The Ebola Epidemic Response:
Perspectives from the U.S. Public Health Service Experience in Liberia

American College of Preventive Medicine Annual Meeting

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Overview

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Learning Objectives

At the Conclusion of this session, the participant will be able to:

Objective 1: Understand the U.S. Public Health Service Commissioned Corps and its unique abilities, the Monrovia Medical Unit’s mission and the critical role both had in Liberia’s fight against Ebola.

Objective 2: Describe the key elements of infection prevention and control related to Ebola Virus Disease and recognize how these could be applied in clinical or public health practice.

Objective 3: Identify the cultural context and influences which impacted the Ebola outbreak and articulate how a culturally sensitive approach can be utilized in the response.
Mobilization of USPHS Commissioned Corps

16 SEPT 2014

President of the United States

“The U.S. Public Health Service Corps is preparing to deploy a team of 65 officers to Liberia to manage and staff a previously announced Department of Defense (DoD) hospital to care for healthcare workers who become ill.”
Why use the Commissioned Corps?

- Directly speaks to our mission and focus in health.
- Historical context against infectious pathogens.
- Skill sets very diverse and broad expertise base. Active practitioners across over 26 agencies.
- Uniformed service that understands Incident Management System, Incident Command Structure, and our deployment roles.
- Can deploy for extended periods
- Cultural fluency
- Collaborative - Civilian-Military
USPHS Commissioned Corps Mission Taskers

• Roster public health care professionals, administrators, and clinical staff to manage/operate a 25-bed Ebola treatment unit (ETU) in Monrovia, Liberia, Monrovia Medical Unit (MMU)*.

• Services are to provide a high level of Ebola treatment to national and international health care workers.

• The MMU will not provide trauma care or non-Ebola related care to those not infected with Ebola.

* The 25-bed ETU is the only one staffed by U.S. government personnel.
MMU Mission

Provide hope through care to healthcare workers in Liberia who may have the Ebola Virus Disease and continue efforts with the Liberian government and international partners to build capacity for additional care.
Clinical Care Support Services

Fluid management included oral rehydration, aggressive intravenous fluid support, electrolyte monitoring and nutritional support.

Laboratory Capabilities

- Blood products
  - Transfusion ability
  - Blood typing

- Laboratory analysis
  - Basic chemistry
  - Urinalysis
  - Basic hematology
  - Ebola samples were collected and analyzed offsite
  - On site rapid test capability for HIV and Malaria
  - Pregnancy tests

In-house Pharmacy

Extensive Pharmacy formulary, included:

- IV Fluids
- Anti-nausea medication
- Pain management
- Malaria treatment
Monrovia Medical Unit at Camp Eason
Schematic of the ETU

Monrovia Medical Unit (Interior)
The Importance of Cultural Sensitivity during the Ebola Response

LCDR Maggie Brewinski Isaacs, MD, MPH, FAAP
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Cultural Context

• Recent prolonged civil wars

• Many socio-political challenges: low literacy rates, high poverty, political instability, multilingual, food insecurity, crowded informal settlements

• Lack of healthcare infrastructure

• Cultural practices

• Burial practices
Fear of Ebola

• Fear has been a powerful force in the recent Ebola epidemic, both domestically and in the most affected countries.

• Individual level: fear of seeking care, of admitting to symptoms and of being admitted to an Ebola Treatment Facility lead to delays in care and potential for increased transmission.

• Provider level: Fear of becoming infected or endangering family can lead to work avoidance, refusal to care for certain patients (especially pregnant women), or potential compromise in personal safety if concentration and focus are diminished.

• Fear of stigma.
Fear of Ebola – Population Level

- **Guinea**
  - 8 of 9 members of a public education team attacked and killed by villagers in an affected area.

- **Liberia**
  - Local residents drove away a burial team and their police escort as they attempted to collect corpses.
  - Angry mob attacks healthcare facility treating suspected Ebola patients, “freeing” patients and looting blood-stained equipment.

- **US**
  - 3 states institute mandatory quarantine for any individual who had direct contact with an individual infected with Ebola while in Liberia, Sierra Leone, or Guinea. Increase in calls for travel ban from affected countries.
Community Engagement

• Engagement of community leaders and members is an essential strategy for planning and implementing public health interventions and is emphasized by leading U.S. and global health agencies including the WHO, CDC and NIH.

• This is particularly true during times of heightened fear and anxiety or when the situation is dynamic and quickly evolving as affected communities often look to existing trusted sources for guidance and direction.

• Information on local knowledge, attitudes and practices is imperative for understanding risk factors, anticipating coming changes, identifying potential interventions and achieving effective communication.
Framework for Community Engagement

- Community, Assets, Responsiveness and Evaluation (CARE) Model

- Developed by Frederick Marais (South Africa) et al.

- Eight step approach for front-line infectious disease control practitioners.

- Offers guidance for the development, implementation and evaluation of community-engaged responsive and culturally congruent control efforts towards prevention, treatment, containment and self-care of Ebola and other viral hemorrhagic fevers.

Reference:

Community, Assets, Responsiveness and Evaluation (CARE) Model

1. Prepare to enter the affected community.
2. Enter the community with cultural humility and with local respected leaders.
3. Identify additional respected male and female community leaders.
4. Organize regular community meetings to promote reciprocal learning and establish trust and respect.
5. Develop a safe, collaborative community-medical Ebola/Viral hemorrhagic fever control protocol.
6. Facilitate continued, multi-method communication.
7. Assess process, progress and outcomes.

Reference:
Enter the community with cultural humility and with local respected leaders

- 9/30/14: Bong County (Liberia) health officer notified the county Ebola task force of a growing outbreak of Ebola virus disease in a village of approximately 800 residents.

- Household quarantine used by the community from 9/9-9/16.

- County authorities suggested 21 day community quarantine be considered and the District Ebola Task Force engaged local leaders and the U.S. CDC to assist.

- Two dozen residents reporting Ebola symptoms were removed from the community and transported to Monrovia Ebola Treatment Unit over 2 days.

- Community quarantine, consisting of restrictions on entering or leaving, regulated river crossings, and market closures, were implemented, ending transmission.

- Village chief, elders and paramount chief played a critical role in identifying challenges and solutions, liaising with and advocating for the community and achieving a successful quarantine.

Reference:
Community Quarantine to Interrupt Ebola Virus Transmission — Mawah Village, Bong County, Liberia, August–October, 2014. Nyenswah T et al. MMWR. February 27, 2015 / 64(07);179-182.
Identify additional respected male and female leaders

• Focus groups with pregnant and lactating women in Sierra Leone.

• Structured interview guide with questions on health facility use for routine health services; reasons for decreased use; ideas for encouraging women and children to return to the facility for care; and perceptions of safety.

• Consensus that the primary reason for decreased use of health facilities was fear of contracting Ebola at a facility. Identified common misconceptions.

• Results used to modify national infection prevention and control (IPC) strategy to incorporate community awareness of the IPC trainings.

Reference:
Perceptions of the Risk for Ebola and Health Facility Use Among Health Workers and Pregnant and Lactating Women — Kenema District, Sierra Leone, September 2014. Dynes M et al. MMWR. January 2, 2015 / 63(51);1226-1227.
Organize regular community meetings to promote reciprocal learning and establish trust and respect. Community outreach provides education on Ebola transmission, symptoms, and prevention and hears concerns from the community that can be used to inform outreach and services.

Photo credits: David Blackley/CDC
Facilitate continued, multi-method communication

District Ebola Response Center
Safety Section

CDR Nikhil Thakur, Chief Safety Officer
LCDR Matt Deptola, Safety Officer
Monrovia Medical Unit Team 3
Camp Safety

• Outside the Hotzone
  – Slips Trips and Falls
  – Heat Stress
  – Food Safety
  – Pesticide Application

• Inside the Hotzone
  – Infection control
  – Heat Stress (PPE non-permeable) Time limitation
  – High Stress/Personnel well-being
Proper Preparation – Dive Plan

• Dive Plan
  – “Dive” – any singular operation within the ETU (e.g. patient care, Ward clean-up, ward maintenance, etc.)
  – Establishes consistency for each operation within the ETU
  – Enables team to focus on Operation for this “Dive”
  – Reinforces “Same Team” mentality
  – A safety officer was always present no matter the type of activity (maintenance of facility vs. patient care)
  – Allows for team to drill down to the finite details to maximize efficient within the ETU
Dive Plan - Sample

Safety Officer planning tool for High Risk Activities

Serves as the tool to assist operations in minimizing exposures
Donning of PPE for High Risk Ward

- Donning Officer must be present to assist and observe Donning PPE.
- We have step-by-step procedures not to be altered.
- All skin and mucous membranes are protected and thoroughly checked.

**DONNING INSTRUCTIONS**

1. Record vital signs in log book in donning area and complete entry plan (including Prev Med signature).
2. Donning Officer will verify that the Officer is free of jewelry, watches, gum, and cell phones. Dog tags are located for accountability.
3. Inside gloves are inspected for imperfections/holes – Donned.
4. Coveralls are inspected for imperfections/holes – Donned.
   - Over/Outside the boots without causing trauma to the coveralls.
   - Thumbs go through thumb loops (or slits for thumbs are made).
   - Zip coveralls completely.
5. Respirator is inspected for imperfections/holes – Donned.
   - Nose piece is fitted – ensure snug fit to reduce fogging
   - One elastic band is fitted high on the scalp
   - One elastic band is fitted low on the base of the skull
   - Perform fit- check by breathing in/out and watching mask is sealed
6. Hood is inspected for imperfections/holes – REMOVE ties on the back of hood by cutting with scissors.
   - Hood is donned in a way to leave a minimum amount of skin visible.
   - Donning partner ties the hood closures to ensure adequate fit.
7. Apron is inspected for imperfections/holes – donned
   - Knot is tied such that no strings are dragging and the Officer is not required to reach behind them to remove the apron during doffing.
8. Goggles - pretreated with anti-fog solution are inspected for imperfections/holes – donned
   - Duct tape is placed on sides of goggles to prevent breaches due to fit
9. Second gloves are inspected for imperfections/holes – Donned
Doffing
Doffing
Principles of EVD Management

LCDR Michael Davis, CRNP
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Monrovia Medical Unit team 3
Principles of EVD Management

– History of Exposure
  • 2-21 days of symptom onset
  • Assess for high risk individuals
  • Assess for contact with the ill and their body fluids
  • Recent participation in traditional burial practices
  • Breastfeeding in convalescents
  • Semen of previously infected males
  • Contact with contaminated items
  • Receipt of healthcare from individuals not practicing appropriate infection control
  • Contact with infected animals
Principles of EVD Management

- Laboratory Investigations
  - PCR is the confirmatory testing for EBV and should be taken upon presentation
  - Consider other tests (e.g., HIV, malaria)
Principles of EVD Management: Optimized Standard Of Care

- Fever
- Pain
- Difficulty Breathing/SOB
- Hypoglycemia
- Nausea/Vomitus
- Diarrhea

- Co-Infections
- Bleeding
- Convulsions
- Anxiety
- Confusion/Aggression
- Hiccups
- Dyspepsia
- Odynophagia/Oral Ulcers
Principles of EVD Management: Dehydration and Electrolytes

With up to 10 liters of diarrhea and vomitus/day plus insensible losses, volume status and electrolyte management is the name of the game!
Principles of EVD Management: Shock

• Shock is likely – expect it
• Monitor for hemodynamic instability
  - Fluid management
  - Pressors if needed
• Combination of septic and hypovolemic
• \( O_2 \) and protect airway
• Broad spectrum antibiotic
• Monitor for overload: respirations, JVD
Principles of EVD Management: Other Considerations

• Labor Intensive Nursing Care
• Nutritional Support
• Psychosocial Support
• Children, breastfeeding, pregnancy:
  – Beyond the scope of this presentation but should be considered in any planning efforts
Principles of EVD Management: Discharge Criteria

WHO discharge parameters of a confirmed case:

– 3 or more days without significant symptom, particularly those suggesting viral shedding

AND

– Significant improvement in clinical condition

AND

– Relatively good condition (perform ADLs independently)

AND

– Negative PCR 72 hours after symptom onset or if previously positive a negative PCR 48 hours from the initial positive test

Note: We did two negative test 48 hours apart and symptom free.
Principles of EVD Management: Discharge Instructions

• Certificate of health
• Ongoing nutrition
• Avoid breastfeeding
• No unprotected sexual contact/contact with sperm for 3 months
Resources Beyond the CDC

• Clinical Management of Patients with Viral Haemorrhagic Fever: A Pocket Guide for the Front-line Health Worker
  http://apps.who.int/iris/bitstream/10665/130883/2/WHO_HSE_PED_AIP_14.05.pdf?ua=1

• Liberia Ebola Virus Disease Clinical Management Manual, 31 December 2014
A New Paradigm of Care

CDR Stefanie Glenn, MS, CRNP – A/AC
Operations Chief
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Protecting, Promoting, Advancing the Health and Safety of our Nation
Clinicians Are **NOT** in Charge

- Social Distancing/patient contact
- Time in Hot Zone
- Direct Patient Care
- Nurse/Provider Staffing
- Doffers
- Control in the Hot Zone
- Inability to Complete Care

Safety/Preventative Medicine Sections (IPC)
Re-integration of Responders and Leadership Challenges for Infectious Disease Management

CAPT Dean Coppola, DDS, MPH
Officer in Charge
Monrovia Medical Unit Team 3

Protecting, Promoting, Advancing the Health and Safety of our Nation
Family Support Network

• Information sharing between deployed officers and families
  – Paired families at home with local officers
  – Provided regular messaging on deployment status

• Lessons learned
  – Timeliness, accuracy and sensitivity of messaging
  – Support systems may already exist
Reintegration

• Challenges faced by returning responders
  – Quarantine vs. monitoring
  – Evolving, varying state and local requirements
  – Perception of family, friends and co-workers
  – Personal perceptions and values
We look forward to your questions and discussion.

Thank You!