short time between when eggs are laid and when maggots emerge. For the green blowfly, this period is short, between 24 and 48 hours. Greer says the ICU nurses discovered the maggots during routine care and were removed before causing any tissue damage.

No lawsuits and an A+ from JCAHO

The situation remained under the radar until the journal article focused publicity on the hospital. Then Secretary of Veterans Affairs **Anthony J. Principi** reassigned two senior administrators at the hospital and ordered independent reviews of the facility. The targeted managers were the regional network director and the deputy director.

"VA has an obligation to provide quality health care to America's veterans," Principi said in announcing the dismissals. "Failure to maintain sanitary standards is unacceptable, both with employees and with managers charged with maintaining standards."

Principi directed the Inspector General of the Department of Veterans Affairs to immediately undertake two investigations. One will deal with the current condition of the Kansas City Veterans Affairs Medical Center, and the effect of any deficiencies on the quality of care and patient outcomes. The second investigation will deal with the adequacy of supervision by both the VA's central office the regional leadership, specifically regarding their ability to monitor health care operations.

The two administrators are temporarily reassigned pending the outcome of the investigations. Even with the investigations, the negative publicity from the incident may be the worst outcome for the hospital. The hospital's risk manager was not available for comment, but Greer says the hospital apparently has escaped any legal liability, possibly because there were no actual injuries tied to the infestation, leaving only the disgusting nature of the problem.

"The physicians called the patients' families at the time and explained the situation," Greer says. "There have been no negative repercussions, no indications of any lawsuits of investigations."

In fact, the incident seems to have slipped right by the Joint Commission investigators. The hospital was scheduled for its triennial survey in August 1998, only one month after the maggot incident and the surveyors made no mention of the problem, Greer says. She says she does not know if hospital staff or leaders volunteered a report on the incident.

"We scored 96 out of 100," Greer says. "We got a Type I recommendation for a pharmacy cart left unattended and for the way we evaluated agency nurses. There were no references to the fly problem and our corrections were in place by then."

A spokesman for the Joint Commission confirms that there was no investigation of the incident in 1998, but he says there might be one now. **Mark Forsteneger** tells *Healthcare Risk Management* that "the Joint Commission will evaluate it" now that the situation has been brought to their attention, and there is no statute of limitations on actions previously unknown to them. The fly problem does not constitute a sentinel event because there was no death or serious physical or psychological injury, he says.

"The report will go into the organization's complaint history, and that is available to anyone," he says. "There is no time limit on how old a complaint can be, so an incident from 1998 still can be entered."

Reference

1. Beckendorf R, Klotz SA, Hinkle N, et al. Nasal myiasis in an intensive care unit linked to hospitalwide mouse infestation. *Arch Intern Med* 2002; 162:638-640. ■

HCA fraud convictions overturned on appeal

The HCA fraud trials set the stage for the growing emphasis on health care fraud in the past few years, but the story has taken another odd twist with the recent reversal of convictions that put two HCA executives in prison.

For health care executives jittery about the possibility of ending up in jail for fraudulent billing, this could be good news, especially in light of the reasoning that led the court to overturn the convictions. There was no evidence that the executives intentionally made false statements and knowingly defrauded the federal government, the court said.

In July 1999, Jay A. Jarrell and Robert W. Whiteside were convicted in Tampa, FL, of

making false statements in Medicaid reimbursement cost reports. The charges related to their work with Fawcett Memorial Hospital in Port Charlotte, FL, part of the HCA hospital chain, one of the biggest in the country. They also were convicted of conspiracy to defraud the government. Prosecutors said Jarrell and Whiteside repeatedly billed expenses as capital outlays when they should have been listed as administrative and general expenses, which would have resulted in lower reimbursement rates.

But in its recent ruling, the 11th U.S. Circuit Court of Appeals in Atlanta said that the government failed "to prove that the alleged statements were knowingly and willfully false." **Walter Dellinger**, JD, attorney for the defendants, called the ruling "a clear vindication of Bob Whiteside, Jay Jarrell, and HCA."

Jarrell was head of HCA's southwest Florida division. He had been sentenced to 33 months in prison and ordered to pay nearly $1.7 million restitution, along with a fine of $10,000. Whiteside was a senior reimbursement executive from Brentwood, TN. He was sentenced to two years in prison and fined $7,500. Neither man had yet gone to prison, remaining free while their cases were appealed.

The investigation of HCA began in 1997 and illustrated the government's determination in rooting out health care fraud. HCA fired its top executives, and the company pleaded guilty to defrauding government health care programs. The company has paid $840 million in fines, civil penalties, and damages. ■

Report calls for national errors reporting system

The National Quality Forum (NQF) recently announced the availability of a report that it says could be used to form the basis for a national, state-based adverse event reporting system.

Titled "Serious Reportable Events in Healthcare: A National Quality Forum Consensus Report," the report and accompanying list of serious medical errors could form the framework of a system that allow health care providers to report medical errors in a consistent way, says **Kenneth W. Kizer**, MD, NQF president and CEO.

"Events, such as wrong-site surgery, medication errors, and infant discharges to the wrong person, occur more frequently than the public would like to believe," Kizer says. "Utilizing the list can be a valuable tool for making health care safer for all patients. Focusing on these serious adverse events should lead to improvements in systems and processes that will minimize their future occurrence."

The report identifies 27 adverse events in six major categories: Surgical Events, Product or Device Events, Patient Protection Events, Care Management Events, Environmental Events, and Criminal Events. Also identified are standardized definitions of key terms that are necessary if the list is to be used in a uniform manner across the country.

Information on ordering the report can be found at www.qualityforum.org. ■

NJ sees 250% increase in its malpractice premiums

New Jersey hospitals' medical malpractice insurance premiums jumped an average of 250% in the past three years, and 65% of facilities said skyrocketing insurance rates are driving some physicians out of the practice of medicine.

Those findings were among the results of a new survey by the New Jersey Hospital Association (NJHA) to gauge the effects of rising medical malpractice insurance rates on the state's health care industry. More than half of NJHA's 106 member hospitals responded to the survey; their responses provided a sobering study of escalating costs, reduced availability of insurance, and ultimately, worries that patients may experience difficulty accessing certain health care services," says **Gary Carter**, NJHA's president and CEO.

"We should consider this information a wake-up call," Carter says. "The fact that malpractice insurance is becoming more expensive is no great surprise. But we should be alarmed that these skyrocketing prices are driving many physicians out of medicine and threaten to have far-reaching effects on our state's health care system."

According to the survey, seven out of 10 New Jersey hospitals experienced increases in their professional liability insurance premiums last year. The average hospital saw its premium jump

from $373,328 in 1999 to $942,539 this year, an increase of 252%. In other findings, the survey showed:

- 78.2% of hospitals said their physicians had experienced sizeable increases in their medical malpractice insurance premiums;
- 74.5% of hospitals said they have had one or more physicians dropped from coverage entirely;
- 64.8% of hospitals said they have had physicians cease practicing medicine or plan to leave the occupation because they were dropped from coverage or could not afford the premium increases.

Who's at the top?

Respondents said OB/GYNs and surgeons were the specialties of physicians who most often reported dramatic malpractice insurance price hikes. In this survey, only hospital executives were surveyed. Their responses included reports on malpractice insurance premiums for physicians within their facilities. Respondents were asked about the impact rising rates have had on their hospitals. Many cited the overall fiscal impact on hospital budgets.

One hospital administrator called the impact a "direct hit to the bottom line, which means less money for salaries, equipment, supplies, building maintenance, etc." The survey also asked respondents' opinions on the potential future impact of skyrocketing medical malpractice insurance rates. The most common response? A loss of ability for hospitals to provide specialty services to their communities.

NJHA general counsel **Betsy Ryan** says the survey results send a loud warning that increasing malpractice premiums will hurt patient care.

"These survey responses make it clear that what's at stake is much more than hospitals' bottom lines and physicians' earnings," Ryan says. "Without relief from these rapidly escalating premiums, more and more physicians will be driven out of health care, and hospitals will face difficult decisions about what services they will — and will not — be able to provide. It's the patient who will feel the ultimate impact." ■

Insurance carrier says device can avoid injuries

A multistate hospital liability insurance carrier has recommended Encision's AEM Surgical Instruments to its client hospitals as a way to reduce the risk of inadvertent injuries during surgery.

Columbus, OH-based OHIC Insurance Co. has informed its client hospitals that, "in light of recommendations from several professional societies, OHIC is recommending that hospitals and surgery centers consider acquiring equipment that protects patients from stray electrical current during laparoscopic surgical procedures. OHIC suggests you investigate the use of AEM instruments to prevent unintended electrical burns to the patient during laparoscopic surgery."

James A. Bowman, Encision president & CEO, explains that AEM Laparoscopic Instruments address a well-documented patient safety risk in surgery. Encision's AEM Laparoscopic Instruments are "shielded and monitored" to prevent stray burns to unintended tissue, a patient safety risk in minimally invasive surgery that has received increasing attention in recent years. AEM technology has been recommended and endorsed by sources from a number of groups surrounding minimally invasive surgery: surgeons, nurses, biomed engineers, the medicolegal community, malpractice insurance carriers, and other electrosurgical device manufacturers. ■

FDA urges recall of some gynecological devices

The U.S. Food and Drug Administration has urged a manufacturing firm to recall potentially dangerous gynecological surgical devices that may be mislabeled as sterile, and the agency cautions risk managers that they should be on the lookout for the items in their own facilities.

The devices were manufactured by A & A of Alpharetta, GA, and distributed internationally, the FDA said in a statement. The firm also does business under the name A & A Medical, Rocket USA, and LifeQuest, the regulatory agency said.

David W. Feigal Jr., MD, MPH, director of the FDA's Center for Devices and Radiological Health, issued a letter addressed directly to health care risk managers. He cautions that the

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items manufactured by A & A Medical "may not have undergone sterilization even though they may be labeled as sterile or ethylene oxide-processed. As a result, these devices could cause serious and possibly life-threatening infections."

The recall includes all products labeled as sterile and shipped since 1999 nationwide and internationally. Feigal explains that the products may be sold by firms other than A & A Medical and its other company names. The FDA is working to identify all distributors of the products, and a list of distributors and the products they receive from A & A Medical is being placed on FDA's web site at www.fda.gov/cdrh/recalls/recall31402.html.

The recall includes all products manufactured under the name A & A Medical, Rocket USA, or LifeQuest that are labeled as sterile or as ethylene oxide processed. The firm manufactures numerous OB/GYN and surgical devices. The recall includes, but is not limited to, curettes (flexible and rigid), uterine dilators, fetal blood samplers, and laparoscopy accessories. A list of known products is attached.

The FDA's advice

The FDA advises against using any A & A Medical, Rocket USA, or LifeQuest products. This is a partial list of items manufactured by A & A: curette (flexible and rigid, all sizes), collection set tubing, aspiration sets, laminaria, IUD removal instruments, mucus samplers, biopsy pipettes/endometrial sampling sets, uterine sounds, Pratt dilator set, ovum forceps, tenaculum forceps, needle extenders and guide, fetal bladder drain, fetal blood sampler, harvesting pump and accessories, loop/ball electrodes, laparoscopy accessories.

The agency also suggests you periodically consult the FDA web site for a listing of distributors of A & A Medical products. If you have any products from these distributors, contact the distributor for further instructions. Not all of the distributors' products may be affected by this recall.

For more information, the FDA suggests calling the company at (800) 424-1234 or (770) 343-8400. You also can contact the FDA's Center for Devices and Radiological Health in Rockville, MD, at (800) 638-2041. ■

Joint Commission urges patients to speak up

Two of the nation's leading advocates of health care quality and safety have launched a national campaign to urge patients to take a role in preventing health care errors. Dubbed "Speak Up," the groundbreaking program sponsored by the Joint Commission on Accreditation of Healthcare Organizations encourages patients to become active, involved and informed participants on the health care team.

The simple steps are based on research that shows that patients who take part in decisions about their health care are more likely to have better outcomes. Such efforts to increase consumer awareness and involvement are supported by the Centers for Medicare & Medicaid Services (CMS).

The next step

Dennis S. O'Leary, MD, Joint Commission president, announced the initiative and said it was the logical next step in the health care industry's efforts to reduce medical errors.

"Everyone has a role to play in preventing health care errors," he says. "Physicians, health care executives, nurses, and other health care workers are already working hard to address this

ongoing problem. It is now time for patients themselves to become part of this effort."

To help prevent health care errors, patients are urged to "Speak Up." The advice for patients spells out the words "Speak Up:"

• **S**peak up if you have questions or concerns, and if you don't understand, ask again. It's your body and you have a right to know.

• **P**ay attention to the care you are receiving. Make sure you're getting the right treatments and medications by the right health care professionals. Don't assume anything.

• **E**ducate yourself about your diagnosis, the medical tests you are undergoing, and your treatment plan.

• **A**sk a trusted family member or friend to be your advocate.

• **K**now what medications you take and why you take them. Medication errors are the most common health care errors.

• **U**se a hospital, clinic, surgery center, or other type of health care organization that has undergone a rigorous on-site evaluation against established state-of-the-art quality and safety standards, such as that provided by JCAHO.

• **P**articipate in all decisions about your treatment. You are the center of the health care team.

The Joint Commission and CMS urge health care providers to promote the "Speak Up" campaign to patients and offers materials to help. On the Joint Commission web site, at www.jcaho.org/speakup_bro_mpfrm.html, you can download a "Speak Up" brochure with instructions for how to customize it with your own logo. There also are instructions for how a printing company can turn the computer file into a brochure for you. ■

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CA providers advised on safe prescribing, education

As part of an ongoing campaign to promote patient safety, the California Medical Association (CMA) and a group of liability insurers are sending recommendations for safe prescribing and measures for educating patients about proper medication use to 50,000 providers.

"Safe Medication Principles" was developed by physicians and risk managers representing the 35,000-member CMA and three physician-sponsored professional liability insurers MIEC, NORCAL, and SCPIE, which collectively insure most California physicians. The document encourages physicians to ensure that their patients understand the proper use and potential side effects of their medicine, says **John Whitelaw**, MD, CMA president. Statewide dissemination of the principles is part of a new focused program by CMA and the liability insurers.

Based on recommendations from a number of medical and liability experts, the principles are reminders of good medical practices. They are part of an overall effort to reduce patient injuries, which may be caused by illegible handwriting, unclear prescription information, duplication of prescription drugs, and inadequate patient understanding about the medications they take. To ensure that prescriptions are clear to pharmacists, Whitelaw says the principles emphasize the use of legible, standardized abbreviations and terminology on prescriptions, improved documentation of medications and refills, and close monitoring of the effectiveness and potential side effects of prescribed drugs.

Whitelaw also says physicians must be aware of all pharmaceuticals and other substances such as herbs and food supplements that their patients receive, in order to reduce medication interactions and other problems. Improving patient adherence to medication advice and reducing the risks of adverse reactions require a strong partnership between patients and their physicians, he says.

The CMA principles can be assessed on-line at www.cmanet.org. Look under "For Your Information" on the home page. ■

Healthcare Risk Management's
Legal Review & Commentary™
A Monthly Supplement

Catastrophic brain damage follows insulin overdose: $4 million present-dollar settlement in California

By **Jan J. Gorrie**, Esq., and **Mark K. Delegal**, Esq.
Pennington, Moore, Wilkinson, Bell & Dunbar, PA
Tallahassee, FL

News: A 43-year-old diabetic man was hit by a car while riding his bike. He was admitted to a hospital and found to have sustained a closed head injury and multiple fractures. Three weeks later, while his condition was improving, he underwent a flap / graft procedure. An anesthesiology resident administered 1,000 units of insulin, which he then attempted to correct by giving the patient approximately 65 amps of dextrose 50%. The massive dose sent the patient's blood glucose to 3,800, which caused a global anoxic cerebral injury, and he went into a hyperosmolar nonketonic coma.

The injuries were so severe that the plaintiff can never recover. The suit against the providers was settled prior to trial for a present-dollar amount of $4 million.

Background: The plaintiff was struck by a car while riding his bicycle. The 43-year-old was taken to a hospital with a closed head injury, and fractures to his ribs and left lower leg. He was hospitalized for the next several weeks and, despite the severity of his injuries, was beginning to improve.

Seventeen days after the accident, while undergoing a flap / graft procedure to address one of his injuries, an anesthesiology resident incorrectly administered 1,000 units of insulin to the patient. The resident attempted to correct the situation by immediately giving the patient 60 to 70 amps of dextrose 50% (D50, which is highly concentrated sugar water) to offset the massive dose of insulin. This antidote sent the plaintiff's blood glucose to 3,800; a normal glucose reading is approximately 120.

Generally prior to surgery and throughout the postoperative recovery period, diabetic patients are placed on short-action insulin, which dissipates within two hours. This is done so that the insulin level can be monitored and properly adjusted. However, the normal dose of insulin is far less than 1,000 units.

The significant overdose of insulin combined with the large-dose D50 elevated the patient's blood-glucose level and caused severe seizures, which led to a global anoxic cerebral nonketonic injury, secondary to hypoxia, hypotension, and metabolic derangement. This also caused the plaintiff to suffer a hyperosmolar nonketonic coma, complicated by acidosis, hypotension, and seizures refractory to medication. The insulin overdose, the large quantity of dextrose 50%, and the patient's pre-existing head injury resulted in severe brain damage. The patient now receives around-the-clock care and his long-term prognosis for gaining any level of independence is negligible.

The plaintiff claimed gross negligence by the hospital physicians and health care personnel assigned to him. The plaintiff maintained their negligence resulted in his massive brain injury and loss of independence. The defendants argued

that the plaintiff was destined to have the same long-term neurological damage that he presently lives with. The hospital and providers denied that any act or omission on the part of its employees caused or contributed to the plaintiff's already compromised neurological condition. The plaintiff's expert maintained that if not for the incident 17 days after the accident, the plaintiff would have been rehabilitated enough to live independently, been able to communicate and ambulate, and have full bowel and bladder function.

The plaintiff also claimed there was a malfunction with the Bayer glucometer, which was used during surgery. The Bayer Corp. was dismissed in exchange for a waiver of costs.

Before trial, the hospital settled with the plaintiff for $2 million, with a present value of $4 million and a life-expectancy payout of more than $10 million. The hospital also agreed to satisfy any lien claims by MediCal or other entities concerning plaintiff's medical care administered in any of its facilities.

What this means to you: Cases involving overdoses by health care practitioners are difficult to defend.

"Despite any evidence that may have been available regarding the long-term effects of the neurological injuries suffered by this patient as a result of being hit by a car while riding a bike as compared with the injuries suffered at the health practitioner's hand, it is very unlikely that a jury would overlook such a massive overdose," states **Cheryl A. Whiteman**, RN, MSN, CPHRM, a risk manager for Cigna Healthcare of Florida Inc., whose opinion does not necessarily reflect Cigna's. "The insult of these drugs on the patient's system undoubtedly eliminated any chance this man might have had to be rehabilitated to the point of providing basic care for himself."

"In summary, to the extent practically anything that a facility can do to mitigate human error should be instituted."

Overdose by definition implies that too much has been administered, inferring the standard of care has been violated and a medical error has occurred. Following reports on medical errors in the early 1990s by the *New England Journal of Medicine*, which noted that the overall systems as opposed to the misdeeds of individuals were often the core problem, most facilities demanded and got more standardized equipment and automated methods for ordering and administering medications.

Accordingly, "the system that supplies medications to the anesthesiologists would need to be evaluated. First, determine if insulin and D50 are controlled in any way. Needless to say, the drugs should have been clearly marked and multidose vials should be clearly labeled in large print, and if that was not the case then a systems overhaul should be implemented. Since insulin is most commonly supplied in multidose vials, this makes labeling critical. Second, drugs should be stored in such a way that those with similar names or spellings are not stored together. This should be the case whether the drugs are stored on a shelf for dispensing or on a cart used by one anesthesiologist from case to case. Every opportunity should be taken to improve the system that makes such large quantities of medication available. If such a system does not exist, a long-term evaluation program could be established to review all anesthesia-related medication errors. The implications of near misses can also be effective in evaluating the medication supply system to the anesthesiologists," states Whiteman.

Once an overdose occurs, as in this case, the system for distributing and labeling medication and the knowledge and training of the medications administering staff should be carefully examined. In particular, following review of the systems, the single most important factor will always be people.

"While it is critical to evaluate the systems that allowed this error to occur, it is also important to ascertain the competence of the anesthesia resident that administered these drugs. One must query as to how much experience this physician had, and investigate just how much supervision he was receiving prior to and during the incident and whether or not the level of supervision was appropriate. It would seem that this resident should have sought immediate assistance from his supervising physician before trying to correct the gravity of the first error, the insulin overdose, with dextrose. Administering multiple ampoules of highly concentrated dextrose poses a threat in terms of a blood-sugar level beyond what the organs of the body, especially the brain, can withstand, as evidenced by the anoxic cerebral injury and hyperosmolar nonketonic coma. The patient's head injury may have also made him more susceptible to injury from the rapid injection of a

significant amount of fluid. Of course, this situation would require immediate peer review under the auspices of the residency program. The risk manager would want to make sure that a fair but thorough review of the program and the situation is conducted and that an appropriate plan for improvement is devised and achieved," adds Whiteman.

"In summary, to the extent practically anything that a facility can do to mitigate human error should be instituted. And, barring systemic errors, seasoned practitioners as well as those in training should be supported in their endeavors," concludes Whiteman.

Reference

• *Steven L. Watson and Linda Watson vs. The Regents of the University of California and Bayer Corp.*, San Diego County (CA) Superior County, Case No. 726938 consolidated with 730944. ■

Post-delivery trouble: $350,000 VA verdict

News: After delivering her third child, a woman was taken to a hospital room. Soon afterward, her husband said, she stopped breathing and turned blue and that he then immediately called for the unit nurse. The unit nurse did not attempt to treat the patient. She called a code, and the code team resuscitated the patient. As a result, the plaintiff claimed that she suffered a hypoxic event, which caused a brain injury. She brought suit against the providers, and a jury awarded her $350,000.

Background: The woman was admitted to the hospital for the birth of her third child. During the course of a difficult labor and eventual cesarean section, she was given pain medications, sedatives, and anesthesia. After delivery, she was taken to her hospital room, where a nurse gave her another shot of morphine. The plaintiff's husband testified at trial that shortly after receiving the additional dose of medication, his wife stopped breathing and turned blue. The floor nurse testified that the plaintiff did stop not breathing, but merely had depressed respirations and was nonresponsive.

When the patient's husband alerted the floor nurse, both the husband and nurse agreed that the nurse called a code but failed to attempt any corrective measures herself. Minutes later, the plaintiff was resuscitated by the code team but the plaintiff claimed that in the interim, she suffered a hypoxic event — lack of oxygen to the brain, which resulted in brain injury to the right frontal lobe. In addition, she claimed to suffer from negative affect disorder, depression, tremors, and profuse sweating. The patient brought suit against the providers for the failure to timely and appropriately treat her respiratory arrest. The jury awarded her $350,000.

The plaintiff's expert testified that the claim was valid, saying the nurse violated the standard of care by failing to properly evaluate the patient's condition and by failing to administer oxygen or attempting to resuscitate the patient while waiting for the code team to arrive. The expert said this resulted in the patient's brain damage and generalized anxiety symptoms.

The defense argued that the plaintiff never stopped breathing, but that she had depressed respirations and was merely nonresponsive. The defendant's expert averred that the plaintiff was not deprived of oxygen for a sufficient period of time to sustain the injury alleged by her, and that the plaintiff's symptoms were, in fact, the result of earlier traumatic life events triggered by postpartum depression.

The jury sided with the plaintiff, awarding her $350,000.

What this means to you: Difficult labor mixed with various medications can lead to complications. This case illustrates what can happen when seemingly routine situations, such as the postlabor and delivery care of a three-time mother, are not carefully monitored.

"This patient was undoubtedly at risk for depressed respiratory effort, but that risk was seemingly not addressed by her caregivers," states **Cheryl A. Whiteman**, RN, MSN, CPHRM, a risk manager for Cigna Healthcare of Florida Inc., whose opinion does not necessarily reflect Cigna's. "It would be a reasonable assumption that her difficult labor had exhausted her. During her labor and ultimate cesarean section, she was given pain medications, sedatives, and anesthesia. The cumulative effects of these various drugs are difficult to predict. Once another dose of morphine was administered on the unit, the unit nurse should have checked on this patient frequently, assessing vital signs and

mental status. The combination of multiple drugs and exhaustion had an obviously negative impact on her patient."

Even though patients generally maintain contact with their admitting physician throughout their hospitalization, nurses are the principal caregivers in most instances. While physicians issue standing orders, there are no such orders to resuscitate patients that stop breathing. It is simply a nurse's duty to attempt to revive a patient unless there are specific "do-not-resuscitate" orders, which was not the case here.

"It would be difficult for the defense to justify the floor nurse's actions. Certainly the standard of care demands an assessment of the patient's condition regardless of how many children the patient had previously birthed," Whitman adds. "Interestingly enough, the hospital maintained that the patient never stopped breathing. However, if this were the case, one wonders why the nurse summoned the code team. In evaluating a code situation, the first step is to try to elicit a response from the individual using both verbal and physical stimulation. For example, the nurse should have shaken the patient by her shoulders while asking if she were all right. A code is generally called when the patient is unresponsive and in the absence of a pulse, absence of respirations, or absence of both. Had the patient experienced a respiratory arrest, the nurse should have called for help and immediately initiated cardiopulmonary resuscitation, utilizing the one-rescuer technique until help arrived. The administration of oxygen is of no value in the absence of respirations and circulation. On the other hand, had the patient continued to breathe spontaneously, but at a depressed rate, the first line of action would be to administer oxygen and attempt to arouse the patient enough to stimulate deeper breathing.

"It is evident that the nurse did not meet the standard of care. First, there was no assessment of the patient's true situation," Whitman says. "Second, the appropriate interventions were not initiated based on the assessment. In order to mitigate the occurrence of such omissions in the future, the risk manager could assess the staff's competence regarding Basic Cardiac Life Support. This certification should be mandatory for bedside nurses, and perhaps for the entire nursing staff. Each staff member should participate in regular refresher courses or drills. In addition, nurses who are responsible for patients in high-risk areas, such as obstetrics, where some patients receive narcotics and anesthesia, should be required to maintain proficiency in understanding the effects of these drugs by themselves and in combination. This could be achieved in a classroom setting or in supervised clinical practice."

Reference

- *Dickson vs. Barnes, et al.,* Alleghany County (VA) Circuit Court, Case No. 970000-76. Jeanne M. Hepner of Lexington, VA, for the plaintiff. ■

BIOTERRORISM WATCH
Preparing for and responding to biological, chemical and nuclear disasters

Traumatized health care providers may need stress counseling in horrific aftermath of bioterror attack

A severe test for a mentally tough profession

In a finding that is likely relevant to many other states, a recent tabletop exercise in Columbus, OH, found that the health care system may be better prepared to deal with bioterrorism victims than the traumatized frontline providers who give them care.

The exercise was conducted by the Ohio Senior Interagency Coordinating Group in Columbus.

After running a scenario involving intentional release of pneumonic plague at a rock concert, emergency preparedness officials discovered there was little in place to address the mental health needs of doctors and nurses in the horrific aftermath. In the exercise, an attack with *Yersinia pestis* resulted in 332 fatalities, 720 hospitalizations, and 4,300 people who were examined and released.

"How do you handle all of the nurses and doctors who have seen many, many deaths, who have tried to decrease panic by remaining calm, and who have survived this huge confusion and turmoil?" asks **Kay Ball**, RN, MSA, CNOR, FAAN, a participant in the exercise and perioperative consultant and educator at K & D Medical in Lewis Center, OH. "What about their mental health? That is something that we found that we are weak in. We really have to develop that better."

The hypothetical event began Friday, March 15, when a popular regional band performed at Shawnee State University in Portsmouth, OH. Approximately 2,000 students and community members went to see the band, which is known for its use of smoke and visual enhancements, according to the scenario. **(See tabletop timeline, p. 3.)**

"[The terrorists] aerosolized the agent in a fogging system and that is how it was spread throughout the building." says **Darren Price**, exercise training officer with the state of Ohio Emergency Management Agency in Columbus.

The players take their seats

The exercise had four groups of about nine people, each working at different tables as the events unfolded. The groups were health / medical, law enforcement, fire / emergency medical services, and government. An audience of about 150 people was on hand to observe and evaluate the exercise.

"The whole purpose was to determine our strengths and weaknesses through the disaster that happened," says Ball, who served as facilitator and discussion leader of the health / medical group. "The planning committee will meet and analyze what we learned from this, and then we will bring back everybody who participated."

The scenario was divided into three phases: incubation, response, and recovery. Each phase received about an hour of discussion at the tables, and all players received updated information at the same time. **(See tabletop tips, p. 2.)** The scenario was necessarily arbitrary but designed to

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test the state's resources at many levels, Price notes.

"Anytime, you are dealing with tabletop exercises there are a lot of assumptions and artificialities built in just to make it flow," he says. "We ask [participants] to bring their emergency operations procedures and plans, and to actually react based upon their plan."

While the exercise is still being analyzed, the mental health needs for medical providers became apparent in playing out the scenario. Part of the problem is the historic perception that health care workers must not succumb to the emotional toll of patient care, Ball says.

"Even in surgery today, if we lose a patient on the table, there is nothing really in place to talk about the trauma the practitioners are going through," she says. "We just think that we are these stalwart people and we can't crumble under emotional strains. That was one of the [identified] weaknesses."

In contrast, firefighters and emergency medical service workers had a more thorough stress debriefing process than their hospital-based counterparts.

"Within the hospitals themselves we really don't have the mental and spiritual health that we need," she says.

Moreover, the scenario projected widespread "psychological manifestations" in the affected area, with students withdrawing from school and residents reluctant to return to their homes. Bioterrorism response planners brainstormed about how to fight the problem, including bringing in celebrities and public officials to show it was safe to return to the stricken area.

The scenario included a short delay in determining the etiological agent, with chaos building before plague was confirmed as the infecting pathogen. Even with the new emphasis on bioterror education, that scenario is fairly realistic because so few clinicians have seen infections caused by the potential bioterrorism pathogens.

"The first problem was what kind of a bug was it?" Ball says. "Where do we send the cultures, and how fast can we get them back?

The scenario also had many students leaving on spring break. Given the anticipated exodus of people from the community — particularly into the neighboring states of Kentucky and West Virginia — there was no attempt to set up mass quarantine areas, Price says. Instead the national stockpile of antibiotics was called up and confirmed or suspect cases were treated and isolated.

"We looked at the issue of quarantine and determined it was not really feasible," he says. "You would have these large [quarantine] circles everywhere. We moved more toward isolation [of patients] at that point."

While identifying a weakness in mental health care, the planners found communications were strong between groups, there were no turf battles, and additional resources became available quickly.

"One of the strengths that we found was that we were able to get supplies in and to call in extra people," Ball says. "We were able to pull in lots of people very rapidly. We are learning how to work more with all of the other diverse factions."

Indeed, the exercise was set in a rural area so that resources would be taxed, reaching thresholds that would trigger state response, Price adds.

"We're better prepared today than we were yesterday," he says. ■

Bioterror tips for running a tabletop

Planners of a recent bioterrorism tabletop exercise in Columbus, OH, **(see cover story for more information)** offered the following tips for participants in the exercise:

- The scenario is plausible, and events occur as they are presented.
- There are no hidden agendas or trick questions.
- All players receive information at the same time.
- There is not a "textbook" solution. Varying viewpoints and possible disagreements are anticipated.
- Respond based on your knowledge or current plans and capabilities.
- Current agency or department policies and procedures should not limit discussion and development of key decisions.
- The outcome is neither intended to set precedents or reflect an organization's final position on specific issues.
- Assume cooperation and support from other responders and agencies.
- Speak up! Talk to your colleagues and ask questions. This is your chance to learn how other agencies in your community would respond in an emergency. ■

Dire straits: Plague released at concert

Tabletop scenario from first case to aftermath

Highlights of a recent bioterrorism tabletop exercise run by planners in Ohio **(see cover story for more information)** included the following timeline of events:

Sunday, March 17, 2002, Portsmouth, OH

8:00 a.m.: At the emergency department (ED) of Southern Ohio Medical Center (SOMC), a doctor has just come on duty and sees her first patient, a 22-year-old woman. The patient's sister says the woman has been complaining of chest pain and has a temperature of 102 degrees F. The sister worries that the patient may have caught the "bug" through her position at the Shawnee State University (SSU) dormitory mailroom where she works part time. A rapid flu test shows a negative result.

The physician is suspicious in light of the national anthrax cases five months earlier and orders a sputum and blood culture. Transport assistance is requested for sending the cultures to the Ohio Department of Health (ODH) laboratory for anthrax testing. The woman is admitted. The Portsmouth City Health Department and Scioto County District Board of Health are notified of the situation. In turn, the ODH and Ohio Emergency Management Agency (EMA) duty officer are called.

2:00 p.m.: The 22-year-old woman admitted to SOMC earlier this morning develops severe respiratory complications and dies. A full autopsy is ordered, and the physician awaits the preliminary results of the sputum and blood cultures. As the day progresses, local emergency medical services (EMS) become overwhelmed with patients presenting with flu-like symptoms. People presenting with the most severe symptoms, including high fever and difficulty breathing, are hospitalized; however, with many more sick waiting in the ED, the hospital beds and wards are filling rapidly.

5:00 p.m.: Traffic around SOMC becomes impassible, and several ambulances are severely hindered. Medical facilities request security assistance from local law enforcement agencies.

10:00 p.m.: Six patients admitted during the day with the severe flu-like symptoms also die. New cases continue to arrive at SOMC with an increase in the number of patients reporting each hour.

Monday, March 18

8:00 a.m.: Overnight, a public health emergency was declared in Scioto County. A request was made by Scioto County Health, via the Scioto County EMA and elected officials for state support in the growing crisis.

A Level 2 emergency status is reached in Scioto County. The state assessment room is activated to support the events in Scioto County.

10:00 a.m.: The preliminary tests of clinical specimens taken from the 22-year-old woman who died Sunday are complete. The ODH Lab notifies the local health departments that the specimens have tested negative for *Bacillus anthracis.* The laboratory begins rule-out testing for other pathogens.

3:00 p.m.: Epidemiological evidence points to an event three days earlier as a common activity of the majority of new patients. On Friday, March 15, a popular regional band performed at SSU in Portsmouth. The band is well known for use of visual enhancements. Approximately 2,000 students and community members attended the concert.

4:00 p.m.: Hospital supplies are insufficient to meet demand. Fifteen additional patients have died, and 111 are listed in critical condition. Reports now include similar symptoms among several health care workers and first responders. SOMC hospital beds are full.

5:30 p.m.: ODH Lab staff notifies Scioto County local health officials that the 22-year-old patient's cultures are preliminarily positive for *Yersinia pestis.* Local health officials inform local health care professionals and EMS personnel that, in order to prevent the spread of disease, patients having confirmed pneumonic plague should be isolated until sputum cultures are negative for *Y. pestis* bacilli.

Those suspected of having pneumonic plague should be isolated for 48 hours after antibiotic treatment begins.

Wednesday, March 27

It has been 10 days since the first victims arrived at SOMC and local clinics. There have been no further cases of illness identified in Scioto County in the past seven days.

Waiting for signs of recovery

Resources begin to flow into the area as a result of national public outreach. Visitors, however, avoid the area and the impact of the event on the local economy becomes apparent as local businesses are slow to reopen.

The psychological manifestations associated with this event are widespread. Although school reopens, many students withdraw from classes for the quarter. Local residents, still frightened and shocked, look to local and state officials for guidance as they attempt to return to normalcy. ■

Winds of war: Researchers track airborne anthrax

A strikingly rapid and wide dispersion

Struck by the surprising level of aerosolization after merely opening an envelope, Canadian researchers are now using a spore surrogate to study how airborne anthrax silently spreads within an office building, *Bioterrorism Watch* has learned.

Researchers are using *Bacillus globigii* spores to simulant the movements of *Bacillus anthracis* in a one-story research building at the Defence Research Establishment Suffield (DRES) at the Canadian Forces Base in Suffield, Alberta, says **Kent Harding,** chief scientist at DRES. "We will be looking at movement between actual offices along corridors using the *B. globigii* as a simulant. It is a spore-like material that is a well-accepted simulant used to assess and challenge biological detection apparatus." The DRES is on the cutting edge of bioterrorism research; scientists there were studying the dispersion of anthrax from envelopes prior to Sept. 11 and its aftermath. In response to an anthrax hoax mailing in Canada in February 2001, the DRES conducted a study last year using an 1,800 cubic foot test chamber to represent an office space. "We had a hoax letter in this country that closed down a major federal office building," he says. "We were interested in [determining] had it been a real infectious material in the envelope, what was the extent of the risk? We went to the scientific literature and really didn't find anything."

It was hypothesized that opening an envelope constituted a "passive form of dissemination" that would produce minimum aerosolization of spores unless additional energy was added via panic behavior or strong airflows, the researchers stated.[1]

"Our scenario was in a chamber, which was conducive to studying the movement of materials on air currents." Harding says. "An individual was given a stack of envelopes and told to keep opening them until powder fell out. When that happened, [he or she] stood quietly by the desk and didn't move for 10 minutes. We just looked at the movement of material around the room, just simply as a consequence of opening the envelope and pulling out a piece of standard 8½ by 11 paper folded in three." Almost immediately upon opening the envelope, a significant aerosol concentration was observed in the area of the "desk." It declined slowly over the 10-minute sampling period, but the high-resolution slit sampler plates used to measure the release became densely packed with bacterial colonies. In the study, significant numbers of respirable aerosol particles were released upon opening envelopes containing 0.1 g or 1.0 g of *B. globigii* spores. A potentially deadly dose could be inhaled within seconds of opening an anthrax spore-filled envelope. Also, the aerosol quickly spread throughout the room so that other workers, depending on their exact locations and the directional airflow within the office, would likely inhale doses. There was very heavy contamination on the back and front of clothing worn by the test subject.

"There was a large dose presented to the person opening the envelope, which was not unexpected," Harding says. "But what was surprising was the very rapid and extensive movement around that room simply as consequence of the movement of normal air currents. It distributed around the room very quickly and in fairly high quantity."

The researchers also found that the spores could escape from a sealed envelope, a phenomenon that caught U.S. investigators off-guard during the 2001 attacks. "We did note that in a standard envelope sealed in the usual way — just with licking the glue on the back of — that there are substantial openings on the back of the envelope," he says. "In fact, the 'envelope people' design them that way so you can get a letter opener inside. Spores did escape from those openings, but we never quantified that and never referred to it to anything more than an anecdotal manner."

The Centers for Disease Control and Prevention (CDC) in Atlanta was apparently unaware of the study during the initial stages of the U.S. anthrax attacks. Whether it would have made any difference is impossible to say, though some wonder if it would have resulted in more aggressive treatment of postal workers.[2] Regardless, the CDC decision to administer antibiotics to a broad range of people, not just those in the immediate exposure area, is reinforced by the study, Hawkins says. The Canadian researchers have now fully briefed the CDC about the study and their ongoing research.

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