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Game changer: Clinical trial sets new standard of care for preventing surgical-site infections

National move to chlorhexidine-alcohol patient prep expected

(Editor's note: In this issue of Hospital Infection Control & Prevention, *we continue our focus on infection prevention advances in the surgical suite, following our report on blunt suture needles last month with this special report on a new standard care emerging for skin cleaning of the patient surgical site.)*

A landmark clinical trial demonstrating the striking efficacy of chlorhexidine-alcohol as a preoperative patient scrub is expected to change the standard of care and slash surgical-site infection (SSI) rates in hospitals, *HIC* has learned.

The clear conclusion of the recently published study is that preoperative cleansing of the patient's skin with chlorhexidine-alcohol is far superior to povidone-iodine in terms of preventing surgical-site infections.[1] Now it gets interesting. For starters, povidone-iodine is currently used as the skin prep in almost three-quarters of all surgeries, with chlorhexidine alcohol the choice for only about 10% of operations to cleanse patient skin. Costs — for the solutions and materials, not for the later SSIs — are a clear factor in that unbalanced proportion. However, the nature of the clinical trial means the results can be widely extrapolated to other settings, says lead author **Rabih O. Darouiche**, MD, director of the Center for Prostheses Infection, Baylor College of Medicine in Houston. In short, it's a game changer.

Rabih O. Darouiche

"Overall, we saw a 41% reduction [in SSIs]," he tells *HIC*. "I cannot think of any confounding variable that essentially would change the potential efficacy of a certain antiseptic preparation in one city vs. another or one hospital vs. another. This is a really easy — a practical, quick and very powerful approach. I really see no barriers that could limit the implementation of

In This Issue

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this approach on a national basis."

Since 2002, the Centers for Disease Control and Prevention has recommended chlorhexidine-alcohol for skin cleansing of the insertion site for vascular catheters. However, the CDC has not issued a similar recommendation for skin cleansing at surgical sites, citing a lack of clinical evidence. Until now. Published in the prestigious *New England Journal of Medicine*, Daroiche's study is expected to lead to new CDC recommendations for surgical site prep to prevent endogenous infections from patient flora.

Talking to *HIC* the day the clinical trial results were published, Darouiche observed, "As of yesterday, povidone-iodine was still the standard of care, but I think that will now change. I anticipate and I am optimistic for the sake of better patient care that this will become national policy. I believe that a number of governmental agencies and professional associations that focus on quality of health care will adopt this approach. Many experts in the field think these results should be able to switch the standard of care from povidone-iodine to chlorhexidine alcohol for preoperative skin cleaning."

One of them is veteran health care epidemiologist **Richard Wenzel**, MD, professor and chairman of the department of internal medicine at the Medical College of Virginia in Richmond, who wrote an accompanying editorial on the study.[2]

"I think the weight of evidence is [sufficient] now to change from iodophors to chlorhexidine-alcohol," Wenzel tells *HIC.* "It's been proven in a number of studies of bathing patients with chlorhexidine, with IV lines compared to povidone-iodine around the lines, and now we have this large multicenter study. The switch to a different skin prep would be at some additional cost, but it is very small compared with preventing 40% of surgical-site infections. And this is not an extra procedure. There is no opportunity costs for the surgeon, he or she is already going to do a prep and they are just changing the materials. It's absolutely remarkable."

Richard Wenzel

The cost of the applicator that contains the chlorhexidine and alcohol is about $6 — roughly twice as much as the iodophor product, Darouiche explains.

"On average, we applied two applicators that contained chlorhexidine-alcohol on the skin of an individual patient in the study; so for each patient who received chlorhexidine-alcohol an additional cost of $9 was incurred," he adds. "This study showed that you would have to apply chlorhexidine-alcohol rather that povidone-iodine

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in 17 patients in order to prevent one case of surgical-site infection," he says.

"So, 17 patients times $9 is $153. That pales in comparison to how much money you can save by preventing the onset of surgical-site infection, which we know can cost anywhere from a few thousands of dollars to tens of thousands of dollars."

Indeed, the latest analysis of the economic burden of SSIs by researchers at Duke University found that a single surgical infection due to methicillin-resistant *Staphylococcus aureus* (MRSA) could lead to charges in the $60,000 range. **(See related story, p. 17.)**

The Darouiche clinical trial randomly assigned adults undergoing clean-contaminated surgery in six hospitals to preoperative skin preparation with either chlorhexidine-alcohol scrub or povidone-iodine scrub and paint. Enrolled patients were randomly assigned in a 1:1 ratio to have the skin at the surgical site either preoperatively scrubbed with an applicator that contained 2% chlorhexidine gluconate and 70% isopropyl alcohol or preoperatively scrubbed and then painted with an aqueous solution of 10% povidone-iodine. The primary outcome was any surgical-site infection within 30 days after surgery.

A total of 849 subjects (409 in the chlorhexidine-alcohol group and 440 in the povidone-iodine group) qualified for the intention-to-treat analysis. The overall rate of surgical-site infection was significantly lower in the chlorhexidine-alcohol group than in the povidone-iodine group (9.5% vs. 16.1%). Chlorhexidine-alcohol was significantly more protective than povidone-iodine against both superficial incisional infections (4.2% vs. 8.6%) and deep incisional infections (1% vs. 3%) — but not against organ-space infections (4.4% vs. 4.5%).

"Actually, we never anticipated that this would reduce the rate of organ-space infection," Darouiche explains. "Most incision infections are caused by organisms that reside on the patient's skin. That's why we anticipated that the chlorhexidine alcohol would significantly reduce the rate of incisional infections, but the skin antiseptics are not expected to find the way below the incisional area and prevent infection in deep organs and spaces."

Moreover, efficacy of infection prevention was not dependent on the organism, meaning MRSA — and all its attendant costs — is as likely to die on the patient's skin as any other bug. Culture of the surgical site in 60 of 61 infected patients yielded growth of organisms (a total of 107 isolates) and similar proportions of infected patients in the two study groups. Gram-positive aerobic bacteria (63 isolates) outnumbered gram negative aerobic bacteria (25 isolates) by a factor of 2.5, with 38% of cultures polymicrobial.

"The protection by chlorhexidine-alcohol was essentially the same across different groups of organisms," he emphasizes.

"Conservatively, even if you say . . . there are 30 million operations a year, if only 1% to 2% get infected, that's 300,000 to 600,000 people. Imagine, if you use this single switch [in surgical-site skin cleansing] plus selected use of elimination of Staph aureus *nasal carriage — you could get close to reducing half of surgical-site infections."*
— Richard Wenzel, MD

The 41% reduction in SSI risk is comparable to a 49% reduction in the risk of vascular catheter-related bloodstream infection in a meta-analysis that showed the superiority of skin disinfection with chlorhexidine-based solutions vs. 10% povidone-iodine.[3] Although both the antiseptic preparations studied possess broad-spectrum antimicrobial activity, the superior clinical protection provided by chlorhexidine-alcohol is probably related to its more rapid action, persistent activity despite exposure to bodily fluids, and residual effect, Darouiche hypothesizes. As a result, some infections that may have been seeded from the patients' flora during the procedure are prevented. Since two-thirds of surgical-site infections are confined to the incision, optimizing skin antisepsis before surgery could result in a significant clinical benefit and immense cost savings, he stresses.

"Personally, I think better patient care is the primary outcome, and everything else is secondary to that," Darouiche says.

Another encouraging approach to preventing endogenous infections is nasal decolonization of patients prior to surgery. Knowing that nasal carriers of *S. aureus* are at increased risk for

health care associated infections with the organism, researchers in the Netherlands found that temporarily decolonizing patients could sharply reduce infection rates.[4] Given the country's highly publicized success in eradicating MRSA, the study was statistically relevant for only susceptible staph strains (MSSA). However, the results should apply in general to MRSA and the clinical situation currently faced by infection preventionists in America, the lead author told *HIC* in an interview via e-mail.

"There are, as far as we know, no comparative data dealing with MRSA," says **Lonneke Bode**, MD, a clinician in the department of medical microbiology and infectious diseases at Erasmus University Medical Center in Rotterdam. "Biologically however, it is plausible that this strategy works for MRSA as well as for MSSA, as long as the MRSA strain is mupirocin-susceptible. Please note that this is not a long-term treatment; it only eradicates the bacterium from the skin and nose for a relatively short period of time. Recolonization frequently occurs, but the purpose of this strategy is to be free of the organism during the period with the highest risk of acquiring an infection — during the hospital stay."

Lonneke Bode

In the randomized, double-blind, placebo-controlled, multicenter trial, Bode and colleagues assessed whether rapid identification of *S. aureus* nasal carriers by means of a real-time polymerase chain reaction (PCR) assay, followed by treatment with mupirocin nasal ointment and chlorhexidine soap, reduces the risk of hospital-associated *S. aureus* infection.

From October 2005 through June 2007, a total of 6,771 patients were screened on admission. A total of 1,270 nasal swabs from 1,251 patients were positive for *S. aureus*. The researchers enrolled 917 of the patients in the intention-to-treat analysis, of whom 808 (88.1%) underwent a surgical procedure. In the mupirocin-chlorhexidine group, nasal ointment was applied twice daily, and the soap was used daily for a total-body wash. The duration of the study treatment was five days, irrespective of the timing of any interventions.

The rate of *S. aureus* infection was 3.4% (17 of 504 patients) in the mupirocin-chlorhexidine group, as compared with 7.7% (32 of 413 patients) in the placebo group. The effect of mupirocin-chlorhexidine treatment was most pronounced for deep surgical-site infections. The time to the onset of nosocomial infection was shorter in the placebo group than in the mupirocin-chlorhexidine group. All the *S. aureus* strains identified on PCR assay were susceptible to methicillin and mupirocin. The number of surgical-site *S. aureus* infections acquired in the hospital can be reduced by rapid screening and decolonizing of nasal carriers of *S. aureus* on admission, Bode concludes. The intervention also significantly reduced the mean hospital stay by almost two days.

"We think that this strategy not only works for high-risk surgical patients, but also for other patients at high risk for infection," she says, "for example, a nonsurgical patient that will get a central venous catheter. Unfortunately, we enrolled only 109 nonsurgical patients, and were thus underpowered to test our hypothesis. Probably there is also an effect in nonsurgical, high-risk patients, but we weren't able to measure the size of it."

There are other issues to consider, including the possibility of spurring mupirocin resistance in staph. "The more we use it, the more we will have that concern," Wenzel says. "I wish we knew the answer to how much of the contribution to their 60% reduction in *Staph aureus* was due to the mupirocin and how much was due to the chlorhexidine baths. We don't know that; they used both. But I would recommend this approach for high-risk patients."

Taken together, the two studies — which were unrelated but published in tandem — could represent landmark new gains against SSIs.

"Conservatively, even if you say for example, there are 30 million operations a year, if only 1% to 2% get infected that's 300,000 to 600,000 people," Wenzel says. "Imagine, if you use this single switch [in surgical-site skin cleansings] plus selected use of elimination of *Staph aureus* nasal carriage — the second study — you could get close to reducing half of surgical-site infections."

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SSI caused by MRSA pushes bill to $60,000

Duke study tracks staggering costs of infections

Surgical-site infections (SSI) significantly increase the chance of hospital readmission and can cost as much as $60,000 per patient, according to Duke University Medical Center researchers who conducted the largest study of its kind to date.

In particular, SSIs caused by methicillin-resistant *Staphylococcus aureus* (MRSA) can set off a spiral of charges to patients and unreimbursed costs to hospitals, says **Deverick J. Anderson**, MD, MPH, an infectious diseases specialist at Duke University Medical Center and lead author of the study.

Deverick J. Anderson

"A lot of the estimates on the costs associated with various surgical-site infections kind of 'take on all comers,"' he tells *Hospital Infection Control & Prevention*. "They were not specifically related to MRSA, but there are cost estimates that quote anywhere from $3,000 to $30,000 in general and vary by type of procedure. I think what this [study] adds is there is also a [cost] variation based on the bug that causes SSIs as well."

While the $60,000 figure could include patient charges — as opposed to strictly hospital costs — even focusing solely on the latter yields a cost estimate in the $45,000 range per SSI caused by MRSA, Anderson says.

"These [MRSA] patients also required more than three weeks of additional hospitalization," he says. "We found that patients with surgical-site infections due to MRSA were 35 times more likely to be readmitted and seven times more likely to die within 90 days compared to uninfected surgical patients."

The Duke study provides the first cost impact data tied to post-surgical MRSA infection in a large group of hospitals. The estimates provide some perspective to the costs associated with SSI prevention, including efforts such as cleansing the surgical skin site and patient nasal decolonization. **(See related story, cover.)** The Duke study evaluated deep-incision and organ/space infections, so the cost figures primarily pertain to SSIs beyond superficial infections at the site of incision.

"But now we are able to say from the hospital administration side, how much investment can we make in these sorts of strategies and what kind of exact payoff are we going to need in order to say that this was cost-effective for our institution?" Anderson says. "Say a hospital puts in an intervention that prevents one [MRSA-SSI] infection each year. If that intervention costs less than $45,000 to $60,000, then I think you could say it's a good intervention. Even though it only decreased one infection it still would have been cost-effective."

A $19 million price tag

Anderson's team looked at the 90-day postoperative period for patients over a five-year period in one tertiary care center and six community hospitals in the Duke Infection Control Outreach Network.[1] They compared hospital readmission, mortality, length of hospital stay, and hospital charges for patients in three groups. Some had surgical-site infections due to MRSA, some were infected with methicillin-susceptible *Staphylococcus aureus* (MSSA), and some were uninfected.

In total, 150 patients with SSI due to MRSA were compared to 231 uninfected controls and 128 patients with SSI due to MSSA. An SSI due to MRSA was independently predictive of readmission within 90 days; death within 90 days; and led to 23 days of additional hospitalization and $61,681 of additional charges compared with uninfected controls.

"For the seven hospitals we looked at, the total estimated cost resulting from surgical-site infections due to MRSA was more than $19 million," Anderson says. "That's a staggering amount, which demonstrates an area of cost-saving potential for these institutions and other

community hospitals."

The researchers found most of the outcomes for MRSA compared to MSSA were worse, as anticipated; however, one finding was surprising, according to Anderson. "Our findings show that methicillin-resistance contributed to longer hospital stays and increased hospital charges but did not increase the risk of mortality," he says.

The data show that patients with surgical-site infections due to MRSA compared to MSSA on average required six more days of hospitalization and incurred $24,000 in additional charges. However, the study adds to the conflicting data on whether MRSA entails higher mortality to surgical patients than MSSA, he says, adding there have now been four studies and the score is "2-2." The bottom line for costs, mortality, and any other measure is it's better not having acquired an SSI.

"Without doubt, when you look at MRSA infections vs. uninfected patients across the board everything is worse — mortality, costs, readmissions," Anderson says.

Reference

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A skeleton key to the new UTI guidelines

Cutting through the thicket of recommendations

The Centers for Disease Control and Prevention has completed a massive update and revision of its 1981 guidelines to prevent catheter-associated urinary tract infections (CA-UTIs).[1] A painstaking review of reams of evidence — even the appendix is 268 pages long — boils down to some of the common-sense measures that many infection preventionists on the front lines are already practicing.

"When you look at the guidelines in general, the primary strategy is trying to minimize urinary catheter use — that's definitely where we have focused our efforts. And once they are in there — get them out as quick as possible," says **Titus Daniels**, MD, MPH, associate hospital epidemiologist at Vanderbilt University Medical Center in Nashville, TN. "One of the things we have found successful is to make this a nursing directed initiative so they can remove them whenever the patient no longer needs them rather than waiting for the physician to actually write an order. It gives the nurses a lot of ownership."

Indeed, the new CDC guidelines specifically recommend establishing "protocols for nurse-directed removal of unnecessary urinary catheters" as one of the quality improvement projects recommended for reducing CA-UTIs. **(See related story, p. 19.)**

"It would be a good idea to initiate quality improvement projects for hospitals focusing on CA-UTIs for a couple of reasons," says **Sanjay Saint**, MD, MPH, a health care epidemiologist at the University of Michigan Health System in Ann Arbor. "The first reason is that now we actually have some evidence about what we should be doing based on these HICPAC guidelines and other [guidelines and articles.] Not only to prevent CA-UTIs, but noninfectious complications associated with indwelling catheters."

Sanjay Saint

This does not have to approach rocket science to be successful. For example, IPs at one hospital reduced the mean duration of catheterization from 4.5 days to 2.8 days after adding a bright yellow sticker to the patient's chart that requested a few pieces of information: Does the patient have an indwelling urinary catheter? If so, when was it inserted and how long has it been in place? A statement to "Please consider if the IUC is still necessary" was the sticker's concluding reminder.

"The nurses took ownership of it and they were very involved in it," says **Judy Ptak**, RN, MSN, infection preventionist at Dartmouth-Hitchcock Medical Center in Lebanon, NH. "It was coming from them. That was one of the keys."

The nurses still need to confer with the doctors on removing the catheter but the prompt moves the process forward at the hospital, which is now considering incorporating the approach as part of its switch to an electronic charting system, she notes.

In any case, hospitals will take particular note

CDC recommends QI to reduce CA-UTIs

Implement based on facility risk assessment

The Centers for Disease Control and Prevention recommends that infection preventionists implement quality improvement (QI) programs or strategies to enhance appropriate use of indwelling catheters and to reduce the risk of CA-UTI based on a facility risk assessment.[1]

That recommendation — and all others in this summary unless otherwise noted — is listed as Category IB, which the CDC Healthcare Infection Control Practices Advisory Committee (HICPAC) defines as: "A strong recommendation supported by low quality evidence suggesting net clinical benefits or harms or an accepted practice (e.g., aseptic technique) supported by low to very low quality evidence."

The purposes of QI programs should be:

1) to assure appropriate utilization of catheters;

2) to identify and remove catheters that are no longer needed (e.g., daily review of their continued need) and;

3) to ensure adherence to hand hygiene and proper care of catheters. Examples of programs that have been demonstrated to be effective include:

- A system of alerts or reminders to identify all patients with urinary catheters and assess the need for continued catheterization
- Guidelines and protocols for nurse-directed removal of unnecessary urinary catheters
- Education and performance feedback regarding appropriate use, hand hygiene, and catheter care
- Guidelines and algorithms for appropriate perioperative catheter management, such as:

1. Procedure-specific guidelines for catheter placement and postoperative catheter removal

2. Protocols for management of postoperative urinary retention, such as nurse-directed use of intermittent catheterization and use of bladder ultrasound scanners

Recommendations considered essential for *all* health care facilities caring for patients requiring urinary catheterization include the following high-priority recommendations, which were chosen in part on the likely impact of the strategy in preventing CA-UTI.

Appropriate Urinary Catheter Use

- Insert catheters only for appropriate indications, and leave in place only as long as needed.
- Avoid use of urinary catheters in patients and nursing home residents for management of incontinence.
- For operative patients who have an indication for an indwelling catheter, remove the catheter as soon as possible postoperatively, preferably within 24 hours, unless there are appropriate indications for continued use.

Aseptic Insertion of Urinary Catheters

- Ensure that only properly trained persons (e.g., hospital personnel, family members, or patients themselves) who know the correct technique of aseptic catheter insertion and maintenance are given this responsibility.
- In the acute care hospital setting, insert catheters using aseptic technique and sterile equipment.

Priority Recommendations for Proper Urinary Catheter Maintenance

- Following aseptic insertion of the urinary catheter, maintain a closed drainage system.
- Maintain unobstructed urine flow.

Reference

1. Gould CV, Unscheid CA, Agarwal RK, et al. Centers for Disease Control and Prevention Healthcare Infection Control Practices Advisory Committee (HICPAC). Guideline for prevention of catheter-associated urinary tract infections 2009. Available at: http://www.cdc.gov/nci-dod/dhqp/dpac_uti_pc.html. ■

of the CDC UTI guidelines because there is, to put it bluntly, money at stake. The Centers for Medicare & Medicaid Services (CMS) has reduced reimbursements for additional costs generated by CA-UTIs in 2008.

"Hospitals now have more of a financial stake in the prevention of CA-UTIs," Saint says. "Given the long time lag between the previous CDC CA-UTI recommendations, people are now looking to operationalize these guidelines. This guideline, like most guidelines, primarily gives an assessment of the evidence, which is very important because that is the starting point. With so much data, it's impractical to expect IPs and hospital epidemiologists to do their own literature searches and evidence review. The CDC has done that, given a grade to evidence, and done it in a fairly transparent way."

Between 15% and 25% of hospitalized patients may receive short-term indwelling urinary catheters, the CDC notes in the guidelines. In many cases, catheters are placed for inappropriate indications, and health care providers are often unaware that their patients have

catheters, leading to prolonged, unnecessary use. In particular, the prevalence of urinary catheter use in residents in long-term care facilities in the United States is on the order of 5%, representing approximately 50,000 residents with catheters at any given time. The high prevalence of urinary catheters in patients transferred to skilled nursing facilities suggests that acute care hospitals should focus more efforts on removing unnecessary catheters prior to transfer, the CDC advises.

Although morbidity and mortality from CA-UTI is considered to be relatively low compared to other HAIs, the high prevalence of urinary catheter use leads to a large cumulative burden of infections with resulting infectious complications and deaths. An estimate of annual incidence of HAIs and mortality in 2002, based on a broad survey of U.S. hospitals, found that urinary tract infections made up the highest number of infections (> 560,000) compared to other HAIs, and attributable deaths from UTI were estimated to be over 13,000 (mortality rate 2.3%). And while fewer than 5% of bacteriuric cases develop bacteremia, CA-UTI is the leading cause of secondary nosocomial bloodstream infections; about 17% of hospital-acquired bacteremias are from a urinary source, with an associated mortality of approximately 10%.

The source of microorganisms causing CA-UTI can be endogenous, typically via meatal, rectal, or vaginal colonization, or exogenous, such as via contaminated hands of health care personnel or equipment. Microbial pathogens can enter the urinary tract either by the extraluminal route, via migration along the outside of the catheter in the periurethral mucous sheath, or by the intraluminal route, via movement along the internal lumen of the catheter from a contaminated collection bag or catheter-drainage tube junction. Again, the key appears to be avoiding unnecessary catheterization in the first place and then removing those appropriately placed catheters as quickly as possible after they are no longer needed.

Cutting through the thicket of recommendations and references, Saint says IPs can best implement the CDC guidelines by taking an elementary "ABCDE" approach. That's the way I distill it down," says Saint, an expert on CA-UTI prevention who has reviewed the CDC guidelines and similar recommendations by other medical groups. Here are Saint's alphabetic essentials:

- **A is for Adherence:** "Adherence to generally accepted infection control principles — hand hygiene, education, feedback, aseptic insertion technique, surveillance. Those types of activities."
- **B is for Bladder** ultrasound to avoid placing an unnecessary indwelling catheter.
- **C is for Condom** catheter or some other type of intermittent catheterization in appropriate patients.
- **D is for Do** not use a catheter unless you must. "That's means avoiding indwelling catheterization especially in the emergency department."
- **E is for Early** catheter removal using nursing protocols, written or computerized reminders or stop orders.

"For me, those are the five key features of the evidence," Saint says. "Unfortunately, I think there is only one that has a 1A [CDC grade of evidence]. "Everything is 1B or less, and that highlights the need for more research."

Indeed, the CDC guidelines inadvertently reinforce the perception that surefire approaches to UTI prevention are few and far between. In that regard, the CDC reminds in the guidelines that "it is important to note that Category I recommendations are all considered strong recommendations and should be equally implemented; it is only the *quality* of the evidence underlying the recommendation that distinguishes between levels A and B."

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Empowered OSHA targets airborne infectious regs

Agency may fire first salvo in March

In a move that could affect hospital infection prevention programs, the U.S. Occupational Safety and Health Administration is taking the first steps toward a possible airborne infectious diseases standard.

In fact, in a web-based address, Labor Secretary Hilda L. Solis highlighted airborne

infectious diseases as one of the top concerns in her new regulatory agenda. "The lack of compliance with everyday infection control procedures has received increased focus because of the 2009 H1N1 pandemic. OSHA is interested in whether current procedures are adequate enough to prevent infections among exposed workers," she said. "Reducing workers' risk of exposure of health and safety hazards is a priority of my administration," Solis added.

OSHA will be hiring 100 additional inspectors in the fiscal year 2010 budget, she says. As of mid-December, OSHA had not yet cited any hospitals for failing to use N95 respirators to protect health care workers caring for 2009 H1N1 patients. But OSHA had conducted "several" inspections, Solis said. "OSHA has moved aggressively to address the hazards of H1N1 pandemic influenza in the workplace," relying on existing standards and the General Duty Clause, said **Jordan Barab**, then acting head of OSHA, in a separate web-based chat. (OSHA chief David Michaels was confirmed by the U.S. Senate on Dec. 4.)

OSHA's decision to enforce the recommendation from the Centers for Disease Control and Prevention for health care workers to use N95s when caring for patients with 2009 H1N1 has been contentious, reviving the longstanding divisions between infection preventionists and industrial hygienists on this issue. Many IPs believe surgical masks provide adequate protection and wrote a letter to President Obama asking for a halt to the OSHA enforcement. **(See *Hospital Infection Control & Prevention,* December 2009, cover.)**

Barab, who will remain as deputy assistant secretary for OSHA, helped promulgate the ergonomics standard when he was previously at OSHA from 1998 to 2001, and he previously worked in health and safety with the AFL-CIO and the American Federation of State, County and Municipal Employees. Sensing political momentum, the unions are preparing to rejoin the fight for an airborne standard that was last waged as a failed attempt to get passage of a specific standard for tuberculosis. Though in deep decline nationally, TB is circulating globally in an extremely drug resistant form and will no doubt be cited as one justification for an airborne regulation.

"This White House is concerned about worker safety and health," says **Bill Borwegen**, MPH, health and safety director for the Service Employees International Union (SEIU). "I know it might be a departure from the previous administration, but we think it's a very healthy development and we applaud the leadership of the Obama administration in protecting health care workers."

Although the National Institute for Occupational Safety and Health (NIOSH) is not a regulatory agency, it also has an ambitious agenda to address health care hazards. In a statement published in the NIOSH online newsletter, *enews,* NIOSH director **John Howard** stated, "I do not think we can return to an era when a health care worker's exposure to transmissible diseases such as influenza can be merely considered 'diseases of life' for which a health care worker 'assumes the risk' when he or she offers their labor to a health care employer."

OSHA said it plans to issue its Request for Information related to airborne infectious diseases in the *Federal Register* in March. The California Aerosol Transmissible Diseases standard may provide a template for an OSHA standard. Cal-OSHA was able to achieve support for the standard from both the California Hospital Association and labor unions representing health care workers. While it requires fit-tested N95 respirators (or greater protection) for health care workers caring for patients infected with a novel pathogen, it also temporarily allows fit-testing to occur biannually rather than every year. That provision was based on the premise that future research will clarify fit-testing issues and it automatically expires in 2014.

"There is evidence that a lack of adherence to voluntary infection control recommendations has resulted in the transmission of disease to workers. OSHA is seeking information on the extent to which voluntary recommendations are being followed and whether mandatory regulations would be more effective," the agency said. Specifically, the agency said it will seek information on:

- Studies and data describing the nature and scope of occupational exposure and illness from airborne infectious diseases.
- The efficacy of current control measures for reducing occupational exposures.
- Components of an effective infection control program.
- Information to help decide whether to pursue rulemaking.

(Editor's note: Look for an e-mail alert from Hospital Infection Control & Prevention *as soon as OSHA issues its call for comments on this matter.)* ■

Beware of complacency during pandemic lull

Deaths rose after a similar reaction in 1957

Citing a fatal complacency during about the same stage of the 1957 influenza pandemic, the Centers for Disease Control & Prevention is urging everyone to be vaccinated for H1N1 influenza A.

"The H1N1 virus is still circulating and it is still causing disease, hospitalizations, and deaths," said **Anne Schuchat**, MD, director of the National Center for Immunization and Respiratory Diseases. "Many people are still susceptible to this virus and would benefit from vaccination. We want to avoid complacency."

Most states have opened up vaccination to anyone who wants it, she noted, urging immunization in part because this is National Influenza Vaccination Week.

"More places and more providers are offering vaccines, making it even easier for those of you who want to be vaccinated to protect yourself and your families to be able to do that," Schuchat said at a press conference.

Four states continue to report widespread activity (Delaware, Maine, New Jersey, and Virginia), but overall the CDC is reporting a decline in H1N1 hospitalizations and deaths. There is little sign of any other circulating flu virus, as H1N1 has taken center stage in the first pandemic since 1968. The CDC is citing the pandemic 11 years before that as a cautionary tale.

"In 1957, [public health officials] essentially gave the 'all-clear' whistle in this December/January time period," Schuchat said. "They had vaccine, but they didn't encourage its use. They did go on to see an increase in mortality. As long as this virus is circulating, it has the potential to cause illness. . . . The illness is down. There's plenty of vaccine. It's a key window of opportunity. We don't want to repeat the story from 1957." ■

Antivirals hoarded, duties dropped as H1N1 hit

'Considerable opportunity for improvement remains'

Lautenbach E, Saint S, Henderson D, et al. **Initial response of health care institutions to emergence of H1N1 influenza: Experiences, obstacles, and perceived future needs.** *Clin Infect Dis* 2010; 50:Epub ahead of print.

Although generally institutions were well prepared for the H1N1 crisis, respondents to this survey said they had to neglect other medical duties, were aware of antiviral hoarding by colleagues and overall favored mandatory vaccination of health care workers, the authors of this timely report conclude. In this survey of members for the Society for Healthcare Epidemiology of America (SHEA), the researchers report that the majority of respondents felt that their institutions were well prepared for the H1N1 crisis and were provided with adequate resources.

"However, the time commitment required to respond to this crisis was considerable, with attention to other critical infection prevention activities suffering as a result," the authors noted. "Personal stockpiling of antiviral agents was common, and many institutions implemented initiatives designed to curtail such practices."

Revising plans on the basis of the H1N1 experience was one of the most common initiatives noted by respondents as an urgent need in the coming months. Future work also should assess beliefs and obstacles in responding to H1N1 among other health care professionals responding to the crisis (e.g., emergency department clinicians, nurses, etc). Accessibility to antimicrobial agents in the event of a pandemic is a critical component of preparedness plans. "In this light, it is concerning that one-third of respondents reported shortages of antiviral medications," the authors note. "That personal stockpiling was reported by many respondents is perhaps not surprising, given past data showing this practice was also widespread during heightened fears of an avian influenza pandemic. Efforts to discourage the prescribing of antivirals for personal stockpiling should be emphasized. Indeed, approximately one-half of the respondents' institutions initiated such efforts."

On April 15, 2009, novel swine-origin influenza A (H1N1) was identified from specimens of two

epidemiologically unrelated patients. Over the next two months, H1N1 spread to more than 70 countries. On June 11, 2009, the World Health Organization raised the worldwide pandemic alert level to Phase 6, indicating that a global pandemic was under way. The ability to respond quickly in the face of an emerging infectious disease is critical for global patient safety efforts. Indeed, the capacity to collaborate across institutions and countries has proved critical in the success of recent pandemics, such as SARS.

An invitation to complete an internet-based survey was sent electronically to all SHEA members on May 26, 2009, with a repeat electronic survey reminder sent one week later. There were 323 survey respondents, which represent 25.9% of the total SHEA membership. Of note, 169 (52.3%) respondents reported that prior to the current H1N1 crisis, their hospital was well prepared for a potentially pandemic situation. After reflecting on their institution's experience and response to the H1N1 crisis, 195 (60.4%) respondents reported that at the time of the

CNE/CME objectives

Upon completion of this educational activity, participants should be able to:

- Identify the clinical, legal, or educational issues encountered by infection preventionists and epidemiologists;
- Describe the effect of infection control and prevention issues on nurses, hospitals, or the health care industry in general;
- Cite solutions to the problems encountered by infection preventionists based on guidelines from the relevant regulatory authorities, and/or independent recommendations from clinicians at individual institutions. ■

CNE/CME instructions

Physicians and nurses participate in this CNE/CME program by reading the issue, using the provided references for further research, and studying the questions. Participants should select what they believe to be the correct answers, then refer to answer key to test their knowledge. To clarify confusion surrounding any questions answered incorrectly, please consult the source material. After completing the semester's activity, you must complete the evaluation form that will be provided and return it in the reply envelope to receive a credit letter. ■

CNE/CME *questions*

5. A recently published study found that preoperative cleansing of the patient's skin with chlorhexidine-alcohol was superior to cleansing with povidone-iodine for preventing surgical-site infections. Which solution is currently used for skin prep in the majority of surgeries nationally?
A. Chlorhexidine-alcohol
B. Povidone-iodine
C. They are used about equally.
D. None of the above

6. Overall, what percentage of SSI reduction was reported in the clinical trail for the chlorhexidine alcohol group?
A. 17%
B. 25%
C. 41%
D. 60%

7. According to Duke University Medical Center researchers, patients who contracted an SSI caused by methicillin-resistant Staphylococcus aureus (MRSA) were hospitalized how much longer on average than uninfected surgical patients?
A. Four days
B. One week
C. 10 days
D. Three weeks

8. Which of the following were cited as basic measures to prevent catheter-associated urinary tract infections?
A. Adherence to generally accepted infection control principles.
B. Use of bladder ultrasound to avoid placing an unnecessary indwelling catheter.
C. Using nursing protocols, reminders or stop orders for prompt removal of unnecessary catheters.
D. All of the above

COMING IN FUTURE MONTHS

■ Full coverage of the 2010 Decennial infections meeting in Atlanta

■ Let the H1N1 postmortems begin

■ Gram negatives returning with a vengeance

■ What are Joint Commission surveyors looking for?

■ OSHA cranking up the compliance

survey, their hospitals were well prepared for a potential pandemic. Furthermore, the majority of respondents reported that senior administrators provided both adequate political support (85.1%) and adequate resources (80.2%). Despite the perceived adequate levels of support, 32.7% of respondents reported that during the busiest week of the H1N1 flu crisis, they spent more than 60% of their time taking care of issues related to H1N1. On a related note, 50.9% of respondents reported that during the H1N1 flu crisis, other important infection prevention-related activities were neglected. Ninety-nine (30.7%) respondents reported a shortage of antiviral medication during the H1N1 crisis. Furthermore, 126 (39%) respondents agreed that personal stockpiling of antiviral medications occurred during the H1N1 crisis at their own institution. With regard to vaccination, 251 (77.7%) respondents felt that health care workers should be mandated to receive flu shots. ■

CNE/CME answers

5. B; 6. C; 7. D; 8. D.

Wisdom Teachers
Voices of Experience in Infection Prevention

Corporation of 1: From hospital IP to consultant

'At this stage of my career, I'm really enjoying it.'

What's it like to make the move from hospital infection preventionist to independent consultant? Who better to ask than **Christine J. Nutty**, RN, MSN, CIC, president of Infection Advice Inc. in Clarksville, TN.


Christine J. Nutty

An IP since 1992, Nutty did not exactly leap lightly into consulting when she made the move in 2006. She did her homework, and advises others mulling the move to carefully do the same. Nutty consults in such areas as outbreak management, infection control program assessment, infection prevention during hospital construction, and legal aspects of infection prevention. We caught up with her shortly after she completed her 2009 term as president of the Association for Professionals in Infection Control and Epidemiology (APIC).

Q. HIC: ***Why did you decide to make the change from hospital-based infection prevention to independent consulting?***

A: Nutty: I worked for almost 34 years in the hospital environment in various settings. I was increasingly burned out on the job — it basically revolved around lack of resources. I wanted to be more independent. I knew several friends who were consultants. I talked to them about their experiences and what was going on in their lives. I talked with my husband a lot about what we could and could not afford. Because when you become a consultant, you probably are going to go without a paycheck for a while.

Q. ***So essentially, you looked at it like you were launching a small business?***

A: Exactly, and you have to go at it that way. You have to think about health insurance, life insurance, the benefits that you will lose. You have to get legal advice and accounting advice and guidance. We decided that we could afford it and we could attempt to do this. I decided to become a small business and at the advice of my lawyer, I became an S corporation. Most consultants who I know are LLC [limited liability companies], but my lawyer recommended going as an S corporation. I'm a corporation of one. The biggest issues around that and the [corporate entity] decision relate to your individual state. You have to decide what you want to do based on the requirements by your state and local [authorities].

It's also very important to think about the area that you are from and ask the questions, 'Do you have customers? Who would those costumers be? How ready are you?' I had done some consulting in long-term care, outpatient settings and some legal consulting. I knew a list of perspective customers. Then you have to make that decision about whether you can afford to do it or not. In 2006, I made the decision.

Q. ***Fortunately, you launched your business before the Great Recession hit. Given this tough economy, any regrets about leaving the security of a hospital job?***

A: No, I don't miss being in the hospital, but I miss the friends I had and those relationships. Working in a hospital or a facility is like a family. I miss those people. But when I got my business off the ground, I was extremely busy and then I became more and more involved with APIC nationally and internationally.

I have been very busy and I already have a lot of work lined up for this year. But many consultants are seeing that the work is slacking off in this economy. Instead of calling a consultant to figure out an outbreak or improve their program, health care facilities are hiring from within or promoting someone [inexperienced] up the ladder and saying, "Here's your new job." It's not necessarily the best thing for the facility, but it saves dollars at the time.

Q. ***On the other hand, it seems like there are going to be a lot of consulting opportunities with some of the national trends. For example, the increasing federal and state oversight of ambulatory care in the wake of the Las Vegas HCV outbreak.***

Yes, especially with the training up front or serving as an interim infection preventionist while they try to find someone permanently. There are areas where it is opening up. There are increasing legal issues and consulting in that arena. There are opportunities, it is just that you have to have the knowledge — No. 1. APIC is filling that need by helping people with the training and the expertise. Of course years of experience help, but even then you have to have the connections — a network of people to contact. There is a lot involved with consulting now. It can be very difficult for the young or the inexperienced consultant to just jump into this position.

Q. ***So you recommend the IPs acquire hospital experience before trying the consultant route?***

A: Yes, the hospital experience is so valuable. We have many very experienced practitioners in long-term care, behavioral health and other settings, but the hospital experience gives the basic education. I think it's easier for the consultant to gain the knowledge if they are in the hospital setting. There are so many components to running a good hospital program; everything from knowing how to design and implement the policies and procedures to giving adult education — that's an entire expertise right there. You have to constantly be educating yourself about infectious diseases. And running a program, you have to know about budgets, about the capital expenditures and a lot of political stuff in your facility. It's a tremendous volume of information that comes out to the practitioners.

But there's just so much expertise you need to get into [consulting] that you need a really strong background. And I think a hospital provides that a little bit better than any of the other settings because you have the disinfection and sterilization people, the microbiology lab, the medical staff — a network of people who are experts in their fields. In many hospitals, you have people that can really help you — diabetes educators, wound therapists, all sorts of people.

Q. ***You mentioned you missed the people in the hospital, can consulting be kind of isolating?***

A: "The big network [in the hospital] is everything from having someone to eat lunch with to having someone to bounce ideas off — having someone to help you guide your practice. No one knows all of the answers. That is the benefit — if someone goes into the consulting business — of being involved in their APIC chapter and with members in their region. It gives them someone to bounce ideas off. In consulting, it really helps to have a network of people that you can work with and learn from as you are helping to design a program or repair a program. But you really have to be a person who is able to work independently and a person that can drive yourself."

Well, at this stage of my life, I find that it is so much more enjoyable for me to work when I want to work. If I want to be busy 80 hours in a week, I can be. If I want to have my own life and take a few days off, I can, but I'm still connected by phone and Internet. I guide the work I'm doing instead of the work guiding and controlling my life. I think that's the benefit. I am independent. I can make adjustments from day to day. If my granddaughter needs me, I can be there.

Q. ***Is that the primary benefit of consulting — autonomy?***

A: Well, at this stage of my life, I find that it is so much more enjoyable for me to work when I want to work. If I want to be busy 80 hours in a week, I can be. If I want to have my own life and take a few days off, I can, but I'm still connected by phone and Internet. I guide the work I'm doing instead of the work guiding and controlling my life. I think that's the benefit. I am independent. I can make adjustments from day to day. If my granddaughter needs me, I can be there. I feel like I'm in control from day to day. Those are the great things about it.

And that's what the younger or inexperienced IPs see. They see all of the benefits, but there are a lot of other issues that go with it — and a lot of them are financial. You may not be busy, you could go for weeks without a job, so you've got to have a comfortable financial capital base to support you. But there are a lot of benefits. For me personally, at this stage of my career, I'm really enjoying it. ■