



# Hospital Employee Health®

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## No need to rush? Hospitals go slow with smallpox vaccination plan

*Caution is a tool to avoid adverse reactions*

Caution prevailed over urgency as hospitals slowly began implementing the smallpox vaccination program in February. By taking extra safeguards and strictly limiting the health care workers receiving the vaccine, they hoped to avoid the adverse effects associated with the vaccine.

Concerns about liability and compensation limited participation in the program, while federal authorities sought to allay those concerns. An increasing number of hospitals opted out, while many of those participating found fewer volunteers than expected.

"We're looking for 150 volunteers at Baystate Medical Center [in Springfield, MA]. We're probably only going to be at a third of that, 50 or 60," said **James Garb, MD**, director of occupational health and safety at Baystate Health System. "Hopefully, it will go well, and people will see it's not so terrible."

The Chicago-based American Hospital Association asked for, and received, written assurances from Health and Human Services Secretary Tommy Thompson that the Homeland Security Act protects hospitals from liability due to adverse reactions and nosocomial transmissions. Thompson also told union representatives that he would work with Congress to develop a compensation plan for those harmed by the vaccine. An Institute of Medicine (IOM) panel had likewise underscored concerns about compensation, safety, education, and the timing of the vaccination program.

But Thompson told representatives of the Washington, DC-based Service Employees International Union (SEIU) that the program could not be delayed. "He told our president, 'We can't delay this program because we're going to war [with Iraq],'" recalls **Bill Borwegen, MPH**, SEIU health and safety director, who was at the meeting.

The SEIU and other unions advised health care workers to make sure

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sufficient safeguards were in place before volunteering for the vaccine.

The speed of the program was a major issue for hospitals, as well. "The program is moving too fast," said **Roslyne Schulman**, AHA's senior associate director for policy development, in the days before the Centers for Disease Control and Prevention (CDC) released the vaccine. "They ought to slow down and reevaluate some of these issues that remain unresolved."

In fact, many hospitals and even state health departments have created a longer timeline. The CDC envisioned a program that would begin at the end of January and last 30 to 60 days.

Arizona public health officials chose to wait until they completed an educational program and received more clarification on compensation issues.

"We're not going to rush into something until

we know people are adequately educated and prepared," says **Marte Keller**, program manager for education and training in the office of bioterrorism preparedness and epidemic response at the Arizona Department of Health Services in Phoenix.

In Georgia, only three of seven trauma centers in metropolitan Atlanta decided to participate. The initial vaccinations in those hospitals will be limited to about 10 or 15 employees, and the program will eventually expand to about 45 employees per hospital, explains **Patrick O'Neal**, MD, EMS medical director for the Georgia Division of Public Health.

"We're not going to move on until we're comfortable that we're not seeing a lot of complications in the early steps," he adds.

"We feel that it's imperative that we evaluate this very carefully, very slowly, and we not move aggressively on this in a pre-event scenario," O'Neal points out. **(For more information on monitoring reactions, see article, p. 32.)**

Elsewhere, the go-slow plan evolved from employee reluctance. In Connecticut, one of the first states to request vaccine and the first to administer it, only four employees received vaccinations on the first day of the program.

Variations in vaccine programs in different states and individual hospitals ultimately may be enlightening. The IOM panel suggested that the CDC evaluate the differences and correlate them with safety data. **(See article, p. 31.)**

The panel also advised CDC to carefully evaluate Phase 1 of the vaccination program — vaccinating as many as 500,000 health care workers — before moving on to other groups, such as emergency responders.

## **Two key concerns: Science and money**

Continuing concerns about the smallpox vaccination revolve around two aspects: science and money.

Clinicians are accustomed to making evidence-based decisions. The smallpox vaccination program presents known risks of the vaccine and unknown risks of a smallpox attack.

Some hospitals have decided that the risks of smallpox are too low to justify exposing employees to potential adverse reactions. For example, Baystate Health System's two smaller hospitals decided not to participate.

"One of the key factors is perceived risk. These two hospitals are in smaller communities," says

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## IOM: Safeguards are vital to smallpox program

*Without protection, HCWs will decline vaccine*

Add more safeguards to ensure that the smallpox vaccination program is as safe as possible, a federal panel of medical experts urged the Centers for Disease Control and Prevention (CDC) in Atlanta.

The CDC should evaluate the program "at every step," including comparisons of safety data related to different implementation in different settings, the Institute of Medicine (IOM) panel said in its report, *Review of the Centers for Disease Control and Prevention's Smallpox Vaccination Program Implementation*.

The panel also recommended that hospitals stagger the vaccinations to lessen the impact on patient care of worker absences due to adverse reactions or administrative leave.

"If the risk of smallpox disease [and thus the benefit of the vaccine] is truly very low, deliberation is key to assuring the safest program possible," the panel said. The IOM panel also said the CDC should take these steps:

- ✓ Consider what criteria (such as higher than expected levels of adverse events) would trigger a reconsideration of vaccination recommendations.

- ✓ Clarify the workers' compensation protections and support other avenues of compensation for those suffering severe adverse reactions.
- ✓ Add compensation information and other clarifications to the informed consent.
- ✓ Evaluate Phase 1 of the program before moving to Phase 2 (with vaccination of other health care workers and emergency workers).
- ✓ Conduct active surveillance of adverse reactions.
- ✓ Ensure the independence of the Data Safety Monitoring Board.
- ✓ Expand the training related to identification, treatment and reporting of adverse reactions.
- ✓ Determine "as well as possible" the true costs of the program.

Greater protection for health care workers who suffer adverse reactions would lead to greater participation, the panel noted.

"Without reimbursement for these losses, the committee fears that some, perhaps many, public health and health care workers will decline vaccination, thus undermining the effectiveness of the program's implementation," the panel said.

"Public health and health care workers who are considering vaccination need accurate information about the rights and protections that are available to them under their state's workers' compensation law."

*(Editor's note: To read the IOM report, go to: [www.nap.edu/catalog/10601.html](http://www.nap.edu/catalog/10601.html).)* ■

Garb, who notes that employees reasoned, "What are the chances of the first case of smallpox showing up here? I'll get vaccinated when the first case of smallpox shows up [somewhere]."

"I can't argue with that logic," he says. "There are some prominent physicians in this country who have said the same thing."

### ***Vaccine a part of preparing for bioterrorism***

Julie Gerberding, MD, MPH, director for the CDC stressed the importance of vaccination as a part of bioterrorism preparedness — a scenario far different from typical medical decision making.

"Sometimes, it is difficult for people who are thinking of this from a totally public health perspective to recognize that this decision is not just a public health decision," she said. "This is an issue of homeland security and an issue of national defense."

Cost is another harsh reality for hospitals. Hospitals have estimated their costs related to vaccination from \$55 to \$1,100 per vaccine,

Schulman explains.

For example, although a federal panel stated that furloughing employees is not necessary if the injection site is properly covered, some hospitals are choosing to furlough workers as an added protection against transmission of vaccinia to patients.

All participating hospitals have expenses related to training, monitoring, and absenteeism. Some hospitals are self-insured for workers' compensation and have even higher potential costs.

"There's no provision for any kind of compensation," Schulman adds.

"Right now, this is sort of an unfunded mandate. We would like to see some sort of a program that would provide compensation to allow hospitals to protect their community," she explains.

*(Editor's note: A copy of the IOM report, Review of the Centers for Disease Control and Prevention's Smallpox Vaccination Program Implementation, is available at [www.nap.edu/catalog/10601.html](http://www.nap.edu/catalog/10601.html).)* ■

# Red, swollen arm? Sounds like a good 'take'

*Even normal vaccine reactions look dramatic*

If your vaccinated employees have red, swollen arms, swollen lymph glands, and fever, are they having an adverse reaction? Probably not, says **William Schaffner, MD**, professor and chairman of the Department of Preventive Medicine at the Vanderbilt University School of Medicine in Nashville, TN.

In most cases, even a significant reaction around the smallpox vaccination injection site is completely normal — an example of a good “take,” says Schaffner, who monitored reactions during a clinical trial of the vaccine at Vanderbilt.

Careful, daily monitoring of the injection site will be a significant task for employee health professionals, who must determine which reactions require reporting and follow-up. Detailed information, including photos, of normal, robust, and adverse reactions are available in a guidance document from the Centers for Disease Control and Prevention (CDC) in Atlanta. **(See editor’s note at the end of this article.)**

Schaffner describes the typical response to the vaccine, which usually produces the most significant symptoms about a week after vaccination:

“Smallpox vaccination involves the inoculation of a live vaccinia virus into the skin over the upper arm. What results then is a local skin infection with vaccinia virus, which produces an inflammatory response. The thing you see is this vesicle: a blister that turns into a blister with pus in it. That blister is teeming with vaccinia virus. What you can get is surrounding inflammation: redness, swelling, tenderness, itching. You can get associated swollen lymph glands under the arm. This is well within normal. This simple viral infection can look like there’s a superinfection with staph or strep,” he explains.

Some vaccines may develop satellite lesions, a “rosette of bumps” around the injection site. Again, this is a normal reaction, Schaffner says.

“The people who’ve been vaccinated will want to talk about that. They’ll need to be provided reassurance,” he says. “The people who are following up need to go to the CDC web site and educate themselves about all the variations of normal.”

Adverse events, such as eczema vaccinatum, should be reported to local or state public health authorities. For consultation or to request therapy, such as vaccinia immune globulin, for adverse events, EHPs can call CDC’s Clinician Information Line at (877) 554-4625.

In setting up a monitoring program, Schaffner recommends that hospitals:

**1. Require all vaccinated employees to receive clearance for work every day until the scab falls off.**

No vaccinated employee should report for duty until someone trained in smallpox vaccine reactions has inspected their site, Schaffner advises.

“There is a responsibility for any hospital to do this in the most rigorous fashion possible,” he says.

In the daily check, EHPs or other trained staff should make sure the injection site is properly covered with gauze and a semipermeable dressing. If the dressing needs changing, which CDC recommends every one to three days, the soiled dressing should be placed in a plastic bag before being disposed of in the trash. The employee also should be advised to keep the site dry.

The Advisory Committee on Immunization Practices determined that health care workers could continue their patient care duties without risk of transmission if the injection site is properly covered and good hand hygiene and other infection control practices are followed.

“If an adverse event occurs involving transmission to a patient, it will take three hours before that’s on CNN,” Schaffner warns. “That hospital will be on the news. That kind of event could imperil the National Smallpox Vaccination Program.”

However, a good monitoring program could reduce the risk of transmission essentially to zero, he contends. “If you are meticulous and you do this exactly according to protocol, we would look at every person who was vaccinated every day before [he or she] began work; we could offer [the hospital] that assurance,” Schaffner says.

**2. Caution employees about the dangers of at-home transmission.**

The greatest risk of transmission actually involves the closer contact found at home. For example, vaccinated employees need to think of added risks of contact involving soiled towels, clothes, and linens. **(For common questions and answers provided by CDC, see box, p. 33.)**

*(Continued on page 34)*

## **CDC answers questions about smallpox vaccine**

**E**mployees are likely to have a wide range of questions about caring for their injection site and protecting others from contracting the disease.

Here are a few questions and answers provided by the Centers for Disease Control and Prevention (CDC). Other questions and answers are available on the CDC smallpox site at [www.bt.cdc.gov/agent/smallpox/vaccination/vaccination-program-qa.a.sp#evaluation](http://www.bt.cdc.gov/agent/smallpox/vaccination/vaccination-program-qa.a.sp#evaluation).

### **Question: What is the optimal size of the semi-permeable dressing for the vaccination site?**

**Answer:** The bandage should be large enough to cover the pustule or scab at the site of the vaccine and provide a barrier to vaccinia virus. In a recent study, the average size of the pustule at the vaccination site was half an inch, and the average size of the erythema, or swelling, at the vaccination site was two-thirds of an inch.

### **Question: Is there any particular risk for adverse reactions from people who wear contact lenses?**

**Answer:** Vaccinia infection of the eye is a potentially serious complication of vaccination and can lead to altered vision. Therefore, all vaccinees need to be very careful to not inoculate the vaccinia into the eye. You should do several things to ensure you do not inoculate virus into your eye.

Covering the vaccine site with gauze, tape, and a sleeved shirt or similar clothing, and careful hand washing decreases the chance of inadvertently getting vaccinia virus on your hands and possibly into your eye.

Additionally, you should take extra care to wash your hands before handling your contact lenses.

### **Question: Is a history of no adverse reactions in childhood to smallpox vaccine a predictor of no or minor reactions to revaccination in adulthood?**

**Answer:** No. Simply because a person did not experience an adverse reaction to the vaccine in childhood does not mean that he or she will not experience adverse reactions as an adult.

Many of the conditions that increase the likelihood of serious adverse reactions may not have been present in childhood (e.g., skin conditions, taking medication that suppresses the immune system).

### **Question: Can I share a bed after vaccination?**

**Answer:** Special care must be taken following vaccination with the smallpox vaccine to avoid contact spread of vaccinia. If specific precautions are followed, then individuals who have been vaccinated can share a bed with others. These precautions are: The vaccination site must be covered with a gauze bandage held in place with medical tape. As an extra precaution, the vaccinated person should wear a T-shirt or pajamas that cover the vaccination site. If the individual who has been vaccinated is not following these precautions then it is better not to share a bed. These precautions must be followed until the scab that forms at the site of the vaccination falls off on its own (two to three weeks).

### **Question: How should bed linens and clothing that has been in contact with the vaccination site be handled?**

**Answer:** Clothing or any other material that may have come in contact with the vaccination site and could be contaminated with vaccinia should be handled with special care; a separate hamper should be used. Contact with these items should be kept to a minimum. They should be laundered in warm water with detergent and/or bleach. After handling, individuals should wash their hands thoroughly in warm water with soap or with an alcohol-based hand rub, such as a gel or foam. If hands are visibly contaminated with fluids from the vaccine, then individuals should wash with warm water and soap.

### **Question: Is it safe to have clothes that have covered the vaccine site dry-cleaned?**

**Answer:** No. Vaccinia is spread by touching a vaccination site before it has healed or by touching bandages or clothing that have become contaminated with live virus from the vaccination site. After you get vaccinated, you must follow instructions for care of the vaccine site in order to avoid spreading vaccinia. **(See CDC fact sheet, inserted in this issue.)** This includes washing any clothing or other material that may have come in contact with the vaccine site in hot water with detergent and/or bleach. You should be able to launder any clothes that come in contact with the vaccine site in this way.

### **Question: Can I prepare food for others while my vaccination site is "active"?**

**Answer:** Individuals who've been vaccinated can cook and clean normally as long as they wash their hands after contact with the vaccination site or any potentially contaminated materials.

"It takes prolonged close contact, by and large, to have transmission," he notes.

While bandage changes would take place at the hospital, Schaffner says he had planned to provide one bandage change for emergency use at home. (Vanderbilt University Medical Center decided in January not to participate in the smallpox vaccination program, but conducted screening, education, and planning so the program could be quickly activated if a smallpox case occurred anywhere in the country.)

### 3. Provide feedback to vaccinated employees.

"If you're going to vaccinate, then you need to provide counseling and follow-up for the individual," Schaffner says. And you should expect a "bushful" of questions.

"Some interesting circumstances will occur, and you've got to be prepared to deal with them," he says.

"You'll have people coming in and saying, 'I developed a bump on my thigh, or on my chest. Can that be related to the vaccination?' Some of those will be disseminated vaccinia," he says.

Those cases need to be reported to the state health department, but likely will not cause the vaccinee any problems and will heal on their own, he says.

During the investigational trial, one Vanderbilt employee came to the emergency department with a severe headache, Schaffner recalls. He considered whether this might be a case of vaccine-related encephalitis. "The patient was watched. His headache went away. No lumbar puncture was done."

The hospital had no serious adverse reactions associated with the vaccination trial, he says.

### 4. Make note of employees who do not have a take.

What if a vaccinee has no reaction and no pustule? A small number of people may fail to have a take, Schaffner notes. One potential reason: If alcohol on the skin isn't allowed to dry before the pricking with the needle, the alcohol may kill the vaccinia. Poor vaccination technique and residual immunity also can cause an "equivocal" reaction.

Vaccination response should be evaluated on day 6, 7, or 8 after vaccination, the time of peak viral replication, the CDC says.<sup>1</sup> Evaluating the take too early or too late may be misleading. If the reaction is equivocal, the individual should be revaccinated, CDC says.

"If a patient has never had a successful take, the patient should be informed that he/she is almost certainly *not* immune," the CDC states.

(Editor's note: For information on vaccine reactions, see MMWR Dispatch, *Smallpox Vaccination and Adverse Reactions*, at [www.cdc.gov/mmwr/preview/mmwrhtml/di52cha1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/di52cha1.htm). For a summary of CDC recommendations on the care of the vaccinee, go to <http://www.bt.cdc.gov/agent/smallpox/vaccination/site-care-pub.asp>.)

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## CDC: Death toll is rising for influenza

*New data underscore need for HCW vaccines*

Death rates from influenza are rising with the aging of the U.S. population, and the virus now kills an average of 36,000 people a year, according to the Centers for Disease Control and Prevention (CDC). The new data underscore the need to protect vulnerable patients from nosocomial spread by vaccinating health care workers, public health experts say.

While healthy individuals may regard the flu as just a nuisance or a bad cold, the virus can lead to dangerous complications in the elderly or immune-compromised, notes **Keiji Fukuda**, MD, MPH, chief of the epidemiology section of CDC's influenza branch. In fact, it is "one of the major infectious disease causes of death in the country," he says.

The CDC researchers combined virus surveillance data and national mortality data to reach the new estimates for influenza deaths, findings that were reported in the Jan. 8 issue of the *Journal of the American Medical Association*. Previously, the CDC had estimated that an average of 20,000 influenza-related deaths occurred each year. While mild years may result in few flu-related deaths, in a severe flu season, the deaths could be as high as 70,000. Some 90% of those deaths occur among people who are 65 or older.<sup>1</sup>

"They're really breathtaking numbers," Fukuda says. "We really have approached it in a conservative way."

The prevalence of a more virulent strain, AH3N2, in the 1990s, contributed to the rise in

deaths. Each year the flu vaccine is reconfigured based on strains that are circulating worldwide.

"When you look at the impact of influenza, or you look at the epidemiology of influenza, this variability is one of the characteristics that we see for this disease," he says.

Along with the elderly and chronically ill, health care workers are a priority target for the vaccine. However, only about 38% receive it, according to the 2000 National Health Interview Survey.

Health care workers may harbor some of the myths that are common about flu vaccination. For example, some may believe that it's possible to get the flu from the vaccine, says Fukuda.

But the greater challenge is making vaccination programs accessible, he says. A single, annual campaign isn't sufficient. Vaccinations should continue even after the major push in October or November, he says.

"For a lot of reasons, which are not so clear, a lot of health care workers believe that after sometime in October or early November, it's time to stop giving flu vaccine," Fukuda says. "That's a mindset that we're really trying to change.

"No matter how big the push is, there are always people who don't get vaccinated. To continue with those activities afterward is an important lesson."

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## NIH panel favors early HCV testing after stick

*Give HCWs option for early treatment*

**H**ealth care workers should be tested for hepatitis C infection within two to eight weeks after exposure, an expert panel has recommended. Although the panel doesn't take a position on early treatment of hepatitis C, early testing offers that option.

"If you are infected with the virus, then the

earlier you know, the earlier you can initiate treatment before chronic infection is established," says **James Boyer**, MD, director of the Liver Center at the Yale University School of Medicine in New Haven, CT, and chair of the National Institutes of Health Consensus Development Conference on Management of Hepatitis C.

The HCV RNA first reaches detectable levels in the blood two weeks after transmission, Boyer notes. Revised recommendations issued by the panel advise that if the early test results are negative, additional HCV antibody testing should occur at six months.

Early treatment of HCV gained favor after a report in 2001 by German researchers, who found that 42 of 43 patients who completed a 24-week series of interferon therapy had undetectable levels of HCV RNA and normal liver enzyme levels.<sup>1</sup> However, the study did not include a control group of untreated patients, and all patients had symptoms of acute HCV.

Other studies have found that one-third to one-half of HCV-infected patients clear the infection on their own.<sup>2</sup> It also is unclear whether early treatment is more effective than treatment initiated at six months.

Because of the significant side effects of the interferon, some HCV experts prefer a more conservative approach to treatment.

Boyer acknowledges that "there's no hard proof" that early treatment is better. The decision should be made on a case-by-case basis by a liver specialist, he says. "I think a lot of people will choose to be treated. They should at least be offered that. Patients should be referred to an expert in that area to make a decision about whether to treat or to wait.

"There are a lot of unanswered questions in this field still," Boyer says. "The panel felt this was the safest way to go at the present time. Certainly, if I got a needlestick from a hepatitis C-positive source, that's what I would want to do."

## EHPs reconsider HCV testing

Employee health professionals are reviewing their HCV post-exposure testing in light of the recommendations. PEpline, a national post-exposure hotline based at San Francisco General Hospital, is considering whether to recommend earlier RNA testing.

PEpline has recommended HCV antibody baseline testing at exposure, viral load and PCR or branch DNA testing at six weeks, and antibody

testing at three months and six months. (For more information on PEPline, see column, at right.)

Early testing brings the inevitable question: What do you do with positive results?

"Our position on the PEPline is that there is no clear answer as to whether early treatment is right or wrong, based on this [*New England Journal of Medicine*] study and based on what we know about hepatitis C," says **Ronald H. Goldschmidt**, MD, director of the family practice inpatient service at San Francisco General Hospital and director of PEPline.

"At the same time, it's our obligation as the PEPline to make sure health care workers and the clinicians taking care of them . . . are informed about this study and the data so they can make an informed decision about whether to take medications against hepatitis C," he says.

"There's no right and no wrong here, at least at this point. It's a personal choice," Goldschmidt points out. "Health care workers have to know there is a potential treatment. There are risks and benefits, and they need to discuss it with someone knowledgeable.

At the Marshfield (WI) Clinic, 16 employees have been exposed to blood from HCV-positive patients, says **Bruce Cunha**, RN, MS, manager of employee health and safety. None became infected with hepatitis C. The clinic has been testing at exposure, three months, six months, and one year.

"I'm still really confused on this. We're going to take a wait and see attitude," Cunha says of the recommendation for early testing.

"How much good are the tests going to do unless the physicians decide they're going to start treating?" he says.

"We're talking about a disease that you can have for 20 years without any signs or symptoms. I do think you need to give the body a chance to take care of it."

*[Editor's note: PEPline is available 24 hours a day at (888) 448-4911. Information on PEPline is also available on the Internet at PEPline piece to: [www.ucsf.edu/hivcntr](http://www.ucsf.edu/hivcntr). For more information on the consensus panel statement, see <http://consensus.nih.gov/cons/116/revision.htm>.]*

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## From the PEPline

### HCV and needlesticks: Fear often outweighs risk

*Reassure, educate, and offer testing to HCWs*

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*[Editor's note: The National Clinicians' Post-Exposure Prophylaxis Hotline (PEPline) provides advice to both health care workers and their treating clinicians on managing occupational exposures to bloodborne pathogens. After nearly 30,000 calls, it has developed some approaches that may be helpful to readers of Hospital Employee Health. This is the first of occasional columns on post-exposure issues.*

*If you have a question about post-exposure response that you would like to see addressed in HEH, please e-mail Michele Marill at [marill@mindspring.com](mailto:marill@mindspring.com). Or you can contact PEPline directly through the National Clinicians' Consultation Center web site: [www.ucsf.edu/hivcntr](http://www.ucsf.edu/hivcntr), or by calling the PEPline at (888) 448-4911.]*

Exposures to bloodborne pathogens can be frightening. Our experience at the PEPline, however, is that the health care workers' fears can be substantially greater than the real risk of transmission. Educating the health care worker about the actual risk usually provides genuine reassurance and prevents unrealistic concern.

This is often the case with HIV and HCV, in which the risks of transmission and infection are quite low.

The PEPline staff's most important step in providing post-exposure consultation is to convey to callers that they will get the help and support they need while being treated in a respectful, nonjudgmental way. The next steps include obtaining a comprehensive assessment of the exposure, deciding whether testing and treatment are needed, and

providing counseling and crisis management.

The PEpline receives many questions that deal with hepatitis B and C. Here is an example of a fairly common hepatitis C question:

**Question.** A registered nurse sustained a superficial needlestick to her thumb after giving an intramuscular injection two days ago. The source patient is known to have hepatitis C and has a negative HIV antibody (ELISA) and hepatitis B surface antigen. The occupational health nurse called the PEpline wanting to know what follow-up HCV testing should be done for the nurse and whether there is any prophylaxis for HCV.

**Answer.** Our first task is to make sure that the occupational health nurse knows the actual risk and conveys the information to the health care worker (HCW) accurately. Our experience is that HCWs, and their treating clinicians, often have an exaggerated idea about the degree of risk that actually exists. Just knowing the actual risk often results in a dramatic sense of relief. In this case, the average per-episode risk generally is regarded as 1.8% for a percutaneous exposure from HCV-positive blood.

In a review of literature on occupational exposure to HCV, Janine Jagger, PhD, MPH, director for the International Health Care Worker Safety Center at the University of Virginia in Charlottesville, estimates the true risk is even lower — about 0.5%.<sup>1</sup>

Although various tests and testing protocols have been suggested, the PEpline recommendations are consistent with the Public Health Service Guidelines. We recommend a basic and relatively simple testing schedule, which has the convenience of following the same schedule as HIV testing (when needed):

Baseline HCV antibody test (ELISA); retest at three months and six months. The HCV antibody generally turns positive in nine to 12 weeks, and nearly all seroconvert by six months.

For those HCWs who want to know earlier, we recommend HCV RNA (viral load) testing at six weeks, consistent with the HIV testing schedule. This approach applies especially if early treatment is desired. **(See related article, p. 35.)**

Although measuring hepatic enzyme (ALT) levels has been part of some protocols, the PEpline does not recommend it as a screening test. People who have elevated ALT levels from causes other than acute hepatitis C can experience unnecessary anxiety and concern about hepatitis C in these

instances. In addition, a normal ALT does not exclude hepatitis C.

HCWs with clinical syndromes consistent with acute hepatitis C should be tested for HCV RNA (viral load) at the time of clinical illness.

For the individual who has an exposure to a source whose HCV status is unknown, the PEpline recommends HCV antibody test at baseline, three months, and six months. HCV RNA (viral load) testing is not recommended unless the exposure was from a high-risk source.

Because no post-exposure prophylaxis is effective in decreasing the risk of transmission of HCV, we would emphasize that there is no current treatment necessary.

Finally, the PEpline clinician would make sure the occupational health nurse and the exposed health care worker are aware that in one important study, early treatment of HCV infection has been shown to be effective in acute hepatitis C.<sup>2</sup> This information can be most reassuring to the exposed HCW at the time of the exposure.

It is also important to convey that some HCWs clear the virus on their own, there are no studies that compare early treatment with later treatment, and treatment itself can be associated with substantial toxicity. Later, if the HCW actually develops hepatitis C infection, further discussions with someone knowledgeable about the risks and benefits of early treatment will be essential.

## References

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2. Jaeckel E, Cornberg M, Wedemeyer H, et al. Treatment of acute hepatitis C with interferon alfa-2b. *N Engl J Med* 2001; 345:1,452-1,457. ■

## Training shatters myths on bloodborne exposures

*Misinformation persists, leads to needlesticks*

When needlestick injuries occur, work practices often are a contributing factor. Training is an essential component of maintaining safe practices. And while bloodborne pathogen training may focus on specific protective devices, it also needs to address and correct some common

misconceptions, says **Sandra Elias**, RN, OHN, an occupational health and workers' compensation consultant with US Health Works in Rancho Santa Margarita, CA.

Elias provides bloodborne pathogen training in a variety of settings, including hospitals. But wherever she goes, she finds a consistency in the myths and misinformation. Here are some misconceptions that Elias tries to correct:

- **Safety engineered sharps automatically are safer.**

These sharps only are safer if the health care worker properly engages the protective feature. "People think it's an engineered safety sharp, they're not being careful, and they're still getting stuck," Elias says. For example, one type of safety device requires the user to place it on a hard surface to flip up the shield. "People are flipping it up with their fingers, and they're getting stuck," she says. People also sometimes use two hands to activate a device when the design calls for using a single hand. Employees may need additional training in using the device, and the training needs to be followed up with observation to make sure staff are activating the devices properly.

- **Recapping needles is OK.**

OSHA has clearly prohibited the recapping of needles, except in the case of medical necessity. There must be no alternative to the recapping — a situation that is rare, Elias says. Many health care workers continue to recap needles despite the warnings. "They don't think there's any harm in it," she says.

- **It is safe to pick up broken glass with gloves.**

If a blood tube or some other specimen falls to the floor and breaks, health care workers often pick up the broken glass with a gloved hand. But the glass can puncture the glove and expose the worker, cautions Elias.

"Employees are not allowed to pick up broken glass or metal with their gloves on," she says. "They need to sweep it up with a broom." One other precaution when cleaning blood or body fluid spills: The workers should wear disposable booties so the substance isn't tracked on their shoes to other parts of the hospital or to their home.

- **Bloodborne exposures can be reported at any time.**

Too often, health care workers fail to report bloodborne exposures immediately. "If they get a bloodborne exposure, even though their company policy is to report it right away, they feel they can wait. If it happens on a Friday, they wait until Tuesday to tell someone," she says. That delays

## CE questions

9. According to Roslyne Schulman, senior associate director for policy development for the American Hospital Association, hospitals have estimated their costs related to smallpox vaccination from:
  - A. \$5 to \$20
  - B. \$55 to \$1,100
  - C. \$500 to \$1,100
  - D. All costs will be paid for by state and federal public health agencies.
10. According to William Schaffner, MD, professor and chairman of the Department of Preventive Medicine at the Vanderbilt University School of Medicine, where does contact spread of vaccination from injection sites pose the greatest risk?
  - A. cancer centers
  - B. emergency departments
  - C. intensive care units
  - D. the home environment
11. CDC researchers updated the estimate of annual flu-related deaths to what level?
  - A. 20,000
  - B. 24,000
  - C. 36,000
  - D. 50,000
12. An NIH panel recommended initial hepatitis C testing within what timeframe after a bloodborne pathogen exposure?
  - A. 2-8 weeks
  - B. 6 weeks
  - C. 3 months
  - D. 6 months

**Answer Key:** 9. B; 10. D; 11. C; 12. A

the assessment and possible post-exposure treatment. If the health care worker has been exposed to HIV or hepatitis B, treatment needs to occur within 24 hours.

- **One exposure control plan is fine for all hospital sites.**

One basic plan may apply to the entire hospital, but each location, such as clinics, satellite campuses, outpatient surgery centers, needs a customized version, says Elias. For example, employees at those locations need to know where to find personal protective equipment.

- **You can get AIDS from someone sneezing.**

Health professionals know that's false, but

what about housekeepers, food service workers, and security personnel? Many of them still may believe that HIV can be transmitted through casual contact. Your bloodborne pathogen training needs to address myths about HIV transmission. Baseless fears still exist among those less knowledgeable about the disease, says Elias.

[Editor's note: Sandra Elias can be reached at [sandraelias@aol.com](mailto:sandraelias@aol.com) or at (714) 324-0807.] ■



## Literature Review

### Rand Corp. identifies risks of smallpox vaccinations

Bozzette SA, Boer R, Bhatnagar V, et al. **A model for a smallpox-vaccination policy.** *N Engl J Med* 2003; 348(5):416-425.

**H**ow great is the risk of a smallpox attack? That question underlies the current campaign to vaccinate health care workers and military personnel — and to offer the vaccinia vaccine to those who want it in the general public.

The benefit of those vaccines can't be calculated without an estimate of the risk both of smallpox and of vaccine-related adverse events.

Researchers at the RAND Corp. in Santa Monica, CA, have attempted to do just that. They identified six possible scenarios, from a hoax to a high-impact attack at a major airport. Their conclusion: Vaccination of health care workers is justified. Widespread vaccination of the public is not.

"In our judgment, the probability of a release of variola virus may exceed the thresholds for prior vaccination of health care workers," the researchers stated. "We endorse a policy of vaccinating all eligible health care workers and first responders before an attack."

Such a policy is even more justifiable when the

risk/benefits are calculated on a local basis, the authors said. "Local officials should welcome such a program, which should include appropriate monitoring and evaluation," they wrote. "In contrast, we cannot endorse a public vaccination campaign at this time, because the certainty of harm outweighs the small chance of a net benefit. Nonetheless, we acknowledge the distinction between this position and the argument for allowing access to vaccination on demand."

In the model, the RAND researchers estimated that vaccination would lead to 25 deaths of health care workers and 482 deaths nationally if the general public received the vaccine. It assumed that about 9 million health care workers would receive the vaccine.

No one knows whether any terrorist group or nation hostile to the United States has access to variola. In fact, the authors noted, "The known supplies of variola virus are limited. Rogue states with the virus would probably fear boomerang effects or devastating retaliation, and terrorists are unlikely to be capable of successfully handling a lethal mammalian virus."

Nonetheless, they assumed that such an event is possible, and they create a range of scenarios: A hoax using monkeypox virus via a mailed threat (monkeypox is not transmitted via person-to-person contact); a release in which a vaccinated laboratory worker unknowingly transmits variola to his or her children due to sabotage of a biosafety hood; attacks in which previously vaccinated terrorists infect themselves, then ride mass transit; aerosolized virus sprayed into a building vent; and attacks with aerosolized virus in terminals of 10 major U.S. airports, with either low- or high impact (depending on success of aerosolization).

The authors then considered how many cases would occur before the smallpox outbreak could be halted. The number of initial infections in the scenarios range from two to 100,000. Including secondary spread of the virus, the expected number of deaths range from seven to 54,728.

"We used public sources of data and expert opinion to develop detailed, realistic, and feasible scenarios for smallpox attacks, given access to variola, historical tendencies, and methods of

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terrorists, and known domestic vulnerabilities," they stated.

"We considered several control strategies, including vaccination of contacts of infected persons [household members, health care workers, and others] and isolation of patients, as well as pre- or post-attack vaccination of 60% of 290 million U.S. residents, 90% of 10.1 million health care workers, or both."

The authors noted that most outbreaks of smallpox in Europe and North America after World War II involved a single index case, and that the highest number of secondary cases occurred in hospital transmission.

"Prior vaccination of health care workers is expected to save lives at lower threshold probabilities of an attack and is expected to cause relatively few deaths, which will be concentrated among workers whose professional ethic includes acceptance of a risk of personal harm for the public good," the authors stated. "In addition, prior vaccination sharply reduces the disproportionate burden of disease among health care workers in the event of an attack and, by eliminating a major route of exposure, helps protect their families — effects that should help maintain staffing levels at health care facilities," they wrote. ■

## NEWS BRIEF

### Ergo site offers free downloads, resources

Back injuries are second only to the common cold as a cause of absenteeism. And they are more than four times more common in health care than in other industries.

After noting those facts, a new web resource from the Premier Safety Institute in San Diego offers basic information about ergonomics and links to dozens of other resources, including cost analyses of ergonomic programs, descriptions of equipment, and success stories of hospitals and nursing homes. The site contains more than 20 downloads with more than 700 pages of information. It can be accessed from [www.premierinc.com/safety](http://www.premierinc.com/safety). ■

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### 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. ■



## SMALLPOX FACT SHEET

### Caring for the Smallpox Vaccination Site

The smallpox vaccine contains a **live** virus called vaccinia. After vaccination, this live virus is present at the vaccine site and can be spread to other parts of the body or to other individuals through contact. To avoid this, the vaccination site must be cared for carefully until the scab that forms after vaccination falls off on its own (in 2 to 3 weeks). Follow these instructions:

#### WHAT YOU SHOULD DO:

- **Cover the vaccination site loosely with a gauze bandage, using first aid adhesive tape to keep it in place.** Keep it covered until the scab falls off on its own. This bandage will provide a barrier to protect against spread of the vaccinia virus. (When involved in direct patient care, healthcare workers should cover the gauze with a semipermeable [semioclusive] dressing as an additional barrier. A semipermeable dressing is one that allows for the passage of air but does not allow for the passage of fluids.)
- **Wear a shirt that covers the vaccination site** as an **extra** precaution to prevent spread of the vaccinia virus. This is particularly important in situations of close physical contact.
- **Change the bandage every 1 to 3 days.** This will keep skin at the vaccination site from softening and wearing away.
- **Wash hands with soap and warm water or with alcohol-based hand rubs such as gels or foams after direct contact with the vaccination site, the bandage or clothes, towels or sheets that might be contaminated with virus from the vaccination site.** This is vital in order to remove any virus from your hands and prevent contact spread.
- **Keep the vaccination site dry.** Cover the vaccination site with a waterproof bandage when you bathe. Remember to change back to the loose gauze bandage after bathing.
- **Put the contaminated bandages in a sealed plastic bag and throw them away in the trash.**
- Keep a **separate laundry hamper** for clothing, towels, bedding or other items that may have come in direct contact with the vaccine site or drainage from the site.
- **Wash clothing or other any material that comes in contact with the vaccination site,** using hot water with detergent and/or bleach. **Wash hands afterwards.**
- When the scab falls off, **throw it away in a sealed plastic bag** (remember to wash your hands afterwards).

#### DO NOT:

- **Don't use a bandage that blocks all air from the vaccination site.** This may cause the skin at the vaccination site to soften and wear away. Use loose gauze secured with medical tape to cover the site.
- **Don't put salves or ointments on the vaccination site.**
- **Don't scratch or pick at the scab.**

For more information, visit [www.cdc.gov/smallpox](http://www.cdc.gov/smallpox), or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY)

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