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Mumps outbreak sparks HCW vaccine questions and public health debate

Hospitals should check HCWs' immune status

An outbreak of mumps in Iowa has led hospitals to re-examine the immunization records of health care workers, with some checking for serologic evidence of immunity in employees who have had an exposure.

With more than 975 reported cases of mumps in Iowa alone and the disease spreading throughout the central states, the Centers for Disease Control and Prevention (CDC) has advised health care workers to have two doses of the MMR (measles, mumps, rubella) vaccine.

"If you have not received two doses of the mumps vaccine, it is very important that you get your second dose," CDC director **Julie L. Gerberding**, MD, MPH, said in a press conference, emphasizing the importance of health care worker immunization. The CDC is using MMR doses from the national stockpile, as well as donated doses from the manufacturer, Merck, to supplement the states' supply.

Health care workers who contract mumps should stay home until they are symptom-free, public health authorities advise.

The Iowa Department of Public Health previously had advised hospitals to review the immunological status of their staff, says **Patricia Quinlisk**, MD, state epidemiologist. Employees should have had mumps or two doses of the mumps vaccine, which usually is given with measles and rubella vaccines in the MMR, she says.

Hospitals in affected areas have responded with employee health efforts. The University of Iowa Hospitals and Clinics in Iowa City is testing the titers of employees who have been exposed and giving them a second MMR vaccine if they only had one. Health care workers with direct patient care responsibilities in high-risk areas also have received a second dose of MMR if they had only one.

A few health care workers have contracted mumps despite the vaccine, probably due to the small margin of vaccine failure, says **Cheryl Person**, RN, BSN, nurse manager of the University Employee Health

Clinic. So far, all exposed health care workers who were tested had a positive titer, showing evidence of immunity, she says.

The mumps outbreak has puzzled public health officials and led to greater scrutiny of vaccine effectiveness and vaccination policies. Iowa typically has about five cases of mumps a year. But the state is now ground zero for the largest epidemic of mumps in the United States since 1988, according to the CDC.

"We're trying to figure out what is contributing to this. We don't have all the answers," Quinlisk says.

She notes that the vaccine is about 95% effective — that still leaves five people per hundred who are susceptible to the disease. Also, Iowa began requiring two doses of the MMR vaccine for schoolchildren in 1991. Many Iowans, including some health care workers, may have received only one dose of the vaccine.

Gerberding also reassured health care providers that the MMR vaccine is effective. "I really want to emphasize that while we are of course investigating the outbreak and we will learn more about the efficacy of the vaccine in this particular setting, we have absolutely no information to suggest that there is any problem with the vaccine," she said.

Air travel contributed to spread

The outbreak began in December with two confirmed cases of mumps in college students at an eastern Iowa university. Another case was confirmed in mid-January, and by February, cases were appearing on college campuses throughout the state. Cases also have been reported in nearby states, including Kansas, Nebraska, Illinois, Minnesota, Missouri, Wisconsin, and Oklahoma.

Air travel may have escalated the spread and could ultimately lead to outbreaks across the country. The CDC reported that two travelers — one going from Waterloo, IA, to Washington, DC, and the other from Tucson, AZ, to Cedar Rapids, IA — may have exposed other air passengers to mumps between March 26 and April 2. A 2005 epidemic in the United Kingdom, involving about 56,000 cases, also may be linked to the Iowa outbreak — the viruses in the outbreaks share the same genotype.

As of late April, Iowa had reported 975 confirmed, probable or suspect cases of mumps, a disease characterized by fever, headache, fatigue, and the telltale swelling of the salivary glands. About 25% of the Iowa cases have been among college students, with a median age of 21. About 20% to 30% of the cases may be asymptomatic, the CDC reports.

Before the vaccination became routine, "nearly everyone in the United States experienced mumps," the CDC says. Although complications are rare, the disease can lead to inflammation of the testicles or ovaries, meningitis or encephalitis, spontaneous abortion or deafness.

Until this outbreak, mumps was not a major vaccination concern. It is included in the MMR vaccine and routinely administered, but its vaccine partners, measles and rubella, were considered a greater potential hazard. "We haven't had a problem with mumps for years," says **William**

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Bellini, PhD, chief of the CDC's Measles, Mumps, Rubella and Herpes Virus Branch.

Is the vaccine effective?

If most people have had either the mumps or the vaccine, why did an outbreak occur? Does this indicate that the vaccine is not effective?

Some 64% of those with reported cases of mumps in Iowa had received two doses of the MMR vaccine, while 10% had received only one dose. But that doesn't necessarily reflect a vaccine failure, public health authorities say.

"It doesn't mean the vaccine's not working," Quinlisk says. "It just means the vaccine is not 100%." A significant outbreak can occur even with just five out of every 100 people susceptible to the disease despite vaccination, she says. "The best thing we can do is make sure everybody is fully vaccinated. You're going to slow down if not stop the spread," she says.

Still, the sudden spread of mumps has raised a number of public health questions. "We're wondering why we're seeing that now, [and] why we haven't seen it before," says Bellini. The CDC is looking into the possibility of waning immunity. Some colleges and universities required an additional dose of MMR before matriculation, but some smaller colleges did not, he says.

Gerberding noted that so far the CDC does not see evidence of waning immunity. "If waning immunity were a primary problem, we would expect much older people to be affected, at least those who did not have mumps when they were children," she said. "So we are looking into this as one of several possibilities, but I think right now with what we know about this vaccine's efficacy, what we know about the undervaccinated people in this age cohort, and what we know about the sociology of life in some of these [college] community settings, we have ample explanation for why the virus is spreading the way it is."

Meanwhile, there have been no outbreaks in hospitals, day care centers, or K-12 schools, Gerberding noted. "[F]ortunately, we are not seeing outbreaks right now in schools or in younger children in large part because they have a higher degree of two-dose coverage."

"The biggest lesson learned is that this could happen anywhere," says Quinlisk, who notes that Iowa's record of vaccination is similar to that of other states. "Now is a really good time to make sure that college campuses, health care workers, and the general population are fully vaccinated." ■

PEP may become easier with 'opt-out' testing

CDC wants more people to know their HIV status

HIV testing would become a routine part of health care under a proposed recommendation by the Centers for Disease Control and Prevention. If adopted by hospitals, that policy could indirectly benefit health care workers seeking post-exposure treatment after a needlestick incident by making HIV status more widely identified.

The first hours after a bloodborne pathogen exposure are a time of high anxiety for health care workers. The CDC recommends that health care workers exposed to HIV-positive blood or body fluids start post-exposure prophylaxis as soon as possible. But if the patient is unconscious or under anesthesia, it may be impossible to get prompt consent. Health care workers often begin taking the medications while the hospital seeks the patient's HIV status.

The CDC now is looking to standardize the process of HIV testing. Routine testing would eliminate the sense of stigma patients may feel when asked if they have any risk factors and whether they want to be tested for HIV, says **Tim Maestro**, MD, deputy director for science in the CDC's Division of HIV/AIDS Prevention.

"The goal of this is to provide better care for the people currently living with HIV and to reduce transmission," he says. "We think the best way to do that is for everybody to know their status."

The CDC estimates that about 25% of Americans who are HIV-infected, or 250,000 to 300,000 people, do not know their HIV status and are not receiving treatment. That includes young women who do not realize they're at risk and who are reluctant to report multiple sexual partners, says Maestro. "If you just make it a routine test, it's very well accepted."

The CDC proposal calls for every person ages 13-64 to receive at least one baseline HIV test. People with identified risk factors, such as those with multiple sexual partners, intravenous drug users, or men having sexual relations with men, should be tested at least annually, the CDC says.

Health care providers, including hospitals, could provide the testing as a routine part of blood tests, with an option for patients to "opt out" if they don't want to be tested. Testing has become even easier with rapid tests that can be

conducted with oral swabs, Maestro notes. The opt-out proposal is under review.

Timing is everything

An opt-out policy presents different possible scenarios for health care workers facing post-exposure evaluation. It may be reassuring for health care workers to learn that the source patient involved in their needlestick was at low risk for HIV — and had previously tested negative. More HIV-positive patients would be identified and placed on treatment, which would make their status known as well.

But what about the patient who is at high risk for HIV but tested negative within the past year? "When are you going to be satisfied with a negative?" wonders **Jim Garb**, MD, director of occupational health and safety at Baystate Health System in Springfield, MA. "If it was done last month, that's great. If it was done a year ago, what were they doing since then? A lot might happen in a year."

In some cases, such as emergency department admissions, the patient's full medical record may not be available. If the patient was unable to consent to testing, then the health care worker still would need to begin prophylaxis while awaiting further information.

"In the event that there would still be exposures to patients whose status is unknown, it wouldn't change our recommendations," says **Elise Beltrami**, MD, MPH, a medical epidemiologist in the CDC's Division of Healthcare Quality Promotion.

In its 2001 guidelines on the management of occupational exposures, the CDC recommends testing source patients as soon as possible after an exposure, maintaining the confidentiality of the source patient, and following state and local laws regarding obtaining consent. All initial tests, including rapid tests, must be followed by a confirmatory test.[1]

If the source is unknown, the CDC offers advice about assessing risk and determining whether to start post-exposure prophylaxis. Sometimes, that risk is difficult or impossible to ascertain.

"The most common situation where it's an unknown exposure is when the source of the blood or needle is unknown," says Beltrami.

Some states require prior consent

Meanwhile, hospitals must work within state laws that vary widely related to the post-exposure testing of source patients. Many of them were drafted in the early 1990s when HIV/AIDS was imbued with stigma and controversy.

For example, Massachusetts has one of the stricter laws regarding HIV testing of source patients, requiring patient consent or a judge's order. Efforts to change the state's law have failed.

It's not uncommon for patients to refuse to be tested, Garb says, though "it's usually in the situation where we don't find out about it until the patient's been discharged and they don't want to come in to have their blood tested."

JoAnn Shea, MSN, ARNP, director of employee health and wellness at Tampa (FL) General Hospital, would like to see a change in the Florida law, to allow for a "blanket consent" that patients would sign when they're admitted. Currently, the hospital can test source patients if consent can't be obtained after a "reasonable attempt" and blood has already been drawn and is available in the lab.

"I believe that the stigma related to HIV is not as great as it was when the laws were developed," says Shea. "Our law has been around since the early '90s when HIV was at its peak. It hasn't been changed or revised. We have to look at protecting our health care workers and not starting them on drugs that are toxic. I think we can still protect [patients'] confidentiality."

A compilation of state laws as they relate to HIV testing is available from the National HIV/AIDS Clinicians' Consultation Center (NCCC) at the University of California at San Francisco (www.ucsf.edu/hivcntr/PDFs/State_HIV_Testing_Laws.pdf).

If opt-out testing becomes the norm, hospitals will need to address issues of patient counseling and confidentiality, as well as the rare false positive, says **Ronald H. Goldschmidt**, MD, director of the NCCC, which runs a post-exposure prophylaxis hotline (PEPLine) for clinicians, and vice chair of the department of family and community medicine at the University of California at San Francisco.

"I think most people would agree that there's a greater need than is presently met in terms of testing people routinely, but we need to make sure that when it happens, people's lives don't get upset unnecessarily," he says.

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Analysis reveals the true cause of injuries

RCA questions encompass six categories

When an accident occurs, the best way to prevent a recurrence is to ask a simple question: Why did this happen? But you don't want an easy answer. Through a nonpunitive, systematic process of root-cause analysis (RCA), you will trigger many other questions.

RCA has been used in other industries, such as aviation and nuclear power, and with patient safety to find the underlying cause of errors. The Veterans Health Administration (VHA) recently adapted the process for use with employee safety — to evaluate a single lost-time injury or a pattern of similar injuries.

"It is a very nice tool that gets away from blame and finger-pointing," says **Pam Hirsch**, APRN, MEd, MS, clinical program manager of occupational health at the VHA. "You really look at what's happening. It makes you ask additional questions so you do get down to the real cause."

For example, when a cluster of bloodborne pathogen exposures occurred at one VHA facility, RCA helped uncover the cause. Medical residents had been trained to use a safety scalpel, but not the type at the facility. With additional training, the cluster of exposures ceased.

"As you determine that one specific issue was a root cause of the incident, you have to go back and say, 'How can I correct that?'" Hirsch says.

Removing the root cause

RCA leads to a permanent change in processes. For example, it would not be enough just to train the current medical residents to use the safety devices. A systems change would ensure that new employees, students, and residents routinely receive training in safety devices. It also would require documentation that the training took place and that the students or employees had developed a level of competency, says Hirsch.

While you obviously will need to talk to the employee about what happened after an accident, RCA casts a wider net. It often involves the supervisor and co-workers as well as employee health and safety. Interviews may be conducted one-on-one or in a focus group format. "When it comes to safety, everybody has to be involved," says Hirsch.

The Department of Veterans Affairs' National Center for Patient Safety identified six categories of questions that provide some direction for RCA:

- **Human factors/communication:** Questions relate to the flow of information, communication about the use of equipment and application of policies and procedures, and barriers to communication. Was communication between management and the frontline staff adequate? Was communication between front line employees adequate? Were policies and procedures communicated adequately? Did the overall culture of the facility encourage or welcome observations, suggestions, or "early warnings" from staff about risky situations and risk reduction?
- **Human factors/training:** Questions address both routine training and special training needs. Was there a program to identify what is actually needed for training of staff? Was training provided prior to the start of the work process? Were the results of training monitored over time? Was the training adequate? If not, consider the following factors: supervisory responsibility, procedure omission, flawed training, or flawed rules, policy, or procedure.
- **Human factors/fatigue/scheduling:** Questions probe the influence of stress, fatigue, workload, and environmental distractions. Were the levels of vibration, noise, or other environmental conditions appropriate? Did personnel have adequate sleep? Did scheduling allow personnel adequate sleep? Was there sufficient staff on hand for the workload at the time?
- **Environment/equipment:** Questions evaluate the use, maintenance, and location of equipment and the suitability of the environment. Was the work area/environment designed to support the function it was being used for? Had there been an environmental risk assessment (i.e., safety audit) of the area? Did the work area/environment meet current codes, specifications, and regulations? Was there adequate equipment to perform the work processes? Was the equipment designed such that usage mistakes would be unlikely to happen? Were personnel trained appropriately to operate the equipment involved in the adverse event/close call?
- **Rules/policies/procedures:** Questions assess the usefulness of directives; the compliance with codes, standards, regulations and safety measures; and the availability of

Five rules to follow with root-cause analysis

The five rules of causation are designed to improve the root-cause analysis (RCA) process by creating minimum standards for where an investigation and the results should be documented. The rules are created in response to the very real biases we all bring to the investigation process.

The VA National Patient Safety Center offers these rules to guide the process of RCA:

• **Rule 1 — Causal statements must clearly show the "cause-and-effect" relationship.**

This is the simplest of the rules. When describing why an event has occurred, you should show the link between the root cause and the bad outcome, and each link should be clear to the RCA team or others. Focus on showing the link from your root cause to the undesirable patient outcome you are investigating. Even a statement such as "resident was fatigued" is deficient without your description of how and why this led to a slip or mistake. The bottom line: The reader needs to understand your logic in linking your causes to the outcome.

• **Rule 2 — Negative descriptors (e.g., poorly, inadequate) are not used in causal statements.**

As humans, we try to make each job we have as easy as possible. Unfortunately, this human tendency works its way into the documentation process. We may shorten our findings by saying "maintenance manual was poorly written" when we really have a much more detailed explanation in our mind. To force clear cause-and-effect descriptions (and avoid inflammatory statements), we recommend against the use of any negative descriptor that is merely the placeholder for a more accurate, clear description. Even words like "carelessness" and "complacency" are bad choices because they are broad, negative judgments that do little to describe the actual conditions or behaviors that led to the mishap.

• **Rule 3 — Each human error must have a preceding cause.** Most of our mishaps involve at least one human error. Unfortunately, the discovery that a human has erred does little to aid the prevention process. You must investigate to determine WHY the human error occurred. It can be a system-induced error (e.g., step not included in medical procedure) or an at-risk behavior (doing task by memory instead of a checklist). For every human error in your causal chain, you must have a corresponding cause. It is the cause of the error, not the error itself, which leads us to productive prevention strategies.

• **Rule 4 — Each procedural deviation must have a preceding cause.** Procedural violations are like errors in that they are not directly manageable. Instead, it is the cause of the procedural violation that we can manage. If a clinician is violating a procedure because it is the local norm, we will have to address the incentives that created the norm. If a technician is missing steps in a procedure because he or she is not aware of the formal checklist, work on education.

• **Rule 5 — Failure to act is only causal when there was a pre-existing duty to act.** We can all find ways in which our investigated mishap would not have occurred — but this is not the purpose of causal investigation. Instead, we need to find out why this mishap occurred in our system as it is designed today. A doctor's failure to prescribe a medication can only be causal if he or she was required to prescribe the medication in the first place. The duty to perform may arise from standards and guidelines for practice or other duties to provide patient care. ■

information to students, volunteers, and temporary or part-time workers. Did management have an audit or quality control system to inform them how key processes related to the adverse event are functioning? Had a previous audit been done for a similar event, were the causes identified, and were effective interventions developed and implemented on a timely basis? Would this problem have gone unidentified or uncorrected after an audit/review? Were there written, up-to-date policies and procedures that addressed the work processes related to the adverse event or close call? Were relevant policies/procedures clear, understandable, and readily available to all staff? Were the relevant policies and procedures actually used on a day-to-day basis?

• **Barriers:** Questions address the barriers that are in place to prevent accidents and injuries, such as safety devices. What barriers and controls were involved in this adverse event or close call? Were these barriers designed to protect patients, staff, equipment, or environment? Were these barriers and controls in place before the event happened? Would the adverse event have been prevented if the existing barriers and controls had functioned correctly?

(Editor's note: Additional tools for conducting an RCA are available from the VA's National Center for Patient Safety at www.va.gov/ncps/rca.html.) ■

Combat *C. difficile* with better hand hygiene

Stick with alcohol except in outbreak

As hospitals across the country struggle to combat a highly virulent strain of *Clostridium difficile*, compliance with hand hygiene takes center stage as a primary defense.

At least 16 states have detected this strain of *C. diff*, which has led to colectomies and deaths. The Centers for Disease Control and Prevention (CDC) is cautioning health care providers about the changing epidemiology of the disease.

"It's still predominantly a hospital-based disease and among people on antibiotics, but there may be more disease than we had previously recognized emerging in other persons [in the community]," says **Clifford McDonald**, MD, a CDC medical epidemiologist.

The CDC reports a 26% increase in the rate of hospital discharges with a diagnosis of *C. diff* from 2000 to 2001. Community cases among younger, otherwise healthy people also have raised concern.[1]

A worst-case scenario occurred in Montreal in 2003-2004, with an outbreak that had a mortality rate of 6.9%. A study of 12 hospitals revealed outbreaks that resulted in more than 80 deaths.[2] One hospital, Hôpital du Sacre-Coeur de Montréal, closed its intensive care unit for a day and partly closed it for three weeks because it was inundated with *C. diff* patients. Based on the mortality rate associated with the *C. diff* strain, Quebec researchers estimated that 1,000 to 3,000 patients died as a result of the epidemic.[3]

The *C. diff* strain is more likely to be fluoroquinolone-resistant than other previous strains, and it produces more toxins that cause severe diarrhea. Victims of the virulent strain were more likely to have been taking fluoroquinolone antibiotics and were more likely to be elderly, researchers found.[2]

U.S. hospitals also have faced outbreaks that forced them into infection control vigilance. For example, in 1999-2000, the University of Pittsburgh reported 20 deaths and performed 40 colectomies related to an outbreak of *C. diff*.

Public health experts are concerned about the identification of cases of *C. diff* in people typically considered to be low risk. For example, researchers identified 10 cases in peripartum women (who were in the last trimester of pregnancy or within six weeks of delivery) in four states during May and June 2005. They detailed a *C. diff* case in an otherwise healthy woman in her second trimester of pregnancy who developed severe colitis, spontaneously aborted her twins, and died despite aggressive treatment.

Still, it remains predominantly a disease spread in hospitals and long-term care facilities.

"We think this organism is spread by a combination of a contaminated environment and contamination of the hands of the health care workers," says **Dale Gerding**, MD, associate chief of staff for research at the Hines VA Hospital in Chicago and a *C. diff* expert. "Those are the major areas of concern. It's a spore, and it's very difficult to get rid of these spores in the environment. They do resist pretty much all of the cleaning agents that we use.

"Clearly the best way to address it is to try to prevent it," he says.

Good hand hygiene is critical

Employee health professionals can play a role by educating employees about the potential for a *C. diff* outbreak and the importance of hand hygiene.

"I don't think you can emphasize enough the need for good hand hygiene between every patient care contact. It's just critical," says Gerding.

Alcohol-based gels have been effective in improving compliance with hand hygiene, public health experts say. **(See related story on p. 68.)** But there has been some confusion about the role of alcohol gels in the prevention of *C. diff*.

Alcohol gels reduce the spore count on hands, though not as effectively as traditional hand washing, Gerding and colleagues found in a study.[4] Because the alcohol-based gels are more readily used by health care workers, "we don't want to send a message not to use alcohol."

Even health care workers treating isolated cases of *C. diff* can continue to use alcohol gels. But the hand hygiene procedures should change if a *C. diff* outbreak occurs in the hospital, Gerding advises.

"When the *C. diff* patient is being cared for, you wear gloves. That is the very important infection control intervention," he says. "For isolated patients, follow the gloving and gowning recommendations for contact isolation. In an outbreak situation, when health care workers take their gloves off, we recommend they wash their hands rather than using alcohol."

McDonald agrees. "There have been many, many reports of hospitals instituting alcohol gel,

using it widely among health care workers, and seeing no increase in *C. diff*," he says.

"There's no reason to believe that going to hand washing is going to change that low endemic rate [of *C. diff* in most hospitals]. If there are high rates in your facility or if there has been an increase, then it's wise to come in with this [hand washing] recommendation," he says.

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Healthy hands: Products provide relief for HCWs

Contact dermatitis remains a problem with gels

Alcohol-based hand gels have been an infection control success story. Health care workers are more likely to comply with hand hygiene and less likely to suffer from broken or raw skin from hand washing.

Yet the increased use of hand hygiene means a greater opportunity for skin irritation. For the minority of health care workers who still suffer from contact dermatitis, a number of products are available that provide relief.

The most obvious is simply moisturizer. "Alcohol, per se, is drying to the skin, but the new products have emollients in them," says **Elaine Larson**, PhD, RN, associate dean for research at Columbia University School of Nursing in New York City and a hand hygiene expert. "The new [Centers for Disease Control and Prevention] guideline [on hand hygiene] does recommend that health care facilities provide some kind of moisturizer."

Some hospitals provide a moisturizer alongside the gel, or purchase a gel that is combined with a lotion. But if the hospitalwide product isn't protective enough for some employees, they may need something stronger.

At the University of Washington Medical Center, nurse practitioner **Barbara Dailey**, MN, ARNP, discovered the Remedy products by Medline Industries in Mundelein, IL, (www.medline.com) which use olive oil and amino acids to provide nutrients to the skin. In a trial with other moisturizers, nurses raved about the healing properties.

The goal, Dailey says, is to renew the hands so "the skin's well moisturized and has the natural protectants on it."

But not every moisturizer is acceptable. If employees bring lotions from home, they may not be compatible with the gels or gloves used by the hospital and could harbor pathogens if they are in bottles that have been refilled, Dailey notes.

One other cautionary note: "Soaps that contain chlorhexidine are neutralized by most moisturizers," says Larson. That should be a consideration in choosing a moisturizer, she adds.

Protection from perspiration

Dig a little deeper into the cause of dermatitis and you'll find that some workers are not reacting to the gloves or gel but to perspiration on their hands under their gloves. "If you're sweating under your gloves, you have bacteria growing there," says **Bruce E. Cunha**, RN, MS, COHN-S, manager of employee health and safety at the Marshfield (WI) Clinic. The clinic is conducting a trial of GloveAid, a hand cream produced by Provectus Pharmaceuticals, of Knoxville, TN, (www.pvct.com/pureific.html) that contains an antiperspirant and an antibacterial agent.

Hand sealants, such as DermaMed, produced by Benchmark Medical of Salt Lake City, provide a barrier that protects the skin for about four hours, throughout regular hand hygiene. A study by Larson and colleagues found that a skin protectant did not cause more bacterial growth or adversely affect gloves.[1] Sealants may help employees tolerate long-term glove use, says Larson.

Cotton glove liners also help some health care workers by keeping hands dry and acting as a barrier between the glove and hand. A new glove liner must be used each time the gloves are changed, notes Dailey. Medline also makes powder-free latex, vinyl, and nitrile gloves that are coated on the inside with aloe vera, providing a moisturizing effect.

Finding the right product may be a matter of trial and error, Cunha says. "We work hard to come up with an individual solution."

It's also important to talk to employees about how they treat their hands outside of work. "I tell our folks, 'Never put your hands in water without having gloves on. If you're washing dishes, make sure you're wearing gloves,'" says Dailey.

Some health care workers may suffer in silence with contact dermatitis, believing it's just part of the job, says Dailey.

"For every one who comes down to my office because their hands are hurting so badly, they say there are five or six on the floor just like them," she says. "I don't think we know the extent of the problem."

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Success story: Improving treatment for latent TB

Convenience, follow-up are key at Harlem Hospital

A newly hired health care worker tests positive in the tuberculin skin test. She comes from a country where TB is endemic, and she received the BCG vaccine as a child. She insists that it isn't a true positive and declines treatment for latent tuberculosis infection (LTBI).

This was once a common scenario at Harlem Hospital in New York City, which has a high proportion of foreign-born health care workers. In fact, it's a situation encountered by many hospitals around the country, as nurses travel here from the Philippines, India, Nigeria, and South Korea, helping to fill the U.S. nursing shortage.

Yet that attitude has been countered with a focus on education, follow-up, and convenience, as Harlem Hospital dramatically improved its rate of initiation and completion of treatment. Initially, only 62% of health care workers who were advised to take LTBI treatment started it, and only 12% completed it. With a fast-track program, the completion rate rose as high as 96%, reports **Paul Colson**, PhD, program director of the Charles P. Felton National Tuberculosis Center at Harlem Hospital.

Understanding the BCG effect

It takes a sustained effort to build awareness of the need for LTBI treatment, says Colson. "When someone tested positive and was appropriate for treatment, we made an effort to speak to them and answer any misconceptions."

For example, BCG causes a lot of confusion. "There's no indication that positive skin tests are consistently caused by BCG vaccination," he says. "If you come from a country that has so much TB that they vaccinate people, then you probably became infected with TB.

"The protective effect of BCG wanes over time," he says. "It hasn't even been definitively established in research how long BCG protects you. It's certainly not lifetime protection."

The use of the blood test, Quantiferon-TB Gold, offers a method for distinguishing between a BCG effect and TB infection. The blood test is more specific and produces fewer false positives than the tuberculin skin test. **(For more information, see *HEH*, February 2006, p. 13.)**

In its 2005 "Guidelines for the Prevention of *Mycobacterium tuberculosis* in Health-Care Settings," the Centers for Disease Control and Prevention (CDC) advised: "In conjunction with a medical and diagnostic evaluation, health care workers with positive test results for *M. tuberculosis* should be considered for treatment of LTBI after TB disease has been excluded by further medical evaluation. Health care workers cannot be compelled to take treatment for LTBI, but they should be encouraged to do so if they are eligible for treatment."[1]

Here are some strategies that enabled Harlem Hospital to improve its LTBI treatment:

- **Address misconceptions about LTBI.** Health care workers may be confused about the recommended treatment for latent tuberculosis infection. In 2000, the CDC made a couple of important changes to its guidelines. Treatment with INH, the standard for LTBI, wasn't recommended for people older than 35. The CDC now says age should not be considered a factor in decisions about LTBI treatment. Also, prior to 2000, the INH treatment lasted for six months. Currently, the treatment period is nine months.
- **Target your message.** Foreign-trained

(Continued on page 71)

FAQs from CDC: Treating latent TB infection

These questions and answers were excerpted from the 2005 CDC "Guidelines for Preventing the Transmission of TB in Health-Care Settings":

Q: A health care worker who has been vaccinated with BCG is being hired. She states that BCG will make her TST result positive and that she should not have a TST. Should this HCW be exempted from baseline two-step TST?

A: Unless she has documentation of a positive TST result or previously treated LTBI or TB disease, she should receive baseline two-step TST or one BAMT. Some persons who received BCG never have a positive TST result. For others, the positive reaction wanes after five years. U.S. guidelines state that a positive TST result in a person who received BCG should be interpreted as indicating LTBI.

Q: Does BCG affect TST results and interpretations?

A: BCG is the most commonly used vaccine in the world. BCG might cause a positive TST (i.e., false positive) result initially; however, tuberculin reactivity caused by BCG vaccination typically wanes after five years but can be boosted by subsequent TST. No reliable skin test method has been developed to distinguish tuberculin reactions caused by vaccination with BCG from reactions caused by natural mycobacterial infections, although TST reactions of $\geq$ 20 mm of induration are not usually caused by BCG.

A: What steps should be taken when an HCW has had a recent BCG vaccination?

Q: When should the TST be placed? A TST may be placed anytime after a BCG vaccination, but a positive TST result after a recent BCG vaccination can be a false-positive result. QFTG should be used, because the assay test avoids cross-reactivity with BCG.

Q: Who should be treated for LTBI?

A: Persons with LTBI who are at increased risk for developing TB disease should be offered treatment for LTBI regardless of age, if they have no contraindication to the medicine.

Q: What are contraindications to treatment of LTBI?

A: Active hepatitis and end-stage liver disease are contraindications to the use of INH for treatment of LTBI. Persons who have these conditions might be eligible for rifampin for four months for treatment of LTBI. Because of the substantial and complex drug-drug interactions between rifamycins and HIV protease inhibitors (PI) and non-nucleoside reverse transcriptase inhibitors (NNRTI), clinicians are encouraged to seek expert advice if the concurrent use of these drugs is being considered in persons infected with HIV. Information regarding use of these drugs is available at www.cdc.gov/nchstp/tb/tb_hiv_drugs/toc.htm.

Q: Do persons need to be in a specific age range to be eligible for treatment of LTBI?

A: No age restriction for eligibility of treatment for LTBI currently exists. Targeted TST programs should be conducted for persons at high risk, and these programs are discouraged for persons or settings considered to be low risk. However, for infection control programs that conduct TB screening that includes HCWs who are frequently at low risk, proper medical evaluation needs to be conducted when an HCW with a positive TST result is identified. In this context, age might be a factor in the decision to administer treatment, because older persons are at increased risk for hepatic toxicity caused by INH.

Q: What is the preferred regimen for treatment of LTBI?

A: Nine months of daily INH is the preferred treatment regimen for patients who have LTBI. The six-month regimen of INH or the four-month regimen of rifampin are also acceptable alternatives.

Q: Why is the two-month regimen of rifampin and pyrazinamide (RZ) generally not offered for treatment of LTBI? Although the two-month regimen of RZ was previously recommended as an option for the treatment of LTBI, reports of severe liver injury and death prompted the American Thoracic Society and the CDC to revise recommendations to indicate that this regimen should generally not be offered for treatment of LTBI. ■

health care workers, including physicians, may need peers from their home country who relay information about BCG, TB testing, and LTBI treatment. After all, their training may contradict the current CDC recommendations and can account for noncompliance. "It's almost like their training works against their accepting new information," he says.

• **Make it convenient.** Health care workers on LTBI treatment need initial education, then monthly appointments for follow-up, Colson says. They are seen by a "fast-track coordinator" and don't wait in the waiting room. Health care workers' charts are placed in a colored folder so they are easy to identify and retrieve. They complete a self-assessment tool to identify any possible side effects of the medication.

• **Follow up with health care workers on treatment.** The fast-track coordinator follows up if a health care worker misses an appointment and sets a new date. The clinic also can provide reminders via the intranet, for example.

• **Spread the word about your LTBI clinic.** If you have a dedicated program to treat both health care workers and patients from the community, make sure your staff know it exists. For example, you may create a brochure providing information about the clinic and the treatment.

Maintaining a high level of treatment completion requires some focus. If you let it slide, your rates may revert to prior levels, Colson cautions.

Reference

1. Centers for Disease Control and Prevention. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health care settings, 2005. *MMWR* 2005; 54(RR17):1-141. ■

COMING IN FUTURE MONTHS

- Tips on preventing record-keeping errors
- Can you phase out TB screening?
- After lifts: Breathing life into your ergonomics program
- Improving workers' compensation outcomes
- Update on pandemic influenza planning

CE *questions*

21. What did the mumps outbreak in Iowa indicate about vaccination against the disease, according to Patricia Quinlisk, MD, state epidemiologist?
A. Most people have not had the mumps vaccine.
B. The mumps vaccine (MMR) does not provide adequate protection.
C. The mumps vaccine is 95% effective.
D. All adults should have a booster MMR.

22. The proposed "opt-out" policy of the CDC related to HIV testing applies to which patients?
A. Anyone ages 13 to 64 who would receive at least one HIV test.
B. Adults and teenagers ages 13 to 64 who would receive the vaccine if they have at least one risk factor.
C. Source patients who could opt out of testing after a sharps exposure.
D. Health care workers who could opt out of post-exposure testing.

23. Which of the following would be a source of questions in a root-cause analysis of an accident?
A. Determining who shares in the blame for the accident.
B. Determining whether fatigue or scheduling were factors.
C. Setting a timeline for recovery and return to work.
D. Finding a link between employee safety and patient safety.

24. A newly emerging strain of *C. difficile* is causing concern in hospitals because:
A. It is spreading widely among healthy people in the community.
B. It is overwhelming emergency departments.
C. It has a mortality rate of 6.9%.
D. Its spread cannot be stopped or prevented.

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

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. **The semester ends with this issue.** You must complete the evaluation form provided in that issue and return it in the reply envelope provided to receive a certificate of completion. ■

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. ■

JCAHO Update for Infection Control

News you can use to stay in compliance

JCAHO tip: Make HCWs 'accountable' on hand hygiene

Kentucky hospital achieving amazing results

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) continues to emphasize that the historic lack of compliance with hand hygiene practices by health care workers will no longer wash. Compliance with Centers for Disease Control and Prevention (CDC) hand hygiene guidelines remains a JCAHO National Patient Safety Goal — lucky No. 7, to be precise.

The CDC shifted its traditional emphasis on sinks and soaps in 2002 with guidelines based on the European model of using alcohol-based hand rubs. As part of those guidelines, the CDC urges clinicians to monitor health care workers' adherence with recommended hand hygiene practices and provide personnel with information regarding their performance.

In updating frequently asked questions about patient safety goals on its web site, the Joint Commission reiterates that "compliance with Goal #7 will be surveyed through interviews with caregiver staff and direct observation. Caregivers should know what is expected of them with regard to hand hygiene and should practice it consistently. It is expected that noncompliance will be quite low, so that any pattern of noncompliance, i.e., more than a sporadic miss, will be scored as noncompliance. During tracer activity, if surveyors observe three or more instances of noncompliance, either through observation of practice or staff interview, a Recommendation for Improvement (RFI) will result. **(See related story, p. 3.)**

In addition, the Joint Commission is listed as a co-authoring agency on a recently published book that urges patients to demand that health care workers wash their hands. "Hand washing is mandatory," the book — *You: The Smart Patient* — emphasizes. "This is not a joke. They should wash their hands after they touch you and before they head to the next patient. It's understandable that harried nurses and doctors occasionally forget to do this, but it's not acceptable." **(See related story, p. 2.)**

Yet when it comes to getting health care workers to comply with hand hygiene practices to protect themselves and patients, much has been tried to remarkably little avail. Hand washing compliance typically falls below 50% in most studies, with more than half of medical workers ignoring the cardinal principle of infection control on any given patient encounter. That is the reality despite widespread knowledge that the transiently colonized hands of health care workers can lead to cross-transmission of pathogens between patients. As a result, some will become sicker and others will die. It's time, one epidemiologist urges, to make health care workers accountable.

'It is time for accountability'

A program based on the straightforward, time-honored concept of accountability is producing remarkable results at the Medical Center in Bowling Green, KY, where observed hand hygiene compliance rates have been in the 98% to 100% range for the last two years.

"I keep expecting it to fall off," says **Rebecca Shadowen**, MD, hospital epidemiologist. "Month after month, it is just a little too overwhelming to me to be true, but it is clearly true."

Shadowen received a strong reaction from her audience when she outlined her program recently in Chicago at a meeting of the Society for Healthcare Epidemiology of America (SHEA). "I think this is a seminal, profound paper that represents a

'Smart Patient' book demands hand hygiene

From authors of You: The Owner's Manual

The Joint Commission on Accreditation of Healthcare Organizations is listed as a co-authoring agency on a recently published book that urges patients to demand that health care workers wash their hands.[1]

Written in a common, often comical way, the book's messages to patients with regard to hand hygiene and infection control are excerpted as follows:

Wash Your Hands! This order goes to every single person who may come in contact with you. They need to scrub their paws before touching you — before touching your sheets or your water cup or your side table or anything else that you could conceivably touch. If they're conscientious enough to put on new rubber gloves, as well, that would be marvelous. But hand washing is mandatory. This is not a joke. They should wash their hands after they touch you and before they head to the next patient.

It's understandable that harried nurses and doctors occasionally forget to do this, but it's not acceptable. No hospital should have a room without a sink or an alcohol hand-gel dispenser. No clinic or doctor's office, either. Posting a sign in your room that says, "THANKS VERY MUCH FOR WASHING YOUR HANDS," can help. This goes for all visitors, and for you, too.

If you're able to get up, wash your hands with soap and water several times a day (especially after you hug or shake hands with a visitor). Don't just do a three-second rinse; the Centers for Disease Control and Prevention (CDC) says you need to wash vigorously for at least fifteen seconds with soap and warm water (about the time it takes to sing "Happy Birthday," the alphabet song, or "I wish I were an Oscar Mayer Weiner") hitting your palms, the backs of your hands, and between your fingers. You could alternatively use an alcohol sanitizing gel, which obviously is easier if you're not mobile.

The importance of hand washing to prevent infection is such a big deal that the Joint Commission came up with buttons for nurses, doctors, and other health care staff to wear that read: ASK ME IF I'VE WASHED MY HANDS. So, if you see those on your health care givers' lab coats (or even if you don't), ask away. Don't be shy about it.

Reference

1. Roizen MF, Oz MC, with the Joint Commission and Joint Commission Resources. *You: The Smart Patient*. New York City: Free Press; 2006. ■

breakthrough in infection control," said **Donald Goldmann**, MD, professor in the department of immunology and infectious diseases at Harvard University School of Public Health. Speaking as a SHEA audience member after Shadowen's presentation, Goldmann said he expects her message to be heard far and wide by the nation's infection prevention programs.

"Coming from a quality improvement organization I am obviously very interested in systems improvement," he told SHEA attendees. "However, once the system has met the needs of the caregiver — by having alcohol available at the point of care, having the dispensers filled, having people educated and competent — it is time for accountability. This is the first time I have ever seen anybody get up at this meeting and talk about the accountability of the individual with punitive consequences. I think everybody is going to look at this and go back to their institution and say if they did it in Kentucky, we can do it in Michigan or wherever. I just think this is absolutely outstanding."

Faced with abysmal hand hygiene compliance, Shadowen convinced hospital administration to back an effort to dramatically change things. As a result, during the years 2003 to 2005, direct observation of hand hygiene practices among health care workers (physicians included) with interventions for noncompliance was implemented. Fifteen-minute, direct observations were done on a daily basis.

Punishment fits the crime

Noncompliant health care workers face the following consequences in order: verbal correction; computer-based learning module; verbal counseling/warning; written counseling/warning; referral to human resources for disciplinary action or dismissal. Physicians are not exempt, underscoring the fact that full administrative support is behind the ongoing program.

"We did have one physician who has been caught twice in the last two months, and who was counseled by the department of medicine," she says. "There has been a lot of activity of counseling of docs in the department of medicine. The chairman does [the counseling] and we have not had to go any further. A culture change has happened over

the last two years here, and it is sustainable. It's just amazing."

Taking organizational ownership

Of course, the key to the success is administrative support — just don't call it a "buy-in" from the suits. "I call it ownership," Shadowen tells *JCAHO Update*. "I don't call it 'buy-in' because that has a connotation to it that over the years has not been very good. Because truly I want you to own it — this is your job. Knowing your role is a big deal, and of course we had to get higher-level administration first to understand that they owned the responsibility for holding others accountable. This ownership/accountability thing is a very important detail."

In other words, you can't buy into something you already own.

"We actually had to [convince] some of our nurse managers because they didn't have ownership," she says. "They didn't really get it that it was their job to take care of this problem. The majority of people have come into the 'culture' now and changed their behavior."

That doesn't mean the sailing has been smooth. Shadowen had the experience and clout to undertake such an effort and show that extraordinary hand hygiene compliance is possible.

"Part of this has a lot to do with the bridges you have built over the years — how long you have been in the facility, how well you are respected — and how much you can tolerate," she says. "I have been here for 17 years and built a lot of bridges, but I am not going to tell you that everybody thought kindly about me. But the door and the phone were always open for any conversation. I think in your heart if you are trying to do the right thing, you've got the literature to back it up, and you're honest and open about it, it is a little easier."

Reference

1. Roizen MF, Oz MC, with the Joint Commission and Joint Commission Resources. *You: The Smart Patient.* New York City: Free Press; 2006. ■

Joint Commission Q&A on alcohol hand rubs

Complying with National Patient Safety Goals

In February, the Joint Commission on Accreditation of Healthcare Organizations provided some new answers to commonly asked questions about complying with its National Patient Safety Goal on hand hygiene.

Questions and answers dealing with alcohol hand rubs, compliance, and fire hazards include the following:

Q: Do we have to use alcohol-based hand cleaners?

A: Accredited organizations are required to provide health care workers with a readily accessible alcohol-based hand rub product. However, use of an alcohol-based hand rub cleaner by any individual health care worker is not required. The Centers for Disease Control and Prevention guidelines describe when this type of cleaner may be used instead of soap and water. If you choose not to use it, then soap and water should be used instead.

Q: Isn't the alcohol-based hand sanitizing gel flammable? Should we be concerned about a fire hazard?

A: The typical alcohol-based hand rub (ABHR) dispensers used in the health care setting are of such limited size and volume that their contribution to the development, acceleration or spread of fire in most situations is small. In a recent survey of 800 facilities reporting a cumulative 1,430 years of hand rub use, no fires attributable to or involving a hand rub dispenser were reported. Studies have shown significantly better compliance when the dispensers are located just outside the patient's room (when permissible) rather than just inside.

The National Fire Protection Agency (NFPA) has modified Life Safety Code (LSC) requirements to allow for installation of ABHR gel dispensers in egress corridors, subject to certain conditions being met (see below). The Centers for Medicare & Medicaid Services (CMS) is in the process of amending its rules to reflect the NFPA position. The "Interim Final Rule" to permit placement of alcohol-based hand rub dispensers in egress corridors, in agreement with the LSC amendment, was published in the *Federal Register* on March 25, 2005. Note that local or state fire code requirements may differ from the national codes; therefore, you should determine and follow the requirements for your particular locale. The best resource for this information is your local fire marshal.

Q: What are the "conditions" that have to be met to be able to install ABHR dispensers in egress corridors?

A: Location conditions and permissible volume

specifications for gel ABHR dispensers to be installed in egress corridors are as follows:

- The corridor width is 6 feet or greater and dispensers are at least 4 feet apart.
- The dispensers are not installed over or directly adjacent to an ignition source, such as an electrical outlet or switch. Adjacent is defined as being at least 6 inches from the center of the dispenser to an ignition source.
- In locations with carpeted floor coverings, dispensers installed directly over carpeted surfaces are permitted only in sprinklered smoke compartments.
- Each smoke compartment may contain a maximum aggregate of 10 gallons of ABHR gel in dispensers and a maximum of 5 gallons in storage.
- The maximum individual dispenser fluid capacity is 0.3 gallons for dispensers in rooms, corridors, and areas open to corridors.
- The maximum dispenser size for individual dispensers in areas designated as suites of rooms is 0.5 gallons.

Q: The ruling on placement of ABHR dispensers in egress corridors specifically refers to gel ABHR dispensers? We would prefer to use the foam product. Do the same rules apply?

A: The situation is a little different with respect to foam ABHR products because all of the testing upon which the NFPA and CMS decisions were based were done on the gel product, not on foam. However, industry experts have indicated that small-quantity ABHR foam dispensers may be equivalent to ABHR gel. Therefore, pending further review, the Joint Commission will allow any ABHR foam installation that meets the location criteria stated above for ABHR gel. Volumes of ABHR foam are based on suppliers' recommendations and in no case exceed the permissible volumes for ABHR gel as defined above. In the event that subsequent testing demonstrates a safety concern relating to foam dispensers in egress corridors, the Joint Commission reserves the right to modify its position on the acceptability of such installations. In that event, previously installed dispensers would be subject to the newer restrictions; that is, they would not be "grandfathered," and noncompliant installations would have to be removed. ■

JCAHO patient safety practices posted on web

New patient safety center resource

The Joint Commission International Center for Patient Safety has launched a new "in-development" Patient Safety Practices resource on the center's web site. The beta version of the new on-line database offers a collection of practices and interventions for preventing adverse events while also soliciting user suggestions for enhancing the content and functionality of the web site.

"This on-line resource of safe practices should be of major assistance to health care professionals in advancing their efforts to deliver safe, high-quality care," says **Laura Botwinick**, co-director, Joint Commission International Center for Patient Safety. "This resource should also be of value to patients and their families in navigating the health care delivery system."

"Patient Safety Practices: An on-line resource for improving patient safety" is available at www.jcipatientsafety.org/psp and features links to more than 400 established sites that include a variety of respected domestic and international patient safety sources. The database is being introduced as a work in progress to encourage users to submit additional safe practices, which can be widely shared, and to suggest ways in which the database can become an even more helpful resource.

"This database is a simple way of getting practical important information into the hands of health care professionals and other provider organization staff to help them improve patient safety," say **Peter Angood**, MD, co-director, Joint Commission International Center for Patient Safety. "This initiative underscores the center's commitment to translating available knowledge about patient safety into actionable information."

The introduction of the Patient Safety Practices site marks the one-year anniversary of the launch of the International Center for Patient Safety web site. The database draws heavily upon the Sentinel Event database that was created by the Joint Commission on Accreditation of Healthcare Organizations a decade ago. It is organized under broad clinical event and health care process headings that are further broken down into categories and specific topic areas. The site also includes a brief survey that invites user participation in the database and suggestions for improving the utility of the site. ■