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Pandemic fears raise stakes for hospital administrators

Supplies to protect HCWs may become scarce

For hospitals that want to create their own stockpile of Tamiflu as a part of pandemic influenza preparedness, infectious disease expert **Michael Osterholm**, PhD, MPH, has one comment: "Good luck."

Worldwide demand for Tamiflu, or oseltamivir, has swamped supply, which presents just a hint of the challenges that may lie ahead for hospitals when they actually need to treat patients and health care workers during a pandemic influenza outbreak. Similar supply issues will arise when a vaccine is developed to protect against H5N1, the avian influenza strain that is spreading throughout Asia.

Amid those concerns, hospitals are being urged to develop contingency plans and to work with state and local health departments on pandemic planning.

"In the next three to four months, we're going to see runs on Tamiflu and [N95 respirator] masks in that they will completely exhaust supply," predicts Osterholm, director of the Center for Infectious Disease Research and Policy at the University of Minnesota in Minneapolis. "We've seen this coming for months. It's really unfortunate."

A Roche pharmaceutical division spokesman told *Hospital Employee Health* that Tamiflu orders are being filled on schedule.

The prospects of a pandemic from H5N1 continue to rise with reports from Russia that avian influenza has been detected as far west as Siberia. Between mid-December 2004 and mid-August, 68 people contracted H5N1 influenza and 25 died, most of them in Vietnam, according to the World Health Organization (WHO).

A vaccine against H5N1 has shown promising results in a study of healthy adults. It may become an important tool to protect health care

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workers and to prepare for a pandemic, influenza experts say. (See related article, p. 123.)

"Clearly, there needs to be aggressive efforts to maximize the availability of these critical interventions," says **Frederick Hayden**, MD, professor of internal medicine at the University of Virginia Health Sciences Center in Charlottesville. He also has consulted with the WHO.

The Department of Health and Human Services was completing work on a detailed pandemic influenza preparedness plan as *Hospital Employee Health* went to press. Hospitals and state and local health departments already were well under way with their own plans.

"I'm hoping that people take this seriously," says **Marion Kainer**, MD, MPH, infectious disease physician and medical epidemiologist with the Tennessee Department of Health in Nashville.

"It's my opinion this is the one thing we definitely need to prepare for; it's a question not of *if*, it's a question of *when* this is going to happen. The consequences are enormous in terms of mortality, morbidity, and economic costs," she notes.

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires hospitals to conduct a "hazard vulnerability analysis" to determine what stresses the hospital might face in an infectious disease outbreak. For example, BJC Healthcare in St. Louis conducted a mass vaccination drill as part of a bioterrorism exercise. (See related article, p. 124.)

JCAHO began debriefing hospitals after disasters even before the Sept. 11 tragedy to find out what issues they faced and what lessons could be learned, says **Robert Wise**, MD, vice president of JCAHO's Division of Standards and Survey Methods.

One conclusion: Disaster drills are not as effective as they should be, he adds. The Joint Commission will be revising its standard and raising expectations on how drills should be conducted, Wise continues.

The Joint Commission's infection control standard requires hospitals to have a process for responding to a large influx of patients. Hospitals need to assume that ambulatory care providers will be overwhelmed during a pandemic and may simply send people to the hospital, he explains.

"If the doctors are no longer there, all these people start coming to the hospital," Wise says. "At a time when sick people are coming to the hospital because they have flu, you have other people who are needing help with diabetes, high blood pressure, and on and on.

"It's a cascading of the pressures on the hospital," he adds. "Pandemic flu will bring out stresses on the system that it's very difficult to model ahead of time."

Pandemic influenza is especially difficult because other communities throughout the world will be facing the same crises and competing for scarce resources, Wise says.

"The issue of preparedness for a pandemic is probably the most complex of all the emergencies this country is going to have to face," he notes.

You can count on staffing to be an issue during a pandemic. During the severe acute respiratory syndrome (SARS) outbreak in Toronto, some

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health care workers were afraid to come to work.

"It's not clear at all whether you're going to get 70% of your staff or 30% of your staff," Wise explains.

Hospitals should think about how they will obtain additional staff, perhaps by calling retired or semiretired health care workers into duty, Kainer says.

"They have to ensure they can get sufficient staff and not rely on the same staff everybody else is relying on," she says.

When health care workers report for work during a pandemic, they're going to expect protective gear, and hospitals will find there is little surge capacity for those products, Osterholm warns.

"I think health care workers are going to be a very difficult area to address without some type

of primary protection, either a vaccine, neuraminidase inhibitor, or a [N95] mask," he says. "And we're going to be short of all three. We'll very quickly exhaust the ability to find masks.

"There are many health care workers who, in the absence of the vaccine or potential drug treatment, are going to demand a very high level of protection to — day in and day out — be on the front lines," Osterholm continues.

Although a recent study of oseltamivir showed promising results, the study involved prophylactic use, he notes. The mice in the study received an initial dose of the antiviral medication before being inoculated with H5N1. Oseltamivir then was given in varying doses, with higher doses providing improved survival rates.¹

Hospitals should draft plans to prioritize the use of available antiviral medications and/or vaccines

New vaccine shows promise against H5N1 influenza

HCWs would be prime candidates for shot

A new vaccine against H5N1 avian influenza appears to be safe and effective, according to early research results. And health care workers may be among the first candidates for the vaccine, experts say.

With serum testing completed on about a third of the 450 vaccine subjects, "those results do suggest that the vaccine effectively induced antibody against the H5 influenza virus that would be expected to protect against the H5 flu," says **John Treanor**, MD, a professor of medicine at the University of Rochester (NY) and lead investigator for the avian influenza H5 vaccine study.

Higher doses of the vaccine are required compared to the annual influenza vaccine to produce the immune response, he says. However, the safety profile of the vaccine is identical, Treanor adds.

"It looks like we're headed down the right pathway, that we've got something that works. We will have a more precise estimate of exactly how frequently people will respond to the vaccine when more serum is tested."

The tests should be completed by the end of October, he says. Researchers then will expand the study to include the elderly and children.

Researchers also will be looking into dose-sparing alternatives that could enhance the vaccine, such as adjuvants and intradermal administration, Treanor says.

An H5N1 vaccine could be an important tool in

the arsenal against avian influenza, but supply will be an issue. Recent shortages of influenza vaccine demonstrate the fragility of the manufacturing system, experts say.

Michael Osterholm, PhD, MPH, director of the Center for Infectious Disease Research and Policy at the University of Minnesota in Minneapolis, estimates that about 88 million to 100 million doses could be produced in the six months after pandemic influenza emerges.

"If you can only provide enough vaccine to protect 88 million to 100 million people [globally] in the first six months after the pandemic hits, that's a drop in the bucket," he says.

If vaccine production is diverted to make H5N1 vaccine for stockpiling, that would reduce the availability of the annual flu vaccine, Osterholm explains.

And the vaccine might not be a perfect match with the strain that circulates during an actual pandemic, Treanor acknowledges.

But experts do agree on one point. Increasing annual, interpandemic flu vaccination — including among health care workers — would mean increasing the manufacturing capability.

"A key message is to make sure that hospitals revisit their current influenza immunization programs and make sure that hospital employees who have patient care responsibilities do get annual immunizations," says **Frederick Hayden**, MD, professor of internal medicine at the University of Virginia Health Sciences Center in Charlottesville. "Increasing vaccination use during the interpandemic period will eventually allow for greater vaccine availability and acceptance.

"It's not just pandemic flu that we need to think about," he adds. "We need to think about the annual outbreaks as well." ■

during a pandemic, based on the Centers for Disease Control and Prevention (CDC) recommendations, Kainer says. CDC advisory panels have designated that health care workers involved in direct patient care will be the top priority for vaccination in a pandemic and the second-highest priority for antiviral treatment. (See *HEH*, September 2005, cover.)

Hospitals also will need a greater supply of gowns, gloves, surgical masks, and if a vaccine is available, syringes, Kainer notes.

Building a stockpile

Some hospitals already have begun to slowly increase their storage of Tamiflu. Hayden, at the University of Virginia, began advocating stockpiling of Tamiflu a year ago.

At least five European countries are developing stockpiles of antiviral medications to treat 20% to 40% of their population. The federal stockpile currently is 2 million courses of treatment. Mike Leavitt, Health and Human Services secretary, said that will rise to 20 million doses within about four to six months, the Associated Press reported. Even that would cover less than 10% of the U.S. population.

"In the short term, I do think that because of the pace of federal decision making and the timing of getting access to drug, it makes sense for institutions to evaluate their own approach to pandemic preparation and seriously consider having an institutional stockpile they can call upon," Hayden says.

Hospitals need a plan for maintaining and using a stockpile, notes Roche spokesman **Terry Hurley**.

"Proper storage would be important for maintaining a hospital stockpile, as would plans for utilization and distribution," he says. "[The] best experience for hospitals would be interpandemic use — in other words, use during the flu season to become familiar with the product. We expect to have adequate supply of Tamiflu for the upcoming flu season."

Roche, which markets and manufactures Tamiflu, also is responding to the surge in demand, Hurley explains.

"To achieve levels of production needed for stockpiling, Roche has doubled production capacity at our European facility from 2003 to 2004, and we are doing so again during 2005. We plan additional expansion of production capacity for Tamiflu in 2006," he says.

Hospitals also can play a role in enhancing the potential for vaccine use during a pandemic by raising the annual rates of health care workers' immunization, says **Tammy Lundstrom**, MD, JD, senior vice president and chief quality and safety officer at Detroit Medical Center.

Having an influenza vaccine should become a habit for health care workers, she says.

Organizing a mass vaccination clinic "gives you a way to test out a plan [that could be used] in an avian influenza outbreak," Lundstrom adds.

Reference

1. Yen H, Monto AS, Webster RG, et al. Virulence may determine the necessary duration and dosage of oseltamivir treatment for highly pathogenic A/Vietnam/1203/04 influenza virus in mice. *J Infect Dis* 2005; 192:665-672. ■

AOHP 'on a mission' to educate EHPs

Preparedness, patient handling on tap

At BJC Healthcare in St. Louis, people began to amass, seeking prophylaxis against an emerging infection. Some at the hospital had small children in tow. Some had elderly parents with Alzheimer's disease. Some couldn't speak English. Healthy adults were ushered to an area marked with green, pediatrics to yellow, and those with special needs to red.

Fortunately, this "outbreak" wasn't real. It was a regional drill to test the distribution of the strategic national stockpile as prophylaxis to hospital employees and their family members.

Members of the emergency preparedness team watched for gaps in planning that might lead to chaos or confusion during mass distribution of medication or vaccination.

Their conclusions from conducting this exercise will be presented as one of about a dozen poster presentations at "AOHP On a Mission," the upcoming annual conference of the Association of Occupational Health Professionals in Healthcare (AOHP), to be held Oct. 12-15 in San Antonio. Speakers at the conference will cover topics ranging from patient handling to latent tuberculosis. (For more information, see editor's note at the end of this article, p. 125.)

This is the first time in several years that AOHP has included poster presentations, notes

Jan Frustaglia, RN, CCM, COHN-S, 2005 conference chair and program coordinator of the Health Professions Institute at Austin (TX) Community College. The presentations will focus on success stories shared by other employee health professionals, she says.

AOHP also will have a larger exhibition area with more vendors, allowing attendees to get a hands-on experience with new technology, she says. The exhibits will include ceiling lifts, other patient handling equipment, and new safety-engineered sharps.

The AOHP program includes the popular "Getting Started" session, as well as workshops for seasoned employee health professionals. "We try to meet the broad expectations of our members," Frustaglia adds.

In her poster session, **Nancy Gemeinhart**, RN, CIC manager of occupational infection control at BJC Healthcare, says she will stress the importance of conducting a communitywide drill and developing key partnerships for successful mass prophylaxis. The BJC exercise had regionwide participation and used role-playing volunteers. The scenario involved anthrax, but it could apply to pandemic influenza or other infectious diseases, she notes.

"Drill, drill, drill," she says. "As you develop these plans you have to drill them to identify any gaps."

[Editor's note: "AOHP On a Mission," the 2005 annual conference, will be held Oct. 12-15 in San Antonio. More information is available from AOHP, 109 VIP Drive, Suite 220, Wexford, PA 15090. Phone: (800) 362-4347. Fax: (724) 935-1560. Web site: www.aohp.org.] ■

Are your HCWs using the right respirator?

Match the hazard to the mask, experts say

Are you providing your employees with adequate respiratory protection? Too often the answer is no, some respiratory protection experts worry. But matching the right device to the hazard remains a difficult task, fraught with conflicting guidance.

For example, in the draft tuberculosis guidelines, expected to become final later this year,

the Centers for Disease Control and Prevention (CDC) says hospitals should consider using a higher level of respiratory protection than an N95 filtering facepiece respirator during bronchoscopies with TB patients. Yet some infection control practitioners question the role of respiratory protection in preventing transmission of TB.

Meanwhile, the American National Standards Institute (ANSI) is finalizing a new standard that lowers the assigned protection factor (APF) for N95 filtering facepiece respirators, which would indicate they are half as effective as previously thought.

The U.S. Occupational Safety and Health Administration (OSHA) is finalizing a standard that would keep the APF the same.

Hospitals need to take a serious look at the level of respiratory protection they are providing, says **James Johnson**, PhD, CIH, QEP, chemical and biological safety section leader at Lawrence Livermore National Laboratory in Livermore, CA.

"If we have a terrorist event, your profession is critical to survival," he adds. "If you don't understand respirators and that safety is compromised because of something simple like not understanding fit-testing or respiratory protection, what a tragedy!"

But sorting out the respiratory risk from other means of transmission is complex. In fact, if a health care worker is uncomfortable and readjusts a mask with contaminated, gloved hands, the device actually may raise the risk of transmission, notes **Linda Chiarello**, RN, MS, of CDC's division of health care quality promotion.

"If we make using personal protective equipment so cumbersome, people break the technique," she adds.

What does OSHA say about choosing respiratory protection?

"We would always err on the side of safety," notes **Craig Moulton**, industrial hygienist with OSHA's division of health enforcement.

There are several factors to consider when assessing the need for respiratory protection:

- **The health care workers**

In the case of an infectious disease outbreak, you want to preserve your health care work force. Although debate continues about whether nurses contracted severe acute respiratory syndrome (SARS) from a respiratory route in the Toronto outbreak in 2003, it's clear that respiratory protection was an important part of the protective gear.

"Staff want to be protected, just like an employee

who goes into a chemical hazard wants some protection,” says **Gabor Lantos**, MD, PEng, MBA, president of Occupational Health Management Services, a consulting practice in Toronto.

“If staff do not feel adequately protected, they’re just not going to show up for work,” he says. “If there’s another SARS, or the next bug, [and] if people aren’t going to feel adequately protected, we’re looking at maybe 25% turnout. People will just call in sick.”

Create clear protection policies

Set up a multidisciplinary committee to look at respiratory protection, Lantos advises. The committee should include infection control, occupational health, industrial hygiene (even if you have to contract with an independent provider), purchasing, and a ventilation expert, he says.

That panel should create clear policies on who needs respiratory protection and when they should wear it, Lantos says.

You need to make sure those personnel are adequately trained in how to use the devices and that there are backup staff who can relieve them, if necessary, he adds. An N95 only can be worn for about two to four hours before becoming too uncomfortable, Lantos explains.

“You have to have designated people who are going to respond to airborne infections,” he says. “You can’t have three different housekeepers rotating through an area and assume everyone’s equally qualified. You need a certain number of people who are trained to do this properly.”

• **The infectious disease**

CDC recommends respiratory protection only for diseases with a known or suspected capacity for airborne transmission. That includes TB, SARS, viral hemorrhagic fevers, and smallpox. CDC’s draft *Guidelines for Isolation Precautions* also recommends using N95 filtering facepiece respirators for avian influenza.

The agency also advises, “Due to the increased risk of *M. tuberculosis* during the performance of bronchoscopy procedures on patients with TB disease, consider using a higher level of respiratory protection than an N95 disposable respirator such as an elastomeric full-facepiece respirator or a PAPR [powered air purifying respirator].”

But what if you don’t know whether the patient has one of those respiratory illnesses, or some new infectious disease that has not been previously encountered?

CDC guidelines recommend that coughing

patients use “respiratory etiquette” — cover their mouths and, if possible, wear a surgical-type mask. Health care workers in close contact with coughing patients should wear masks also, the CDC says.

“If you really don’t know what you’re being exposed to and its means of infection — is it a droplet nuclei, or is it an aerosol? — the thing to do is to err on the side of caution and use, as a minimum, an N95 respirator,” says **John Steelnack**, MS, an industrial hygienist and project officer of OSHA’s respiratory standard revision.

“You can always remove them later, but you can’t put them on later if you should have been wearing them,” he notes.

There are other complicating factors related to infectious disease transmission. Chemical exposures can be calculated, and permissible exposure limits can be set based on toxicity. But infectious doses cannot be quantified in the same way. One person may become infected after a small exposure; another person may never become infected despite repeated exposure.

Patients’ transmissibility varies. The so-called “superspreader” phenomenon has been documented with SARS and TB.

Mark Nicas, PhD, MPH, CIH, industrial hygiene program director in the environmental health sciences division at the University of California at Berkeley, is working with a subcommittee of ANSI to develop a standard related to respiratory protection and infectious aerosols.

When it comes to infectivity and superspreaders, “I say you treat all people as if they’re highly infectious unless proven otherwise,” he suggests.

Nicas argues that the risk of infection can be calculated by using estimates of the airborne concentration of an organism, the duration of exposure, the probability of infection with a given dose, and the leakage properties of the respirator.

He says that CDC and OSHA avoid trying to quantify the risks. “Instead, they [say] things like ‘The risk is low’ without ever identifying what they mean by low, or ‘This respirator is acceptable’ without saying what they mean by acceptable risk,” Nicas continues. “You need to know something about the risk without the respirator and then you need to know what the acceptable risk is.”

Infection control experts contend that other measures are much more important in preventing transmission and that it’s not clear how much additional protection the respirators provide.

Outbreaks have been controlled by early

identification of patients and isolation of patients in negative pressure rooms, Chiarello adds. Surface contamination and inadvertent touching of the mouth or eyes with contaminated hands may be of much greater concern, she says.

Chiarello was in Vietnam during the SARS outbreak and notes, "Nobody was wearing a fit-tested respirator. People weren't even putting them on appropriately. Respiratory protection had nothing to do with interrupting transmission of SARS."

- **The devices**

Every N95 respirator is not equal. Some have better inherent fit characteristics. That is, they are more likely to fit well without a fit-test or to pass fit-tests than others. Everyone's facial shape is different, and some respirators will tend to fit a given population better than others.

It is crucial for health care workers to know the brand and size of the respirator that fits them best — and to use that at all times when they need a respirator.

"The whole purpose of the respiratory protection program is to provide the worker with the right respirator and training so they can wear it properly and safely," says Johnson, of the Lawrence Livermore National Laboratory. He also is chair of the ANSI Z-88 secretariat, which sets voluntary respirator standards.

"In the long term, when you look at the benefits over the negatives, annual fit-testing is a really good investment as part of a respiratory protection program," he adds.

"It familiarizes the worker with the mask, [and] it demonstrates and provides data that the mask fits. It also provides the opportunity for hands-on training," Johnson explains.

Hospitals need to select the respiratory protection that matches the hazard. Surgical masks are used only for barrier protection against droplets and provide no respiratory protection, he notes. "I've seen anywhere from 70% to 90% leakage for surgical masks," Johnson says.

N95 filtering facepiece respirators are the lowest level of respiratory protection available.

If the APF for the masks is 5, that means 20% of contaminants can penetrate the mask from leakage around the face seal. If the APF is 10, then only 10% of the contaminated air can leak through.

Elastomeric full-facepiece respirators have an APF of 50, which means they have a leakage value of 2%. The hood-type PAPRs have an APF of 25, which means they have a leakage of 4%.

In other industries, the selection of a respirator is based on the concentration of a toxic substance in the air and the permissible exposure limit.

However, there are no permissible exposure limits for infectious diseases. Infection control practitioners argue that infectious agents can't be treated the same way as construction dust or other industrial contaminants.

But by regulation, they are.

"Right now, we really don't have enough information to separate [bioaerosols] out from the respirator standard," Steelnack adds. ■

Ergonomic efforts move to the states

Texas first to require program

Texas has become the first state to require safe patient handling programs in hospitals. That milestone has captured national attention as other states consider their own versions of a safe patient handling mandate.

The state's activity echoes the early days of the needle safety movement, which started in California and swept through state legislatures until it gained national momentum, resulting in a federal law. Could that happen again with patient handling?

"Obviously, we would love for that to occur," says **Sue Whittaker**, RN, MSN, associate director of state government relations for the American Nurses Association (ANA) in Silver Spring, MD. ANA still would like to see a federal regulation, but that seems a distant hope. Both a Washington state and an Occupational Health and Safety Administration standard were rescinded, she notes. "For us, this was the way to go."

Texas may seem an unlikely state to be the standard bearer for a new worker safety requirement, but concern over nurses' injuries and the nursing shortage brought the Texas Nurses Association and the Texas Hospital Association together.

"We want to make sure hospitals and nursing homes are paying attention to the fact that it is important to retain the nurses we have," says **Jennifer Banda**, JD, director of governmental affairs for the Texas Hospital Association in Austin. "Our nursing shortage in Texas is at a crisis level."

The nurses association previously had worked with the hospital association to lobby for more funding for nursing schools and nurse staffing. That relationship made it easier to reach agreement on patient handling, says **James Willmann, JD**, general counsel and director of governmental affairs for the Texas Nurses Association, also in Austin.

"It wasn't going to be sufficient to just address the supply of nurses unless you addressed some of the work force issues they had," he says.

Hospital must assess risk of injury

Under the new law, as of Jan. 1, 2006, hospitals in Texas will be required "to identify, assess, and develop strategies to control risk of injury to patients and nurses associated with the lifting, transferring, repositioning, or movement of a patient."

The law actually doesn't require the use of equipment or the purchase of new equipment, but it says the hospital's policy must include "an evaluation of alternative ways to reduce risks associated with patient handling, including evaluation of equipment and the environment" and a "restriction, to the extent feasible with existing equipment and aids, of manual patient handling or movement of all or most of a patient's weight to emergency, life-threatening, or otherwise exceptional circumstances."

Hospitals must analyze risks to patients and nurses and educate nurses about the risks.

They also must have "procedures for nurses to refuse to perform or be involved in patient handling or movement that the nurse believes in good faith will expose a patient or a nurse to an unacceptable risk of injury."

The law requires an annual report on patient handling activities to the nurse staffing committee and the hospital's governing body or quality assurance committee. Construction or remodeling of a hospital or nursing home also must involve a consideration of patient handling equipment.

"We really do believe that if we can get the hospitals and nursing homes to seriously look at this issue — and the legislation forces them to look at it — it will translate into some results," Willmann says.

The Texas law reflects some political realities. It mentions only nurses, although its supporters hope and expect that hospitals will create a broader policy and program that includes other

health care workers.

It doesn't require the purchase of equipment. "We agreed we would not mandate that by some certain date we'd have to eliminate manual lifting," Willmann notes.

"You'd probably have to have an exception for small rural hospitals. They'd say, 'We'll just close our doors.' Well, that's not an option in rural Texas," he says.

Willmann points out that a bill in California requiring hospitals to use lift teams and equipment to reduce patient handling injuries was vetoed by the governor. (*See Hospital Employee Health, November 2004, p. 147.*)

"We went into this believing that hospitals will operate in good faith," Willmann says. "If they're going to be required to develop policies, most of them are going to develop policies that make good sense."

Meanwhile, other states have fashioned legislation to promote safe patient handling. The New York legislature authorized a two-year study of safe patient handling programs. "Hopefully, it will raise awareness in health care institutions and elsewhere about how critical this issue is," Whittaker adds.

Ohio provided interest-free loans to long-term care facilities that implement a "no manual lift" program. The loans are targeted for equipment and employee training. Savings from the reduction in injuries could be used to repay the loans, she explains.

California, Iowa, Massachusetts, Minnesota, New Jersey, and Washington also considered safe patient handling legislation this year.

The Texas Hospital Association has been promoting the new safe patient handling law, educating CEOs, and touting its benefits — not just for nurses, but for patients, too.

"Overall, we're getting a positive response," Banda continues. "Hospitals realize that we want to do something to have a positive impact on the work force in the hospitals. This is a very good first step in working with the nursing work force."

The ANA has emphasized patient handling with its Handle with Care campaign. These new state laws are just a beginning, Whittaker points out.

"Until we can take nurses off the list as one of the higher professions being injured, then we have a lot of work to do," she explains. "We know what causes it, and we know what prevents it." ■

Undiagnosed TB among HCWs raises concern

Be vigilant to prevent active cases

A labor and delivery nurse at Northside Hospital in Atlanta went to work with active tuberculosis for about three months, exposing 37 newborns, about 160 other patients, and colleagues. Based on news reports, she was the third nurse in two years to continue to work while having active TB. One nurse in Virginia died of undiagnosed TB.

Prompt diagnosis of tuberculosis is considered the key to preventing transmission in hospitals. But it seems surprising — and even embarrassing — when the undiagnosed case is a health care worker.

Yet often, persistent cough, fever, and weight loss are ignored or explained away. Even health care workers may scarcely think of TB as a possibility.

“When TB starts, it’s sort of like you just have a cold. Do we all run to the doctor when we have a cold?” says **Susan M. Ray**, MD, associate professor of medicine in the division of infectious diseases at Emory University School of Medicine and associate hospital epidemiologist at Grady Memorial Hospital, both in Atlanta.

Health care workers still need to be reminded that TB is not just a disease of the past, she adds. Early detection depends on their vigilance.

Employee health plays an important role in preventing that nightmare scenario of a health care worker who infects patients and co-workers. Here are some steps you can take:

- **Educate health care workers about TB.**

Guidelines from the Centers for Disease Control and Prevention (CDC) call for ongoing training of health care workers in the recognition, prevention, and transmission of TB, even in facilities that would transfer any identified TB patients.

CDC suggests the training include signs and symptoms; policies on isolating patients; risk factors; epidemiology in the community, country and worldwide; and infection control practices.

“We do need to improve the awareness among health care practitioners that TB, although less common than it used to be, is still very much with us,” says **Ken Castro**, MD, assistant surgeon general of the Public Health Service and director of the Division of Tuberculosis Elimination. He

notes that more than 14,000 cases of TB were diagnosed in the United States in 2004.

- **Maintain a thorough TB testing program.**

CDC’s draft TB guidelines recommend baseline TB screening for all health care workers, but do not recommend further screening for low-risk facilities unless an exposure occurs. The TB risk assessment should be conducted at least once a year, and medium-risk facilities should maintain TB screening at least annually, the draft guidelines state.

CDC recommends two-step testing for all baseline tests, unless the health care worker has a documented positive TB screen or a documented negative screen within six months of employment.

Adequate follow-up of health care workers in the TB screening program is critical, Ray points out.

Hospitals use different policies to ensure that health care workers receive their annual screening. For example, at Grady Memorial Hospital, health care workers cannot get an updated badge allowing them access to the building unless they have received their TB skin test, she says.

“Knowing what their skin test conversion rate is among their employees is very important to being aware of whether things are going well in their hospital or not,” Ray notes.

“That’s a bare minimum for an employee health organization in a hospital. They need to be able to tell you that they have reasonably complete testing. They should test very close to 100% [of eligible HCWs],” she explains.

CDC also has placed an emphasis on the training of TB skin test readers. (See related article, p. 131 and TST checklist, inserted in this issue.)

- **Consider treating health care workers for latent tuberculosis.**

If a health care worker has a positive skin test, first consider whether this is a true conversion, Castro advises. For example, if you recently changed skin test agents (Tubersol vs. Aplisol), the reaction may simply look different.

For HCWs with HIV infection, a skin test result greater than or equal to 5 mm is considered positive. For others, a baseline result or increase over baseline of greater than or equal to 10 mm is considered positive, although in low-risk settings, a cutoff of greater than or equal to 15 mm may be used, according to the CDC draft guidelines.

Health care workers tested with Quantiferon who have a positive or “conditionally positive” baseline result should be considered positive and receive a medical and diagnostic evaluation,

according to the guidelines. Those changing from conditionally positive to positive in serial testing should be referred for evaluation but should not be counted as newly converted. Those who change from negative to positive in serial testing are converters, the guidelines state.

Follow up of a newly positive result should be immediate, Ray points out. "The day the PPD [skin test] is read, they should get the chest X-ray in the next five minutes," she says. "You can't be cleared to work until your chest X-ray has been looked at."

Someone with a recent conversion or with certain underlying conditions, such as diabetes, renal disease, HIV, or rheumatologic conditions that require steroid use, should be encouraged to have treatment for latent tuberculosis infection, Ray explains.

"The treatment is so effective and so well tolerated, the risk-benefit ratio is in favor of treatment," she says. "I think we should try to be very persuasive to take therapy."

Those who have had a longstanding latent infection would not be candidates for treatment unless they are immunocompromised or have certain underlying conditions that could increase their likelihood of developing TB, Castro points out.

However, they should be questioned annually at least about signs and symptoms, he says.

"We wouldn't recommend routine X-rays," Castro says. "They haven't been shown to be a way to pick up TB in the absence of a symptom screen."

Ray also reminds HCWs with positive skin tests, "if you are ill in the future and it's something that just doesn't get better when you think it should have, try to remember you had this positive skin test."

- **When in doubt, consult your local health department.**

CDC also is sponsoring regional training and medical consultation centers in San Francisco, Texas, Florida, and New Jersey, Castro says.

"It's our effort at a national level to make sure there's access to the desired expertise," he adds. "It is not realistic to expect that all practitioners are going to remain proficient at the diagnosis and treatment and management of TB patients, especially if they don't see them."

(Editor's note: Information about TB and health care workers is available at www.cdc.gov/ncidod/hip/guide/tuber.htm#2.) ■

CE questions

13. According to Robert Wise, MD, vice president of JCAHO's Division of Standards and Survey Methods, what is one common deficiency in preparedness planning?
 - A. lack of coordination with other hospitals
 - B. lack of communication with public health departments
 - C. ineffective disaster drills
 - D. insufficient policies and procedures
14. According to Gabor Lantos, MD, PEng, MBA, president of Occupational Health Management Services, a first step in devising a respiratory protection program involves:
 - A. setting up a multidisciplinary committee
 - B. hiring an industrial hygienist
 - C. contacting vendors
 - D. fit-testing all workers
15. Texas has become the first state to require safe patient handling programs in hospitals. Its new law requires hospitals to:
 - A. Purchase sufficient lift equipment for all units.
 - B. Reduce patient handling injuries by 20%.
 - C. Use lift teams for all patient transfers.
 - D. Assess risks and develop strategies related to patient handling.
16. According to Ken Castro, MD, assistant surgeon general of the Public Health Service and director of the Division of Tuberculosis Elimination, one reason health care workers may not think of TB when they have symptoms of cough, fever, and weight loss is:
 - A. They don't understand how it's transmitted.
 - B. They think TB is a disease of the past.
 - C. They are more concerned about continuing to work.
 - D. They are likely to be smokers.

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

CE instructions

Nurses participate in this CE 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 answer key to test their knowledge. To clarify confusion surrounding any questions answered incorrectly, please consult the source material. After completing this semester's activity with the **December** issue, you must complete the evaluation form provided in that issue and return it in the reply envelope to receive a certificate of completion. ■

Tough training rules for TB skin tests

CDC hopes to avoid common mistakes

Effective tuberculin skin testing relies on the proper administration of the test.

That is why new rules on training those placing and reading skin tests will remain in the final version of the Centers for Disease Control and Prevention (CDC) guidelines, says **Ken Castro**, MD, assistant surgeon general of the Public Health Service and director of the Division of Tuberculosis Elimination.

"The [screening] tool is only as good as our ability to administer and read it," he says. "If we're going to rely on this tool, we're going to need to be trained on how to do it well."

Some common problems occur with the test, Castro adds. Sometimes, the skin test is administered intramuscularly instead of intradermally. Some readers can't distinguish between redness and induration, he says, and they may have never seen a positive TB skin test.

CDC recommends recruiting volunteers with known positive skin tests so a trainee can practice reading a positive result. Annual retraining of those administering and reading skin tests also is recommended.

According to the draft guidelines, initial training for a skin test placer involves:

- Three hours of introductory lecture and demonstration by an expert TST (tuberculin skin test) placer or trainer.
 - Nine hours of supervised practical work using procedural checklists and coached by the expert TST trainer.
 - Administering 10 or more skin tests on volunteers, using injectable saline, and producing 10 or more wheals that measure 6 mm to 10 mm.
- The initial training for a TST reader involves these steps:
- Six hours of introductory lecture and demonstration by an expert TST reader.

- Four sessions (16 hours total) of supervised practical work using procedural checklists (observed and coached by an expert TST reader).
- Performing 80 or more blinded independent duplicate readings. TST trainers should attempt to organize the sessions so that at least 50% of the TST results read have a result of greater than 0 mm, according to the expert TST reader.
- On the last day of TST training, performing 30 or more blinded, independent duplicate readings (out of the total 80 readings). TST trainers should attempt to ensure that at least 25% of those tested have a TST result of greater than 0 mm, according to the expert TST readers.
- Missing no more than two items on the procedural observation checklist (recommended by CDC) for three random observations by an expert TST reader.
- Performing all procedures on the checklist correctly during the final observation. ■

Nursing homes dominate OSHA's hazard list

800 will receive comprehensive inspections

Twenty-eight hospitals and about 800 nursing homes will receive comprehensive inspections from the U.S. Occupational Health and Safety Administration (OSHA) because of high injury rates.

Nursing homes represent about 16% of the total high-hazard workplaces that have been selected for targeted inspection — and that is half of the number eligible for greater scrutiny. OSHA reduces the number of nursing home inspections by half because they would be overrepresented in the 5,000 inspections, explains **Tom Galassi**, MPH, CIH, deputy director of OSHA's Directorate of Enforcement Programs.

The high profile of nursing homes among high-hazard workplaces in the past is due to

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their overall number, says **Dave Schmidt**, chief of the division of data analysis. Some 17,000 of the 80,000 employers surveyed for the site-specific targeting program were nursing homes, he says.

But nursing homes also are hazardous because of resident handling injuries.

To be on the primary inspection list, employers reported a rate of 12 or more injuries or illnesses that resulted in days away from work, restricted work activity, or job transfer (DART) for every 100 full-time workers.

The DART rate for nursing homes is 6.3, compared to 2.6 for general industry. Sites on the targeted inspection list have a DART rate of 12 or higher or a "Days Away from Work [due to Injury and Illness]" rate of 9 or higher.

Since OSHA began using the general-duty clause — which requires employers to maintain a workplace free of recognized hazards that could cause serious harm — as an ergonomics enforcement tool, the agency has issued 16 citations. Ten of them were given to nursing homes; no hospitals have received a citation.

But according to Galassi, the enforcement actions and the targeted inspections, along with patient handling guidelines geared toward nursing homes, have led employers to respond to the hazard.

"We think we're getting some buy-in from the industry and recognition and agreement that resident handling problems can be addressed through engineering controls and work practices," he adds. ■

CE objectives

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

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

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Quality Control Procedural Observation Checklist for Reading Tuberculin Skin Test (TST) Results

Reading a TST result, palpation method

Date _____

Trainer (QC by) _____

Trainer (TST result read by) _____

Scoring: ✓ or Y = yes; N = no; NA = not applicable

I. Preliminary

- Utilizes appropriate hand hygiene methods before starting
- Keeps fingernails shorter than fingertips to avoid misreading TST result
- Keeps TST reading material at hand (eyeliner pencil or ballpoint pen¹, ruler)
- Uses well-lit area

II. Inspect for site

- Inspects for the site of the injection

III. Palpate: Finding margin ridges (if any)

- Palpates with arm bent at elbow 90°
- Lightly sweeps 2 inches diameter from injection site in four directions
- Uses zigzag featherlike touch
- Repeats palpation with arm bent at elbow at a 45° angle to determine presence or absence of induration

If induration is present, continue with these steps²:

IV. Mark: Placing marks

- Holds palm over injection site
- Moves finger pad toward injection site
- Drops fingernail on skin at indurated margin before marking with marker
- Places single dot with marker on skin at fingernail, left
- Places single dot with marker on skin at fingernail, right
- Inspects dots, repeats finger movements toward indurated margin, adjusts dots if needed
- Dots are transverse (perpendicular) to long axis of forearm

V. Measure: Placing and reading ruler

- Places zero ruler line inside left dot edge
- Reads ruler line inside right dot edge
- Reads lower mark when between scale divisions

VI. Documenting results

- Correctly records results in mm; only a single measured induration in mm should be recorded
- Trainee's measurement: ____ mm
- Trainer's ("gold standard") measurement: ____ mm
- Trainee's result within 2 mm of gold standard reading?³ ____ (yes/no)

¹ A fine-tipped eyeliner or ballpoint pen may be used as a marker. An eyeliner pencil is useful for TST training and for blinded independent duplicate readings (BIDRs) because marks are easily removed.

² If induration is not present, record the TST result as 9 mm and go to the end of this form (VI).

³ If the TST trainer reads the TST result as 11 mm (the "gold standard" reading), the trainee's TST result should be between 9 mm and 13 mm to be considered correct. Only a single measured induration in mm should be recorded.