



Published in final edited form as:

Am J Obstet Gynecol. 2015 April ; 212(4): 417–419. doi:10.1016/j.ajog.2015.01.018.

US hospital preparedness for obstetrics patients with possible Ebola

Dana Meaney-Delman, MD, MPH, Lisa M. Koonin, DrPH, MN, MPH, and Denise J. Jamieson, MD, MPH

National Center for Emerging and Zoonotic Infectious Diseases, (Dr Meaney-Delman); the Influenza Coordination Unit, Office of Infectious Diseases (Dr Koonin); and the Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion (Dr Jamieson), Centers for Disease Control and Prevention, Atlanta, GA

Since early March 2014, >20,000 probable and suspect cases of Ebola virus disease (EVD) have been reported in Guinea, Sierra Leone, and Liberia, with more than 8000 deaths reported as of Jan. 4, 2015.¹ Although pregnancy data are limited, reports of pregnant women with EVD in this^{2,3} and previous^{4,5} outbreaks describe very high maternal, fetal, and neonatal death rates. The diagnosis of EVD remains rare in the United States with only 4 confirmed cases and none among pregnant women. Because the greatest risks for exposure to Ebola virus remain residence in or travel to countries with wide-spread Ebola virus transmission, pregnant women should continue to be screened regarding recent international travel and potential exposure to Ebola virus.^{4,6}

Health care providers who care for pregnant women should identify those women who are at risk for EVD and, as described by Minkoff and Ecker,⁷ have an obligation to ensure safe, prompt, and appropriate care. Pregnant women who have traveled recently from a country with wide-spread Ebola virus transmission (<http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html>) or have had exposure to a person with EVD within the past 21 days and who are exhibiting EVD-compatible signs or symptoms⁸ (fever, severe headache, muscle pain, weakness, fatigue, diarrhea, vomiting, abdominal pain, or unexplained hemorrhage) require isolation, triage, and appropriate evaluation. While being evaluated, pregnant women require continuous access to care.^{7,9} The vast majority of pregnant women (even those with recent travel to countries with wide-spread Ebola virus transmission) do not have EVD; therefore, it is critical that there be no delay or interruption in care, and it is equally important that other diagnoses are considered while an evaluation for possible EVD is being conducted. This editorial addresses considerations for pregnant women with epidemiologic risk factors for EVD and highlights recent efforts to prepare US hospitals and clinicians for the care of pregnant women with possible EVD.

Corresponding author: Dana Meaney-Delman, MD, MPH. vmo0@cdc.gov.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

The authors report no conflict of interest.

A multifaceted targeted screening approach has been developed and implemented for early identification of persons who are potentially at risk for EVD. All individuals who depart Guinea, Sierra Leone, and Liberia are screened for fever and symptoms^{10,11}; passengers are routed from these affected countries through 1 of 5 US airports¹²; individuals who arrive at these airports undergo entry screening for fever, symptoms and risk assessment¹³; and returned travelers who are at any risk for EVD undergo active health monitoring by public health authorities.¹⁴ This layered strategy provides multiple opportunities to evaluate at-risk individuals so that those individuals with symptoms can be identified promptly, isolated, and evaluated and receive appropriate care.

The Centers for Disease Control and Prevention (CDC) has defined 4 epidemiologic risk categories for Ebola virus exposure: high risk, some risk, low (but not zero) risk, and no identifiable risk.¹⁵ For individuals who are at any risk for EVD, the recommendation is individual health monitoring, combined with active monitoring of temperature and symptoms by state and local health officials.¹⁴ For individuals in the high and some risk categories, the recommendation is direct observation at least once a day for fever and other symptoms.

If a fever or symptoms develop during active health monitoring, individuals are directed by public health authorities to an appropriate health care facility.¹⁶ Individuals with an epidemiologic risk factor within the preceding 21 days who are experiencing elevated body temperature or subjective fever, severe headache, fatigue, muscle pain, vomiting, diarrhea, abdominal pain, or unexplained hemorrhage are referred to as “persons under investigation” (PUIs).¹⁷ PUIs with these nonspecific signs and symptoms may have EVD; however, they are more likely to have other more common infectious illnesses (eg, malaria, influenza, norovirus). It is important that health care providers consider pregnancy-associated complications (eg, hemorrhage, chorioamnionitis, nausea and vomiting of pregnancy, hyperemesis gravidarum) and symptoms that are associated with normal pregnancy (eg, round ligament pain) in the differential diagnosis. Although EVD should be considered,^{9,18} testing and management of other etiologic factors should continue.^{4,16}

With the activation of CDC’s Emergency Response Operations Center in July 2014, the CDC has provided clinical consultation to US health care providers who evaluate individuals who are potentially at risk for EVD. As of Nov. 15, 2014, the CDC responded to clinical inquiries regarding 650 persons who were thought to be at risk for EVD, including 8 pregnant women. Among these inquiries, 118 cases (18%) met the CDC’s case definition for a PUI (ie, epidemiologic risk factor and compatible symptoms) and 61 persons, including 2 pregnant woman, were tested.¹⁹ Ebola virus testing is conducted at the CDC or in state or local public health laboratories, most of which are part of the CDC Laboratory Response Network.^{19,20} Among the 61 individuals who have been tested for Ebola virus in the United States, only 4 individuals have had positive test results; none were pregnant. For some PUIs, medical evaluation and treatment were delayed while awaiting Ebola testing results.¹⁹ Pregnant women PUIs should continue to receive indicated obstetric care, in conjunction with appropriate infection control precautions, while Ebola virus laboratory testing is pending.^{6,9}

The CDC has developed a 3-tiered hospital preparedness program to ensure that PUIs, including pregnant women, are directed to appropriate levels of care.¹⁶ These include Frontline Healthcare Facilities (acute care facilities that are equipped for emergency care), Ebola Assessment Hospitals, and Ebola Treatment Centers. Recently returned travelers who are being monitored actively by public health officials will be directed to Ebola Assessment Hospitals if they experience symptoms that are consistent with EVD. These facilities are prepared to care for patients with possible EVD until a diagnosis of EVD can be confirmed or ruled out and until discharge and transfer have been completed.¹⁶ Because not all health care facilities that are designated as Ebola Assessment Hospitals are prepared to receive and isolate pregnant women for evaluation, public health planners will need to identify specific facilities that are capable of addressing the medical needs of these women.

Ebola Assessment Hospitals that are prepared to evaluate pregnant women for possible EVD must provide care until a diagnosis can be established firmly; facilities are best positioned within 1–2 hours driving distance of large populations of returning travelers from West Africa and should be prepared to coordinate Ebola virus testing, monitoring, and care for up to 96 hours. This timeframe was established based on the 72-hour window from onset of symptoms that is required to rule out EVD by polymerase chain reaction testing, plus the additional time that is required for specimen transport and processing.

Because it is possible that patients with unrecognized EVD will seek care without prior notification, the Frontline Healthcare Facilities remain a component of the tiered strategy. Frontline Healthcare Facilities should be equipped to identify promptly and isolate pregnant patients who may have EVD and to contact the relevant public health agency for guidance regarding immediate patient transfer.¹⁶ Transfer of these patients should be to a facility that can safely treat obstetrics patients and that have the capacity to provide neonatal care if required.

Ebola Treatment Centers are facilities that are prepared to treat patients with confirmed EVD throughout the course of the illness. For both Ebola Assessment Hospitals and Ebola Treatment Centers, minimum capabilities have been established and include appropriate personal protective equipment and trained staff, facility infrastructure, laboratory services, and waste management.¹⁶ For the evaluation and treatment of pregnant women with possible EVD, an added capability for Ebola Treatment Centers is the ability to provide safe and prompt obstetrics and neonatal care, which includes the treatment of common acute pregnancy conditions (eg, threatened or spontaneous abortion, preterm or full-term labor). Thus, public health authorities will need to identify specific hospitals for pregnant women with EVD and pregnant PUIs in their preparedness planning efforts.

The identification, evaluation, and treatment of pregnant women with possible EVD present unique challenges. With careful planning, however, the needs of these women and their health care team can be met. Great strides have been made towards ensuring that these women receive timely uninterrupted care and that health care providers are prepared, trained, and competent. Education and training on the appropriate use of personal protection equipment has been coordinated at a national level.^{21,22} CDC Rapid Ebola Preparedness teams have been deployed to assist health care facilities prepare for patients with possible or

confirmed EVD; considerations for pregnant patients have been included in some Rapid Ebola Preparedness team visits. Tools that have been designed to assist hospitals are being revised, and a new domain on special populations includes specific pregnancy considerations.¹⁶ In addition, multiple institutions have developed protocols that are specific to obstetrics care for patients with EVD, and some of these resources are available publicly.¹⁸ More data are needed to guide these efforts, including a better understanding of specific symptomatology and timing of EVD symptoms during pregnancy. Efforts, thus far, reflect major steps forward to ensure that pregnant women with possible EVD receive appropriate care and that obstetrics providers can provide this care safely.

References

- Centers for Disease Control and Prevention. Ebola outbreak in West Africa: case counts. 2014 Dec 24. 2014 Available at: <http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html>. Accessed Jan. 8, 2015
- Chertow DS, Kleine C, Edwards JK, Scaini R, Giuliani R, Sprecher A. Ebola virus disease in West Africa: clinical manifestations and management. *N Engl J Med*. 2014; 371:2054–7. [PubMed: 25372854]
- Baggi F, Taybi A, Kurth A, et al. Management of pregnant women infected with Ebola virus in a treatment centre in Guinea, June 2014. *Euro surveill*. 2014:19.
- Jamieson DJ, Uyeki TM, Callaghan WM, Meaney-Delman D, Rasmussen SA. What obstetrician-gynecologists should know about Ebola: a perspective from the Centers for Disease Control and Prevention. *Obstet Gynecol*. 2014; 124:1005–10. [PubMed: 25203368]
- Francesconi P, Yoti Z, Declich S, et al. Ebola hemorrhagic fever transmission and risk factors of contacts, Uganda. *Emerg Infect Dis*. 2003; 9:1430–7. [PubMed: 14718087]
- Centers for Disease Control and Prevention. Guidance for screening and caring for pregnant women with Ebola virus disease for healthcare providers in US hospitals. Dec 2. 2014 Available at: <http://www.cdc.gov/vhf/ebola/hcp/guidance-maternal-health.html>. Accessed Dec. 18, 2014
- Minkoff H, Ecker J. Physicians' obligations to patients infected with Ebola: echoes of AIDS. *Am J Obstet Gynecol*. 2014 Dec 18. [Epub ahead of print].
- Centers for Disease Control and Prevention. Ebola virus disease: signs and symptoms. Nov 2. 2014 Available at: <http://www.cdc.gov/vhf/ebola/symptoms/index.html>. Accessed Dec. 22, 2014
- Centers for Disease Control and Prevention. Identify, isolate, inform: Emergency Department evaluation and management for patients who present with possible Ebola virus disease. Nov 18. 2014 Available at: <http://www.cdc.gov/vhf/ebola/hcp/ed-management-patients-possible-ebola.html>. Accessed Dec.18, 2014
- Centers for Disease Control and Prevention. Ebola virus disease (Ebola) pre-departure/exit screening at points of departure in affected countries. Aug 30. 2014 Available at: <http://wwwnc.cdc.gov/travel/pdf/ebola-exit-screening.pdf>. Accessed Dec. 19, 2014
- Centers for Disease Control and Prevention. Information for airports. Dec 4. 2014 Available at: <http://www.cdc.gov/vhf/ebola/airports/index.html>. Accessed Dec. 18, 2014
- Centers for Disease Control and Prevention. CDC update on Ebola response: 10-22-2014. Oct 22. 2014 <http://www.cdc.gov/media/releases/2014/t1022-ebola-reponse-update.html>. Accessed Dec. 18, 2014
- Centers for Disease Control and Prevention. Fact sheet: screening of travelers at airports collab. Dec 19. 2014 Available at: <http://www.cdc.gov/vhf/ebola/travelers/ebola-screening-factsheet.html>. Accessed Dec. 20, 2014
- Centers for Disease Control and Prevention. Questions and answers about CDC's Ebola monitoring and movement guidance. Dec 16. 2014 Available at: <http://www.cdc.gov/vhf/ebola/exposure/qas-monitoring-and-movement-guidance.html>. Accessed Dec. 18, 2014
- Centers for Disease Control and Prevention. Epidemiologic risk factors to consider when evaluating a person for exposure to Ebola virus. Dec 24. 2014 Available at: <http://>

www.cdc.gov/vhf/ebola/exposure/risk-factors-when-evaluating-person-for-exposure.html.

Accessed Dec. 29, 2014

16. Centers for Disease Control and Prevention. Interim guidance for US hospital preparedness for patients with possible or confirmed Ebola virus disease: a framework for a tiered approach. Dec 15, 2014 Available at: <http://www.cdc.gov/vhf/ebola/hcp/us-hospital-preparedness.html>. Accessed Dec. 18, 2014
17. Centers for Disease Control and Prevention. Case definition for Ebola virus disease (EVD). Dec 10, 2014 Available at: <http://www.cdc.gov/vhf/ebola/hcp/case-definition.html>. Accessed Dec. 18, 2014
18. Society for Maternal Fetal Medicine. Ebola and pregnancy. Available at: <https://www.smfm.org/education/ebola>. Accessed Dec. 18, 2014
19. Karwowski MP, Meites E, Fullerton KE, et al. Clinical inquiries regarding Ebola virus disease received by CDC: United States, July 9–November 15, 2014. *MMWR Morb Mortal Wkly Rep.* 2014; 63:1175–9. [PubMed: 25503923]
20. Centers for Disease Control and Prevention. Interim guidance for specimen collection, transport, testing and submission for persons under investigation for Ebola virus disease in the United States. Oct 22, 2014 Available at: <http://www.cdc.gov/vhf/ebola/hcp/interim-guidance-specimen-collection-submission-patients-suspected-infection-ebola.html>. Accessed Dec. 18, 2014
21. Centers for Disease Control and Prevention. Information for health-care workers and settings. Dec 12, 2014 Available at: <http://www.cdc.gov/vhf/ebola/hcp/index.html>. Accessed Dec. 18, 2014
22. US Department of Health and Human Services. 35 US hospitals designated as Ebola treatment centers. Dec 2, 2014 Available at: <http://www.hhs.gov/news/press/2014pres/12/20141202b.html>. Accessed Dec. 18, 2014