



## High Consequence Infectious Diseases New Tools from MDH



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### Objective 1

- The learner will describe the concept of High Consequence Infectious Disease (HCID).

### Objective 2

- The learner will discuss the HCID Toolbox for Frontline Facilities and Ambulance Services.

### Objective 3

- The learner will describe the process for the Ebola ready ambulance services.

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## 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

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## Why prepare for these unlikely threats?




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ASIA PACIFIC The New York Times

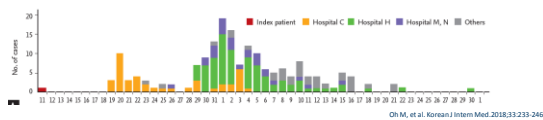
**MERS Virus's Path: One Man, Many South Korean Hospitals**

PHOTO BY J. J. ... [Read the full story](#)

By CHOI SANG-HOON ... JUNE 6, 2015

Delayed suspicion of MERS led to:

- 186 cases, 38 deaths
- Transmission in 16 clinics and hospitals
- \$8.5 billion US dollars in economic loss




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Open Forum Infectious Diseases

MAJOR ARTICLE



### A Case of Lassa Fever Diagnosed at a Community Hospital—Minnesota 2014

Mary J. Chan,<sup>1</sup> Ghanshyam Wankar,<sup>2</sup> Barbara Kozak,<sup>3</sup> Arnold Wang,<sup>4</sup> Ruth Lyndall,<sup>5</sup> Mark R. Mouton,<sup>6</sup> Tina Ohja,<sup>7</sup> Shelley Brown,<sup>8</sup> James Griffin,<sup>9</sup> Deborah Hubert,<sup>10</sup> Susan Lipsett,<sup>11</sup> Elizabeth Ervin,<sup>12</sup> Ute Strohm,<sup>13</sup> Henry Weitzman,<sup>14</sup> Wendell Stetler,<sup>15</sup> Faith Weitzman,<sup>16</sup> John Harper,<sup>17</sup> Madeline Knoch,<sup>18</sup> Carol Olson,<sup>19</sup> Pierre Audin,<sup>20</sup> Stuart Reichel,<sup>21</sup> Ryan Dow,<sup>22</sup> and Aaron Levine<sup>23</sup>

<sup>1</sup>Minnesota Department of Health, St. Paul, Minnesota; <sup>2</sup>Henry Hospital, Allina Health, Cook County, Minnesota; <sup>3</sup>University of Minnesota, Minneapolis; <sup>4</sup>University of Minnesota, Minneapolis; <sup>5</sup>University of Minnesota, Minneapolis; <sup>6</sup>University of Minnesota, Minneapolis; <sup>7</sup>University of Minnesota, Minneapolis; <sup>8</sup>University of Minnesota, Minneapolis; <sup>9</sup>University of Minnesota, Minneapolis; <sup>10</sup>University of Minnesota, Minneapolis; <sup>11</sup>University of Minnesota, Minneapolis; <sup>12</sup>University of Minnesota, Minneapolis; <sup>13</sup>University of Minnesota, Minneapolis; <sup>14</sup>University of Minnesota, Minneapolis; <sup>15</sup>University of Minnesota, Minneapolis; <sup>16</sup>University of Minnesota, Minneapolis; <sup>17</sup>University of Minnesota, Minneapolis; <sup>18</sup>University of Minnesota, Minneapolis; <sup>19</sup>University of Minnesota, Minneapolis; <sup>20</sup>University of Minnesota, Minneapolis; <sup>21</sup>University of Minnesota, Minneapolis; <sup>22</sup>University of Minnesota, Minneapolis; <sup>23</sup>University of Minnesota, Minneapolis

- 46-year old man transported from MSP to hospital after returning from Liberia
- Confusion, abdominal pain, low-grade fever
- Admitted to ICU for acute renal failure
- Next day started bleeding from nose and mouth
- Placed on contact and airborne precautions
- 37 hospital staff monitored for 21 days

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### Ebola virus disease (EVD) in the DRC, 2018-19

- 1146 cases, 721 deaths (63%)
  - Healthcare workers: 81 cases, 27 deaths
- Massive response
  - >65,000 contacts identified
  - >93,000 people immunized (investigational vaccine)
  - >800 reports daily for illnesses concerning for EVD, (97% assessed in <24 hr)
- Risk assessment for disease spread
  - Regionally: **Very high**; Globally: **Low**
  - CDC guidance for travelers, including for aid workers & healthcare workers

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### Recent HCIDs in Travelers

**August**

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

By Mary Smith, CNN  
Updated 12:40 PM ET, Thursday, August 23, 2018

**September**













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

By Helen Matthews, BBC  
Updated 9:38 AM ET, Wednesday, September 26, 2018

**September**

WHO details South Korea's imported MERS case

### A Tiered Approach to HCID Preparedness

Frontline Healthcare Facility	HCID Assessment Hospital	HCID Treatment Center
 <p>Quickly identifies and isolates patients with possible Ebola</p>	 <p>Safety measures and isolates a patient with possible Ebola</p>	 <p>Safety measures and isolates a patient with confirmed Ebola</p>
 <p>Notifies facility infection control and state and local public health officials</p>	 <p>Provides immediate laboratory evaluation and consultation: HCID testing</p>	 <p>Cares for patients with Ebola for duration of illness</p>
 <p>Has enough Ebola personal protective equipment (PPE) for at least 12-24 hours of care</p>	 <p>Plans for a patient for up to 5 days (including evaluation and management of alternative diagnosis and Ebola diagnosis is confirmed or ruled out)</p>	 <p>Has enough Ebola PPE for at least 5 days of care (not to be used to return to work so needed)</p>
	 <p>Has enough Ebola PPE for up to 5 days of care</p>	 <p>Has sustainable staffing plan to manage potential waves of care</p>
		 <p>HCID Ebola treatment teams (CERTs) are made available to provide assistance as needed</p>

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

Mayo Clinic  
UMMC-Fairview



## HCID Frontline Toolbox

- 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

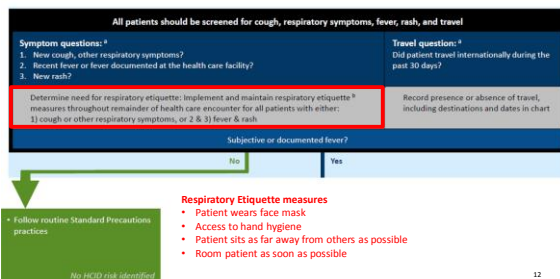
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## HCID Screening Guidance

- 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

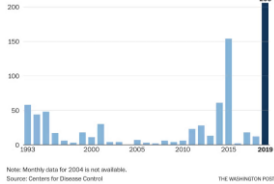


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## Measles: life-threatening & healthcare-paralyzing preventable disease

### Worst start to the year for measles in a quarter century

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)

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**HCID Toolbox**

HCID Toolbox Home  
Darning and Drifting  
Videos  
Exercise Templates  
HCID Binder

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**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 ready-made 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, exam) and templates for the exercises (Planning Tool, After Action Report).

**ICAR**

**Spotlight**

**Education on MDI**  
Infectious Disease Associated  
Infections Updates

Learn to improve  
information about  
wearing/choosing your hands.  
Antimicrobial Susceptibilities  
of Selected Pathogens (MSL)  
Antimicrobial

Making Health Care Safer  
CMS: What's Right, Attention  
Non-MDH RH.

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**High Consequence Infectious Disease (HCID) Toolbox for Ambulance Services**

**Purpose of toolbox**

**Executive Summary (PDF)**

- Provides ready-to-use tools for ambulance services 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 ready-made 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, exam) and templates for the exercises (Planning Tool, After Action Report).
- Use components to make a binder for staff to use at point of care.

**Planning tools**

- Components Necessary for a "Ready" Facility (PDF)
- Sample Needs Assessment Questionnaire (Word)

**ICAR**

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Infectious Diseases and Control  
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## Four Components of the Toolbox

Planning Tools

Training Tools

Exercise Templates

Readiness Binder / Readiness resources



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## Start with the PLANNING TOOLS: Sample Needs Assessment Questionnaire

### Needs Assessment Questionnaire

SAMPLE

(Sample only intended to stimulate some assessment ideas.)

- 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

Yes/No	Sample Questions
	Is the emergency operations plan (EOP) up-to-date and includes section on infectious agent emergencies?
	Has the section of the EOP for infectious agents been executed in the past year? (either in an actual occurrence or an exercise)
	Are all policies and guidelines for response to an infectious emergency spelled out clearly in the EOP? (e.g., incident triage, etc.)
	Has the hospital (H) been activated in the past year for an infectious situation?
	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)
	Are all appropriate personnel (including new staff, leadership, etc.) familiar with the EOP (and the defined authorities) for responding to an infectious emergency?
	Are identified personnel familiar with their role in infectious agent emergency operations? (Do employees know where to get correct information?)
	Do current personnel possess the knowledge and skills necessary to respond as indicated for an infectious agent emergency in the EOP?
	Have resources been identified and incorporated into the EOP to deal with an infectious agent emergency?

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## Training and Exercise Plan

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

SAMPLE

Training and Exercise Schedule 2019											
Quarter 1			Quarter 2			Quarter 3			Quarter 4		
J	F	M	A	M	J	J	A	S	O	N	D
Annual Required Training in IAMS re: HCID	HCID presents to the ED	Decontamination & Doffing PPE - all patient care staff				ED Staff & MD Training HCID				EMS Education HCID	
	Lab HCID specimen management										

Training Exercise

*Be sure to insert any real life scenarios that will count as exercises or drills!*

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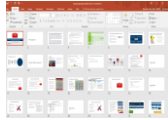
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## Training Tools

- 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



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## PPE videos: fun and short

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




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## 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, 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

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## 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



[www.health.state.mn.us/diseases/hcid/index.html](http://www.health.state.mn.us/diseases/hcid/index.html)

## Make HCID tools available

- An App?
- Smart phone accessible tools on line or preloaded
- For:
  - HCID reference grid
  - Check list of things to do
  - Donning and doffing guide



[www.health.state.mn.us/divs/depc/dtopics/hcid/index.html](http://www.health.state.mn.us/divs/depc/dtopics/hcid/index.html)

## High Consequence Infectious Disease Isolation Grid

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

	Standard Precautions	Droplet Isolation	Contact Isolation	Airborne Isolation	Airborne & Contact Isolation	Level 1 HCID PPE	Level 2 HCID PPE
Suspected infection	For all patients	e.g. Influenza, Pertussis, meningococcal meningitis	e.g. MRSA, CDI, MRCNS, Lice, Scabies	Measles, Tuberculosis, Chickenpox, disseminated zoster	Chickenpox, disseminated zoster	Monkeypox, smallpox, Respiratory diseases (like MERS, SARS, pandemic influenza), dry viral hemorrhagic fevers (no vomiting, diarrhea, bleeding and clinically stable)	Wet viral hemorrhagic fevers (wet is defined as vomiting, diarrhea, bleeding, in need of intubation or suctioning, or otherwise clinically unstable)
PPE	Standard Precaution definition	Simple face mask	Gown and gloves	Respirator – fit-tested N95 or PAPR	Gown, gloves, respiratory (fit-tested N95 or PAPR)	Hair cover, face shield (or comparable eye protection), gloves, ANS/AAIM 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), ANS/AAIM level 4 gown that extends all around the wearer and comes down below the knees, knee high boots.
Isolation Room Type	Regular room No special ventilation needed.	Regular room No special ventilation needed	Regular room No special ventilation needed	Prefer negative pressure room with exhaust to the outside	Prefer negative pressure room with exhaust to the outside	Prefer negative pressure room with exhaust to the outside	Prefer negative pressure room with exhaust to the outside

### c. Checklist for Arrival of Patient with a High Consequence Infectious Disease (HCID)

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

✓ Action	Comments
1. Place mask on suspected HCID patient (with respiratory illness, travel, and/or rash).	
2. Explain process to the patient.	
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.	
4. Escort patient to the room as soon as possible. Negative pressure room is preferred.	
5. Locate HCID Management Binder with reference material.	
6. Close door and hang appropriate signage (visible to staff).	
7. Hang the list to document persons entering the room who are potentially exposed.	
8. Notify Charge Nurse.	
9. Evaluate people arriving with patient for illness. Isolate or direct to another room to wait as indicated.	

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### g. Personnel Potentially Exposed to Patient with High Consequence Infectious Disease

name	Role	Exposure Type	Significant (Yes/No)	Follow up Needed (Yes/No)	Notes

Minnesota Department of Health  
Infectious Disease Epidemiology, Prevention and Control  
PO Box 54875, St. Paul, MN 55154

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### Level One and Level Two Full Barrier Isolation



## MDH Posters for Donning / Doffing Level 1 PPE



[www.health.state.mn.us/facilities/patientsafety/infectioncontrol/pre/fullbarrier.html](http://www.health.state.mn.us/facilities/patientsafety/infectioncontrol/pre/fullbarrier.html)

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## Resources for Infection Prevention in EMS

APIC Implementation Guide to Infection Prevention in Emergency Medical Services  
[https://www.ems.gov/pdf/workforce/Guide\\_Infection\\_Prevention\\_EMS.pdf](https://www.ems.gov/pdf/workforce/Guide_Infection_Prevention_EMS.pdf)

EMS INFECTIOUS DISEASE PLAYBOOK ASPR TRACIE  
<https://www.ems.gov/pdf/ASPR-EMS-Infectious-Disease-Playbook-June-2017.pdf>

2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings  
<https://www.cdc.gov/infectioncontrol/pdf/guidelines/isolation-guidelines.pdf>

Infection Control Guidance for EMS, First Responders, Fire, and Law Enforcement: Influenza  
<http://www.health.state.mn.us/divs/idepc/diseases/flu/ps/icems.html>

Infection Preventionist at your local hospital



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## What's Next?

- Hospital Preparedness
  - Toolbox – additional videos and posters, some revisions
  - Mystery drills
- EMS
  - Toolbox by June  
[www.health.state.mn.us/divs/idepc/dtopics/hcid/index.html](http://www.health.state.mn.us/divs/idepc/dtopics/hcid/index.html)
  - Compendium  
<https://apps.health.state.mn.us/redcap/surveys/?s=AJMDPNK3L3>
  - Infection prevention assessment – would like to pilot in 15 services

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### 911 vs. Inter-facility

- 911 transports to closest Critical Access Hospital
- 7 HCID Transport services
- Transport from CAH to hospital designated by the MDH
- Transport of confirmed HCID patient to UMMC from home?

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### PPE

- Contact
- Airborne
  - Measles
  - TB
- Droplet
  - Influenza

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### Ebola

- Direct contact
  - Blood
  - Body fluids
  - Entry through broken skin or mucus membranes

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## Recommended PPE

- N95 or PAPR
- Impermeable gown or coverall
- Two pair of gloves (12inch sleeves)
- Boot covers Mid calf
- Apron
- Head cover
- Eye Protection




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## Ambulance PPE

Overkill?



Cabinets are covered




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## Conclusion

- HCIDs could present at anytime and being prepared can reduce negative consequences of HCIDs
- Key aspects of HCID preparedness:
  - Ability to **identify** and **isolate** possible HCIDs, and **inform** response partners
  - Integrate HCID preparedness into routine infection control practices
- Toolbox offers adaptable tools to aid with HCID preparedness

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## What questions do you have for us?

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