Ebola Virus Poses New Challenge To Healthcare Community

Elizabeth Hollis

This fall, several U.S. hospitals found themselves grappling with a handful of cases of the Ebola virus. Although facilities expected to be prepared—particularly since they treat other easily transmissible diseases—Ebola has proven trickier.

Ebola “has really driven home having security of public health,” said Barbara Knust, an epidemiologist and veterinarian in CDC’s Viral Special Pathogens Branch. She spoke at the Interscience Conference on Antimicrobial Agents and Chemotherapy, held in Washington, DC, in September.

“Weak public health infrastructure in one place—in a little corner of the world—can have ripple effects throughout the world,” she said in a presentation during the conference.1

She was confident in the preparedness of U.S. hospitals, but there are still a lot of unknowns about the virus, causing anxiety among healthcare workers—especially after two Dallas nurses were infected after treating the first Ebola patient in the United States. The patient, Thomas Duncan died, but the two nurses have successfully been treated for the virus. “It is obvious that after the incident in Texas, everyone is worried about Ebola transmission in the healthcare setting,” said Genti Koci, a sterile processing professional formerly with Mount Carmel Health System in Columbus, OH. “We don’t know much about the disease, and there is a fear factor that has spread among us through the media.”

With the situation changing almost daily, the CDC has issued frequent updates, and healthcare facilities are doing their best to keep their employees safe. “We are following CDC Guidelines and making sure all patient care equipment is cleaned and disinfected per the [instructions for use] (IFUs). However, we are reinforcing the correct application and removal of personal protective equipment (PPE), which seems to be a weak spot in this,” said Nancy Chobin, a consultant and educator with the Saint Barnabas Health Care System.

As Jesse Goodman, MD, attending physician at the Washington DC Veterans Affairs Medical Center and MedStar Georgetown University Hospital, noted during an Ebola town hall meeting on Washington D.C.-area radio station WTOP, facilities should be “overclear, overtrained, and overcautious.”2

That recommendation seems to have resonated with the healthcare community. Donna Swenson, president of Sterile Processing Quality Services, Inc, in Berwyn, IL, has advice to keep facilities prepared. “Both when performing surgery and after the procedure when cleaning the instrumentation, it is necessary for healthcare workers to ensure that they take adequate precautions to protect themselves from blood and body fluid exposure,” she said.

That protection includes gowns and drapes. Swenson is co-chair of the committee that developed ANSI/AAMI PB70:2012, Liquid barrier performance and classification of...
protective apparel and drapes intended for use in healthcare facilities which provides information on the appropriate attire for those attending to patients with communicable diseases. (See sidebar on opposite page.)

The standard spells out different types, or levels, of surgical gowns, and those levels are included in a new protocol for operations involving suspected or confirmed Ebola patients. That protocol, developed by the American College of Surgeons, calls for all operating room personnel to wear AAMI Level 4 impervious surgical gowns. The protocol also advises that healthcare workers who transport such patients wear AAMI Level 3 fluid-resistant gowns.

Swenson noted that sterilization professionals also need a high level of protection, based on the expected level of liquid contamination. “If surgical instruments are being processed, then the level of exposure is expected to be high, and a Level 4 gown is needed,” she said. “When hand washing even lightly soiled instruments, it is necessary to use a gown with a high level of protection,” Swenson added. “If one is wiping down patient care equipment, e.g., an IV pump or pole, then the level of protection needed is not as high. In this case, a Level 1 or 2 gown may be appropriate.”

**CDC, WHO Step Up**

The CDC has posted infection control recommendations for patients who are known or are suspected of having Ebola. The guidance recommends situating the person in a single-patient room and maintaining a log of all who enter and leave. Dedicated medical equipment—preferably disposable—should be used when caring for the patient. In addition, healthcare personnel should limit the use of needles and sharps, if at all possible these instruments should be
disposable, single-use devices, which should be handled with care and disposed of in puncture-proof, sealed containers.

Hand hygiene should be performed often when dealing with Ebola patients. Healthcare personnel should wash with soap and water before and after patient contact or contact with potentially infectious material, as well as before putting on and after removing PPE. Alcohol hand rubs can be used when handling materials that have not been contaminated with potentially infectious materials, such as the Ebola virus.

If personnel are exposed to the disease, the facility should have measures in place to ensure the safety of all involved. Those who develop any signs of Ebola should either stop work immediately or not report to work; notify their supervisor; seek prompt medical evaluation; inform state and local health departments; and comply with work exclusions until they are no longer infectious.

Regarding sterile processing professionals, “PPE should be applied at all times; there is no need for panic if an Ebola patient were to hit our [emergency room] ER doors,” said Koci. “We as managers should encourage our technicians to treat every single instrument as if they had been used to treat a patient with Ebola, HIV, hepatitis C, or similar condition. Based on the education that I have had in microbiology, I always encourage my staff to be safe; it is our responsibility to protect our patients and ourselves. Our team is very confident tackling this issue, as we have a very strict PPE protocol in place. Furthermore, our staff always is reminded of the consequences if a protocol were to be breached.”

Koci expressed confidence should his facility accept a patient with Ebola. “We have a multidisciplinary team that has already prepared a detailed protocol on how to treat a patient. All of the parties have been educated on the protocols, while the CDC website is monitored daily for updates.”

**Transportation of Waste**

Members of Congress have had many questions about the CDC's handling of the Ebola outbreak. During an October hearing by the House Energy and Commerce's Oversight and Investigations Subcommittee, Rep. Marsha Blackburn, R-TN, asked about the disposal of waste from Ebola patients. As with other patient waste, the Ebola waste will be trucked to central processing centers—a move that seemed to cause some concern to Blackburn.

“Waste from Ebola patients can readily be decontaminated,” CDC Director Tom Frieden, MD, said in response to Blackburn's query about whether the waste is as infectious as patients themselves. “The virus itself is not particularly hardy. It's killed by bleach, by autoclaving, by a variety of chemicals.”

This stance was voiced by Knust in an August conference call. “In terms of the virus, it is not that difficult to inactivate, 10%
bleach, hospital grade phenolics or quaternary ammonium solutions are appropriate disinfection procedures," she said. “The virus is liable to desiccation.”

Blackburn then asked about the safety of transporting these materials. “We work very closely with both the Department of Transportation, as well as the commercial waste management companies to ensure that capability,” Frieden answered.

The Pipeline and Hazardous Materials Safety Administration, part of the Department of Transportation issued guidance for the transportation of Ebola-contaminated items, labeling it Category A infectious substance. A Category A infectious substance “is a material known or reasonably expected to contain a pathogen, such as Ebola, that is in a form capable of causing permanent disability or life-threatening or fatal disease in otherwise healthy humans or animals when exposed to it. An infectious substance classification is based on the patient or animal’s known medical history or symptoms, endemic local conditions, or professional judgment concerning the individual circumstances of the source human or animal.”

According to an interim CDC guidance, examples include medical equipment, sharps, linens, soiled absorbent pads or dressings, kidney-shaped emesis pans, portable toilets, used PPE, or byproducts of cleaning.

As the guidance noted, a Category A infectious substance must be triple packed in a primary watertight receptacle, watertight secondary packaging, and rigid outer packaging. “If available, steam sterilization (autoclave) or incineration as a waste treatment process can inactivate the virus and reduces waste volume,” according to the CDC. Employees preparing the waste for transportation must have training that covers the following: general awareness, function-specific, safety, security awareness training, and modal-specific training, e.g., driver training and procedures necessary for the safe operation of a motor vehicle.

The guidance also requires a security plan that addresses personnel security, unauthorized access, and en route security.

References


For More Information

AAMI has assembled a number of news articles, guidance documents, standards, and other resources related to the Ebola outbreak on a special page on its website: www.aami.org/hottopics/ebola/index.html.

A Ray of Hope

The federal government is backing efforts to find a vaccine to the deadly Ebola virus. Working with the financial support of Uncle Sam, Baltimore, MD-based Profectus BioScience Inc., is trying to develop an experimental Ebola vaccine. Meanwhile, an arm of the National Institutes of Health, is backing Phase I clinical trials evaluating a potential Ebola vaccine from GlaxoSmithKline and an experimental Ebola vaccine developed by the Public Health Agency of Canada and licensed to NewLink Genetics Corp. Phase II efficacy trials for these vaccine candidates are expected in 2015.

There are many steps everyone can take to prevent Ebola transmission.

**EBOLA VIRUS PREVENTION**

- Avoid direct contact with infected people.
- Don’t touch animals, raw meat, and dead animals without protection.
- Don’t touch infected body fluids.
- Don’t get in contact with infected dead bodies.
- Wash hands often with detergent.
- Disinfect raw food.
- Boil water.
- Boil infected people’s clothes and belongings using gloves.
- Burn used syringes.
- Always use toilets.
- Go to hospital when infection is suspected.
- Notify health officials if contagious is suspected.

**Symptoms of Ebola**

- Fever
- Headache
- Sickness
- Internal bleeding
- Bore throat
- Nausea and vomiting
- Diarrhea