Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
practices, including appropriate use of personal protective equipment (PPE), is essential to protect them and their patients because health care–associated transmission has played a part in transmission during previous outbreaks.4,9

EFFECTS TO CONTROL THE CURRENT OUTBREAK

To implement prevention and control measures in both Guinea and Liberia, ministries of health, with assistance from Médecins Sans Frontières, the World Health Organization, and others, put in place Ebola treatment centers to provide better patient care and interrupt virus transmission. Teams from CDC traveled to Guinea and Liberia at the end of March as part of a response by the Global Outbreak Alert and Response Network to assist the respective ministries of health in characterizing and controlling the outbreak through collection of case reports, interviewing of patients and family members, coordination of contact tracing, and consolidation of data into centralized databases. Cases are categorized into one of 3 case definitions: suspected (alive or dead person with fever and at least 3 additional symptoms, or fever and a history of contact with a person with hemorrhagic fever or a dead or sick animal, or unexplained bleeding), probable (meets the suspected case definition and has an epidemiologic link to a confirmed or probable case), or confirmed (suspected or probable case that also has laboratory confirmation).

In late April, it appeared that the outbreak was slowing when Liberia did not report new cases for several weeks after April 9, and the number of new reported cases in Guinea decreased to 9 for the week of April 27. Since then, however, the EVD outbreak has surged, with neighboring Sierra Leone reporting its first laboratory-confirmed case on May 24, Liberia reporting a new case on May 29 that originated in Sierra Leone, and Guinea reporting a new high of 38 cases for the week of May 25.

As of June 18, the total EVD case count reported for all 3 countries combined was 528, including 364 laboratory-confirmed, 99 probable, and 65 suspected cases, with 337 deaths (case-fatality rate=64%). Guinea had reported 398 cases (254 laboratory-confirmed, 88 probable, and 56 suspected), with 264 deaths (case-fatality rate=66%) across 9 districts. Sierra Leone had reported 97 cases (92 laboratory-confirmed, 3 probable, and 2 suspected), with 49 deaths (case-fatality rate=51%) across 5 districts and the capital, Freetown. Liberia had reported 33 cases (18 confirmed, 8 probable, and 7 suspected), with 24 deaths (case-fatality rate=73%) across 4 districts.

Major challenges faced by all partners in the efforts to control the outbreak include its wide geographic spread, weak health care infrastructures, and community mistrust and resistance.10 Retrospective case investigation has indicated that the first case of EVD might have occurred as early as December 2013.1 To control the outbreak, additional strategies such as involving community leaders in response efforts are needed to alleviate concerns of hesitant and fearful populations so that health care workers can care for patients in treatment centers and thorough contact tracing can be performed. Enhancing communication across borders with respect to disease surveillance will assist in the control and prevention of more cases in this EVD outbreak.

In June 2014, the World Health Organization, through the Global Outbreak Alert and Response Network, requested additional support from CDC and other partners, necessitating the deployment of additional staff members to Guinea and Sierra Leone to further coordinate efforts aimed at halting and preventing virus transmission. Persistence of the outbreak necessitates high-level regional and international coordination to bolster response efforts among involved and neighboring nations and other response partners to expeditiously end this outbreak.

Section editors: David A. Talan, MD; Gregory J. Moran, MD; Satish K Pillai, MD, MPH; Scott Santibanez, MD, MPHTM

Author affiliations: From the Department of Emergency Medicine, Bellevue Hospital Center, New York University School of Medicine, New York, NY.

http://dx.doi.org/10.1016/j.annemergmed.2014.10.010

REFERENCES

1. World Health Organization. Global alert and response: Ebola Virus Disease (EVD). Geneva, Switzerland: World Health Organization; 2014. Available at: http://www.who.int/csr/don/archive/disease/ebola/en, Accessed September 7, 2014.

2. Baize S, Pannetier D, Oestreicher L, et al. Emergence of Zaire Ebola virus disease in Guinea—preliminary report. N Engl J Med. 2014;371:1418-1425.

3. World Health Organization. Ebola Viral Disease: Fact Sheet. Geneva, Switzerland: World Health Organization; 2014. Available at: http://www.who.int/mediacentre/factsheets/fs103/en, Accessed September 7, 2014.

4. Médecins Sans Frontières. Filovirus Haemorrhagic Fever Guideline. Barcelona, Spain: Médecins Sans Frontières; 2008:39-48.

5. Formenty P. Ebola-Marburg viral diseases. In: Heymann DL, ed. Control of Communicable Diseases Manual. Washington, DC: American Public Health Association; 2008:204-207.

6. Leroy EM, Kumulungui B, Pourrut X, et al. Fruit bats as reservoirs of Ebola virus. Nature. 2005;438:575-576.

7. Rollin P, Roth C. Lassa fever. In: Heymann DL, ed. Control of Communicable Diseases Manual. Washington, DC: American Public Health Association; 2008:335-337.

8. Nkoghe D, Formenty P, Leroy EM, et al. Multiple Ebola virus haemorrhagic fever outbreaks in Gabon, from October 2001 to April 2002 [French]. Bull Soc Pathol Exot. 2005;98:224-229.

9. Pattyn SR, ed. Ebola Virus Haemorrhagic Fever. Amsterdam, the Netherlands: Elsevier; 1978.

10. Ebola in West Africa: gaining community trust and confidence [Editorial]. Lancet. 2014;383:1946.

COMMENTARY

[Ann Emerg Med. 2015;65:115-117.]

Since the initial report of an EVD outbreak in Guinea in March 2014, the disease incidence has increased rapidly and expanded to Liberia, Sierra Leone, and Nigeria.1-3 As of October 14, 2014, there have been 9,191 infected persons, including 4,546 deaths reported by the World
Health Organization during the course of 6 months. The case fatality rate is 71% in patients with definitive clinical outcomes.

In the past months, the media have focused significant attention on the spread of the virus to the developed world. On September 30, 2014, the first case of imported EBV diagnosed in the United States occurred in Texas. The diagnosis was missed during the patient’s initial emergency department (ED) visit and the patient was discharged home. Detection of a case requires a careful travel and exposure history. Symptomatic patients with travel to endemic regions within the incubation period of 21 days need immediate isolation and evaluation. Patients at highest risk of becoming infected are those with direct bodily fluid contact with Ebola-infected patients; those with participation in funeral rites and handling of bats, rodents, and primates in endemic areas; and persons who have handled laboratory specimens without appropriate PPE. All personnel caring for patients with suspected illness must use contact and droplet protection with appropriate PPE until the diagnosis of EVD is excluded.

The initial symptoms of EVD are nonspecific and include fever, malaise, loss of appetite, vomiting, diarrhea, headaches, myalgia, arthralgia, and abdominal pain. Delayed hemorrhagic symptoms occur in approximately 50% of cases. Major bleeding is uncommon. Most patients with fever and other constitutional symptoms who are from endemic regions and presenting to EDs in the United States are more likely to have illness caused by something other than Ebola virus, including malaria, rickettsial infections, dengue, Salmonella typhi and paratyphi infections, and Lassa fever. The ED workflow for these patients includes managing the acute illness, screening for Ebola, evaluating for alternative diagnoses, and limiting transmission risk to hospital personnel and other patients. In general, patients with high epidemiologic risk and some symptoms, or those with some epidemiologic risk and severe symptoms, will need specific testing for Ebola. State and local health departments should be contacted immediately to assist in coordinating with CDC in providing additional guidance on diagnosis and management. ED testing should include CBC count, electrolytes and renal function, and liver function tests. Leukopenia, thrombocytopenia, and elevated liver function tests are commonly associated but not specific for EVD. Thick and thin blood smears for malaria should be obtained; however, performance of blood smears for malaria could pose special risk to laboratory workers if Ebola has not yet been ruled out, and the laboratory should be notified in as soon as the diagnosis is suspected for precautionary purposes. Additional safety precautions include using plastic tubes for blood collection, limiting unnecessary blood testing (for more information, see http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html), and notifying state and local health departments. A limited number of local health department laboratories, along with the CDC, have the capacity to perform real-time reverse transcription polymerase chain reaction testing for Ebola. Medical facilities with close proximity and previous communications with these centers may be able to obtain Ebola results rapidly.

Treatment is mostly supportive, with fluid resuscitation, electrolyte repletion, pressors, and respiratory support. Although there are no controlled data, the significantly lower mortality of Marburg virus infections in Europe in 1967 compared with that in Africa (22% versus 87%) reinforces the role of supportive therapy in filovirus infections. It will be interesting to examine the clinical outcomes of EVD patients treated in developed countries in the current outbreak when more data are available. Experimental treatments, including antiviral drugs, antibody therapy, and vaccines, are currently in accelerated phases of testing.

EDs have had to prepare and manage various public health outbreaks and biological terrorism concerns in the past 2 decades, including anthrax, smallpox vaccination, severe acute respiratory syndrome, Middle East Respiratory Syndrome coronavirus, measles, influenza, and tuberculosis. Vigilance is imperative, and protocols for response to potential cases should be in place in every health care facility according to guidance from the CDC and state and local health departments. Protocols should include screening at triage for possible geographic or contact exposure, isolation and infection control, laboratory testing, and cleaning and disposal of equipment and waste. Patients with suspected Ebola should be treated only by those using standard, contact, droplet, and airborne precautions, with impervious coverage of the entire body and respiratory protection for all persons entering the room. Standard PPE includes double gloving, impervious body suit, leg and boot covers, impervious gown, and powered air purifying respirator or face hood with N95 mask. Additional precautions may be indicated in certain situations such as copious secretions or aerosol-inducing procedures (http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html). Risk of transmission to health care workers is greatest when PPE and infection precautions are not strictly used. Proper training and the use of a direct observer is imperative, especially with the donning and removal of PPE (http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html). Transmission risk may be lower for ED personnel when compared to inpatient staff because lower viral load early in the course of illness and less direct patient contact time. CDC guidelines for the evaluation, isolation, and management of EVD have changed and will continue to evolve during the current outbreak. It is vital to keep abreast with the latest updates. Although significant global resources and collaboration have been mobilized to combat the current Ebola outbreak in West Africa, emergency providers and EDs must be vigilant and well prepared to serve in the front line against a potential global outbreak.

REFERENCES
1. Dixon MG, Schafer IJ; Centers for Disease Control and Prevention (CDC). Ebola viral disease outbreak—West Africa, 2014. MMWR Morb Mortal Wkly Rep. 2014;63:548-551.
2. Baize S, Pannetier D, Oestreicher L, et al. Emergence of Zaire Ebola virus disease in Guinea—preliminary report. N Engl J Med. 2014;371:1418-1425.
3. WHO: Ebola response roadmap update 17 October 2014. Available at: http://apps.who/iris/bitstream/10665/136645/1/roadmapup date17Oct14_eng.pdf?ua=1. Accessed October 22, 2014.
4. WHO Ebola Response Team. Ebola virus disease in West Africa—the first 9 months of the epidemic and forward projections. N Engl J Med. 2014;371:1481-1495.
5. Feldmann H, Geisbert TW. Ebola haemorrhagic fever. Lancet. 2011;377:849-862.
6. Bwaka MA, Bonnet MJ, Calain P, et al. Ebola hemorrhagic fever in Kikwit, Democratic Republic of the Congo: clinical observations in 103 patients. J Infect Dis. 1999;179(suppl):S1-S7.
7. Freedman DO, Weld LH, Kozarsky PE, et al. Spectrum of disease and relation to place of exposure among ill returned travelers. N Engl J Med. 2006;354:119-130.
8. Bausch DG, Feldmann H, Geisbert TW, et al. Outbreak of filovirus hemorrhagic fever: time to refocus on the patient. J Infect Dis. 2007;196(suppl 2):S136-S141.
9. Kortepeter MG, Bausch DG, Bray M. Basic clinical and laboratory features of filoviral hemorrhagic fever. J Infect Dis. 2011;204(suppl 3):S810-S816.
10. Bausch DG, Towner JS, Dowell SF, et al. Assessment of the risk of Ebola virus transmission from bodily fluids and fomites. J Infect Dis. 2007;196(suppl 2):S142-S147.
11. Borchert M, Mutyaba I, Van Kerkhove MD, et al. Ebola haemorrhagic fever outbreak in Masindi district, Uganda: outbreak description and lessons learned. BMC Infect Dis. 2011;11:357.

http://dx.doi.org/10.1016/j.annemergmed.2014.10.011

---

**Annals’ Impact Factor**

Impact Factor score, one of many metrics of a journal’s influence, is a measure of the frequency with which the average article in a journal has been cited over a given period of time.

*Annals’ Impact Factor rose to an all-time high this year, to 4.333.*

*Annals’ score ranks #1 out of 25 journals in emergency medicine.*