Identify, Isolate, Inform
Objectives

1. Describe strategies for screening patients to identify highly infectious diseases

2. Differentiate various administrative, engineering control strategies to prevent transmission of various highly infectious pathogens

3. Determine how to integrate newly obtained knowledge into one’s work place to prevent transmission of various highly infectious pathogens
National Ebola Training and Education Center (NETEC)

Mission: To increase the capability of United States public health and health care systems to safety and effectively manage individuals with suspected and confirmed special pathogens.

For more information:
Visit [www.netec.org](http://www.netec.org)
Email us at [info@netec.org](mailto:info@netec.org)
Role of NETEC

Through the 5 year project period and in collaboration with ASPR, CDC and other stakeholders, the NETEC will:

- Create readiness metrics
- Conduct peer review readiness assessments of regional and state ETCs as well as assessment centers as requested by state health departments
Role of NETEC (continued...)

- Create, conduct, and maintain a comprehensive suite of onsite and online education courses and helpful resources and tools.

- Develop a repository for education resources, announcements, links to key information, exercise templates at www.netec.org

- Provide technical assistance to public health departments and healthcare facilities

- Create a research infrastructure across the 10 regional ETCs
History of Ebola Outbreaks

<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Cases</th>
<th>Deaths</th>
<th>Species</th>
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Species
- Zaire ebolavirus
- Sudan ebolavirus
- Tai Forest ebolavirus
- Bundibugyo ebolavirus

https://www.cdc.gov/vhf/ebola/history/distribution-map.html
8/1/2018: DRC declared a new outbreak of Ebola virus disease in North Kivu Province.

- 1089 EVD cases
  - 679 deaths
  - 29% < 18 yo
  - 16% were children < 5 yo
  - 7% were infants
- 86 cases of nosocomial infection
  - 81 EVD cases involving healthcare workers
  - 28 have died

Updated 2 April 2019
Current Studies in DRC

- 4 arm, randomized clinical trial
- Zmapp™ (MappBio)
  - 3 anti-Ebola antibodies
- Remdesivir (Gilead Sciences)
  - antiviral nucleotide analog prodrug
- MAb114 (Merck)
  - Human IgG1 MAb targeted to the Zaire ebolavirus (EBOV) glycoprotein (GP)
- REGN-EB3 (Regeneron)
  - 3 anti-Ebola antibodies
- All arms receive standard of care as well

- Ring Vaccination strategy
- Vaccinating people that have been in contact with confirmed cases
- Vaccinating health care workers that will likely have contact with Ebola infected patients
- Then vaccinating people around these groups
- This creates a protective ring, or buffer zone, to prevent spread of the infection

https://clinicaltrials.gov/
Current Studies in US

Expanded Access Protocol for Ebola Treatment

• Make available Zmapp™ (MappBio) in the US

• For any patients admitted to Regional Ebola Treatment Center/Biocontainment Unit

• NIH sponsored 4-arm clinical trial, mirroring the DRC trial, should be coming soon

PREPARE vaccine study

• Ebola vaccine (rVSVΔG-ZEBOV-GP) for Pre-Exposure Prophylaxis (PREP) in People at Potential Occupational Risk for Ebola Virus Exposure
The Special Pathogens: Infectious, Highly Hazardous, and Communicable
The Special Pathogens: 2017-2018 Outbreaks

- Monkeypox
- Lassa
- Marburg
- MERS
- Nipah
- Ebola
Global travel means the next special pathogen is a flight away
Beyond the VHFs: Other Special Pathogens

<table>
<thead>
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<th>Family</th>
<th>Examples</th>
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<tr>
<td>Coronaviruses</td>
<td>SARS, MERS-CoV</td>
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<td>Avian &amp; Novel Influenza Viruses</td>
<td>H7N9</td>
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<td>Henipaviruses</td>
<td>Nipah, Hendra</td>
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<td>Orthopoxviruses</td>
<td>Smallpox, Monkeypox</td>
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</table>
Expect the Unexpected

https://youtu.be/AyB7dEFFze8
Current State: A Tiered Approach to Ebola In the US

Frontline Healthcare Facility
- Quickly identifies and isolates patients with possible Ebola
- Notifies facility infection control and state and local public health officials
- Has enough Ebola personal protective equipment (PPE) for at least 12–24 hours of care
- Prepares for patient transfer, if needed

Ebola Assessment Hospital
- Safely receives and isolates a patient with possible Ebola
- Provides immediate laboratory evaluation and coordinates Ebola testing
- Cares for a patient for up to 96 hours (including evaluation and management of alternative diagnoses) until Ebola diagnosis is confirmed or ruled out
- Has enough Ebola PPE for up to 96 hours of care
- Transfers a patient with confirmed Ebola to an Ebola treatment center in consultation with public health officials

Ebola Treatment Center
- Safely receives and isolates a patient with confirmed Ebola
- Cares for patients with Ebola for duration of illness
- Has enough Ebola PPE for at least 7 days of care (will restock as needed)
- Has sustainable staffing plan to manage several weeks of care
- CDC experts are ready to deploy to provide assistance as needed

All Healthcare Facilities

Designated Centers

Identify

Person Under Investigation (PUI):
A person who has both consistent signs or symptoms + risk factors as follows should be considered a PUI

PIU for Ebola Virus Disease

Elevated body temperature OR subjective fever OR symptoms, including severe headache, fatigue, muscle pain, vomiting, diarrhea, abdominal pain, or unexplained hemorrhage; AND

An epidemiologic risk factor within the 21 days before the onset of symptoms

Identify
Isolate
Inform
Screening

- Travel history to a geographical area where a pathogen of concern is present within the known incubation period
- Contact with a confirmed person with a highly infectious disease
- Presenting signs and symptoms in addition to a positive travel history and/or contact with a person confirmed to have the disease
- Persons without signs and symptoms but have traveled to a country where the disease is widespread

Consider all screeners and First Points-of-Contact as Opportunities to Mask

Early recognition is key to preventing the spread of infection
Identify

Potential Points of Entry
- Emergency department
- Clinics
- Ambulatory care centers

Walk-ins
- Arrive by themselves
- Brought in by another person(s)

By Ambulance
- Pre identified as a PUI
- Identified enroute as a PUI
- May not be identified as a PUI until arrival

Patient Condition
- Non-Emergent
- Emergent
- Critical
- Expired
Do you have a fever? If you do, please put on a face mask.

¿Tiene fiebre? Si tiene fiebre, por favor use una mascarilla facial.

¿Ha viajado fuera del país en los últimos 21 días? Si lo ha hecho, por favor infórmese a nuestro personal.

Have you traveled internationally in the past 21 days? If you have, please inform our staff.

Signage: Help patients to self identify
Signage: Help patients to self identify
Facility Infection Prevention

Local and State Health Departments

CDC Current Outbreak List - [http://www.cdc.gov/outbreaks/](http://www.cdc.gov/outbreaks/)

Health Alert Network Network (HAN) - [http://emergency.cdc.gov/han/hantable.asp](http://emergency.cdc.gov/han/hantable.asp)

Travel Tracker/International SOS (ISOS)

Providing care to a patient in isolation to rule in or rule out a special pathogen disease involves implementing control measures to ensure the safety of staff.
Hierarchy of Controls: Elimination

Replace the hazard

- Identify the Hazard
- Limit the amount of staff entering the patient room
  - Install a means for communicating remotely
- Eliminate equipment and furniture that is not required
- Sequester waste to eliminate a costly process if PUI is ruled out
- Cover equipment to eliminate sensitive parts from exposure
Hierarchy of Controls: Substitution

Physically Remove the Hazard

- Cross-train staff to perform other duties within their scope of practice
  - For example RNs can draw labs, do ECGs, etc...
- Use bedside cardiac monitoring instead of an EKG
- Use ultrasound instead of x-ray when applicable
- Substitute equipment i.e. disposable, digital or electronic stethoscopes
Isolate People from the Hazard

- Designated **Cold**, **Warm** and **Hot** zones
- Airborne Infection Isolation Room (AIIR)
- Single occupancy room with toilet or bedside commode
- Use safe medical devices where available
Hierarchy of Controls: Administrative

Change the Way People Work

- Policies and Procedures that guide/direct work processes
- Algorithms/ checklists
- Coordination between other departments and other agencies
- Record keeping of everyone who enters the patient care room
- Training, Drills, Exercises
Although PPE is described as the least affected method for hazard elimination, it is intertwined with each control.

It is intertwined with in EACH control.

- PPE ensemble that meets the CDC minimum requirements
- There is a vast amount of PPE to choose from

- Head Covers
- Masks
- Respirators
- Gloves
- Gowns
- Coveralls
- Eye Protection
- Disposable Boots

Protect the Worker with Personal Protective Equipment
Isolate

Protect the Worker with Personal Protective Equipment

Room location
  Separate Ingress/ Egress
Communication process
Patient belongings
PPE
  For staff and the patient
Location for Supplies and patient care equipment
Furnishings/ equipment kept to a minimum
In the clinical judgment of the medical team, the PUI’s illness no longer appears consistent with the suspected condition.

All symptoms that are compatible with the disease (i.e. in the case of Ebola, fever, diarrhea and/or vomiting) have either resolved or can be accounted for by an alternative diagnosis.

Approval of your public health authority, in confirmed cases.

Who needs to know?

Facility Personnel
- Unit Lead
- Manager
- Infection Control
- Administration
- Others as appropriate

Public Health Department
- Public Health Lab

CDC
High Risk Procedures

- Central Line Placement
- Code
- Intubation
- Lumbar Puncture
- Care of the Deceased
How waste is handled is dependent upon the disease

Category A waste may be inactivated on or offsite by:
- Autoclaving
- Chemical Treatment*
- Incineration

Category B medical waste may be disposed of in accordance with routine procedures.
Inactivating Hazardous Medical Waste

**Autoclave**
Inactivation or incineration of category A waste is subject to state, local, EPA, and OSHA regulations.

**Incineration**
Incineration products (i.e., the ash) can be transported and disposed according to state and local regulations and standard protocols for hospital waste disposal.

Ebola-associated waste that has been appropriately inactivated or incinerated is no longer infectious and is not considered regulated medical waste or a hazardous material under federal law, but is subject to EPA regulations.

Sequester waste that is generated in the care of PUI’s that if positive would result in Category A Waste

Package waste where it is generated

Plan how to handle:
- Liquids
- Sharps
- Other items that such as batteries
Questions?