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IN THIS ISSUE

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TOPOFF showdown: Mask confusion reigns in terrorism drill in CT and NJ

The CDC and OSHA sought a compromise on masks vs. respirators

If another major terrorist event occurs in the United States, the protection of health care workers may be affected by confusion over who's in charge and what respiratory protection is needed, safety experts say.

Those issues arose from the recent TOPOFF3 exercise in New Jersey and Connecticut — an extensive anti-terrorism drill that simulated biological and chemical terrorist attacks. The drill involved about 84 New Jersey hospitals and 32 Connecticut hospitals, with volunteer actors who flooded hospitals as panicked "patients." The drill involved more than 10,000 "deaths" and more than 30,000 casualties.

Even before TOPOFF3 began, the Centers for Disease Control and Prevention (CDC) in Atlanta and the U.S. Occupational Safety and Health Administration (OSHA) clashed over what respiratory protection should be used against pneumonic plague in the exercise — and in the case of a real-life event. That issue also arose in TOPOFF2, the previous exercise held in Chicago in 2003, and was never resolved.

OSHA insisted that fit-tested filtering facepiece respirators should be used in such a bioterrorism event because public health authorities wouldn't immediately know enough about the organism, which could be genetically engineered to be more transmissible. The CDC asserted that, because pneumonic plague is spread through droplets, surgical masks would be sufficient as barrier protection. **(For more on the issue of surgical masks vs. respirators, see *Hospital Employee Health*, June 2005, p. 65.)**

The New Jersey Department of Health and Senior Services in Trenton stepped in with guidance on personal protective equipment (PPE). **(See "NJ issues respirator guidance," p. 83.)** "We were, certainly prior to TOPOFF and during TOPOFF, doing our very best to harmonize the messages between CDC and OSHA on how health care workers could best protect themselves," says **James Blumenstock**, the agency's deputy commissioner for health protection and preparedness.

Leadership conflicts occur, as well, regarding the role of local vs. federal

authorities, says **Joseph T. Hughes Jr.**, director of the National Institute for Environmental Health and Safety Worker Education & Training Program in Research Triangle Park, NC.

"When we get into these mass casualty disasters of national significance, it becomes fuzzy whether local people make the decisions or whether federal people tell you want to do," he says.

In the TOPOFF3 exercise, the New Jersey Hospital Association (NJHA) in Princeton took a leading position providing some cohesiveness among the hospitals. They held conference calls every morning of the exercise to update hospitals and answer questions. They took their guidance from the New Jersey Department of Health and Senior Services, says **Valerie Sellers**, MHA, CHE, NJHA's senior vice president for health planning and research.

The backdrop of bioterrorism revealed how agency disagreements could affect emergency response. OSHA and CDC tried to resolve the respiratory protection conflict and actually forged a compromise. That guidance on pneumonic plague, which appeared briefly on the CDC web site, stated that hospitals should use N95 filtering facepiece respirators in a bioterrorism event involving pneumonic plague. But if the respirators weren't available or hadn't been fit-tested, health care workers could wear surgical masks or nonfit-tested respirators because pneumonic plague is transmitted by droplets, the guidance said.

"We felt it would be prudent to step up the level of PPE in an event like that to protect workers," says **Don Wright**, MD, director of OSHA's Office of Occupational Medicine, who helped forge the compromise. "We felt it was potentially a mistake to assume that pneumonic plague used in a weaponized event would be the same as one that occurred in a naturally occurring event.

"They went from a document that surgical masks were adequate to protect health care workers to the statement that it might be prudent in the event of a bioterrorism event to up the level of protection. We were pleased with that result," he says.

However, unions that represent health care

(Continued on page 84)

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Editorial Questions

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Correction

In an article on rapid HIV tests in the April 2005 issue of *Hospital Employee Health*, the explanation of the specificity and sensitivity of the tests was misstated. It should have stated that specificity identifies the number of false positives produced by the test. The whole blood version of OraQuick Advance produces no false positives (specificity=100%), and the plasma and oral fluid test produces one false positive for every 1,000 tests performed (specificity=99.9%). It will result in four false negatives per 1,000 tests (sensitivity=99.6%) in the whole blood and plasma versions, and seven false negatives per 1,000 (sensitivity=99.3%) for oral fluid.

The new Multi-Spot HIV-1/HIV-2 Rapid Test produces no false negatives (sensitivity=100%) and seven false positives per 10,000 tests (specificity=99.93%) for serum and nine false positives per 10,000 tests (specificity=99.91%) for plasma.

We apologize for the error. ■

NJ issues respirator guidance

To resolve disagreement about what protection is needed to treat victims of bioterrorism when the agent is pneumonic plague, the New Jersey Department of Health and Senior Services (NJDHSS) in Trenton issued this guidance:

> NJDHSS recognizes the challenges in reconciling conflicting infection control guidance from our federal partners, CDC and OSHA, as they continue to argue for their respective recommendations. These same issues have remained unresolved since TOPOFF2, and it is likely that these issues will continue throughout TOPOFF3. Therefore, NJDHSS will continue to provide our best interpretations of federal guidance as it evolves. As additional information for your TOPOFF3 preparatory activities, please review the message below regarding (1) NJDHSS clarification of CDC's "Interim Guidance for Protecting Health Care Workers Caring for Patients Potentially Exposed to Aerosolized *Yersinia pestis* from a Bioterrorism Event," (2) contacts of plague patients, and (3) historical information on person-to-person transmission of pneumonic plague. NJDHSS thanks you in advance for all your efforts related to next week's exercise.

1. NJDHSS would like to clarify the CDC "Interim Guidance for Protecting Health Care Workers Caring for Patients Potentially Exposed to Aerosolized *Yersinia pestis* from a Bioterrorism Event."
   The interim guidance mentions the following:
   (1) Case reports describing occurrences of pneumonic plague have found that transmission of *Y. pestis* from persons (or animals) with pneumonic plague usually occurs among persons in direct and close contact with the ill person (or animal). . . . Therefore droplet precautions have been recommended for health care workers caring for patients with pneumonic plague.
   (2) "When there is a suspicion of a biological attack, infection control practice should include airborne and contact precautions. Historical and contemporary epidemiological evidence from naturally occurring pneumonic plague outbreaks indicates that the infection is not easily transmitted from person to person, and that a surgical mask in combination with other droplet precautions provides adequate protection for health care workers. However, given the initial uncertainties associated with a bioterrorism event, additional precautions may be prudent, and the use of an N95 filtering facepiece respirator will offer an additional degree of protection. Other complementary strategies should also be in place, including temperature monitoring of unprotected close contacts. In addition, the use of antibiotic prophylaxis may be considered. These precautions should be continued at least until a definitive diagnosis is established and antimicrobial sensitivity of the agent is known, and the presence of other agents is ruled out."
   In other words, during the initial response to caring for patients with unknown potentially infectious respiratory illnesses (including situations where bioterrorism is suspected), individuals should use N95 respirators. However, once plague is confirmed (or is ruled out), individuals may then follow standard and droplet precautions, in light of evidence demonstrating that droplet precautions provide adequate protection while working with patients with pneumonic plague. The above information is consistent with previous guidance issued by the NJDHSS. Health care workers should follow standard, contact, and airborne precautions when caring for patients with unknown, potentially infectious respiratory or influenza-like illnesses. Airborne precautions include the use of properly fitted N95 respirators. Once the illness is diagnosed, health care workers should use precautions appropriate for the etiologic agent. For plague, standard and droplet precautions are recommended; current evidence suggests that droplet precautions provide adequate protection while caring for patients with pneumonic plague. A health care worker may choose to wear an N95 respirator; however, surgical masks are considered adequate to prevent infections transmitted via droplets. NJDHSS continues to be actively involved in discussions with the CDC and other stakeholders regarding this matter and will provide updates as they become available.
2. Current CDC guidance defines a close contact as any person who has been within 6-7 feet of a symptomatic plague patient. However, distance cutoffs should NOT be used as a hard and fast rule for identifying contacts who should be monitored for illness or given antimicrobial prophylaxis. In addition to distance, duration and nature of exposure are important factors that should be considered when assessing contacts. For instance, one example of a high-risk exposure that is not necessarily predicated on distance is sharing eating or drinking utensils with a symptomatic pneumonic plague patient.
3. Finally, for your information, please also review the attachment, "Risk of Person-to-Person Transmission of Pneumonic Plague" by Jacob L. Kool, from CDC's Division of Vector-Borne Infectious Diseases (also available in *Clinical Infectious Diseases* 2005; 40:1,166-1,172). This article provides a historical overview regarding risk of *Y. pestis* transmission.

workers were not pleased with the guidance. They later complained about the CDC plague guidance, arguing that surgical masks should not be recommended at all as protection during a bioterrorism attack. CDC withdrew the guidance from its web site, calling it a draft document. **(See *HEH*, June 2005, p. 68.)**

Even during the TOPOFF exercise, conflicting messages caused confusion, says Blumenstock. "I think the TOPOFF3 exercise brought to a head the possible conflicts in policy between CDC and OSHA with regard to the appropriate level of respiratory protection," he says. "In our after-action analysis, that is one of the issues to reflect on."

The decisive factor in choosing respiratory protection is the identification of the organism, says **Eddy A. Bresnitz**, MD, MS, deputy commissioner of New Jersey Public Health Services and State Epidemiologist. "We all said, 'If you're not sure what it is, an N95 is appropriate.' Once you know, a surgical mask is fine. If workers want to have an N95 respirator, they should be provided that, with appropriate fit-testing."

That may prove a sticking point for hospitals where the administration and workers may have different opinions about what level of respiratory protection is adequate.

Can you use gauze?

TOPOFF3 intentionally strained the resources of the participants. In the process, it provided lessons about everything from supplies to staffing.

The incident began when patients arrived at hospitals in Union and Middlesex counties with a mysterious, flulike illness. By the next day, 92 people had died in 12 New Jersey counties and more than 2,000 victims needed care. The disease was identified as pneumonic plague, spread with a sprayer device mounted on an abandoned SUV. The state announced a plan to provide prophylactic antibiotics to health care workers from the national stockpile.

By Day 3, hospitals were overwhelmed, and staff absenteeism was rising. Federal authorities arranged an airlift called "Operation Exodus" to transfer patients to hospitals in Dallas.

By Day 5, the outbreak subsided. About 10,000 people had died, and more than 29,000 had fallen ill. Pneumonic plague affected 28 states.

When hospitals began to run low on respirators and surgical masks, which they placed on patients as well as health care workers, the distributors were instructed to tell them that the supplies had been depleted.

"One hospital actually started using gauze and rubber bands to protect [health care workers]," Sellers notes. "Another cut up bed sheets. The problem with that is that you can run out of bed sheets, too. They tried to find some creative ways to allow for some protection while they awaited replenishment of their supplies."

The exercise forced hospitals to think about supply issues and health care worker protection. "If we can get them to think about it, we would hope an effective response [will be] included in their plan," she says.

TOPOFF3 also assumed absenteeism of hospital staff who feared contracting plague. For example, hospitals were told that 50% of their staff were out. Hospitals had plans to distribute prophylactic antibiotics to the health care workers and their families. "You want to make sure your employees and their family members have access to the prophylactic antibiotics and [will] be protected," Sellers adds. ■

First receivers can rely on protection from PAPRs

CT incident highlights risks of chemical terrorism

In New London, CT, terrorists set off a car bomb on a crowded pier. The explosion at first belies the greater threat: Mustard gas disperses throughout the crowd attending a festival.

As the first patients trickled into the hospital, it was not immediately apparent what caused their symptoms. "No one knew it was a blister agent," says **David Ippolito**, director of Occupational Safety and Health Administration's (OSHA) Office of Science and Technology Assessment. "Because of the very low levels of the material needed to cause blistering of the skin and the sickness that followed, it would not be readily evident that decontamination was necessary."

OSHA offers best practices guidance to hospitals dealing with unknown hazardous material incidents or chemical terrorism in its "first receivers" document, available at www.osha.gov/dts/osta/bestpractices/html/hospital_firstreceivers.html#table1.

In this case, the agency actually lowered the level of respiratory protection required by distinguishing "first receivers" from first responders

who arrive at the scene.

According to the first receivers document, hospitals first must have policies, equipment, and procedures in place to minimize employee exposure. For example, in the zone where newly arrived patients are decontaminated, the victims' clothing must be removed promptly and contained in a way that will not cause further exposure to employees. The hospital must have a hazard vulnerability analysis and emergency management plan. If the release of a hazardous substance occurs near the hospital, so that it takes 10 minutes or less for the victims to arrive, the first receivers' designation doesn't apply because the gas or vapors may not have had time to dissipate.[1]

If criteria are met, first receivers may use the following personal protective equipment (PPE): a powered air-purifying respirator (PAPR) with an assigned protection factor of 1,000, a chemical-resistant protective garment, head covering if it is not already included in the respirator, a double layer of protective gloves, and chemical-protective boots. "As part of OSHA's required hazard assessment process, each hospital also must consider the specific hazards first receivers might reasonably be expected to encounter. The hospital must then augment OSHA's PPE selection when necessary to provide adequate protection against those specific identified hazards," the document states.

After patients have been decontaminated, health care workers may wear normal PPE for infection control purposes. (That assumes the emergency department has not become contaminated, OSHA states.) The first-receivers document also outlines training requirements.

By contrast, first responders on the scene of a hazardous incident must wear self-contained breathing apparatus for unknown hazards.

"The amount of material brought to the hospital is limited to the amount of material that can exist on a living patient after a period of time after the exposure and transportation," Ippolito explains.

The first receivers approach worked well in Connecticut, he notes. He also lauds improvements in emergency preparedness.

"I'm heartened by the fact that I believe that hospitals are becoming more aware of their responsibilities to be prepared," Ippolito says. "I believe the best practices document helps give them a start in that direction. As a general rule, they're much better prepared than they were three or four years ago."

Reference

1. Occupational Safety and Health Administration. *OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances.* Washington, DC; January 2005. Web site: www.osha.gov/dts/osta/bestpractices/html/hospital_first receivers.html#table1. ■

Preparedness training lacks clear goals

All workers need some level of training

In late May, officials still were reviewing TOPOFF3 for lessons learned. But here's an obvious one: Adequate training of health care workers is critical.

A subcommittee of the National Response Team is considering the barriers to training and how to address them. The group is trying to develop clear competencies, as well as incentives for employees to attend training.

"There's no understanding or clarity about what training requirements [are available] for people in the health care industry," says **Joseph T. Hughes Jr.**, director of the National Institute for Environmental Health and Safety Worker Education & Training Program in Research Triangle Park, NC. Often health care workers have difficulty finding time to attend training, whether it's outside of work or during a shift, he says. Training needs to be tailored to the risk and vulnerability of the workers, Hughes adds.

Hospitals often provide only the minimum training required by the U.S. Occupational Safety and Health Administration, says **Paul Penn**, MS, CHEM, CHSP, president of EnMagine, a Diamond Springs, CA-based consulting firm that specializes in planning and training in emergency management for health care. "Some have really stepped up and taken an aggressive posture to protect their employees and their patients, while most likely the majority have serious gaps," he adds. "Time away from work for training is the greatest challenge and cost that hospitals will encounter."

Yet hospitals need to train a wide variety of employees — and even volunteers, Penn notes. "We recommend that hospitals take a tiered approach. Everyone in the hospital is required to have hazard communications training." That includes a brief orientation to Material Safety

Data Sheets that could be incorporated into new employee orientation and annual competencies.

"A fairly significant portion of the work force should be trained to the first responder awareness level . . . for people who may encounter a hazardous materials incident," he says. That could be a hazardous hospital spill encountered by employees in the lab, pharmacy, environmental services, or materials management. Or it could be a contaminated patient who walks into the hospital and encounters the receptionist, lobby volunteer, security guard, or emergency department staff.

"We tell people to look at [this] organization at 2 o'clock in the morning. That's when things happen, and that's when your staffing is lowest," Penn explains.

Training should include information on handling internal spills, he advises. **(For more information on handling internal chemical spills, see *Hospital Employee Health*, May 2005, p. 57.)**

In New Jersey, the hospital association provides emergency preparedness training. The TOPOFF3 exercise helped focus that message – and the importance of preparedness. "Our real objective was to ensure that the training would benefit them well beyond the exercise," says **Valerie Sellers**, MHA, CHE, senior vice president for health planning and research at the New Jersey Hospital Association in Princeton. ■

OSHA: EtO rule still needed to protect HCWs

Need to remain vigilant to prevent exposures

Overexposures to ethylene oxide (EtO) still occur and a regulatory standard remains necessary to protect workers, the U.S. Occupational Safety and Health Administration (OSHA) concluded after an extensive review of the standard.[1]

"Although we think the risk has gone down since the [implementation of the] standard, we do know that overexposures and accidental releases continue to occur," says **Joanna Friedrich**, MS, program analyst and project officer on the look-back review.

The EtO review was part of a systematic review of longstanding regulations. After considering comments, medical research, and exposure data, OSHA decided that more guidance would be helpful in promoting compliance. "Difficulty in understanding or interpreting some requirements of the standard was reported in the hospital sector, which contains the majority of affected small entities," OSHA reported.

In fact, hospital exposures have begun to increase after years of decline, a trend that corresponds with a decline in enforcement action by OSHA,[2] says researcher **Anthony D. LaMontagne**, ScD, MA, MEd, associate professor at the Centre for the Study of Health & Society at the University of Melbourne in Australia. "It's even more urgent that they continue to act on this standard. There's evidence that, if they don't keep an eye on it, the problems could come back."

The EtO standard clearly has been effective in reducing exposures since 1985, when it was implemented. At that time, hospital employees were exposed during spills, cartridge changes, and other handling of the sterilizers and chemicals in central processing facilities.

"Based on exposure monitoring data from several sources indicating that occupational exposure to EtO has fallen markedly since the EtO standard went into effect, workers are being protected," OSHA stated.

LaMontagne evaluated more than 130,000 personal breathing zone samples — data from employee monitors — collected from 1984 to 2001. In 2001, about 12% of hospitals had exceeded the short-term limit of 5 ppm in a 15-minute period.

During that time frame, enforcement activity changed dramatically. In 1989, OSHA issued 250 citations from 70 inspections, LaMontagne found. In fiscal year 2002, OSHA issued 10 citations related to ethylene oxide stemming from four inspections.

LaMontagne contends OSHA should have considered lowering the permissible exposure limit (PEL) to reduce exposures. At the least, the agency needs to maintain active enforcement, he notes. "Following the declines in exposures, we now see some evidence of a turnaround, so it's even more important that OSHA get active. Vigilance is required."

OSHA officials said they are not aware of an increase in exposures. "What we found was that the exposures were actually below the PEL," Friedrich explains.

Still, the OSHA review stated, "OSHA enforcement program data documenting that overexposures and accidental releases of EtO continue to occur at workplaces that are not in compliance with the standard underscore the continuing need for the standard." Hospitals have wrestled

with ways to reduce EtO use and control exposures. OSHA plans to offer guidance that will help hospitals improve employee training and will clarify the emergency alert requirement.

"There are a range of issues we're currently considering in regard to compliance materials in response to [comments]," says **John Smith**, director of OSHA's Office of Evaluation and Audit Analysis.

Dartmouth-Hitchcock Medical Center in Lebanon, NH, represents a success story. The hospital has completely eliminated EtO exposures among staff through a variety of strategies:

- **Making EtO reduction a part of purchasing specifications.** Dartmouth-Hitchcock tries to choose products that do not require EtO sterilization, says **Lindsey C. Waterhouse**, manager of safety and environmental programs. (A similar effort has greatly reduced the hospital's use of glutaraldehyde.) For example, some products are pre-sterilized and disposable.
- **Reviewing items that currently are sterilized with EtO.** In some cases, there may be an acceptable alternative method of sterilization, he says.
- **Using a contractor for necessary EtO sterilization.** Dartmouth-Hitchcock found it couldn't completely eliminate the use of EtO. So the hospital contracts with a processing facility, which allows it to remove the use of EtO from within the hospital itself.

"If properly controlled, EtO is a very effective cold sterilant and has helped health care a lot," Waterhouse adds. "But in any kind of occupational health and safety program, you need to try to reduce occupational exposures."

Fortunately, newer sterilizers have safety features that reduce potential exposures, he notes.

But hospitals still need to focus on monitoring employees and controlling the hazard, cautions LaMontagne. "There's a whole range of things hospitals are dealing with, but this [hazard] won't go away. All you have to do is maintain some level of attention. If you forget about it, it can come back to haunt you."

References

1. Occupational Safety and Health Administration. *Regulatory Review of the Occupational Safety and Health Administration's Ethylene Oxide Standard.* Washington, DC; March 2005.

2. LaMontagne AD, Oakes JM, Turley RNL. Long-term ethylene oxide exposure trends in U.S. hospitals: Intervention needed to preserve gains made following 1984 OSHA standard. *Am J Public Health* 2004; 94:1,614-1,619. ■

It takes a blitz to promote needle safety

NIOSH shows change in attitude, behavior

Changing habits is a lot more difficult than switching to safety devices. Almost five years after passage of a federal law requiring the use of safer sharps, hospitals still are struggling to reduce needlesticks and sharps injuries.

It's time for an all-out blitz. Presenting your message for four to six weeks in many different formats — posters, presentations, newsletters, incentives, safety fairs — can boost awareness and reduce injuries, according to research by the National Institute for Occupational Safety and Health (NIOSH) in Cincinnati.

Pre- and post-blitz surveys showed changes in knowledge and attitudes. At one hospital, the proportion of respondents who knew about the relative risk of contracting hepatitis C from a blood or body fluid exposure rose by 46%. At another hospital, the number of respondents saying, "I worry about the risk of blood/body fluid exposure to members of my surgical team" rose significantly.

Even the use of blunt suture needles rose at one hospital that focused on OR sharps safety.

"We can say that, as a result of the blitz, if you have sufficient support for sharps safety from management, doing a blitz will likely result in an improvement in behavior in the workplace," says **Ray Sinclair**, PhD, NIOSH health communications researcher and coordinator of the project.

A blitz can be an effective way to get the message across in the OR, where surgeons and employees otherwise may be resistant to change, notes **Alice Weiss**, RN, performance improvement coordinator for surgical and anesthesia services at Palmetto Health Richland in Columbia, SC.

"It directly increases awareness of the risk and awareness of what is happening in their hospital," she says. "It provides them with a list of behaviors and practices they can institute."

Creating a blitz is fundamentally different from standard sharps safety training, says Sinclair. NIOSH is drafting guidance on how to conduct a blitz, but here are some initial pointers:

- **Plan a sustained campaign.** A blitz differs from other sharps safety training in its intensity. This isn't just a one-hour seminar, or a set of snazzy

posters placed around the hospital. The blitz is tailored to each hospital, but it always involves many different ways of getting out the message, Sinclair says. "It comes from communication theory that you do multiple messages using multiple means of communication. Too often, people put up a series of posters and think that's enough." Keep the message going for at least several weeks, and then repeat a version of the blitz about once a year, he advises. "You have to have a sustained program if you're going to get sustained results."

- **Focus on your problem areas.** NIOSH conducted a blitz at four acute care hospitals, one cardiac specialty hospital, and a nursing home in the Columbia, SC. Each blitz was tailored to the needs of the hospital. For example, Baptist Hospital wanted to improve compliance with eye protection in the OR, so a portion of the blitz focused on that issue. The hospital brought in new eyewear and had a contest with rewards for the surgical team that had the highest compliance with eyewear rules during a blitz week. Sinclair advises using the hospital's exposure data to determine which areas of the hospital to target with a blitz. Facilitywide blitzes can be beneficial, but a focused blitz can attack one problem area. For instance, you may discover the OR only has 5% of the hospital's employees but 25% of the exposures. Reducing exposures there can have a big impact. "It's difficult to focus on everybody in an awareness campaign that's going to be really effective," he says.

- **Involve opinion leaders.** Success depends on leadership, Weiss notes. "You've got to have an influential physician or physicians and representatives from all the involved groups — surgical techs, circulating nurses, anesthesiologists, environmental services, even sterile processing." You'll need a physician champion and commitment from top leadership to change longstanding behavior, she says. If you decide to bring in new devices, you'll need financial resources and someone who can influence change. In the blitzes, NIOSH brought in experts to talk about sharps safety, particularly in the OR. But outside speakers aren't necessarily the most convincing. "It's better to have local people who are opinion leaders in their own community," Sinclair says.

- **Provide feedback.** In addition to surveys, NIOSH used behavior observation before and after the blitz to gauge progress. "It's very, very telling," Sinclair explains. "It will give you a wealth of insight about where the main problems are and how you improved." Weiss regularly posts information about exposures in the OR and provides information by job classification — anesthesia, scrub techs, nurses, residents. But she notes, with greater awareness about sharps safety, you actually may have an increase in exposures as your reporting improves. However, after the initial increase in exposures as a result of improved reporting, the facility likely will see a decrease in exposures. Weiss also encourages employees to complete an occurrence report when they have a near miss. "We believe we've gotten an improved reporting system, and the employees know they have the support of management and that they want these things to be reported."

- **Follow up after the blitz.** A blitz alone won't transform needle safety in your hospital. It's just a beginning, but it can provide momentum for change, Weiss notes. "It jumpstarted a continuing focus on sharps safety in the OR." For example, she found three safety scalpels that have a similar feel to the conventional version and would be acceptable to surgeons. They planned to select one of the three to adopt in the OR. Weiss also continues to share information on blood and body fluid exposures. She has focused sharps safety training on new residents and constantly looks for new safety engineered devices. That long-term commitment is essential, she says. "If you want to make behavioral changes, there has to be something that follows up on the blitz. That has to be prepared before the blitz ever starts." ■

Why a 'no-lift' policy may not be good enough

Stress, workload affect MSD injuries

Look beyond the lift to prevent ergonomic injuries. Stress, working conditions, and other psychosocial factors play a role as well, recent research shows.

That means even the best equipment and lift policies will not eliminate work-related musculoskeletal disorders (MSD). You may need to

consider such issues as working hours, staffing, and stress reduction, says **Nancy Menzel**, PhD, RN, assistant professor at the University of Florida College of Nursing in Gainesville.

"Virtually all of the attention has been on the physical risk factors of nursing," she says. And while lift equipment is important, "it's not the whole story. In addition to reducing the physical risk factors in the workplace, employers are going to have to also address the psychosocial risk factors."

The Institute of Medicine recognized this aspect of MSDs in its report, *Musculoskeletal Disorders and the Workplace*, when it determined that work-related MSDs are multifactorial.[1] The National Institute of Occupational Safety and Health (NIOSH) also has sponsored research to shed light on working conditions and its impact on nursing injuries.

Long working hours are linked to musculoskeletal injuries, according to preliminary findings from a University of Maryland School of Nursing study of 2,600 nurses. The nurses were surveyed three times over an 18-month period about working conditions, schedules, shoulder and back pain, and needlesticks.

"We've seen already, with the longer work hours, that there is some impact for patients. It's not surprising that it would be the same for nurses," says researcher **Alison Trinkoff**, RN, ScD, FAAN, professor at the University of Maryland School of Nursing in Baltimore.

Scheduling can increase stress, but long hours also increase the opportunity for injury, says Trinkoff. "Your scheduling can affect how much physical demand your body is exposed to and how much chance you get to rest," she says.

Stress adds to muscle strain

Stress itself has a physical component, as the body tenses and muscles tighten. Those changes can increase the risk of injury. "Clearly, we know that work stress also interacts with the physical factors," says **Tom Waters**, PhD, CPE, team leader in the Human Factors and Ergonomics Research Section of NIOSH in Cincinnati.

A study evaluating the NIOSH lifting equation found a strong correlation between job dissatisfaction and back pain.[2] "If [employees] were not satisfied at all, they were seven times more likely to have back pain in the past year," he explains.

More research is required to explore the relationship between satisfaction and back pain. But the research findings show a link between the physical and psychosocial aspects of work and indicate that improving the psychosocial factors would bring broad benefits. Efforts to improve the work environment could include creating greater support from supervisors, building a stronger safety climate, and improving staffing, Waters adds.

Employers also could help bridge the work-home life balance with on-site day care or exercise gyms and programs. "There are interventions . . . that can alleviate the psychosocial factors," he says.

In her studies, Menzel tried to find interventions that might reduce stress and risk of injury in nurses. In one, she recruited 32 nurses and randomly assigned them to an intervention or control group. The intervention group attended an 1½-hour class using cognitive behavioral therapy to reduce stress and pain every week for six weeks. The sample size was small because the study was designed to test the feasibility of this approach.

"To be in the study, we asked for people who had back pain in the last year of at least a week's duration," adds Menzel, whose study has not yet been published. "Some of them had current back pain, some had back pain in the past."

None of the participants were on work restriction due to injury, she says. The intervention group reported less pain, while the control group reported more pain at the end of the study.

However, that finding was not statistically significant because of the small sample size, Menzel notes. Stress levels actually rose in the intervention group, although again, that was not statistically significant.

"We speculated because it was another added burden to their schedules," she says. "They had to arrange child care and show up for the sessions. They were also made more conscious of their stress levels."

In another small study, Menzel looked at the combination of cognitive behavior therapy and lift equipment. The study did not find a link between the cognitive therapy and fewer lost workdays, but it did show that employees who were depressed, as measured on a screening tool, were more likely to have lost work time.

Menzel also advises employee health professionals to look at pain rather than injury as the outcome variable. "If you reduce back pain and [resolve] some of the psychosocial issues, the injury rates should fall," she says.

Of course, proper lift equipment remains most

important in reducing MSDs. "This is the next frontier," Menzel adds. "Once they get the equipment in, and nurses buy in and use it, and facilities have a no-lift policy, then facilities need to look at some of these other factors."

References

1. Panel on Musculoskeletal Disorders and the Workplace, Commission on Behavioral and Social Sciences and Education, National Research Council. *Musculoskeletal Disorders and the Workplace: Low Back and Upper Extremities.* Washington, DC: National Academy Press; 2001.
2. Waters TR, Baron SL, Piacitelli LA, et al. Evaluation of the revised NIOSH lifting equation: A cross-sectional epidemiologic study. *Spine* 1999; 24:386-394. ■

OSHA finally may update ionizing radiation rule

Increase in X-ray uses prompts review

More than 30 years after first creating a standard on ionizing radiation, the U.S. Occupational Safety and Health Administration (OSHA) wants to determine if the rule needs an update. The review was prompted by the growth in potential exposures to ionizing radiation with new medical uses and increased prevalence of security screening devices, OSHA said.

"We've detected a very large increase in that type of activity — not only in public buildings but also in private buildings," an OSHA official said. "We believe the increased use of X-ray devices is certainly one reason why we want to look at our standards — whether to update them and how to update them."

Regulatory jurisdiction related to radiation exposure is split among several agencies. The Nuclear Regulatory Commission (NRC) regulates uses of radiation that are byproducts of nuclear power, including such radiopharmaceuticals as iodine-131 and technetium-99m. State radiation protection programs have licensing and inspection authority regarding X-rays, including CT scanners and radioactive material that is produced by accelerators. The Food and Drug Administration has jurisdiction over the production of many radiopharmaceuticals, including those used in positron-emission tomography (PET) and the radiation exposure of research subjects in clinical trials.

CE *questions*

1. In the TOPOFF3 pneumonic plague bioterrorism exercise, OSHA insisted on the use of respirators instead of surgical masks because:
   A. They believe respirators should be worn against all infectious agents.
   B. Weaponized plague could have had different characteristics.
   C. Plague is transmitted by the airborne route.
   D. There weren't enough surgical masks.

2. OSHA's first receivers document says that health care workers involved in decontaminating patients should wear:
   A. self-contained breathing apparatus
   B. PAPRs with a protection factor of 1,000
   C. N95 filtering facepiece respirators
   D. surgical masks

3. One way Dartmouth-Hitchcock Medical Center in Lebanon, NH, eliminated ethylene oxide from the hospital was by:
   A. substituting heat sterilization
   B. substituting glutaraldehyde
   C. purchasing pre-sterilized, disposable items
   D. reducing the need for sterilization

4. The sharps safety "blitz" presented by the National Institute for Occupational Safety and Health lasted about how long?
   A. one day
   B. one week
   C. two weeks
   D. four to six weeks

Answer Key: 1. B; 2. B; 3. C; 4. D

CE instructions

Nurses participate in this continuing education program by reading the issue, using the provided references for further research, and studying the questions at the end of the issue. Participants should select what they believe to be the correct answers, then refer to the list of correct answers to test their knowledge. To clarify confusion surrounding any questions answered incorrectly, please consult the source material. After completing this semester's activity with the **December** issue, you must complete the evaluation form provided in that issue and return it in the reply envelope provided to receive a certificate of completion. ■

In addition, OSHA standards cover worker exposures from radiation sources such as x-ray equipment, accelerators, accelerator-produced materials, electron microscopes, and naturally occurring radioactive materials that are used in the workplace.

Thirty-three states conduct their own radiation protection program under an agreement with the NRC. Another 17 have direct inspections and oversight from the NRC.

OSHA posed more than 50 questions about radiation use, including who's exposed, how much exposure employees have, and what employers are doing to minimize exposure.

"It's a complicated area. It deserves a lot of questions," the OSHA official commented. "The point of our RFI [request for information] is to get hospitals and everybody else who has employees who are potentially exposed to X-rays to tell us what they're doing."

Radiation use in medicine has greatly expanded, but exposures remain low, says **Robert Reiman**, MD, MSPH, assistant clinical professor of radiology at Duke University Medical Center in Durham, NC. Reiman is a nuclear medicine physician, and he oversees clinical operations in radiation protection at the hospital.

"For most health care workers, the exposures are very, very low. They don't even approach a tenth of the current occupational limit," he says.

In fact, that should be the goal of employee protection programs, Reiman continues.

"There's a concept in radiation protection [called] ALARA — as low as reasonably achievable. What you strive to do is make sure everyone's dose is below that 10% of occupational exposure. We badge a lot of people who are below that 10% level to make sure we're in compliance with the ALARA program," he says.

Some employees, such as those working with radiopharmaceuticals, should wear a ring badge as well as a body badge to monitor exposure to both the body and hands, Reiman advises. The NRC sets an occupational exposure limit of 5 rem whole body exposure in a year. The OSHA rule limits exposure to 1.25 rem per quarter.

"They're set at a level that we believe, even with chronic long-term exposure over a working lifetime — [that is] 20 to 30 years — the person has a good chance of not having any radiation-induced effects," he says.

Pregnant employees have a limit of 500 mrem during the gestation period, and they wear a waist-level monitor to check potential fetal exposure. At Duke, pregnant employees may have some accommodations and stop doing some activities, such as handling radioactive iodine, Reiman says.

[Editor's note: A copy of OSHA's Federal Register *notice seeking comments on the ionizing radiation rule is available at www.osha.gov/SLTC/radiationionizing/index.html. The deadline for comments is Aug. 1. Comments may be faxed to OSHA's Docket Office at (202) 693-1648 or sent electronically to http://ecomments.osha.gov. A copy of OSHA's standard on ionizing radiation is available at www.osha.gov/SLTC/radiationionizing/standards.html.]* ■

NEWS BRIEF

AOHP survey: Needle safety is top concern

Needle safety continues to be a top concern of employee health professionals, according to a member survey by the Association of Occupational Health Professionals (AOHP), based in Wexford, PA.

In a survey of about 250 members, bloodborne pathogens ranked as the top public policy concern. Work environment and safe patient handling were second and third in priority.

"Sharps injuries remain an ongoing problem," says **MaryAnn Gruden**, MSN, CRNP, NP-C, COHN-S/CM, coordinator of employee health services at Western Pennsylvania Hospital in

COMING IN FUTURE MONTHS

- Why can't respirators be made with a better fit?
- Questionnaire for monitoring exposure to chemo agents
- Experts answer FAQ on varicella vaccine
- A better way to evaluate sharps safety
- Don't just feel their pain — try to lessen it

Pittsburgh and president emeritus and association community liaison of AOHP. "Even in light of the safety devices out there, people are still getting stuck."

AOHP plans to look more closely at work environment issues, such as workload, long working hours, and workplace violence, Gruden notes.

Meanwhile, AOHP has been working in an alliance with the U.S. Occupational Safety and Health Administration (OSHA) on safe patient handling. OSHA will revise its e-tool web site (www.osha.gov/SLTC/etools/hospital/main page.html) to make unit-specific recommendations, such as safe patient-handling advice for the intensive care unit, she says.

AOHP also is working with OSHA to develop safe patient-handling guidance for acute care hospitals. ■

CE objectives

After reading each issue of *Hospital Employee Health*, the nurse will be able to do the following:

- Identify particular clinical, administrative, or regulatory issues related to the care of hospital employees;
- Describe how those issues affect health care workers, hospitals, or the health care industry in general;
- Cite practical solutions to problems associated with the issue, based on overall expert guidelines from the Centers for Disease Control and Prevention, the National Institute for Occupational Safety and Health, the U.S. Occupational Safety and Health Administration, or other authorities, or based on independent recommendations from clinicians at individual institutions. ■

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