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IN THIS ISSUE

APRIL 2003
VOL. 22, NO. 4 • (pages 41-52)

So far, so good: As vaccinations begin, few serious smallpox reactions emerge

Screening adds safety to smallpox vaccination

Despite widespread fears about the smallpox vaccine, there were few serious adverse reactions and no known spread to contacts in the first month of the vaccination program.

Careful screening has greatly reduced the risk of the vaccine, public health authorities say. Based on the vaccination experience in the 1960s, they had estimated there could be 14 to 52 life-threatening events and as many as 1,000 "serious" reactions for every million vaccinees.

In the first month of the program, 7,354 health care workers received the vaccine. A 39-year-old female nurse suffered from a suspected case of generalized vaccinia, and a 60-year-old man with a history of hypertension suffered from angina four days after being vaccinated.[1] Angina has not previously been associated with the smallpox vaccine, and that case was being investigated. Both health care workers had been vaccinated previously, and both live in Florida, one of the first states to begin health care worker vaccination.

Even more reassuring news came from the military after the vaccination of 10,000 health care workers and more than 250,000 military personnel. The Department of Defense reported two possible cases of vaccine-related encephalitis, six possible cases of generalized vaccinia, four possible cases of vaccine-related myocarditis, and one possible case of ocular vaccinia. All have recovered.

Only 3% of military personnel took sick time due to vaccine reactions, and "we've had zero cases of transmission of vaccinia in the health care setting," says Lt. Col. **John Grabenstein**, RPh, PhD, deputy director of clinical operations for the Military Vaccine (MILVAX) Agency in Falls Church, VA. "We expected the serious events to be rare," he adds. "What we're seeing is they're very, very rare."

In fact, screening appears to greatly reduce the risk of the vaccine. In the 1960s, the benchmark for the current program, screening might have prevented as many as two-thirds of the complications, according to a

Centers for Disease Control and Prevention (CDC) report.[2]

"However, screening will not eliminate risk, because the risk factors for certain adverse reactions have not been clearly defined and screening success is subject to recall bias and the participant's willingness to disclose personal information," the report concluded. "Stringent medical screening of potential vaccinees for risk factors for adverse events, coupled with improved infection-control measures to prevent vaccinia transmission, will probably decrease preventable complications of vaccination."

Swelling, itching, and even fever and malaise are common reactions to the live-virus vaccine. But one reaction has proved vexing for some health care workers: a sensitivity reaction to the semipermeable bandage or its adhesive.

A survey of vaccinated military personnel found that 18% had a reaction to the bandage. Those were resolved by changing the tape or bandage type, Grabenstein says.

The Healthcare Infection Control Practices Advisory Committee (HICPAC), an advisory panel to CDC, is drafting an algorithm that advises health care workers with a sensitivity to latex or adhesives to use an alternate dressing.

In fact, two of the HICPAC members had a reaction to the bandage adhesive after vaccination. "It was so bad on the seventh day, at first I thought I might have superinoculation or satellite lesions," says **Loretta Fauerbach**, MS, CIC, a representative from the Association for Professionals in Infection Control and Epidemiology.

HICPAC members advised asking potential vaccinees whether they are sensitive to bandage adhesives or latex. They also should avoid unnecessarily irritating the area, says HICPAC co-chair **Jane Siegel**, MD, a professor of pediatrics at the University of Texas Southwestern Medical Center in Dallas. "If there is no fluid accumulation, it is not necessary to remove the dressing," Siegel says. If a vaccinee has a reaction to the adhesive and no adequate alternative can be found, she or he may need to keep the site open and refrain from patient care until the scab separates, Siegel says.

"If they absolutely cannot tolerate the semipermeable dressing, I don't think it would be appropriate for them to have continuing patient contact," she says.

Meanwhile, vaccination programs in many states were scheduled to begin in March, six weeks after the official start date of the vaccination program. By the end of February, 488 hospitals had participated — about 10% of the nation's acute care hospitals. About half of those vaccinated were public health workers who would administer the vaccine or respond to a smallpox event.

Continuing concerns about compensation for health care workers or household contacts suffering from adverse events have affected the program, CDC officials acknowledged. But the slow start also has provided time for extensive screening and education.

"We're actively screening right up to the moment of vaccination to make sure people don't fall through the cracks," says **Allen Craig**, MD, state epidemiologist with the Tennessee Department of Health in Nashville. Tennessee had vaccinated 881 public health and health care workers with no serious adverse events. Three vaccinees developed vesicles on other parts of the body, which may have been due to autoinoculation, but

Hospital Employee Health® (ISSN 0744-6470), including **JCAHO Update for Infection Control** and **Bioterrorism Watch**, is published monthly by Thomson American Health Consultants, 3525 Piedmont Road, Building Six, Suite 400, Atlanta, GA 30305. Telephone: (404) 262-7436. Periodicals postage paid at Atlanta, GA 30304. POSTMASTER: Send address changes to **Hospital Employee Health**®, P.O. Box 740059, Atlanta, GA 30374.

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Subscription rates: U.S.A., one year (12 issues), $429. Outside U.S., add $30 per year, total prepaid in U.S. funds. Two to nine additional copies, $343 per year; 10 to 20 additional copies, $257 per year. For more than 20 copies, contact customer service for special handling. Missing issues will be fulfilled by customer service free of charge when contacted within 1 month of the missing issue date. **Back issues**, when available, are $72 each. (GST registration number R128870672.)

This continuing education offering is sponsored by Thomson American Health Consultants, which is accredited as a provider of continuing education in nursing by the American Nurses Credentialing Center's Commission on Accreditation. Provider approved by the California Board of Registered Nursing, provider number CEP 10864.

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Eczema & Atopic Dermatitis Screening for Potential Smallpox Vaccine Recipients

Source: Centers for Disease Control and Prevention, Atlanta.

none posed a risk, Craig says. "This is a very different program than was in place in the '50s and '60s, in which there wasn't so much rigorous concern about transmission [of vaccinia]," he notes.

The relative safety of the program may encourage other health care workers to be vaccinated. But for now, it appears that the numbers will be far lower than the 500,000 originally projected by CDC. State plans called for the creation of 4,532 health care teams with 396,062 people vaccinated. It appears that less than half that number may actually be vaccinated.

For example, Tennessee had requested 13,000 doses for response teams at 130 hospitals, but Craig anticipates that just 5,000 to 6,000 health care workers will receive the vaccine at 108 hospitals.

In Connecticut, the first state to begin vaccinations, numbers were likewise lower than projected. At Yale-New Haven Hospital, about 20 health care workers received the vaccine in the first day. "We are shy of the originally envisioned 100 to 150 [members of a response team]," says **Mark Russi**, MD, associate professor of medicine and public health at the Yale University School of Medicine and director of occupational health at Yale-New Haven Hospital. "I'm not sure what our final numbers will be once we finish this."

Thanks in part to the lackluster response, the logistics of smallpox vaccination have been smooth. Yet the program is still placing great burdens on employee health.

For **JoAnn Shea**, MSN, ARNP, director of employee health and wellness at Tampa (FL) General Hospital, it's as if she's been on extended leave. All her regular duties piled up as she spent her time preparing for smallpox vaccination. "It's been almost like a full-time job in the last month for me. We've had to create all these consents and agreements and follow-up forms. I had to create an educational program suited to our hospital."

Although CDC has a wealth of educational information on its web site (www.cdc.gov), the education had to be streamlined and specific to Tampa General. What kind of dressing would employees wear? Who do they call after hours? Who do they contact during regular hours?

Shea also addressed various issues to reduce the likelihood of vaccinia transmission to patients. The hospital didn't want contaminated scrubs mixed in with the hospital laundry. Operating room personnel bring freshly laundered, long-sleeved T-shirts in a bag to work and wear them under their scrubs. "There are a lot of little things that came up that we didn't realize were issues," she says.

Monitoring vaccination sites

Shea set up a system of site checks, with an emphasis on monitoring the site during days six through eight to determine if there was a "take." Any employee who might be on vacation during those days would not be eligible to get the vaccine, she says. Employees on scheduled days off would need to come into the hospital for a site check. Shea selected the semipermeable bandage that she thought would provide the best protection. "I paid almost $1,000 just for these Tegaderm dressings, and I need to order more," she says. "It's a very costly program for us in staff time and materials."

Employee health professionals can't even imagine a second phase of the program, in which the vaccine would become available to emergency responders, law enforcement personnel, and all health care workers who want it.

In a press briefing earlier in February, CDC director **Julie L. Gerberding**, MD, MPH, said she envisioned a smooth transition between Phase 1 and Phase 2. "There is not going to be a stop date where we say, 'OK. Stage 1 is over; now Stage 2

Adverse Events

The Centers for Disease Control and Prevention recommends that these adverse events after smallpox vaccination be reported to the Vaccine Adverse Event Reporting Systems and to state health departments:

- ✔ Eczema vaccinatum
- ✔ Erythema multiforme major or Stevens-Johnson syndrome
- ✔ Fetal vaccinia
- ✔ Generalized vaccinia
- ✔ Inadvertent inoculation
- ✔ Ocular vaccinia
- ✔ Post-vaccinal encephalitis or encephalomyelitis
- ✔ Progressive vaccinia
- ✔ Pyogenic infection of vaccination site
- ✔ Vaccinia transmission to contacts
- ✔ Vaccination of people with a contraindication to vaccination
- ✔ Other serious adverse events (i.e., those resulting in hospitalization, permanent disability, life-threatening illness, or death)

Note: Any adverse event that is of concern to the clinician or patient should be reported.

Is it a vaccine reaction? CDC offers guidance

According to the Centers for Disease Control and Prevention, an adverse event can be causally attributed to vaccine more readily if:

- The exact chronology of vaccination and adverse event is known.
- The adverse event corresponds to those previously associated with a particular vaccine.
- The event conforms to a specific clinical syndrome whose association with vaccination has strong biologic plausibility (e.g., anaphylaxis).
- A laboratory result confirms the association (e.g., isolation of vaccine-strain varicella vaccine from skin lesions of a patient with rash).
- The event recurs on re-administration of the vaccine (positive re-challenge).
- A controlled clinical trial or epidemiologic study demonstrates greater risk for a specific adverse event among vaccinated vs. unvaccinated (control) groups.

Source: Iskander JK, Miller ER, Pless RP, et al. *Vaccine safety post-marketing surveillance: The Vaccine Adverse Event Reporting System.* Atlanta: Centers for Disease Control and Prevention National Immunization Program; 2003.

begins," she said. "Rather, each jurisdiction will be able to expand to accommodate the larger group of people volunteering for vaccination at their own pace."

However, a broader vaccination program would escalate the concerns about nosocomial transmission, adverse reactions, cost, and compensation. "I'm actually very hopeful that we don't find it necessary to progress to Stage 2," says Russi, who says that the Stage 1 response teams may provide a sufficient infrastructure.

"If you vaccinate 10 million health care workers, you have to contemplate 10 to 20 deaths," he says, based on CDC estimates of adverse events. "It's awfully serious for something when we don't know if there's even smallpox out there."

While occasionally health care workers who are not designated for response teams have requested the vaccine, there hasn't been a groundswell of demand. "Given the fairly tepid response on the part of health care workers to Stage 1, I'm just not sure anything will change that much in progressing to Stage 2 vaccination," he says. "I have to wonder, is it realistic to think there would be 10 million health care workers and first responders who would want to be vaccinated?"

State public health departments are unsure even how to conduct a Phase 2 program. Tennessee will submit a Phase 2 plan by May 1, but Craig notes, "We've not been told that Phase 2 will happen at this point. Until we get guidance from CDC, our plans can't be finalized." Public health clinics would need to create an ongoing smallpox program that would last for months. "The size of this effort would probably be 20 times greater than our current effort," he says. "We would probably have to institutionalize this into our current operation."

Hospitals would need financial resources from the federal government to pay for extra staff and other costs, Shea says.

"Imagine if we had a Phase 2, and anyone could get it, and we had to check them [daily]," she says. "This is uncharted territory."

[Editor's note: Clinical consultation on possible adverse reactions is available from state public health departments or CDC's Clinician Information line: (877) 554-4625.

Health care providers should report smallpox vaccine adverse events to their state/ local health department and to the Vaccine Adverse Event Reporting System (VAERS) at www.vaers.org or (800) 822-7967. Clinical evaluation tools are available at www.bt.cdc.gov/agent/

smallpox/vaccination/clineval/. Other guidance on adverse reactions is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5204a1.htm.]

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Terror alert: Are you ready for any possibility?

Hospitals move beyond smallpox in hazard analysis

As Americans encountered an elevated terror alert and braced for war with Iraq, Tom Ridge, Homeland Security chief, announced a "Ready Campaign," saying, "Terror forces us to make a choice. We can be afraid, or we can be ready."

For homeowners, that meant stocking up on duct tape and bottled water. But how ready are hospitals to respond to an act of terrorism that results in contaminated patients and mass casualties? Preparedness experts worry that the smallpox vaccination program may be diverting resources from other types of emergency capability. Many hospitals have not done enough to coordinate with other hospitals and agencies in their community or to maintain effective equipment and training — even though that is required by the Joint Commission on Accreditation of Healthcare Organizations' standard on emergency management.

More importantly, many hospitals lack the "big picture" perspective that is essential to preparedness, says **Paul Penn**, MS, CHEM, CHSP, western director/vice president of the Environmental Hazards Management Institute in Diamond Springs, CA.

Terrorism should be integrated into other disaster preparedness plans, he says. For example, a nerve agent that could be used in chemical terrorism is not much different from organophosphate poisoning due to a pesticide spill.

"Let me put this into perspective. Terrorism is a 'menace with malice.' In health care, we are more concerned with the menace component. A chemical terrorism event is a hazardous materials incident. A bioterrorism event is an infectious disease outbreak. Instead of focusing entirely on the chemical terrorism or the bioterrorism event, let us prepare organizations to handle the broader and more likely event so they can handle the other ones," Penn explains.

At a minimum, every hospital should have the capability to decontaminate one or two patients, and determine if a larger capacity is appropriate, he says. That sounds simple, but actually entails the ability to assess risk, identify hazards, conduct safe decontamination, provide protective equipment to select employees, and keep up skills through training.

"Ideally, everybody should attain a level of preparedness that is appropriate for their own unique situations and make sure that what they are doing supplements what their nearest neighbors are doing," says **Luke Petosa**, MSc, HEM, director of the Center for Healthcare Environmental Management at ECRI in Plymouth Meeting, PA. Petosa developed an advisory on selecting personal protective equipment for chemical and biological terrorism events (available at www.ecri.org).

As of January 2003, the Joint Commission added a new requirement to its emergency management standard: Hospitals must plan cooperatively with other health care organizations in their geographic area. That includes identifying resources that could be shared during an event.

The occupational health nurse plays a key role in both planning and response, as someone who will help identify hazards, protect health care workers, and possibly coordinate a hospital's emergency response, according to the American Association of Occupational Health Nurses in Atlanta.

Here are some major steps that hospitals must take in their emergency management:

• **Conduct a hazard vulnerability analysis.** Think of every imaginable hazardous event, either inside or outside your hospital: sewage backup, HVAC failure, a massive chemical spill, an act of terrorism.

To evaluate the risk of those and numerous other events, **Mitch Saruwatari**, MPH, national threat assessment manager at Kaiser Permanente in Pasadena, CA, developed an Excel-based spreadsheet. Hospitals can identify their highest priorities and focus their resources on training and preparedness. (The form is available free of charge at www.hazmatforhealthcare.org.)

"Since Sept. 11, we've asked all of our hospitals to reconfigure their hazard vulnerability analysis," Saruwatari says. "If you're next to a stadium, you may not have thought that was a big

risk. But under today's standard [of a terrorism alert], that adds a greater risk to your facility."

Saruwatari advises meeting with community response agencies, such as fire department officials or law enforcement, to gain additional perspective on risks. Then you can make your planning and resources flexible. "Any preparation that you do in a hospital will have overlap for preparing for any other event," he says.

For some incidents, you may be able to take mitigating action. For example, earthquake damage can be minimized through structural reinforcements of a building. "Those mitigation activities reduce the severity, which ultimately reduces the risk," says Saruwatari.

You also should understand your internal capabilities for containing a hazard, such as the HVAC system.

"You need to understand how your ventilation system works," says Petosa. "What happens if an individual walks into your facility and you don't know that he has smallpox, but three weeks later you do? Can you quarantine an area?"

• **Create an incident command center (or emergency operations center).** The Joint Commission requires hospitals to have an "all-hazards" command structure that links with a community command structure. The key is to make this something more than just a policy placed on a shelf. "It's only good if you truly incorporate it into the organization and you practice it," says Penn.

During a disaster, you want to be able to use a common nomenclature and organizational structure such as the hospital emergency incident command system, which is patterned after the systems used by first responders. (For more information, go to: www.emsa.ca.gov/dms2/heics3.htm.) You want to be able to communicate readily not just with first-responder agencies but with other hospitals in the community, he notes.

Hazmat for Healthcare offers training that enables hospitals to practice using their incident command center. **(For more information, see editor's note, p. 48.)** "The things that occur the least frequently are the things you need to practice the most," Penn says. "Doing an unusual process has to be practiced so if they need to do it, they can do it competently."

• **Select appropriate personal protective equipment (PPE).** What contaminants are you likely to encounter? Who will be wearing the respirators, and for how long? How much time will be required for training and fit-testing related to the respirators?

Those are questions you must consider when selecting respirators and other equipment, such as protective clothing. (An advisory on PPE is available at www.ecri.org.)

At Johns Hopkins University in Baltimore, **John Schaefer**, CIH, HEM, CPEA, associate director for health care, safety, and environment for the university and hospital, has chosen not to use N95 respirators — even for protection against tuberculosis. Schaefer notes that by definition, N95s allow penetration of 5% of any substance. Even with a good fit, another 10% of contaminated air will penetrate. Moreover, N95s will not provide protection against a chemical contaminant.

"The best protection you can get from an N95 is 85% reduction of the exposure," says Schaefer, who is an assistant professor of medicine and environmental health sciences. "That's a big concern. That's why we don't use the N95s for bioterrorism."

Instead, Schaefer favors powered air-purifying respirators, which blow HEPA filtered air and don't require a tight fit. The air-purifying respirators are costly — $300 to $500 each — but the hospital saves money on training and fit-testing, he says. "Once [hospitals] use N95s for anything other than TB, they have to comply with the full respirator protection program."

On the other end of the spectrum, self-contained breathing apparatus (SCBAs) can be too difficult and unwieldy for health care workers, he says. "A lot of people want to grab air tanks to handle chemicals," says Schaefer. "It's very easy to say that until you take a physician or a nurse and put a 60-pound air tank on that person that's good for 30 minutes and watch this person try to maneuver. It's very heavy. If you're not ready for it, you can wind up with some back injuries."

• **Be prepared to recognize a potential hazard.** As with an infectious disease, swift identification is the single most important factor in protecting staff and other patients from chemical and other hazards. "You're looking for physical signs," says Penn. "Their body is twitching, as they might if they were exposed to a nerve agent. They're sweating profusely, as if they were exposed to some contagion or pathogen. These should be immediate signs. Unfortunately, many hazards of concern cause flu-like symptoms. It is often a challenge to differentiate between the traditional and the extraordinary illnesses."

Your emergency department (ED) and health care workers may be contaminated in the first moments of contact with a patient if they haven't

taken protective measures, notes Petosa.

"If you do not have the training and background in assessing a hazard, then everything else is for naught," he says. "You might know how to put the suit on and a respirator, if you don't recognize when you need that and when you do not, it doesn't matter."

Penn teaches hospitals to direct patients who are ambulatory and can follow directions to self-decontaminate before they enter the ED. **(See box, below right.)** When they remove their clothes, they will have reduced the contamination by 85% to 90%, he says. "You want to protect the victim, the other patients, the facility, your employees, the community, and the environment," he says. "For the more common one to five patients with contamination, you get them outside, put them in a shower with soap and tepid water. You do that without touching them. For nonambulatory patients and mass decontamination, a greater level of training and equipment is necessary."

Indoor decontamination raises a host of issues, notes Petosa. Do you have a space with separate ventilation, so the contaminated air doesn't seep into other parts of the hospital? Do you have explosion-proof lights? "When you're outside and you're doing your decontamination, now you're using God's good outside air to provide you with an enormous amount of free ventilation," he says.

Your hazard vulnerability analysis will tell you which substances you are most likely to encounter in a disaster scenario. At Detroit Medical Center, a multidisciplinary task force met with local emergency planning teams to identify potential dangers as part of a two-year effort.

"We now have a map of which [hazardous] sites are near us and what hazardous chemicals are used at those facilities," says **Tammy Lundstrom**, MD, the hospital's vice president/chief quality and safety officer. Those chemicals represent a risk of both accidental and intentional release. "Anything in the immediate vicinity is something that has potential [for use by terrorists]."

Failure to swiftly identify a contaminant can cripple your hospital. Schaefer recalls a night more than a decade ago when he was awoken by a phone call from the ED. A contaminated patient had carried a tear gas grenade into the ED. Schaefer ordered part of that area shut down.

Now, security guards encounter patients as they walk in. "If they're reeking of a chemical, they are isolated," he says.

• **Maintain regular training of staff.** The Joint Commission requires disaster drills to maintain emergency preparedness. But your ability to respond to an incident will only be as good as your ongoing training in every area of response, from hazard communications to PPE uses.

"No matter what you buy, unless you train right initially and keep your skills up, you're fooling yourself," says Petosa. "You're actually doing yourself more harm. You're lulling yourself into a false sense of security. You think you're prepared, and you're really not. You've got to remember what we're doing here," he says.

"We're buying, assessing, selecting, and training for an event or events that are highly unlikely to ever occur. Unless you properly train and continue to train and stay on top of things, you won't be ready." Petosa adds.

Directed Self-Decontamination

PATIENT:
You have been or possibly been exposed to a hazardous substance. For your own health and safety as well as others, you must be thoroughly cleaned before we can safely treat you. This is what you must do. Please read all the steps. Then proceed to follow them. We will be waiting for you at the end with towels to dry you off.

1. Go to the designated area.
2. Prepare to undress behind the privacy curtain.
3. Open the plastic bags.
4. Place all of your valuables (wallet, keys) into the small plastic bag and seal it. If you have prescription glasses or hearing aids, keep them with you.
5. Remove ALL your clothing.
6. Put clothes into large plastic bag.
7. Put the small valuables bag and large clothes bag in the designated place.
8. Put on the wristband or neck identification.
9. Now step into the shower / tub area.
10. Wet yourself all over in the shower.
11. Thoroughly wash with soap and water, paying attention to hair, ears, etc.
12. Rinse for at least one minute.
13. Step out of the shower area, and we will have a towel and covering for you.
14. We will keep you covered.
15. Then we will take you to the treatment area.

If it is safe, we will give you back your clothes and valuables.

Source: Hazmat for Healthcare, Diamond Springs, CA. Web: www.hazmatforhealthcare.org.

[Editor's note: An advisory on PPE, as well as other information and consulting services, is available from ECRI. For more information, call (610) 825-6000, ext. 5326, or e-mail chem@ecri.org. For more information on Hazmat for Healthcare training programs, contact Paul Penn, Western Director/VP, Environmental Hazards Management Institute, P.O. Box 280, Diamond Springs, CA 95619. Telephone: (530) 622-5964. E-mail: ppenn@ehmi.org. Web site: www.ehmi.org or www.hazmatforhealthcare.org. Information sheets on chemical and radiologic terrorism are available on the CDC web site at www.bt.cdc.gov/index.asp.] ■

In push for safer gloves, 'we have a long way to go'

Latex allergy risk persists, advocates say

When **Lise Borel**, DMD, developed symptoms of a severe latex allergy in 1994, she was barely aware of the risks associated with the gloves and powder. Today, thanks in part to her advocacy efforts through the organization, ELASTIC of Torrington, CT, latex allergy is widely recognized as a major occupational health hazard for health care workers.

On Jan. 31, Borel quietly shut down ELASTIC due to personal reasons. As she transitions to a life of more private advocacy, she reflects on an environment that includes better glove choices and safer workplaces — yet one with significant hazards that remain. While many hospitals have switched to low-protein, powder-free or synthetic gloves, many health care workers remain at risk of latex allergy across the country, says Borel.

"There are pockets of awareness and islands of latex-safe facilities," she says. Efforts need to continue to make hospitals latex-safe for both staff and patients. "I know the people I've worked with closely over the years are not going to stop [their efforts]," she says. "I'm not stopping either. I'm just going to do it from a different perspective and at my own speed."

The American Nurses Association (ANA) in Washington, DC, and other specialty nursing associations continue to lobby federal and state agencies and legislatures to promote latex safety, while they encourage voluntary action by hospitals. "We have a long way to go," says **Susan Wilburn**, RN, MPH, ANA senior specialist for occupational safety and health. "I think that we have been stalled in progress. People think they have done what they need to do.

"I go into health care facilities, and I'll see a box of synthetic gloves, a box of powder-free gloves, and a box of powdered gloves on a shelf side by side. If you have any powdered gloves in a facility you have circulating [aerosolized particles] of latex allergens."

In interviews with *Hospital Employee Health*, advocates for safer glove use gave this assessment of the efforts to promote latex safety:

• **Litigation.** At one time, plaintiffs' lawyers anticipated that latex gloves would generate thousands — perhaps hundreds of thousands — of cases from injured of cases from injured workers. Instead, there have been just a couple thousand cases related to latex allergy among health care workers, says **David Shrager**, the national lead counsel for the plaintiffs in the federal, multidistrict litigation and an attorney with Shrager, Spivey & Sachs in Philadelphia.

In fact, the litigation seems to have spurred improvements in the products, says Shrager, who is the former president of the Association of Trial Lawyers of America. "Very quickly after latex allergy was identified as a problem with powdered gloves, we saw a change in manufacturing technology, which lowered the incidence of protein and powder," he says. "I think industry probably reacted very quickly when they saw the development in the early '90s of this problem."

Only about 10 cases have reached trial in various states, and those verdicts were mixed, says Shrager. In some cases in which the manufacturer prevailed, juries have concluded that an allergy was "nobody's fault," he says. Recently, about 700 federal latex-allergy cases that had been consolidated for pretrial discovery were sent back to their origin courts. Most of those are likely to result in a settlement before they reach trial, Shrager says.

• **Regulation.** In 1998, the Food and Drug Administration (FDA) proposed a rule that would require labeling of protein and powder content in medical gloves. It would also reclassify latex gloves as Class 2, which involves greater regulatory attention. **(For more information on the FDA rule, see *HEH*, March 2000, p. 25.)**

Gloves already undergo FDA testing, but any "up-classing" of a device invites scrutiny, says **John Farnham**, consumer safety officer in FDA's Center for Devices and Radiological Health. The FDA also conducted extensive economic analysis of the rule and sifted through numerous comments.

Despite the long time frame, the FDA is still actively pursuing the rule, he says. "We've had some meetings to try to move the process along," he says.

Meanwhile, several states (Arizona, Rhode Island, Oregon, and New Jersey) have prohibited the use of latex gloves by food handlers. "That protects those food service workers from allergy to latex. It makes food safe for latex-sensitive people to eat," says Wilburn. "It does nothing to stop the new incidence of latex allergy in health care facilities."

Ironically, she notes that the Centers for Disease Control and Prevention (CDC) issued a warning in the wake of the anthrax incidents that postal workers should use nonlatex gloves when handling mail. The agency has never issued such a warning for health care workers, she notes. "You would think the CDC, having made progress on this one issue for a particular work area, would revise their other statements. But it hasn't happened."

The Occupational Safety and Health Administration is expected to release an updated technical assistance bulletin on latex later this year. But further regulation seems unlikely on a federal level due to heavy industry opposition, Wilburn says.

She notes that one-quarter of nurses cited latex allergy as one of their top health and safety concerns in a recent ANA survey. **(For more information on the survey, see *HEH*, January 2002, p. 10.)** "If you've got a population of workers that, according to [the National Institute for Occupational Safety and Health], is 8% to 12% sensitive, what is your threshold for saying this is a product that is too dangerous to use? Isn't 10% a significant minority of workers?"

• **Voluntary action.** No data are available on how many hospitals nationwide have created a latex-safe environment, with synthetic gloves and/or low-protein and powder-free gloves. But surveys show a mixed response.

In the ANA survey, 60% of nurses said their facilities continue to use powdered latex gloves. A 2001 survey of hospitals in Washington state found that about one-third of hospitals had adopted latex-free gloves or were phasing out latex. About 15% of hospitals still used some powdered latex gloves.[1]

"There are many institutions that have made some changes and think they've taken care of the problem when they haven't," says Wilburn.

Even changing glove type may not be enough to protect sensitized workers. When hospitals switch from powdered to powder-free or synthetic gloves, they should clear their HVAC filters to remove latex powders, she notes. The aerosolized latex proteins are a significant cause of work-related asthma and can trigger reactions in latex-allergic staff and patients, she says.

Other organizations echo that concern. The Emergency Nurses Association in Des Plaines, IL, calls for latex-safe emergency settings and "the removal or abatement of latex contamination from the pre-hospital environment and the entire hospital setting, including contamination through ventilation systems."

Greater precautions might have allowed Borel to continue working and to face fewer health consequences from her latex allergy. "I was diagnosed in '94 and tried to practice [dentistry]," she recalls. "I switched to nonlatex gloves, but everyone else was still using powder. I ended up in the ICU. I was so sick, I lost my practice."

Borel notes that today, many latex-allergic health care workers are able to continue their careers by working in latex-safe hospital environments. If she been in such an environment, "my life would have turned out completely differently," she says.

Reference

1. Marino C, Cohen M. Prevention of hand dermatitis in the health care setting. Safety and Health Assessment and Research for Prevention (SHARP) Program, Washington Department of Labor and Industries, July 2001; Technical Report Number 66-6-2001 (www.lni.wa.gov/sharp/derm/prevent_hcw.pdf). ■

More hospitals seek to be 'magnets' for nurses

Autonomy, respect linked to lower injuries

One word describes hospitals that have the best overall work environment: Magnet.

Hospitals that give more autonomy to nurses and have less hierarchy — qualities that gained them designation by the Magnet Recognition Program of the American Nurses Credentialing Center in Washington, DC — have lower levels of "emotional exhaustion" and burnout, lower rates of needlestick injuries, higher job satisfaction, and better retention and recruitment of nurses, according to several recent studies.[1]

"In every dimension we've ever studied, the

magnet hospitals look substantially different and better," says **Linda Aiken**, PhD, FAAN, FRCN, RN, director of the Center for Health Outcomes and Policy Research at the University of Pennsylvania School of Nursing in Philadelphia. Patients benefit as well as workers. Hospitals that achieve the standards of the magnet program also have better patient outcomes and satisfaction, she says.

In a time of labor shortages, those attractions are compelling. Magnet status is becoming a highly sought designation, as the number of applications nearly tripled from 2001 to 2002. There are 67 magnet hospitals, and more than 90 pending applications. Eighteen hospitals applied in the first few weeks of January. The magnet program began in 1994.

"As there are more magnets out there, more people hear about it and they have more access to mentors," says **MaryMoon Allison**, MHSE, BSN, RN, assistant director for accreditation and the magnet recognition program.

"We have good documentation that retention rates within magnets are significantly better than nonmagnets. In this time of nursing shortage, people are looking for any avenue to get or to keep their nurses," she says.

Attaining the "magnet" designation is not a simple process. It is based on the overall organizational structure and climate, not just on a checklist of equipment and policies. Hospitals can spend up to two years gathering documentation after their initial application and have spent as much as eight years completing the process, says Allison.

"It's really about forces of magnetism, and about the internalization of those and the reflection of those within the organization and the function of the organization of the facility. It takes a long time," she says.

Even before they apply, hospitals must gauge how they compare to the magnet attributes — and what it would take to change. "Only about 19% of the hospitals in the U.S. have a good work environment that could potentially qualify them for magnet status," says Aiken.

Magnets avoid severe nursing shortage

The concept that some hospitals become a magnet for the best employees first emerged in a 1983 study by the American Nurses Association's (ANA) American Academy of Nursing. While some hospitals faced severe nursing shortages, others continued to attract and keep their nurses.

'Forces of Magnetism': Qualities of Magnet Hospitals

The following 14 characteristics have been identified as key elements of magnet hospitals:

- Strong nursing leadership
- Decentralized, nonhierarchal organizational structure
- Participatory management style
- Personnel policies that include competitive compensation and flexible staffing models
- Models of care that give nurses authority and accountability
- High-quality nursing care
- Nurse participation in quality improvement
- Availability of consultation and resources
- Autonomy for nurses within a multidisciplinary approach to care
- Hospitals have a strong community presence
- Nurses engage in teaching activities
- Image of nurses as essential to good patient care
- Mutual respect in interdisciplinary relationships
- Emphasis on professional development

Source: Adapted from: Urden LD, Monarch K. "Forces of Magnetism: Organizational Elements of Excellence in Nursing Care." In: McClure M, Hinshaw AS, eds. *Magnet Hospitals Revisited: Attraction and Retention of Professional Nurses.* Washington, DC: American Nurses Association; 2002, pp. 106-107.

The common qualities of those hospitals proved to be the "magnet" elements of leadership, organizational structure, and good communication.

Today, the magnet criteria are based on the ANA's *Scope and Standards for Nurse Administrators,* and the commonalities are well studied. **(See box, above.)**

In a magnet hospital, "nurse leaders are dynamic, innovative, respected people within the hospital organizational environment," Allison says. "You're talking about getting the right leadership team together and on the same track."

Nurses have more autonomy and a better relationship with physicians. Administrators are responsive to the concerns and suggestions of nurses, and create opportunities for career advancement, says Aiken.

As a result, magnet hospitals have better protective equipment and safer work practices, she says. "I'd be willing to venture that anything that facilitates clinical care magnet hospitals would be more likely to have," she says. "They are by definition very patient-centered, and they invest a lot in the

people closest to patients: nurses.

"They have better staffing ratios. They don't have to, but they do. We know they tend to have better equipment on the prevention of needlestick injuries. Everything we've ever looked at that has anything to do with making patient care better and creating a more satisfying work force, the magnet hospitals have it," she says.

One study compared magnet hospitals without a specialty unit for the treatment of AIDS with nonmagnet hospitals that have that specialty. The magnet hospitals had a lower mortality rate.[2]

"The positive organizational climate appeared to have a greater impact than did specialization on reducing death rate," concluded the authors of a literature review in the *American Journal of Infection Control* linking organizational climate to worker and patient safety.[3]

"Establishing a safety culture in an organization is the only way you can promote safety," says **Gina Pugliese**, RN, MS, vice president of the Premier Safety Institute in Chicago and one of the authors. "It has to be throughout your organization — how you plan safety into all the things you're doing, how you provide opportunities to enhance reporting so it's nonpunitive."

[Editor's note: More information on magnet hospitals is available from the American Nurses Credentialing Center, 100 Maryland Ave. S.W., Suite 100 West, Washington, DC 20023-2571. Telephone: (202) 651-7262. E-mail: magnet@ana.org. Web site: www.nursingworld.org/ancc/magnet/magnet.htm.]

References

1. Aiken LH. "Superior Outcomes for Magnet Hospitals: The Evidence Base." In: *Magnet Hospitals Revisited: Attraction and Retention of Professional Nurses*, McClure ML, Hinshaw AS (eds.). Washington, DC: American Nurses Publishing; 2002.
2. Aiken LH, Sloane DM, Lake E. Satisfaction with inpatient AIDS care: A national comparison of dedicated units and scattered beds. *Med Care* 1997; 35(9):948-962.
3. Lundstrom T, Pugliese G, Bartley J, et al. Organizational and environmental factors that affect worker health and safety and patient outcomes. *Am J Infect Control* 2002; 30: 93-106. ■

CE *questions*

13. According to a CDC report, what proportion of adverse events might have been prevented in the 1960s if there had been screening for contraindications?
    A. one-third
    B. one-half
    C. two-thirds
    D. Few people had the contraindications that exist today.
14. According to John Schaefer of Johns Hopkins, what level of protection will N95 respirators provide against chemical contamination?
    A. 95%
    B. 85%
    C. 80%
    D. no protection
15. When hospitals stop using powdered latex gloves, what additional step should they take to protect latex-allergic employees and patients, according to Susan Wilburn?
    A. Remove powder-free latex gloves from the premises.
    B. Clear HVAC filters of latex powder residue.
    C. Eliminate other allergenic products.
    D. No other action is necessary.
16. Which of the following has been shown to be a quality of magnet hospitals, as designated by the American Nurses Credentialing Center in Washington, DC?
    A. lower staff burnout
    B. fewer needlestick injuries
    C. higher job satisfaction
    D. all of the above

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

COMING IN FUTURE MONTHS

- HIV in health care: A profile of HCWs who seroconverted
- Can you recover employees from substance abuse?
- Inching toward Phase 2: Will you vaccinate HCWs at request?
- State-by-state push for ergonomics regulation
- Why depression is an employee health issue

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. ■

Hospital Employee Health®

Hospital Employee Health Reader Survey

In an effort to learn more about the professionals who read *Hospital Employee Health*, we are conducting this reader survey. The results will be used to enhance the content and format of *HEH*.

Instructions: Mark the appropriate answers by circling your response. Please write in your answers to the open-ended questions in the space provided. Return the questionnaire in the enclosed postage-paid envelope. The deadline is May 16, 2003.

1. What are you most dissatisfied with in your job?
   A. staffing
   B. heavy workload
   C. low morale in your department or facility
   D. impact of cost-cutting on quality of care
   E. other (please specify)_____

2. What impact has the nursing shortage had on the quality of care in your field?
   A. significant impact
   B. moderate impact
   C. little impact
   D. no impact

3. How would you rate your overall satisfaction with your job?
   A. very satisfied
   B. somewhat satisfied
   C. somewhat dissatisfied
   D. very dissatisfied

4. Are the articles in *Hospital Employee Health* newsletter written about issues of importance and concern to you?
   A. always
   B. most of the time
   C. some of the time
   D. rarely
   E. never

Questions 5-17 ask about coverage of various topics in *HEH*. Please mark your answers in the following manner:

	A. very useful	**B. fairly useful**	**C. not very useful**	**D. not at all useful**
5. JCAHO requirements	A	B	C	D
6. OSHA requirements	A	B	C	D
7. CDC guidelines	A	B	C	D
8. latex allergies	A	B	C	D
9. occupational exposures	A	B	C	D
10. ergonomic issues	A	B	C	D
11. disaster planning	A	B	C	D
12. smallpox vaccination	A	B	C	D
13. workers' compensation	A	B	C	D
14. TB compliance regulations	A	B	C	D
15. bioterrorism readiness	A	B	C	D
16. immunization programs	A	B	C	D
17. record-keeping compliance	A	B	C	D

18. Approximately how many workers are employed at your facility?
    A. fewer than 200
    B. 200-500
    C. 501-1,000
    D. 1,001-2,000
    E. more than 2,000

19. How large is your hospital?
    A. fewer than 100 beds
    B. 100-200 beds
    C. 201-300 beds
    D. 301-500 beds
    E. more than 500 beds

20. Do you have Internet access at work? yes no

21. How much time do you spend accessing job-related information via on-line services (e-mail listservs, web sites, etc.)?
    A. 0 hours per week
    B. 1-5 hours per week
    C. 6-10 hours per week
    D. more than 11 hours per week

22 Would you prefer to receive your newsletter electronically by e-mail? yes no

SATISFACTION

23. How would you describe your satisfaction with your subscription to *HEH*?
    A. very satisfied
    B. somewhat satisfied
    C. somewhat dissatisfied
    D. very dissatisfied

Please rate your level of satisfaction with the following: Please mark your answers in the following manner.

	A. excellent	**B. good**		**C. fair**	**D. poor**
24.	quality of newsletter	A	B	C	D
25.	article selections	A	B	C	D
26.	timeliness	A	B	C	D
27.	length of newsletter	A	B	C	D
28.	overall value	A	B	C	D
29.	customer service	A	B	C	D

30. On average, how much time do you spend reading each issue of *Hospital Employee Health*?
    A. less than 10 minutes
    B. 11-20 minutes
    C. 21-30 minutes
    D. 31-60 minutes
    E. more than an hour

31. On average, how many people read your copy of *Hospital Employee Health?*
    A. 1-3
    B. 4-6
    C. 7-9
    D. 10-15
    E. 16 or more

32. On average, how many articles do you find useful in *Hospital Employee Health* each month?
    A. none
    B. 1-2
    C. 3-4
    D. 5-6
    E. 7 or more

33. Do you plan to renew your subscription to *Hospital Employee Health?*
    A. yes
    B. no

If no, why not?_____

_____

COMPETITION

To what other publications or information sources about employee health do you subscribe?
Circle the number of the publications you subscribe to and write any others in the blank below.

34. *Journal of the AOHP*
35. *AAOHN Journal*
36. *Occupational Health Management*
37. none
38. other (please specify)_____

39. Which publication or information source do you find most useful?
    A. *Hospital Employee Health*
    B. *Journal of the AOHP*
    C. *AAOHN Journal*
    D. *Occupational Health Management*
    E. other (please specify)_____

What did you like most about that publication or information source? _____

_____

ABOUT YOU:

40. What is your title? (please choose the title that most closely reflects your position and responsibilities):
    A. employee health director/manager/coordinator
    B. employee health nurse
    C. occupational health director/manager
    D. employee health/infection control manager
    E. other (please specify) _____

41. What is the highest degree that you hold?
    A. ADN (2-year)
    B. diploma (3-year)
    C. bachelor's of nursing
    D. master's of nursing
    E. other (please specify)_____

42. How long have you been employed in hospital employee health?
    A 0-2 years
    B. 3-5 years
    C. 6-9 years
    D. 10-15 years
    E. 16 or more years

43. How long do you intend to remain in hospital employee health?
    A. 1-2 years
    B. 3-4 years
    C. 5-7 years
    D. 8-10 years
    E. indefinitely; have no plans to change

44. From where do you most frequently get your continuing education contact hours?
   A. hospital provided
   B. travel off-site to live conferences
   C. subscription-based newsletters/journals
   D. outside-sponsored audio conferences
   E. other (please specify)_____

45. Has participating in this activity changed your clinical practice? yes no
If yes, how?_____

_____

46. What are the most effective teaching methods used to train staff at your hospital? _____

_____

47. What, if any, outside vendors do you use for your training programs? _____

_____

48. List the top three challenges you face in your job today:_____

_____

_____

_____

49. What do you like most about *Hospital Employee Health* newsletter? _____

_____

_____

50. What do you like least about *Hospital Employee Health* newsletter?_____

_____

_____

51. What issues would you like to see addressed in *Hospital Employee Health* newsletter?_____

_____

_____

CONTACT INFORMATION:

Name: _____ Facility: _____

Address: _____

Phone: _____ Fax: _____ E-mail: _____