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Mandatory flu shots: Science relatively weak on protecting patients, absenteeism

APIC cites "ethics," occ health experts call for more science

Everyone agrees that health care workers should receive the influenza vaccine each year to protect themselves and their patients. But the call for mandatory policies relies on the premise that gaps in vaccination jeopardize vulnerable patients. Although a number of studies are widely cited to support mandatory vaccination, there is actually little evidence of the impact of flu vaccination in hospitals.

As momentum grows for mandatory vaccination, *HEH* examined major studies and spoke to experts to assess some common assertions made about influenza vaccination of health care workers. Emotions run high on this issue, which is framed either as an imperative to "do no harm" or an unnecessary coercion with limited benefit.

"The science at best weakly supports voluntary vaccination of nursing home staff, achieving a goal rate in the 40% to 70% range," says **Melanie Swift**, MD, medical director of the Vanderbilt Occupational Health Clinic at Vanderbilt University in Nashville, TN. "I think to extrapolate any benefit in the acute care setting beyond that is not supported by the evidence."

Swift, who is vice chair of the Medical Center Occupational Health Section of the American College of Occupational and Environmental Medicine (ACOEM), notes, "We already have a vaccination rate in acute care hospitals that meets or exceeds that [level achieved] in all of the studies."

Infection preventionists support mandatory vaccination as the way to catapult rates from about 62% of health care workers to close to 100%.

The rates from voluntary programs simply aren't high enough, says Linda Greene, RN, MPS, CIC, director of infection prevention at the Rochester (NY) General Health System. "What we're looking at is the ethical responsibility to protect those who are most vulnerable. We really felt that was a very strong message we needed to bring forth to our health care workers," says Greene, who was lead author of the position paper of the Association for Professionals in Infection Control and Epidemiology (APIC).

In February, APIC became the most recent infection control organization to support mandatory programs: "As a profession that relies on evidence to guide our decisions and actions, we can no longer afford to ignore the compelling evidence that supports requiring influenza vaccine for [health care personnel]. This is not only a patient safety imperative, but is a moral and ethical obligation to those who place their trust in our care."[1]

However, occupational health professionals, as a group, have not supported mandatory policies. The Association for Occupational Health Professionals in Healthcare (AOHP) issued a statement emphasizing the importance of health care worker vaccination but opposing the policies that require vaccination as a condition of employment: "AOHP respects the individual [health care worker's] right to make an informed decision regarding accepting or declining the influenza vaccine."

ACOEM also has declined to endorse mandatory programs: "Current evidence regarding the benefit of influenza vaccination in HCW as a tool to protect patients is inadequate to override the worker's autonomy to refuse vaccination," ACOEM said in its guidance statement.[2]

Examining the evidence

Here are some of the assertions about flu vaccination of health care workers and the scientific basis:

Low vaccination rates of health care workers are associated with higher rates of mortality among patients: The evidence that influenza vaccination reduces the risk of mortality among patients or residents comes from long-term care facilities and is relatively weak. In one often-cited article from 1997, mortality rates declined in British long-term care facilities in which health care workers were offered vaccine. (Sixty-one percent of them were vaccinated.)

However, there was very little laboratory-confirmed influenza: 6 of 107 in patients in the staff-unvaccinated group and 5 of 118 in the staff-vaccinated group. The authors noted that some elderly people do not have a rise in antibody titer after influenza vaccination — or perhaps after influenza infection — which may have resulted in an undercount of influenza cases. Other respiratory illnesses were circulating as well and were detected in the study population. The authors cautioned, "... we do not have any direct evidence that the reduction in rates of patient mortality and influenza-like illness that were associated with HCW vaccination were due to prevention of influenza."[3]

Other studies have shown effects on mortality in long-term care, with caveats. In one, vaccination of caregivers (51% vaccinated) was associated with overall lower mortality but not lower rates of non-fatal influenza infection.[4] A 2009 study found that doubling the vaccination rate of health care workers (32% to 70%) did not produce a statistically significant difference in mortality — although an analysis that adjusted for other possible contribu-

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tors to mortality did show an impact from vaccination.[5]

A Cochrane Review of five studies on influenza vaccination among health care workers in long-term care (including the three cited here) found that "all [are] at high risk of bias....We conclude there is no evidence that vaccinating HCWs prevents influenza in elderly residents in long-term care facilities."

Overall, influenza infection causes less than 10% of mortality in people 60 years of age or older, the Cochrane authors noted. Future studies should test for the impact of a variety of interventions, including hand-washing, mask use, quarantine of ill patients/residents, and restriction of visitors, they said.[6]

Increasing vaccination rates reduces nosocomial transmission of influenza. There have been few studies of nosocomial transmission of influenza in hospitals, and they include other variables that make it difficult to assess the impact of vaccination. A widely cited 2004 study at the University of Virginia Health System found that the proportion of nosocomial flu cases to community-acquired cases among hospitalized patients dropped over 12 years (in 13 influenza seasons), while health care worker vaccination increased. The overall number of nosocomial cases varied, but averaged about four cases per year. (It was zero in 1994-95, 1995-96, and 1999-2000, the final season of the study.) Community cases also varied but spiked in the last years of the study. The peak vaccination rate of health care workers was 67%.

Although other infection control interventions also were used to prevent nosocomial spread, the authors concluded that the change over time could be attributed to the rise in vaccination.[7]

A recent French study found patients had an increased risk of a health care-associated influenza-like illness (ILI) if they were exposed to a health care worker with ILI — but the risk was even greater if they were exposed to a patient with ILI and greatest with exposures to both a patient and health care worker who were sick. Only 20% of the ILI cases were laboratory-confirmed influenza. The study was not designed to detect the protective effect of influenza immunization.[8]

Interestingly, a recent German study did not find that health care workers were at increased risk of influenza because they worked in an acute care facility. The greatest risk: Having children in their home. Most (74%) of the ILI was not influenza, and 30% of the lab-confirmed influenza was asymptomatic.[9]

Mandatory vaccination results in lower absenteeism. Studies have found only a modest impact on health care worker absenteeism. The flu vaccine varies in effectiveness, and influenza typically causes only a small portion of the respiratory illness seen each winter.

But there's one other reason: Health care workers often come to work sick. One study of hospital-based physicians, nurses and respiratory therapists found a lower amount of absenteeism and febrile respiratory illness in the vaccinated group, but the results weren't statistically significant. "The health care professionals in our study seem unlikely to be absent from work even when they experience a febrile respiratory illness," the authors noted.[10]

Virginia Mason Medical Center, the first hospital to require flu vaccination as a condition of employment, achieved vaccination rates above 98% but wasn't able to demonstrate a significant impact on absenteeism.[11] There are simply too

OSHA: Mandatory vaccine policies allowed

The U.S. Occupational Safety and Health Administration has not stepped into the fray over mandatory influenza vaccination. OSHA issued a "letter of interpretation" in response to a question about the mandates, saying that employers may mandate the vaccination as long as they don't retaliate against employees who have "a reasonable belief" that they would have a serious medical reaction to the vaccine. Here's what OSHA said:

"OSHA does expect facilities providing healthcare services to perform a risk assessment of their workplace and encourages healthcare employers to offer both the seasonal and H1N1 vaccines. It is important to note that employees need to be properly informed of the benefits of the vaccinations. However, although OSHA does not specifically require employees to take the vaccines, an employer may do so. In that case, an employee who refuses vaccination because of a reasonable belief that he or she has a medical condition that creates a real danger of serious illness or death (such as serious reaction to the vaccine) may be protected under Section 11(c) of the Occupational Safety and Health Act of 1970 pertaining to whistle blower rights." ■

many variables, notes **Joyce Lammert**, MD, PhD, chief of the Department of Medicine. For example, employees may take leave to stay home with a sick child, or there may be other diseases, such as norovirus, circulating in the community.

A mandatory program greatly increases the proportion of health care workers who receive the vaccine. There is no question that a mandatory policy produces almost universal health care worker vaccination. When Virginia Mason implemented the policy in 2005, the vaccination rate rose from 29.4% (a low rate in 2004 due to supply shortages) to 97.6%. The rates have since been above 98%.

When BJC Healthcare in St. Louis implemented a mandatory policy, vaccination rates rose from 71% in 2007 to 98.4% in 2008. The health system granted medical exemptions to 321 employees and religious accommodations to 90 employees, and eight employees were terminated for failing to comply with the policy.[12]

In a survey conducted by the RAND Corp. for the Centers for Disease Control and Prevention, 21% of hospital workers reported that their employers have a flu vaccination requirement. Overall among health care workers in various settings, flu mandates led to a vaccination rate of 97.6% compared with 64.5% when employers recommended the vaccine.

REFERENCES

1. Greene LR, Cox T, Dolan S, et al. APIC position paper: Influenza vaccination should be a condition of employment for healthcare personnel, unless medically contraindicated. Association for Professionals in Infection Control and Epidemiology, Washington, DC. January 27, 2011. Available at www.apic.org/Content/NavigationMenu/GovernmentAdvocacy/PublicPolicyLibrary/APIC_Influenza_Immunization_of_HCP_12711.PDF. Accessed on February 21, 2011.
2. Swift MD, Buchta WG, Russi M, et al. Seasonal influenza prevention in health care workers. American College of Occupational and Environmental Medicine, Elk Grove Village, IL. November 17, 2008. Available at www.acoem.org/guidelines.aspx?catID=3. Accessed on February 21, 2011.
3. Potter J, Stott DJ, Roberts AG, et al. Influenza vaccination of health care workers in long-term-care hospitals reduces the mortality of elderly patients. *J Infect Dis* 1997;175:1-6.
4. Carman WF, Elder AG, Wallace LA, et al. Effects of influenza vaccination of health-care workers on mortality of elderly people in long-term care: a randomized controlled trials. *Lancet* 2000;355:93-97.
5. Lemaitre M, Meret T, Rothan-Tondeur M, et al. Effect of influenza vaccination of nursing home staff on mortality of residents: a cluster-randomized trial. *Jrl Amer Geri Soc* 2009;57:1580–1586.
6. Thomas RE, Jefferson T, Lasserson TJ. Influenza vaccination for healthcare workers who work with the elderly. Cochrane Database of Systemic Reviews 2010; 2:CD005187. Available at www.thecochranelibrary.com/userfiles/ccoch/file/CD005187.pdf. Accessed on February 7, 2011.
7. Salgado CD, Giannetta ET, Hayden FG, Farr BM. Preventing nosocomial influenza by improving the vaccine acceptance rate of clinicians. *Infect Control Hosp Epidemiol* 2004;25: 923-928.
8. Vanhems P, Voirin N, Roche S, et al. Risk of influenza-like illness in an acute health care setting during community influenza epidemics in 2004-2005, 2005-2006, and 2006-2007: A prospective study. *Arch Intern Med* 2011;171:151-157.
9. Williams CJ, Schweigher B, Diner G, et al. Seasonal influenza risk in hospital healthcare workers is more strongly associated with household than occupational exposures: results from a prospective cohort study in Berlin, Germany, 2006/07. *BMC Infect Dis* 2010; 10:8. Available at www.ncbi.nlm.nih.gov/pmc/articles/PMC2836320/. Accessed on February 7, 2011.
10. Wilde JA, McMillan JA, Serwint J, et al. Effectiveness of influenza vaccine in health care professionals. *JAMA* 1999; 281:908-913.
11. Rakita RM, Hagar BA, Crome P, and Lammert JK. Mandatory influenza vaccination of healthcare workers: A 5-year study. *Infect Control Hosp Epidemiol* 2010;31:881-888.
12. Babcock HM, Gemeinhart N, Jones M, et al. Mandatory Influenza Vaccination of Health Care Workers: Translating Policy to Practice. *Clin Infect Dis* 2010; 50:459-464. ■

Injuries drop in OSHA crackdown on OR safety

Tenn. OSHA expects safer practices

It is notoriously difficult to convince surgeons to change their methods and tools in the operating room to improve sharps safety. But in Tennessee, intransigence is apt to lead to a citation from the Tennessee Occupational Safety and Health Administration.

A "special emphasis program" honed in on the bloodborne pathogen hazards in the operating room, and TOSHA has made it clear that they expect to see safe work practices (such as double-gloving and hands-free passing of instruments) and safer devices (such as blunt suture needles and safety engineered scalpels).

From October 2006 to October 2010, TOSHA conducted 175 inspections and issued 1,280 citations for serious hazards, 10 for repeat hazards, and 57 for other than serious hazards. The total fines: $587,000.

Needless to say, that has gotten some attention. And it has made a difference. TOSHA's modest goal was to reduce sharps injuries in the state's hospitals and ambulatory surgery centers by 10% over five years. In four years, the sharps injuries dropped by 14.5% in hospitals and by 17.1% in surgery centers. The reductions came despite an emphasis on better recordkeeping.

"There's an increased awareness. Most everybody's on board," says **Jan Cothron**, manager of health compliance at TOSHA in Nashville.

Cothron and her colleagues knew it would be a challenge to address sharps safety in the OR. For example, an analysis of sharps injury data showed that injuries rose by 6.7% in the OR from 1993 to 2006 while they declined by 31.6% elsewhere in the hospital. (See *HEH*, June 2010, cover.)

Cothron knows the burden of needlesticks, both in actual costs and in repercussions for the health care worker. She was stuck 34 years ago when she managed a blood-testing lab for a doctor's office. She was pregnant at the time but never reported the injury. She worried, over the years, that the source patient had hepatitis, but she was never tested.

As she travels the state, Cothron also hears from health care workers who have had needlesticks and have contracted hepatitis B or C. "We're trying to stop these [events] however we can," she says.

ORs must comply with law

Since the federal Needlestick Safety and Prevention Act was passed in 2000 and the U.S. Occupational Safety and Health Administration beefed up its Bloodborne Pathogen Standard, safety needles have become commonplace. Everywhere, that is, except the OR.

Tennessee has its own law, passed in 1999, which requires the use of safety devices and the reporting of sharps injuries within six days of an incident.

"People are not complying with this law," Cothron says bluntly. TOSHA's job was to make sure they complied, through awareness, compliance assistance, and enforcement, she says.

Cothron began by obtaining baseline data. TOSHA requested submission of sharps injury logs from the state's 161 hospitals and 158 ambulatory surgery centers.

The logs and previous inspections revealed common problems, including: Removing scalpel blades with forceps or hands, hand-washing contaminated surgical instruments without cut-resistant gloves, failure to use safer devices, hands-free passing or double-gloving, and lack of compliance by anesthesiologists and surgeons.

TOSHA offered free seminars across the state and compliance assistance. The agency also created randomized inspection lists of hospitals and surgery centers.

"We developed a checklist and provided it to participants" to indicate what TOSHA would look for in inspections, says Cothron. "Are people double gloving where they can? Are they using blunt tip suture needles where appropriate?

"We're interviewing employees to find out if these [measures] that are in written programs are being implemented," she says.

If surgical kits came with non-safety devices, TOSHA informed hospitals and surgery centers that they must replace those items with a safety-engineered device. Exceptions to using safety-engineered devices needed to be explained in writing — and they needed to be specific to a procedure. After all, the American College of Surgeons has endorsed the use of blunt suture needles and safety scalpels. (See *HEH*, October 2007, cover.)

"We've had hospitals tell surgeons, 'It's a condition of employment at our hospital,'" says Cothron.

This tough stance has paid off. From 2009 to 2010, TOSHA found that sharps injuries stayed steady or declined at 106 out of 161 (65%) hospitals and 125 out of 158 (80%) ambulatory surgery centers. Some individual facilities had dramatic results. One hospital system experienced a 58% decrease in suturing injuries from 2001 to 2010, Cothron says.

"Overall, it's made work safer for the employees," she says. ■

Will OSHA build on 10-year BBP success?

Rule review may result in changes

Ten years ago this month, the U.S. Occupational Safety and Health Administration issued its revised Bloodborne Pathogens Standard. As the agency now considers making changes to that rule, it has amassed largely favorable reviews from health care providers, professional organizations, and safety experts alike.

Unquestionably, the Bloodborne Pathogens Standard has led to fewer injuries and reduced risk

of transmitting HIV and hepatitis B and C. It is the only standard directed specifically at the health care industry, and it is the most frequently cited standard in inspections of hospitals.

About 95% of core hypodermic needles and blood collection needles purchased by acute care hospitals are safety-engineered, according to manufacturer data. And sharps injuries dropped by about a third (31.6%) from 1993 to 2006, according to surveillance data collected by the International Healthcare Worker Safety Center at the University of Virginia in Charlottesville.

Since 2001, OSHA has conducted almost 20,000 inspections in health care facilities. The largest number of inspections occurred in nursing homes, which have been included in targeted inspection programs as a high-hazard workplace.

The most cited section of the standard: Employers must update their exposure control plan annually and consider new technology. Failure to use safety devices is the second most-frequent cause of citations.

"We are more frequently citing that section of the standard that deals with use of engineering devices because there are more devices available and it's easier for us to say...employers should be using those," says **Dionne Williams,** MPH, an OSHA senior industrial hygienist who presented the enforcement data at the conference of the International Healthcare Worker Safety Center marking the 10th anniversary of the Needlestick Safety and Prevention Act.

The center plans to release a white paper outlining areas for improvement in sharps safety. The comments received in OSHA's review of the Bloodborne Pathogens Standard also reveal what may be the new direction for needle safety.

More emphasis on the OR?

In 2007, suture needles were responsible for about one-quarter (23.9%) of all sharps injuries, and OR was the site of 35.9% of sharps injuries, according to EPINet surveillance data from the International Healthcare Worker Safety Center. Sharps injuries rose by 6.7% in the operating room while they declined by almost 32% elsewhere in hospitals.[1]

"We think more focused attention by OSHA on enforcement and compliance in this clinical setting is warranted and needed," says **Jane Perry**, MA, associate director of the International Healthcare Worker Safety Center.

The American College of Surgeons has endorsed the use of blunt suture needles, double-gloving, a neutral zone for passing instruments, and other safety devices in the OR. The Association of peri-Operative Registered Nurses also is pressing for safer practices in the OR.

Weaker rules in non-hospital settings?

The National Federation of Independent Business (NFIB) asked OSHA to scale back its enforcement of the sharps safety rules, particularly in dentists' offices. "OSHA should limit the scope of this standard to only the most at-risk workplace settings. By doing so, OSHA could substantially limit the number of small businesses affected by this clearly burdensome standard, without sacrificing the safety of the workers employed by those businesses," said **Susan Eckerly**, NFIB senior vice president for public policy.

However, others argued for continued protections for health care workers outside acute care. "For outpatient settings, particularly long-term care and home health, the need is for more basic epidemiological research. We need a better grasp on how the sharps injury risk picture differs in the various healthcare settings that are grouped in the category 'alternate sites,' " says Perry. "These vary from a single healthcare worker providing in-home care to large staffs working in long-term care facilities or nursing homes.

"While data for outpatient and alternate care settings are limited, it would be unwise to weaken any part of the standard or grant exemptions to specific non-hospital settings, given that non-acute care settings are currently the most rapidly expanding segment of the health care market."

More pressure on manufacturers?

Health care employers are required to provide safety devices, when possible, but manufacturers are not required to produce the devices. While manufacturers have responded to the demand for safety products, there are still gaps remaining, as noted in comments to OSHA.

For example, surveillance data from Massachusetts hospitals found that in 2008, 20% of sharps injuries involved devices contained in pre-packaged kits. Some 58% of those injuries involved devices that had no safety feature. "Many hospitals are working to comply with the letter and spirit of the regulations but find that much energy is put into negotiating with product suppliers and manufacturers to obtain [devices with safety-engi-

neered sharps injury prevention]. Hospitals have also questioned how it is possible that manufacturers and suppliers can continue to provide devices lacking sharps injury prevention features," wrote **Angela Laramie**, MPH, epidemiologist with the Sharps Injury Surveillance Project in the Massachusetts Department of Public Health in Boston.

REFERENCE

1. Jagger J, Berguer R, Phillips EK, et al. Increase in sharps injuries in surgical settings versus nonsurgical settings after passage of national needlestick legislation. *J Am Coll Surg* 2010;210:496–502. ■

IOM: Protecting HCWs is 'integral' to quality care

Panel supports new OSHA rule, PAPR design

The H1N1 influenza pandemic may prompt lasting changes in the personal protective equipment for health care workers and the rules that govern them.

In the wake of the pandemic, a new report from the Institute of Medicine supports the creation of an infectious disease standard with protections that parallel those in the Bloodborne Pathogens Standard. The U.S. Occupational Safety and Health Administration has included such a standard in its regulatory agenda, although no draft language has been issued.

The IOM panel also supports the establishment of standard criteria for face masks and the development of a powered air-purifying respirator (PAPR) specifically for health care.

Although the report is primarily designed to guide future research, it wades into issues that have been hotly debated — and urges that they not be sidelined until the next pandemic. Health care providers need clear guidelines about how to protect workers from a novel viral respiratory infection, and there needs to be more research on the protections provided by face masks compared to respirators, the panel said.

The bottom line: "While there are clear gaps and deficiencies in our knowledge base…there should be universal acknowledgement that PPE [personal protective equipment] use is an integral component of providing quality health care."

The IOM report is an important step toward a respirator that health care workers will tolerate — and wear, says **Lewis J. Radonovich**, MD, director of the National Center for Occupational Health and Infection Control in the Office of Public Health and Environmental Hazards of the Veterans Health Administration in Gainesville Florida and Washington DC. "What's needed now is development of respiratory protection devices that are tailored to the needs of health care workers," says Radonovich, who is spearheading a project to work with manufacturers on improved design.

Confusion over H1N1 guidance

From supply shortages to differing guidance, challenges emerged for hospitals in the effort to protect health care workers from the novel influenza virus.

The Centers for Disease Control and Prevention advised using N95 respirators when caring for patients with the novel influenza, but some state or local health departments recommended using face masks unless performing aerosol-generating procedures. "Delayed and/or disparate recommendations often led to confusion among health care personnel and their employers, who had to decide what to tell personnel about what type of PPE to wear and when," the IOM panel said.

The result was that health care workers in different parts of the country or at different facilities received different levels of protection from the H1N1 influenza. "During the 2009 H1N1 pandemic, the California standard was the only workplace standard in the United States that required a mandatory level of worker protection to be provided to health care personnel," the panel said.

"What we found was wide variation in the use of personal protective equipment during the H1N1 pandemic," says **Bill Kajola**, industrial hygienist with the AFL-CIO in Washington, DC, and a member of the IOM panel. "Some employers adhered to the [Centers for Disease Control and Prevention] and OSHA guidelines in their entirety, other employers followed some of the recommendations and other employers did very little."

An infectious diseases standard "is a means to put everybody on the same level playing field as far as the protections that all health care workers should expect," he says.

Need more info on face masks

A central question emerged from the debate over appropriate PPE: How protective are face masks?

The IOM panel called for "an expedited mecha-

nism for funding these studies" on influenza transmission, face masks and respirators. The National Institute for Occupational Safety and Health (NIOSH) currently is sponsoring research on masks and respirators.

Face masks should be certified and required to meet a set of standards if they are used as personal protective equipment, the IOM panel said. And in a twist on the traditional concept of personal protective equipment, the panel cited research that shows greater protection to the health care worker if the patient wears a mask — an infection control measure that is part of "respiratory hygiene."

"There needs to be more research to validate that" protection before "source control" could be considered a form of PPE for health care workers, says **Maryann D'Alessandro**, PhD, associate director for science at the NIOSH's National Personal Protective Technology Laboratory (NPPTL).

The decision about PPE ultimately hinges on the risk of infection. And not enough is yet known about the transmission of influenza, says **Roland Berry Ann**, deputy director of the NPPTL.

"Not knowing the infectivity or the level of exposure for the [infectious] agent, it's hard to determine what level of protection is adequate — whether the lower protective factor of a surgical mask is sufficient to stop the transmission or if you need the aerosol stopping characteristics of the respirator," he says.

Meanwhile, NIOSH is moving forward with its "total inward leakage" rule that will set a new criteria for fit for N95 respirators. The agency also will focus research on another area highlighted by the IOM: The need for a simpler fit-test.

Creating a health care-specific PAPR may actually be easier than resolving some of the N95 challenges. Current PAPRs were designed for industry and must meet performance standards under silica dust loading conditions for four hours, says Berry Ann. "We've heard from some of the [health care] stakeholders that they may only need it for 15 minutes [at a time]," he says.

With different filtering requirements, a health care PAPR could be lighter and quieter, he says.

[Editor's note: The IOM report, "Preventing Transmission of Pandemic Influenza and Other Viral Respiratory Diseases: Personal Protective Equipment for Healthcare Personnel Update 2010," is available at www.nap.edu/catalog.php?record_id=13027.] ■

OSHA: Train employees on proper use of PPE

Directive highlights PPE requirements

Do all of your employees know which personal protective equipment (PPE) to wear — and when? A compliance directive from the U.S. Occupational Safety and Health Administration underscores the employer's responsibility to assess hazards and identify appropriate PPE and to train employees on each type of PPE.

"The [compliance officer] shall determine whether the employee knows when and what eye, face, head, foot and hand PPE is necessary, how to properly don, doff, adjust and wear the assigned PPE, the limitations on the assigned PPE, and the proper care, maintenance, useful life and disposal of the assigned PPE. If each employee required to use the assigned PPE does not know all of the above, a citation shall be issued . . ." according to the OSHA directive.

In hospitals, this encompasses a wide range of PPE, from medical gloves, gowns and goggles to hard hats or welding gloves, notes **Bruce Cunha**, RN, MS, COHN-S, manager of employee health and safety at the Marshfield (WI) Clinic. "The list of PPE products that are being used in health care is probably higher than in most other industries," he says.

The OSHA directive primarily addresses the requirement for employers to pay for PPE. But it also addresses OSHA requirements for hazard assessment and training. Documenting the assessments and the training could be a significant task for health care employers, Cunha says.

Just providing the PPE isn't enough. According to the directive: "The employer must ensure that each affected employee uses protective eye and face wear that fits properly and protects against specific workplace hazards. In addition, the employer should ensure that the protective eye and face wear is reasonably comfortable, provides unrestricted vision and movement, is durable and clean, and provides unrestricted functioning of any other required PPE."

In February, OSHA cited Northeast Hospital Corp. after an inspection of its facility in Beverly, MA, alleging repeat and serious violations of electrical safety standards. The agency issued $63,000 in proposed fines. Among the cita-

tions, OSHA found that "the employees lacked or did not use personal protective equipment while working with energized electrical equipment."

[*Editor's note: The directive, "Enforcement Guidance for Personal Protective Equipment in General Industry," is available at* www.osha.gov/OshDoc/Directive_pdf/CPL_02-01-050.pdf.] ■

Beyond droplets: Is flu airborne in near-range?

Study finds viable small particles in coughs

A recent study of flu aerosols may lead to a new way of thinking about disease transmission. A patient's cough spews tiny particles that remain viable and can penetrate to the lower regions of the lungs, according to a report from West Virginia University in Morgantown.

That finding may require a new paradigm of a near-range spread — something between the droplet model, which assumes the transmission risk is from the splash of a cough or sneeze, and the airborne model, in which disease particles remain viable over time and distance.

"It's time to change this paradigm," says **Lisa Brosseau**, ScD, CIH, associate professor in the School of Public Health at the University of Minnesota in Minneapolis, an industrial hygienist who specializes in respiratory protection and aerosols but was not involved in this study.

"We [need to] make people aware that there are likely to be very small particles when you're standing near a patient and you can breathe them in," she says. "What you should be protecting yourself from is not something that sprays onto your face but something that makes its way around the edges of a surgical mask and into your mouth and nose."

This concept is controversial because it points to the need for respirators rather than surgical masks to prevent transmission. The Centers for Disease Control and Prevention already has recommended the use of respirators when health care workers are performing aerosol-generating procedures, such as intubation or bronchoscopy, on patients with influenza because of the increased volume of aerosolized particles.

Brosseau says her support for respirators ultimately stems from a focus on patient safety. Health care workers who inhale the particles and become infected with influenza can then unknowingly transmit it, she says. "I'm concerned about their passing infection on to patients," she says.

A continuum from droplet to airborne

In the West Virginia study, researchers recruited 58 students with influenza-like symptoms. Of the 47 who had confirmed H1N1 influenza, viral RNA was collected in the coughs of 38 students, or 81%. About two-thirds (65%) of the RNA was found in particles less than 4 microns, or in the respirable range.[1]

"We always talk about aerosol versus droplet transmission as if there's a distinction, but in fact it's a continuum," says **William G. Lindsley**, PhD, research biomedical engineer with the Health Effects Laboratory Division at the National Institute for Occupational Safety and Health in Morgantown and lead author of the study. "As particles get bigger, they have more inertia and they're heavier."

More importantly, Lindsley and colleagues found viable virus in cough particles of two of 21 samples tested — despite the fact that method used to collect aerosols can lead to inactivation of the virus.

"What we're finding is that there's a certain amount of airborne flu, [and] a certain amount is viable, so potentially there's a risk of inhaling particles."

Lindsley concedes that it's not known whether those small particles could actually cause illness. "There are going to have to be other studies to determine what the infectious dose is," he says. Researchers in the flu division of the Centers for Disease Control and Prevention are using ferrets to study contact and airborne transmission of flu.

Lindsley's study also suggests that some influenza patients may be "super-spreaders." Almost half (45%) of the viral RNA collected from cough aerosols came from just four of 38 students with influenza.

In this flu season, Lindsley and colleagues are recruiting more students to further test the viability of small flu particles.

REFERENCE

1. Lindsley WG, Blachere FM, Thewlis RE, et al. Measurements of airborne influenza virus in aerosol particles from human coughs. *PLoS ONE* 2010; *5*: e15100. doi:10.1371/journal.pone.0015100. Available at www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0015100. ■

Top slip and fall hazard: Water on the floor

Measures can reduce major cause of injury

The water that splashes onto the floor in the kitchen, gets tracked into the lobby on a rainy day, and spills near the nurses' station is more than just a nuisance. It's a hazard that could lead to costly injuries.

Contaminants on the floor, including water, are the leading cause of slips and falls, according to research by the National Institute for Occupational Safety and Health (NIOSH). Almost half (48%) result in sprains and strains and 8% result in fractures. Overall, slips and falls are second only to overexertion as the most common source of reportable injury in hospitals, according to U.S. Bureau of Labor Statistics data.

The good news: Slips and falls are preventable with a comprehensive program that includes walk-arounds to look for potential hazards.

"The problem can be larger than it appears at first glance," says **Jennifer Bell**, PhD, research epidemiologist with the Division of Safety Research at NIOSH in Morgantown, WV. "If you treat it [in as comprehensive way], as you would a safe patient handling and movement program, you can really have an impact."

Bell advises employee health professionals to look for patterns in their slip and fall incidents. But be aware that injury reports may not contain sufficient information. "Slipped on water" doesn't tell you whether the floor was wet from a recent mopping or whether a leaky pipe is creating a hazard. And too often, the report simply says an employee fell, without a full explanation, she says.

Look for the most detailed report — often, that's the first report of employee injury, advises **Jim Collins**, PhD, MSME, associate director for science in NIOSH's Division of Safety Research.

NIOSH developed a workbook and checklist to help hospitals reduce their slips and falls (www.cdc.gov/niosh/docs/2011-123/pdfs/2011-123.pdf). An evaluation of a slips and falls prevention program at BJC Healthcare in St. Louis found that slips and falls workers compensation claims declined by 59% over a 10-year period. (See *HEH*, November 2008, p. 124.)

A comprehensive slips and falls program involves a shift in safety culture. Hazards exist throughout the facility, so the approach must be

CNE QUESTIONS

13. According to a Cochrane Review, studies showing that influenza immunization of health care workers reduces influenza-related illness or mortality in elderly nursing home residents are flawed because:
A. not enough health care workers received the vaccine.
B. the vaccine was not well-matched to the circulating strains.
C. the elderly nursing home residents were also vaccinated.
D. the studies were subject to bias.

14. From 2006 to 2010, the Tennessee OSHA focused on sharps safety in the OR. How much did OR sharps injuries decline in hospitals?
A. 5.5%
B. 10%
C. 14.5%
D. 23%

15. What concern did an IOM panel have about the use of personal protective equipment during H1N1 that influenced the panel to support an infectious diseases standard?
A. Differing guidance was confusing and led to different levels of protection.
B. Not enough PPE was available to protect workers.
C. The PPE wasn't effective and many workers became ill.
D. New forms of PPE would be developed under a new standard.

16. According to NIOSH, what is the greatest hazard for slips and falls in hospitals?
A. Contamination on the floor
B. Icy conditions
C. Walking surface irregularities
D. Exposed cords

CNE INSTRUCTIONS

Nurses participate in this continuing nursing 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 June issue, you must complete the evaluation form provided in that issue and return it in the reply envelope provided to receive a credit letter.

interdisciplinary, including housekeeping, maintenance, dietary, nursing, and others.

Too many employees just walk past a spill hazard with a feeling of disregard, Collins says. "Very few people in a hospital feel that it's their responsibility to clean up spills," he says. But a comprehensive program arms them with a way to respond, from paging housekeeping to placing an absorbent spill mat on the spills.

BJC Healthcare built awareness — and a spirit of fun — by rewarding employees who were spotted cleaning a spill with a $25 restaurant gift certificate.

The NIOSH workbook provides suggestions on addressing hazards, from uneven pavements to tangled cords. "They are simple recommendations, but we have evidence that they are effective in preventing worker injuries," says Bell.

Top 10 causes of slips and falls

1. Contaminants on the floor, including water, grease, and other fluids. The kitchen is one of the most fall-prone areas of the hospital because of water and grease that often spills onto the floor. Water-absorbent mats and slip-resistant shoes can help prevent falls.

Highly visible barrier signs can keep employees (and visitors) from walking on floors that are still wet from cleaning. Just be sure environmental services workers don't keep the barriers up after the floor is dry, says Bell. Employees will begin to ignore the signs if they remain up when the floor is dry, she says.

If disposable spill pads are available at convenient locations, employees can place them on the spills until housekeeping arrives to clean the area. Plastic umbrella bags at doorways also minimize the dripping of water in entry areas.

2. Poor draining of pipes and drains. Sometimes the hazardous puddles of water in the kitchen or in walkways outdoors are caused by clogged drains. A walk-around inspection also may reveal drainage pipes that direct water onto sidewalks or walkways rather than draining away from them.

3. Indoor walking surface irregularities. Damaged or uneven floor tiles and buckled carpet creating unnecessary — and unexpected — tripping hazards.

4. Outdoor walking surface irregularities. The path from the parking lot to the hospital entrance can contain a variety of hazards, including stones and debris, holes in grassy areas, and cracks in walkways. Make sure that curbs or changes in pavement elevation are marked with yellow caution paint.

5. Weather conditions. It may seem inevitable that ice and snow will create a greater falling hazard, but there are steps you can take to reduce it. Some hospitals use temperature-sensitive ice alert signs at entrances to serve as a caution. Special bins with ice-melting chemicals and scoops allow employees to respond to icy patches. Slip-resistant mats and footwear may be especially beneficial in winter weather.

6. Inadequate lighting. Although poor lighting in itself won't cause slips and falls, it may make it more difficult for employees to see fall hazards such as uneven pavement. Make sure that walking areas both inside and outside the hospital have good lighting.

7. Stairs and handrails. Sometimes handrails are missing or are too low to be useful. Steps should be clearly marked and should be slip-resistant.

8. Step stools and ladders. Reaching for supplies from atop a step stool or ladder creates a fall hazard in many parts of the hospital — from the kitchen to medical records. Train employees in the safe way to use ladders. They should wear shoes with a closed back that have sufficient tread, and they should maintain three-point contact at all times (two hands and one foot).

9. Clutter, exposed cords, and other trip hazards. As equipment is placed in patient rooms, nursing stations, and other work stations, sometimes loose cords or cables stretch into walking areas. Bundle cords, tape them to the floor, or rearrange the space to clear walkways.

10. Mats can be helpful to avoid slips and falls, but they need to be in good condition. If they are damaged or may slide on the floor, they can cause a problem instead of preventing one. Replace damaged or inadequate mats and use larger or additional mats, if necessary. ■

COMING IN FUTURE MONTHS

- Healthy tweets: Using social media in occ health
- New guidelines on HCW vaccination?
- Workplace disincentives: Slapping the hands that aren't washed
- What to expect from an injury prevention standard
- Washington state's safe patient handling success story

CNE 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 the clinical, administrative and regulatory issues particular to the care of hospital employees affect health care workers, hospitals, or the health care industry at large;
- cite solutions to the problems faced in the care of hospital employees based on expert guidelines from relevant regulatory bodies, or the independent recommendations of other employee health professionals.

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CNE Answer Key: 13. D; 14. C; 15. A; 16. A