Rajal Mody, MD MPH
Captain USPHS Commissioned Corps
CDC Career Epidemiology Field Officer, Division of State and Local Readiness
MDH High Consequence Infectious Disease Medical Officer

Mary Ellen Bennett, MPH, RN CIC
Infection Preventionist, ICAR Program
MN Department of Health

Zuza Kuchta, RN, BSN, CCRN
Nurse Educator, Biocontainment Unit
Special Pathogens Program

Courtney Pickel, RN, BSN, CCRN
Nurse Educator, Biocontainment Unit
Special Pathogens Program
High Consequence Ice Dams (HCIDs)
High Consequence Infectious Diseases (HCIDs)

- Highly fatal
- Highly infectious
- Rare, but...
  - Mimic common conditions
  - Could present to any facility at anytime

- Transmission can be prevented, assuming...
  - HCID preparedness integrated into routine infection control practices
- Minnesota has robust HCID treatment centers and HCID-Ready EMS systems
Minnesota HCID Definition

Defined by the Minnesota HCID Collaborative* as a disease that:

1. **All forms of medical waste are classified as Category A infectious substances (UN2814) by the U.S. Department of Transportation**
   or...

2. **Has potential to cause a high mortality among otherwise healthy people, and...**
   - **no routine vaccine exists,** and...
     - **some types of direct clinical specimens pose generalized risks to laboratory personnel**
       or
     - **risk of secondary airborne spread or unknown mode of transmission**

* MN HCID Collaborative: MN Department of Health, Mayo Clinic, University of Minnesota Medical Center, Minnesota Hospital Association, Minnesota Healthcare Coalitions, Minnesota HCID-Ready EMS services
### Pathogens that meet HCID definition

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>HCID Pathogen Examples (viruses)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unknown highly fatal disease with</strong></td>
<td>To be determined</td>
</tr>
<tr>
<td><strong>evidence of person-to-person spread</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Hemorrhagic fever</strong></td>
<td>Ebola, Marburg, Lassa, Crimean-Congo, Guanarito, Machupo, Junin, Sabia, Lujo, Chapare, Kayasnur</td>
</tr>
<tr>
<td></td>
<td>Forest Disease, Omsk Hemorrhagic Fever, Hantaviruses causing HFRS</td>
</tr>
<tr>
<td><strong>Poxvirus diseases</strong></td>
<td>Smallpox, Monkeypox</td>
</tr>
<tr>
<td><strong>Febrile respiratory or neurological</strong></td>
<td>Nipah and Hendra virus, <em>MERS-CoV, SARS-CoV, Pandemic Influenza</em></td>
</tr>
<tr>
<td><strong>illness</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Requires airborne infection isolation room, but not necessarily biocontainment unit
Why prepare for these unlikely threats?
Delayed suspicion of MERS led to:

- 186 cases, 38 deaths
- Transmission in 16 clinics and hospitals
- $8.5 billion US dollars in economic loss
Recent HCID Activity Around the World

Lassa Fever
CDC Continuing Education (CME/CNE):
https://www.cdc.gov/vhf/lassa/index.html

Middle East Respiratory Syndrome
Ebola virus disease (EVD) in the DRC, 2018-19

- 925 cases, 584 deaths (63%)
  - Healthcare workers: 74 cases, 26 deaths

- Massive response
  - ~57,000 contacts identified
  - >85,000 people immunized (investigational vaccine)
  - ~1500 EVD tests per week
  - Randomized trials & compassionate use protocols

- Risk assessment for disease spread
  - Regionally: Very high; Globally: Low

- CDC guidance for travelers, including for aid workers & healthcare workers
Recent HCIDs in Travelers

First case of deadly MERS virus in five years diagnosed in England

By Rory Smith, CNN
Updated 11:40 AM ET, Thu August 23, 2018

Third case of monkeypox reported in the UK, in health care worker

By Meera Senthilingam, CNN
Updated 9:28 AM ET, Wed September 26, 2018

WHO details South Korea’s imported MERS case
A Tiered Approach to HCID Preparedness

<table>
<thead>
<tr>
<th>Frontline Healthcare Facility</th>
<th>HCID Assessment Hospital</th>
<th>HCID Treatment Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quickly identifies and isolates patients with possible Ebola</td>
<td>Safely receives and isolates a patient with possible Ebola</td>
<td>Safely receives and isolates a patient with confirmed Ebola</td>
</tr>
<tr>
<td>Notifies facility infection control and state and local public health officials</td>
<td>Provides immediate laboratory evaluation and coordinates HCID testing</td>
<td>Cares for patients with Ebola for duration of illness</td>
</tr>
<tr>
<td>Has enough Ebola personal protective equipment (PPE) for at least 12–24 hours of care</td>
<td>Cares for a patient for up to 5 days (including evaluation and management of alternative diagnoses) until Ebola diagnosis is confirmed or ruled out</td>
<td>Has enough Ebola PPE for at least 7 days of care (will restock as needed)</td>
</tr>
<tr>
<td></td>
<td>Has enough Ebola PPE for up to 5 days of care</td>
<td>Has sustainable staffing plan to manage several weeks of care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CDC Ebola Response Teams (CERTs) are ready to deploy to provide assistance as needed</td>
</tr>
</tbody>
</table>

Every facility is a Frontline facility
3 critical roles: Identify, Isolate, Inform

Mayo Clinic
UMMC-Fairview
• Aim is to make HCID preparedness business as usual...
  • Tools applicable to mundane as well the exotic infections
• Can’t plan for every event, so focus on infection control principles
HCID Screening Guidance

- Suggested framework to aid with the Identify, Isolate and Inform components of HCID preparedness
  - 4 short questions for all patients
    - Respiratory symptoms
    - Fever
    - Rash
    - Travel
### Assessed by Front Desk or Triage Nurse

#### All patients should be screened for cough, respiratory symptoms, fever, rash, and travel

<table>
<thead>
<tr>
<th>Symptom questions:</th>
<th>Travel question:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. New cough, other respiratory symptoms?</td>
<td>Did patient travel internationally during the past 30 days?</td>
</tr>
<tr>
<td>2. Recent fever or fever documented at the health care facility?</td>
<td>Record presence or absence of travel, including destinations and dates in chart</td>
</tr>
<tr>
<td>3. New rash?</td>
<td></td>
</tr>
</tbody>
</table>

Determine need for respiratory etiquette: Implement and maintain respiratory etiquette measures throughout remainder of health care encounter for all patients with either:
1) cough or other respiratory symptoms, or 2 & 3) fever & rash

<table>
<thead>
<tr>
<th>Subjective or documented fever?</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
</table>

- **Respiratory Etiquette measures**
  - Patient wears face mask
  - Access to hand hygiene
  - Patient sits as far away from others as possible
  - Room patient as soon as possible

- Follow routine Standard Precautions practices

  No HCID risk identified
Measles: life-threatening & healthcare-paralyzing preventable disease

Confirmed measles cases in January and February of each year

Global Reports of Measles, August 2018-January 2019

Cases in 11 states, including 6 outbreaks (NY, WA, TX, IL)
Assessed by Front Desk or Triage Nurse

- Subjective or documented fever?
  - No
  - Yes
    - Fever (no rash or respiratory symptoms) and travel?
      - No
      - Yes
        - Vomiting or diarrhea?
          - No
          - Yes
    - Fever & rash and travel?
      - No
      - Yes
        - Exposed to measles, chickenpox, or zoster in past 30 days?
          - No
          - Yes
    - Fever & respiratory symptoms (no rash) and travel?
      - No
      - Yes

- Close contact with a person with a febrile respiratory illness that developed within 14 days of returning from international travel?
  - No
  - Yes

- Move patient to private room with closed door or to an airborne infection isolation (AI) room & control access to patient; post appropriate isolation signage
- Assess possible infections based on travel history, clinical presentation, or exposures to ill persons who have recently travelled internationally
- Viral hemorrhagic fever may need to be considered even in the absence of specific travel alerts

HCID assessment recommended
Assessed by provider

- Move patient to private room with closed door or to an airborne infection isolation (AI) room & control access to patient; post appropriate isolation signage
- Assess possible infections based on travel history, clinical presentation, or exposures to ill persons who have recently travelled internationally
- Viral hemorrhagic fever may need to be considered even in the absence of specific travel alerts

**HCID assessment recommended**

For patients with recent travel, check for travel health notices:
- Travel Clinical Assistant (TCA): dph.georgia.gov/TravelClinicalAssistant
- CDC Travel Health Notices: wwwnc.cdc.gov/travel/notices
- WHO Disease Outbreak News: www.who.int/csr/don/en/

**Suspect HCID or other highly infectious disease?**

1. Implement airborne (or droplet for meningococcal disease or plague) and contact precautions & control access to patient
2. Providers should [don appropriate PPE before entering room](#)
3. Notify infection preventionist and MDH (651-201-5414)
4. Screen persons accompanying the patient for symptoms & collect information on other contacts

*Activate HCIDs plans, including possible transfer to biocontainment unit*
High Consequence Infectious Disease Ambulance Transport
GUIDANCE FOR FRONTLINE FACILITIES

7 HCID-Ready EMS services
• Allina Health Emergency Medical Services
• Altru Ambulance Service
• FM Ambulance Service
• Gold Cross Ambulance Service
• HealthEast Ambulance Service
• North Memorial Health Ambulance Service
• Willmar Ambulance Service

REQUEST PROTOCOL
1. Regardless of circumstance, please follow your normal protocol and contact your hospital’s usual EMS hospital to hospital transport provider.
2. If your usual EMS hospital to hospital transport provider is not one of the identified Ebola/HCID services they will contact an appropriate service.
3. Please Do Not attempt to contact an identified Ebola/HCID EMS Service on your own. This Will Create a DELAY in Patient Transport.

If there are any clinical questions while awaiting transport, please contact the Infectious Disease Epidemiology, Prevention and Control Division at MDH at 651-201-5414 or 1-877-676-5414 and ask for the Medical Director 24 hours a day, 7 days a week.

IDENTIFIED EBOLA/HCID AMBULANCE SERVICES IN MINNESOTA
• Allina Health Emergency Medical Services
• Altru Ambulance Service
• FM Ambulance Service
• Gold Cross Ambulance Service
• HealthEast Ambulance Service
• North Memorial Ambulance Service
• Willmar Ambulance Service

Minnesota Department of Health
Emergency Preparedness and Response
(phone) 651-201-5700
Health.HPP@state.mn.us
www.health.state.mn.us
UMMC Special Pathogens Unit

- Region V Treatment Center
  - Serving Minnesota, Wisconsin, Illinois, Michigan, Indiana, Ohio

- Dedicated biocontainment unit
  - Capacity for two patients
  - Lab capabilities
  - High-volume autoclave for decontamination of infectious waste
UMMC Special Pathogens Unit

• Our Team
  • Specialized RN and MD volunteers
  • Collaborative development of protocols with Hospital Infection Prevention
  • Quarterly Trainings with focus on simulation and hands on practice in PPE
  • Combined Hospital Hazmat team and Special Pathogens team
High Consequence Infectious Disease (HCID) Toolbox for Frontline Health Care Facilities

Purpose of toolbox

Executive Summary (PDF)

- Provides ready-to-use tools for frontline facilities to prepare to respond to patients who may have a high consequence infectious disease (HCID).
- Helps facilities meet CMS emergency preparedness regulatory requirements for training and testing programs.
- Helps facilities develop a multi-year plan for HCID education and exercises.
- Incorporates standard infection prevention concepts into training and exercises.

How to use the toolbox

- Use sample multi-year planning, training and exercise plan templates to lay out preparedness activities over multiple years.
- Incorporate readymade slides and personal protective equipment (PPE) videos into facility infection prevention and emergency preparedness training.
- Use or modify sample exercises (seminar, workshop, table top, mini-exercise, game) and templates for the exercises (Planning Tool, After Action
Goal of the Toolbox

• To help Frontline Facilities prepare to Identify, Isolate, and Inform regarding a person with a High Consequence Infectious Disease (HCID).

• To incorporate basic infection prevention principles of standard precautions, transmission based isolation, personal protective equipment, hand hygiene, and health care provider safety into preparedness efforts.

• To help facilities meet regulatory requirements.
Leadership engagement

• Critical to the success of the program and to support people to participate

• Leadership needs justification to allot resources:
  • Patient safety
  • Employee safety
  • Regulatory requirements

• Quantify in hours, how much time is planned for the year
Four Components of the Toolbox

Planning Tools
Training Tools
Exercise Templates
Readiness Binder
Start with the PLANNING TOOLS: Sample Needs Assessment Questionnaire

- Sample intended to stimulate some assessment ideas
- Answering “no” to any of these questions could be an area in your plan that needs to be exercised

<table>
<thead>
<tr>
<th>Yes/No</th>
<th>Sample Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is the emergency operations plan (EOP) up-to-date and includes section on infectious agent emergencies?</td>
</tr>
<tr>
<td></td>
<td>Has the section of the EOP for infectious agents been executed in the past year? (either in an actual occurrence or an exercise)</td>
</tr>
<tr>
<td></td>
<td>Are all policies and guidelines for response to an infectious emergency spelled out clearly in the EOP? (e.g., mutual aid agreements, etc.)</td>
</tr>
<tr>
<td></td>
<td>Has the hospital ICS (HICS) been activated in the past year for an infectious situation?</td>
</tr>
<tr>
<td></td>
<td>Has infectious agent screening at point of entry to the facility been tested in the past year? (either in an actual occurrence or an exercise)</td>
</tr>
<tr>
<td></td>
<td>Are all appropriate personnel (including new staff, leadership, etc.) familiar with the EOP (and the defined authorities) for responding to an infectious emergency?</td>
</tr>
<tr>
<td></td>
<td>Are identified personnel familiar with their role in infectious agent emergency operations? Do employees know where to get current information?</td>
</tr>
<tr>
<td></td>
<td>Do current personnel possess the knowledge and skills necessary to respond as indicated for an infectious agent emergency in the EOP?</td>
</tr>
<tr>
<td></td>
<td>Have resources been identified and incorporated into the EOP to deal with an infectious agent emergency?</td>
</tr>
</tbody>
</table>
Training and Exercise Plan

- Create multi-year training and exercise plan
- Incorporate into hospital’s emergency plan

### Training and Exercise Schedule 2019

<table>
<thead>
<tr>
<th>Quarter 1</th>
<th>Quarter 2</th>
<th>Quarter 3</th>
<th>Quarter 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>F</td>
<td>M</td>
<td>A</td>
</tr>
<tr>
<td>Annual Required Training in LMS re: HCID</td>
<td>HCID presents to the ED</td>
<td>Donning &amp; Doffing PPE – All patient care staff</td>
<td>ED Staff &amp; MD Training HCID</td>
</tr>
<tr>
<td>Lab HCID specimen management</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Be sure to insert any real life scenarios that will count as exercises or drills!*
Then Move to the TRAINING TOOLS

• High Consequence Infectious Disease Screening Guidance
• Sample Slide Sets – for facility training
  • Toolbox components
  • HCID specific slides
• Fun PPE Video Vignettes – for use in HCID training and general PPE training
PPE videos: fun and short

- Gloves
- Gown
- Facial Protection
- Level 1 – HCID Full Barrier Precaution

https://www.health.state.mn.us/diseases/hcid/videos.html
CDC Developed 2 Levels of PPE for Ebola

<table>
<thead>
<tr>
<th>Clinically stable with no bleeding, vomiting, diarrhea (&quot;Dry&quot; patient)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Fluid resistant gown</strong> (ANSI/AAMI level 3)</td>
</tr>
<tr>
<td>• 2 pairs of gloves</td>
</tr>
<tr>
<td>• <strong>Full face shield</strong></td>
</tr>
<tr>
<td>• <strong>Face mask</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinically unstable with bleeding, vomiting, diarrhea, or aerosol-generating procedures (&quot;Wet&quot; patient)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Impermeable gown</strong> (ANSI/AAMI level 4)</td>
</tr>
<tr>
<td>• 2-3 pairs of gloves</td>
</tr>
<tr>
<td>• <strong>PAPR or N95</strong></td>
</tr>
<tr>
<td>• <strong>Boot covers to mid-calf</strong></td>
</tr>
<tr>
<td>• <strong>Cover all skin completely</strong></td>
</tr>
</tbody>
</table>
We Can Apply Ebola PPE Levels for other HCID

**HCID Full Barrier Level 1:** for suspected viral respiratory pathogens and “dry” viral hemorrhagic fevers (VHF)

- *Fluid resistant gown (ANSI/AAMI level 3)*
- 2 pairs of gloves (for suspected VHF), 1 pair for viral respiratory pathogens
- *Full face shield and hair cover*
- *N95 or PAPR preferred. Use regular face mask if no access to respirators*
- *Booties (optional)*

**HCID Full Barrier Level 2:** for “wet” VHF or pox virus

- *Impermeable gown (ANSI/AAMI level 4)*
- 2-3 pairs of gloves
- *PAPR or N95*
- *Boot covers to mid-calf*
- *Cover all skin completely*
Level One and Level Two Full Barrier Isolation

**Level One Full Barrier Isolation**

- Respirator (fit-tested N95 or PAPR)
- Hair cover
- Face shield (or comparable eye protection)
- ANSI/AAMI level 3 gown
- Gloves - extend over the gown cuff
- Booties (optional)

**Level Two Full Barrier Isolation**

- Respirator (fit-tested N95 or PAPR)
- Head cover – covers all skin
- Face shield
- ANSI/AAMI level 4 gown that extends below the knee and completely around back plus apron if needed
- 2-3 pairs gloves - extend over the gown cuff
- Impervious boots extending to below knee
Frontline Facilities: HCID Full Barrier Level 1

- Recommended to have enough Level 1 PPE to care for a HCID for at least 24 hours
- Have PPE in variety of sizes to fit large and small (gloves and gowns)
- Supplies accessible to frontline staff
- Train staff on regular basis – suggest at least annually
- Have experts on the HCID topic who can be resources
Then Move to EXERCISE TEMPALES: Use One Page Simple Form

- Use for mini-drill
- Use for real life occurrence – just fill in what happened
- Use prepared exercises provided online, modify the prepared exercises or make your own with the blank template

### Exercise Plan: Frontline Facilities for HCID

<table>
<thead>
<tr>
<th>DATE:</th>
<th>TIME:</th>
<th>TYPE OF EXERCISE (CIRCLE ONE): mini-drill, tabletop, game</th>
</tr>
</thead>
<tbody>
<tr>
<td>PURPOSE:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCENARIO:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJECTIVE (SMART):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOCATION IN FACILITY (CIRCLE ONE): Emergency Department, Urgent Care, Clinic, Procedure Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PARTICIPANTS AND AGENCIES INVOLVED:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise Director:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluator:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Action:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Master Scenario Events List (MSEL)

<table>
<thead>
<tr>
<th>Event #</th>
<th>Event Time</th>
<th>Event Description</th>
<th>Expected Action</th>
<th>Outcome – Evaluation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Hotwash Notes:

- Director, Evaluator, Actor, Participants

### After Action Report:

**Struggles:**

- Opportunity for Improvement (Ask the 5 Whys)

<table>
<thead>
<tr>
<th>Improvement/Correction Action:</th>
<th>Assigned To:</th>
<th>Due By:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Determine Time Required

<table>
<thead>
<tr>
<th>Action</th>
<th>Estimated Time in minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to plan the exercise</td>
<td>&lt;20 minutes</td>
</tr>
<tr>
<td>Time to obtain and train players: patient, observer, moderator</td>
<td>&lt;20 minutes</td>
</tr>
<tr>
<td>Time to perform</td>
<td></td>
</tr>
<tr>
<td>• Drill</td>
<td></td>
</tr>
<tr>
<td>• Hot-wash,</td>
<td></td>
</tr>
<tr>
<td>• fill out after action report,</td>
<td></td>
</tr>
<tr>
<td>• identify strengths and weaknesses (5 whys),</td>
<td></td>
</tr>
<tr>
<td>• list opportunities for improvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Make a High Consequence Infectious Disease Readiness Binder

• Binder should be kept on unit – assessable to staff at point of care

• Put the tools in plastic sleeves so can be taken out and used

• Regularly update binders with current versions of document from MDH website

[Website link: www.health.state.mn.us/diseases/hcid/index.html]
# High Consequence Infectious Disease Isolation Grid

The following guidance is intended for frontline hospitals, urgent care clinics, and outpatient clinics.

<table>
<thead>
<tr>
<th>Suspected infections</th>
<th>PPE</th>
<th>Isolation Room Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all patients</td>
<td>Simple face mask</td>
<td>Regular room No special ventilation needed.</td>
</tr>
<tr>
<td>e.g. Influenza, Pertussis, meningococcal meningitis</td>
<td>Gown and gloves</td>
<td>Regular room No special ventilation needed</td>
</tr>
<tr>
<td>e.g. MRSA, CDI, MDRO, Lice, Scabies</td>
<td>Respirator – fit-tested N95 or PAPR</td>
<td>Prefer negative pressure room with exhaust to the outside</td>
</tr>
<tr>
<td>Measles, Tuberculosis,</td>
<td>Gown, gloves, respiratory (fit-tested N95 or PAPR)</td>
<td>Prefer negative pressure room with exhaust to the outside</td>
</tr>
<tr>
<td>Chickenpox, disseminated zoster</td>
<td>Hair cover, face shield (or comparable eye protection), gloves, ANSI/AAMI level 3 gown that extends up over the gown cuff, respirator (fit-tested N95 or PAPR), booties.</td>
<td>Prefer negative pressure room with exhaust to the outside</td>
</tr>
<tr>
<td>Monkeypox, smallpox, Respiratory diseases (like MERS, SARS, pandemic influenza), dry viral hemorrhagic fevers (no vomiting, diarrhea, bleeding and clinically stable)</td>
<td>All skin covered. Head/neck/face cover, 2-3 sets of gloves that extends up over the gown cuff, respirator (fit-tested N95 or PAPR), ANSI/AAMI level 4 gown that extends all around the wearer and comes down below the knees, knee high boots.</td>
<td>Prefer negative pressure room with exhaust to the outside</td>
</tr>
</tbody>
</table>

**Standard Precautions**

- Simple face mask
- Gown and gloves
- Respirator – fit-tested N95 or PAPR

**Tissue Isolation**

- Hair cover, face shield (or comparable eye protection), gloves, ANSI/AAMI level 3 gown that extends up over the gown cuff, respirator (fit-tested N95 or PAPR), booties.

<table>
<thead>
<tr>
<th>Airborne Isolation</th>
<th>Airborne &amp; Contact Isolation</th>
<th>Level 1 HCID PPE</th>
<th>Level 2 HCID PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles, Tuberculosis,</td>
<td>Chickenpox, disseminated zoster</td>
<td>Monkeypox, smallpox, Respiratory diseases (like MERS, SARS, pandemic influenza), dry viral hemorrhagic fevers (no vomiting, diarrhea, bleeding and clinically stable)</td>
<td>Wet viral hemorrhagic fevers (wet is defined as vomiting, diarrhea, bleeding, in need of intubation or suctioning, or otherwise clinically unstable)</td>
</tr>
</tbody>
</table>

**Level 1 HCID PPE**

- Respirator – fit-tested N95 or PAPR
- Gown, gloves, respiratory (fit-tested N95 or PAPR)
- Hair cover, face shield (or comparable eye protection), gloves, ANSI/AAMI level 3 gown that extends up over the gown cuff, respirator (fit-tested N95 or PAPR), booties.

**Level 2 HCID PPE**

- Hair cover, face shield (or comparable eye protection), gloves, ANSI/AAMI level 3 gown that extends up over the gown cuff, respirator (fit-tested N95 or PAPR), booties.
- All skin covered. Head/neck/face cover, 2-3 sets of gloves that extends up over the gown cuff, respirator (fit-tested N95 or PAPR), ANSI/AAMI level 4 gown that extends all around the wearer and comes down below the knees, knee high boots.
c. Checklist for Arrival of Patient with a High Consequence Infectious Disease (HCID)

This is a sample list. Steps may vary for each facility.

<table>
<thead>
<tr>
<th>Action</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Place mask on suspected HCID patient (with respiratory illness, travel, and/or rash).</td>
<td></td>
</tr>
<tr>
<td>2. Explain process to the patient.</td>
<td></td>
</tr>
<tr>
<td>3. Prepare room for patient if possible. Remove unnecessary equipment from room. If patient is clinically stable (no bleeding, diarrhea, vomiting), remove large objects. If patient is clinically unstable (bleeding, having diarrhea and vomiting), remove as much as possible.</td>
<td></td>
</tr>
<tr>
<td>4. Escort patient to the room as soon as possible. Negative pressure room is preferred.</td>
<td></td>
</tr>
<tr>
<td>6. Close door and hang appropriate signage visible to staff.</td>
<td></td>
</tr>
<tr>
<td>7. Hang the list to document persons entering the room who are potentially exposed.</td>
<td></td>
</tr>
<tr>
<td>8. Notify Charge Nurse.</td>
<td></td>
</tr>
<tr>
<td>9. Evaluate people arriving with patient for illness. Isolate or direct to another room to wait as indicated.</td>
<td></td>
</tr>
</tbody>
</table>
### g. Personnel Potentially Exposed to Patient with High Consequence Infectious Disease

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Exposure Type</th>
<th>Significant (Yes/No)</th>
<th>Follow up Needed (Yes/No)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**f. Personal Protective Equipment Volume List for Level One Full Barrier Precautions**

**HIGH CONSEQUENCE INFECTIOUS DISEASE (HCID) READINESS BINDER**

- Have enough on hand to care for a patient for 24 hours.
- If possible, use a cart that can be pushed to the door.
- Consider making kits that are easy to grab.

<table>
<thead>
<tr>
<th>Item</th>
<th>Number Stocked in Department</th>
<th>Number stocked in Location</th>
<th>Actual Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masks</td>
<td>Box of 100</td>
<td>5 boxes of 100 Storeroom</td>
<td>600</td>
</tr>
<tr>
<td>N95 Respirators</td>
<td>Box of 20</td>
<td>5 boxes of 20 Storeroom</td>
<td>120</td>
</tr>
<tr>
<td>Type</td>
<td>1870+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powered Air Purifying Respirator (PAPR)</td>
<td>2</td>
<td>2 in Sara’s office</td>
<td>4</td>
</tr>
<tr>
<td>PAPR Hoods</td>
<td>4</td>
<td>10 in Storeroom</td>
<td>14</td>
</tr>
<tr>
<td>Face Shields</td>
<td>20</td>
<td>50 in Storeroom</td>
<td>70</td>
</tr>
<tr>
<td>Gowns: ANSI/AMMI level 3 fluid resistant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td>10</td>
<td>25</td>
<td>35</td>
</tr>
<tr>
<td>XX Large</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Gloves: 4 sizes</td>
<td>5 boxes of 100 each size</td>
<td>10 boxes of 100 each size</td>
<td>15 boxes of 100 each size</td>
</tr>
</tbody>
</table>
Level One and Level Two Full Barrier Isolation

**Level One Full Barrier Isolation**

- Respirator (fit-tested N95 or PAPR)
- Hair cover
- Face shield (or comparable eye protection)
- ANSI/AAMI level 3 gown
- Gloves - extend over the gown cuff
- Booties (optional)

**Level Two Full Barrier Isolation**

- Respirator (fit-tested N95 or PAPR)
- Head cover – covers all skin
- Face shield
- ANSI/AAMI level 4 gown that extends below the knee and completely around back plus apron if needed
- 2-3 pairs gloves - extend over the gown cuff
- Impervious boots extending to below knee
MDH Posters for Donning / Doffing Level 1 PPE

www.health.state.mn.us/facilities/patientsafety/infectioncontrol/pre/fullbarrier.html
Next Steps

• Revise and enhance the toolbox by June 2019
  • Centers for Enhanced Response (CER)
    New – more comprehensive Self Assessment
  • PPE donning and doffing

• Developing similar toolbox for EMS – Spring 2019
  • Compendium list of ambulance services
  • Developing a general infection prevention assessment tool
Conclusion

• Toolbox offers adaptable tools to aid in HCID preparedness

• Key aspects of HCID preparedness:
  • Ability to identify, isolate, and inform response partners
  • HCID preparedness built into routine infection control practices
  • Will help identify exotic as well as mundane infections

• Work in progress. Welcome feedback to enhance the Toolbox
What questions do you have for us?

www.health.state.mn.us/diseases/hcid/index.html
(or search “MDH HCID”)

• Dr. Raj Mody  raj.mody@state.mn.us
• Mary Ellen Bennett  mary.ellen.bennett@state.mn.us
• Tammy Hale  tammy.hale@state.mn.us

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.