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Bioterrorism fears put ICPs front and center following WTC, Pentagon attacks

Terrorists could strike again: Are you ready?

On the heels of the vicious terrorist attacks of Sept. 11, 2001, and a harrowing succession of bioterrorism events involving anthrax, infection control professionals find themselves front and center in America's new war.

In particular, the unfolding anthrax investigations and mailings underscore that bioterrorism is

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COMING IN FUTURE ISSUES

Testing, testing: Is it time to screen admissions for MRSA and VRE?

Innovation award winners: 'Latex Lucy' warns of allergic reactions

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Emerging infections: Updates from the international meeting in Atlanta

no longer a theoretical concern. **(See *Bioterrorism Watch* supplement inserted in this issue.)**

While many ICPs have been warning about the threat of bioterrorism long before recent events, they are now less likely to have their voices ignored or their efforts unfunded.

"I have heard the frustrations that [bioterrorism planning] has not been given as high a priority as other things," says **Ellen Gursky,** ScD, senior fellow and bioterrorism expert at the Center for Civilian Biodefense Studies at Johns Hopkins University in Baltimore.

"That has all changed. I think there will be a lot more [federal] money, and we need to determine the best ways of using those dollars. Very definitely some of that money has to be used to help hospitals with their capacity to handle a large-scale disaster event," she says.

Indeed, groups such as the American Hospital Association in Chicago have argued that overly regulated and fiscally strapped hospitals have no money to prepare for such an event. **(See *Hospital Infection Control*, March 2000; Feb. 2001, under archives at *www.HIConline.com*.)** In the wake of the attacks, the Joint Commission on Accreditation of Healthcare Organizations is asking Congress to earmark federal assistance for the nation's hospitals if it expects them to handle a bioterrorism event. **(See related story, 148.)**

Scholars from the biodefense center have been testifying regularly before Congress on bioterrorism issues, warning repeatedly that most hospitals are ill prepared to deal with an attack in their communities.

"We know that there are people who have these bioweapons," Gursky says. "They have the capability to manufacture and probably successfully use them. We have all had a wakeup call. It is likely that they are considering other opportunities to inflict mass harm."

But by the same token, bioterrorism preparedness will no doubt substantially increase nationwide, making a successful large-scale attack less likely than it was before Sept. 11.

"A lot of people now in the government are taking this [threat] very, very seriously," Gursky says.

"They have significantly ramped up surveillance, oversight, prevention procedures, and awareness. So while there may be a greater 'believability' that [bioterrorists] might try something, I think we are better prepared and more rigorous in our oversight to prevent it from happening," she adds.

"What all this has done is to create an environment where all of a sudden there is a very receptive audience in hospital administration and among other local medical entities for discussing bioterrorism and for concrete planning," says **Allan J. Morrison Jr.**, MD, MSc, FACP, a bioterrorism expert and health care epidemiologist for the Inova Health System in Washington, DC. "Previously, it may have been pushed off as a lesser priority given the constraints of health care in the current economy."

APIC issues preparedness plans

To guide in such preparations, the Association for Professionals in Infection Control and Epidemiology (APIC) in Washington, DC, is urging ICPs to review its disaster readiness checklist and its overall bioterrorism preparedness plan. **(See highlights, p. 147.)**

"Everybody ought to go through it and seriously deal with all of the issues on that list," says APIC President **Judith F. English**, RN, MSN, CIC. "Now. The sooner the better. The list will help [ICPs] integrate what they do into the big picture. Communication will be everything."

In addition to bioterrorism preparedness, the checklist can help facilities prepare for chemical attacks and natural disasters, she says. The lead author of many of APIC's bioterrorism plans, English is an ICP at the National Naval Medical Center in Bethesda, MD.

The new emphasis on bioterrorism preparedness must include the critical component of protecting health care workers and their families, she says. Health care workers trying to treat hundreds of incoming infected patients would face a risk akin to firefighters and policemen who lost their lives trying to aid victims at the World Trade Center in New York City, she adds.

"They were just as victimized as the people in the buildings at that point," she says. "Health care providers need to be given assurances that they and their loved ones will be given appropriate antibiotics and preventive prophylaxis and therapy so they will show up for work. That is a very serious concern."

Asked about the anthrax cases, English somberly reminded that one man already has died, calling the situation "a tragedy."

For those who witnessed the recent carnage, bioterror threats can scarcely approach the horror they already have experienced. **Peggy Fracaro**, RN, MA, CIC, infection control director at Columbia Presbyterian Hospital in New York City, saw the second of the Twin Towers collapse while standing outside her facility with stunned co-workers. **(See related story, p. 146.)**

"I'm on 168th Street and Broadway, with a full view of downtown," she tells *Hospital Infection Control*. "What you see on television does not reflect the true devastation. You don't get that dimension of destruction."

If a wide-scale bioterror attack occurs, major metropolitan areas will be the likely targets, Morrison says. And as bad as the recent attacks on their cities were, both Morrison and Fracaro note that the toll of devastation could have been much worse. For example, emerging evidence suggests that the Washington, DC-bound plane that was brought down in Pennsylvania by heroic passengers likely was headed for another major target such as the Capitol or the White House.

"This breed of terrorists has no regard for human life," Morrison says. "But also they are very geared toward the symbolic aspects of the attack."

Likewise, had the Trade Center buildings fallen over rather than imploding, even New York could have seen a worse result, Fracaro adds. "You could have had a domino effect. Imagine what that would have done. You could have had miles of collapsed buildings. As awful as it was, the reality is it could have been worse. That's hard to imagine from what you see down there."

The end result is that as gruesome as the Sept. 11 attacks were, they did not really test the health care system in the same way as a large-scale biological event. By the same token, the scattershot anthrax mailing campaign that has followed is not likely to generate any great number of victims because the disease is not communicable.

The prime concern regarding hospital preparedness for bioterrorism is the ability to handle a mass surge of casualties and/or infected patients, Gursky says.

That scenario did not play out in the recent attacks because there were so many immediate deaths. A rapid assessment conducted by city health officials during the first 24 hours after the incident indicated that most emergency department visits were for minor injuries. Approximately 10% to 15% of emergency patients were admitted, but few deaths occurred in the hospitals. Hospital bed and staff capacity was adequate, the department reported. "What we learned from the 11th in terms of surge capacity was limited because of the high mortality rate," Gursky says.

Indeed, in the shocking aftermath of the attack, New York City hospitals rolled out their disaster plans, discharged noncritical patients and waited for an onslaught of injured. At most facilities, they never came.

"It became pretty clear early on that there were going to be many more deaths than patients to try and save," Fracaro says. "Even in [hospitals] that were much closer to the disaster, the wave of injuries was in those first hours, that first day, then it stopped. Just body parts, pulverized concrete and steel. Devastating."

In the immediate aftermath, New York health officials alerted hospital ICPs to begin looking for signs of a secondary bioterrorism attack as evidenced by clusters of patients with the classic symptoms. **(See box, p. 145.)**

"People in the emergency departments [EDs] were looking for any cluster of fever, sepsis, or respiratory illness," Fracaro says. "[State health] was telling us to be alert and get back to them if they had any kind of suspicion that patients were being admitted with those kinds of symptoms."

At the same time, Centers for Disease Control and Prevention epidemiologists began staking out EDs to look for signs or symptoms of bioterror infections. CDC Epidemic Intelligence Service officers were stationed at EDs in 15 sentinel hospitals distributed throughout the city's five boroughs. The efforts complemented an existing syndromic surveillance system that monitors 911 emergency calls.

"I think this was a prudent concern on the part of the city and the CDC," says **Mike Bell**, MD, medical epidemiologist in the CDC division of healthcare quality promotion. "We find it very unlikely, but it is not an impossibility. Rather then being caught flat-footed, it makes much more sense to be on the lookout."

In addition, the CDC mobilized to the site to get as much firsthand experience as possible with such a disaster. "Our main role was to gather information about what the impact was on individuals and on health care facilities following the attack," Bell says. "There is also a lot of work to look at the impact of the rescue efforts on the emergency workers and field working staff. You can imagine there is dust inhalation, trauma, and so on that occurs while you are trying to dig people out," he adds.

While nothing was found to indicate any biological agents were released in the immediate aftermath of Sept. 11, Bell says there will likely be a secondary wave of suffering of a different sort.

"I think the thing that we might well find is that the psychological impact will likely be prolonged and fairly extensive," he says. "I imagine that people are going to be seeking counseling and care for post-traumatic stress syndrome for some time to come."

As far as the likelihood of more bioterrorism events in the days and months ahead, it remains an unpredictable problem, he adds.

"The very nature of the problem is what makes it impossible to predict," Bell says. "What this does tell us is that there is a will to do damage. Whether it will be further incendiary attacks or whether it will be biological, I don't think there is any way to predict. The problem with terrorism is that it is a sporadic thing. Denominators and baseline rates don't mean anything. Then, if it happens, it's 100%." ■

DC attack: Anthrax rumors turned up 'pseudopatients'

Hospitals were on alert for bioterror before 11th

In a stark commentary on the state of the world, some hospitals in Washington, DC, had implemented syndromic surveillance for the commonly suspected bioterrorism agents days *before* a hijacked airliner struck the Pentagon on Sept. 11, 2001, *Hospital Infection Control* has learned.

Health care facilities were geared up because of threats circulating to disrupt an upcoming meeting of the International Monetary Fund (IMF), which cancelled its planned conference after the terrorist attacks on the 11th, says **Allan J. Morrison Jr.**, MD, MSc, FACP, a bioterrorism expert and health care epidemiologist for the Inova Health System in Washington, DC.

"Protests have become much more violent and disruptive," he says. "There were vows by members of organizations who commonly protest the IMF and the monetary policies to bring Washington to a standstill. That heightened the concern about a possible bioterrorism event to the extent that the syndromic surveillance was felt to be appropriate. So, those plans were already under way."

Thus before and after the attacks, participating hospitals in Washington were on a bioterror alert

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Treatment of Biological Agent Exposure

AGENT	CLINICAL SIGNS AND SYMPTOMS	TREATMENT	OTHER	SECONDARY TRANSMISSION
Anthrax (spore)	Fever, malaise, non-productive cough, progressing to dypsnea, stridor, shock. Incubation 1-6 days.	Prophylaxis/treatment: ciprofloxin, doxycycline, PCN licensed vaccine. IV therapy: ciprofloxin doxycycline, PCN licensed vaccine.	High mortality (>90%) even with treatment.	None except aerosolized body fluids.
Pneumonic Plague (bacteria)	High fever, chills, headache, hemophysis, toxemia, dyspnea, stridor, bleeding diathesis. Incubation 2-3 days.	Prophylaxis/treatment: vaccine, doxycycline, TMP/sulfamethoxazole. IV therapy: streptomycin (>1 yo), gentamicin, chloramphenicol.	Antibiotic treatment effective if begun early.	Strict isolation needed. Isolation mandatory for at least the first 48 hours of treatment.
Tularemia (bacteria)	Regional lymphademepathy, fever, chills, headache, malaise, cutaneous ulcers. Incubation 2-10 days.	Streptomycin, gentamicin. Adult prophylaxis: doxycycline.	Low mortality (about 5%).	Rare, body fluid precautions only.
Q Fever (bacteria)	Fever, cough, pleuritic chest pain. Incubation 10+ days.	Tetracycline, doxycycline.	Low mortality.	Does not require universal precautions.
Smallpox (virus)	Malaise, fever, rigors, vomiting, headache, backache; 2-3 days later lesions appear and quickly progress from macules to papules to pustular vesicles. Incubation 16-17 days.	Supportive — vaccine available from CDC. Immune globulin may be available from CDC. No antiviral medication available.	Supposed to be extinct (doubtful).	Highly contagious.
Viral Equine Encephalitis	Supportive. No antiviral medication exists.	Ribaviron, supportive care.	Isolate patients in single room with an adjoining anteroom stocked with PPE. Negative air pressure if possible.	Body fluids. Otherwise infectious by vector (mosquitoes).
Viral Hemorrhagic Fevers	Fever, malaise, myalgias, headache, vomiting, diarrhea, easy bleeding, petechiae, shock.	Ribaviron, intensive care, convalescent plasma (Argentine HF), vaccine (yellow fever), blood replacement products for DIC.	Decontaminate with hypochlorite or phenolic disinfectants.	Transmitted by bodily fluids. Strict barrier-nursing techniques. Limit patient transfers: may increase risk for secondary transmission.
Botulism (toxin)	Ptosis, weakness, dizziness, dry mouth, blurred vision, diplopia, descending paralysis. Incubation 24-36 hours.	Several antitoxins are available and effective if administered early. CDC vaccine good only for A and B.	Disinfect with hypochlorite and/or soap and water. Supportive long-term mechanical ventilation.	None.
Ricin (toxin)	Weakness, fever, cough, pulmonary edema, incubation 18-24 hours.	Supportive — oxygenation and hydration. No antitoxin or vaccine available.	Disinfect with hypochlorite and/or soap and water.	None. Derived from caster beans.
Staphylococcal Enterotoxin B (toxin)	Fever, headache, chills, myalgias, cough, nausea, vomiting, diarrhea. Incubation 3-12 hours.	Supportive — oxygenation and hydration. Ventilator support may be required.	Disinfect with hypochlorite. Most victims recover.	Use PPE.

Source: Robert Suter, DO, MHA, FACEP, Questcare Emergency Services, Plano, TX.

along with health departments, clinics, emergency departments, urgent care centers, and sentinel primary care physicians, he says.

"There was also an increased linkage with a regional medical examiner's office because autopsy findings could be a sentinel event," Morrison adds.

The Inova Health System is comprised of four hospitals in the District of Columbia area, including one in Alexandria, VA, that received some of the Pentagon victims. "As the epidemiologist for the health system, I was in my office when the first reports came over," Morrison says. "We had just come back from an infectious disease section meeting at Fairfax Hospital."

Immediately after the attack, the hospital put disaster plans in place that included rapid discharge of patients to free up beds for potential causalities. Unaware of what they might be dealing with, Morrison and colleagues determined how many negative and positive pressure isolation rooms were available in the hospital system.

"We did an infrastructure resource review in case of a hemorrhagic virus or, God forbid, smallpox," he says. "Early on, there were rumored reports that there had been anthrax released [at the Pentagon]."

The result of that rumor was an influx of "pseudopatients," he says. "People who were down in that area — because of the smoke and dust and rumors about a biologic release — presented to be evaluated for health care fearing that they had been exposed to a biologic [pathogen]." Morrison says. "This happened in Japan with the sarin [gas] release in the subway. You have a lot of real patients and then you get pseudopatients. They tend to outnumber the actual patients by a factor of about two to one or three to one."

Those patients were more in need of mental health care, chaplain services, and general emotional support, he says. "They are patients, but they are not [physically] sick. They have tremendous angst. Having said that, they are still a burden to the health care system trying to provide care for the real patients."

All measures went smoothly, but Morrison is far from convinced that the city is ready to deal with a bioterrorism event. "The caveat is that we didn't have the pressure of hundreds or thousands of people presenting at our doors," he says.

"We had the concern that it might be true, but not the actual event. It was physical disaster, not a biologic disaster," he points out. "I don't want to take too much comfort in the orderliness that took place, because I am not convinced that we are at the place we need to be." ■

ICP eyewitness to day of infamy

'There was this sense that we had been attacked'

The morning of Sept. 11, 2001, began as "a magnificent late-summer, early-fall day," recalls **Peggy Fracaro**, RN, MA, CIC, infection control director at Columbia Presbyterian Medical Center in New York City.

That morning she was in her office, having arrived to work before the first attack began. The hospital is located at 168th Street and Broadway, with a clear view of downtown. "We heard in my office that a plane had gone into the World Trade Center," she recalls. "Everyone thought it was not a commercial plane but just a plane that got lost. It was crystal clear here."

A radio had been turned on, and then word came that a second plane appeared to have deliberately crashed into the other tower.

"There was this sense that we had been attacked. We looked out our offices because you can see the Hudson River and the George Washington Bridge," Fracaro says. "One of my concerns was that the bridge was next. If they wanted to isolate Manhattan, that would be a place they would [target]." She called the safety department to see if disaster plans were going into affect. Shortly thereafter, the announcement was made that the hospital was in disaster mode.

"We discharged patients, cancelled all elective surgery, readied the emergency department, and called everybody back to work," Fracaro says. "We were told to stay for the duration."

As the wait for the wounded began, Fracaro joined other health care workers on a connecting bridge off the 11th floor with a good view of downtown. "We looked out and saw the cloud, which was extremely visible, then you could see the second building go down. You could see just the cloud, but the cloud increased, the cloud just expanded and got much darker. There were a lot of hospital people up there looking, just dumbfounded."

Expecting an onslaught of patients, Fracaro was

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Answers to These Questions Will Reveal Facility's Readiness

The Association for Professionals in Infection Control and Epidemiology in Washington, DC, has issued a bioterrorism/disaster preparedness checklist for infection control professionals to assess their facility's readiness. The checklist includes the following key questions:

IDENTIFICATION OF AUTHORIZED PERSONNEL

A. Is there an individual designated as a disaster coordinator on a 24-hour-per-day basis?
B. Has the hospital/health care facility designated a medical commander who will be responsible for the hospital's medical responses during the time the plan is activated?
C. Have other key position holders who have a role in disaster management been identified?

RESPONSE

A. Has the hospital/health care facility developed internal plans for internal emergencies?
B. Has the hospital/health care facility developed internal plans to respond to an external disaster? Does this plan indicate how the hospital will respond to an abnormally large influx of patients?
C. Has the hospital/health care facility developed plans indicating how the hospital will be able to supply resources and personnel in response to an external disaster?
D. Have provisions been made for activating a hospital disaster medical team in response to both internal and external disasters?
E. Does the plan include procedures for incorporating and managing volunteers and unexpected medical services responders who want to help?
F. Has each department developed standard operating procedures to reflect how the department will continue to provide services in a timely and 24-hour manner?
G. In the Emergency Department (ED) section of the plan, are the following detailed?
   1. Is there a separate entry to the ED for contaminated patients?
   2. Is there a dedicated facility, area, or portable device for decontamination?
   3. Is there a hot and cold water supply to the decontamination area?
   4. Can water runoff from the decontamination area be contained?
   5. Can the ventilation system in the ED be isolated from the rest of the facility?
   6. Is a communication method established within the ED so communication can be established and maintained with the local emergency medical services agencies, Emergency Management Agency, Federal Bureau of Investigation, and the local health department?

RECEPTION OF CASUALTIES AND VICTIMS

A. Is there a precise plan of action whereby at short notice, multiple casualties can be received and: identified; triaged; registered; treated in designated treatment areas; admitted or transferred; transported as needed
B. In the confirmation notification of a disaster, does the plan provide for:
   1. Clearance of all nonemergency patients and visitors from the ED
   2. Cancellation of all elective admissions and elective surgery
   3. Determination of rapidly available or open beds
   4. Determination of space that can be converted to patient care areas
   5. Determination of number of patients who can be transferred or discharged
C. Has provision been made to secure traffic access to the ED and control the access to allow timely ambulance turnaround?
D. Is the receiving and sorting area accessible and in close proximity to the areas of the hospital in which definitive care will be given?
E. Is the reception area equipped with portable auxiliary power for illumination and other electrical equipment, or can power be supplied from hospital emergency power (generator) circuits?
F. Does the reception area allow for retention, segregation, and processing of incoming casualties?
G. Are sufficient equipment, supplies, and apparatus available, in an organized manner, to permit prompt and efficient casualty movement?
H. Can radiological monitors and radiation detection instruments be assigned to the area, if required?
I. Has provision been made for a large influx of casualties to include such factors as:
   1. Bed arrangements
   2. Personnel requirements
   3. Extra resources such as interpretive services, linen, pharmaceutical needs, dressings, etc.
J. Are the medical records and admission departments organized to handle an influx of casualties?
K. Is there a system for retention and safekeeping of personal items removed from casualties?
L. Is there a plan to segregate/isolate disaster victims from the rest of the hospital if those victims are contaminated (e.g. hazardous materials)?

(Editor's note: The complete APIC checklist and other bioterrorism materials are available at http://www.apic.org/bioterror/.)

ready to assist in any way possible beyond her infection control expertise. "If we luckily had an influx of 2,000 people than we would have done some other kinds of duties," she says. "We were prepared to do that, whatever it would take. I've been out of patient care for a while, but I would have been pretty comfortable with transporting or feeding patients or doing some elementary kinds of stuff. We were ready, but I think that it was clear by late in the day that there were many more dead than [those] we could hope to save."

According to information from the hospital system's web site, 38 of the Trade Center victims sought care at Columbia Presbyterian and 117 patients were treated at its sister institution at New York Weill Cornell Medical Center. The next day, staff learned that three emergency medical technicians from the Cornell site were killed in the collapsing wreckage, she says.

"It was hard to concentrate," Fracaro says. "Meetings were cancelled and people were subdued. The phones were not ringing a lot. People were very sad. There was this big profound sense of loss, but a recognition that we had to do a job." Trauma counseling was provided for employees. But amid the devastation, a city's spirit shone through. "Fourteen hundred people lined up to give blood," she says. "That's what happened all over the city. It was very controlled chaos. I can't tell you how this city pulled together. It was just a remarkable feat. The fact is, I went home by subway that first night. I was able to actually take a subway and then a bus home in the middle of this disaster. That's pretty remarkable."

Fracaro lives downtown, on the East Side of Manhattan. "Later in the week, when the wind shifted you could smell what those [rescue workers] had been smelling. It was this acrid smell. It wafted up at night to cover Manhattan. There is nothing like the smell of that to make you feel that you were really there at ground zero." ■

JCAHO chief appeals for bioterror funding

A health care system that has seen economic forces steadily beat down its ability to meet peak demand situations now finds itself facing a real threat of bioterrorism, **Dennis O'Leary**, MD, president of the Joint Commission on Accreditation of Healthcare Organizations told members of Congress. Mixing a call for more government funding with the "stark realities" of the current health care system, O'Leary set out a series recommendations Oct. 10, 2001, at a special hearing on bioterrorism by the Subcommittee on Oversight and Investigations of the House Committee on Energy and Commerce.

"For more than two decades, public policymakers have taken clear steps to reduce excess delivery system capacity [and] hospital beds," he said. "During this time many emergency departments and satellite clinics have closed. But we are entering a new era that requires a re-examination of fiscal public policy on emergency preparedness."

"Resource commitments" at the federal, state, and local levels are essential to any effective bioterrorism response capacity, he said.

"Some people believe that the health care delivery system — if faced with a bioterrorism event — will somehow be able to accommodate the thousands of ill, injured, and worried who will seek health care in that situation," he said. "The unfortunate truth is that we have much to do before such a belief can be fulfilled. This is not intended as an alarmist statement, but there are some stark realities that must be faced about the current [readiness]."

For example, victims of a virulent pathogen could pose risk to physicians, nurses, and other staff, and thus limit the availability of critical medical personnel, he said. "Under such circumstances, it may be prudent to keep the hospital free from contamination by setting up off-campus isolation units and treatment modalities outside of the hospital that are overseen by properly protected staff," he said. "This would permit the hospital itself to remain a safe haven for management of other injuries and illnesses."

Medical personnel must also become knowledgeable about routes of transmission, the vectors for various biologic agents, and the effective therapeutic approaches to these agents, he added.

"The reality is that most physicians would not recognize a case of anthrax, tularemia, or smallpox that presented to them in the emergency department or in their office," O'Leary said. "Nor would they know what kinds of specimens to collect for testing, how to handle such specimens, or which clinical laboratories possess the expertise to detect some of the rare agents that could be used by terrorists. Such education is essential to a prompt response to any bioterrorism attack."

While the Joint Commission has always required

some level of disaster planning, it has recently moved to broaden the ability of individual health care organizations to deal with rare events, he said. This was in response to the threat of bioterrorism as well as the growing threat of emerging infections across the globe. "Regardless of the source of the threat, readiness for managing biological events has certain common elements."

New standards, effective January 2001, require accredited organizations to take an "all hazards approach" to planning: Organizations must develop emergency management plans with a chain-of-command approach that is common to all hazards deemed to be credible threats — an approach that also can be easily integrated into their community's emergency response structure, he said. "Hospitals must start this aspect of planning by considering a wide variety of threats that could befall their community, including terrorism," O'Leary said. "While this vulnerability analysis is obviously important, the abilities of the individual organizations, and indeed of communities, to prepare for and respond to the full array of potential threats are seriously constrained by the major cost restraints in most health care organizations." ■

ICPs whap pneumonia to claim first prize

(Editor's note: The following describes the winning entry for the patient safety category in our 2001 Infection Control Innovation Awards. ***The story on p. 151*** *describes the innovations that won second place and honorable mention. Look for reports on the other winning categories in upcoming issues.)*

Our *2001 Infection Control Innovation Awards* winning innovation in the protecting patients category has a title suggestive of a slap in the face: "WHAP VAP!" But as a result of this comprehensive educational campaign, many patients could be saying, "Thanks. I needed that." The acronyms translate to a prevention approach to a costly, serious infection, ventilator-associated pneumonia (VAP). The whap stands for: *Wean* the patient; *Hand* washing; *Aspiration* precautions; *Prevent* contamination.

The campaign was developed by **Teresa Garrison**, RN, MSN, CIC, an ICP, and colleagues at Barnes-Jewish Hospital in St. Louis. The multidisciplinary education program is designed to improve infection control practices and reduce risk of infection in the mechanically ventilated intensive care patient. Bottom line: The intervention resulted in a 47% reduction in VAP infections and saved $582,270 over three-quarters of a year. "This cost saving alone is almost the entire annual budget for the infection control department."

The facility has six intensive care units [ICUs] totaling 101 beds. In 1998, the infection control department focused surveillance on ventilator-associated pneumonia (VAP) in the ICUs. They found that a single VAP resulted in additional hospitalization for six days and added $8,330 in costs. To lower VAP rates and associated costs, they created a self-study booklet and pre-/ post-test for documenting competency. The educational content was supported by a series of fact sheets and a poster highlighting key points of the WHAP VAP! campaign.

All respiratory therapists and ICU nursing staff were offered the educational module. Although nursing compliance varied unit to unit, 100% of the respiratory therapists completed the module and testing. The intervention took place July to September 2000. Results were measured at the end of March 2001, showing a clear cost impact. Excess cost of VAP prior to the intervention was $1.26 million, which dropped 46% ($582,270) to $683,060. Providing feedback to the staff about infection rates, excess length of stay, and cost factors helped them realize the impact of poor clinical outcomes for the patient and the facility, Garrison says. "A successfully decreased VAP infection rate in our ICUs excited the nursing and respiratory staff and has lowered their tolerance for infections," she adds. "They remind each other about the rates and infection control practices. The success also has resulted in stronger partnerships and more requests for infection control's assistance with other types of infections. We are seen as part of their team and not the hand-washing police." ■

Whapping pneumonia by reducing patient risk

These recommendations to reduce ventilator-associated pneumonia (VAP) are from educational handouts developed for the WHAP VAP! program at Barnes-Jewish Hospital in St. Louis:

Risk Factors

➜ Age: Infants, young children, people over 65

➜ Disease: People with chronic disease,

immunosuppressed, depressed level of consciousness, and cardiothoracic patients
- ➜ Position: Lying flat in bed
- ➜ Ventilation: Prolonged ventilation, reintubation
- ➜ Nasal intubation associated with sinusitis, VAP
- ➜ Gastric overdistention
- ➜ Inadequate pressure in endotracheal-tube cuff
- ➜ Collection of condensate in ventilator circuits or improper drainage of condensate
- ➜ Routine changing of ventilator circuits (tubing)
- ➜ Nonspecific antibiotic therapy or use of multiple antibiotics
- ➜ Stress ulcer treatment
- ➜ Nasogastric (NG) tubes promote gastric reflux and aspiration of contaminated secretions into the lower airway

VAP Causes

- ➜ Contaminated hands of health care workers
- ➜ Colonization of the aero-digestive tract
- ➜ Contaminated respiratory equipment
- ➜ Aspiration of contaminated secretions into the lower airway. These bacteria thrive in warm moist environments, such as respiratory therapy equipment.

Decreasing the Risk to Patients

The primary intervention associated with preventing all nosocomial infections is hand washing. Meticulous infection control practices related to respiratory care services also are essential to preventing VAP. The following recommendations are for all ventilated patients:

- ➜ Wash hands before / after patient or ventilator contact; the primary intervention for preventing nosocomial infections is hand washing.
- ➜ Do not change ventilator circuits and in-line suction catheters unless visibly soiled or malfunctioning.
- ➜ Do not use HMEs for patients with excessive secretions or hemoptysis (be sure to provide alternative form of humidification).
- ➜ Change HME every 24 hours.
- ➜ Maintain adequate ventilation and cuff pressure.
- ➜ Drain ventilator circuit condensate before repositioning patient.
- ➜ Place ventilated patients in semi-recumbent position with head of bed elevated 30 degrees, as tolerated, even during transport.
- ➜ Avoid nasal intubation.
- ➜ Adequately secure endotracheal tube and / or restrain the patient to prevent accidental self-extubation.
- ➜ Monitor gastric residual volumes before initiating feedings to avoid gastric overdistention (residual maximum < or equal to 200 cc).

CE/CME questions

17. Judith F. English, RN, MSN, CIC , president of the Association for Professionals in Infection Control and Epidemiology, said the new emphasis on bioterrorism preparedness must include the critical component of:
    A. moving now to contact precautions for all patients
    B. designating sports stadiums for victims to protect hospitals
    C. protecting health cares workers and their families
    D. all of the above

18. Some hospitals in Washington, DC, had implemented syndromic surveillance for the commonly suspected bioterrorism agents days before a hijacked airliner struck the Pentagon on Sept. 11, 2001. Why?
    A. an upcoming meeting of International Monetary Fund
    B. drills were planned one year ago
    C. a miscommunication among city health officials
    D. none of the above

19. Teresa Garrison, RN, MSN, CIC, an ICP, and her colleagues at Barnes-Jewish Hospital in St. Louis developed a catchy acronym to combat a costly and serious infection. What was the program's slogan?
    A. Battle Cry Against BSI
    B. WHAP VAP!
    C. VRE is History
    D. You Can Make a *C. diff*-erence

20. Darcy Koch, RN, ICP and colleagues at Jefferson Memorial Hospital in Crystal City, Mo, made a video that showed correct infection control procedures during patient interactions.
    A. true
    B. false

- ➜ Drain condensate from ventilator circuits regularly using appropriate technique to avoid contamination of circuit.
- ➜ Avoid overuse of multiple antibiotics.
- ➜ Limit stress ulcer treatment if possible.
- ➜ Use daily chlorhexidine oral rinse (only for patients undergoing cardiac surgery).
- ➜ Provide immunizations (Influenza, Pneumococcal, *Haemophilus* B vaccines).
- ➜ Remove NG tubes as soon as possible.
- ➜ Extubate patient as soon as clinically indicated.

Teaching right by showing wrong

While these ICPs may have no future on the big screen, their "homemade" video captured common infection control mistakes with the accuracy of a Meryl Streep accent.

Taking second place in the protecting patients category of our *2001 Infection Control Innovation Awards* contest is **Darcy Koch**, RN, ICP at Jefferson Memorial Hospital in Crystal City, MO. The video showed Koch and fellow actors leaving rooms with gloves on, letting transported patients cough freely in the halls, and practicing a conspicuous lack of hand washing. "More and more, we were seeing health care workers forgetting the basics," she says. "Our employees were becoming so overly concerned with getting the correct isolation ordered or following precautions in those rooms only. My partner and I set out to reeducate but felt we were falling on deaf ears. We needed a new approach."

Thus began the "Back to the Basics" campaign. The hospital marketing department was completely booked up so they grabbed a camcorder and did their best *General Hospital* dramatics. The idea was to keep them "entertained, talking, and exchanging questions and concerns," Koch says. The video consists of seven short skits that displayed poor infection control practices. "We paused the VCR throughout, allowing time for them to find [mistakes] and discuss them. The clincher was at the end. After much disbelief of what the nurses were doing in the video, we told them that the issues were taken directly from our top 30 surveillance findings in-house. That was a big eye opener."

Clinical consequences include lower rates of important pathogens, including methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant enterococcus, she reports. "Administration has now agreed to back another video for us, this time using professional equipment."

Honorable mention in the same category was a storage innovation designed by **Lanette Rhodes**, RN, ICP, and colleagues at Winchester (VA) Medical Center. As antibiotic resistance increases, there is an increased need for hospital isolation compliance. But bulky isolation supplies often are located in patients' rooms, hall isolation carts, and boxes cluttering hallways and posing fire, logistic, and regulatory problems. The innovation began with a linen sheet prototype with four pockets: two for isolation gowns, one for masks, one for regulated medical waste bags, and one for linen isolation tags and waterless hand cleaner. The caddy can be folded with the items secured in the pockets. The folded bag can be secured with a loop and ties to the patients' door. Christmas wreath hangers were used to secure the bags. The heavy-duty hangers held the weight of the caddy and the contents and allowed the door to close securely. The caddies are now used for storage of isolation supplies for patients in contact and enteric isolation. ■

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CE objectives

After reading each issue of *Hospital Infection Control*, the infection control professional will be able to do the following:

- identify the particular clinical, legal, or educational issue related to epidemiology;
- describe how the issue affects nurses, hospitals, or the health care industry in general;
- cite solutions to the problems associated with those issues, based on guidelines from the federal Centers for Disease Control and Prevention or other authorities, and/or based on independent recommendations from clinicians at individual institutions. ■

BIOTERRORISM WATCH

Preparing for and responding to biological, chemical and natural disasters

Clinicians must be voice of reason, reassurance now that bioterrorism battle has been joined

The threat is real, but we are far from defenseless

A new era of bioterrorism has begun with the intentional anthrax scares that have left several people dead and many more exposed as this issue went to press.

But amid the shrill coverage of the widening anthrax investigations, the scramble for gas masks and the expected hoarding of Cipro, there must be a voice of calm and reason. That voice must be your own.

Infection control professionals, hospital epidemiologists, and other key clinicians involved in health care bioterrorism readiness and response must set the tone for a panicky public and an uneasy health care work force, emphasizes veteran epidemiologist **William Schaffner**, MD, chairman of preventive medicine at Vanderbilt University School of Medicine in Nashville.

"We have to re-instill a sense of confidence for people who work in the health care system," he says. "Start with the doctors. They are the ones who are going to be more panicked than the nurses."

Restoring calm to health care community

The current situation is reminiscent of the early stages of the HIV epidemic, when there was much anxiety about the communicability of the disease and whether even casual contact would spell a death sentence for health care workers.

In that chilling time of alarmist reactions and burning mattresses, Schaffner recalls that ICPs, epidemiologists, and other clinicians, stepped into the fray to provide calming confidence and accurate risk data.

"I'm beginning to think that we may be in a similar position now," he says. "We could have a very powerful educational and reassuring effect. Everybody's anxious about this, but I think we can diminish the level of anxiety," Schaffner adds.

Infection control methods in place

Health care workers must be educated about bioterrorism agents and provided reassurance that the patient isolation precautions developed by the Centers for Disease Control and Prevention (CDC) are extremely effective, urges Schaffner.[1]

"The barrier precautions are going to work for bioterrorism. Once you get to chemical [weapons] then you get into the whole 'moon suit' issue. But for bioterrorism, we don't need that," he says.

For example, systems of barrier precautions such as gloves, gowns, and masks to isolate patients infected with all manner of infectious diseases are already in place in virtually all U.S. hospitals.

"They work," he says. "Look, we all know pulmonary tuberculosis is communicable. I'm an infectious disease doctor, have been for 30 years. I've seen a lot of patients with tuberculosis, but I have also been meticulous about my use of [face masks and respirators]. My tuberculin test continues to be negative."

This supplement was prepared by Gary Evans, editor of *Hospital Infection Control*. Telephone: (706) 742-2515. E-mail: gary.evans@ahcpub.com.

A Bioterrorism Time Line

1155 Barbarossa uses the bodies of dead soldiers to poison the wells at the battle of Tortona.

1346 Mongols catapult corpses of plague victims into the city of Kaffa to infect the defenders.

1763 British commander Sir Jeffrey Amherst ordered the transfers of blankets used by British smallpox victims to Native American tribes, ostensibly as a gesture of goodwill, with the intention of inducing illness.

1970 The United States ends its programs of developing biological agents for use in warfare. The offensive use of such weapons was forbidden by U.S. policy under executive orders of President Richard Nixon.

1972 Soviet Union signs off on Biological and Toxin Weapons Convention, but continues a high-intensity program to develop and produce biological weapons at least through the early 1990s. Hundreds of tons of weaponized anthrax spores are stockpiled, along with dozens of tons of smallpox and plague. Many of these agents are reputed to have been specifically designed to be resistant to common antibiotics.

1984 Members of the Rajneesh cult contaminated salad bars in Oregon with salmonella, resulting in the infection of 751 people. The Paris Police raided a residence suspected of being a safe house for the German Red Army Faction. During the search, they found documentation and a bathtub filled with flasks containing *Clostridium Botulinum.*

1990s Japan's Aum Shinrykyo cult plans attacks using biological agents, specifically, anthrax and botulinum toxin. While these biological attacks were not successful, cult members later implemented the release of sarin nerve gas in the Tokyo subway system.

1995 A U.S. microbiologist with right-wing ties orders bubonic plague cultures by mail. The ease with which he obtained these cultures prompts new legislation to ensure that biologic materials are destined for legitimate medical and scientific purposes.

1998 A variety of feigned exposures to anthrax spores occurred in several U.S. cities including Indianapolis, where a full-scale response by emergency services and public health occurred before the episode was found to be a hoax.

Sources

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2. Bosker G. Bioterrorism: An update for clinicians, pharmacists, and emergency management planners. *Emergency Medicine Reports* (in press) 2001. ■

And anthrax, of course, is not communicable from person to person, reminds Schaffner, who investigated a case of occupational anthrax in an animal-hide worker when he was a epidemiologist for the CDC in the late 1960s.

"The bacteria do not cause a conventional pneumonia," he says. "They replicate locally and then release toxins. Because the bacteria never replicate to very high numbers the person is not communicable. It is not so much an infection as it is an intoxication."

Inordinate fear of anthrax could cause another problem — hoarding and misuse of Ciprofloxacin and other antibiotics. That tactic eventually could contribute to emerging resistance in pathogens such as *Streptococcus pneumoniae,* Schaffner notes.

"It is one thing for a hospital and the health department to develop an inventory in the event of an emergency," he says. "I do not recommend that individuals do that. I'm quite concerned that with antibiotics in their medicine cabinets there will be a temptation to just use it now and again for inadequate reasons in inadequate doses. If there was a recipe for antibiotic resistance — that's it."

More terror than toll

While the anthrax mailing campaign now under way sends out another shock wave with every news report, the tactic will likely result in more terror than actual toll. The rapid administration of antibiotics has offset illness following exposures, the disease is not communicable from those actually infected, and everyone is now on high alert for suspicious mailings.

Indeed, if the wave of anthrax mailings continues, postal-treatment technologies may become a growth industry.

Regardless, anthrax is problematic as a bioweapon because only a certain micron size of the inhaled spore will lodge in the upper lungs where it can release its toxins, says **Allan J. Morrison Jr.**, MD, MSc, FACP, a bioterrorism expert and health care epidemiologist for the Inova Health System in Washington, DC.

"If it is too large, it won't go in," says Morrison, a former member of the U.S. Army Special Forces. "If it's too small, it goes in and moves about freely without ever lodging. This is not as easy as getting a culture, growing it in your home, and the next day having infectious microbes.

"The sizing, preparation, and ability to deliver such a weapon are extremely difficult," he adds.

The Aum Shinrykyo cult in Tokyo attempted at least eight releases of anthrax or botulism during 1990 to 1995 without getting any casualties, he recalls. **(See time line, p. 2.)** Variables such as humidity can come into play, clumping up spores even if they are perfectly sized for inhalation. Anthrax spores bound for human targets are also at the whims of ultraviolet light, rain, and wind dispersal patterns, Morrison says.

"It is a very hostile climate for microbes on planet earth." Morrison says. "The intent may be widespread, but the ability to deliver weapons grade agents is going to be restricted to a very small subgroup. And even among them, they still will require optimal climatic conditions to carry it out. There will be causalities, as in war, but the distinction here is that there has not been widespread infection."

While anthrax is the current weapon of choice, the direst scenarios usually turn to the most feared weapon in the potential arsenal of bioterrorism: smallpox.

"Invariably, I have seen smallpox described as 'highly infectious,'" Schaffner says. "It's not. That is erroneous." For example, during the global eradication efforts in the 1960s, African natives infected with smallpox were often found living with extended families in huts, he adds. "It would usually take two to three incubation periods for smallpox to move through an extended family."

"It doesn't happen all it once. This was a critical concept in the strategy to eradicate smallpox. If you could find smallpox, you could vaccinate around that case and prevent further transmission. If it had been a frighteningly [rapid] communicable disease, that strategy would never have worked," Schaffner explains.

In addition, some medical observers question the certitude of the general consensus that all those vaccinated decades ago are again susceptible to smallpox. They argue that those immunized during the eradication campaign may at least have some greater protection against fatal infection.[2]

Regardless, rather than dropping like flies, as many as 70% of those infected with smallpox actually survive and then have lifelong immunity.

While there are many other agents to discuss and prevention plans to outline in the weeks and months ahead, perhaps the greatest protective factor is the unprecedented level of awareness in the health care system. The world has changed so much since Sept. 11th that hospitals are probably more prepared for bioterrorism than they have ever been. Everywhere, lines of communication have been opened with health departments and affiliated clinics, emergency plans have been reviewed and hot-button phone numbers posted on the wall.

"We're on alert," says **Fran Slater**, RN, MBA, CIC, CPHQ administrative director of performance improvement at Methodist Hospital in Houston. "We are *all* on alert."

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Should clinicians get smallpox vaccinations?

Questions arise, stockpile expansion fast-tracked

The recent decision to accelerate production of a new smallpox vaccine is raising the complex question of whether health care workers — front-line soldiers in the war against bioterrorism — should be immunized against the disease.

As opposed to the current anthrax attacks, a biological release of smallpox would result in incoming patients with an infectious disease. Even health care workers directly exposed to anthrax could be treated with ciprofloxacin and several other antibiotics, so the anthrax vaccine is not a likely candidate for health care.

On the other hand, legitimate questions have been raised about whether health care workers will stay on the job during a smallpox outbreak unless they and their families are rapidly vaccinated. The only known stocks of smallpox virus are held by the United States and Russia, but many bioterrorism experts have warned for years that another nation or group might have secret stocks.

"I think if smallpox [vaccine] became available, we should definitely immunize all the health care workers," says **Martin Evans**, MD, hospital epidemiologist at the University of Kentucky Chandler Medical Center in Lexington. "A lot of people think [health care workers] ought to

be high on the list because they are part of the response team if there was an outbreak in the community. Not to sound self-serving, but I think we ought to immunize the medical community."

But the question currently is somewhat moot because the Centers for Disease Control and Prevention (CDC) is not wavering from its established policy of mobilizing the available vaccine only if smallpox is released. "I'm sure CDC wants to conserve its current stocks for dealing with an outbreak so it could immunize contacts," Evans says. "If [the agency has] already used [its stock] by immunizing all the health care workers in the country, then it won't be able to respond."

15 million doses stockpiled

Currently, there are some 15 million doses of the old smallpox vaccine available, according to Secretary of Health and Human Services **Tommy Thompson,** who recently announced plans to accelerate production of a new smallpox vaccine. Forty million new doses of vaccine are expected to be available by mid-to-late 2002, moving the project up considerably from its original completion date of 2004 or 2005.

The manufacturer of the new vaccine is Acambis Inc. (formerly OraVax) — based in Cambridge, UK, and Cambridge and Canton, MA. The new vaccine will be a purified derivative of the same strain of cowpox virus (vaccinia) that was used in the United States previously, because the old vaccine's efficacy was clearly demonstrated by direct exposures to those infected. While the method of immunization through scarification will be essentially the same, the new vaccine will be produced in a mammalian cell culture that contains no animal protein.

Acambis stated on its web site that it would have no other comment on the project other than to confirm it has "accelerated" its production plans. But when the project was first announced in 2000, company officials said they had the ability to scale up production well beyond the requested 40 million doses. They were even scouting for other global markets. That means the capability to produce smallpox vaccine in abundance is on the horizon, and the question of immunizing health care workers will invariably arise. *Bioterrorism Watch* was unable to get a CDC response on the question as this issue went to press, but CDC director **Jeffrey Koplan**, MD, MPH, outlined the agency's position in an Oct. 2, 2001 Health Alert posted on a CDC web site.

"Smallpox vaccination is not recommended and, as you know, the vaccine is not available to health providers or the public," Koplan said. "In the absence of a confirmed case of smallpox anywhere in the world, there is no need to be vaccinated against smallpox. There also can be severe side effects to the smallpox vaccine, which is another reason we do not recommend vaccination. In the event of an outbreak, the CDC has clear guidelines to swiftly provide vaccine to people exposed to this disease. The vaccine is securely stored for use in the case of an outbreak."

One factor in favor of the CDC's position to rapidly deploy the vaccine — rather than do widespread vaccinations — is that immunization should still be effective several days after a smallpox exposure. In the smallpox global eradication campaign, epidemiologists found they could give vaccine two to three days after an exposure and still protect against the disease. Even at four and five days out, immunization might prevent death. Still, though the new vaccine will be improved in many ways, the hazards and risk factors of introducing cowpox into the human body are expected to be roughly the same as those documented with the old vaccine.

"We are looking at probably about one death per million primary vaccinations," says **D.A. Henderson**, MD, director of the Center for Civilian Biodefense Studies at Johns Hopkins University in Baltimore. "We are looking at one in 300,000 developing post-vaccinal encephalitis — an inflammation of the brain, which occasionally is fatal and sometimes can leave people permanently impaired."

Based on those estimates, if the new stockpile of 40 million doses is eventually rolled out, approximately 40 of those immunized will die, and another 133 will develop encephalitis. In addition to those severe outcomes, the arm lesion created during inoculation can be very large and painful, serving as a reservoir to self-inoculate the eyes or even infect immune-compromised patients.

The downside is real, but as more vaccine becomes available immunization will certainly be discussed at hospitals in previously targeted areas such as New York City and Washington, DC. If they are not immunized in advance, health care workers are going to want vaccine very quickly if they are expected to take care of smallpox patients, says **Allan J. Morrison Jr.**, MD, MSc, FACP, health care epidemiologist for the Inova Health System in Washington, DC. "Forget about smallpox patients. We're talking about taking care of any patients." ■

HOSPITAL INFECTION CONTROL®

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Aging IC work force faces economic uncertainty

Bioterrorism preparedness could strengthen profession

Infection control professionals come into this time of economic uncertainty as an entrenched but aging work force, cutting a broad band across the mid-five figure income bracket, according to the 2001 salary survey by *Hospital Infection Control*.

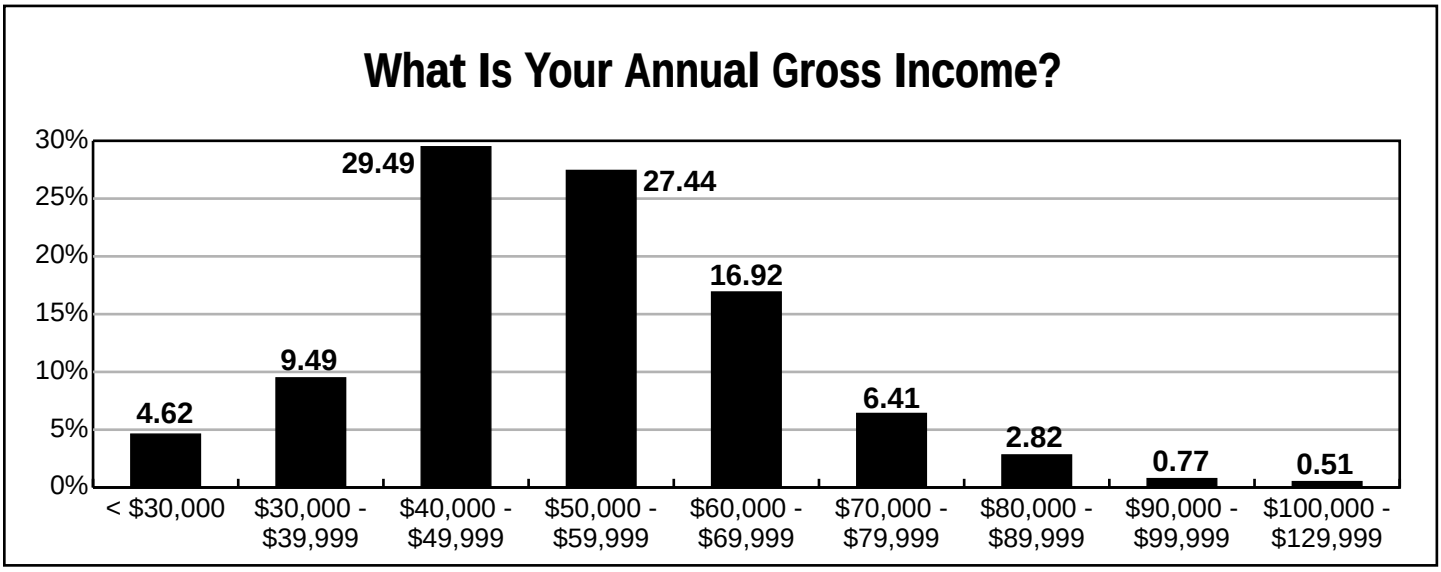
How broad is the band? Fifty-seven percent of survey respondents reported incomes in the range of $40,000 to $60,000. That breaks down to 30% in the range of $40,000 to $49,999, and 28% in the $50,000-$59,999 bracket. Another 17% reported incomes between $60,000 and $69,999.

Raises were steady but unremarkable over the last year, with 52% reporting wage hikes in the 1% to 3% range. Another 21% reported raises of 4% to 6%, and 6% reported raises of 7% to 10%.

The 2001 HIC survey showed an easing in past trends of department downsizing, as 83% of respondents reported their staffing was holding steady (66%) or had actually been increased (17%). That left 14% of departments reporting staff cuts, as opposed to 25% in the 2000 HIC salary survey. But the future, to say the least, is marked by uncertainty and challenge for the profession. All surveys were completed prior to September 11th and subsequent events.

Bioterror, patient safety critical for future

A key question — at a time when there are no easy answers — is whether ICPs can leverage the



nation's expected investment in bioterrorism readiness into professional recognition, job security, and wage growth.

"It could be a real important role, but there are a lot of players right now," says **Elaine Larson**, PhD, professor of pharmaceutical and therapeutic research at the University of Columbia School of Nursing in New York City. "If ICPs want a role, then they have to actively seek a role. [Other] people want it and are ready to jump in. My question is, is the infection control community ready to jump in?"

> *"As with the big patient safety initiative within the last few years, we have a niche to carve. Unless we are very active — and a lot of us are — I could see us being edged off to the side. But bioterrorism puts us right back in the bulls-eye."*

Don't get left behind

The theme of "go forward or risk being left behind" is somewhat similar to the patient safety movement, but — depending on unfolding events — the bioterrorism issue could dwarf patient safety in terms of health care investment.

ICPs are in a fairly strong position at the outset, as they are one of the few professional groups that have been actively discussing and planning for bioterrorism over the last several years. "We're an integral part in preparing for bioterrorism," says **Pamela Niemiec**, RN, infection control coordinator at Alexian Brothers Medical Center in Chicago. "But we're not the only part. We need to work as a multidisciplinary team with pharmacy, the EMS coordinator for safety and environmental services in disaster planning."

ICPs must raise their program profiles if they expect to emerge as key benefactors in national spending on health care bioterrorism preparedness, she says.

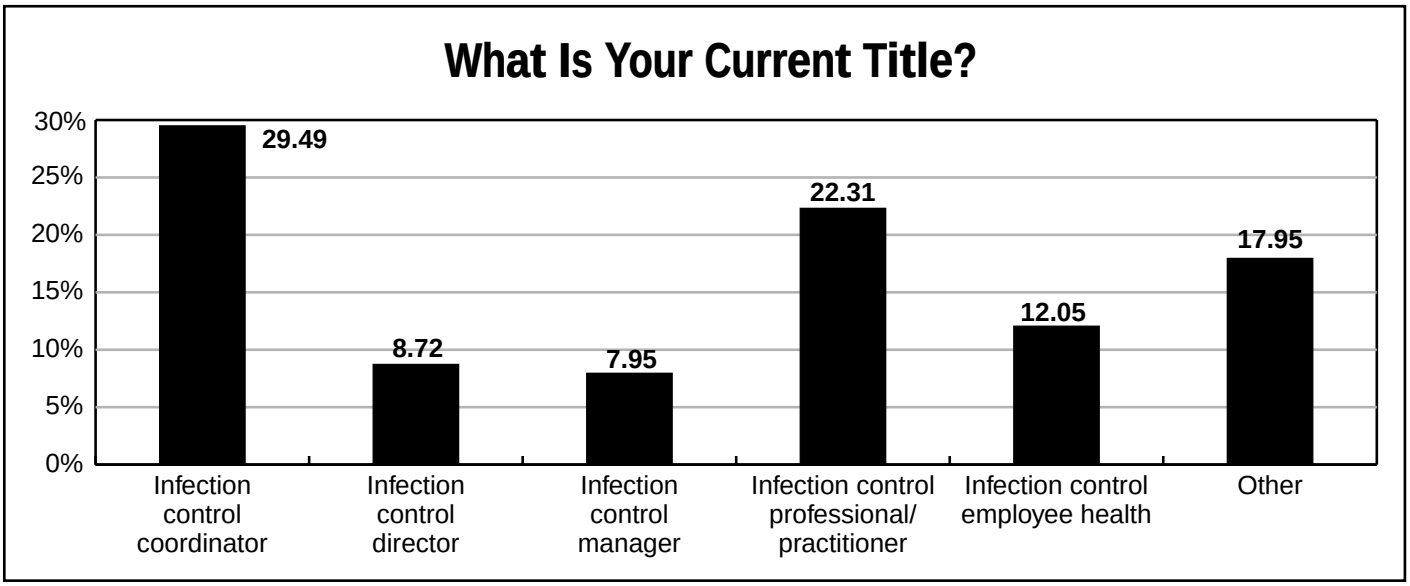
"As with the big patient safety initiative within the last few years, we have a niche to carve," Niemiec says. "Unless we are very active — and a lot of us are — I could see us being edged off to the side. But bioterrorism puts us right back in the bulls-eye."

A veteran of both the nursing field and infection control, Larson points to the emerging nursing labor shortage as another huge challenge.

Shortage of nurses is worsening

"There are predictions that we are going to be way, way under needs within the next five years," she says. "Already, hospitals are offering incentives to get nurses. The shortage is like a roller coaster; we go up and down. But the average age of nurses now is about 45 — a lot older than it has been previously."

According to the American Hospital Association in Chicago, there currently are about 126,000 vacant nursing positions in U.S. hospitals, a figure that could grow to 400,000 by 2020. Some of the commonly cited factors in the exodus from nursing are high job dissatisfaction due to managed care staffing cuts and rising in-patient acuity.



That situation, coupled with fewer students entering the field, is contributing to a trend that could leave hospitals severely understaffed to treat an aging population.

ICP recruiting key as pioneers depart

By the same token, as the industry tries to respond to the labor crunch, there will be jobs galore for nurses. According to the Bureau of Labor Statistics, employment of RNs is expected to grow faster than the average for all occupations through 2008.

There will be a need for traditional hospital nurses, but a large number of new jobs will be in home health, long-term care, and ambulatory care. That spells fierce competition between nursing professions looking to replenish their ranks.

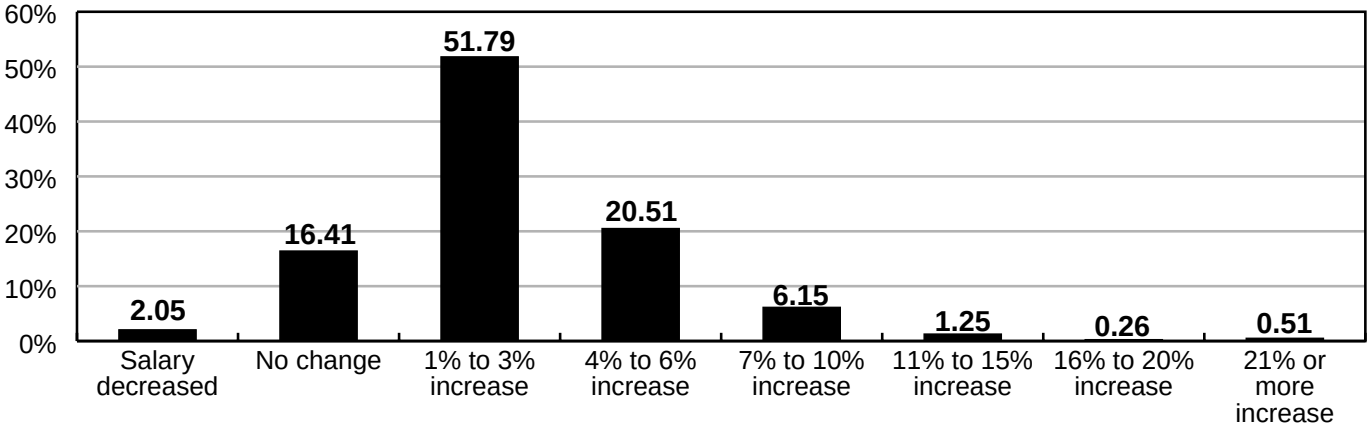
"The options for nurses are much greater," says Larson. "And that may have an impact on infection control."

Heading for retirement

New recruits will be needed. More than half of the ICPs responding to the *HIC* survey had been working in health care 25 years or more, and roughly two-thirds of respondents were between 41 and 55 years old.

"The profession has been around for 30 years

Has Your Income Increased or Decreased?



Salary by Region

West

Less than $30,000	5.00%
$30,000 to $39,999	5.00%
$40,000 to $49,999	40.0%
$50,000 to $59,999	30.0%
$60,000 to $69,999	15.0%
$70,000 to $79,999	5.00%

West Coast

Less than $30,000	6.25%
$30,000 to $39,999	6.25%
$40,000 to $49,999	3.13%
$50,000 to $59,999	12.5%
$60,000 to $69,999	40.6%
$70,000 to $79,999	12.5%
$80,000 to $89,999	6.25%
$90,000 to $99,999	9.38%
$100,000 to $129,999	3.13%

Midwest

Less than $30,000	9.09%
$30,000 to $39,999	10.0%
$40,000 to $49,999	34.5%
$50,000 to $59,999	30.0%
$60,000 to $69,999	10.0%
$70,000 to $79,999	4.55%
$100,000 to $129,999	1.82%

Northeast

Less than $30,000	2.17%
$30,000 to $39,000	9.78%
$40,000 to $49,999	20.6%
$50,000 to $59,999	30.4%
$60,000 to $69,999	19.6%
$70,000 to $79,999	9.78%
$80,000 to $89,999	6.52%
$100,000 to $129,999	1.09%

Southeast/Southwest

Less than $30,000	2.52%
$30,000 to $39,999	10.1%
$40,000 to $49,999	37.8%
$50,000 to $59,999	28.6%
$60,000 to $69,999	16.0%
$70,000 to $79,999	4.20%
$80,000 to $89,999	0.84%

now, and people who started out in it in their mid-30s are now retiring," says Niemiec.

If the infection control profession is to preserve its vitality, it must attract new recruits and move beyond the perception that it is a transition job for those weary of patient care, she adds.

"We have been the retirement home for staff nurses," she says. "I see us having problems with the nursing shortage as well, even though that is not the only pool we get people from. It certainty is the majority, but we also draw people who work in microbiology and laboratories."

If ICPs can hold key positions in patient safety and bioterrorism, the field could be attractive to clinicians considering careers in epidemiology and public health, she says.

"People who are thinking about public health are not necessarily thinking about the hospital infection control position as kind of integral," she says. "We have to market ourselves and show the role as being interesting. Anytime there are interns from MPH (master's in public health) programs or nursing staff who are interested, we need to take the time and offer internships or at least talk it up." ■