



# Hospital Infection Control & PREVENTION

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## IPs should prepare for Ebola, as cases increasing dramatically in West Africa

*WHO: 'Terribly disturbing' projections of thousands of cases*

**By Gary Evans, Executive Editor**

**T**he Ebola epidemic in Africa is rapidly overwhelming containment efforts, increasing the threat of spread to other countries and continents while giving the virus ample time to mutate as it burns through the human population in a jungled epicenter that borders three nations.

"The border of the three areas — where Guinea, Sierra Leone and Liberia meet — is a dense forested region with roughly about one million people in it," said **Tom Frieden**, MD, director of the Centers for Disease Control and Prevention. "That has been the epicenter, if you will, the crucible of this outbreak. That is where most of the cases have been, where it's continued to smolder and burn throughout all of these outbreaks, and where we believe it likely started."

In an urgent addition to the Ebola situation, federal public health officials recently issued a checklist for U.S. hospitals to prepare for incoming cases from the expanding outbreak in Africa. (*See related story, p. 100*)

Having just returned from the region, Frieden said the number of cases is increasing rapidly and it will now take a global response to stop the worst Ebola outbreak on record. "Everything I've seen suggests over the next few weeks it's likely to get worse," he said at a Sept. 2, 2014 press conference at the CDC. "We're likely to see significant increases in cases."

Indeed, an infectious disease strategic planner for the World Health Organization (WHO) recently told the BBC News in London that the current rate of some 500 new Ebola cases a week is increasing exponentially.<sup>1</sup>

"I've just projected about five weeks into the future and if current

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trends persist we would be seeing not hundreds of cases per week, but thousands of cases per week — that is terribly disturbing,” said **Christopher Dye**, FRS, FMedSci. “The situation is bad and we have to prepare for it getting worse.”

As of August 31 2014, 3,685 (probable, confirmed and suspected) Ebola cases and 1,841 deaths had been reported by the Ministries of Health of Guinea, Liberia and Sierra Leone, according to the WHO. In Nigeria, there have been 21 cases and 7 deaths while in Senegal, one case has been confirmed and there have been no Ebola deaths or further suspected cases. The involvement of more countries is particularly concerning, as international air travel routes and connections could eventually disperse asymptomatic passengers traveling during an incubation period that can last up to three weeks.

In what appears to be an incredible case of bad luck — given the heretofore relatively rare occurrence of Ebola — an unrelated outbreak has also erupted in the Democratic Republic of the Congo (DRC), where runs the eponymous Ebola River. A total of 24 suspected cases of Ebola, including 13 deaths, have been identified and linked to that outbreak, which is occurring in central Africa where Ebola was first detected in 1976. The Congo outbreak has been traced to a single person who became infected after preparing bush meat for consumption. The outbreak in West Africa is

thought to have begun when a toddler became infected by handling a fruit bat, one of the known wild reservoirs for the virus. The Congo virus is also of the Zaire species, but its lineage is more closely related to a virus from the 1995 Ebola outbreak in Kikwit, DRC, the WHO reported.

“Results from virus characterization, together with findings from the epidemiological investigation, are definitive: the outbreak in DRC is a distinct and independent event, with no relationship to the outbreak in West Africa,” the WHO reported.

For planning purposes, the World Health Organization is currently estimating that the outbreak in West Africa may peak at 20,000 cases, but some scientists think it could far exceed that. An elaborate mathematical model developed by **Alessandro Vespignani**, PhD, of Northeastern University in Boston predicts the outbreak will reach 10,000 cases as early as September 24, 2014 if control efforts are not dramatically improved.<sup>2</sup> His one-line assessment of the situation was starkly non-scientific in an email interview: “The numbers are really scary.”<sup>1</sup> Vespignani and colleagues estimated that the spreading Zaire strain of Ebola in West Africa has a reproductive ratio of 1.5 to 2.0. Typically any etiologic agent reaching a reproductive ratio of 1 and above will continue to spread and cause new infections.

“The numerical simulation results show a steep increase of cases in the West Africa region, unless

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the transmissibility of [Ebola] is successfully mitigated," the authors warn. "The probability of case exportation is extremely modest (upper bound less than 5%) for non-African countries, with the exception of the United Kingdom, Belgium, France and the United States. We show by a modeling effort informed by data available on the 2014 [Ebola] outbreak that the risk of international spread of the Ebola virus is still moderate for most countries. The current analysis however shows that if the outbreak is not contained, the probability of international spread is going to increase consistently, especially if other countries are affected and are not able to contain the epidemic."

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### ***Many cases going uncounted***

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There is widespread consensus among investigators that the known count of Ebola cases and deaths underestimates the real toll of the epidemic — possibly by two- or three-fold — as cases and contacts elude surveillance efforts.

"Staff at the outbreak sites see evidence that the numbers of reported cases and deaths vastly underestimate the magnitude of the outbreak," the WHO stated.

The incubation period is 8 to 10 days on average, with 21 days being the outer limit. Thus those infected could be geographically dispersed to just about anywhere before the onset of the symptoms begin and they become capable of transmission to their contacts.

Given these troubling signs, Frieden said it "is certainly possible we will see cases elsewhere. That's why we are alerting clinicians throughout the U.S. to think of Ebola, [identify] people who have been traveling to countries that have been affected, and rapidly test for it. We have helped laboratories around the U.S. become able to test for Ebola safely and accurately. That's in place now so that testing can be done quickly."

The CDC continues to emphasize that U.S. hospitals can handle cases with a combination of contact and droplet patient isolation precautions, though a respirator at least equivalent to an N95 should be worn if a procedure is likely to produce aerosols. The CDC recommends keeping the patient's door closed and posting someone outside the room to sign people in and out.

"The current CDC recommendations make practical sense," said **Terry Rebmann**, PhD, RN, CIC, director of the Institute for Biosecurity at St. Louis (MO) University. "They are very reasonable and if they are enforced consistently they should be

able to contain the disease. We are less concerned about in the United States as long as practitioners and clinicians are really very stringent about infection prevention."

In addition, the CDC recently issued recommendations for environmental cleaning of Ebola patient rooms, though conceding there is paucity of data to base guidance on. (*See related story, p. 103.*) "We don't think Ebola would spread widely within the U.S. — routine health care infection control would probably prevent most transmission," Frieden said. "We have had five cases of other bleeding viruses in the U.S. over the past decade. Four of a virus called Lassa, one of Marburg — very much like Ebola. Even though they were not identified in the hospital before they were diagnosed — even though people did not take special precautions — there was not a single secondary spread from that. That doesn't mean there couldn't be a family member or health care worker who doesn't 'think' Ebola [and becomes infected]."

In a sense, the recent introduction of the first MERS cases in the United States can serve as a trial by fire, as the critical component of discerning travel history of symptomatic patients still serves as the first triage point. MERS can be confused with community acquired pneumonia or other severe respiratory diseases, but a symptomatic Ebola patient should be somewhat easier to identify, Rebmann said.

"The recommendations are similar in that both are severe communicable diseases with high mortality," she said. "With Ebola the symptoms are relatively severe, which should make identification and surveillance a little easier. Clinicians should make sure that if someone does present with an unusual illness they should be asking about travel history and considering the incubation period for Ebola."

Still, there's something of a mixed message to this outbreak, as infected American caregivers returning to this country are being admitted to specially designed, failsafe biocontainment units like those at Emory Healthcare in Atlanta and the University of Nebraska in Omaha. (*See related story, p. 102.*) Compounding this confusion, health care workers in the outbreak zone in Africa are shown wearing extensive barrier precautions that go beyond what the CDC is recommending for U.S. facilities.

"SHEA is concerned about the mixed messages that our health care workers, patients and others receive when they see that health care workers in outbreak zones are dressed in moon suits

# CDC Ebola checklist outlines IP role

*‘Now is the time to prepare’*

In an urgent addition to the Ebola situation, federal public health officials have issued a checklist for hospitals to prepare for incoming cases from the expanding outbreak in West Africa. The six-page detailed checklist issued by the Department of Health and Human Services, the Centers for Disease Control and Prevention and the office of the Assistant Secretary for Preparedness and Response is available at: <http://1.usa.gov/1qjDiC9>

“Every hospital should ensure that it can detect a patient with Ebola, protect healthcare workers so they can safely care for the patient, and respond in a coordinated fashion,” the agencies advised. “...Now is the time to prepare, as it is possible that individuals with Ebola in West Africa may travel to the United States.”

The checklist highlights key areas for hospital staff — especially hospital emergency managers, infection preventionists and clinicians -- to review in preparation for an incoming case of Ebola. In particular infection preventionists should:

- Ensure appropriate infection control procedures are being followed, including for lab, food, environmental services, and other personnel.
- Maintain updated case definitions, management, surveillance and reporting recommendations.
- Properly train healthcare personnel in personal protection, isolation procedures, care of

Ebola patients.

- Ensure that administrators are familiar with responsibilities during a public health emergency.

The checklist advises hospitals to maintain situational awareness of reported Ebola case locations, travel restrictions and public health advisories, and update triage guidelines accordingly. Review Emergency Department (ED) triage procedures, including patient placement, and develop or adopt screening criteria (e.g. relevant questions: exposure to case, travel within 21 days from affected West African country) for use by healthcare personnel in the ED to ask patients during the triage process for patients arriving with compatible illnesses.

Post screening criteria in conspicuous placements at ED triage stations, clinics, and other acute care locations. Treat all symptomatic travelers returning from affected West African countries as potential cases and obtain additional history. Remember: Ebola is a nationally notifiable disease and must be reported to local, state, and federal public health authorities.

Ensure that all triage staff, nursing leadership, and clinical leaders are familiar with the protocols and procedures for notifying the designated points of contacts to inform hospital leadership, infection prevention and control, infectious disease, administration, laboratory, and others as applicable. ■

and using respirators consistent with airborne spread,” said **Daniel Diekema**, MD, president of the Society for Healthcare Epidemiology of America (SHEA). “The message that we are trying to reinforce is that there is a vast difference between reducing risk in an outbreak setting where there are limited resources and limited access to things like potable water or water for hand hygiene. Health care workers may spend many hours in large multipatient wards providing continuous care for many very sick patients with absolutely no idea when or how their next exposure may occur. This is very different from the controlled setting of an acute care hospital in the U.S.”

Moreover, erring on the side of excessive precautions could actually increase the risk to workers if they have not been adequately trained to don

and remove the equipment, Diekema added.

“We are working with the CDC to try to get this message across because there are some risks of hospitals overreacting — not just in resource utilization but some practical issues as well,” he told *Hospital Infection Control & Prevention*. “For example, if a hospital felt they needed to introduce a brand new, unfamiliar form of personal protective equipment (PPE) without proper training it could paradoxically increase the risk of the HCW contaminating themselves — [unless they are] well trained in how to remove that personnel protective equipment.”

While in Africa, Frieden donned the full regalia of PPE to enter an Ebola care clinic run by the Doctors without Borders volunteer group.

“I felt completely safe,” he said. “You’re basi-

cally swaddled in protective gear. If you're not risking a needle stick, the risk is essentially nil. The challenge is things like removing [the PPE] if that equipment is soiled and doing that very, very carefully. Doctors without Borders is extraordinarily careful in doing that. As I came out of the treatment unit, a local person trained by [them], was basically screaming at me, 'Hold your hand this way, do this, move this way,' and spraying me down with bleach at every step. The biggest risk to health care workers has not been in the Ebola treatment units. It's been in the general health care system because Ebola in these countries doesn't look very different from a disease like malaria, typhoid or gastroenteritis. When it starts, it has very similar symptoms."

CDC epidemiologists on the scene are teaching their African colleagues how to set up triage points, putting possible Ebola patients in one group and other patients in a separate area.

"For those who might have Ebola, assume that they do until proven otherwise," Frieden said. "One of the real challenges in these countries — particularly Liberia and Sierra Leone — is getting the health care system up and running again. Ebola is not just harming people by [infections], it's ... essentially shutting [down] much of the health care system. People are afraid to go — health care workers are afraid to go. That's exacerbating the situation. One of the things we are doing is helping to establish a core level of infection control at every health care facility throughout the country so health care workers are better protected."

Compounding the problem are unsafe burial rituals where the bodies of those who have just died of Ebola are handled and washed. The virus can still spread from a corpse but changing cultural morays of honoring the dead has been difficult. The harsh conditions and lack of public health infrastructure make the laborious work of tracking down contacts of cases and monitoring them for symptoms for a three-week incubation period all the more difficult. Disease fighters may face both ignorance and distrust, as they are seen by some as spreading the virus rather than trying to eradicate it. For example, a recent spike of cases in Guinea was met by resistance to prevention measures in one village.

"This is a community which does not have access to radio, which has been isolated, and which has a lot of misconceptions," Frieden said. "For example, when people were going in with sprays of bleach to sterilize after people had died, the rumor went around that [the spray] was spreading Ebola."

Though the global effort must rapidly increase

to meet the threat, Frieden cited the establishment of laboratories and other assistance by teams from the European Union, China, South Africa and Canada. Still, much more assistance is needed if the outbreak is to be contained, he warned.

"The number of cases is increasing so quickly that for every day's delay, it becomes that much harder to stop it," Frieden said. "There are three key things that we need. The first is more resources. This is going to take a lot to confront. The second are technical experts in health care and management to help in country. And the third is a global coordinated unified approach. This is not just a problem for West Africa, it's not just a problem for Africa, it's a problem for the world and the world needs to respond."

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### *The threat of viral mutation*

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Given that this is the longest lasting Ebola outbreak in history, concern is mounting that the virus could mutate and become more transmissible as it continues to infect people. "That risk may be very low, but it's probably not zero," Frieden said. "The longer it spreads, the higher the risk."

WHO Director **Margaret Chan**, MD, warned in a speech to the affected countries that "constant mutation and adaptation are the survival mechanisms of viruses and other microbes. We must not give this virus opportunities to deliver more surprises." Even President Obama weighed in on the risk of mutation, saying in a recent interview, "We have to make this a national security priority. We have to mobilize the international community, get resources in there... If we don't make that effort now, and this spreads not just through Africa but other parts of the world, there's the prospect then that the virus mutates. It becomes more easily transmittable. And then it could be a serious danger to the United States."

The virus has already made numerous subtle mutations, though none that would clearly enhance transmission, increase virulence or impair diagnostic detection. Researchers recently generated 99 viral genome sequences from 78 confirmed Ebola patients.<sup>3</sup> "Phylogenetic comparison to all 20 genomes from earlier outbreaks suggests the 2014 West African virus likely spread from Middle Africa within the last decade," they reported. "Genetic similarity across the sequenced 2014 samples suggests a single transmission from the natural reservoir, followed by human-to-human transmission during the outbreak. "

Thus, continued exposures between humans

and viral reservoir animals (i.e., fruit bats) does not appear to be a factor in this outbreak. The genomic data also showed a strong epidemiologic link between acquiring the virus and attending a funeral.

The genomic analysis revealed some 50 “mutational events,” though “determining whether individual mutations are deleterious, or even adaptive, would require [more] analysis,” the authors report. “However, the rate of ... mutations suggests that continued progression of this epidemic could afford an opportunity for viral adaptation, underscoring the need for rapid containment.”

In a grim postscript to the paper that underscores just how dangerous it is to try and stop an Ebola epidemic, the authors conclude by observing, “Tragically, five co-authors, who contributed greatly to public health and research efforts in Sierra Leone, contracted [Ebola] in the course of their work and lost their battle with the disease before this manuscript could be published. We wish to honor their memory.” ■

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## American doc knew he faced ‘tsunami’ of Ebola

*4th health care worker with Ebola comes to U.S.*

In an August 30, 2014 blog post, **Rick Sacra**, MD, worried about the “many people in Liberia who are at risk because of the Ebola tsunami that swept through an already fragile healthcare system.”

“The healthcare system in Liberia has had to go through a complete reboot after every single hospital in the city of Monrovia closed down to be decontaminated with bleach water as a result of Ebola cases landing in emergency rooms, outpatient clinics and medical wards,” he continued. “We hope to gradually increase our services over

the next couple of weeks to include children and adults, but we must first make some changes to our building to allow us to triage everyone before they enter the hospital grounds to check for any signs of Ebola. A large shipment of personal protective gear arrived yesterday from our partner, Samaritan’s Purse. This has been one of the key issues in reopening — ensuring that we have adequate protective equipment.”

Shortly after that post, the 51-year-old family Ob/Gyn physician began exhibiting signs and symptoms of Ebola, which he probably contracted working long hours in the previous three weeks treating pregnant women and literally saving lives.

“When the patients started arriving, they had often been to several other hospitals and traveled for hours seeking care,” Sacra wrote in his blog. “More than 35 cesarean sections were performed to save women and their babies in the first 20 days — sometimes two or three a day.”

Sacra was flown back to the states and admitted Sept. 5th to a specially designed 10-bed biocontainment unit at the Nebraska Medical Center in Omaha. Two of his colleagues with Samaritan’s Purse had undergone successful treatment for Ebola at a similar biocontainment unit at Emory Hospital in Atlanta. By late August, each had recovered and was discharged. As this issue went to press, Sacra was making some progress but doctors said it was too early to give a definitive prognosis. Meanwhile, a fourth health care worker infected with Ebola in Africa was admitted to the Emory biocontainment unit on Sept 9th, though few details were being released.

The biocontainment units at Emory and Nebraska have had years to train and prepare staff to handle infectious disease cases that might overwhelm some hospitals. They were designed according to federal guidelines for handling CDC category A diseases, which include Ebola, plague, anthrax, hemorrhagic fever and smallpox.

“There is anxiety amongst hospital staff in ordinary hospitals about handling Ebola cases,” says **Philip Smith**, MD, professor in the division of infectious diseases at the Nebraska Medical Center. “We have people volunteer to work in this unit and to receive special training. They’re mentally prepared for something like this.”

Emory uses a similar system, with a team of volunteers from various specialties ready if the alarm is sounded. “Staff involved in the direct care of these patients received extensive training with demonstrated competency verification,” says **Nancy Feistritz**, DNP, RN, vice president of patient care

# New CDC Ebola guidelines for environmental cleaning

## *Dearth of data on role in transmission*

The Centers for Disease Control and Prevention has updated its Ebola infection control guidelines to include a new section on cleaning and disinfection of the patient environment. (See *Hospital Infection Control & Prevention* Sept. 2014 issue.)

Hospitals admitting a suspect or confirmed case linked to the ongoing Ebola outbreak in West Africa should be aware that the virus can be transmitted through direct contact with blood or body fluids/substances (e.g., urine, feces, vomit) of an infected person with symptoms or through exposure to objects (such as needles) that have been contaminated with infected blood or body fluids, the CDC reminded.

"The role of the environment in transmission has not been established," the CDC stated. "Limited laboratory studies under favorable conditions indicate that Ebola virus can remain viable on solid surfaces, with concentrations falling slowly over several days.<sup>1,2</sup> In the only study to assess contamination of the patient care environment during an outbreak, virus was not detected in any of 33 samples collected from sites that were not visibly bloody. However, virus was detected on a blood-stained glove and bloody intravenous insertion site."<sup>3</sup>

There is no epidemiologic evidence of Ebola virus transmission via either the environment or fomites that could become contaminated during patient care (e.g., bed rails, door knobs, laundry), the CDC noted.

"However, given the apparent low infectious dose, potential of high virus titers in the blood of ill patients, and disease severity, higher levels of precaution are warranted to reduce the potential risk posed by contaminated surfaces in the patient care environment," the CDC advised.

CDC recommendations for environmental infection control include:

- Be sure environmental services staff wear recommended personal protective equipment including, at a minimum, disposable gloves, gown (fluid resistant/ impermeable), eye protection (goggles or face shield), and facemask to protect against direct skin and mucous membrane exposure of cleaning chemicals, contamination, and splashes or spatters during environmental cleaning and disinfection activities. Additional barriers (e.g., leg covers, shoe covers) should be used as needed. If reusable heavy-duty gloves are used for cleaning and disinfecting, they should be disinfected and kept in the

room or anteroom. Be sure staff are instructed in the proper use of personal protective equipment including safe removal to prevent contaminating themselves or others in the process, and that contaminated equipment is disposed of as regulated medical waste.

- Use a U.S. Environmental Protection Agency (EPA)-registered hospital disinfectant with a label claim for a non-enveloped virus (e.g., norovirus, rotavirus, adenovirus, poliovirus) to disinfect environmental surfaces in rooms of patients with suspected or confirmed Ebola virus infection. Although there are no products with specific label claims against the Ebola virus, enveloped viruses such as Ebola are susceptible to a broad range of hospital disinfectants used to disinfect hard, non-porous surfaces. In contrast, non-enveloped viruses are more resistant to disinfectants. As a precaution, selection of a disinfectant product with a higher potency than what is normally required for an enveloped virus is being recommended at this time. EPA-registered hospital disinfectants with label claims against non-enveloped viruses (e.g., norovirus, rotavirus, adenovirus, poliovirus) are broadly antiviral and capable of inactivating both enveloped and non-enveloped viruses.

- Avoid contamination of reusable porous surfaces that cannot be made single use. Use only a mattress and pillow with plastic or other covering that fluids cannot get through. Do not place patients with suspected or confirmed Ebola virus infection in carpeted rooms and remove all upholstered furniture and decorative curtains from patient rooms before use.

- To reduce exposure among staff to potentially contaminated textiles (cloth products) while laundering, discard all linens, non-fluid-impermeable pillows or mattresses, and textile privacy curtains as a regulated medical waste. ■

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services at Emory. "Members of the team all volunteered to care for these patients. Even so, care of acutely ill patients at their most vulnerable can be stressful under any circumstances."

Emory provided staff and physicians caring for the Ebola patients with support through daily team huddles, leader rounding, and hospital chaplains. "The staff support team was present throughout these challenging and stressful times in order to provide emotional and spiritual support for staff," she says.

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### ***'We want rock stars on this unit'***

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Even during the ongoing Ebola outbreak in West Africa, more hospital staff have applied to join the Nebraska unit, says **Shelly Schwedhelm**, MSN, RN, director of emergency trauma and emergency preparedness at the medical center.

"People say, 'Sign me up — I want to do this,'" she says. "It's a professional development opportunity and they see it as an opportunity to enhance their skills in other ways."

Schwedhelm doesn't hire every person who applies. First, she speaks with their managers to learn more about their clinical skills, energy, and ability to be self-directed. "We want rock stars on this unit," she says.

Volunteers have to be experts in their disciplines because they'll need to learn special skills involving high level of infection control, adds Kate Boulter, RN, lead nurse of the biocontainment unit in Nebraska. The ideal worker in a biocontainment unit is someone who is very detail oriented and a critical thinker, she says. Employees have to follow rules and instructions precisely, as shortcuts and mistakes could lead to exposures and injuries. Team-work is a top priority.

"Each person has a partner who watches them put on their personal protective equipment and take it off," Schwedhelm says. "They hold each other accountable."

The biocontainment team functions as one unit, and everyone involved agrees on decisions and steps taken, says **Uriel Sandkovsky**, MD, an infectious disease physician and medical director for employee health at Nebraska Medical Center.

Biocontainment team volunteers also have to be eligible to receive the smallpox vaccination in the event of an exposure. "With smallpox you have a four-day window to get vaccinated after exposure, so if we had a smallpox or monkeypox case we could vaccinate them," Smith says.

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### ***A watchful eye for symptoms***

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Emory University developed a comprehensive surveillance program consistent with CDC guidelines to monitor physicians and staff caring for the Ebola patients, Feistritz says.

"Inclusion criteria were defined as individuals who were involved in direct patient care or those involved in the handling of contaminated blood or body fluids," she says.

The surveillance protocol included taking employees temperature twice daily for 21 days — the outer limits of the incubation period — after their last episode of care for Ebola patients. Also, each employee tracks their own symptoms, including headache, joint or muscle aches, weakness, diarrhea, vomiting, stomach pain, or lack of appetite. They use a log to document and track results and follow a protocol to report any symptoms.

Emory also addressed concerns among patients and other employees through hospital-wide education and communication. The hospital educated staff about infection control practices and the Ebola protocols. They held town hall meetings to provide accurate information and to have clinical experts and hospital leaders answer any questions staff might have, she explains. "Physician and nurse executive teams rounded on each patient care unit to answer questions staff or patients might have had," Feistritz says.

The Emory website posted educational material with frequently asked questions and regular updates, available to both staff and patients.

As other hospitals prepare for the possibility of admitting an Ebola patient, it's a good idea to regularly train on the proper use of isolation precautions and personal protection equipment.

"One of our colleagues in the unit has an innovative educational approach where people get into gowns and take care of mock patients," Smith says. "It's recorded, and supervisors go over the video with employees to reinforce compliance." ■

## **Stop CAUTI program aims for 25% cut in hospitals**

### *The challenge of changing behavior*

**T**here are two angles of attack to cutting catheter-associated urinary tract infection (CAUTI)

rates by 25%, and the harder approach involves changing provider behavior.

"One of the things we find in the literature is that changing the mindset of people really takes time," says **Linda Greene**, RN, MPS, CIC, one of the six representatives of the Association for Professionals in Infection Control and Epidemiology (APIC) on the national faculty of the On the CUSP: Stop CAUTI initiative.

"Ideally, we want to set aggressive goals," Greene says. "You want a stretch goal, and it is very aggressive."

A preliminary report released last fall showed a 16% decrease in CAUTI. These results were mostly achieved through technical changes, following the evidence, Greene notes.

Changing practices involving technique is the low-hanging fruit. Staff can learn to insert properly, use antiseptic technique, and make sure the bag is secured and below the bladder, she says.

Many hospitals have made these evidence-based practice changes already, and that's why initial results look good. Bridging the gap between 16% and 25% will be more challenging. The next step is to tackle socio-adaptive, behavioral changes.

"How do we get evidence to the bedside, and how do we make sure doctors and nurses are very engaged, making urinary tract infection prevention a priority?" Greene asks. "Not every patient needs a urinary catheter, so how do we find ways to initiate physician reminders or protocols that instruct the nurse to pull the catheter when it's not needed?"

To illustrate the challenges of changing culture and behavior, Greene offers an example of ICU practice.

"In the CDC guidelines one of the indications for urinary catheter is output monitoring of a critically ill patient," she explains.

"For years, people thought if you were in the ICU you needed a catheter to see how much [urine] you're putting out," she adds. "But now we know that many ICU patients don't need to be monitored that closely, or they can be monitored by other means."

For CUSP to work, it needs to blend the evidence-based changes with socio-adaptive changes, making both a part of the hospital's value system, she says.

Greene understands from personal experience why the socio-adaptive changes are so difficult.

"I've been a nurse since I was 19, working in emergency rooms, ICUs, and the mantra was you put in an IV and catheter," Greene says. "We thought we were doing the right things for patients, but now we know that some of these things are not

necessary to use for as long as we once thought."

When Greene worked at a busy hospital years ago she resisted the hospital's attempts to focus more on UTIs.

"I said, 'Quite frankly, I have bigger fish to fry.' If they think a patient has a UTI, then we'll give a drug and the patient will be fine," she recalls.

What she's learned since is that giving out antibiotics has consequences, and urinary catheters can harm patients in a number of ways, including leading to bedsores.

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### *A change of thinking*

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"It's a change of thinking, and that change of thinking can get us to that next level," Greene says.

APIC will assist hospitals with making these cultural and behavioral changes through an army of CUSP leaders, including 35-40 fellows, most of whom are infection preventionists. Launched in May, the fellow program has each IP doing a project on CAUTI, submitting a performance improvement project, and going through intense training, and work with mentors, like Greene and the other CAUTI faculty.

The fellows return to their organizations to interview staff and executives. They explain what the Stop CAUTI initiative is about and help their hospitals establish initiatives to work collaboratively to reduce CAUTI.

Another strategy is to showcase hospitals that have achieved zero CAUTI rates.

"I was on a call last week with a Florida hospital that had gone two years without a CAUTI, and she was sharing her strategies," Greene says. "There is no better way to help people get to where they need to be than through story telling by the people who have been able to achieve the results they need."

Success stories resonate with everyone, she notes.

"One of the big mistakes we make in health care is to try to go in and educate people before we really engage them," Greene says. "It's better to get people engaged and help them understand why it's important before you educate them and share strategies."

Hospitals can accelerate CAUTI reduction rates by implementing strategies that make use of electronic health records. They can make stop orders or protocols regarding catheter use.

"We are seeing a number of hospitals where the catheter that is inserted for surgery is removed in the post-anesthesia care unit," Greene notes.

"The other thing that is beginning to catch on,

and it's been a little slower, is appropriately collecting urine cultures," she says.

The idea is that urine cultures often are ordered inappropriately, resulting in unnecessary antibiotic use, she adds.

"If a patient is not symptomatic — even if there are organisms in the culture — then do not treat asymptomatic bacteremia," Greene says.

As hospitals and providers adopt Stop CAUTI changes there also are opportunities to improve results further through patient and family education.

"Let's say I'm going for surgery and they're going to put a catheter in me," Greene says. "Instead of saying, 'You'll have this catheter and it might be uncomfortable, but we'll take it out when you no longer need it,' you can say, 'We'll put this in and take it out the next day because we don't want you to get an infection.'"

The idea is to set expectations for patients and their families that the catheter is temporary.

"This sets up a patient and family to ask a question about the catheter if it's been forgotten," Greene adds. ■

## New Jersey hospital pushing CAUTIs to zero

### *Catheter use shows steep decline*

After expanding a successful initiative to cut catheter-associated urinary tract infections (CAUTI) rates, a New Jersey hospital's catheter days and CAUTIs were cut in half.

East Orange (NJ) General Hospital had already achieved a zero CAUTI rate on its unit that previously had the highest rate of infections. There have been no CAUTIs on that unit since the project was implemented several years ago.

In late 2013, the hospital expanded the CAUTI prevention program to all med-surg units, producing these results, comparing the first six months of 2013 with the first six months of 2014:

- CAUTIs went from four to two;
- Total catheter days went from 3,609 from January to June, 2013, to 1,783 from January to June, 2014;
- The number of patients receiving catheters dropped from 620 in 2013 to 336 in 2014;
- The number of catheter days per patient declined from 5.82 to 5.31.

The hospital's CAUTI initiative followed the

lead of the Hospital Engagement Network (HEN) and the New Jersey Hospital Association, says **Mary Anne Marra**, BNP, MSN, RN, vice president and chief nursing officer at East Orange General Hospital.

HEN has promoted the On the CUSP: Stop CAUTI project of the Agency for Healthcare Research and Quality (AHRQ).

The first steps in the project were to form teams, identify team leaders, and select the med-surg unit with the highest CAUTI level for the pilot initiative, Marra says.

"All team members first were educated, and when they implemented the initiative they did a lot of education with the staff on the unit," Marra says.

Other changes included having daily Foley rounds, performed by the clinical coordinator and infection control nurses.

"They would see if patients met the criteria for having a Foley catheter," Marra says. "The hospital also changed policies and procedures to require a urine culture after two weeks, and the Foley catheter was changed at two weeks."

Stickers were put on Foley bags. They listed the reason for having the Foley and the date it was to be changed.

"We changed criteria for insertion of the Foley and for maintenance," Marra says. "We made sure patients who had a Foley needed to have a Foley, and if not, the catheter was discontinued."

The policy changes included recommending that Foley catheters be discontinued within 24 to 48 hours post-surgery. A physician's order is required to continue the catheter, she says.

The hospital gave nurses the authority to discontinue a Foley catheter without a physician's order, she adds.

Criteria for inserting and retaining a catheter included:

- If a patient needed strict input and output;
- If a patient had stage 3 or 4 sacral pressure ulcer;
- If the patient's bladder had an output obstruction;
- If the patient was post-surgery and the surgery required the patient to have a Foley, such as a urological procedure; and
- If the patient was at the end of life care and it was deemed the patient would be more comfortable with a Foley.

The hospital has not incorporated the CAUTI program policies into an electronic health record, but written reminders are placed on patient charts

within 24-48 hours of admission, Marra says.

"We incorporate the written orders in the hand-off of shift so every time nurses change they will know how long the Foley was in," she explains.

"They added Foley care and CAUTI initiatives in the annual nursing competency," she adds.

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### *IP input on cause of CAUTIs*

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Compliance has improved since the program was initiated, but it requires having an infection preventionist available to answer questions, doing ongoing staff training, engaging support from nurse champions, holding the Foley rounds, and providing compliance follow-up, Marra says.

"Every time we have an infection we do a post-analysis and have a detailed discussion with the infection control committee," Marra says. "It's reviewed by the infection preventionist, and if it's not clear to the preventionist what was the cause of the CAUTI, then an infectious disease doctor also will review the case."

One of the lessons learned during the project was that the emergency room needed to be included in the pilot, Marra says.

Also, the new protocol called for having the Foley catheter changed when a new patient arrived from another facility, and this change took a while for staff to adopt, she notes.

There were other issues related to staff adapting to the protocol changes, but over time the behavioral changes took place, she adds. Nurses now are less hesitant to remove catheters without physician orders.

"They know they are supported by the organization, the administration, and by this team," Marra says. "What we've achieved in overall numbers in Foley catheter days shows there definitely has been a change here with the nurses: we don't use as many Foleys, and so there is less opportunity for catheter-associated urinary tract infections." ■

## CNE/CME Instructions

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## 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. ■

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■ Our Joint Commission Supplement for Infection Control

## CNE/CME Questions

1. A mathematical model on the Ebola outbreak developed by **Alessandro Vespignani**, PhD, of Northeastern University in Boston, determined the probability of case exportation is "extremely modest" for non-African countries, with the exception of:  
A. China  
B. Germany  
C. United States  
D. All of the above
2. The incubation period for Ebola extends to 21 days at its outer limits. What is it on average?  
A. 2 days  
B. 3 to 5 days  
C. 8 to 10 days  
D. 12 to 14 days
3. An Ebola preparedness checklist issued by federal public health officials called for infection preventionists to focus on which of the following?  
A. Ensure appropriate infection control procedures are being followed, including for lab, food, environmental services, and other personnel  
B. Maintain updated case definitions, management, surveillance and reporting recommendations.  
C. Properly train healthcare personnel in personal protection, isolation procedures, care of Ebola patients.  
D. all of the above
4. The CDC continues to emphasize that U.S. hospitals can handle Ebola cases with a combination of contact and droplet patient isolation precautions, though a respirator at least equivalent to an N95 should be worn if:  
A. The patient is coughing  
B. The patient is not in an airborne isolation room  
C. Treatment may produce aerosols  
D. All of the above

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