

Interim Guidance for Managers and Workers Handling Untreated Sewage from Individuals with Ebola in the United States

November 20, 2014

Who this is for: Workers who handle untreated sewage that comes from hospitals, medical facilities, and other facilities with confirmed individuals with Ebola.

What this is for: To provide recommendations for workers on the types of personal protective equipment (PPE) to be used and proper hygiene for the safe handling of untreated sewage that may contain Ebola virus.

How to use: Use this document to reduce the workers' risk of exposure to infectious agents including Ebola virus when working with untreated sewage.

Key Points:

- Ebola virus is more fragile than many enteric viruses that cause diarrheal disease or hepatitis.
- The envelope that covers Ebola makes it more susceptible to environmental stresses and to chemical germicides than non-enveloped viruses, such as hepatitis A, poliovirus, and norovirus.
- To protect workers against Ebola
 - Educate them on
 - What PPE to use to protect broken skin and mucous membranes and
 - How to properly use the PPE, including how to put it on and take it off.
 - Develop and fully implement routine protocols that ensure workers are protected against potential exposures (i.e., prevent contact with broken skin, eyes, nose or mouth) when handling untreated sewage.
 - Ensure all workers always practice good personal hygiene, including frequent hand washing to reduce potential exposures to any of the pathogens in sewage.

This guidance is based on current knowledge of Ebola virus, including detailed information on Ebola virus transmission, recommendations from the World Health Organization (WHO), and scientific studies of wastewater treatment and workers who handle wastewater.^{1,2,3} Updates will be posted as needed on the CDC Ebola webpage at <http://www.cdc.gov/vhf/ebola/>.

Some workers come in contact with untreated sewage before it enters the wastewater treatment plant and could be at very low risk of exposure to Ebola virus. These workers include:

- Plumbers in hospitals that are currently treating an Ebola patient
- Sewer maintenance workers working on the active sewer lines serving the hospital with an Ebola patient
- Construction workers who repair or replace active sewer lines serving the hospital with an Ebola patient

Transmission

Ebola virus is transmitted through:

- Direct, unprotected contact (i.e., with broken skin, eyes, nose or mouth) with blood or other body fluids (e.g., , feces, vomit, urine, saliva, sweat, breast milk, tears, vaginal fluid, and semen) of an infected patient who is actively ill
- Needle stick injuries from needles and syringes that have been contaminated with infected blood or other body fluids and tissue from an infected patient who is actively ill
- Unprotected contact with medical equipment contaminated with blood or body fluids from an infected patient who is actively ill
- Direct, unprotected contact with the body of someone who has died from Ebola

The World Health Organization recommends that human wastes, including waste from Ebola patients such as vomitus and feces, be either disposed of through a sanitary sewer or be buried in a pit toilet or latrine with no additional contact or treatment.^{4,5,6} There has been no evidence to date that Ebola can be transmitted via exposure to sewage.⁷ The WHO has established guidelines for hygiene and PPE to prevent exposure to potential pathogens when working with untreated sewage.^{4,5} In the United States, human waste (i.e., excreta), blood, and other potentially infectious materials are routinely released into sanitary sewers. Wastewater handling processes in the United States are designed to inactivate and remove pathogens, such as Ebola. Workers should follow the guidelines below to prevent exposure to human pathogens, including Ebola virus, when working with untreated wastewater.

Personal Protective Equipment (PPE)

Workers handling human waste or sewage should be provided hand washing facilities at the worksite, PPE (described below), and training on how to use this PPE. The training should specifically address methods for the correct and safe removal of PPE to prevent workers from contaminating themselves or others during its removal. Trained workers should demonstrate both knowledge of the appropriate PPE they will be expected to wear and proficiency in its use. If using a respirator, the worker should be part of a respiratory protection program that includes medical clearance and fit-testing under OSHA's PPE standard (29 CFR 1910.132). Workers should wash hands with soap and water immediately after removing PPE. Leak-proof infectious waste containers should be provided for discarding used PPE. Guidelines for dealing with potentially infectious waste can be found at <http://www.cdc.gov/vhf/ebola/hcp/medical-waste-management.html> and https://www.osha.gov/Publications/OSHA_FS-3756.pdf

The following PPE is recommended for workers handling untreated sewage:

- Goggles or face shield: to protect eyes from splashes of untreated sewage
- Face mask (e.g., surgical mask): to protect nose and mouth from splashes of human waste. If undertaking cleaning processes that generate aerosols, a NIOSH-approved N-95 respirator should be used.
- Impermeable or fluid-resistant coveralls: to keep untreated sewage off clothing

- Waterproof gloves (such as heavy-duty rubber outer gloves with nitrile inner gloves) to prevent exposure of hands to untreated sewage
- Rubber boots: to prevent exposure of feet to untreated sewage.

Basic Hygiene Practices

- Wash skin with soap and water immediately after handling sewage, or any materials that have been in contact with sewage.
- Avoid touching face, mouth, eyes, nose, or open sores and cuts while handling sewage, or any materials that have been in contact with sewage.
- Wash hands with soap and water before eating or drinking after handling sewage.
- Remove soiled work clothes and do not take home to launder. Launder clothing at work or use a uniform service.
- Eat in designated areas away from untreated sewage.
- Do not smoke or chew tobacco or gum while handling human waste or sewage, or any materials that have been in contact with human waste or sewage.
- Cover open sores, cuts, and wounds with clean, dry bandages.

References

¹ McCunney RJ [1986]. Health effects of work at waste water treatment plants: a review of the literature with guidelines for medical surveillance. *Am J Ind Med* 9(3):271–279.

² Khuder SA, Arthur T, Bisesi MS, Schaub EA [1998]. Prevalence of infectious diseases and associated symptoms in wastewater treatment workers. *Am J Ind Med* 33(6):571–577.

³ CDC (Centers for Disease Control and Prevention) [2011]. Guidance for reducing health risks to workers handling human waste or sewage. http://www.cdc.gov/haiticholera/workers_handlingwaste.htm. Date accessed: November 2014.

⁴ WHO (World Health Organization) [2014a]. [Infection prevention and control guidance for care of patients in health-care settings, with focus on Ebola](#). Date accessed: November 2014.

⁵ WHO [2014b]. Safe management of wastes from health-care activities. 2nd ed. Chartier Y, Emmanuel J, Piper U, Prüss A, Rushbrook P, Stringer R, Townend W, Wilburn S, Zghondi R, eds. http://apps.who.int/iris/bitstream/10665/85349/1/9789241548564_eng.pdf?ua=1. Date accessed: November 2014.

⁶ WHO [2014c]. Ebola virus disease (EVD): key questions and answers concerning water, sanitation and hygiene. http://www.who.int/water_sanitation_health/WASH_and_Ebola.pdf?ua=1 Date accessed: November 2014.

⁷ Weber DJ, Rutala WA [2001]. Risks and prevention of nosocomial transmission of rare zoonotic diseases. *Clin Infect Dis* 32(3):446-456