

FEATURE

BRIEFING

US revamps domestic Ebola response

Recent cases have exposed weaknesses in US procedures for controlling the spread of Ebola virus. The CDC has responded by tightening the guidelines, **Michael McCarthy** reports

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US health officials have been scrambling to tighten up their control protocols and procedures after the emergency room staff of a hospital in Dallas, Texas, misdiagnosed the first case of Ebola in the US—in a Liberian man who became ill shortly after arriving from west Africa—and two of the hospital's nursing staff contracted the disease while caring for him.

On 20 October, the US Centers for Disease Control and Prevention (CDC) issued new guidelines for healthcare providers caring for patients with Ebola virus disease.^{1 2} The stricter guidelines require personal protective equipment that covers the entire body, including face shields and respirators. The revised guidelines also call for more rigorous staff training in how to take on and off the protective equipment and requires that a trained monitor be at hand to supervise staff every time they put it on and take it off.

What steps are being taken to stop Ebola coming into the country?

US health officials expect few cases of Ebola will come to the US and are confident they can quickly and effectively contain any outbreak by relying on the traditional public health practices that emphasize detecting, isolating, and treating cases and tracing their contacts. Airport screening is seen as the first line of defense, and as of 21 October, anyone flying from one of the three affected west African countries—Senegal, Liberia, and Guinea—can enter the US only through one of five designated airports: Kennedy International in New York, Newark Liberty International, Washington Dulles International, O'Hare International in Chicago, and Hartsfield-Jackson International in Atlanta. Currently, 94% of travelers from these countries enter through these airports. People from the affected countries who had planned to fly into other airports will now have to rebook their flights. There are no direct flights to the US from west Africa, and only about 150 travelers from the affected countries arrive in the US each day.

Upon arrival travelers from the affected countries are being separated from other arriving passengers to have their temperatures taken and to be questioned by US Customs and Border Protection officials. Anyone who may have been exposed

to the Ebola virus or who has fever or other symptoms of the disease is being referred to CDC officers on site, who will determine whether the traveler should be taken to hospital for further evaluation or referred to the local health department for follow-up monitoring. All travelers must supply contact information for the duration of their stay in the US and are encouraged to seek medical attention should they develop fever or other symptoms.

Several Republican and a few Democratic politicians have called for a ban on all travelers from the affected countries. However, US health officials fear a ban would be difficult to implement and might drive some people to use other routes into the country, making cases harder to detect. Should the Ebola outbreak spread beyond these three countries, the US might consider a travel ban, says CDC director, Tom Frieden. "We will look at whatever works," he said.

The CDC has posted a level 3 travel notice recommending Americans avoid non-essential travel in the affected countries. US colleges and universities have been advised to identify students, faculty, and staff who have been in affected countries in the past 21 days—the incubation period for Ebola virus disease—and assess their risk of exposure. School officials are to consult public health authorities should any student, staff, or faculty be found to be at risk.

What happens if a patient could be infected?

To reduce the chances that someone infected with Ebola virus is missed, US healthcare workers are being urged to "Think Ebola," Frieden said. "Any time you have a patient with fever or other signs of infection, ask where they've been for the past 21 days. If they've been in Liberia, Guinea, or Sierra Leone then you need to get help."

Under protocols described in detail on the CDC's website, any patient whose symptoms and travel history suggest possible Ebola infection is to be immediately isolated in a separate room with a private bathroom, and the hospital or clinic's Ebola preparedness plan is to be activated. State and local health

departments are to be notified, and staff are not to have contact with the patient without putting on the recommended personal protective equipment.

If the index of suspicion is high, health departments are to report the case to the CDC's emergency operations center. The agency has created rapid response teams that are ready to be deployed to a hospital within hours. These teams will include experts in infection control and care and treatment of patients with Ebola. In addition, the US Secretary of Defense has ordered the military to form a 30 member medical support team to help civilian hospitals with Ebola cases if needed. The team will consist of 20 critical care nurses, five doctors trained in infectious disease, and five trainers in infectious disease protocols.

Because the signs and symptoms of Ebola infection are non-specific, laboratory confirmation is required. Several diagnostic tests are available, but acute infections will be confirmed using a real time polymerase chain reaction (PCR) assay. The CDC has a network of collaborating laboratories throughout the country capable of testing for Ebola in a matter of hours, but samples from all patients are sent to the CDC for confirmation.

How will infected people be cared for?

US health officials initially expected that most US hospitals would be able to handle patients with Ebola, but the experience in Dallas has shaken that confidence. Speaking on the ABC Sunday television news program *This Week*, Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases at the National Institutes of Health, said, "I think this idea that every single hospital can take care of a seriously ill Ebola patient right now is just not true."

Future cases that present to community hospitals will now be transported to one of the four high level biocontainment isolation facilities in the US or to designated local hospitals that have the requisite facilities and staff expertise. So far five Americans who contracted Ebola in west Africa have been flown home and successfully treated in high level isolation units without any staff infections. However, these units have the capacity to handle only about 12 patients.

Because there is no approved effective treatment for Ebola infection, management focuses on supportive care of complications, such as hypovolemia, electrolyte abnormalities, hematologic abnormalities, refractory shock, hypoxia, hemorrhage, septic shock, multiorgan failure, and disseminated intravascular coagulation. Drugs are in development, but their effectiveness is unknown and their supply limited.

How are contacts being monitored?

So far contact tracing and quarantine measures instituted by local and federal health officials seem to have been effective. Depending on their level of risk, contacts may be monitored by public health officials or allowed to self monitor. Monitoring includes checking temperatures twice a day. People who develop a fever of 100.4°F (38°C) or higher or other signs and symptoms of Ebola are required to have a medical evaluation.

Quarantine restrictions have been lifted for about 50 people in Dallas who were known or probable contacts of the patient from Liberia because they had not developed signs or symptoms of infection 21 days after their last contact with the patient. Several hundred people who were aboard two flights taken by one of the Dallas nurses infected with Ebola shortly before she was diagnosed continue to be monitored. Their risk of infection is thought to be extremely low, and none has developed signs or symptoms of infection.

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- 1 US Centers for Disease Control and Prevention. Ebola (Ebola virus disease). www.cdc.gov/vhf/ebola/index.html.
- 2 McCarthy M. US issues new guidelines for health workers caring for Ebola patients. *BMJ* 2014;349:g6418.

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