Preparing for Ebola and Other Emerging Infectious Diseases

Safe Management of an Infectious Disease Threat in the Pre-Hospital Setting

EMS Perspective
Objectives

1. Describe the current situation of Ebola Virus Disease and other emerging infectious disease threats.

2. Review current guidance for safe management of infectious disease cases including community and hospital settings.

3. Discuss using incident command to manage effectively an event involving multiple infectious disease patients within both community and hospital settings.
Current Situation

September 25, 2014

*From the New York Times*

“The man, Thomas Eric Duncan, 42, had a high fever — his temperature was 103 degrees — during his four-hour visit to the emergency room of Texas Health Presbyterian Hospital on Sept. 25, according to 1,400 pages of medical records that Mr. Duncan’s family provided to The Associated Press. Mr. Duncan reported severe pain, rating it an eight on a scale of one to 10. His fever was marked with an exclamation point in the hospital’s record-keeping system, The A.P. reported.” (Fernandez and Sack, 2014)

He was discharged home that same day…
Current Situation

• *First Responders (Dispatchers, EMS, Police, Fire)* are some of the first individuals to have contact with potentially infected persons

Dallas Fire Department

• Three EMS Personnel (2 staff and an intern) transported Thomas Duncan, the 1st U.S. diagnosed Ebola patient, to the hospital on *Sunday, September 28, 2014* (Watson, 2014)
  – Duncan activated 911 due to nausea and vomiting symptoms
Current Situation

Dallas Fire Department

- Duncan was actively vomiting when EMS transported him back to the hospital
- It is unknown what level of PPE EMS was wearing at the time of transport

October 2, 2014

“An image shot by a WFAA News 8 chopper shows unprotected workers cleaning up the sidewalk outside an apartment block in Dallas where Ebola victim Thomas Eric Duncan vomited before he was bundled into an ambulance.” (Watson, 2014)
Current Situation

• Although Thomas Duncan was “immediately placed into isolation” upon his return to the hospital on Sunday, EMS personnel were not officially notified of the possible exposure until 48 hours following the transport. (Price, 2014)

October 1, 2014- Facebook posts from Dallas Fire Department Paramedic Geoffrey Aklinski

“How do you not test and contact the firefighters at the station on Sunday!!! Only the two medics and the intern on the ambulance? I was freaking in that ambulance hours later driving it!!! No one bothered to contact me about it?!!!”

“How three days after the fact I had to demand exposure testing and they are reporting following up with all the people in the ambulance??? They haven’t even followed up with the ten firefighters that were on duty Sunday.”
Know Your Rights

• Part G of the Ryan White HIV/AIDS Treatment Extension Act of 2009 (which amended the Public Health Service Act on October 30, 2009) pertains to the notification of emergency response employees (EREs) who may have been exposed by victims of emergencies to potentially life-threatening infectious diseases. (CDC, 2013)

• Part G requires medical facilities to respond to requests from Designated Officers as soon as is practicable, but no later than 48 hours after receiving the request.

• Part G also requires notification as soon as is practicable, but not later than 48 hours, from medical facilities to Designated Officers after determining that a transported victim has a listed airborne or aerosolized infectious disease.
First Response Risk

- Ebola has brought to light gaps within the response system, from PPE to interagency communications.
- What can responders do to protect themselves and their families from infectious disease?
- What can the response system do to protect their public servants?
A quick lesson on PPE

- Four levels of PPE (OSHA, NIOSH, April 2005)
  - Level A
  - Level B
  - Level C
  - Level D
Level A

- **Level A** protection should be worn when the **highest level of respiratory, skin, eye and mucous membrane protection is needed**. A typical Level A ensemble includes: Positive pressure (pressure demand), self contained breathing apparatus (SCBA) (NIOSH approved), or positive-pressure supplied air respirator with escape SCBA.
  - Fully encapsulating chemical protective suit.
  - Gloves, inner, chemical resistant.
  - Gloves, outer, chemical resistant.
  - Boots, chemical resistant, steel toe and shank; (depending on suit boot construction, worn over or under suit boot.)
Level B

- **Level B** protection should be selected when the highest level of respiratory protection is needed, but a lesser level of skin and eye protection is needed. Level B protection is the minimum level recommended on initial site entries until the hazards have been further identified and defined by monitoring, sampling, and other reliable methods of analysis, and equipment corresponding with those findings utilized. A typical Level B ensemble includes: Positive-pressure (pressure-demand), self-contained breathing apparatus (NIOSH approved), or positive-pressure supplied air respirator with escape SCBA.
  - Chemical resistant clothing (overalls and long-sleeved jacket, coveralls, hooded two-piece chemical splash suit, disposable chemical resistant coveralls.)
  - Gloves, outer, chemical resistant.
  - Gloves, inner, chemical resistant.
  - Boots, outer, chemical resistant, steel toe and shank.
Level C

- Level C protection should be selected when the type of airborne substance is known, concentration measured, criteria for using air-purifying respirators met, and skin and eye exposure is unlikely. Periodic monitoring of the air must be performed. A typical Level C ensemble includes: Full-face or half-mask, air-purifying respirator (NIOSH approved).
  - Chemical resistant clothing (one piece coverall, hooded two piece chemical splash suit, chemical resistant hood and apron, disposable chemical resistant coveralls.)
  - Gloves, outer, chemical resistant.
  - Gloves, inner, chemical resistant.
  - Boots, steel toe and shank, chemical resistant.
Level D

- Level D protection is *primarily a work uniform* and is used for nuisance contamination only. It requires only coveralls and safety shoes/boots. Other PPE is based upon the situation (types of gloves, etc.). Level D should not be worn on any site where respiratory or skin hazards exist.
So.....

What level should First Responders wear?
Three key principles in the enhanced guidance:

1. All healthcare workers undergo *rigorous training* and are practiced and competent with PPE, including putting it on and taking it off in a systemic manner.

2. *No skin exposure* when PPE is worn.

3. All workers are *supervised by a trained monitor* who watches each worker putting PPE on and taking it off.

(Tightened Guidance for U.S. Healthcare Workers on Personal Protective Equipment for Ebola, CDC)
CDC Guidance

October 20, 2014

PPE

PPE recommended for U.S. healthcare workers caring for patients with Ebola includes:

- **Double** gloves
- Boot covers that are waterproof and go to at least mid-calf or leg covers
- Single-use fluid resistant or impermeable gown that extends to at least mid-calf or coverall **without integrated hood**.
- Respirators, including either N95 respirators or powered air purifying respirator (PAPR)
- Single-use, **full-face shield** that is disposable
- **Surgical hoods** to ensure complete coverage of the head and neck
- Apron that is waterproof and covers the torso to the level of the mid-calf (and that covers the top of the boots or boot covers) should be used if Ebola patients have vomiting or diarrhea

(Tightened Guidance for U.S. Healthcare Workers on Personal Protective Equipment for Ebola, CDC)
CDC Guidance

October 20, 2014

PPE

CDC is recommending all of the same PPE included in the August 1, 2014 guidance, with the addition of coveralls and single-use, disposable hoods. **Goggles are no longer recommended** as they may not provide complete skin coverage in comparison to a single-use, disposable full-face shield. Additionally, goggles are not disposable, may fog after extended use, and **healthcare workers may be tempted to manipulate them with contaminated gloved hands**.

(Tightened Guidance for U.S. Healthcare Workers on Personal Protective Equipment for Ebola, CDC)
CDC Guidance

October 20, 2014

Trained Monitor

CDC is recommending a trained monitor actively observe and supervise each worker putting PPE on and taking it off. This is to ensure each worker follows the step by step processes, especially to disinfect visibly contaminated PPE. The trained monitor can spot any missteps in real-time and immediately address.

(Tightened Guidance for U.S. Healthcare Workers on Personal Protective Equipment for Ebola, CDC)
CDC Guidance

October 20, 2014

Rigorous Training

• **Designated areas for putting on and taking off PPE.** Facilities should ensure that space and layout allows for clear separation between clean and potentially contaminated areas

• **Step-by-step PPE removal instructions** that include:
  – Disinfecting visibly contaminated PPE using an *EPA-registered disinfectant wipe prior* to taking off equipment

• **Disinfection of gloved hands** using either an *EPA-registered disinfectant wipe or alcohol-based hand rub between steps of taking off PPE.*

(Tightened Guidance for U.S. Healthcare Workers on Personal Protective Equipment for Ebola, CDC)
CDC Guidance

October 20, 2014

It is critical to focus on other prevention activities to halt the spread of Ebola:

1. Prompt screening and triage of potential patients
2. Designated site managers to ensure proper implementation of precautions
3. Limiting personnel [in contact with the patient]
4. Effective environmental cleaning

(Tightened Guidance for U.S. Healthcare Workers on Personal Protective Equipment for Ebola, CDC)
Prompt Screening and Triage of Potential Patients

CALL-TAKER (911 + others)

EBOLA SCREENING QUESTIONS

SYMPTOMS
If the caller has flu-like symptoms, please ask the following questions:

1. Do you have fever?
   - If NO
     - Normal Response: Dispatch Appropriate Responder
   - If YES
     - CONTINUE TO 2.

2. Are you a resident of – or have you traveled within the last 21 days – a country where an EBOLA outbreak is occurring?
   - If NO
     - CONTINUE TO 3.
   - If YES
     - SKIP AHEAD TO 4.

3. Have you been exposed to someone who is suspected or known to have EBOLA?
   - If NO
     - ONLY IF 2 AND 3 are “NO”:
   - If YES
     - CONTINUE TO 4.

4. If the caller answered “YES” to 1 AND “YES” to 2 AND/OR 3 …
   - Advise ALL dispatched responders:
     - That this may be a SUSPECTED Infectious Patient.
     - To limit exposure, proper PPE required to enter the scene.
   - Proper PPE:
     - GOWN
     - MASK OR RESPIRATOR
     - GOGGLES OR FACE SHIELD
     - GLOVES
Prompt Screening and Triage of Potential Patients

FIRST RESPONDERS

CALL TAKERS (911 + others)
- Ask screening questions.
- Report screening answers to ALL dispatched responders.

IF it is determined through Call-Taker screening this is a SUSPECTED Infectious Patient case, provide a unified public safety response.

FIRST RESPONDER

POLICE
- Secure scene.
- If risk of exposure exists, allow EMS to perform their function.
- If proper PPE is not available:
  - Maintain distance of 6 feet.
  - Put on goggles or face shield AND gloves, if available.
- Report possible exposure to your supervisor.
- Follow your departmental protocols.

FIRE RESCUE
- Secure scene.
- If risk of exposure exists, allow EMS to perform their function.
- If proper PPE is not available:
  - Maintain distance of 6 feet.
  - Put on goggles or face shield AND gloves, if available.
- Report possible exposure to your supervisor.
- Follow your departmental protocols.

EMS
- If EMS requires direct assistance with the patient, you MUST put on proper PPE.
  - Gown AND mask or respirator AND goggles or face shield AND gloves.
- If necessary, ensure post-exposure DECON, including your vehicle if exposed to the patient.
- Safely remove PPE if used, follow CDC guidelines for disposal.

SUSPECTED Infectious Patient: Call DHH/OEO of Public Health/Infectious Disease Epidemiology (ID EP) Section at 1-800-256-2748 prior to transport.
- Ensure DECON of ambulance as soon as patient is moved from ambulance to ER.
- Safely remove PPE; follow CDC guidelines for disposal.

HOSPITAL

END OF DISEASE:
High Viral Load
- Loss of consciousness + severe headache + fever + muscle aches
- Sudden high fever + vomiting patient + purulent
- Diagnosed + brain damage + breathing becomes very shallow + death due to a stroke

RISK:
- Early Stages: Low Viral Load

PPE
- GOWN
- MASK OR RESPIRATOR
- GOGGLES OR FACE SHIELD
- GLOVES

Publication Date: October 14, 2014
Designated Site Managers to Ensure Proper Implementation of Precautions and Limiting Personnel [in Contact with the Patient]

• Unified Command
  – Preplanning amongst police, fire, EMS, hospitals, dispatch, hazmat, etc. absolutely vital

• Slow down the response
  – Once a patient is pre-screened via 911 dispatch as a “potential” infected person, the response must slow down and re-group

• Personnel Accountability
  – Ingress and egress from the scene must be planned and monitored
  – Can limit the number of responders coming into contact through management
  – SCENE MANAGEMENT MUST BE UNIFIED!!!
Effective Environmental Cleaning

- All response agencies must follow and practice their decontamination policies/protocols.

- Can make practicing fun
  - Chocolate Sauce
  - Food Coloring
  - Jell-O
  - Black-light illuminating solution (milk)

- Wide array of EPA-Registered disinfectants available (including bleach). Research the most appropriate solution for your organization.
Louisiana EMS Response

1. **Patients with flu-like symptoms must be screened**
   - These patients should be asked two additional screening questions:
     - Within the past 21 days, has the patient traveled to a location where an Ebola outbreak is occurring?
       - If ‘Yes’ **immediately** call the Louisiana Epidemiology Hotline: 1-800-256-2748
       - If ‘NO’ ask the second question (below)
     - Has the patient been exposed to someone who is a suspected or known to have Ebola?
       - If ‘Yes’ immediately call the Louisiana Epidemiology Hotline: 1-800-256-2748
       - If both questions are “no” continue patient care according to routine protocols
     - The epidemiologist will make a determination, on the phone call, if the patient meets the criteria as a ‘Potential Ebola Patient’ or if the patient does not meet the Ebola screening criteria. If the patient does not meet the criteria, transport per routine protocols.
Louisiana EMS Response

2. Modified Patient Care

- Do not transport a suspected Ebola patient until the Epidemiology hotline (1-800-256-2748) has been called

- If the epidemiologist classifies the patient as a ‘Potential Ebola Patient’ detailed instructions will be provided to the EMS provider and crew members as to how and when the patient should be transported.
  - EMS on-scene will inform the Epidemiologist of the underlying etiology and based on patient choice and medical protocols recommend a receiving hospital.
  - Prior to transport of the patient, EMS, the epidemiologist, and GOHSEP will develop a plan to include:
    - Notification of the receiving hospital
    - Transportation plan (route, time, entrance at receiving facility, etc.)
    - Care / Transport / Evaluation of family members, others at scene
    - Determine if a Haz-Mat response to the scene is required
Follow-up and/or reporting measures by EMS personnel after caring for a suspected or confirmed Ebola patient

1. EMS personnel should be aware of the follow-up and/or reporting measures they should take after caring for a suspected or confirmed Ebola patient.
2. EMS agencies should develop policies for monitoring and management of EMS personnel potentially exposed to Ebola.
3. EMS agencies should develop sick leave policies for EMS personnel that are non-punitive, flexible and consistent with public health guidance.
4. Ensure that all EMS personnel, including staff who are not directly employed by the healthcare facility but provide essential daily services, are aware of the sick leave policies.

(2014 Louisiana Ebola Response Plan)
Follow-up and/or reporting measures by EMS personnel after caring for a suspected or confirmed Ebola patient

5. EMS personnel with exposure to blood, bodily fluids, secretions, or excretions from a patient with suspected or confirmed Ebola should immediately:

a. Stop working and wash the affected skin surfaces with soap and water. Mucous membranes (e.g., conjunctiva) should be irrigated with a large amount of water or eyewash solution;

b. Contact occupational health/supervisor for assessment and access to post-exposure management services; and

c. Receive medical evaluation and follow-up care, including fever monitoring twice daily for 21 days, after the last known exposure. They may continue to work while receiving twice daily fever checks, based upon EMS agency policy and discussion with local, state, and federal public health authorities.

(2014 Louisiana Ebola Response Plan)
Follow-up and/or reporting measures by EMS personnel after caring for a suspected or confirmed Ebola patient

6. EMS personnel who develop sudden onset of fever, intense weakness or muscle pains, vomiting, diarrhea, or any signs of hemorrhage **after an unprotected exposure** (i.e., not wearing recommended PPE at the time of patient contact or through direct contact to blood or body fluids) to a patient with suspected or confirmed Ebola should:

a) Not report to work or immediately stop working and isolate themselves;

b) Notify their supervisor who should notify local and state health departments;

c) Contact occupational health/supervisor for assessment and access to post-exposure management services; and

d) Comply with work exclusions until they are deemed no longer infectious to others.

(2014 Louisiana Ebola Response Plan)
What else?

• Showering before going home
• Changing clothes before going home
• How you wash your clothes
• Shoes
• Hair
• Nails
• Other??
Not Just for Ebola

Healthcare workers must modify their behaviors in response to the more virulent, infectious, and contagious diseases that are presenting in patients.

We are no longer able to snub PPE as a tool for the paranoid and the amateurs. Just as breathing apparatus and training can save the lives of firefighters, utilizing PPE and following proper precautions in the healthcare setting can do the same.
EMS Reference Documents

1) The “Guide to Infection Prevention in Emergency Medical Services” is a 2013 publication specifically written to protect EMS from infectious disease transmission, including Ebola. This is a well-prepared resource.

2) A model/sample protocol for preparing and cleaning your ambulance if you need to transport a suspected/potential/confirmed Ebola patient.

3) A model/sample Ambulance Transport policy for Ebola patients

4) A copy of the Ebola reference pocket-cards. We have mailed 10,000 of these out to agencies across the state. We hope all licensed EMS providers have access to one of these cards and know that they should call the 24-hour Epi hotline immediately if they encounter a suspected Ebola patient.

5) The CDC Ebola checklist for EMS

Works Cited


• 2014 Louisiana Ebola Response Plan


