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IN THIS ISSUE

■ **Mask confusion:** Should health care workers wear surgical masks to protect against some respiratory diseases? cover

■ **Why? Why? Why?** Accident investigation probes beyond the easy answers 69

■ **Turn it down:** Noise exposure can be stressful and even hazardous 70

■ **JCAHO Update for Infection Control** 71

■ **Sharper image:** Manufacturers respond to complaints with better needle safety devices. 77

■ **Fire alarm:** Concerns arise over the use of alcohol-based surgical preparation and fire hazards in the OR 79

■ **Also in this issue:**
— Accident Investigation Form

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Beyond fit-testing: Why can't health care workers just use surgical masks?

CDC guidance sparks controversy over protection

If terrorists spread pneumonic plague in your community, will surgical masks be sufficient to protect health care workers? That question has renewed a controversy over respiratory protection, this time whether surgical masks are appropriate for some diseases while fit-tested N95 filtering facepiece respirators are required for others.

As part of a national bioterrorism exercise, the Centers for Disease Control and Prevention (CDC) issued interim guidance on plague that said surgical masks would provide adequate protection but that the additional protection provided by N95s would be "prudent."

The guidance also noted that "exigent circumstances" during a large-scale event might require suspension of fit-testing and medical clearance requirements.

Labor unions responded swiftly with a letter to CDC director Julie L. Gerberding, MD, MPH, stating: "This guidance, if followed, would put health care workers at risk of serious and potentially deadly exposure. We ask that this inaccurate and harmful document be withdrawn immediately."

The CDC did withdraw the interim guidance, but not just because of the union response, says **Von Roebuck**, spokesman. The guidance "was placed on the CDC web site to gather additional input and information" during the exercise, he says. "CDC removed the interim guidance after the training exercise ended and after receiving a variety of comments. The interim guidance was not removed from the web site because of one specific complaint or comment."

The CDC recommends surgical masks as a part of droplet precautions for certain diseases, such as influenza, pertussis, and naturally occurring plague, yet recommends a respirator for severe acute respiratory syndrome (SARS) and avian influenza.

In its draft isolation guidelines, which are undergoing revision, the CDC offers no recommendation on whether to use a surgical mask or a

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respirator for exposure to measles and varicella.¹

Not surprisingly, in the front lines of occupational health in hospitals where employee health professionals are trying to protect health care workers but function under financial constraints, confusion reigns.

"In the real world of health care delivery, health care is imploding under technical and economic burdens," says **Michael Hodgson**, MD, MPH, director of occupational health programs for the Veterans Health Administration in Washington, DC.

Is annual fit-testing really necessary? Who should be fit-tested? When should you use an

N95? There are little scientific data that link the protective properties of masks and respirators with the transmissibility of different diseases. And of course, there's the practical difficulty of following disease-specific guidelines when presented with a coughing patient. Is it pertussis? Tuberculosis? Pneumonic plague? Avian influenza?

"In the current national scene, there's unwillingness to say clearly what we think, to face the risk," says Hodgson. "[CDC experts] don't give real guidance to us in a way we can act and justify in the way we need to."

"Tuberculosis, for example, has all but disappeared despite the absence of annual fit-testing, because of the effectiveness of other program elements," he says. "Does adding the cost of annual fit-testing, resources taken from other safety programs, meaningfully improve health care safety?"

Droplet vs. airborne precautions

The CDC's recommendations on protective equipment are based on mode of transmission. Droplet precautions are triggered when a health care worker has close contact (3 feet or fewer) with a patient known or suspected to be infected with diseases spread by respiratory droplets.

The large droplets do not remain suspended in the air, explains **Denise Cardo**, MD, director of CDC's Division of Health Care Quality Promotion. They may fall to a surface, creating a risk of surface contamination and making hand hygiene an important factor in transmission, she says.

By contrast, with an airborne disease such as TB, infective droplet nuclei can remain in the air and can infect someone who breathes them in. TB is not spread by surface contamination.

"We know a lot from the clinical setting," adds Cardo. "We've learned a lot about most of the diseases that are being transmitted. Lab and animal studies may add to that equation, but they aren't the only way of knowing how they're transmitted."

Infection control experts have reviewed the literature and concluded that droplet precautions with surgical masks provide adequate barrier protection for some diseases. For example, plague guidance is based on historical and modern information on transmission patterns of naturally occurring illness.²

"It's not like [respiratory infections] are such rare events that I think we could have missed something," says **Loretta Litz Fauerbach**, MS, CIC,

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Editorial Questions

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director of infection control at Shands Hospital at the University of Florida in Gainesville and communications team leader for the Association of Professionals in Infection Control and Epidemiology (APIC). “Even with the resurgence of pertussis that’s occurring in the United States, if people are masked, they are not being exposed.

“We have a large history of epidemiology that shows surgical masks protect [against droplet-borne diseases],” she says.

Yet industrial hygienists arrive at different conclusions based on measurements of filtration and face seal properties of masks and respirators and the characteristics of aerosolized particles.

Large droplets expelled from a patient immediately evaporate and become droplet nuclei, notes **Steven Lenhart**, a retired industrial hygienist from the National Institute for Occupational Safety and Health (NIOSH) who co-authored a literature review on surgical mask and respirator research. The infectivity of the droplet nuclei may vary depending on the microorganism and the immunity of the exposed person.³

Even defining large droplets as 5 micrometers or larger, as they are in CDC’s *Guidelines for Isolation Precautions*,⁴ is problematic, Lenhart says. “The room currents in the average room are going to keep that buoyant, and it’s going to penetrate the filter of some surgical masks and get around the seal,” he says.

Lenhart also concludes that outbreak investigations alone shouldn’t be the basis for determining the necessary respiratory choice. Surgical masks provide barrier protection from splashes and splatters, but “surgical masks cannot be considered respirators,” he states.

To health care worker union representatives, CDC and APIC use “canary in the mine” logic: Health care workers aren’t getting sick, therefore, this protection must be adequate.

“It’s medical malpractice, what they’re recommending now,” contends **Bill Borwegen**, MPH, health and safety director of the Service Employees International Union (SEIU). “There is no such thing as an exclusively droplet agent. . . . They immediately turn into droplet nuclei. There’s no evidence that when they desiccate into droplet nuclei, they become less infectious.”

Confusion on the front lines

From a practical perspective, this issue is infused with confusion and controversy and inadequate science-based guidance for occupational medicine

physicians and nurses, Hodgson says. The measurements of filtration properties alone can’t provide answers. “There’s a difference between airborne exposure and delivered dose. Exposure does not equate to delivered agents,” he says.

There are other functional issues, as well. In the case of an avian influenza pandemic, hospitals wouldn’t be able to get enough N95 respirators to protect staff — not to mention the rush to fit-test thousands of additional health care workers.

Yet serious questions remain about how to protect health care workers. For example, it’s unclear for many illnesses how much of the transmission is due to surface contamination vs. inhalation of aerosols or droplets. And not every patient is equally infectious.

“We don’t understand the superspreader phenomenon. We don’t understand host susceptibility issues. And nobody’s researching that. If there’s a research program on those for these emerging diseases, we don’t see it or have input,” Hodgson explains.

Cardo agrees that research gaps remain. “We do believe there is a need for more research, and we are doing more research with the [CDC] Division of TB Elimination and NIOSH,” she says. “Three centers at CDC are working together in terms of looking at the main gaps and seeing how we can do research on that. It is a priority for CDC.”

Meanwhile, it’s tough to tell frontline workers when to wear a surgical mask and when to wear a respirator.

“Operationally, it is very confusing,” says **Pam Hirsch**, APRN, MS, medical clinical program manager in occupational health at the Veterans Health Administration in Washington, DC. “Many times someone is coming in, and you do not know what they have.

“To say, ‘For this disease, you wear a surgical mask; for this one, you wear an N95’ — where do you go with that? You’re going to grab whatever’s there.”

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Surgical Mask or Respirator?

Here are excerpts of the Centers for Disease Control and Prevention's (CDC) disease-specific guidance on whether health care workers should use surgical masks or respirators:

Influenza:

A surgical or procedure mask should be worn by health care personnel who are in close contact (i.e., within 3 feet) with a patient who has symptoms of a respiratory infection, particularly if fever is present, as recommended for standard and droplet precautions. These precautions should be maintained until the patient has been determined to be noninfectious or for the duration recommended for the specific infectious agent.

(Source: CDC. *Guidelines & Recommendations: 2004-05: Interim Guidance for the Use of Masks to Control Influenza Transmission*. Nov. 18, 2004. Web site: www.cdc.gov/flu/professionals/infection_control/mask_guidance.htm.)

Avian influenza:

Given the uncertainty about the exact modes by which avian influenza may first transmit between humans additional precautions for health care workers involved in the care of patients with documented or suspected avian influenza may be prudent. Use a fit-tested respirator, at least as protective as a National Institute of Occupational Safety and Health (NIOSH)-approved N95 filtering facepiece (i.e., disposable) respirator, when entering the room.

(Source: CDC. *Interim Recommendations for Infection Control in Health Care Facilities Caring for Patients with Known or Suspected Avian Influenza*. Web site: www.cdc.gov/flu/avian/professional/infect-control.htm.)

Pertussis:

Because droplet transmission of pertussis can occur at the first contact with an ill patient, HCWs and hospital infection control services should take measures to prevent hospital transmission. Many nosocomial outbreaks might be prevented by HCWs' observing droplet precautions (i.e., wearing procedural or surgical masks and hand washing).

(Source: CDC. Outbreaks of pertussis-associated with hospitals — Kentucky, Pennsylvania, and Oregon, 2003. *MMWR* 2005; 54:67-71.)

Tuberculosis:

Personal respiratory protection should be used by:

- People entering rooms in which patients with known or suspected infectious TB are being isolated.

- People present during cough-inducing or aerosol-generating procedures performed on such patients.
- People in other settings where administrative and engineering controls are not likely to protect them from inhaling infectious airborne droplet nuclei.

The facility's risk assessment may identify a limited number of selected settings (e.g., bronchoscopy performed on patients suspected of having TB or autopsy performed on deceased persons suspected of having had active TB at the time of death) where the estimated risk for transmission of *M. tuberculosis* may be such that a level of respiratory protection exceeding the standard performance criteria is appropriate. In such circumstances, a level of respiratory protection exceeding the standard criteria and compatible with patient care delivery (e.g., more protective negative-pressure respirators; powered air-purifying particulate respirators [PAPRs]; or positive-pressure air-line, half-mask respirators) should be provided by employers to HCWs who are exposed to *M. tuberculosis*.

(Source: CDC. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health care facilities, 1994. *MMWR* 1994; 43:1-132.)

Plague:

Droplet precautions require health care providers and others to wear a surgical-type mask when within 3 feet of the infected patient. Based on local policy, some health care facilities require a mask to be worn to enter the room of a patient on droplet precautions. Droplet precautions should be maintained until patient has completed 72 hours of antimicrobial therapy. Patients suspected or confirmed to have pneumonic plague require droplet precautions.

(Source: CDC, Association for Professionals in Infection Control and Epidemiology Bioterrorism Working Group. *Bioterrorism Readiness Plan: A Template for Health Care Facilities*. 1999. Web site: www.cdc.gov/ncidod/hip/Bio/13apr99APIC-CDC/Bioterrorism.PDF.)

Smallpox:

For patients with suspected or confirmed smallpox, both airborne and contact precautions should be used in addition to standard precautions. Airborne precautions require health care providers and others to wear respiratory protection when entering the patient room. (Appropriate respiratory protection is based on facility selection policy; must meet the minimal NIOSH standard for particulate respirators, N95.)

(Source: CDC, Association for Professionals in Infection Control and Epidemiology Bioterrorism Working Group. *Bioterrorism Readiness Plan: A Template for Health Care Facilities*. 1999. Web site: www.cdc.gov/ncidod/hip/Bio/13apr99APIC-CDC/Bioterrorism.PDF.)

No more excuses: Every accident is preventable

Accident investigation seeks out the 'why?'

It's never "just an accident" when someone gets hurt.

Even an unusual accident can shed light on weaknesses in your processes and procedures, says **Linda Haney**, RN, MPH, COHN-S, CSP, clinical director of Diligent Services, a consulting division of Arjo Inc., the health care ergonomics firm based in Roselle, IL. If you ask the right questions after an accident or a near miss, you may be able to prevent future incidents, she says.

"If you say, 'If it's going to happen again and you know now what you didn't know then, what would you change?' there's always something you can change," Haney says.

By conducting regular accident investigations — sometimes called after-action reviews — hospitals can lower their injury rates and improve the overall safety climate, safety experts say.

The "accidents are preventable" attitude is pervasive in other settings. For example, Dupont chemical company sets an expectation of zero accidents, Haney notes. The U.S. military also has integrated after-action reviews into its culture.

Investigations can be formal, such as those conducted by safety committees. Or they can be informal, such as discussions before shift changes about problems or potential problems. But they should never be punitive, safety experts agree.

With the right atmosphere, employees will feel comfortable brainstorming about what led to an accident or what steps could have prevented it. In that context, they may mention safety concerns that haven't yet led to injury, notes **Mary Matz**, MSPH, a Tampa, FL-based national patient care ergonomics specialist for the Veterans Health Administration (VHA).

"You can just learn so much from the near misses and close calls to prevent injury," she says.

Repeatedly asking 'Why?'

Having the right mindset is the first step toward effective accident investigation. Often the employee takes the blame, and the injury report simply notes "carelessness," "distracted," or "didn't follow procedure." The common solution: Retraining.

But Haney urges employers to ask the "5Ys," which triggers a repeated questioning of "Why?" Why were you distracted? Why didn't you follow procedure? Why did you feel hurried?

Ultimately, the "why?" questions assume that there should be safeguards or backups built into the process to prevent accidents. Not just the employees are responsible, Haney says. Management also plays a role. "You have to start with the mindset that accidents are a controllable management function," she says.

Here's an example: A resident in a long-term care facility fell to the floor, and two nursing aides rushed to help him. They lifted the 6-foot-2-inch resident manually, and both suffered serious injuries. The man had previously objected to the use of a mechanical lift, and administrators said that was his prerogative.

"What could be done to prevent that?" Haney asked. "Nothing," the administrators answered.

"If I told you this afternoon that exact same thing was going to happen, can you think of anything that could be done to protect those employees?" she asked.

With some brainstorming, the administrators agreed that the patient could be acclimated gradually to the lift. A lift was placed in the room for a while, without being used. Then nursing aides slipped the sling under him but didn't use it. They also talked to the resident about the injury of the nursing aides, the lift equipment, and why it was important for his safety as well as theirs.

"Sometimes it takes a lot of creativity, but you can prevent those injuries," Haney says.

Managers bear responsibility

Accident investigation actually is not an employee health or safety committee function. It should be carried out by the manager or senior manager with input from employees, safety experts say.

Managers need to take responsibility for accidents that occur in their departments, explains Haney. "Do you have responsibility for what goes on with your patients on your unit? Do you have responsibility for staffing it? Then you also have responsibility for the people who are there," she says.

In the VHA, back injury resource nurses (BIRNs) on each unit become safety coaches who engage in other types of accident investigation, as well, Matz adds. After-Action Reviews occur on each shift, in each unit.

After-Action Review: What you need to ask

Here are some questions identified by the Veterans Health Administration for conducting an After-Action Review. The program emphasizes the need to engage in open discussion based on objective facts without blaming individuals.

1. What happened to threaten patient or staff safety?
2. What should have happened?
3. What accounted for the difference?
4. How could the same outcome be avoided the next time?
5. What is the follow-up plan?

The units decide how to structure them, but often they occur at a shift report when employees talk about the upcoming shift.

Other units have regularly scheduled meetings. A short synopsis provides lessons learned that can be shared with other shifts and units, and BIRNs also spread the word.

An example: Nurses on a unit of a VHA hospital weren't using the lateral-transfer devices. Someone raised the issue at a unit After-Action Review, and nurses complained that the devices were just too narrow. The patients didn't fit.

The unit brought up the complaint with a manufacturer representative, and the manufacturer ended up redesigning a broader device. "You can just learn so much from the near misses and close calls to prevent injury," Matz says.

Conducting an accident investigation or After Action Review isn't difficult, but it is useful for a facilitator to have training in accident investigation. The American Society of Safety Engineers (www.asse.org) and the National Safety Council (www.nsc.org) offer on-site seminars in incident investigation.

Information on how to conduct an After-Action Review also is available on the safe patient handling web site of the VHA Patient Safety Center in Tampa at www.patientsafetycenter.com/AAR_rev081103.pdf.

It helps to have a clear form that guides the team through the accident investigation. **(A sample form for patient handling injuries has been inserted in this issue.)** But a form can't take the place of some nonjudgmental, probing questions. **(See box, above.)**

If an employee tells Haney that the accident

happened because she was in a hurry, Haney follows up: "Help me understand why. What was different about today?" Employees may simply say they are understaffed, and the hospital may be unable to add staff because of budget constraints. But that isn't the end of the prevention effort, Haney says.

"I say, realistically, do you really think you're going to get more people? If not, we've got a choice to make. Do we continue to use that as an excuse for injury, or can we figure out a better way [to function] with the staff we have so we're still safe? People always have choices. They often don't think they do, but they do," she says.

Ultimately, a system of accident investigation builds teamwork, says Matz. And that in itself is a step toward a safer workplace.

"You have to have at least the beginnings of some kind of an effective safety culture to carry this out," she says. "There has to be trust among team members." ■

Hospital noise leads to higher work stress

Levels rarely rise to hearing hazard

With alarms sounding, helicopters landing, dishes clashing in a washer, compressors whirring, hospitals are noisy places.

Most of that noise will not rise to a hazardous level, but it's still important for employee health professionals to assess noise levels and try to lower them, where possible, says **Siobhan Dugan**, MPH, PhD, health and safety consultant with Allina Employee Occupational Health at the Allina Health System in Minneapolis. Maintenance staff, in particular, may be exposed to noise levels that can harm their hearing due to working with compressors, generators, woodworking equipment, and motorized landscaping equipment. Dugan assesses noisy areas once a year and provides hearing conservation education for at-risk employees.

The U.S. Occupational Safety and Health Administration (OSHA) requires employers to monitor noise exposure and to identify affected workers if the noise is at or above 85 dB when averaged over eight hours. That length of exposure may be uncommon in health care, but peak levels can be high, Dugan says.

(Continued on page 75)



JCAHO Update for Infection Control

News you can use to stay in compliance

‘Joint Commission effect’: Awareness of looming JCAHO survey increases hand hygiene compliance

‘Manager effect’ also found in observational study

An impending visit by surveyors from the Joint Commission improved hand hygiene compliance rates, which remained higher than baseline even after the inspection, an epidemiologist reports.

An 18-month observational study, which included thousands of hand hygiene opportunities, documented the “Joint Commission effect” on compliance, says **SeJean Sohn-Tuma**, MPH, an epidemiologist at Memorial Sloan-Kettering Cancer Center in New York City. JCAHO has come on strongly in the infection control area in recent years, including an emphasis on compliance with hand hygiene guidelines by the Centers for Disease Control and Prevention.

“We knew the JCAHO would be looking at hand hygiene with the issuance of the hand hygiene guidelines,” she says. “It was definitely something they were going to be looking at.”

Forewarned is forearmed. Knowing a JCAHO survey was slated for December 2004, the infection control teams at the hospitals started a prospective, interventional study of hand hygiene in June 2003. Trained members of the infection control staff recorded whether workers performed hand hygiene before (HH Pre) and after (HH Post) a patient care episode. “We looked at hand hygiene at two points, before patient care and after patient care,” Sohn-Tuma explains.

Twenty observation sessions per week were distributed randomly during the hours of 7 a.m. to 5 p.m., Monday through Friday. Each observation session lasted approximately 30 minutes. Palm Pilots were used to collect the data. An introduction of alcohol hand rubs was timed to

coincide with the beginning of the study.

“The course of this study was about 18 months long, and so the interventions were staggered,” she adds. “With the introduction of the alcohol product we had an introductory education — your traditional inservice, which was kind of interactive. We had also a poster campaign so it was multifactorial. After three months we went back to the same group and we would refresh them, and we would also [feed] back baseline compliance data. Three months after that, we initiated a monthly feedback to nurse leadership.”

Compliance rates for HH Pre increased significantly with each passing week of November 2004, from 9.1% to 24.8%. Similar results were observed for rates of HH Post: 41.8% to 61.9%. Hand hygiene compliance reached record levels in the weeks before the JCAHO inspection, suggesting health care workers are capable of rapid change given the right incentive, Sohn-Tuma notes. “It was funny that there was a temporal association. The Joint Commission effect was basically [seen during] the weeks before and after the JCAHO was supposed to come and visit. What we found was that though the compliance had steadily been creeping up over time, the Joint Commission period was quite dramatic. The data looked pretty, with a nice line [toward] the highest rates.”

The study raises the question of whether the traditional ramp-up for an accreditation survey may have more impact on worker behavior than the threat of surprise visits, which the Joint Commission increasingly favors.

“It’s true that the element of surprise does add something [different],” she says. “But one of the strong points of our observational study was that the observation sessions were quite intensive and

constant and had been going on for a long time. We had [some] 14,000 opportunities for hand hygiene that we observed over time. We think that our findings are real.”

Indeed, in looking at compliance in January — a month after the JCAHO inspection — rates had fallen but were still well beyond the baseline rates. “The hand hygiene [post-patient care] did decrease from week to week from about 63% to about 40%,” Sohn-Tuma continues. “They were still much higher than our baseline rates. Unfortunately, we had to end the hand hygiene observation. It was time- and resource-intensive, with each ICP doing quite a few half-hour observation sessions.”

Losing the observers may have diminished compliance. Awareness that they are being observed may change test subjects’ behavior, a phenomenon commonly called the Hawthorne effect. She found it is not just whether a person is being watched, but by whom. The epidemiologist called it “the manager effect” in presenting her hand hygiene study recently in Los Angeles at the annual meeting of the Society for Health Care Epidemiology of America.

“Throughout the whole course of the study, when a manager was watching the hand hygiene [compliance] was significantly higher than if infection control staff [were observing],” Sohn-Tuma tells *JCAHO Update for Infection Control*. “It does seem as if there were occupational differences. Nurses consistently had higher hand hygiene [rates] if they saw a manager observing. Initially, physicians [washed hands] like 90% when a manager was watching and 0% when the ICP was watching. That finding did change over time. That was just during the baseline.”

Though Hawthorne effects typically wane, she notes that the manager effect lasted for the 18-month study period over thousands of observed hand hygiene opportunities. The study included guest observers from hospital administration. The data suggest associations between worker hierarchy and hand hygiene compliance, meaning the perceived power of the observer influences behavior in the observed.

Compliance rates for both HH Pre and HH Post were significantly higher during every study phase when the infection control manager performed observations. HH Pre compliance also was higher when guest observers from hospital administration were present compared to other observations recorded during the same two-week period (35.7% vs. 24.6%). Similar results were observed for HH Post (78.6% vs. 59.4%). ■

Homeland security warns of fake JCAHO surveyors

Contact JCAHO to make sure they’re authentic

Federal counterterrorism officials are warning about a disturbing pattern of incidents in which people tried to gain access to hospitals by posing as surveyors from the Joint Commission.

The Department of Homeland Security (DHS) issued a bulletin on the incidents, April 22, 2005. “This bulletin is intended to raise awareness and share information about recent suspicious reports involving hospitals. [We have] no information indicating a specific and credible threat of an al-Qaida-associated terrorist attack against hospital facilities inside the United States.”

Over the past year, there have been several reported cases of personnel falsely representing themselves as JCAHO officials, the bulletin said. These individuals were attempting to gain public health service information from hospital personnel and behaved in a manner inconsistent with legitimate inspection professionals. No suspects have been detained as of this reporting, the DHS reported.

There is only one known example of Islamic extremists targeting hospitals. In 1995, known terrorist Shamil Basayev and Chechen rebels led a hostage-taking raid at Budennovsk in southern Russia in which 2,000 hostages were taken at a hospital. About 150 of them died when Russian forces stormed the building; Basayev himself managed to escape.

However, DHS has noted an increased number of suspicious incidents involving hospitals. On March 27, 2005, a New Jersey hospital experienced its fourth separate incident in a six-week period. Three male subjects in their 30s and 40s, possibly of Middle Eastern descent, spoke fluent unaccented English and presented themselves as physicians from JCAHO. The subjects inquired about capacity, services, and operations of the hospital and left the facility when their questions were not answered.

From Feb. 26 to March 10, 2005, three other U.S. hospitals in Boston, Los Angeles, and Detroit also reported individuals posing as JCAHO inspectors. These individuals similarly behaved in a manner inconsistent with professional inspection staff and were described respectively as:

- a Caucasian woman man and woman at the Los Angeles hospital;

- a male of South Asian descent at the Boston hospital;
- a Caucasian woman at the Detroit hospital.

JCAHO administrators have stated that these suspects were not with JCAHO and that there were no planned inspections at these facilities. The suspicious individuals entered hospitals at 3 a.m. local time in Los Angeles and Boston; the Detroit entry time was reported only as "AM." Suspects from all three locations left immediately after being challenged by hospital staff. Hospitals routinely hire commercial inspection teams before a JCAHO inspection, to evaluate their processes, etc. These teams typically would inspect during normal day duty hours and report to senior hospital management/administrators, the DHS bulletin noted. Early morning evaluations are out of character, at least in the initial stages of a pre-JCAHO "spin-up." U.S. hospitals offer easy public access and would be recognized by terrorist planners as easy, accessible targets. Known targeting of such facilities would instill great panic and fear in the general public, the agency reasoned.

These most recent nationwide impersonations are more noteworthy when seen in the broader context with similar incidents that have occurred from October 2004 to February 2005. While these suspicious activities may exhibit characteristics of criminal activity or even possible pre-operational planning activity, DHS has no information indicating they are tied to a specific and credible threat of an al-Qaida-associated terrorist attack against hospital facilities inside the United States.

The use of false credentials to gain entry into hospitals is not new. However, according to JCAHO, these new events mark a different trend because of the number of incidents over this time period and nature of the questions seeking information on services. As an emerging pattern, this activity needs to be closely followed and reported. The DHS advises:

- Enforce stringent credentialing and badging of all hospital employees. Implement credentialing and badging of contractors, official visitors, inspectors, and others with hospital business.
- Do not allow access or give information to JCAHO representatives without first contacting hospital administration and senior security representatives.
- Require photo identification of JCAHO representatives. Contact JCAHO office to verify an inspection has been authorized.
- Provide security guard and hospital administration staff escort to JCAHO representatives as

they conduct inspections. Defer any requests for access or information that are not consistent with established inspection protocols.

- Inspect parcels and packages being brought into the facility by JCAHO representatives. Conduct random inspections of parcels and packages brought in by visitors. ■

JCAHO launches new patient safety center

Strong emphasis on IC on web

The Joint Commission has launched a new web-based patient safety initiative that continues its strong emphasis on infection control.

JCAHO's International Center for Patient Safety web site (www.jcipatientsafety.org) is designed to serve as a central repository of resources and information related to all aspects of patient safety. Also, it's aimed at both patients and health care workers.

"Our goal is to provide a wide spectrum of important patient safety information that is readily accessible and highly relevant," says **Peter Angood**, MD, chief patient safety officer at the new center. "This site should also become a key resource for patients, their families, and the general public to help them understand the roles they can play in improving patient safety."

The wealth of information on this web site should be valuable to health care professionals and to health care organization leaders who are seeking to implement recognized safety, quality and efficiency principles, he adds.

Infection control will be an obvious area of interest on the site, which debuted with a poll question regarding infection control challenges. (See related story, p. 74.) But overall, JCAHO is aiming at broad audience, with content aimed at patients, employers, physicians, nurses, and pharmacists, Angood says.

The site ultimately will provide a wide array of practical safety solutions that can be used to improve the safety and quality of patient care in a variety of health care environments. Those will include hospitals, outpatient clinics, physician offices, nursing homes, home care settings, behavioral health centers, and assisted-living facilities.

Health care organizations and health professionals will be able to use the center's web site, for example, to find information on the most frequent

types of reported sentinel events and their root causes; resources for understanding and meeting the National Patient Safety Goals; and *Sentinel Event Alert* newsletter recommendations. Patients and their families, as well as employers, will be able to use the center's web site to obtain quality-related performance information on health care organizations or become familiar with public education campaigns on patient safety.

The web site also will become a focus of the center's efforts to create a worldwide collaborative network of patient safety leadership organizations. Further, on-line discussion groups will provide an interactive forum for international dialogue on critical patient safety issues and topics.

The new web site is one of the first priority projects for the recently announced International Center for Patient Safety. Jointly sponsored by the Joint Commission and Joint Commission Resources (JCR), the center advocates for safety in health care through prompting the adoption of solutions that are based on sound scientific research, expert professional consensus opinion, and principles of multidisciplinary education. ■

Survey says: Hand hygiene compliance biggest woe

Limiting exposures cited second

A new patient safety center founded by the Joint Commission on Accreditation of Healthcare Organizations will include an emphasis on infection control. Not surprisingly, improving hand hygiene was the most frequently cited problem area cited by ICPs in a poll posted shortly after the web site debuted. As this issue went to press, here were the results for this question:

Which of the following infection prevention and control strategies is the most difficult for you to implement?

- promoting and monitoring hand hygiene (54%);
- limiting unprotected exposures to pathogens through the hospital (21%);
- minimizing the risk of infection transmission associated with procedures, medical devices, and equipment (e.g., urinary catheters, intravenous lines, staff in-service) (10%);
- assessing staff for risk of exposure to infectious pathogens during their course of work in your organization (9%);

- establishing system procedures for cleaning, sterilization, disinfection, storage and/or disposal of supplies and equipment. (4%). ■

JCAHO praises disclosure of health care quality data

Movement to open records continues

The Joint Commission is applauding the public release of information on hospital clinical performance by the Hospital Quality Alliance. The measures used to produce this information meet the highest contemporary standards for reliability and validity.

The initial measures for which performance information is being reported — on heart attacks, heart failure, and pneumonia — were identified and developed by the Joint Commission in collaboration with the Centers for Medicare & Medicaid Services (CMS) and subsequently were endorsed by the National Quality Forum (NQF).

Nearly 3,200 Joint Commission-accredited hospitals nationwide currently are collecting data on these clinical measures. In addition, the Joint Commission has been making information on these conditions — as well as pregnancy and related conditions — available since July 2004 on its free Quality Check web site at www.qualitycheck.org.

The Joint Commission's Quality Check web site provides data that permit individuals to compare the performance of local hospitals against state and national averages both for individual performance measures and for aggregate performance at the clinical condition level (for example, for heart attack care). Quality Check also provides performance information on accredited home care agencies, nursing homes, ambulatory care facilities, behavioral health programs, and laboratories. In addition, users of Quality Check are able to determine how well health care organizations are performing in meeting separate standardized national patient safety goals that have specifically been designed to prevent serious medical errors.

The requirements seek to avoid misidentification of patients, surgery on the wrong body part, miscommunication among caregivers, unsafe use of infusion pumps, medication mix-ups, and infections acquired in the health care setting, among other problem areas. ■

(Continued from page 70)

"It's cheap to take care of this problem," says Dugan. "It is debilitating and impairs the enjoyment of people's older years [when hearing problems often worsen]."

Hearing loss isn't the only impact from noise, notes **Peter M. Rabinowitz**, MD, MPH, assistant professor of medicine in the Yale Occupational and Environmental Medicine Program of the Yale University School of Medicine in New Haven, CT.

Noise can significantly add to work-related stress, he notes. And some types of noises may be particularly annoying, such as the high-pitched whine from an orthopedic bone saw.

"I think it's a little bit of an overlooked issue in hospitals," he says. "Hospitals are supposed to be quiet places, and they have become quite noisy places."

One study of nurses in a pediatric intensive care unit found that nurses working in higher sound areas had higher heart rates and reported more stress and annoyance. While noise must be at 85 dB for a sustained period to damage hearing, the noise in this environment averaged 61 dB in the daytime and 59 dB at night.¹ "The level of noise to increase stress level can be much lower than the noise necessary to hurt your hearing," says Rabinowitz.

Here are some strategies to control noise in the hospital:

- **Consider both the intensity and duration of noise.**

One study of noise in an orthopedic practice found a level of 119.6 dB generated by the equipment. Three meters away, the sound level was 73 dB. The health care workers did not show any significant hearing loss at the end of a shift, perhaps because of intermittent exposure.²

It may be reassuring to health care workers who are exposed to occasional loud noises that even very loud noises of short duration may not be harmful, Dugan notes.

It's still important to provide protection from very loud noise even if it is of short duration, she says. For example, Allina monitors the noise levels experienced by security staff who greet helicopters when they arrive to unload patients. The helicopters produce intense noise over 100 dB, but the duration is typically shorter than 20 minutes.

The health system requires employees to wear hearing protection, which basically are ear muffs with built-in communications devices, Dugan says.

- **Consider noise levels when buying new equipment.**

One Allina hospital asked for noise testing before selecting certain landscaping equipment. Dugan tested weed whackers and found one that had a high, annoying pitch but noted that it was no different in intensity.

Even so, she lauded that perspective. "I thought that was forward thinking," she says. "When you have a choice, include the safety screenings."

Dugan also responds to concerns throughout the hospital to test the intensity of equipment. For example, based on staff requests, she tested vacuum cleaners (she didn't find one in the hospital above 85 dB) and lab equipment (it was well below the limit).

- **Reduce noise to lower stress on workers and patients.**

Ironically, the sickest patients and the most stressed health care workers are subjected to the most noise — such as the alarms that sound in the intensive care unit or neonatal intensive care unit.

"Hospitals are places where people are supposed to get better. We should try to create an environment where that can happen easily. It means rest is very important," says **Les Blomberg**, MA, director of the Noise Pollution Clearinghouse in Montpelier, VT.

For example, neonatal incubators have loud fans that could be quieted with insulation, says Blomberg.

A World Health Organization (WHO) report recommended a weighted average sound level of no more than 35 dB in treatment or observation areas and 30 dB in patient rooms.³ (The "A-weighting" of noise places greater emphasis on the more annoying, higher frequencies and mimics the impact on the human ear.)

"For most spaces in hospitals, the critical effects of noise are on sleep disturbance, annoyance, and communication interference, including interference with warning signals," the WHO stated. "Particular attention should be given to the sound pressure levels in intensive care units and operating theatres. Sound inside incubators may result in health problems, including sleep disturbance, and may lead to hearing impairment in neonates."

Sometimes, the noise level of alarms creeps up to levels that are unnecessarily high, Rabinowitz says. "The alarms need to be set to be louder than the background noise. The louder the background

(Continued on page 77)

OSHA outlines hearing standard

The U.S. Occupational Safety and Health Administration (OSHA) recently developed an "e-tool" to help employers assess noise and create hearing conservation programs (www.osha.gov/dts/osta/otm/noise/exposure/index.html). Here is an excerpt:

INDICATIONS OF A PROBLEM:

There are various factors that may indicate noise is a problem in the workplace. While people react differently to noise, subjective responses should not be ignored because they may provide warnings that noise may be at unacceptable levels. Noisy conditions can make normal conversation difficult.

1. When noise levels are above 80 dB, people have to speak very loudly.
2. When noise levels are between 85 dB and 90 dB, people have to shout.
3. When noise levels are greater than 95 dB, people have to move close together to hear each other at all.

WALKAROUND SURVEY:

A walkaround survey should be performed to screen for noise exposures and to determine if additional monitoring is necessary. When screening for noise exposures, sound level meter measurements and estimates of the duration of exposure are sufficient. The resulting spot readings can be used to determine the need for a more complete evaluation. The following general approach may be followed:

1. Tour the facility and develop a detailed understanding of facility operations and potential noise sources. Take the tour with someone who is familiar with plant operations. Speak with knowledgeable personnel about operations and maintenance requirements. Make notes on a diagram of the floor plan if possible. Look for indications that noise may be a problem.
2. Use a sound level meter to take spot readings of operations that are in question. It may be useful to mark the sound levels on a diagram of the floor plan. Make notes regarding what equipment is on or off.
3. Estimate exposures by identifying workers and their locations and estimate the length of time they spend in different areas or how long they operate particular equipment or tools.

If the results of the walkaround survey indicate time-weighted average (TWA) exposures of 80 dBA or more, then additional noise monitoring should be performed. Remember to take into account the accuracy of the sound level meter when making this estimation. For example, a Type 2 sound level meter has an accuracy of ± 2 dBA.

WORK SHIFT SAMPLING:

When the results of the walkaround survey indicate that noise levels may exceed those outlined in OSHA's noise standard 1910.95, additional monitoring is necessary.

1. Establish a sampling protocol for your workplace. (OSHA provides an example of a general protocol on the e-tool.)
2. In addition to the general information collected during all health inspections, OSHA may collect certain information where it is pertinent to evaluate compliance with OSHA standards. (Additional information is available on the e-tool.)
3. Sample the noise exposures of representative employees from each job classification that potentially may be overexposed.
4. Use a dosimeter with a threshold of 80 dBA (A-weighted sound pressure level) and 90 dBA to measure noise exposures. Most modern dosimeters use simultaneous 80 dBA and 90 dBA thresholds and may be used accordingly.
 - A dosimeter with a threshold of 80 dBA is used to measure the noise dose of those employees identified during the walkaround survey as having noise exposures that are in compliance with Table G-16 of OSHA's noise standard, but whose exposure may exceed the levels specified in Table G-16a. In other words, the 80 dBA threshold is used to determine compliance with the 85 dBA TWA action level under OSHA's noise standard.
 - The dosimeter with a threshold of 90 dBA is used to measure the noise dose of those employees identified during the walkaround survey as having potential noise exposures that exceed the sound levels in Table G-16 or Table D-2. In other words, the 90 dBA threshold is used to determine compliance with the permissible exposure limit (PEL).
5. As a minimum, sampling should be conducted for a length of time necessary to establish whether exposures are above the limits permitted. Instrument accuracy must be taken into account.
6. Consider the following with respect to the monitoring results:
 - TWA exposures at or above the action level of 85 dBA require a hearing conservation program (results obtained from the 80 dBA threshold).
 - TWA exposures exceeding the PEL require feasible engineering or administrative controls to be implemented (results obtained from the 90 dBA threshold). Refer to the *OSHA Field Inspection Reference Manual* for additional information.
7. There also is information specific to evaluating noise exposure of employees wearing sound-generating headsets. ■

noise, the louder the alarms need to be. It's like a vicious cycle," he says.

- **Educate employees about the importance of hearing conservation.**

You may need to monitor the hearing annually of only a small number of employees who are exposed to high levels of noise. But many employees can benefit from education about hearing conservation.

Dugan offers a training session on hearing protection, describing the difference between muffs and different types of plugs, and explaining why and when they should be worn. She encourages employees to use the protection outside the workplace — for example, when hunting, at a loud concert, or using power tools at home.

Dugan also offers information on the signs of hearing loss, which may affect a greater number of workers as the work force ages.

"It's an area where we know what to do, but we're not doing enough of it," she says of hearing conservation. "We have a lot of wasted hearing."

References

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3. Berglund B, Lindvall T, Schwela DH, eds. *Guidelines for Community Noise*. Geneva: World Health Organization; 1999. Web site: www.who.int/docstore/peh/noise/guidelines2.html. ■

New sharps devices are technically better

Ease of use adds to needle safety

If you have doctors or nurses who still complain about awkward sharps safety devices, take a look at new technologies. There's good news: Manufacturers have responded to concerns by producing safety devices that are more user-friendly, more effective, and integrate patient safety.

In fact, the U.S. Occupational Safety and Health Administration (OSHA) requires hospitals to consider new technologies each year as they update their exposure control plans. You'll find niche products in areas that once had no safety-engineered devices.

New Safety Devices

Here are a few new safety devices that are now on the market. You can find additional information about safety products from the International Healthcare Worker Safety Center in Charlottesville, VA. Web site: www.healthsystem.virginia.edu/internet/epinet.

- ✓ **BD Vacutainer Passive Shielding Blood Collection Needle:** With this integrated needle and tube holder, a sheath automatically releases when the first blood tube is inserted. It rests on the patient's skin and completely covers the needle as the device is withdrawn. BD Diagnostics — Preanalytical Systems, (888) 237-2762. Web site: www.bd.com/vacutainer.
- ✓ **Perifix Safety Epidural Needle:** This epidural needle uses the same technique as a conventional device but has a safety clip that is pushed from the hub to the tip of the needle to prevent needlesticks. B. Braun Medical Inc., (610) 691-5400. Web site: www.bbmunusa.com.
- ✓ **Diamatrix Protekt Ophthalmic Knife:** A safety handle with a sheath that covers the blade. Available with disposable or reusable handles and a variety of blade sizes. Diamatrix, (800) 867-8081. Web site: www.diamatrix.com.
- ✓ **BD Cataract Safety Knife System:** A single-use device with a safety shield that can be activated single-handedly. It includes both corneal and MVR-style blades for side-port incisions. BD Ophthalmic Systems, (800) 237-2174. Web site: www.bd.com/ophthalmology.
- ✓ **Personna Plus Safety-Scalpel System:** A safety-engineered scalpel with a reusable metal handle that is weighted to have a similar feel to a traditional device. American Safety Razor Co., (973) 753-3000. Web site: www.asrco.com. ■

"It seems as though [manufacturers] are listening to what people want," says **Robyn Silverman**, senior project officer with ECRI, a nonprofit health services research organization based in Plymouth Meeting, PA. Silverman has been involved in developing the second edition of *Sharps Safety and Needlestick Prevention*, a device evaluation guide, which will be available later this year.

The greatest advances involve the introduction of a few truly passive devices, which do not require any extra effort on the part of the user,

she says. "You want people to feel comfortable operating the device and operating the safety mechanism," she says. "That's one reason you want a passive device."

Two-handed devices, which require users to use two hands to activate the safety mechanism, have fallen out of use, Silverman adds.

Yet the use of safety devices remains variable around the country, despite a federal law and an OSHA standard requiring conversion to safety-engineered sharps.

"Almost all hospitals in the United States are using at least some safety devices, but I don't think we're anywhere near 100% [conversion]," notes **Jane Perry**, MA, director of communications for the International Healthcare Worker Safety Center at the University of Virginia in Charlottesville. "We're still at the stage of working toward 100% compliance with safety devices. It is going to take a while to get newer, better safety devices adopted." (See **list of new safety devices, p. 77.**)

Where do you start in your quest for new and better devices? With your sharps safety log.

"The sharps injury log is a good tool to help [hospitals] decide which devices to evaluate," says **Amber Hogan**, MPH, manager of health affairs for Becton Dickinson, a device manufacturer based in Franklin Lakes, NJ. "[Then] they can see where their injuries are continuing to occur or where the safety devices may not be as effective as they'd hoped."

In some cases, needlesticks may continue to occur because health care workers aren't activating the safety device. That might indicate that the device didn't win acceptance from frontline health care workers, and they may need to be involved in an evaluation of other devices, she advises.

Surgeons and anesthesiologists, in particular, have been reluctant to adopt safety devices, often because they feel the devices would require a change in their techniques. Manufacturers are trying to respond to some of the concerns, notes Silverman.

For example, heavier reusable safety scalpels now are available, offering the same feel as the conventional device. Suture needles are sharper, while still blunt enough to avoid piercing the skin.

"There's a range of bluntness with these needles," Perry says. "Some of them are almost as sharp as regular sharp suture needles."

Convincing surgeons that a better device is now available may be challenging, she acknowledges. "With suture needles, a lot of times physicians

CE questions

21. What type of protection is recommended for health care workers who may be exposed to pneumonic plague?
 - A. N95 filtering facepiece
 - B. surgical mask
 - C. powered air-purifying respirator
 - D. No mask or respirator is needed.
22. Which of the following is a basic premise of accident investigation?
 - A. Accidents happen.
 - B. Be more careful.
 - C. Take time to educate.
 - D. Every accident is preventable.
23. At what level of noise does OSHA require employers to have a hearing conservation program?
 - A. All noise levels must have a program.
 - B. a time-weighted average of 80 dB over an eight-hour period
 - C. at or above 85 dB as a time-weighted average of eight hours
 - D. at or above 85 dB for any time period
24. According to Amber Hogan, MPH, manager of health affairs for Becton Dickinson, a device manufacturer based in Franklin Lakes, NJ, what is the best place to start when deciding which new technologies to review?
 - A. clinical literature
 - B. your sharps injury log
 - C. a survey of frontline workers
 - D. materials management input

Answer Key: 21. B; 22. D; 23. C; 24. B

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 this issue**, you must complete the evaluation form provided and return it in the reply envelope provided to receive a certificate of completion. ■

especially have tried earlier generations of devices and said this didn't work for us," she says. "It can be hard to get their attention again and say there are better things."

In some categories, a hospital may choose not to adopt an advanced device if the current safety device has eliminated needlesticks. OSHA does not require hospitals to make changes, Hogan notes, who previously worked in compliance assistance with OSHA.

"You don't need to evaluate the same technologies every year, but keep abreast of new technologies and determine if the ones you chose are effective," she says.

Document your review so you can demonstrate that you have evaluated new technology, Silverman advises.

Better technology may help with acceptance of some devices, but it still may be difficult to change behavior, particularly in the OR, needle safety experts say.

"The problem is often not with the technology. The problem is with behavior modification," says Hogan. "It's just something that's going to be eventual. As technology for safety becomes better, we can speed [the conversion to safety] along a little bit more." ■

Surgical preps: New fire worries affect OR

Maintain strict protocols, safety experts say

Just as the Center for Medicaid & Medicare Services (CMS) granted hospitals new latitude to place alcohol-based hand rub containers in hallways, new fire concerns emerged that could restrict the use of alcohol-based surgical preparations in the operating room.

Infection control advocates and safety experts scrambled to respond to a ruling by a regional CMS officer that prohibits the preparations containing alcohol when cautery, electrosurgery, or laser devices are in use. The ruling came after a

device sparked a surgical fire and burned a patient in Nebraska.

Alcohol has been a mainstay of antiseptic procedures, and infection control professionals expressed concern that its removal from operating rooms could lead to an increase in surgical site infections.

A National Fire Protection Association (NFPA) committee will meet in July to consider issuing clarification on the issue as a Tentative Interim Amendment (TIA) to the fire code.

CMS also is working with the NFPA and the American Society for Healthcare Engineering (ASHE) of the American Hospital Association to allow the use of alcohol-based surgical preparation solutions if there is a time-out to allow the substance to dry.

It's a matter of balancing risks, explains **Susan McLaughlin**, MBA, CHSP, MT(ASCP)SC, president of SBM Consulting in Barrington, IL, and a codes and standards consultant to ASHE.

"Of course, we have the risk of surgical-site fires, and unfortunately there have been some," she adds. "But . . . we're trying to reduce the number of hospital acquired infections. It truly becomes an education process that we have to undertake in the health care industry, to be able to use the materials that we need to use to provide the patient care, and use them safely."

Infection control professionals expressed alarm that restrictions on the use of alcohol could have serious repercussions. "We don't know the unintended consequences, which could well be an increase in surgical-site infections," says **Judene Bartley**, MS, MPH, CIC, vice president of Epidemiology Consulting Services in Beverly Hills, MI, and a member of the public policy committee of the Association of Professionals in Infection Control and Epidemiology.

In fact, the fire code doesn't prohibit the use of alcohol-based products in the operating room, ASHE asserts in an advisory (www.ashe.org): "In fact, NFPA 99 [the fire code used by CMS] specifically addresses germicidal solutions in surgery and provides conditions for their safe use."

You can use the alcohol-based preparations safely with cautery or lasers if you follow a strict

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protocol, according to the TIA proposed by ASHE.

Operating room personnel should make sure the solutions do not pool under the patient's drapes and should implement a time-out before starting a surgical procedure to make sure the solution has dried completely, ASHE advises.

"[Hospitals] should risk-assess their process and educate the surgical team about the issues and the precautions to be taken," McLaughlin says.

The Nebraska case dramatically highlights the fire hazard in an operating room. An 86-year-old woman was undergoing a biopsy when the linens supporting her head caught fire. She received severe burns to her head, neck, and shoulders and died of pneumonia a month later, according to news reports.

There always will be a risk of fire in the OR, as long as heat-producing devices are used in the procedures, Bartley notes. But the discussions can place a sharp focus on preventive measures, she says.

"We can use the opportunity to take another look at what our processes are and how they can be better," Bartley adds.

Meanwhile, CMS officially has allowed the placement of containers of alcohol-based hand rubs in hospital hallways. As of May 24, CMS is adopting the amendment to the NFPA Life Safety Code that allows the dispensers.

The amendment dictates the size, spacing, and placement of the containers. For more information, go to www.ashe.org/ashe/codes/handrub/index.html. ■

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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Please take a moment to answer the following questions to let us know your thoughts on the CE program. Fill in the appropriate space and return this page in the envelope provided. **You must return this evaluation to receive your certificate.** Thank you.

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1. If you are claiming nursing contact hours, please indicate your highest credential: ○ RN ○ NP ○ Other _____

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
After participating in this program, I am able to:						
2. Identify particular clinical, administrative, or regulatory issues related to the care of hospital employees.	○	○	○	○	○	○
3. Describe how those issues affect health care workers, hospitals, or the health care industry in general.	○	○	○	○	○	○
4. 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.	○	○	○	○	○	○
5. The test questions were clear and appropriate.	○	○	○	○	○	○
6. I am satisfied with customer service for the CE program.	○	○	○	○	○	○
7. I detected no commercial bias in this activity.	○	○	○	○	○	○
8. This activity reaffirmed my clinical practice.	○	○	○	○	○	○
9. This activity has changed my clinical practice.	○	○	○	○	○	○
If so, how? _____						

10. How many minutes do you estimate it took you to complete this entire semester (6 issues) activity? Please include time for reading, reviewing, answering the questions, and comparing your answers to the correct ones listed. _____ minutes.

11. Do you have any general comments about the effectiveness of this CE program?

I have completed the requirements for this activity.

Name (printed) _____ Signature _____

Please make label address corrections here or PRINT address information to receive a certificate.

PLEASE NOTE: If your correct name and address do not appear below, please complete the section at left.

Account # _____
 Name: _____
 Company: _____
 Address: _____
 City: _____ State: _____ Zip _____
 Fax: _____ Phone: _____
 E-mail: _____