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Included with this issue: Bioterrorism Watch

IN THIS ISSUE

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Ready for duty: EHPs are gearing up for smallpox vaccination

Focus on education, pre-screening of volunteers

The first stage of smallpox vaccination has begun, even before the doses are released or a final plan formulated. Across the country, hospitals are educating health care workers about smallpox and the vaccinia vaccine.

It's impossible to know how many health care workers will decline the vaccine due to concerns about adverse events. But already, nurses have shown a patriotic commitment to fight bioterrorism: More than 2,900 have expressed interest in becoming part of the National Nurses Response Team, a group co-sponsored by the American Nurses Association (ANA) and the U.S. Public Health Service, both in Washington, DC.

The team's mission is "to vaccinate and administer chemoprophylaxis in the case of use of a biological agent," says **Cheryl Peterson**, RN, a senior policy fellow at the ANA. "We have a number of nurses who are concerned because they want to help.

"What we're seeing is that many nurses did not feel equipped to respond on Sept. 11. They didn't feel they could do anything. If they did respond, they weren't utilized well," she says. "We're seeing a lot of nurses who are saying, 'I want to be able to respond.'"

Otherwise, health care workers' unions have heard surprisingly little from their members who may be asked to take the vaccine. That underscores the need for education to make sure workers know what health issues, such as eczema and other skin conditions, might make them ineligible for the vaccine.

"Once they start vaccinating people, the phone's going to be ringing off the hook; by then, it will be too late," says **Bill Borwegen**, MPH, director of occupational health and safety for the Service Employees International Union (SEIU) in Washington, DC.

At Memorial Sloan-Kettering Cancer Center in New York City, **Kent Sepkowitz**, MD, director of hospital infection control, has begun educational sessions to help health care workers decide if they should receive

the vaccine. "I've been impressed that most workers are of a mind to volunteer and take their chances. It seems like the right thing do," says Sepkowitz, who also is associate professor of medicine at the Weill Medical School of Cornell University, also in New York City.

He is encouraging a conservative approach to vaccination, starting with small groups of vaccinees and closely monitoring adverse events. Congress removed one hurdle to the vaccinations by addressing an aspect of liability: A provision added to the homeland security bill states that the federal government will assume liability for serious adverse effects of the vaccine. Those administering the vaccine cannot be held personally liable for adverse events, and those suffering from the effects can receive compensation but not punitive damages.

As the nation moved closer to smallpox vaccination, the Centers for Disease Control and Prevention (CDC) released new educational resources. On-line continuing education training on the vaccine and its potential adverse effects is now available on the CDC web site at www.bt.cdc.gov/training/smallpoxvaccine/reactions/default.htm. The site includes images of normal reactions and adverse reactions, such as eczema vaccinatum, in which the vaccinia virus becomes implanted in the diseased skin and produces numerous lesions.

The most important aspect of the training involves the contraindications, screening, and reporting of complications of the vaccine. For example, CDC recommends against vaccination for those who have a history of eczema or who have other skin conditions, including acne and contact dermatitis — or who have close household contacts with those conditions. That exclusion alone could affect thousands of health care workers.

The Association for Professionals in Infection Control and Epidemiology in Washington, DC, has an on-line course and templates for bioterrorism preparedness (www.apic.org). **Judith English**, RN, MSN, CIC, chair of APIC's Bioterrorism Work Group and director of infection control at the National Naval Medical Center in Bethesda, MD, lauded CDC's educational efforts.

"Those real concerns are being addressed. [Health care workers] know they need to self-select out if they are personally at risk or if their significant others are at risk," she says.

In its Smallpox Vaccination Clinic Guide, the CDC provides a sample screening form and screening information. **(See form, inserted in this issue.)** This information was developed to help state and local governments plan for widespread, emergency vaccination following an actual case of smallpox. However, it provides a useful tool to educate health care workers about the vaccine. (More information is available at www.bt.cdc.gov/agent/smallpox/response-plan/files/annex-3. doc.)

Many questions still unanswered

Even as more information emerges about the vaccinia vaccine, many questions remain unanswered. Data on adverse effects of the vaccine come from immunization that occurred more than 30 years ago, Sepkowitz notes. Today's population — including cancer patients and individuals with HIV infection and other immunosuppressant conditions — is more vulnerable to accidental transmission of the live virus from injection sites.

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Editor: **Michele Marill**, (404) 636-6021, (marill@mindspring.com).
Vice President/Group Publisher: **Brenda Mooney**, (404) 262-5403, (brenda.mooney@ahcpub.com).
Editorial Group Head: **Coles McKagen**, (404) 262-5420, (coles.mckagen@ahcpub.com).
Senior Production Editor: **Ann Duncan**.

Editorial Questions

For questions or comments call **Michele Marill** at (404) 636-6021.

THOMSON
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Two federal expert advisory panels have stated that precautionary measures such as covering the site with gauze and a bandage would prevent transmission. **(See *Hospital Employee Health*, December 2002, p. 133.)**

Sepkowitz reviewed the literature on nosocomial transmission of vaccinia, encompassing 12 articles published between 1907 and 1975. The 62 individuals who acquired vaccinia from nosocomial transmission all had underlying skin disorders. Most cases involved children, some of whom were in different cribs or even different wards from the source case, and the mortality rate was 16%.

"The route of transmission is still puzzling to everyone," he says. But by taking a slow and cautious approach, hospitals can successfully vaccinate health care workers without putting patients at risk, Sepkowitz adds. "I think that flexibility is the key. You start conservative and slowly gain confidence."

Meanwhile, advocates for health care workers are looking for job protections as well as education and screening. "Who's going to protect people from discrimination if their employer says, 'We want you to be vaccinated?' Most people are going to be reluctant to say no; but if they say no, are they going to be protected from discrimination?" Borwegen says. "We would argue if people want to be reassigned because they don't want to be in a job that requires smallpox vaccination, they should be allowed to transfer into a job with the same pay and benefits."

Borwegen and others want to know who will pay for medical treatment for workers or their family members who suffer adverse effects. They also want reassurance that education and vaccination will occur during paid time.

"We have more questions than we have answers," Peterson says. "I really think some of these questions need to be addressed by the [Bush] administration or there needs to a dialogue about them among the stakeholders." ■

APIC: We helped kill OSHA's TB rule

Rule withdrawn from agency's agenda

Amid a nationwide decline in tuberculosis cases and opposition to new rules on skin testing and respirator fit-testing, the Occupational Safety and Health Administration (OSHA) is prepared to withdraw its proposed tuberculosis standard.

Even before the agency released a new regulatory agenda that omitted the TB rule from further consideration, the Association for Professionals in Infection Control and Epidemiology (APIC) declared victory in its campaign against it. The American Hospital Association also had urged OSHA to rely on voluntary guidelines rather than a regulatory standard.

"After more than six years of high-energy dedication, hard work, political strategy, and perseverance in opposing the proposed OSHA TB rule, APIC learned Oct. 29 that the agency is expected to announce the dissolution of its proposed TB rule," the Washington, DC-based association announced on its web site.

"OSHA officials have devoted the better part of a decade to developing this rule, and we commend them for recognizing and acknowledging the fact that a standard is not scientifically justified," **Jennifer Thomas**, APIC director of governmental affairs, tells *Hospital Employee Health*.

The OSHA rule, proposed in 1997, would have required annual skin testing and respirator fit-testing. In 2001, a National Academy of Sciences/Institute of Medicine panel released a report endorsing the need for a TB standard but criticizing the OSHA proposal for a lack of flexibility based on the risk of transmission and flawed estimates of the tuberculosis threat. **(See *HEH*, March 2001, p. 31.)** OSHA recently had asked for comment on the IOM report and the risk assessment used to draft the rule.

Meanwhile, the Centers for Disease Control and Prevention in Atlanta is revising its TB guidelines, which includes recommendations that vary based on a risk assessment.

OSHA's decision to abandon the rule drew a sharp rebuke from health care worker advocates. Instead of killing the rule, the agency should expand it into an airborne infectious disease control standard that could be part of bioterrorism readiness, asserts **Bill Borwegen**, MPH, director of occupational health and safety for the Service Employees International Union (SEIU) in Washington, DC.

"They're just piecemealing this whole problem," he says. "They need a much larger program to protect health care workers from airborne infections. It would be the first time employers would be required to set up good, solid respiratory protection programs. That could do as much to protect workers against smallpox as TB."

Employee health professionals took a more restrained view of the impact of the OSHA action. "I really don't think anything will change in terms of enforcement or attention to TB," says **Geoff Kelafant**, MD, MSPH, FACOEM, medical director of the occupational health department at the Sarah Bush Lincoln Health Center in Mattoon, IL.

OSHA inspectors and surveyors from the Joint Commission on Accreditation of Healthcare Organizations will continue to ask about skin testing, fit-testing, and other protective measures, says Kelafant, who is chairman of the medical center occupational health section of the American College of Occupational and Environmental Medicine in Arlington Heights, IL. ■

Chemo drug exposures put health workers at risk

NIOSH to issue new alert on hazards

Health care workers may be at risk for reproductive disorders and cancer due to improper handling of hazardous drugs in hospitals.

Many chemotherapeutic agents have similar toxicity profiles as benzene and other industrial chemicals, but often they aren't being handled with the caution they require, says **Melissa McDiarmid**, MD, MPH, director of the occupational health program and professor in the School of Medicine at the University of Maryland in Baltimore.

An alert from the Washington, DC-based National Institute for Occupational Safety and Health (NIOSH) will be released this spring, urging better compliance with guidelines for handling hazardous drugs. In addition to the anti-cancer agents, the category of hazardous drugs includes antivirals and immunosuppressants.

"We know what to expect from overexposed, underprotected workers. We know precisely what the drug does even at what doses in treated patients," says McDiarmid, who co-chairs the NIOSH working group developing the alert. "Even though treated patients are at the high end of the dose-response curve, we know [health care worker] exposures are taking place. People handling these drugs have the drugs in their own urine."

In a recent study, researchers at a lab in Italy found cyclophosphamide in 13% of urine samples taken before, during, and after the work shifts of nine pharmacy technicians and seven nurses.[1] University of Texas researchers found substantial contamination from three antineoplastic agents in the pharmacy drug preparation areas and drug administration areas in six cancer treatment centers in Canada and the United States.[2] Another study found that 40% of hospital pharmacists reported a skin exposure to antineoplastics at least once a month.[3]

Even facilities that follow the hazardous drug guidelines from the U.S. Occupational Safety and Health Administration (OSHA) may find significant exposure, says **Thomas Connor**, PhD, senior service fellow at NIOSH in Cincinnati and associate professor of environmental and occupational health at the University of Texas School of Public Health in Houston. (For a copy of the guidelines, go to: www.osha.gov/SLTC/hazardousdrugs.)

Connor once specialized in hazards in the petrochemical industry. The dangers associated with preparing and administering antineoplastic agents are greater than those posed in oil refineries, he says.

"The patients get high doses [of antineoplastics] over a very short period of time, but pharmacists and nurses are exposed possibly for a lifetime. They're exposed to 20, 30 different drugs in a day," he says. "We don't know what the low doses will do. The potential is there.

"Health care is an unusual type of occupational setting. Usually, you have two or three hazardous agents [in a nonhealth care environment]. Here you have a whole host of them — very, very toxic, very hazardous. Many of [the drugs] themselves cause cancer," he says.

While the risk of chemotherapeutic agents may be obvious, the extent of the exposure isn't. Currently there's no method of monitoring individual exposure, such as badges or air sampling.

Connor and colleagues at NIOSH are launching a comprehensive study to look for blood markers or other methods of detecting exposure. They will conduct environmental and air sampling and will conduct urine tests. Nurses, pharmacy technicians, and pharmacists who handle the hazardous drugs will answer detailed questionnaires about their health, reproductive history, and work practices.

Meanwhile, following the current OSHA guidelines is imperative; but in visits to hospitals, Connor says he has seen a wide variation of adherence.

"We've seen people eating and drinking where

they're preparing chemotherapy and not wearing protective equipment," he says. "There are other places where people wear all the protective equipment and do everything they should. It varies considerably from hospital to hospital."

The OSHA guidelines call for "a systematic program of medical surveillance," with medical exams yearly or every two to three years. "The physical examination should be complete, but the skin, mucous membranes, cardiopulmonary and lymphatic systems, and liver should be emphasized," the guidelines state.

OSHA also stresses the importance of exposure assessment for health care workers who work with hazardous drugs. "A confidential database should be maintained with information regarding the individual's medical and reproductive history, with linkage to exposure information to facilitate epidemiologic review," the guidelines state.

"The most important aspect of surveillance is knowing who in your institution is actually exposed and having record linkage," explains McDiarmid, who helped draft the hazardous drug guidelines when she served as chief medical officer at OSHA. "An annual questionnaire [about exposure] could easily serve the majority of the purpose of surveillance."

The upcoming NIOSH alert will remind hospitals what they need to do to monitor exposure and protect workers. Meanwhile, McDiarmid says she hopes eventually there will be a set of "universal precautions" to follow whenever handling hazardous drugs, similar to the approach used with bloodborne pathogens. This would involve using a combination of methods to control exposure, such as mixing in hoods, using safe work practices, and personal protective equipment.

That approach would include continual training about safe handling. Training should emphasize the risks involved with exposure to the drugs, McDiarmid says.

"Using Material Safety Data Sheets, as required by OSHA's hazard communications standard goes a long way in this regard," she says. Many institutions do annual training to refresh knowledge of hazards and safe work practices, she says.

Some vendors provide products that allow workers to check their technique. For example, Kendall-LTP of Chicopee, MA, sells ChemoChek Training Kits that allow pharmacists, nurses, and technicians to see the potential exposure while handling antineoplastics. The kit uses a fluorescent dye that shows up under UV light.

"These drugs are very toxic," McDiarmid says. "That's necessary for the patients but not necessary for the person who handles them. That's the tension for health care workers — providing good care for the patient while not harming themselves."

[For information about the ChemoChek Training Kits, call (800) 669-1009. Web site: www.kendall-ltp.com/pdf/chemocheck.pdf.]

References

1. Turci R, Sottani C, Ronchi A, et al. Biological monitoring of hospital personnel occupationally exposed to antineoplastic agents. *Toxicol Lett* 2002; 134:57-64.
2. Connor TH, Anderson RW, Sessink PJ, et al. Surface contamination with antineoplastic agents in six cancer treatment centers in Canada and the United States. *Am J Health Syst Pharm* 1999; 56:1,427-1,432.
3. Christensen CJ, Lemasters GK, Wakeman MA. Work practices and policies of hospital pharmacists preparing antineoplastic agents. *J Occup Med* 1990; 32:508-512. ■

Safe and soap-free: CDC endorses alcohol rubs

Hand hygiene rises with water-free products

Stop trying to get health care workers to wash their hands.

If they rub their hands with an alcohol-based gel, they can save time, avoid skin irritation, and reduce hospital-acquired infections, advises the Centers for Disease Control and Prevention (CDC).

Washing with soap and water still is the only way to remove debris, including blood and body fluids. But a fundamental change in the way hospitals handle hand hygiene will save lives, says CDC director **Julie L. Gerberding**, MD, MPH, as the agency released the new hand-hygiene guidelines at the annual meeting of the Infectious Diseases Society of America in Chicago.[1]

"We'll end up with more people doing the right things to clean their hands more of the time — and, ultimately, a better impact for patient safety," she says.

The problem of hospital-acquired infections has gained widespread attention beyond medical circles. It was the focus of a series in the *Chicago Tribune* last summer, which reported that more than 100,000 people die each year of hospital-acquired infections. The newspaper used various

data sources to estimate the total number of infection-related deaths and arrived at a number that is higher than CDC estimates.

By making it easier for health care workers to practice good hand hygiene, compliance will go up and infections will go down, Gerberding and task force members say.

"There are [more than] 30 studies that have been done in about the last 20 years that show that health care workers have just not been able to wash their hands as often as recommended. So this is very well-documented, and it's not a new problem," says **John Boyce**, MD, lead author of the guidelines and chair of the Hand Hygiene Task Force. Boyce is chief of the division of infectious diseases at the Hospital of Saint Raphael in New Haven, CT.

In fact, the guidelines cite studies that show, on average, that health care workers comply with proper hand hygiene only about 40% of the time.

Hospitals using alcohol-based rubs that employees can carry in small bottles report dramatic improvement in hand hygiene. "The convenience and the ease with which one can perform hand hygiene is so much [better] than waiting in line at the sink and then having to do something with the towel afterward," says **William Shaffner**, MD, chairman of the department of preventive medicine at Vanderbilt University Medical Center in Nashville, TN.

The new hand-hygiene guidelines seek to spark a fundamental change in the way health care workers clean their hands. They state that:

- Alcohol-based hand rubs can be used in place of soap and water for surgical scrubs.
- Alcohol-based hand rubs should be used for routine decontamination before, during and after patient care.
- Antimicrobial wipes aren't as effective as alcohol-based hand rubs or hand washing with antimicrobial soap in reducing bacterial counts.
- Washing with soap and water, either antimicrobial or nonantimicrobial, is necessary to remove visible soil such as dirt, blood, or body fluids.
- Alcohol-based products aren't effective against the spores of *Bacillus anthracis*, so if exposure is suspected, health care workers should use soap and water.
- Hand hygiene should be practiced in conjunction with glove use — before and after donning gloves.
- Health care workers who have direct contact with high-risk patients, such as in the operating room or intensive care unit, should not wear artificial nails or nail extenders.

While it will take education to shift the practices of health care workers, they will quickly discover the advantages, predicts **Elaine L. Larson**, RN, PhD, a professor at the Columbia University School of Nursing in New York City and a hand-hygiene expert. Until recently, hand hygiene was time-consuming and difficult. Total compliance with proper hand washing in an intensive care unit would take 16 hours per nursing shift, compared with just three hours using a bedside-based alcohol-based rub, Larson says, citing a study from the Netherlands and Switzerland.[2] Such frequent hand washing also would be damaging to the hands, she notes.

"There's a huge benefit to the new guidelines recommending alcohol-based hand products in terms of the ability to actually have the time to do what the guidelines suggest," she says.

At Vanderbilt, Shaffner says he quickly expanded the new hand-hygiene products from the intensive care unit to the entire institution because of the positive response. "These are acceptable, and our health care workers were indeed involved in choosing the specific products," he says. "There is no doubt that compliance has increased."

CDC's Hand-Hygiene Performance Indicators

The Centers for Disease Control and Prevention recommends these indicators to measure improvement in adherence to hand-hygiene guidelines:

- ✔ Periodically monitor and record adherence as the number of hand-hygiene episodes performed by personnel/number of hand-hygiene opportunities, by ward or by service. Provide feedback to personnel regarding their performance.
- ✔ Monitor the volume of alcohol-based hand rub (or detergent used for hand washing or hand antisepsis) used per 1,000 patient days.
- ✔ Monitor adherence to policies dealing with wearing artificial nails.
- ✔ When outbreaks of infection occur, assess the adequacy of health care worker hand hygiene.

Source: Healthcare Infection Control Practices Advisory Committee. *Hand Hygiene in Healthcare Settings.* Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Atlanta; 2002.

Hand-hygiene experts expect health care workers to embrace the new products. After all, alcohol-based hand rubs that contain emollients may be less irritating than soap products, the guidelines state.

But there are differences in the products. They come in the form of gels, foams, or rinses. Health care workers should be involved in the selection of the product, Gerberding advises.

In fact, the hospital may purchase more than one product to allow a choice. If the products are drying, the hospital also may choose to provide a lotion.

"There are big differences in how they smell, how they feel, user-friendliness of the various preparations, and so it has to be a process that engages the work force in the selection and the choice of the specific materials that work for them," she says.

Meanwhile, the CDC has developed a variety of staff education materials to promote hand hygiene, including buttons and posters that say, "Clean hands save lives." The CDC also is developing other educational materials.

Monitoring compliance with hand hygiene is an essential part of the program, the guidelines state. Gathering performance indicators can help hospitals determine the effectiveness of the program and motivate workers. **(For a list of performance indicators, see box, p. 6.)**

"However, making an alcohol-based hand rub available to personnel without providing ongoing educational and motivational activities may not result in long-lasting improvement in hand-hygiene practices," the task force stated in the guidelines.

(To see the hand-hygiene guidelines and related materials, go to: www.cdc.gov/handhygiene.)

References

1. Guideline for hand hygiene in health care settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. *MMWR* 2002; 51(RR16):1-44.

2. Voss A, Widmer AF. No time for handwashing? Handwashing versus alcoholic rub: Can we afford 100% compliance? *Infect Control Hosp Epidemiol* 1997; 18:205-208. ■

If the gloves fit, check them out

HCWs need voice in glove selection

Are your gloves the right fit for your hospital? To answer that, you need to consider much more than just whether they contain latex or powder. Does the level of tear resistance match the tasks of the wearer? Is the manufacturer known for quality? Is there a method for monitoring breaks in barrier protection? Did health care workers help choose the gloves they prefer?

Those are just a few of the questions that hospitals need to ask before selecting gloves, advises **Denise M. Korniewicz**, DNSc, RN, FAAN, professor at the University of Maryland School of Nursing in Baltimore and an expert on glove quality.

In fact, she has one overriding question for those who make glove purchasing decisions at hospitals: "Do we always look at the bottom dollar amount or do we actually ask some questions about the quality of gloves?"

To follow federal guidelines, health care workers need to wear gloves when they have contact with patients or blood and bodily fluids. Although no mention is made of the type of glove, not every glove is equal to its task, Korniewicz notes.

For example, vinyl and copolymers are known to have the least resistance to tears and punctures. Neoprene and nitrile have stronger properties, and latex has the ability to reseal after a puncture. "There are many issues related to gloves that aren't as simple as people make [them] out to be," she says.

Here are some issues to consider as you select gloves:

- **Allergenic properties**

Latex allergy is a problem that affects an estimated 8% to 12% of health care workers. Some hospitals have switched to powder-free and low-protein products to reduce the risk of sensitization while offering alternatives to those with latex allergy. Others have chosen to replace all latex gloves with nonlatex synthetics. However, even the synthetic gloves, such as neoprene, may contain chemical accelerants that cause a reaction in some health care workers.

"A lot of institutions are worried about latex sensitization or latex allergy. They jump to a nonlatex product that may or may not be powdered, and they're still having problems," Korniewicz says.

She recommends using powder-free gloves, whether latex or latex-free, and taking into consideration other allergy issues. Some latex-sensitive employees may be able to tolerate low-protein gloves; others may need a protection against an irritating accelerant.

- **Barrier integrity**

Barrier integrity is a criteria that is directly related to the use of the gloves. If a phlebotomist is wearing the gloves for 30 seconds while drawing blood, there is little opportunity for a tear or degradation to occur. (A needlestick could penetrate any of the glove types.) However, tear-resistance and monitoring of glove integrity becomes very important when the wearer is involved in hours of surgery, she notes.

In one study, Korniewicz tested 1,254 pairs of gloves used in emergency department procedures and found that about 10% of them leaked. Only 1% of the nonused control pairs leaked. The glove failure rate nearly doubled after 20 minutes of wear.[1] Various rates of glove failure (as high as 60%) also have been reported among surgical personnel.[2]

A double-gloving system with different colored gloves can allow the health care worker to tell if the glove integrity has been breached. The worker can then remove the gloves, wash hands, and don a new pair.

- **Comfort and fit**

It's important to involve health care workers in the selection of gloves, says Korniewicz. "They know if the glove works or it doesn't; if it feels good or it doesn't," she says.

As with other protective products, new gloves will be accepted more readily if the end user has a voice in the process. "Any time they introduce a new glove into a new area, one suggestion could be to hand a survey to your employees," she says. "Give them the gloves for a month or two weeks and follow up with a short survey."

- **Manufacturing quality**

There are clear differences between glove types: their fit, their feel, their resistance to tears. Yet gloves also vary in quality by manufacturer. "There are quality differences in every product one buys, not just gloves," Korniewicz notes.

While gloves must meet basic standards set by the Food and Drug Administration (FDA), their durability and resistance to tears may differ.

Korniewicz suggests asking manufacturers for studies that show the barrier effectiveness of their gloves. "The better manufacturers have [done studies], and they will actually have data related to that," she points out.

A proposed FDA rule that would provide labeling of protein and powder content has been long-delayed. Meanwhile, Korniewicz is working on a rating system that would provide an independent method for determining glove quality. "You know an 'A' tire; if it has an 'A' rating, it's an excellent tire. If you have a 'C' tire, it doesn't get as many miles on it. It's the same in the health care world, but I don't think that's realized," she says.

References

1. Hansen KN, Korniewicz DM, Hexter DA, et al. Loss of glove integrity during emergency department procedures. *Ann Emerg Med* 1998; 31:65-72.
2. Korniewicz DM, Rabussay D. Surgical glove failures in clinical practice settings. *AORN J* 1997; 66:660-673. ■

A real pain in the neck: Ergonomics in the lab

New products, guide help reduce ergo hazards

They're peering into microscopes: their forearms resting on the sharp edge of a counter, their shoulders slumped, one hand repeatedly tapping a counter. They're popping the tops off tubes and squeezing pipettes, repeating the motions over and over.

Ergonomic hazards in the laboratory may not be as obvious or as dangerous as those in patient handling, but they, nonetheless, lead to strain and injury. Fortunately, new equipment and resources have been developed to help hospitals and others improve the ergonomic conditions in the lab.

"Attention is making its way into the laboratory," says **Debra Campbell**, occupational and environmental safety officer at the University of Massachusetts Medical Center in Worcester. "In the last five years or so, you've seen a lot of implementation in the laboratory."

Problems in the lab may not show up in dramatic, costly workers' compensation injuries. But those employees may be suffering with pain and discomfort that can eventually affect their work, says **Valeria Shropshire**, MSPH, CIH, industrial hygienist with the health and safety branch of the National Institute of Environmental Health Sciences (NIEHS) in Research Triangle Park, NC.

(Continued on page 10)

Laboratory Self-Assessment Checklist

DATE: _____ **LABORATORY LOCATION:** _____

COMPUTER WORKSTATIONS

1. Is a seat provided? **Yes** ☐ **No** ☐ *
2. Is the seat height adjustable within the recommendations? **Yes** ☐ **No** ☐ *
3. Lumbar back support provided? **Yes** ☐ **No** ☐ *
4. Is a footrest provided? **Yes** ☐ **No** ☐ *
5. Is there ample leg room? **Yes** ☐ **No** ☐ *
6. Are all adjustability features easy to use? **Yes** ☐ **No** ☐ *
7. Is there ample room to accommodate a keyboard and a computer mouse so employees can rest their arms at their side and forearms parallel to the floor? **Yes** ☐ **No** ☐ *
8. Is there ample room to place the monitor at an arm's length distance? **Yes** ☐ **No** ☐ *
9. Is the monitor at the recommended height? **Yes** ☐ **No** ☐ *
10. If documents are used frequently, is there a document holder? **Yes** ☐ **No** ☐ *

LABORATORY BENCHES

1. If the worker stands, is anti-fatigue matting supplied? **Yes** ☐ **No** ☐ *
2. Is the height of the bench appropriate for the work that is performed? **Yes** ☐ **No** ☐ *
3. Is there adequate leg room? **Yes** ☐ **No** ☐ *
4. Do contact stressors exist such as bench tops with sharp edges? **Yes** ☐ **No** ☐ *

LABORATORY CHAIRS

1. Can all laboratory chairs be adjusted to accommodate all of the employees who need to use the chairs? **Yes** ☐ **No** ☐ *

MICROSCOPES

1. Do the shoulders appear rounded and/or is the worker hunched over? **Yes** ☐ * **No** ☐
2. Is there excessive neck flexion (>25 degrees)? **Yes** ☐ * **No** ☐
3. Are there contact stresses between sharp edges and the forearms? **Yes** ☐ * **No** ☐
4. Is the microscope pulled out to the edge of the workbench? **Yes** ☐ **No** ☐ *
5. Armrests or padding provided? **Yes** ☐ **No** ☐ *
6. Is there sufficient leg room? **Yes** ☐ **No** ☐ *
7. Do the workers rest their feet on the lab stool? **Yes** ☐ * **No** ☐
8. Is a footrest provided? **Yes** ☐ **No** ☐ *
9. Has the individual been trained to sit properly at a microscope workstation? **Yes** ☐ **No** ☐ *
10. Are microscope work breaks provided? **Yes** ☐ **No** ☐ *

PIPETTING

1. Are manual pipettors used? **Yes** ☐ * **No** ☐
2. Are electronic pipettors provided? **Yes** ☐ **No** ☐ *
3. Are latch-mode pipettors provided? **Yes** ☐ **No** ☐ *
4. Is the pipettor designed to reduce contact with sharp edges? **Yes** ☐ **No** ☐ *
5. Has the individual been trained how to properly operate pipettor (e.g., pickup tips, eject tips, program electronic pipettor, etc.)? **Yes** ☐ **No** ☐ *
6. Does the worker pipette more than two hours per day? **Yes** ☐ * **No** ☐
7. Are frequent breaks provided? **Yes** ☐ **No** ☐ *
8. Is the pipettor computer-controlled to allow for computer-activated multiple dispensing instead of finger-activated dispensing? **Yes** ☐ **No** ☐ *

FINE MOTOR SKILLS

1. Are vials with the fewest amount of threads allowable used? **Yes** ☐ **No** ☐ *
2. Does the worker perform dissection or micromanipulation with forceps more than five hours per week? **Yes** ☐ * **No** ☐
3. Are frequent micro breaks provided? **Yes** ☐ **No** ☐ *
4. Do contact stresses exist between the forearm and workbench? **Yes** ☐ * **No** ☐

MICROTOME AND CRYOSTAT

1. Does the worker use excessive wrist flexion and extension when operating the microtome or cryostat? **Yes** ☐ * **No** ☐
2. Is the workstation at a height that reduces arm abduction as much as possible? **Yes** ☐ **No** ☐ *
3. Does the worker have access to an automatic microtome/cryostat? **Yes** ☐ **No** ☐ *
4. Are frequent breaks provided? **Yes** ☐ **No** ☐ *
5. Is a fully adjustable chair provided? **Yes** ☐ **No** ☐ *

Important note: Follow up on all responses with a "*" beside the box.

Source: National Institutes of Health, Bethesda, MD.

Ergonomic problems at the NIEHS labs may be more apparent than in a typical hospital clinical laboratory, if only because of numbers. NIEHS has about 500 lab workers. Even so, it took some urging from employees to spark the ergonomic effort, which now includes an extensive list of resources and guidelines that has been placed on-line (www.niehs.nih.gov/odhsb/ergoguid/home.htm).

The guide notes that lab workers are at risk for tendinitis, carpal tunnel syndrome, and other disorders affecting the hands, arms, shoulders, neck, and back.

When NIEHS began working on ergonomic solutions about five years ago, "there wasn't much out there for laboratory ergonomics," Shropshire says. "We ended up piecing things together and coming up with this [guidance] document."

The solutions aren't necessarily costly or complex. "It's not hard to rectify some of these problems," says Shropshire.

Here are some simple steps to take:

- **Provide ergonomics training and worksite assessments.**

With some guidance, lab workers may be able to improve their own work environment, she says. Employee health professionals can adjust chairs, put padding on the lab bench, or rearrange the equipment. Since many lab workers also use computers, they may need wrist rests or keyboard trays — items that may have been purchased for clerical areas.

Shropshire uses a checklist to determine the areas that need to be addressed. **(See copy of checklist, p. 9.)**

- **Encourage frequent breaks.**

Continuous pipetting or cell counting creates the strain of repetitive motion. "They can't sit there and continuously pipette without taking breaks," Shropshire says. "For every 20 minutes of pipetting, you want to take at least a two- or three-minute break."

Striking the cell counter too hard also can cause unnecessary problems, she says.

- **Purchase ergonomic equipment to prevent injury.**

Ergonomically correct lab equipment can vary in price from a simple anti-fatigue mat (about $50) to electronic pipettes (about $400). When the lab purchases new equipment, employee health professionals can make sure the items — including microscopes and lab chairs — are designed with ergonomic features, Campbell says.

For example, lab stools should have adjustable backrests and ring stands as a footrest.

"There are a lot of nice products coming out," she says. "It's just a matter of seeing what works for your facility."

- **Identify problems before injuries occur.**

When Shropshire conducted her ergonomic training for lab workers, she gave each employee a hard copy of the lab ergonomics guidebook she developed. She encourages them to contact her if they're feeling discomfort or pain and they can't resolve the problem with simple changes.

The benefits may not show up in dramatic reductions in workers' compensation claims. Even in her large lab facility, Shropshire notes that she usually only has two or three significant injury claims in a three-year period.

But ergonomics can have a broader impact. In a busy clinical lab in a hospital, eliminating ergonomic problems can help reduce stress, Campbell notes.

"When the employee is more comfortable, productivity will go up," she says. "It's also important for employees to know that they're important enough for you to pay attention to them." ■

Why do HCWs get stuck more than once?

OR is the source of multiple sticks

The operating room (OR) presents the greatest risk of multiple needlestick injuries, according to a study at BJC Healthcare in St. Louis.

In a five-year period from 1997 to 2001, 2,523 health care workers reported sharps injuries at the system's eight hospitals. Of those, 390, or 15%, reported more than one such injury.

Those injured more than once were more likely to work in the OR or to be physicians in training, says **Hilary Babcock**, MD, instructor in medicine at Washington University School of Medicine in St. Louis and lead author of the study.

"Suture needles were the most common item being used among people injured more than once," she says. "If you're in the OR, you spend much more time at risk with those devices. It's not surprising that's a high-risk area."

Babcock expected to find that the risk increased with greater exposure — that those who worked in the OR for a longer period would report more needlesticks. However, that pattern didn't show up in the data. Instead, those reporting multiple

needlesticks were younger at the time of the first injury and reported their first needlestick on average just 18 months after hire.

That may reflect better reporting by physicians in training of younger workers, Babcock notes. "We don't really know whether the people who report more than one are just more compliant reporters," she says. "Maybe the younger workers have less experience in the system, have gotten more information about post-exposure prophylaxis, and just report more."

The data on multiple needlesticks provide evidence to support renewed efforts to implement safer devices, Babcock says. Surgeons have been resistant to the use of blunt suture needles, she says.

Armed with this new data, Babcock and her colleagues plan to address the OR risks. "When trying to make these changes, it's important to have a team that involves the people you're targeting," she says. "If you can get a surgeon on the staff to help make decisions about how things should be implemented, that makes acceptance of any changes much more promising." ■

CE *questions*

1. According to Kent Sepkowitz, MD, director of hospital infection control at Memorial Sloan-Kettering Cancer Center in New York City, smallpox vaccination should begin with:
   A. a small group of workers who are monitored closely
   B. a team of 100 workers who report adverse events to a hotline
   C. nonemergency staff who can be furloughed
   D. anyone who volunteers to vaccinated first
2. OSHA's decision to abandon the TB rule was based on:
   A. a shortage of inspectors
   B. questions about the effectiveness of the personal protective equipment
   C. a reduction in TB cases nationwide
   D. elimination of TB worldwide
3. According to OSHA guidelines, workers who handle antineoplastic agents should have thorough medical exams:
   A. at time of hire and exit
   B. every five years
   C. at least every two to three years
   D. at least yearly
4. In its new hand-hygiene guidelines, what does the CDC say about the use of alcohol-based rubs with surgical scrubs?
   A. They should not be used.
   B. They can be used in place of soap and water.
   C. They should be used in conjunction with soap and water.
   D. There is not enough evidence on the use of alcohol-based rubs with surgical scrubs.

Answers: 1. A; 2. C; 3. C; 4. B

NEWS BRIEFS

Needle safety expert wins MacArthur 'genius' award

Janine Jagger, PhD, MPH, whose research and advocacy brought attention to the preventable hazards posed by needle devices, has received a MacArthur Foundation award, which provides an unrestricted award of $100,000 for five years. Jagger, who is director of the International Health Care Worker Safety Center at the University of Virginia Health Sciences Center in Charlottesville, says she plans to use the funds to expand the center's work in developing countries.

The Chicago-based MacArthur Fellows Program, often dubbed "genius grants," recognizes people in a wide range of fields who have shown uncommon creativity and had "the courage to challenge inherited orthodoxies."

Jagger, an epidemiologist, was studying air bags and brain injury in the early 1980s when she heard from health care workers that they were

COMING IN FUTURE MONTHS

- ■ When should you test for HCV infection after needlesticks?
- ■ Update on the hazards of surgical smoke
- ■ EH traits that the best hospitals have in common
- ■ How to draft a smallpox readiness team
- ■ Stress rises to the top of EH concerns

concerned about the risk of contracting AIDS from contaminated needles.

At the time, needlestick prevention focused exclusively on technique — an assumption that health care workers caused their own injuries by careless or improper use of the devices. Jagger developed a prototype safety device and conducted research showing that safety devices could significantly reduce needlesticks.

She established a database of needlestick information: the Exposure Prevention Information Network, or EPINet, which now has about 1,500 member hospitals. Her continued research and advocacy of safer devices ultimately led to the passage of the Needlestick Safety and Prevention Act in 2000.

Jagger did not know she was even being considered for the award when she received the phone call. "I'm speechless, just absolutely speechless," she tells *Hospital Employee Health*.

Jagger says she plans to use the money to fund projects in developing countries, including a plan to safely eliminate infectious medical waste. ▼

AHA offers new ergo program with guarantee

AHA Financial Solutions Inc., a subsidiary of the American Hospital Association in Chicago, is offering a new ergonomics consultation program. Diligent, which is associated with the Arjo Corp. ergonomic equipment company, will provide ongoing consultation, employee training, implementation of equipment, and measurement of progress. The Diligent Ergonomic Risk Management Program provides a guarantee of a 60% reduction in transfer-related injuries for three years.

The benefits of an ergonomics program go beyond workers' compensation cost-savings, says **Tony Spohn**, ARM, vice president of risk management for AHA Financial Solutions. "This is another way to improve the quality of life for health care workers. It will improve productivity by improving their health and morale. That will ultimately improve the retention of workers at that hospital."

Diligent also will provide a risk assessment and estimate of potential cost-savings for a "nominal" fee, Spohn says. For more information, contact Spohn at (800) 242-4677. ■

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. ■

Investigational Smallpox Vaccine
Screening and Consent Signature Form

Date:_____
Patient Identifying Number: _____
(Please check only one: ☐ SSN ☐ Passport # ☐ Driver's license # and Issuing State:____ Other ☐ , List:_____ None available☐)

Participant Information:
Print Name:_____ Date of Birth:_____ Sex: M☐ F☐
Current Address:_____
City *State* *Zip code* *Telephone Number*

Contact History:
Have you been told that you may have been a contact to someone with smallpox? Yes ☐ No☐
Have you been in contact with someone who had a bad rash in the past 3 weeks? Yes ☐ No ☐

Screening:
Do the following apply to you or your child?

Yes	No	Maybe	
☐	☐	☐	Immune system problems such as HIV/AIDS, cancer, leukemia, lymphoma, organ transplant, agammaglobulinemia
☐	☐	☐	Autoimmune system problem like lupus that weakens your immune system
☐	☐	☐	Currently taking medicines like oral steroids (such as prednisone), chemotherapy agents/radiation, or organ transplant medications.
☐	☐	☐	Eczema, atopic dermatitis, or a history of eczema or atopic dermatitis
☐	☐	☐	Other skin conditions such as burns, impetigo, contact dermatitis, or zoster.
☐	☐	☐	Currently pregnant
☐	☐	☐	Allergy to antibiotics polymyxin B, streptomycin, chlortetracycline, neomycin
☐	☐		Age less than 1 year old
☐	☐		Have additional questions about any health conditions you might have and whether you should be vaccinated
☐	☐		Are you less than 18 years of age and your parent or guardian is not with you?
☐	☐		Do you have any questions you would like to have answered before you decide on vaccination?
☐	☐		This adult is incapacitated and this screening/consent signature form is being completed by the parent or guardian [checked box for this question alone does not require additional screening counseling]

Participant Informed Consent Signature for Vaccination:

I HAVE:

- Viewed the vaccine informational video or read the video script in the packet, or talked with a translator.
- Received the information packet (which includes information on why this vaccine is being offered, why it is investigational, voluntary participation, benefits, risks, side effects, risks to contacts, precautions for vaccination and adverse events, Vaccinia Immune Globulin, cidofovir, care of my vaccination site, confidentiality, costs, what to do in case of injury, my right to refuse, alternative treatments, and contact information for problems or questions.)
- Completed the medical screening form
- Received counseling and additional information if I was identified as a contact or fell into any of the groups listed on the front of this form
- Had the opportunity to have my questions answered

I have been informed of why smallpox vaccine is being made available, the risks and benefits associated with vaccination and based on the information provided to me, I have decided to receive or have my child receive smallpox vaccination today.

Participant Signature/ Parent or Guardian:_____

FOR VACCINATOR USE ONLY

Vaccine clinic ID:_____Vaccinator ID (name or ID number): _____
Vaccine Name: ☐ Dryvax ☐ Aventis ☐ ACAM1000 ☐ ACAM2000 Lot #: _____

Source: Centers for Disease Control and Prevention, Atlanta.