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INSIDE

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APIC 2015

Treating HAIs with Ebola team approach could save lives

The harsh lessons of Ebola subject of a wide-ranging discussion

By Gary Evans, Senior Writer

The Ebola outbreak that fueled fear in America and still smolders on in West Africa has left infection preventionists with a legion of lessons to ponder. Accordingly, practical points on improving communications, training, donning and doffing of protective gear were recently discussed in Nashville at the opening session of the annual APIC conference. But in addition to some 4,300 infection preventionists, there was an elephant in the room.

Michael Bell, MD, deputy director of the division of healthcare quality promotion at the CDC, started the topic once the discourse on the rigorous demands of Ebola infection control concluded.

"I will ask you based on what we have seen, is this what [infection control] looks like when we decide we are really going to do it for real?" he said. "There are hundreds of thousands of infections being caused, transmitted through hands, a soiled environment — all of the things that we paid attention to for Ebola, but we seem to be doing it in a different way. Granted, it is a more threatening infection, we certainly fear it a great deal more, but the person who just had a bypass operation is fearful of MRSA. What does this mean for us as a profession down the road?"

> "IN ADDITION TO SOME 4,300 INFECTION PREVENTIONISTS, THERE WAS AN ELEPHANT IN THE ROOM."

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It was a tough question, implying that some, if not many, of the 75,000 patients lost every year to healthcare-associated infections (HAIs) could be alive today if they had been treated with the vigilance applied to Ebola. Indeed, in the silence after his comments, Bell asked, "Was that too honest?"

Applying some of the approaches used in the care of the 10 Ebola patients treated in the U.S. would cause some culture shock at hospitals using the entrenched, hierarchical approach of traditional medicine. Imagine going from that to a system where all healthcare workers are empowered to speak up about a breach or oversight that may endanger other healthcare workers or the patient.

"There's no hierarchy. Everybody was expected — not only allowed to, but expected to go up to anybody else and say, 'The back of your gown isn't taped,' or, 'I saw you accidently touching your visor,'" said **Philip Smith**, MD, medical director of the Nebraska Medicine Biocontainment Unit in Omaha. "It was a classless society, and that's the only way we could get it done and achieve maximal safety."

Citing this concept of a "level playing field," APIC 2015 President **Mary Lou Manning** PhD said, "I think that is something we are challenged with all the time. How did you do that?"

"We really put a premium on it," Smith said in the panel discussion. "We did it in our drills and in real life. Basically, if somebody came up to me and said, 'I made a suggestion to Dr. X and they didn't like it,' Dr. X was not invited back. It [extends to] leadership, too — they loved to catch us. I would say 'thank you.' And at our next team meeting I would stand up and say, 'thank you [again], you may have saved my life.'"

No room for error

One of only four medical biocontainment units in the country, the Nebraska unit has a staff of volunteers that continuously train to prepare for any and all emerging infections and bioterror agents. "We drilled ad nauseum and we are really glad we did because it is hard to be prepared enough," Smith said. "Was it like we expected? Yes and no. Some things were different, most of them we tried to anticipate. But it is hard to anticipate what it is going to be like when they are rolling an Ebola patient on a cart down the hall. Suddenly, nine years of drills have been translated to reality and there is not much room for error."

One of the three Ebola patients admitted to the unit last year required dialysis and a ventilator, examples of advanced medical practices that may not be available in an Ebola treatment tent in Africa. "In resource-limited settings we very specifically tried not to do things that could be more dangerous — things that could be at risk of tipping the patient over, when you can't rescue them again with things like dialysis," said Bell, who has experience treating Ebola patients in Africa. "In U.S. hospital settings, we are able to do more and the challenge becomes … what are the new things we need to implement to make sure that the healthcare delivery can be done safely?"

Such procedures may increase the risk to healthcare workers, as they create more opportunities for body fluid exposures and the possible generation of aerosols. Smith showed a slide of an intensivist working in the unit in full gear and three layers of gloves to put an intravenous line in an Ebola patient.

"Even though he practiced many times putting a line in with three pairs of gloves on a simulation model, it is

just not the same as real life," Smith said. "One is very cognizant of the needle's potential contamination."

After a procedure is performed and a worker is ready to leave the patient care area, there is a huge emphasis on carefully and correctly removing each piece of PPE in an order and manner that will not expose the worker. The emphasis on carefully removing PPE using a buddy system could have implications for control of other infections like *Clostridium difficile*, he said.

"We realize not every floor in the hospital can have a doffing partner when you come out of a *C. diff* isolation room, [but] I think there are some lessons that can be learned from this," he added.

An immediate application of the Ebola training in donning and doffing of personal protective equipment is the continuing emergence of Middle Eastern Respiratory Syndrome (MERS) coronavirus, said **Russell Olmsted**, MPH, CIC, director of infection prevention and control at Trinity Health in Livonia, MI.

"Clearly with Ebola we understand that doffing is the critical control point, so we want to make that as safe as possible," he told APIC attendees. "Lessons learned from that we can easily extend to MERS coronavirus. It's the same issue."

Challenge of change

But could such attention to detail — such equanimity among doctors and nurses, for example — be applied to day-to-day infection control? Some of the volunteers in the Ebola care unit took their team's mindset back to their regular jobs at the University of Nebraska Medical Center, but found a very different reaction from co-workers.

"They went back to their normal floors and when they found someone not washing their hands or changing a dressing without gloves, they mentioned this to them," Smith said. "The person would not say thank you — they would growl at them. This in a way caused more frustrations. This is something we have to do and it is something that we can do: insist on a level playing field."

This concept is not completely foreign to infection control; indeed, it was used to great effect in the step-by-step checklist for central line insertion developed by Peter Pronovost, MD, at Johns Hopkins. A key feature of the program, which resulted in dramatic reductions in central line-associated bloodstream infections (CLABSIs) nationwide, is that all team members are empowered to "stop the line" if they see a break in the protocol.

"BUT COULD SUCH ATTENTION TO DETAIL — SUCH EQUANIMITY AMONG DOCTORS AND NURSES, FOR EXAMPLE — BE APPLIED TO DAY-TO-DAY INFECTION CONTROL?"

"There are a lot of people who contribute to the care of the individual patient," Bell said. "It's an extension of the CLABSI approach: If you insert the central line perfectly every time, you can reduce central line-associated infections by 70%. So therefore you have to because that's an ethical imperative. What is the same sort of concept when it comes to the rest of care? It's daunting — it's a huge issue."

The Ebola response teams essentially systematized every step of healthcare and practiced transparency by removing traditional barriers to open dialogue during patient care.

"There's nothing more valuable than a pair of fresh eyes to give you an external perspective of what you're doing," Bell said. "We all become very comfortable with our way of doing things, with our habits. I think this kind of approach is new to American medicine. It ties into some of what we are doing with HAIs. We are now tracking how facilities are doing. If a facility, a unit, is having a high rate of something, we can call and ask to come [in and] help. It's not punitive. This is a very forward-leaning approach to improving quality. I'm looking ahead at how this [kind of] relationship may lead to a new kind of medical care."

Indeed, in the wake of a historic Ebola outbreak, such transformations of safety culture could have momentum.

"Really looking at this level playing field — no more hierarchy — I am thinking of the entire culture of safety," Olmsted said. "Co-workers feeling comfortable to bring up concerns, accountability, and also the receptivity to that accountability. They are the key lessons learned and improvements we could spread for not only a response to a new zoonotic disease, but also the daily stuff that we deal with: CLABSIs, CAUTIs, *C. diff*, MRSA, you name it."

One striking difference

With the notable exception of MERS, many HAIs have one striking difference when compared to Ebola. Healthcare workers may acquire nosocomial pathogens, but they rarely die of them. In the Ebola outbreak in West Africa that is still receding, 509 healthcare workers have given their lives trying to save others. As

of July 5, the deaths translate to a mortality rate of 58% of the 875 infected healthcare workers, the WHO reports. (*See related story, p. 90.*) Two Dallas nurses acquired Ebola, but both survived. Of the 10 patients treated for Ebola in the U.S., two died, one at Texas Health Presbyterian Hospital in Dallas, and the other at the Nebraska biocontainment unit.

"A sad moment — our 3rd patient arrived in florid shock," Smith said. "We had him for 36 hours and we were never able to save him. People for 36 hours solid put their heart and soul into it. And they could not save this individual. Afterward, even though we didn't know the family very well, we had a memorial ceremony. Lots of hugs, kisses, crying, and individuals standing up spontaneously and calling out their partners on the team and saying, 'We did everything we could, we did great as a team.'"

Victories were celebrated as well, as Smith showed a slide photo of the first patient running down the hall giving the healthcare team high fives after being discharged Ebola-free. Indeed, for all the hysteria, the medical response to Ebola in the U.S. was really a success story made possible by the infection control infrastructure in this country, said **Patti Grant**, RN, BSN, MS, CIC, a former APIC president and the director of infection prevention and quality at Methodist Hospital for Surgery in Addison, TX.

"The discipline [of infection control] is so important," Grant said in a video montage of IP comments shown during the APIC Ebola session. "Think about what would have happened if we were not here when this happened in the United States. We did have healthcare transmission, but it stopped dead in its tracks. We have so many resources here that other countries don't have. We need to take advantage of that and get as close to zero infections as we can." (*See related story, this page.*)

Eye of the storm

Echoing a theme underscored by Manning in her APIC presidential address, Bell concurred that IPs provide a calm voice of assurance in an infectious disease crisis. (*See related story, p. 89.*)

"This is part of the stock and trade of IPs," he said. "When things are messy, when things are confusing, when things are frightening, the calm voice of evidence-based rationale is what people are hungry for. I see this again and again where the trusted source of information ends up being an IP."

In the aftermath of Ebola, IPs should extend outreach and form relationships with those they work with for the next infectious disease threat, he said. Another critical role IPs can fill is to explain to healthcare workers and others the rationale for barrier precautions and other infection control measures.

"Explain the reasons for the rituals," he said. "I think this group, in particular, APIC is well poised to bring that knowledge to the people that we work with so they understand why a gown is important, they understand why it is the face we are focusing on."

If nothing else, every IP should be overly familiar with all manner of protective gear after the gold rush for PPE when it appeared that an Ebola patient could walk into any hospital in the country. Actually, that is still the case.

"Suddenly we are all simultaneously gathering all types of equipment, especially the gowns and PAPRS — going from a minimum stock to a hundred. The scalability was absolutely huge," Olmsted said. "And there are some great lessons we've taken away from that. The biggest question I get almost every day is, 'When can we take the signs down, Russ?' I say stay the course. It's not all clear."

Indeed, there were 30 confirmed cases of Ebola virus disease (EVD) reported in the week ending July 5 in Guinea, Liberia, and Sierra Leone. "Although this is the highest weekly total since mid-May, improvements to case investigation and contact tracing, together with enhanced incentives to encourage case reporting and compliance with quarantine measures, have led to a better understanding of chains of transmission than was the case a month ago," the WHO reported. As of July 5, there were a total of 27,573 reported confirmed, probable, and suspected cases of Ebola in West Africa, with 11,246 reported deaths. That translates to a mortality rate of 41%. ■

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Eyewitness to history: IPs tell their Ebola stories

Trying to make a difference at home and overseas

Infection preventionists have responded to the Ebola outbreak in West Africa in a variety of ways: Some going abroad to serve on the front lines, others heavily involved in the U.S. training workers and preparing

their facilities to treat possible cases. A video montage of IP comments on their Ebola experience was shown recently in Nashville as part of the opening session of the annual APIC conference. Some of the comments from the IPs in the presentation include the following:

• "I was in Serra Leone as an infection preventionist. It was very hot. There was no electricity. There was no running water. Patients were housed in what were basically tents. I walked in and there were rows and rows of cholera beds. The patients that I saw that were very ill, that were probably not going to survive Ebola, were lying on the grass covered in body fluids and they were moaning. Nothing can prepare you for that."

• "I thought they should be sending people who are retired and have no children. People like me."

• "When I agreed to take this assignment, I was quite frightened and I gave it quite of bit of thought. I have a family, three young children — am I placing myself in danger by going over there? But the real answer for me was no. This is what I do."

• "It was the right time in my life and I thought it was important to be on the right side of history. This in the world's largest outbreak of Ebola and I wanted to do something directly to improve conditions in Africa."

• "There has been a trend in [U.S.] healthcare in general, medicine and nursing, toward more and more sophisticated technology. Something like the Ebola outbreak is humbling for the whole profession because it is really back to basics."

• "We were just working around the clock, trying to get the night shift trained, dayshift, running drills."

• "I got calls from people saying this patient was admitted from Bali. [I said] that's the South Pacific. That is not Africa."

• "We had three people walk off the street — into the lobby, thank you very much, not even the ER — saying, 'I have Ebola.' It was a wild time [in Dallas]."

• "We trained over 770 healthcare workers going to West Africa."

• "I joined the Ebola response and I was sent to train a certain group of people who only spoke Spanish."

• "During the week that I was there in training we had two fires in the Ebola Training Unit. And I said, 'Our facility is going to have a fire plan.'"

• "A lot of the time the moms were already sick and the babies and children under 8 or 9 were left by themselves. And one day I was doing infection prevention rounds in between shifts of clinicians and found that one of the little guys had pushed open his crib and crawled across the courtyard and was sitting up on another ledge in another area. I think he just wanted company. I carried him back and he was crying inconsolably — he knew he was going to be left alone. He was crying and I had to leave him crying. It was heartbreaking." ■

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APIC President: IPs are 'living history' in their fight against infections

From HIV to Ebola, the next infectious disease challenge is always on the horizon

In an age of epidemics and emerging infections, the new normal for infection prevention is an "unending series of challenges" that require interprofessional partnerships and learning from mistakes, said **Mary Lou Manning**, PhD, CRNP, CIC, president of APIC.

Delivering a keynote address recently in Nashville at the annual APIC conference, Manning cited some of the infections and outbreaks that have come in waves at the profession: ARS coronavirus (2002-2003); H1N1 pandemic influenza A (2009); MERS coronavirus (ongoing); Enterovirus D68 (2014), the return of measles and certainly Ebola (both ongoing).

"And this has been within the backdrop of every single thing that we do every day to begin with," said Manning, director of the doctor of nursing practice program at Thomas Jefferson University School of Nursing in Lafayette Hill, PA. "So these new challenges are placed on top of what we already have. That is the new normal. It seems like it is just accelerating."

Enduring partnerships must be formed with a wide variety of colleagues to meet the continual challenge of the next crisis.

"The work of the infection prevention team, while very specialized, cannot be performed independently," she told some 4,300 APIC attendees. "We need all of the professions. The work requires multiple healthcare workers from different professional backgrounds working together with patients, with families, with

communities and organizations. [We must call on] lots of others in order to do our work, and that is to deliver safe, quality care free from infection. Ultimately it is about the patients that come into our care every single solitary day. That is our mission: [Keep them] free from infection."

But it was two other major infectious disease events that "shaped my thinking," Manning said, recalling the first occurred in 1981 when she had entered nursing practice. "It was June 5 in the *MMWR* — a report of gay men who had this unusual pneumonia. It was the first report of what would become the AIDS epidemic. This was something we had never seen and knew nothing about."

As the epidemic began to expand nationally and globally, Manning had the sense that she was "living history" as the number of HIV infections continued to increase.

"This became very personal to me because my brother was one of them," she said.

Then in 2001 following the 9/11 terrorist attacks, envelopes containing high-grade anthrax were mailed out to various political and media offices, setting off a series of exposures and deaths that were followed by the "white powder" panics and hoaxes for months after. As with AIDS, Manning found herself facing a new threat that she and other infection preventionists knew very little about.

"To me, AIDS and anthrax each showed that IPs work with and are connected to others to figure out what to do when there is no rule book," she said. "So there is no rule book and you are mobilizing action, but you are not doing it alone. You are doing it with lots of others. The IP is often the calm voice of evidence-based reason. We are also reminded that there are limitations in our knowledge. You have to learn from your mistakes and keep moving forward."

Viewed over time, these events reveal the pattern of recurrent crisis that continues to this day.

"You are doing real work in real time as history is happening," she told APIC attendees. "In times of crisis, infection prevention and control becomes a very interprofessional, collaborative endeavor. The takeaway here is that there is strength in our combined efforts, there is energy in our collaboration, but probably most of all, there is wisdom in our collective experience. It is the power of all of us." ■

A 58% mortality rate: 509 healthcare workers have died in Ebola outbreak in West Africa

Yet CDC training program had no shortage of volunteers ready to don the gear

During the historic Ebola outbreak in West Africa that is now making its last stand, 509 healthcare workers have given their lives trying to save others. The deaths translate to a mortality rate of 58% of the 875 healthcare workers infected as of July 5, 2015, the WHO reports.

Factors that have been cited by the WHO for the occupational Ebola infections include shortages of personal protective equipment, improper use of PPE, and for much of the outbreak, far too few medical staff for the overwhelming number of cases. In such circumstances, healthcare workers demonstrate a compassion that contributes to working in isolation wards far beyond the number of hours recommended as safe, the WHO notes.

With a few exceptions — like some of the U.S. healthcare workers — many of the infected caregivers were treated under the very conditions of the epidemic they were fighting, making it difficult to deliver the full measure of care needed. Consider that the two deaths among the 10 cases treated in the U.S. cases translates to a mortality rate of 20%, suggesting that part of the reason Ebola is so deadly in Africa is that the level of patient care demanded cannot be adequately delivered. In particular, clinicians who treated some of the first cases in the U.S. said Ebola patients have massive fluid loss — rivaling conditions seen in cholera — that can be difficult to restore.

From Alabama to Africa

The knowledge that they could be flown back to the U.S. for better treatment may have provided some reassurance for the American healthcare workers, but facing Ebola, even in a simulated training situation, has a way of getting one's attention. Last September in a hot Alabama field, trainees in full PPE regalia and respirators entered a mockup Ebola Treatment Unit (ETU) as part of a three-day training program by the CDC.

"When they entered that mock ETU from the classroom, you could sense the increased level of concentration and also some anxiety," says **Rupa Narra**, MD, a CDC Epidemic Intelligence Service officer and one of the Ebola trainers. "I think that was an appropriate response — we really wanted to get them in that mindset and try to prepare them as well as we could."

The sense of urgency was intensified by the knowledge that those who completed the three-day course could soon be bound for West Africa, where they would do some additional onsite training and then step into ranks of a healthcare response that was being practically overwhelmed at that point. Having faced Ebola in Guinea and worked with *Médecins Sans Frontières* (MSF)/Doctors Without Borders for years, Narra was well aware what they were in for.

"We basically put them through what they would normally go through in an Ebola treatment unit," she tells *Hospital Infection Control & Prevention*. "Starting with getting on scrubs and gum boots and then donning all the high-level PPE. And of course in Alabama in September in head-to-toe PPE they were sweating. I felt they could really see what the situation or atmosphere [in Africa] was going to be like."

Developed in collaboration with the WHO and the MSF, the CDC course also included lectures and table-top exercises. Ninety-eight different instructors taught at eight course sessions; each required approximately 20 instructors. The situation called for a different mindset for both the first responders taking the course and the trainers, she says.

"We had a classroom aspect and a hands-on aspect, which required these responders putting on PPE, taking it off or doffing it and also doing some patient care exercises in the PPE," Narra says.

In particular, donning and carefully doffing the protective gear was emphasized in a routine and ritual observed by a partner.

"We taught them the kind of breaches to look for; for example, if you have some skin showing between your mask and your goggles," she says. "We did this through a buddy system and they would be checking themselves as well. Then after they got dressed we would have them enter what we called the 'hot zone' — the patient care area — and do simulated patient care activities in the PPE."

The workers were taught that if they detected a breach in PPE in themselves or others, stop the procedure and have that person immediately leave and doff their gear.

> "USING DUMMY PATIENTS FOR DRILLING CARE PROCEDURES, IN ONE EXERCISE THE TRAINEES HAD TO DRAW LAB SPECIMENS FROM A SUSPECT EBOLA PATIENT."

"We showed them the different [disinfection] methods — a sprayer with chlorine or someone wiped you down," she says. "We tried to show them all the different things they may see in the field. [Always] adopt a safety culture [mindset] when doing the procedures — that was really the theme."

Doffing a challenge

Removing protective equipment without contaminating yourself after treating an Ebola patient is probably the biggest employee health challenge in both the classroom and the real world.

"Doffing seemed to be a common theme in breaches or problems," Narra says. "The responders felt like they needed the most practice in doffing, and we agreed. That is the most critical part of the process. It is just small things like making sure not to touch the inside of the suit with a dirty glove and making sure they are washing their hands with chlorine during every step of what is about a 15-step process. And being very rigorous and methodical about it — even though they were hot, tired, sweaty and dehydrated. That was the most challenging and the most repeated process. It was important to them."

Using dummy patients for drilling care procedures, in one exercise the trainees had to draw lab specimens from a suspect Ebola patient. Thus, they reviewed how to safely draw the specimen, how to prepare it after drawing, and how do you carefully dispose of waste materials.

"We also had them practice putting a [dead] patient into a body bag and take them to the morgue," she says. "We really tried to recreate what it would be like in the field."

A total of 570 responders graduated from 16 separate three-day courses. Some 70% of them were clinical care providers, including 175 nurses and 167 physicians.

"The others were infection control, logistics engineers, mental care providers," Narra says. "We are very happy to report at this time — though we still have people in the field — that no [CDC trainee] has contracted Ebola." ■

With TB at a record low in U.S., OSHA ramps up inspections in healthcare

Critics question whether 'update' is a new TB standard by another name

OSHA — which lost an epic battle with the infection control community to adopt a separate tuberculosis standard more than a decade ago — has decided to put TB back on its radar and update compliance requirements for healthcare settings.

An OSHA directive issued July 13 (http://1.usa.gov/1SjEWwI) essentially incorporates the Centers for Disease Control and Prevention's 2005 TB guidelines,[1] replacing the 1994 CDC version the agency had heretofore been using. As part of this, OSHA adopts the CDC's TB risk classifications for healthcare settings: low, medium, and potential ongoing transmission.

"The employer's decisions concerning medical surveillance should be based on up-to-date risk assessments," the OSHA directive states. "In low risk settings, annual screening is not necessary; however, if an exposure to a person with, or specimen containing, TB occurs, the employer should provide screening and update the risk assessment in accord with the 2005 CDC Guidelines. In medium risk settings, screening should be provided at least every year. In settings where there is the potential for ongoing transmission, workers should be tested every 8–10 weeks until a determination is made that there is no more ongoing transmission. At that point, the setting should be reclassified as medium risk, and should remain at that classification (at a minimum) for at least one year."

Other changes in the new directive include inspecting additional healthcare settings, "in which emergency medical services are provided, and laboratories handling clinical specimens that may contain *Mycobacterium tuberculosis*," the directive states.

Examples cited by OSHA include:

Inpatient settings: Patient rooms, emergency departments, intensive care units, surgical suites, laboratories, laboratory procedure areas, bronchoscopy suites, sputum induction or inhalation/respiratory therapy rooms, autopsy suites, and embalming rooms.

Outpatient settings: TB treatment facilities, medical offices, ambulatory care settings, dialysis units, and dental care settings.

Nontraditional facility-based settings: Emergency medical service facilities, medical settings in correctional facilities (e.g., prisons, jails, and detention centers), long-term care settings (e.g., hospices and skilled nursing facilities), drug treatment centers, and homeless shelters.

The new instructions to OSHA inspectors also allow less frequent TB screening of healthcare workers in some situations (e.g., low risk classification). The update also includes newer screening methods like blood analysis for *M. tuberculosis*.

No comment period?

Most infection preventionists should already have their programs in line with the 2005 CDC guidelines, says **Patti Grant**, RN, BSN, MS, CIC, Director of Infection Prevention/ Quality at Methodist Hospital for Surgery in Addison, TX.

"IPs traditionally are solid when it comes to treating a CDC/HICPAC guidance as a roadmap for patient, employee, and visitor protection," she says. "Although OSHA is strictly employee safety driven, most IPs will take any CDC/HICPAC peer-reviewed, full-publication referenced document, and give it the respect and implementation it deserves."

That said, Grant raises the "worrisome" question of whether OSHA has essentially established a TB standard without the requisite public comment period on a draft version published in the *Federal Register*.

"Regardless, this brings OSHA surveyors and inspections into current, realistic, and practical employee safety/TB elimination as sanctioned by the CDC — not something that is mired down in a document that cannot keep current with the evidence-based practice," she says.

Still, one could take the view that OSHA is adding compliance demands in the absence of evidence of increased risk of occupational transmission of TB in healthcare settings.

"I am dismayed with this and feel it is another round of unnecessary new compliance expectations," says **Ruth Carrico**, PhD, FSHEA, RN, CIC, a former IP who is now an infectious disease professor at the University of Louisville in KY. "There are so many ways to better use the limited resources we have in our efforts to prevent transmission of infection."

Even in issuing the rule, OSHA conceded that 2013 saw the lowest recorded TB rate (three cases per 100,000 people) since national reporting began in 1953.

"In 2013, 9,582 TB cases were reported in the United States, and

approximately 383 of those cases were among healthcare workers," OSHA states. "Multi-drug-resistant and extremely drug-resistant TB continue to pose serious threats to workers in healthcare settings. [TB] is the second most common cause of death from infectious disease in the world after HIV/AIDS."

Threat of XDR-TB

Given the current era of emerging infections that can travel internationally, OSHA cites the global threat of TB strains that are extremely drug resistant. Extensively drug-resistant tuberculosis (XDR-TB) is a relatively rare variety of multidrug-resistant tuberculosis (MDR TB), but it is loose in the world and therefore a plane ride away from the U.S. It is resistant to almost all drugs used to treat TB, including the two best first-line drugs: isoniazid and rifampin. XDR-TB is also resistant to the best second-line medications: fluoroquinolones and at least one of three injectable drugs (i.e., amikacin, kanamycin, or capreomycin), according to the CDC. Not surprisingly, mortality rates are off the charts, particularly if the patient is co-infected with HIV.

Researchers have described the cause and abiding threat of drug-resistant TB as "rooted in inadequate TB treatment and compounded by a vicious circle of diagnostic delay and improper treatment, MDR-TB/XDR-TB has become a global epidemic that is fueled by poverty, HIV and neglect of airborne infection control. … It is difficult and costly to treat MDR-TB/XDR-TB. Without timely implementation of preventive and management strategies, difficult MDR-TB/XDR-TB can cripple global TB control efforts."[2]

The CDC notes the risk of acquiring XDR-TB in the U.S. "appears to be relatively low. However, it is important to acknowledge the ease at which TB can spread. As long as XDR-TB exists, the United States is at risk and must address the threat."

OSHA states that the new TB directive applies to all agency interventions, inspections, and violation abatement assistance. All inspections related to occupational exposure to TB should include a review of the employer's written plans for employee TB protection, OSHA states. Such plans may include a TB infection control program, a respiratory protection plan, and a medical screening program. Employee interviews and site observations are also an integral part of the evaluation process, the directive states.

> "MULTI-DRUG-RESISTANT AND EXTREMELY DRUG-RESISTANT TB CONTINUE TO POSE SERIOUS THREATS TO WORKERS IN HEALTHCARE SETTINGS."

Some key points on the OSHA inspection process include:

• Upon entry, the Certified Safety and Health Official (CSHO) should request the presence of the infection control director and the occupational health professional responsible for the control of occupational health hazard(s). Other individuals who may be responsible for providing records pertinent to the inspection include: the training director, the facility engineer, and the director of nursing.

• The CSHO must determine whether the facility has had a suspected or confirmed TB case among patients/clients or employees within the six months prior to the opening conference. This determination may be based, in part, upon interviews and a review of available infection control data. As soon as possible after an inspection has been initiated, the CSHO should contact the appropriate local or state health department to determine whether the facility has reported any TB cases during the previous year.

• The CSHO shall also review OSHA 300 log entries for confirmed cases of work-related TB. If the CSHO determines there are no suspected or confirmed TB cases among patients/clients or employees in the facility within the previous six months, he or she should suspend the TB portion of the inspection.

• If the facility has had a suspected or confirmed TB case within the previous six months, the CSHO shall proceed with the TB portion of the inspection. The CSHO should verify implementation of the employer's plans for TB protection through employee interviews and direct observations where feasible. Compliance will be determined through review of the facility plans for employee TB protection, employee interviews, and an inspection of appropriate areas of the facility.

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APIC 2015

APIC looks to frame the future, empower IPs

Increasing IP profile, resources, and Congressional clout

At risk of being overwhelmed by data collection demands, infection preventionists are also arguably at their highest profile in the field's history in a time of Ebola, MERS, and the threat of other emerging infections and pandemics. Real reductions in healthcare infections once considered inevitable are proving possible for those that can find the time and resources to intervene and implement prevention strategies. For today's IP, the opposite poles are the infamous silo and the patient bedside.

Fittingly, some 4,300 IPs at the recent APIC conference in Nashville heard tales of woe and heroism. Research reported at the meeting calculated that it can take as much as a mind-numbing five hours a day to meet all the reporting requirements for healthcare-associated infections (HAIs) to federal agencies and regulators. (See *Hospital Infection Control & Prevention,* July 2015, page 81.) At the other extreme, IPs shared extraordinary accounts from the frontlines of the Ebola outbreak in West Africa. Which way is the field headed? The national furor over the American Ebola cases certainly brought infection prevention into the spotlight, with one post-mortem report on the response arguing that IPs should be fully funded to bring their expertise to the forefront in such times.[1]

The outbreak revealed that the thin line between the patient and infection is typically one overworked IP with little surge capacity. APIC took the unusual step of holding a press conference to warn that other infections may increase as IPs devoted all of their time to training workers to protect themselves from Ebola. That national priority of antibiotic stewardship has also heightened the IP profile, with current APIC president Mary Lou Fanning, PhD, invited to attend a recent White House summit on the issue.

"We were thrilled to be able submit APIC's name and application and have APIC and infection preventionists represented at this very special forum," **Katrina Crist**, MBA, APIC CEO, said at the opening session of the conference. "For the first time also this year, the chairs of all our [APIC] committees actually went to Capitol Hill. We are starting to educate Congress and connect with them on who APIC is — use APIC's influence and bring infection preventionists to talk to them very directly. And we have had impact already with just one visit. The board of directors will also go this year in September and will follow up on that."

The goal is to demonstrate the value of infection prevention programs and secure full funding for IP programs. "We all know the value of what you do and we want to bring that forward and help you evolve with the changing environment," she said.

To do that, APIC will use the time-honored epidemiological approach: establish a baseline. Yes, that means more data collection, but this time about infection preventionists themselves.

APIC is urging IPs to take a collective look in the mirror and complete an unprecedented "MegaSurvey" to bring a profession at the crossroads into sharp demographic focus. The detailed information collected will not only set a baseline, but "frame the future" for the profession, Crist said. The survey will collect crucial information related to IP demographics, organizational structure, practice and competencies, and compensation.

Understanding how other infection prevention programs are structured and staffed, as well as how much other IPs are paid based on experience, credentials, competencies, and regional differences, are just a few of the ways this data can provide opportunities for the individual IPs, APIC notes.

A highly informed view of the field is going to be critical if IPs are to get out to the wards and bedsides and be vocal advocates for patient safety and worker health. As high profile as the field has become as a voice of evidence-based reason during the emergence of Ebola and MERS, there are the aforementioned pressures that threaten to relegate IPs back to the computer screen, crunching numbers.

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1. Presidential Committee for the study of Bioethical Issues. Ethics and Ebola: Public Health Planning and Response. Feb. 2015: http://1.usa.gov/1BMv0Ut. ■

Clostridium difficile causing some 8,700 fatal infections in long-term care annually

Antibiotics trigger onset; stewardship programs a must

C. diff is becoming a leading killer in nursing homes, as residents predisposed to the brutal infection by antibiotic treatments in both hospitals and long-term care settings succumb to this opportunistic gut dweller.

Broad spectrum antibiotics in particular can wipe out commensal gut flora and set the stage for *C. diff* infection (CDI) in this frail, elderly population.

In the U.S. some 1.4 million residents live in nursing homes, with many shuttling back and forth to hospitals for treatment that typically includes antibiotics. Researchers with the CDC recently analyzed population-based surveillance data to estimate the national incidence of nursing home onset (NHO) of CDI.

C. diff caused some 115,400 infections with onset in nursing homes in the United States in 2012, comprising nearly one-quarter of all U.S. CDI cases. Of those, some 8,700 (8%) residents died within 30 days of diagnosis, the researchers reported.[1]

"This number [of overall cases] is 9% higher than the 104,400 estimated CDIs in nursing homes in 2011 using the same surveillance population," says **Jennifer Hunter**, MD, lead author of the study and a CDC epidemic intelligence service officer. "However, this difference is likely related to increased adoption of nucleic acid amplification testing [NAAT] by U.S. laboratories."

So the increase is at least due in part to more sensitive testing, but with continuing use of the NAAT assay ongoing surveillance will allow more "apple to apple" comparisons in future reports. The highly virulent NAP-1 strain caused almost a third of infections (30%) in both years.

CDI cases were defined as a *C. difficile*-positive stool collected in a nursing home or within four days after a nursing home stay in a resident without a positive test in the prior eight weeks. Medical records were reviewed on a random sample of cases. The CDC researchers identified a total of 3,506 NHO-CDI cases and extrapolated the findings nationally. Among 262 cases with medical record review, median age was 82 years, 60% were female, 77% received antibiotics in the 12 weeks prior to a *C. difficile*-positive specimen, and 57% were discharged from a hospital in the month prior. The movement back and forth between long-term and acute care was very much in evidence.

"Among NHO-CDI cases nationwide, we estimated that 31,362 (27%) were hospitalized within seven days of positive specimen," Hunter says. "These were considered nursing home onset, but in these cases the antibiotics given in hospitals set the patients up for infections."

Though much of the discussion about antibiotic resistance and stewardship has focused on a future "post-antibiotic era," the direct correlation between antimicrobial use and CDIs is a clear and present danger. Another recent study quantified this cause and effect phenomenon, determining that each 10% increase in antibiotic use was associated with an increased incidence of CDI of 2.1 per 10,000 patient-days.[2]

In the CDC analysis, researchers found that antibiotic use in the 12 weeks prior to symptom onset was common for both recently hospitalized NHO-CDI cases as well as those without a recent hospitalization. These findings suggest reducing unnecessary antibiotic use in acute and long-term care settings will be an important factor in decreasing nursing home onset CDIs, they concluded.

However, the nursing home study did not collect information on whether the hospitals and long-term facilities had antibiotic stewardship programs.

"The National Action Plan for Combating Antibiotic-resistant Bacteria calls for strengthening antibiotic stewardship in long-term care settings by expanding existing programs, developing new ones, and monitoring progress and efficiency," Hunter says.

The reported deaths include both those whose death was directly attributable to *C. diff* and those who died while they had a CDI, but could have died from other causes, she adds.

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2. Brown K, Valenta K, Fisman D, et al. Hospital ward prescribing and the risks of *Clostridium difficile* infection. *JAMA Intern Med* 2015;175:626-633. ■

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COMING IN FUTURE MONTHS

- CRE infection control: Contact precautions on steroids
- Joint Commission focuses in on central services
- Extending infection control to ambulatory care
- Continuing controversies in HCW vaccinations

CNE/CME INSTRUCTIONS

To earn credit for this activity, please follow these instructions:

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CNE/CME QUESTIONS

1. According to *Russell Olmsted*, MPH, CIC, lessons learned in training to safely don and doff personal protective equipment for Ebola could be applied to:

A. Norovirus
B. CRE
C. Enterovirus D68
D. MERS

2. A new OSHA directive said tuberculosis inspections should include a review of the employer's written plans for employee TB protection, which may include:

A. TB infection control program
B. Respiratory protection plan
C. Medical screening program
D. All of the above

3. In updating its TB compliance directive, OSHA cited the continuing importation of TB from the foreign born and the fact that U.S. TB cases have increased three consecutive years.

A. True
B. False

4. Factors that have been cited by the WHO for the hundreds of occupational Ebola infections in West Africa include:

A. Shortages of personal protective equipment
B. Improper use of PPE
C. Too few medical staff for the number of cases
D. All of the above

CNE/CME OBJECTIVES

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

1. Identify the clinical, legal, or educational issues encountered by infection preventionists and epidemiologists;
2. Describe the effect of infection control and prevention issues on nurses, hospitals, or the health care industry in general;
3. 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.