Infection Prevention and Control for Hospitalized Pediatric Ebola Patients

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Objectives:

• To describe processes for managing patients under investigation for Ebola viral disease (EVD) at Children’s National Health System in D.C.
• To recognize basic infection control principles to prevent EVD in a hospital setting
• To be familiar with roles that Infection Preventionist plays in EVD response
Ebola in America - Timeline

August 2 & 5, 2014
- First two Ebola patients arrived at Emory University
- Bio-Containment unit
- Survived after 32 and 16 days hospitalization, respectively

September 5, 2014
- Third Ebola patient arrived at Nebraska Medical Center
- Bio-Containment unit
- Survived after 16 days hospitalization

September 16, 2014
- Forth patient arrived at Emory University
- Bio-Containment unit
- Survived after 40 days of hospitalization

All four cases confirmed before arriving U.S.

- Well-planned and coordinated intake and care
- Bio-containment units
- Full PPE coverage
- No transmission of EVD to healthcare workers
September 25, 2014, Texas


Ebola Response at Children’s National Health System (CNHS) – Timeline

8/7/2014

- Released the first house wide Infection Control recommendations for patients with known or suspected EVD

8/12/2014

- Upgraded PPE standard to include impervious coverall bunny suite, head cover, foot cover, goggle, and glove for suspected Ebola patient
Ebola Response at CNHS – Timeline

8/16/2014
- 14 years old, day 5 upon arrival from Nigeria
- Fever, hypotension, tachycardia
- Severe malaria (27% parasitemia)

9/16/2004
- 8 years old, day 3 upon arrival from Sierra Leone and Guinea
- Fever
- Upper respiratory viral infection

11/5/2014
- 10 years old, day 3 upon arrival from Sierra Leone
- Fever, with a history of prolonged bone infection
- *Staphylococcus aureus* Osteomyelitis

11/28/2014
- 7 years old, day 5 upon arrival from Sierra Leone
- Fever, post-immunization
- Severe malaria
Facts for Planning EVD Response at CNHS

- Multiple entry points:
  1. The Sheikh Zayed (SZ) Campus:
     1. 313 beds, 54-bed Level IV NICU
     2. A pediatric trauma center that serves three states;
     3. A critical care transport program
  2. Two large emergency departments located at SZ campus and in Southeast Washington, DC
  3. Seven neighborhood health centers and a mobile health program in the District
  4. Seven Regional Outpatient Centers in VA, MD and Washington, DC

- Three airports serve the Washington DC area including one international flight hub
- Patients from 20 countries around the world
Apply Basic Infection Prevention Principle - Break the Chain of Transmission

Susceptible hosts – staff, patients, families, and visitors

Environment

Ebola virus

Debunking Common Myths about Ebola

Myth # 1: Ebola is death sentence

• 50% survival rate, with good medical care can improve outcomes even more

Myth # 2: Ebola patient is always hemorrhage blood

• Most of Ebola patients do not bleed at all. Early signs of Ebola symptoms similar to flu

Myth # 3: Ebola can spread by air

• Spreads by body fluids

Myth # 4: Ebola is easy to get

• The rate for secondary cases from a single case of EVD is two to three cases
• In contrast, a single case of measles will lead to 15 or 17 additional cases

https://www.ncbi.nlm.nih.gov/books/NBK355339/
Recognizing the Effect of Myths

My View as an Infection Preventionist

To serve as a content expert for the creation and operation of a safe environment that will ensure staff to continue the safe and quality of care as seamlessly as possible
Infection Preventionist’s Role:

- Create a process for early identification and isolation of suspected EVD case
- Select personnel protective equipment (PPE) that meets both infection control standards and staff needs
- Create a process to minimize exposure risk in both people and environment
- Select best technique to disinfect contaminated environment
- Create a process to handle possible staff and patient exposures
- Create a process to maintain “one-voice” communication
EVD Planning and Response – a continuous PDSA cycle

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Standard screening but accounting for variances in the system

- Various entry points and patient population
  - Primary care clinics for both well-child and sick-child visits
  - Specialty care clinics
  - Emergency departments
  - Direct admit
  - Onsite surgery suite serving both inpatients and outpatients
  - Ambulatory surgery center
- Various venues
  - Private vehicle, EMS responders, or CN transport team
- Various approaches to capture same information
  - Built-in electronic medical records
  - Paper forms

Screening tool – Accurate and Easy to use

- Promptly updated based upon guidelines from CDC or local public health agencies
- Consistency is critical to avoid confusions
Patient placement, accommodation, and flow

- Minimizing exposure risk as a guiding principle
- Each clinic defines its own process to immediately isolate individual(s) that meet travel and symptom criteria
  - Pre-identify a room/space to accommodate the individual(s)
  - Pre-identify a route to walk the individual(s) to the designated space
  - Drill the process

Inpatient Transport Team

- Multifunctional unit – transport, stabilize, and transfer
- Involves staff, environment, and equipment
- Limited number of vehicles available
Special Isolation Unit (SIU)

- General features:
  - Built after “9.11” for bioterrorism or pandemic situations
  - 17 beds surge up to 28, including 8 ICU beds
  - Dedicated entrance on the ground level
  - Dedicated elevator from ground level to SIU
  - Divided into 3 zones to accommodate patient volume
  - Negative air flow and lockdown zone-by-zone
Special Isolation Unit (SIU)

- Retrofit for Ebola patient treatment center
  - Two suites that include a patient room with an ante-room designated as patient rooms
  - Two exit pathways were added to create a “dirty – clean” one-way direction

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Personal Protective Equipment

- Maximum staff protection
- Minimum disturbance of clinical care functions
- Easy doff to minimize contamination
- Durability
- Availability

Personal Protective Equipment – training, practice, and efficiency
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Care Model - Staffing

- Use minimum number of staff to maintain optimal patient care
- “Ebola care is nursing care”
  - critical care nursing as the primary core staff in anticipation that patient may progress to critically ill
  - Two nurses in the room for up to two hours
- Physician
  - Critical care physician and infectious disease physician
- Specialty
  - Radiology
  - Dialysis
Care Model - Telemedicine

- Includes two-way camera and a digital stethoscope
- Initially designed to enable remote assessment of patient’s condition without physical interaction
- Evolved to assist with family centered care
Care Model – Parental Presence

• Common dilemmas:
  • patients returned from an Ebola affected county, but parents had no travel
  • both patient and parent had travel history but child experienced symptoms

• Should a parent be allowed to stay with the child?
  • No: to prevent one additional individual from exposure, “what if the adult develops symptoms?”
  • Yes: to preserve patient rights, language barriers, babysitting responsibilities

Care Model – Laboratory medicine

• Ebola virus is a Category A Bioterrorism Agent
• Handling Ebola virus in a laboratory or in a public environment are subject to local and federal regulations

Care Model – Laboratory Medicine

- Ideally, a laboratory within the SIU
- When lab specimen must be transported off SIU but within the institution, precautions must be taken for
  - handling
  - processing
  - discarding
- When lab specimen must be transported off the institution, engage Public Health Lab to jointly define the process for
  - packaging
  - shipping

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Wastes:
- Liquid: patient body fluid (urine, emesis, stool, and others)
- Solid: mainly from used or contaminated medical supply and PPE

Environment:
- Medical equipment
- Countertop, surfaces, wall, other fixtures in the room

Wastes:
- Disposal of liquid waste in the public sewer system is regulated by local Environmental Protection Agency
- Disposal of solid waste needs to work with hospital’s contractor for municipal and biohazard waste disposal

Environment:
- Constantly wiping down with germicidal disinfectants
Germicidal Disinfectant Selection

- Must be EPA registered hospital-grade product with a claim that against nonenveloped viruses
  - A list of product available on EPA website
- Account for disinfectant’s modality:
  - Wipes
  - Read-to-use bottles
  - Vapored

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Create a process to handle possible staff and patient exposures

Accidental exposure

• Patient walk-in the ED and later diagnosed with EVD
• may include patients, visitors, and staff

Known exposure

• Staff works inside of a patient room
• Ones experiencing PPE breaches

Accidental Exposure

• Post-exposure workup process:
  • define exposure
  • define follow-up procedures
  • identify those meeting the exposure definition
  • notify exposed individual(s)
    • who is going to call and what to tell
• Key stakeholders: institution Legal department, Public Relations, and local department of health
Known Exposure

• Track staff that enters the patient room
  • Use a paper-log, camera, or badge for tracking
  • Document in – and out – time and if any PPE breach noted
• Create a system to enforce the compliance for measuring and reporting temperatures X2 daily
  • Build-in PeopleSoft
  • Separate reminder system
• Questions to be answered:
  • Can staff return to their home units to take care of non-EVD patients?
  • If a staff develops symptoms suggesting of EVD, will hospital be responsible for their medical care? loss of workdays?
• Key stakeholders: Legal department, Human Resources, Occupational Health, and Public Relations

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• **Create a process to maintain “one-voice” communication**
Communication

• Messages prepared based upon facts
• “One-voice” but multiple posting venues:
  • Intranet homepage
  • Hospital-wide emails
  • Management staff meeting

https://emergency.cdc.gov/cerc/index.asp

Crisis & Emergency Risk Communication (CERC)

Care for baby delivered by a EVD PUI Mother
Care for baby delivered by a EVD PUI Mother

June 30, 2016

Care of a Neonate Born to a Mother who is Confirmed to have Ebola, is a Person under Investigation, or has been Exposed to Ebola

Guidance for Screening and Caring for Pregnant Women with Ebola Virus Disease for Healthcare Providers in U.S. Hospitals

Summary

• Basic infection control principles
• Advanced infection control practices
• Planning and practicing