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**AHC Media**

## Ebola in America: Reign of fear ending, will science prevail?

*Panic and politics, mistrust of CDC, bode ill for next pandemic*

*By Gary Evans, Executive Editor*

**A** U.S. Ebola outbreak characterized more by fear than science — marked by distrust, rumor and false assumptions — may yet yield something positive: A rededication to basic infection control practices in the nation's hospitals and increased support for infection prevention programs and public health.

As this issue went to press, an American physician who acquired Ebola fighting the epidemic in West Africa had been released from a hospital in New York City, and the outbreak in Texas appeared to be over as well. The index case, Thomas Duncan, acquired Ebola in Africa and traveled to the U.S. while the virus was in the incubation phase. He died Oct. 8 at Texas Health Presbyterian Hospital in Dallas. Two nurses who cared for Duncan acquired Ebola, but subsequently were treated and have fully recovered. The

cause of transmission has not been determined, but investigators theorize that exposures could have occurred during removal of personal protective (PPE) equipment after performing high-risk procedures like hemodialysis and intubation on the patient. In the aftermath of the incident the hospital conceded in a letter of apology that "training and education programs had not been fully deployed before the virus struck."<sup>1</sup>

Texas Health also apologized that Duncan was not admitted when he first appeared at the hospital on Sept. 26 with the initial signs and systems of Ebola. His travel history from Liberia was noted in the medical record, but was not "communicated effectively" between medical staff, the hospital reported. Duncan returned to the hospital and was admitted two days later, raising the painful and inevitable

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question whether he might have survived Ebola if he had been admitted on the first visit. The hospital was roundly criticized, but some wonder if other U.S. hospitals that have never seen a case of Ebola would have suffered a similar fate, particularly in the practice of infection control when a single breach could lead to transmission.

“Who knows what happened in the [transmission to the nurses], but I would challenge anyone to look at the practices they used before the first case was identified and to answer honestly, ‘Were you adhering with standard precautions and the other activities that guidelines say we should do to practice safely both for patients and ourselves?’” says **Ruth Carrico**, PhD, RN, FSHEA, CIC, a former infection preventionist who is now an associate professor of infectious diseases at the University of Louisville (KY) School of Medicine.

“How many of us could have said, ‘Yes I am willing to go into [an Ebola] environment because I’m confident in my practice,’” she continued. “I think if you asked 100 people that, 99 of them would have taken a step back. Because we know that is not what we were doing. We have been kind of flying loose and easy [with infection control] because up till now it has been OK — so we think. Now we are seeing that ‘almost’ practicing infection control is not OK. Mother nature has given us a stern reminder.”

## An era of pandemics

Moreover, there is every expectation among epidemiologists and researchers that emerging infections and potential pandemic pathogens will continue to arise,

as the speed of global travel and continued encroachment of humans on animal habitats yield highly mobile zoonotic agents like Severe Acute Respiratory Syndrome (SARS), H1N1 pandemic flu and Middle East Respiratory Syndrome (MERS) coronavirus.

Those pandemic pathogens all emerged this century, but the reaction to Ebola in this country has been more reminiscent of the early days of the AIDS epidemic in the 1980s. Some of the same themes seen with Ebola characterized the early days of AIDS — stigmatization of certain groups, mistrust of public health officials, rumors of airborne spread and a litany of other falsehoods and fears that undermined the response to the epidemic. (*See related story, p. 125.*)

“As we gathered the [HIV] science we were able to figure out what was relevant and what was not — what were we doing just because of fear?” Carrico says. “Then unfortunately over the last 30 years we’ve become very complacent. We thought that ‘almost’ practicing good infection control was good enough.”

Ebola’s arrival in America — and whatever future pandemic pathogens will follow — demands a new rigor and dedication to infection control in the nation’s hospitals. The Ebola crisis also revealed that infection prevention departments are understaffed and insufficiently resourced for the kind of surge capacity and training that is needed to meet an emerging epidemic threat, the Association for Professionals in Infection Control and Epidemiology (APIC) emphasized. (*See related story, p. 127.*) Though the CDC has promised to dispatch rapid response teams to the next hospital that has

an Ebola case, facilities large and small must still be able to determine by travel history and symptoms if a patient sitting in their emergency room has the deadly virus. Identification and initial isolation are still necessary no matter how quickly the CDC arrives on site.

“At the base of all this, infection control practice has to be excellent,” Carrico says. “That has to be the core, fundamental foundation to every single thing we do. We can’t change this for the disease of the day. As we push our ‘reset’ button we hope the new normal is a practice that is more precise with less deviation. It also points out that infection control is everyone’s responsibility. The infection preventionists have to be the leader of this process, [but] we need to build a capacity within our healthcare settings [that includes other health care workers and administration].”

The CDC has done a good job in responding to the changing challenge of Ebola and updating and revising guidelines, she notes.

“Hindsight is great — anybody can go back and say you should have done this and that after the situation has been well revealed,” she says. “We need to trust the science to help us make these decisions, but we are a very risk-averse society. We’re not willing to accept one situation occurring and because of that then we have to ask how do we reach zero? With Ebola, to reach zero requires a massive undertaking with many unintended consequences.”

## A delicate balance

Throughout the Ebola outbreak the CDC has had the difficult task of being reassuring without inviting complacency and, on the other hand,

issuing urgent warnings without inducing panic. From the onset there were some mixed messages or at least perceptions, as the CDC was originally recommending a combination of contact and droplet isolation (airborne for aerosols) and saying any U.S. hospital should be able to admit and isolate an Ebola patient. Yet the first American cases of care workers infected in Africa were brought in under heavy barrier precautions and treated in virtually failsafe biocontainment units at Emory University in Atlanta and the University of Nebraska in Lincoln. Likewise some hospitals were apparently already preparing to use N95 respirators or powered air purifying respirators (PAPRs) if they had an Ebola case, even though those measures went beyond the initial CDC guidelines.

“I think this ‘fear of Ebola’ started this summer when the first patients were brought back home to Emory for care. Somehow transmission was not emphasized enough at that time,” says **Patti Grant**, RN, BSN, MS, CIC, director of infection prevention at Methodist Hospital for Surgery in Addison, TX. “Not placing blame on the news media or the CDC, yet in retrospect that might be a lesson learned. When any ‘new’ disease comes into a geographic region we should emphasize transmission facts as ‘we know them today.’”

The public was more forgiving about lack of transmission knowledge with a truly novel agent like SARS, but there was the perception that the CDC has been aware of Ebola for decades and should know “everything” about the virus, she adds.

“Well, they did know ‘everything’ there was to know about Ebola until the U.S. health care system

introduced dialysis and intubation into the mix -- creating the opportunity for aerosolization of Ebola,” Grant says. “That’s aerosolization — not airborne.”

The situation is similar to what occurred during the 2001 anthrax mail attacks, which included inhalational infections in the Brentwood postal processing facility in Washington, D.C. CDC officials later conceded that they thought the postal workers were at risk of cutaneous anthrax from handling mail but not inhalational exposures from the sealed envelopes.

“Today it is still true that anthrax is not an ‘airborne’ pathogen, yet who in their wildest dreams would have thought anthrax spores would be placed in an envelope, subjected to high-speed mail sorting machinery and then become airborne?” Grant says. “Some of these very real situations can be misconstrued as lack of CDC knowledge, or one hand not knowing what other is doing, or flat-out deliberate misrepresentation of the facts.”

Although Ebola is a bloodborne pathogen like HIV, and hepatitis B and C, the relatively short incubation period and high mortality rate of the virus have contributed to “Ebola hysteria,” Grant observes. Even HIV in the era when there was no treatment progressed slowly when compared to Ebola’s typical onset within 8 to 10 days of exposure.

“Ebola has a short incubation period and can kill quickly, and the [misperception] is ‘if it can happen to a health care worker then it must be easy to get,’” she says.

## Mistrust of government

Another factor in the criticism

# Ebola cases in Africa exceed 13,000, but there are a few encouraging signs

*Safe burials increasing, fewer bodies being picked up*

As of Nov. 7, 2014, the World Health Organization reported that Ebola in three West African countries that comprise the epicenter of the outbreak — Guinea, Liberia, and Sierra Leone — had reached 13,241 cases, with 8,142 of them laboratory confirmed and 4,950 dead.

While the fight goes on, there are a few encouraging signs, including that the Sierra Leone capital of Freetown has tripled the number of safe burials of Ebola victims. Rituals of touching and kissing the deceased were early contributors to Ebola spread. There are also reports that the Red Cross is picking up fewer dead bodies of Ebola victims.

“That’s encouraging, but the biggest problem we have there is not having enough health care workers,” says **Eddie Hedrick** MT(ASCP), CIC, project coordinator in the state Bureau of Communicable Disease Control & Prevention in the Department of Health and Senior Services in Columbia, MO.

“Discouraging people from this country from going there with these quarantines would really do major damage to the effort to bring it under control. I think they have estimated they need about 5,000 people coming in there a month to get this under control.”

There have been some astronomical projections of Ebola cases, but most of them are based on old data and do not account for current interventions. The Centers for Disease Control and Prevention ramped up the fear factor at one point with projections of Ebola cases in Africa hitting 550,000 to 1.4 million. However, even in releasing the projections, the CDC said they were based on old data and thus already obsolete. At that time the agency was trying to desperately stir the rest of the world into action and stop Ebola before it gets out of Africa and into another regions with insufficient health infrastructure to prevent transmission. ■

and distrust of the CDC during the Ebola outbreak was the buildup to the Nov. 4 midterm elections. Future outbreaks are going to be difficult to contain if CDC recommendations are ignored, as was the case when Draconian quarantine laws were initially enacted to confine symptomless health care workers for three weeks after their return from the Ebola outbreak in West Africa.

“We are in a period where we don’t have a lot of trust in government because the government hasn’t been functioning well,” says **Eddie Hedrick**, MT(ASCP), CIC, an infection preventionist for decades who is now project coordinator in the state Bureau of Communicable Disease Control & Prevention in Columbia, MO. “The

political aspects of the quarantine they put on that young nurse from Maine polarized people. A lot of people looked at her as being some kind of pariah and others on the other side recognized what was happening — that these guys were using this for political gain. It just further divided people.”

Infection control groups immediately came out against the harsh measures initially adopted in New York and New Jersey, which were triggered by a symptomless physician who traveled about the city after returning from the frontlines of the Ebola outbreak in Africa. **Craig Spencer**, MD, was recently discharged from Bellevue Hospital in NYC. Spencer was self-monitoring for symptoms and

called in when he began to spike a fever. Ebola is not communicable until the viral titer builds and begins triggering symptoms in the host — fever, headache, nausea, diarrhea, et al. Though the CDC has been emphasizing that point for months, it seems to have been largely lost amid the public fear of Ebola.

Ironically, misguided Ebola quarantine laws for asymptomatic health care workers — ostensibly enacted by states to ensure public safety — could have the opposite effect both in the U.S. and at the outbreak epicenter in West Africa.

“If we turn them into pariahs instead of recognizing their heroic work they may be less likely to disclose their health care worker status and we lose the opportunity

to directly monitor them,” said **Tom Frieden**, MD, MPH, director of the CDC. “They may be less likely to go help stop it at the source in Africa, and with that, if it spreads further or longer in the three countries ... the risk to us would increase.”

Urging “individualized assessment” of health care workers returning to the U.S. after treating Ebola patients, the CDC unveiled a risk stratification approach at an Oct. 27 press conference. The three risk categories are high risk (i.e., needlestick); some risk (close contact with someone with symptoms); and low, but not zero risk (air travel with a symptomatic patient). Based on the risk assessment, monitoring, travel restrictions and other control measures are recommended as health care workers report to their state health departments.<sup>2</sup>

Appealing to reason, APIC reminded that no one in the community was infected by index case Duncan. “The evidence is clear

that individuals are not infectious until they show symptoms of the illness,” APIC said in a statement. “[Ebola] is not transmitted through the air. It is important to be guided by the scientific evidence, and apply the lessons learned so far from other experiences, including the fact that even family members who were in close contact with Mr. Duncan in Dallas have not gotten sick.”

That is a point well taken, as the late Duncan was clearly symptomatic for two days in the community after Dallas Presbyterian failed to admit him when he first presented for care. No one has acquired Ebola in a U.S. community and Duncan remains the only person to die of the disease in the U.S. The only people who have actually acquired the virus in the U.S. are the two Dallas nurses. Thus, after all the sound and fury, as this issue went to press no one was hospitalized with Ebola in the U.S. and eight people had been successfully treated for the

disease. With one death among the nine U.S. cases we have a mortality rate of 11%, suggesting that part of the reason Ebola is so deadly in Africa -- with 50% to 90% fatal cases -- is that the level of patient care demanded cannot be adequately delivered. In particular, **Bruce Ribner**, MD, who treated some of the first cases at Emory University, said Ebola patients have massive fluid loss — rivaling conditions seen in cholera — that can be difficult to restore. ■

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# Ebola: Triumph of fear echoes early days of AIDS

*A ‘toxic mix of scientific ignorance and paranoia’*

**A**fter the index case of Ebola in the U.S. died and two nurses who treated him in a Dallas hospital became infected, there was an outbreak of irrationality that spread as rapidly as any epidemic.

People that had merely visited Dallas, miles from the hospital involved, were told not to return to work. Incinerated waste, burned beyond viral recognition, was not allowed to cross state lines to a landfill. People wore hazmat suits at airports and every passenger on a plane with even a symptomless Ebola patient was perceived to be in

grave danger. Yet no person on any plane acquired Ebola from a fellow passenger.

Some of the same themes seen with Ebola characterized the early days of AIDS — stigmatization of certain groups, mistrust of public health officials, rumors of airborne spread and a litany of other falsehoods and fears that undermined the response to the epidemic.

Two AIDS activists recently wrote that the reaction to Ebola — a “toxic mix of scientific ignorance and paranoia” — was very much

reminiscent of AIDS in the 1980s.<sup>1</sup> They reminded where such fears can lead, as at one point the *New York Times* actually published an op-ed piece wherein the late William F. Buckley Jr. proposed in apparent seriousness that ‘Everyone detected with AIDS should be tattooed in the upper forearm.’<sup>2</sup>

In terms of the threat to health care workers, there were occupational HIV infections due to needlesticks and blood exposures that were tantamount to a death sentence before the first treatments and post exposure prophylaxis

regimens were available.

“Those of us who are HIV-positive and have survived all these years owe a deep debt of gratitude to health care workers,” the AIDS activists wrote. “None of us would be alive today if it were not for their generosity and passion for their work and their willingness and even eagerness at the start of this plague to treat some of our country’s most marginalized populations, including gay men, drug users, and sex workers.”

Yet these providers — some of whom acquired HIV trying to treat the first AIDS patients — were subjected to threats and witch hunts that could mean a loss of livelihood if their infection was discovered.

This era reached a fever pitch in 1990 when the Centers for Disease Control and Prevention reported provider transmission of HIV to six patients in a Florida dental practice.<sup>3</sup> At one point during the heated debate, Sen. Jesse Helms (R-NC) introduced an amendment — which the Senate approved by a vote of 81-18 — calling for a minimum 10-year prison term for HIV-infected health care workers who perform invasive procedures without informing patients. A compromise was eventually reached involving expert review panels for infected providers, but fear triumphed over reason for much of this unfortunate chapter in American medicine.

An infection preventionist for decades before he transitioned into public health, **Eddie Hedrick**, MT(ASCP), CIC, has seen these recurrent themes emerge in outbreaks and pandemics.

“Every outbreak that I’ve been involved in — going back to 1976 with Legionnaires, swine flu, all these major epidemics — we do

three predictable things,” says Hedrick, project coordinator in the state Bureau of Communicable Disease Control & Prevention in Columbia, MO. “First, we want to quarantine people because we always feel [safer] if they are over there and we are over here. Most of the time that is a false sense of security because the majority of diseases are contagious before you show signs and symptoms. With Ebola, that doesn’t appear to be the case, however people continue to believe that.”

The second common response is a tendency toward overkill in donning personal protective equipment (PPE), which paradoxically may increase risk because it increases the likelihood of contamination when the equipment is removed. This is particularly true if there has been only a cursory review of donning and doffing the PPE, which was no doubt the case in many hospitals before the first case of Ebola was admitted for treatment.

“Training is everything,” Hedrick says “I worked with some emergency response people recently who I thought were highly skilled. They put on hazard suits and much to my dismay they really weren’t [prepared]. All of them contaminated themselves taking the PPE off. If people don’t do this a lot they don’t get very comfortable with it.”

And the third recurrent response to a pandemic or an outbreak in Hedrick’s trifecta? The assignation of blame.

“That depends on the scenario, but if you go back to plague the rich blamed the poor. Go back to HIV we blamed the gay community and the drug abuse community,” he says. “With H1N1 we blamed Mexico.

It even happens in hospitals — the hospital blames the nursing home for MRSA [infections] and the nursing home blames the hospital.”

The CDC has certainly been blamed during the Ebola outbreak, particularly over the decision to screen and actively monitor travelers to the epidemic area rather than stopping all flights from the three main countries at the epicenter — Guinea, Liberia, and Sierra Leone. The CDC wants to keep travel open to keep aid and workers moving in and out of the area, which could be subject to economic collapse and chaos if the rest of the world shuts it off.

“Ebola has captured our headlines but in Liberia, Sierra Leone and Guinea, it has shut down their countries since March,” says **Walter Tsou**, MD, MPH, a professor of health policy at the Center for Public Health Initiatives at the University of Pennsylvania in Philadelphia. “Nothing can reverse an economy with the speed of an infectious disease out of control. We are widely ignorant that we live in a global economy and what is happening in other countries matters here.” ■

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# APIC: Ebola response may leave patients vulnerable to more common infections

*Time for full funding and support of infection control in the nation's hospitals*

While infection preventionists in the nation's hospitals are diverting time and resources to Ebola preparedness there is a real risk that a host of other infections – from *Clostridium difficile* to MRSA – will increase and claim many more American lives than the highly publicized virus out of West Africa.

“Our fear is that while we are dedicating these resources to Ebola are infection preventionists ignoring other types of things?” said **Linda Greene**, RN, MPS, CIC, of the Association for Professionals in Infection Control and Epidemiology (APIC). “Will we miss those red flags if we have a flu epidemic or we have a number of patients with CRE [carbapenem-resistant Enterobacteriaceae]? We are taking care of [Ebola] patients — we are doing what we need to do — but when resources are dictated one way we may be missing other things. That's really [why] we are sounding the alarm.”

In testimony recently submitted to Congress, APIC argued that it was time for full funding and support of infection control in the nation's hospitals.

“Our members are an essential link to understanding and addressing risks that can contribute to serious public health threats,” APIC stated. “However, hospital infection control departments lack adequate funding and staffing to meet this need in addition to current HAI prevention and reporting requirements. In order for our nation to develop an adequate capacity to plan and prepare for the

spread of novel infectious diseases, we respectfully submit that this limitation must be remedied.”

Only 6% of U.S. hospitals are “well-prepared” to receive a patient with Ebola, according to an APIC survey of infection preventionists conducted Oct. 10-15. The survey asked APIC's infection preventionist members, “How prepared is your facility to receive a patient with the Ebola virus?” Of the 1,039 U.S.-based respondents working in acute care hospitals, about only 5% admitted to being unprepared for Ebola. The remaining responses reported various levels of preparedness in between the two extremes, with the majority (40%) indicating they were “somewhat prepared.” Survey responses were received from hospitals that ranged in size from less than 100 to more than 400 beds.

According to the survey, 51% of respondents had only one IP or less than one full-time equivalent infection preventionist on staff. Experts in identifying sources of infections and limiting their transmission in healthcare facilities, IPs have warned for years that they are under-resourced and have little surge capacity to handle epidemics like Ebola.

“We know that many hospitals do not have enough staff dedicated to infection prevention and control,” said **Jennie Mayfield**, BSN, MPH, CIC, president of APIC. “Facilities that are inadequately staffed to begin with are stretched beyond capacity at a time like this.”

Such times are expected to

continue in one form or another, as predicted at last year's APIC conference by keynote speaker virologist **Nathan Wolfe**, PhD, who warned that we will continue to see pandemics arising from animal reservoirs as emerging viruses take full advantage of unprecedented paths into susceptible human populations. The current outbreak of the Zaire strain of Ebola was possibly sparked by an African toddler handling a fruit bat, one of the known reservoirs of the deadly virus.

While thousands are dying in Africa, the truth is that only one patient has died of Ebola in the U.S. The only documented cases of Ebola transmission in the U.S. have been to two Dallas nurses who treated the late index case. According to the CDC — in what is almost certainly an underestimate — 75,000 people die annually of infections acquired in hospitals.

APIC is calling on healthcare facilities to assess their infection prevention programs by looking at all the care and services provided by the institution and determining the appropriate level of personnel and resources necessary to meet the increased need. APIC is urging facilities to focus on three aspects of infection prevention in order to effectively protect healthcare workers, patients, and the public.

- Personnel — Because Ebola readiness demands intense, in-person training and drilling led by infection prevention experts, adequate infection prevention staffing is critical.

- Training — To ensure that

guidelines are followed precisely 100% of the time, healthcare workers must be trained and drilled on safety protocols so that they can

demonstrate proficiency in essential infection control practices.

- Technology and equipment — To maximize efficiencies and provide

real-time data to help infection preventionists detect and control infectious diseases. ■

## CDC adds respirators, clarifies confusing issue of droplet, aerosol and airborne transmission

*Rigorous step-by-step approach recommended for donning, removal of PPE*

An issue that has caused considerable confusion and fear during the Ebola outbreak is the difference between airborne, aerosol and droplet transmission. There are clear differences, but they weren't elucidated particularly well at the onset of Ebola cases in the U.S., leaving the public uninformed and then panicked when some reputable scientists warned that there was a small chance the Ebola virus could mutate and spread like a truly airborne pathogen such as measles.

"When I hear people talk about this going airborne — some very well-known people have made that comment — that is a giant leap," says **Eddie Hedrick** MT(ASCP), CIC, project coordinator in the state Bureau of Communicable Disease Control & Prevention in in Columbia, MO.

"Although viruses mutate, they mutate to evolve through natural selection and that kind of thing," he says. "They really don't suddenly change how they are transmitted. For that to happen would take changes not just in genetic characteristics but changes in physical characteristics that are well beyond the organism's ability. For the virus to stay in the air for long periods of time it would have to be able to survive by itself in a dried state. It really doesn't do that very well."

While emphasizing that Ebola does not spread by the airborne route (e.g., tuberculosis), the Centers for Disease Control and Prevention recently revised its infection control guidelines and recommended that health care workers wear N95 respirators or powered air purifying respirators (PAPRs) for treating patients stricken with the deadly virus.

"We are recommending either of those options — but not a face mask," said CDC Director **Tom Frieden**, MD, MPH. "That's not because we think that Ebola is airborne, but rather because we think that [procedures] in American hospitals can be so risky, whether that is suctioning or intubation or other things that may not be done in other parts of the world such as Africa. We want to add the extra margin of safety."

The CDC previously recommended that respiratory protection and negative pressure rooms should be used if a procedure that may generate aerosols is being conducted on an Ebola patient. (i.e., bronchoscopy, sputum induction, intubation and extubation, and open suctioning of airways.) In such cases the fine mist of the aerosol, possibly including infective virus from the patient may be inhaled if the worker is unprotected.

Respiratory protection was one

of the bigger points of discussion in the development of the new "consensus" guidelines for Ebola personal protective equipment (PPE), which included input from clinicians who treated Ebola patients at Emory University Hospital, Nebraska Medical Center and the National Institutes of Health Clinical Center, he said.

Though it was starting to appear that many hospitals were going to err on the side of caution and use respirators regardless, the CDC argued in earlier Ebola guidelines that a surgical mask and face shield were sufficient to contain contact and droplet spread of the virus unless procedures were likely to generate aerosols that could be inhaled. Despite persistent questions, concerns and the occasional conspiracy theory, the CDC held to that recommendation for months.

The agency was likely trying to head off public misperceptions — and the ensuing high anxiety — that Ebola could transmit through the air. That is still not the case, but health care workers could use as much reassurance as possible if they are going to be asked to walk into the isolation room of an Ebola patient. A single exposure could mean death. And as a practical matter, the old guidelines could lead to situations where clinicians may decide the patient could benefit from

# CDC Q&A: What is the difference between airborne and droplet

The Centers for Disease Control and Prevention provides these answers to commonly asked questions about Ebola transmission:

**Is Ebola airborne?** Ebola is not a respiratory disease and is not spread through the airborne route.

**Can Ebola be spread by coughing or sneezing?** There is no evidence that Ebola is spread by coughing or sneezing. Ebola is transmitted through direct contact with the blood or body fluids of a person who is sick with Ebola; the virus is not transmitted through the air (like measles virus). However, large droplets (splashes or sprays) of respiratory or other secretions from a person who is sick with Ebola could be infectious, and therefore certain precautions (standard, contact, and droplet precautions) are recommended for use in healthcare settings to prevent the transmission of Ebola from patients to healthcare personnel and other patients or family members.

**Is Ebola spread through droplets?** To get Ebola, you have to directly get body fluids (blood, diarrhea, sweat, vomit, urine, semen, breast milk) from someone who is sick with Ebola in your mouth, nose, eyes or through a break in your skin or through sexual contact. That can happen by being splashed with droplets, or

through other direct contact, like touching infectious body fluids. Healthcare providers caring for Ebola patients and the family and friends in close contact with Ebola patients are at the highest risk of getting sick when they touch or are splashed by infectious blood or body fluids from a sick patient.

**What's the difference between infections spread through the air or by droplets?** Airborne spread happens when germs float through the air after a person talks, coughs, or sneezes. Those germs can be inhaled even after the original person is no longer nearby. Direct contact with the infectious person is NOT needed for someone else to get sick. Germs like chicken pox and TB are spread through the air.

Droplet spread happens when fluids in large droplets from a sick person splash the eyes, nose, or mouth of another person or through a cut in the skin. Droplets may cause short-term environmental contamination, like a soiled bathroom surface or handrails, from which another person can pick up the infectious material. Germs like plague can be spread through large droplets. Ebola might be spread through large droplets but only when a person is very sick.” ■

an aerosol-generating procedure, but they would have to leave the room and re-garb to don a respirator.

“We don't want the health care worker who is already suited up — and it takes a while to suit up — saying, ‘[I need] to suction this patient and that might [create] aerosol generation, so I'm going to leave — take all of this off — and put on an N95 or PAPR and come back,’” Frieden said. “So we've [decided] that we are not going to recommend that face masks be used, but either N95s or PAPRs. For other countries [in Africa] that may be less relevant, but it's because of the kind of [aerosol generating] procedures that are done here.”

## Ritual removal of PPE

The new CDC guidance focuses on specific PPE that health care workers should use, providing detailed instructions on how to remove equipment safely.

“The greatest risk in Ebola care is in the taking off of whatever equipment the health care worker has put on” Frieden said. “One of the critical aspects of these guidelines is a very structured way of doing that step-by-step which is supervised, and in a way ritualized, so that it is done the same way every time.”

The CDC Ebola guidelines are centered on three principles:

- All healthcare workers undergo rigorous training and are practiced and competent with PPE, including taking it on and off in a systematic manner
  - No skin exposure when PPE is worn
  - All workers are supervised by a trained monitor who watches each worker taking PPE on and off. This is to ensure each worker follows the step by step processes, especially to disinfect visibly contaminated PPE. The trained monitor can spot any missteps in real-time and immediately address them.
- The CDC is essentially recommending the same PPE

included in its August 1, 2014 guidance, with the addition of respirators, coveralls and single-use, disposable hoods and face shields. Goggles are no longer recommended, as they may not provide complete skin coverage in comparison to a full face shield. Additionally, goggles are not disposable, may fog after extended use, and healthcare workers may be tempted to manipulate them with contaminated gloved hands, the CDC noted. The CDC is recommending an extensive ritual for donning and removing PPE that will take some practice to learn, and should be

done in the presence of a trained observer when actually treating an Ebola patient. A video demonstration of how to safely don PPE gear and remove it after contact with Ebola patients is available at: <http://bit.ly/13HBkTb>

The new CDC recommendations for PPE use by health care workers caring for Ebola patients include:

- Double gloves
- Boot covers that are waterproof and go to at least mid-calf or leg covers
- Single use fluid resistant or impermeable gown that extends to

at least mid-calf or coverall without integrated hood.

- Respirators, including either N95 respirators or powered air purifying respirator (PAPR)

- Single-use, full-face shield that is disposable

- Surgical hoods to ensure complete coverage of the head and neck

- Apron that is waterproof and covers the torso to the level of the mid-calf should be used if Ebola patients have vomiting or diarrhea. ■

*Editor's note: The CDC infection control guidelines for Ebola are available at <http://1.usa.gov/10ixUos>*

## Not just hospitals — public health underfunded, ill equipped to face Ebola, future pandemics

*'We are a country lurching from crisis to crisis'*

While it has been duly noted that many hospitals lack the surge capacity and training to deal with an Ebola patient, the public health system is also ill prepared for emerging infectious disease outbreaks and pandemics, an expert in the field warns.

"The next few cases of Ebola or another infectious threat will show that we underfund public health at great peril to our country," says **Walter Tsou**, MD, MPH, a professor of health policy at the Center for Public Health Initiatives at the University of Pennsylvania in Philadelphia. "We are a country lurching from crisis to crisis without making the planned and dedicated investment in scientific research and public health preparedness."

Indeed there is every expectation among epidemiologists and researchers that emerging infections and potential pandemic pathogens

will continue to arise, as the speed of global travel and continued encroachment of humans on animal habitats yield novel zoonotic agents like SARS and MERS coronavirus.

"People forget that there are very few things that could close down a city the size of Toronto or for that matter a superpower like China, but in fact in 2003, SARS did precisely that," Tsou says. "SARS closed down air travel to much of Asia and devastated its economy."

China was able to end the crisis by changing its hospital emergency department policies, allowing anyone with respiratory symptoms — regardless of ability to pay — to come in for medical evaluation and treatment, Tsou tells *Hospital Infection Control & Prevention*.

"After SARS, China's 'CDC' found their budget was doubled and they built an entire new campus and moved from their cramped space

in downtown Beijing," he says. "In Taiwan, their 'CDC' budget was tripled. Asia learned not to mess with public health."

The Ebola threat in the U.S has been stopped at least temporarily by the labor intensive efforts of public health staff and clinicians, but how much easier might the response have been if there was a safe available vaccine for Ebola? One would almost certainly be available by now if researchers and governments had acted when Ebola first appeared in the Congo in 1976 near the eponymous river that bears its name.

"There was no way for pharmaceutical companies to profit and our NIH budget has been cut, it has not been a priority for researchers — as if the lives of Africans did not matter," Tsou says. "Now we are trying to paddle up a stream desperately looking for a treatment or vaccine without the type of basic

research and safety trials that should have been in place decades ago.”

Other largely unknown diseases like Marburg, Chikungunya, Dengue and other unwelcome viruses could

become part of the American lexicon soon without a dedicated effort to confront them now and put in place the research needed to address their prevention, Tsou warned.

“All of this requires money and planning — something in short supply for a largely ideologically driven, crisis directed government,” he says. ■

## PPE supplies for Ebola in high demand, CDC bolsters strategic national stockpile

*But will they really be needed in most hospitals?*

**W**ith sincere apologies to the ghost of Winston Churchill, never in the field of infection prevention was so much purchased by so many to be worn by so few.

U.S. hospital storage shelves are brimming with personal protective equipment (PPE) in many facilities, while others scramble to stock up before an Ebola patient is sitting in their emergency department. Yet, unless things take a dramatic and unlikely turn for the worse, most of this gear will never be worn to protect health care workers from Ebola.

Though all hospitals must prepare to diagnose and isolate an Ebola patient, very few will actually have to admit a patient infected in the ongoing outbreak in West Africa. Sporadic cases could continue to occur however, opening up the possibility that the next U.S. Ebola case seeks care in a hospital with a shortage of PPE gear.

Thus, the Centers for Disease Control and Prevention has ordered \$2.7 million in PPE to increase the Strategic National Stockpile (SNS) supplies to assist U.S. hospitals caring for Ebola patients. Products are being configured into 50 kits that can be rapidly delivered to hospitals. Each kit can provide the PPE needed by clinical teams to manage the care of one Ebola patient for up to five days. Purchases are based on PPE

guidance for caring for Ebola patients that was issued by CDC on October 20. (See related story, p. 128) As product is delivered to SNS facilities, it is assembled into kits by SNS personnel. The kits can be rapidly delivered from the SNS as requested to those hospitals that receive suspected or confirmed Ebola cases but may need additional PPE supplies that otherwise are not immediately available. Although the number of kits is limited, they will help address short-term PPE needs.

Purchases include impermeable gowns, coveralls, and aprons; boot covers; gloves; face shields and hoods; N95 respirators; powered-

air purifying respirator systems and ancillaries; and disinfecting wipes.

Since the issuance of the CDC guidance, there has been a sudden increase in demand for PPE. Across the United States, availability for these products varies by product type and model, requested quantity, manufacturer, distributor, and geographic region, the CDC stated. Hospitals should coordinate with their state public health departments if there is a need to request PPE supplies from CDC to care for an Ebola patient. The state health department will follow the established protocol for submitting this request to CDC. ■

### 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.

### COMING IN FUTURE MONTHS

- CMS infection control survey to be finalized in spring 2015
- OSHA drafts infectious disease rule – will Ebola give it political momentum?
- IP profile: Antibiotic stewardship and the infection preventionist
- Union sues hospital over mandatory flu shots. Precedent or last stand?



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## CNE/CME QUESTIONS

1. **Rather than simply confining health care workers for a 21-day quarantine after returning from providing care to Ebola patients in West Africa, the CDC recommended "individualized assessment" and use of a risk stratification approach.**  
A. True  
B. False
2. **Eddie Hedrick, MT(ASCP), CIC, said which of the following are "predictable" themes that arise in virtually every major outbreak?**  
A. Demand for quarantines  
B. Overuse of personal protective equipment  
C. Assigning blame  
D. All of the above
3. **In a survey by the Association for Professionals in Infection Control and Epidemiology (APIC), what percentage of respondents said their hospital was "well prepared" to receive a patient with Ebola?**  
A. 3%  
B. 6%  
C. 11%  
D. 18%
4. **Which infectious disease was cited by Walter Tsou, MD, MPH, for sharply reducing air travel to China?**  
A. H1N5 avian flu  
B. MERS  
C. SARS  
D. H1N1 pandemic flu

### TIPPING POINT

*"I've thought often about it. I wish we had put a [CDC response] team like this on the ground the day the [index Ebola] patient was diagnosed. That might have prevented [the nurse's] infection, but we will do that from this day onward."* CDC Chief **Tom Frieden**, 10/14/14



# Hospital Infection Control & PREVENTION

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