



Hospital Employee Health®

THE PRACTICAL GUIDE TO KEEPING HEALTH CARE WORKERS HEALTHY

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More HCWs stepping up for flu shot, but pressure builds for hospital mandates

But mandates have 'logical, ethical, administrative pitfalls'

More health care workers responded to this season's push for influenza vaccination by rolling up their sleeves and getting the vaccine. By mid-November, 56% reported having gotten the vaccine and 7% said they definitely planned to get the vaccine, according to a web-based survey conducted for the Centers for Disease Control and Prevention. About 68% of hospital employees had received the vaccine, and another 5% said they definitely intended to be vaccinated, for a total of 73%.

But while that vaccination level was similar to last year and higher than rates that hovered near 40% in recent years, it wasn't enough to stem the call for mandatory programs, particularly within the infection control community. Unions and occupational medicine physicians continued to press for voluntary programs as the best way to boost vaccination.

Although some hospitals have been able to get vaccination rates above 80%, it requires such an intense focus and strong leadership involvement that a hospital must create an expectation that all employees will be vaccinated, says **William Schaffner, MD**, an infectious disease expert who is chairman of the Department of Preventive Medicine at Vanderbilt University in Nashville, TN. Most hospitals, however, can't reach that level, he asserts.

"[The survey] affirms my notion that the era of voluntary compliance is over. I think influenza immunization for all health care workers ought to be mandatory," he says. "We have been promoting health care workers immunization in a very intense way for 10 years. We have seen the national proportion of health care workers inch up but we're not making great progress. The thing that seems to get health care workers almost completely immunized is a mandatory policy."

However, **Melanie Swift, MD**, medical director of the Vanderbilt Occupational Health Clinic at Vanderbilt University in Nashville, TN, remains unconvinced about the merits of mandatory vaccination. In fact, studies have failed to demonstrate the benefits of vaccination on patient outcomes,



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even in long-term care settings, she says.

“Employer-mandated vaccinations are fraught with logical, ethical, and administrative pitfalls and constitute a false sense of security even though they may create the impression of strong action,” Swift said as an author of recent comments to the U.S. Department of Health and Human Services on its draft Flu Action Plan from the American College of Occupational and Environmental Medicine (ACOEM). Swift is vice chair of ACOEM’s

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Medical Center Occupational Health section.

Resources spent on vaccination programs “should not drain resources from other important programs to protect the health of workers,” she cautioned.

Ironically, the most persuasive message to send to health care workers may be one of self-interest. According to the CDC survey, 85% of health care workers received the flu vaccine because they didn’t want to get the flu. About 58% said they wanted to protect their family and friends. Transmission to patients was a concern for just 38% of health care workers, according to the survey, which is unpublished.

How high can you go?

One thing is clear: The pressure continues to grow for hospitals to improve health care worker immunization rates.

In Iowa, hospital rates of health care worker influenza immunization are publicly reported, along with health care associated infections. A number of hospitals have adopted mandatory vaccination programs, and the state touted a 91% vaccination rate in 2009-2010.

Wisconsin opted to promote voluntary programs that require health care workers to sign a declination form if they don’t want to be vaccinated. The state’s median rate rose to 72%. About 40 hospitals reached the state’s target of 80% or more. The state provided feedback to hospitals and nursing homes and offered recommendations to improve rates.

“We want health care workers to do this because it’s the right thing, and so far, it’s working,” **Gwen Borlaug**, CIC, MPH, infection control epidemiologist with the Wisconsin Division of Public Health, said in a statement.

The Maryland Partnership for Prevention in Baltimore has been promoting health care worker influenza immunization for about six years, with an emphasis on education and making vaccinations free and convenient. The partnership offers a free online toolkit to assist hospitals and other health care employers. (See www.immunizemaryland.org.)

Hospital vaccination rates range from a low of about 30% to 100%, says **Tiffany Tate**, MHS, executive director of the partnership.

“We have been reluctant as an organization... to make that recommendation that [health care employers] should make it mandatory,” she says. “But we do think people should really push for

vaccinations and ask people to sign a declination form if they don't have the vaccine."

Meanwhile, the list of hospitals requiring influenza immunization continues to grow, says **Deborah Wexler, MD**, executive director of the Immunization Action Coalition in St. Paul, MN, which tracks mandatory programs on its "honor roll." (Those include institutions that allow declinations or exemptions for personal reasons.)

"We need every health care worker who can be vaccinated to be vaccinated," says Wexler. "That's how we're going to optimally protect the patients we take care of."

Editor's note: How did you do with the flu? A flu vaccination campaign assessment tool is inserted in this issue of HEH. ■

Infected HCWs shunned protective measures

Few H1N1 infected wore N95s, goggles, gowns

In the H1N1 influenza A pandemic, many infected health care workers failed to wear personal protective equipment. They became sick after caring for infected patients. In addition, they were infected after socializing with co-workers who came to work sick.

The bottom line: Health care workers need to improve their adherence to infection control precautions and they need work policies that encourage them to stay home when sick. Those are findings from analyses of cases in which health care workers acquired H1N1 in the early weeks of the pandemic.

From May 4 to June 1, 2009, the Centers for Disease Control and Prevention received 81 reports of health care workers with confirmed or probable pandemic H1N1 in 25 states. Two were hospitalized, including one health care worker with other underlying medical conditions. On average, the ill health care workers missed a week of work.

Half of the cases involved likely transmission in the health care setting, according to detailed information on 70 of the cases. About two-thirds of those occurred in inpatient care or an emergency room. In 20% of cases, there was no known exposure, either in the hospital or in the community.¹

"One commonality we saw is that uniformly people who acquired H1N1 infection were not wearing respiratory protection of any sort when

caring for patients," says **Matthew Wise, PhD**, epidemiologist with CDC's Division of Healthcare Quality Promotion and lead author. "This really points to a need for a comprehensive approach to infection control in these settings. We're not going to be able to promptly identify every patient who walks through the door."

A Health Hazard Evaluation of four hospitals affiliated with the University of Utah School of Medicine in Salt Lake City found similar gaps in the use of personal protective equipment.² In part, that might have been because residents rotated among hospitals with different policies, says **Marie A. de Perio, MD**, medical officer in the Hazard Evaluations and Technical Assistance Branch for the National Institute for Occupational Safety and Health in Cincinnati and co-author of the Health Hazard Evaluation.

"The four medical centers all had four different recommendations for appropriate PPE when taking care of flu patients. That caused a lot of confusion among the house staff," she says.

Medical residents were most likely to report that they used PPE if they were present during aerosol-generating procedures or in the Intensive Care Unit. "That suggests to us that emphasis on PPE was strong in these high-exposure settings," she says.

Rare use of respirators, goggles

The spotty use of infection control precautions is striking, particularly considering that H1N1 was still emerging in the spring of 2009.

In 20 cases of probable or possible patient-to-

Why do HCWs come to work sick?

In a Health Hazard Evaluation, researchers from the National Institute for Occupational Safety and Health asked medical residents and cardiology, pulmonary, and critical care fellows at the University of Utah why they had reported for work sick during the H1N1 pandemic.

They said:

- I have a professional obligation to patients.
- I did not think I would put patients at risk.
- I did not think I would put any co-workers at risk.
- I did not think I was contagious.
- I did not want to admit feeling sick.

Protecting house staff from flu

In an analysis of transmission of pandemic H1N1 to residents and fellows at the University of Utah in Salt Lake City, the National Institute for Occupational Safety and Health advises:

What program and medical center managers can do

- Develop procedures for tracking ill housestaff and fellows and excluding them from work.
- Develop a written plan for staffing of housestaff and fellows in the event of a pandemic or other emergency.
- Educate housestaff and fellows on the evaluation, diagnosis, treatment, and complications of patients with symptoms of influenza. Recommended isolation precautions, proper hand hygiene, and use of recommended PPE should also be covered.
- Continue to require housestaff and fellows to get the annual seasonal influenza vaccine as part

of health care worker transmission reported to CDC, less than half of the health care workers (9, or 45%) reported wearing gloves most or all of the time. Only two reported wearing respirators always or most of the time, and only five reported wearing a surgical mask always or most of the time.

Goggle or face shield use was virtually non-existent, although CDC had recommended eye protection (as well as respiratory protection, contact and standard precautions) when caring for pandemic H1N1 patients. Sixteen, or 89%, reported that they never used eye protection.

CDC's infection control guidelines recommend "protection of the eyes, nose and mouth by using a mask and goggles or face shield alone" when caring for a patient with a respiratory illness in which there is a risk of a splash or spray of respiratory secretions or bodily fluids.³

The findings were similar in the Utah evaluation. About two-thirds of the physicians were considered to have "low adherence" to protections based on their reports of PPE use.

Why didn't the physicians wear protective equipment? More than half of them (55%) said they didn't know the patient had pandemic H1N1 or an influenza-like illness. Lack of availability was identified as a common reason, as well, in the Utah survey.

In fact, even in those early weeks of the pan-

dem of a comprehensive influenza infection control strategy.

- Place signs indicating appropriate isolation precautions outside patients' rooms as soon as patients are placed in the rooms.
- Limit healthcare personnel entering the room of a patient in isolation precautions for influenza to those performing patient care activities.
- Develop, implement, and maintain a respiratory protection program for all housestaff and fellows to protect against airborne infectious agents.
- Work with a designated person in charge to ensure an adequate inventory of N95 respirators for emergencies.

What housestaff and fellows can do

- Self assess for symptoms of ILI. Report any symptoms to appropriate supervisors as soon as possible.
- Do not report for work when ill.
- Get the seasonal influenza vaccine every year.
- Use recommended PPE when caring for critically ill and non-critically ill patients with pandemic H1N1 or influenza-like illness.

dem, three of the four hospitals reported having supply shortages of N95s and facing high prices to obtain more N95s, powered-air purifying respirators, or fit-testing kits.

Co-workers infected HCWs

Personal protective equipment wasn't the only problem. Health care workers faced an exposure risk from co-workers who came to work sick.

"That was a relatively common route of transmission among health care workers who were infected," says Wise.

He notes that about 20% of health care workers who became infected with H1N1 were non-clinical personnel — a receptionist in an outpatient clinic, a pharmacy technician, and a front office manager, for example.

"Those people didn't [seem to be] infected by contact with patients, but they were infected by ill health care workers," he says.

In the Utah evaluation, about three-quarters (77%) of physicians with influenza-like illness reported working while ill, and about half (52%) of all physicians surveyed reported having contact with a co-worker who was ill.

In dramatic evidence of the potential for transmission, a cluster of eight cases of influenza-like illness occurred among the residents and fellows

within 48 and 96 hours of a resident dinner. Six of them had attended the dinner.

De Perio suggests that programs should be clear about how absences will be handled so that residents don't feel pressured to come into work because they don't want to burden their colleagues.

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Time to build up for future pandemic

Short supplies, high costs plagued hospitals

As the H1N1 virus receded even as a seasonal influenza threat, there was a collective sigh of relief in the health care community. It wasn't as bad as was feared.

But as a “drill” for a worse pandemic, H1N1 leaves behind a key question: Are hospitals prepared to protect their employees from a widespread, emergent virus that is a respiratory hazard?

As H1N1 struck, hospitals struggled with shortages of respirators, goggles, safety needles, children's masks, and even swabs. When respirators ran out, hospitals scrambled and were forced to pay more for brands and models their employees had never used, which then meant time-consuming and expensive fit-testing. Can we do better than that?

“[The H1N1 pandemic] was a good test of the supply chain. It showed where we had some holes in it,” says Al Cook, CMRP, FAHRMM, chief resource director at Regional Medical Center in Orangeburg, SC, and chair of the Health Sector Coordinating Council of the Health and Public Health Critical Infrastructure Protection Advisory Committee, which advises federal agencies on pre-

paredness. “Thank goodness the effects weren't as severe as everyone anticipated.”

Hospitals need to analyze how they fared during the pandemic and take steps to address the supply issues, Cook told HEH. But they'll need some support from the federal government and cooperation from manufacturers, he says.

“The manufacturing and warehouse folks have no business incentive to carry surplus inventory — and they don't know how much inventory to carry,” explains Cook. “We still are studying the overall impact. How many masks per patient day will we actually consume [in a severe pandemic]? This was not a severe pandemic.”

Wanted: Respirators, masks, needles

A pandemic presents a sort of “perfect storm” for hospitals. For typical emergency preparedness, The Joint Commission requires hospitals to be self-sustaining for four days. In that timeframe, supplies and personnel could be brought in from unaffected areas of the country.

But a pandemic spreads rapidly from coast to coast. A survey of materials managers and infection preventionists at hospitals around the country found that 58% experienced shortages of respirators. Even surgical mask supplies were tight as demand suddenly surged; 38% said they had a shortage or back orders of masks. Safety needles were needed for millions of vaccinations — and 46% of respondents said they were unable to vaccinate frontline workers from September to November 2009.

(The survey was conducted in February and March 2010 and had 1,109 responses. It was sponsored by *Materials Management in Health Care*, the Association for Healthcare Resource and Materials Management (AHRMM) and the Association for Professionals in Infection Control & Epidemiology (APIC) and was originally published in *Materials Management in Health Care* in June 2010.)

For example, at Regional Medical Center in Orangeburg, a facility of 286 beds, the normal use of four to five boxes a week of N95 respirators spiked to a demand for four to five boxes per day. Cook centralized the distribution, so that nurses would receive a supply of respirators upon request. This was designed to cut back on hoarding or taking respirators for family members.

He also had previously obtained reusable respirators — elastomers and powered-air purifying respirators (PAPRs) — that could become a pri-

mary resource if the disposables ran out.

Meanwhile, Cook fielded calls from materials managers at other hospitals that had run out of masks. He tried to connect them with resources.

“To me it’s a scary thing,” he says. In a pandemic with a disease that had higher morbidity and mortality, a hospital treating patients without appropriate protective gear “could be the epicenter for the spread,” he says.

Circulate the inventory

What can hospitals do to prepare? Ideally, hospitals should develop a circulating inventory of N95 respirators, says Cook. They can’t be stored indefinitely because the respirators can break down due to temperature or humidity, he says.

Some health care organizations and at least two states — Virginia and Michigan — have developed agreements with distributors to pay the carrying costs of an N95 inventory, he says. In a pandemic, the distributor would ship the respirators within 24 hours, and the customers would then pay for the product. The distributor would manage the inventory, so it would remain fresh.

Hospitals also should work with their group purchasing organizations to obtain better pricing for an alternative brand and model of respirator so they’ll still have price protection if their preferred model is not available, he says.

The federal government can encourage the development of inventories through financial incentives, such as tax incentives, he suggests.

Hospitals that were forced to pay steep prices for respirators and other supplies may be taking a new look at their pandemic preparedness. Cook notes that supplies usually stabilize about 45 to 60 days after an emergency, but it took five to six months for the N95 respirator market to stabilize.

“I really hope they’re managing that inventory and not sequestering it,” he says, noting that without a plan to circulate the inventory into regular use, “eventually it will become unusable.” ■

Chemo drugs damage HCW chromosomes

Studies show risk, widespread contamination

Nurses and pharmacists who handle chemotherapeutic drugs are unknowingly being

exposed to a potential carcinogenic and reproductive hazard, and those with the highest exposures have significant chromosomal abnormalities, according to two recent studies.

The research sheds new light on the risks of chemotherapeutic agents to health care workers that persist even with updated handling policies and safety equipment.

“These findings were not in borderline hospitals but in university hospitals that all endorsed the safe handling practices,” says lead author **Melissa A. McDiarmid**, MD, MPH, DABT, director of the Occupational Health Program at the University of Maryland School of Medicine in Baltimore.

Proper work practices need to be reinforced and clean rooms and closed mixing and dispensing systems need to be adopted to minimize exposure, says **Thomas H. Connor**, PhD, a research biologist at the National Institute for Occupational Safety and Health in Cincinnati who is lead author of a study that found widespread surface contamination in pharmacy and nursing areas.

Sixty percent of wipe samples in work areas tested positive for contamination with at least one of five antineoplastic drugs in Connor’s study. That included carts, trays, countertops, IV bags, and even floors in patient rooms. The highest concentration was found on the lid of a hazardous waste container in a nursing station. About a third (32%) were contaminated with more than one drug, and pharmacy areas tended to be more contaminated than nursing areas.¹

Three of 68 exposed workers had measurable concentrations of cyclophosphamide or paclitaxel in their urine, Connor and his colleagues found. In McDiarmid’s companion study, nurses and pharmacists were 20% more likely to have an abnormality of chromosome 5 or 7 than a control group if they had 100 or more chemotherapeutic drug handling events. Those involved in the most handling — 500 events — had a 2.5 increased likelihood of a chromosomal 5 or 7 abnormality. When alkylating agents alone were considered (23% of handling events), the likelihood of chromosomal damage doubled at just 100 events and was almost 7-fold at 200 events.²

This is the first time U.S. researchers have looked at the specific chromosomal markers that are observed in leukemic patients and found important genotoxic changes in nurses and pharmacists handling chemotherapeutic drugs. That

should be a wake-up call for greater attention to this hazard, says McDiarmid.

“There needs to be some vigilant attention to the application of the current safe handling guidance,” she says. “These are probably the most toxic agents that are present in health care and we need to act like it. They are designed to kill cells. Why are we surprised they can’t tell the difference between who is the patient and who is the health care worker?”

Hazards on par with radioactivity

The findings underscore why chemical hazards should be treated with the same high level of concern as radiologic hazards, says McDiarmid.

“We need to realize the high pressure milieu in which chemo is given,” says McDiarmid. “Everything needs to get done in a short amount of time . . . I think that promotes short-cuts. We’re sacrificing ourselves for the patient.

“If there was genuine respect for these [agents] the way there was for a radiation hazard, I think people would take fewer shortcuts,” she says.

For example, health care workers may not be aware that studies have found contamination on the outside of virtually all vials — which creates risk for everyone from the person unloading supplies in shipping and receiving to pharmacists and nurses. “As long as you have [contaminated vials], you can do everything else right, but you’re going to have some contamination,” says Connor.

Placing protective sheeting on the outside of vials may reduce contamination, studies show.³ Other measures to protect health care workers include:

Double-gloving. Health care workers should wear double-gloves when handling hazardous drugs, Connor says. After mixing or administering the drug, the outer glove should be removed and placed in a hazardous waste container. The remaining glove then will be clean and will not contaminate surfaces, he says.

Gowns. Gowns should be worn during compounding, administration, and waste handling, and they should be made of a material that is protective against the hazardous drugs being used. Gowns should not be reused and should be disposed of as hazardous waste.

Closed-system drug transfer devices. These devices can reduce contamination when used with a biologic safety cabinet. However, risk still remains from surface contamination on the outside

of vials.

Sterile handling. The careful practices and design of a “clean room” decrease the risk of contamination, Connor says. “In general, the clean room design with proper air flows is a good way of reducing the contamination,” he says. “When you’re protecting the product from contamination, you’re also protecting the worker because conditions in general are much stricter and cleaner.”

[Editor’s note: *The American Society of Health-System Pharmacists provides guidelines on handling hazardous drugs at www.ashp.org/DocLibrary/BestPractices/PrepGdlHazDrugs.aspx.]*

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NIOSH updates hazardous drugs

First update since 2004 adds 21 drugs

In the first update of a hazardous drug alert since 2004, the National Institute for Occupational Safety and Health added 21 drugs to the list of drugs that may pose an occupational risk to health care workers.

Anti-neoplastic agents are on the list, as are some new medications that could be absorbed through occupational exposure. “Some have severe reproductive effects. Some might produce skin irritation,” says **Thomas Connor**, PhD, research biologist with NIOSH in Cincinnati.

These are new drugs or had new warnings during the years 2004 to 2007. NIOSH is already working on another update for 2007 to 2010.

Drugs are considered hazardous based on six criteria: Carcinogenicity, mutagenicity, teratogenicity, reproductive effects, organ toxicity at low doses, and a structural similarity to another hazardous drug. The list is available at www.cdc.gov/niosh/docs/2010-167/. ■

OSHA cites hospitals for recordkeeping flaws

Problems with forms top bloodborne lapses

Beware of recordkeeping violations. That's a word to the wise based on recent enforcement activity by the U.S. Occupational Safety and Health Administration.

In the last fiscal year ending Oct. 1, 2010, federal OSHA cited hospitals more frequently for failures related to the OSHA 300 log than any other standard. (Bloodborne pathogens came in second.)

Meanwhile, OSHA's pending new rule on recording of work-related musculoskeletal disorders would add a new requirement for employers to check a box on the OSHA 300 log indicating that an MSD occurred. It has been delayed due to an extended review from the U.S. Office of Management and Budget.

The proposed rule also removes the language in an OSHA compliance directive that says that "if a health care professional determines that the employee is fully able to perform all of his or her routine job functions, and the employer assigns a work restriction for the purpose of preventing a more serious injury."

"We're seeing them taking [recordkeeping] more seriously than they have [in recent years]," says **Brad Hammock**, Esq., workplace safety compliance practice group leader at Jackson Lewis LLP in the Washington DC region office.

Some common errors: Failing to post summary forms, improperly completing particular recordkeeping entries, not recording an injury or illness that should have been recorded, failing to have a proper signature on a form.

That increase in recordkeeping citations coincided with an OSHA national emphasis program on recordkeeping, which was announced in October 2009. The program focused on workplaces that reported low rates of injury that were in high-rate industries. Nursing homes were among the targeted employers, but hospitals were not.

Yet the increased scrutiny on recordkeeping may have been reflected in some hospital inspections, Hammock says.

"[OSHA is] citing employers for underreporting injuries and illnesses. That's a major problem because if hazards are underreported then there's no urgency to address them," says **Bill Borwegen**, MPH, health and safety director of the Service Employees International Union (SEIU).

Overall, hospitals typically do not receive many OSHA inspections relative to their workforce. Federal OSHA inspections overall rose by 5%, but declined in hospitals by about 7%, according to industry-specific OSHA data.

Yet that may change as well. In Fiscal Year 2011, OSHA included hospitals and nursing homes among the "high hazard" workplaces that are subject to unannounced, targeted inspections.

Hospitals that receive the targeted inspections have a rate of days away, restricted or transferred (DART) of 15.0 or more per 100 full-time equivalent employees or a case rate of days away from work due to injury and illness of 14 or higher. For nursing homes, the rates are somewhat higher, with a DART rate of 16 or above and a "days away from work" case rate of 13 or above.

In nursing homes, OSHA said it will focus on "ergonomic stressors; exposure to blood and other potentially infectious materials; exposure to tuberculosis; and slips, trips, and falls." Citations related to ergonomics would require use of the General Duty Clause, which requires employers to keep the workplace free of "recognized hazards that are causing or are likely to cause death or serious physical harm" to employees.

"OSHA will be doing more programmed inspections in the hospital sector, so it's good to know what OSHA is focusing on," says Borwegen, noting that OSHA is interested in recordkeeping and bloodborne pathogens. ■

OSHA: Employers must reduce noise hazards

Agency says PPE isn't enough

Ear plugs aren't protection enough from high levels of noise at work. The U.S. Occupational Safety and Health Administration wants employers to rely more on eliminating or mitigating a noise hazard than on using personal protective equipment.

In a proposed new interpretation of the Occupational Noise Protection standard, OSHA would change the meaning of what's "feasible." Employers can't choose ear protection rather than other methods of controlling the noise hazard simply because personal protective equipment is less expensive, says OSHA.

"Although OSHA has not changed its interpretation of the standard, its enforcement policy since 1983 has allowed employers to rely on a hearing

conservation program based on PPE if such a program reduces noise exposures to acceptable levels and is less costly than administrative and engineering controls,” the agency said in a Federal Register notice. The interpretation applied to noise less than 100 decibels. (edocket.access.gpo.gov/2010/2010-26135.htm)

Instead, OSHA would consider “feasible” to mean “capable of being done” or “achievable” and would consider administrative or engineering controls to be economically feasible “if they will not threaten the employer’s ability to remain in business or if the threat to viability results from the employer’s having failed to keep up with the industry safety and health standards.”

Under the new interpretation, employers would rely on PPE only if the administrative and engineering controls weren’t completely effective in reducing the noise hazard.

“There is sufficient evidence that hearing protection alone cannot prevent workers from suffering preventable hearing loss,” Assistant Secretary of Labor for OSHA David Michaels, MD, said in a statement. “Easily applied administrative or engineering controls can and must be used to protect workers. There are plenty of employers out there who play by the rules and want to do the right thing, and we’re hopeful we can work with them to craft a policy that’s good for all.”

This proposed interpretation “represents a major change in how OSHA enforces its noise standard,” says Brad Hammock, Esq., workplace safety compliance practice group leader at Jackson Lewis LLP in the Washington DC region office. “My opinion has been that stakeholders really need to comment on this to provide as much information as possible.”

OSHA extended the comment period to March 21. Comments may be submitted to www.regulations.gov or to the OSHA Docket Office, Docket No. OSHA-2010-0032, U.S. Department of Labor, Room N-2625, 200 Constitution Ave. NW, Washington, DC 20210, 202-693-1648 (fax). ■

EMS face peril from ambulance crashes

Lack of restraints, poor design cause injury

The ambulance was 20 minutes into a 60-minute drive, taking a patient with complications of influenza from a clinic to an urban hospital. No lights or sirens. This was a transport, not an

emergency run. Suddenly, the driver of a Chevrolet Lumina crossed the center lane. The ambulance driver veered to the right, trying to avoid impact, but the Chevrolet hit the front left portion of the ambulance. The impact severed the ambulance wheel. The ambulance spun and fell off a steep embankment beside the road, landing on its side. The ambulance driver, who was not wearing a seat belt, was ejected and died of his injuries three days later. The patient, who was restrained with leg straps but not shoulder straps, was thrown from the cot, propelled against the paramedic, and tossed against the ambulance wall. She died at the scene from internal thoracic injuries. A cardiac monitor also came loose and struck the paramedic, who was sitting unrestrained on a jump seat. He landed against the passenger entry door. He had multiple injuries, including spinal fractures, but survived.

Emergency Medical Services (EMS) workers enter an ambulance prepared to take care of any emergency but their own. As this 2009 crash scenario shows, EMS workers are at risk from equipment that isn’t properly secured, unsafe design features of ambulances, and their own failure to wear seat restraints. Patients who aren’t properly secured also are at risk – and can endanger the paramedics caring for them.

“There’s about one fatality involving an ambulance every week, and about 10 serious injuries every day,” including injuries to other drivers and pedestrians, estimates Nadine Levick, MD, MPH, an emergency room physician at Brookdale Hospital in Brooklyn, NY, and chair of the National Academies Transportation Research Board (TRB) EMS Transport Safety Subcommittee. She notes that there is little detailed data on deaths and injuries in ambulance crashes and what causes them.

Yet there’s growing evidence about how to reduce the hazards to EMS workers and their patients. The main message: Use the restraints that are available.

Even a sudden jolt in an ambulance that is racing down the road – a relatively common event – can result in minor injuries to EMS workers monitoring patients in the rear of the vehicle, says Jim Green, BSME, MBA, safety engineer in the Division of Safety Research at Protective Technology Branch of the National Institute for Occupational Safety and Health (NIOSH) in Morgantown, WV.

“You can go to any ambulance service in this country and talk to workers, and they will tell you either they have been injured or a partner or coworker has been injured in an ambulance event,” he says.

Bench seats are inherently less safe than forward- or rear-facing seats in the back compartment of an ambulance, says Levick. But wherever the paramedics sit, they should wear the belt as much as possible, she says. If the paramedic must release the seat restraint to care for a patient, he or she should notify the driver, as EMS workers do in helicopter transports, she says.

In older ambulances, it actually wasn't possible to care for a patient and sit in a restraint at the same time. "If you scooted just two inches from the seat back, you would have to release the seat belt and you weren't protected anymore," says Green. "There are folks who are sitting at the edge of their seat all the time and working with patients."

NIOSH is now working with manufacturers of ambulances to create voluntary safety design standards, he says.

Whether in older or newer ambulances, EMS workers also need to be sure to secure equipment, such as monitors and defibrillators, so they don't become projectiles in a crash, says Green. The patient should be secured on the cot with shoulder straps — not just the leg straps, says Levick.

Why speed kills

Do ambulances really need to fly down the road with sirens blaring? That may sound like an odd question, since emergency responders are judged by how quickly they respond and get the patient to a hospital. But going as fast as possible isn't necessarily safe for the patient or EMS worker, says Levick, who founded the EMS Safety Foundation and a resource-rich website, www.objectivesafety.net.

"The scoop-and-run philosophy began when we didn't have the lifesaving skills and paramedic training we have now. The only thing they could do is drive really fast to get to the hospital," she says.

Now patients are getting quality emergency care and monitoring, she says. Furthermore, "driving really fast to the hospital can have detrimental effects on your patient," she says. The jolts and bumps may be uncomfortable or even frightening, which can impact patients with cardiac conditions, she says.

A review of ambulance crashes found that intersections weren't the only dangerous moments in the race to the hospital. From 1991 to 2000, 27 EMS workers died in 25 fatal ambulance crashes. Almost three-quarters (72%) did not take place at an intersection and 60% occurred during daylight hours. "While it is

intuitively acknowledged that traveling through intersections is inherently dangerous for an ambulance, it may be that the higher speeds traveled away from intersections are a significant crash factor as well," the authors stated.¹

In more than half of the fatalities, the EMS workers were not wearing seat restraints, whether they were driving, riding in the passenger seat or attending to the patient in the rear compartment.²

Hospitals and other EMS employers should emphasize safety by setting policies that require safety belt use — and provide performance incentives for compliance, says Levick. Employee health professionals can play a role in raising awareness among EMS workers about the risks of motor vehicle accidents and the benefits of seat restraints, she says.

Life-saving design

New technology and design also can help save lives. Driver feedback devices can alert drivers to unsafe conditions, such as speeds that are too high, says Levick. After all, 97% of EMS transports are non-urgent and do not involve life-threatening situations, she says.

Meanwhile, work continues on improving the design of ambulances. Most ambulances are vehicles that are modified by manufacturers who create the rear transport "box." They are not required to meet federal motor vehicle safety standards that apply to passenger vehicles. "We're trying to bring that environment up to the same level of protection as you would have in your passenger vehicle," Green says.

Levick prefers focusing on a new, integrated ambulance design that is retrofitted into the Mercedes Sprinter van. The rear transport area is smaller, but that enables the paramedic to reach items and care for patients while remaining seated, Levick says.

Side benches are inherently unsafe, even with a harness, she says. Paramedics should ride in forward-facing or rear-facing seats.

"It saves you time, lives and money to have an evidence-based safety solution," she says.

REFERENCES

1. Proudfoot, SL. Ambulance crashes: Fatality factors for EMS workers. *EMS* 2005;34:71-74.
2. Centers for Disease Control and Prevention. Ambulance crash-related injuries among emergency medical services workers—United States, 1991-2002. *MMWR* 2003;52:154-156. ■

Joint Comm looks at patient/worker safety

Seeks examples of integrated approach

Employee safety boosts patient safety. And that overall commitment to safety is something that The Joint Commission wants to promote.

The accrediting body is partnering with the National Institute for Occupational Safety and Health (NIOSH) to gather examples of effective practices that involve both patient and worker safety. The examples will be presented in a monograph and at a meeting later this year. They may come from hospitals, long-term care, home care, behavioral health, laboratories, or ambulatory care.

This collaboration represents a growing recognition of the interrelationship between patient and worker safety, says **Barbara I. Braun**, PhD, project director at The Joint Commission in Oakbrook Terrace, IL.

“High reliability organizations have always been focused on worker safety,” she says. “We’re trying to find organizations that have integrated their worker safety functions with their patient safety functions to see if that makes the organization as a whole a safer place for both.”

In its notice, The Joint Commission says: “We are particularly interested in practices that integrate leadership and functional responsibility, training, surveillance and management systems for patient and worker safety. There is a wide range of relevant topics including, but not limited to, worker and patient safety culture, satisfaction, injury prevention, infection prevention, performance improvement and individual engagement in safety activities.”

More information is available at jointcommission.qualtrics.com/SE/?SID=SV_1BT3uOdkKBFOryY. ■

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CNE QUESTIONS

5. According to a web-based survey conducted for the Centers for Disease Control and Prevention, which health care occupation has the highest rate of influenza immunization?

- A. Physician
- B. Nurse
- C. Technician
- D. Nurse's aide

6. According to Matthew Wise, PhD, epidemiologist with CDC's Division of Healthcare Quality Promotion, lead author of a report on health care workers who acquired pandemic H1N1 in the first weeks of the pandemic, what commonality did they share?

- A. They all worked in the emergency department or urgent care center.
- B. They were all under 30.
- C. They had not been vaccinated.
- D. They were not wearing respirators or masks.

7. Double-gloving is important when handling chemotherapeutic agents because:

- A. the drugs can penetrate a single layer.
- B. when the outside glove is removed, the inside glove will be clean and will not contaminate surfaces.
- C. single gloves may develop a puncture.
- D. chemotherapeutic drugs are corrosive.

8. In Fiscal Year 2010, which ended in October, what was the No. 1 citation of hospitals by the U.S. Occupational Safety and Health Administration?

- A. Bloodborne Pathogens
- B. Respiratory Protection
- C. Recordkeeping
- D. Hazard Communication

Answers: 5. A; 6. D; 7. B; 8. C.

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.

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- 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;
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Post-Campaign Assessment Worksheet

Number of employees immunized: _____

How much vaccine did you purchase for your employees this year? _____ doses

Did you have enough vaccine?

- Yes. Consider setting next year's immunization goal at 110% of this year.
- No. Consider purchasing 20% more next year.

Which departments or disciplines had the least number of staff members getting the flu vaccination (e.g., physicians, nurses, housekeepers, maintenance workers, aides, dietary staff, etc.)?

What were some of the reasons/barriers cited by this department/discipline for not receiving the vaccine?

In the space below, brainstorm strategies to address these barriers.

Did you have a multidisciplinary strategic planning team?

- Yes
- No

Methods used to administer vaccine:

- Kick-off event
- Stationary clinic
- "Rolling cart" clinic
- Other _____

Tools used for campaign promotion and staff education:

- Flyers
- Posters
- E-mail
- Employee newsletters
- In-service training
- Paycheck stuffers
- Other _____

Incentives or rewards for staff who obtained immunization:

- Departmental competition
- Refreshments
- Raffle
- Games
- Other _____

What were the methods used to track your immunization progress?

Evaluate your organization's immunization campaign.

- What were the strengths?

- What were the weaknesses?

Document adapted from Massachusetts Medical Society, Masspro, and the Massachusetts Department of Public Health