

Ebola Virus Disease (EVD):

What you need to Know

Wayne County Department Of Public Health



HHS Division of Public Health

WAYNE COUNTY, MICHIGAN



Contents

- What is Ebola?
- History of Ebola
- Known reservoir
- How is Ebola transmitted?
- What Personal Protective Equipment should be used?
- Who is at greatest risk of contracting Ebola?
- Testing for Ebola
- Treatment
- Quarantine and Isolation Issues
- Timeline December 2013 to Present
- Current Epidemic
- Culprits
- Differential Diagnosis
- Conclusions



What is Ebola

- Ebola is a viral hemorrhagic fever (VHF) found naturally in Africa (Ebola River)
- In public health emergency preparedness, ebola is one of the six (6) CDC Category A agents, along with anthrax, tularemia, plague, smallpox, and botulism that state and local health departments plan for



Different types of Ebola

- There are 5 known different types of ebola:
 - **Ebola Zaire** (the most deadly of all the ebolas, currently causing the epidemic in W Africa)
 - **Ebola Sudan**
 - **Cote D'Ivoire Ebola** virus (now Tai Forest Ebolavirus)
 - **Ebola Bundibugyo** (in Uganda)
 - **Ebola Reston** – non-human (in Virginia, USA)



Known Reservoir

- Fruit bats are likely (not confirmed) to be natural carriers of the ebola virus



History of Ebola

- Ebola first appeared in 1976 in 2 outbreaks simultaneously
 - a village near the Ebola River (Democratic Republic of the Congo)
 - remote area of Sudan (Nzara village)



Known outbreaks since 1976

But the largest outbreaks have been in:

- Zaire in 1995
(315 cases)
(now called DRC)
- Uganda in 2000-2001
(425 cases)
- Republic of the Congo in
2007 (264 cases)

And now West Africa...



West Africa Outbreak: Timeline

- December 2013:
 - Current epidemic started in Guinea-Conakry with patient zero being a 2-yo boy who died after falling ill in a village in Guéckédou.
 - Guéckédou is at the intersection of 3 countries: Guinea, Sierra Leone, and Liberia





HHS Division of Public Health

WAYNE COUNTY, MICHIGAN



Timeline: December 2013

- Shortly afterwards, the boy's immediate family became sick and died afterwards.
- Etymology was still unknown at this point
- The mourners from the funeral left to their homes and passed the disease to their families.
- A health worker carried it to his home, where he died, but not before infecting his doctor, who died as well



Timeline: March 2014

- By March, more than a dozen people in 8 Guinean communities were dead
- Suspected cases were investigated in Liberia and Sierra Leone.
- Doctors Without Borders indicated that this particular outbreak was unprecedented because infected patients were popping up “everywhere” and it was hard to contain
- Urban vs rural



Timeline

March 2014

- Pasteur Institute (in France) types Ebola Zaire as the causative agent
- March 19: Guinea reported 35 people sick and 23 dead
- March 25: WHO and Guinea reported 86 cases and 59 deaths
- March 31: WHO reported 112 suspected and confirmed with 70 deaths

April/May/June 2014

- April 30: Guinea reported 221 suspected/confirmed cases and 146 deaths (included 25 health care workers with 16 deaths)
- May 28, total cases reached 281 with 186 deaths
- Mid-June, Liberia starting to report cases and deaths.
- June 20: Sierra Leone reported 158 suspected cases

Timeline

July 2014

- July 17: Sierra Leone suspected cases stood at 442
- July 25: first death reported in Nigeria (but was quickly contained and by Sept 22, no new cases appeared)
- 2 Americans (medical doctor and humanitarian worker) fall ill while treating patients with ebola

August 2014

- Aug 20: WHO announces total deaths in West Africa has reached 1,350 people with 2760 suspected and probable cases
- Aug 29: first case reported in Senegal (but was also quickly contained)
- American Ebola patients flown to the US and given experimental drug ZMapp.

Culprits?

- Bushmeat eaten in that part of Africa
- Traditional practices on how to handle the dead
- Lack of knowledge about Ebola in the region
- Poor or weak healthcare infrastructure



Culprits?

- Ebola was not a known agent in West Africa; therefore, it was harder for health care to recognize it as such. By then, it was too late and cases were popping up everywhere (no training and no equipment)
- Rural vs urban landscape
- First case occurred at a crossroads
- Relative ease of travel between borders
- Travel made it easier for the disease to spread



Current Confirmed Cases in West Africa



Current Confirmed Cases Outside of West Africa



Madrid, Spain



Dallas, Texas



Ebola in the US: September 2014

- **Sept 19:** Eric Thomas Duncan leaves Liberia and arrives in Dallas, TX on Sept 20 with no signs or symptoms
- **Sept 24:** Showing signs and symptoms of ebola
- **Sept 26:** drives to Presbyterian Hospital in Dallas in ER. He is given antibiotics and sent home, even after he told hospital staff he was from Liberia
- **Sept 28:** ambulance crew takes him (and homeless person) to hospital. Tests sent to CDC
- **Sept 29:** Confirmed to be Ebola
- **Oct 8:** Patient died at 7:51 CST in Dallas, Texas

Sun	Mon	Tues	Wed	Thur	Fri	Sat
14	15	16	17	18	19 Leaves Liberia	20 Arrives in the US
21	22	23	24 Showin g s/s	25	26 Drives to hospita l	27
28 Ambul ance called	29 Diagno sed with Ebola	30	1	2	3	4
5	6	7	8 Died			

Total Cases (as of Oct 16, 2014)

	<u>Cases (Confirmed)</u>	<u>Deaths</u>
• Spain	1 (1)	0
• Guinea	1350 (1097)	778
• Sierra Leone	2950 (2593)	930
• Senegal	1 (1)	0
• Liberia	4076 (943)	2316
• Nigeria	20 (19)	8
• United States	3 (2)	1



How is ebola transmitted?

- Species jump from host to infected animal to human
- Human to human transmission
 - through direct contact with an infected person's bodily fluids (blood, sweat, tears, saliva)
 - contact with a needle that is contaminated with Ebola
- People don't become infectious until they show or present with symptoms
- A person is still infective even if they are no longer alive



Who is at Greatest risk for Ebola

- Healthcare, family and friends who are caring for patients with Ebola
- They may have contact with patients body fluids, especially if they are not using proper PPE
- Persons handling the bodies of patients with Ebola



Signs and Symptoms of Ebola

- Symptoms may appear anywhere from 2 to 21 days after exposure to Ebola, but the average is 8 to 10 days.
- Signs and Symptoms include:
 - Fever (greater than 101.5°F)
 - Severe headache
 - Muscle pain
 - Weakness
 - Diarrhea
 - Vomiting
 - Abdominal (stomach) pain
 - Unexplained hemorrhage (bleeding or bruising)

Differential Diagnosis

- Influenza-like illness (ILI), such as fever and chills with nausea and vomiting, is not indicative solely of ebola.
- Several factors:
 - If the individual is from a region that is endemic with malaria or cholera
 - If the individual is from a region that is endemic with meningitis or norovirus
- Only laboratory **confirmation** of the case is definitive of ebola

Protection: Healthcare Workers

- Use of Personal Protective Equipment (PPE)
- Universal precautions protocol, including gloves, gown, and goggles (G3)
- Use of standard, contact, and droplet precautions is sufficient for most situations when treating a patient with a suspected case of Ebola. Health personnel should wear:
 - Gloves
 - Gown (fluid resistant or impermeable)
 - Eye protection (goggles or face shield that fully covers the front and sides of the face)
 - Facemask
- Additional PPE might be required in certain situations (e.g., large amounts of blood and body fluids present in the environment), including but not limited to double gloving, disposable shoe covers, and leg coverings.
- Wash hands (5 steps)
 - Think Wet, Lather, Scrub, Rinse, Dry

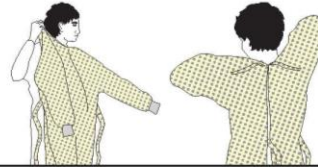


SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

1. GOWN

- Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
- Fasten in back of neck and waist



2. MASK OR RESPIRATOR

- Secure ties or elastic bands at middle of head and neck
- Fit flexible band to nose bridge
- Fit snug to face and below chin
- Fit-check respirator



3. GOGGLES OR FACE SHIELD

- Place over face and eyes and adjust to fit



4. GLOVES

- Extend to cover wrist of isolation gown



USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

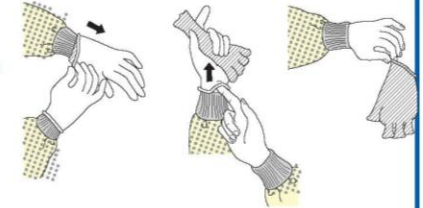


SEQUENCE FOR REMOVING PERSONAL PROTECTIVE EQUIPMENT (PPE)

Except for respirator, remove PPE at doorway or in anteroom. Remove respirator after leaving patient room and closing door.

1. GLOVES

- Outside of gloves is contaminated!
- Grasp outside of glove with opposite gloved hand; peel off
- Hold removed glove in gloved hand
- Slide fingers of ungloved hand under remaining glove at wrist
- Peel glove off over first gloved hand
- Discard gloves in waste container



2. GOGGLES OR FACE SHIELD

- Outside of goggles or face shield is contaminated!
- To remove, handle by head band or ear pieces
- Place in designated receptacle for reprocessing or in waste container



3. GOWN

- Gown front and sleeves are contaminated!
- Unfasten ties
- Pull away from neck and shoulders, touching inside of gown only
- Turn gown inside out
- Fold or roll into a bundle and discard



4. MASK OR RESPIRATOR

- Front of mask/respirator is contaminated – DO NOT TOUCH!
- Grasp bottom, then top ties or elastics and remove
- Discard in waste container



PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE



Protection: Individuals

- DO wash your hands often with soap and water or use an alcohol-based hand sanitizer.
- Do NOT touch the blood or body fluids (like urine, feces, saliva, vomit, sweat, and semen) of people who are sick.
- Do NOT handle items that may have come in contact with a sick person's blood or body fluids, like clothes, bedding, needles, or medical equipment.
- Do NOT touch the body of someone who has died of Ebola.



Treatment for Ebola

- Supportive care
 - Providing fluids and electrolytes for dehydration
 - Maintaining oxygen status and blood pressure
 - Treating other infections if they occur
- Experimental treatments have been used on some patients
- Blood transfusions from Ebola survivors



Quarantine and Isolation

- Once a patient has presented with signs and symptoms, and has been **diagnosed** with Ebola (at least until laboratory confirmed) they are quarantined (self or imposed) from general population
- Section 311 of the Public Health Service Act: General Grant of Authority for Cooperation 42 U.S.C. § 243: Federal Statutes assists state and local authorities in the prevention and suppression of communicable diseases
- Section 361 of the Public Health Service Act: Regulations to Control Communicable Diseases 42 U.S.C. § 264: authorizes the federal government to make and enforce regulations “to prevent the introduction, transmission, or spread of communicable diseases” into the states and possession of the United States from foreign countries...
- Wayne County Department of Public Health has protocols and procedures on isolation and quarantine for people who present with a communicable disease. (Policy No. 60125-006/Procedure No. 60125-006.01): “All suspected, probable, and confirmed case or contacts to communicable disease that will require isolation and/or quarantine... with support from emergency management or law enforcement communities”



Facts

- **Ebola virus is not spread through**
 - Casual contact
 - Air
 - Water
 - Food grown or legally purchased in the U.S.
- **Ebola only spreads when people are sick.**
 - A patient must have symptoms to spread the disease to others.
- **After 21 days, if an** exposed person does not develop symptoms, they will not become sick with Ebola.

Remember the Facts

- Ebola is NOT airborne
- Universal precautions for Protection (PPE) is highly recommended and strongly encouraged
- No known vaccines (currently vaccine is in experimental mode)
- Unless the patient is **laboratory confirmed**, there is no Ebola
- If patient survives Ebola, then they have antibodies to the disease that will give immunity for at least 10 year
- Household pets (cats and dogs) are not currently known to get sick with Ebola or transmit disease



Resources

- www.waynecounty.com
- www.mdch.gov/ebola
- <http://www.cdc.gov/vhf/ebola/index.html>
- <http://wwwnc.cdc.gov/travel/notices/>
- <http://www.who.int/csr/disease/ebola/faq-ebola/en/>
- <http://www.bt.cdc.gov/agent/agentlist-category.asp>
- <http://www.cdc.gov/vhf/ebola/outbreaks/history/chronology.html>
- http://www.nytimes.com/2014/08/10/world/africa/tracing-ebolabreakout-to-an-african-2-year-old.html?_r=0
- <http://www.cnn.com/2014/04/11/health/ebola-fast-facts/>



Resources (cont)

- <http://www.ctvnews.ca/health/ebola-outbreak-timeline-tracks-creeping-spread-through-west-africa-1.2009572>
- <http://www.cdc.gov/vhf/ebola/transmission/qas-pets.html>





Please contact us for questions or concerns:

33030 Van Born, Wayne, MI 48184

Or Call the Ebola Hotline at 734-727-7163

**WAYNE COUNTY DEPARTMENT
OF PUBLIC HEALTH**