Infection Prevention and Emergency Management

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Objectives

• Impact of infectious diseases during disasters

• Interventions for infection prevention during disasters
  – All healthcare settings

• How to assess organization’s response plan r/t infection prevention
9/11: Food Safety at the Pentagon
Hurricane Katrina
Biggest Threat r/t Infectious Diseases

Battling Bioterrorism

Emerging infectious disease
Impact of 2003 SARS Outbreak

SARS Demographics 2003 Outbreak

- Total cases: 8,096
- Mortality rate: 9.6%

Nosocomial transmission 55 - 72%

- 72% of cases in Canada were HCWs

Costs: $18 billion in Asia; $1.5 - $2.1 billion in Canada

HCW infection associated with aerosolizing procedures & poor infection prevention practices, including PPE use/removal
H1N1 pandemic:
Real life test of preparedness for infectious disease disasters
Diseases travel globally
Diseases travel locally

Index Case (Mother)

Case A
Mr. T
(Son)

Mr. D

SGH

24 persons

Mr. P’s wife in waiting room

21 persons

15 persons

4 persons

7 persons

Mr. R
Diseases Travel with Animals & Insects
The Environment Plays Role in Infection Transmission
How are Infection Prevention Interventions Different During a Disaster?

**Difference: Scope**

- Healthcare
- Public
And then Jake saw something that grabbed his attention.

Biosurveillance

We need rapid identification of an incident.
Screening & Triage Best Practices

- Screen all visitors & staff
  - Consider limiting visitors
- Limit number of entrances
- Separate staff entrance

Train screeners well
Isolation

• Follow HICPAC guidelines when possible
• Undiagnosed: transmission based precautions

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Isolation Precautions Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough, runny nose, watery eyes</td>
<td>Standard</td>
</tr>
<tr>
<td>Fever &amp; cough (adults)</td>
<td>Droplet</td>
</tr>
<tr>
<td>Fever &amp; cough (kids)</td>
<td>Droplet &amp; Contact</td>
</tr>
<tr>
<td>Fever, cough, bloody sputum, &amp; wt loss</td>
<td>Airborne</td>
</tr>
<tr>
<td>Eye infection or drainage</td>
<td>Standard</td>
</tr>
</tbody>
</table>

See table in APIC document
Better to over-isolate SARS Outbreak in Canada

Infected person

10 HCW’s infected per day that infected case was not identified & isolated
H1N1 in NYC*

26 H1N1 pts associated with 277 unprotected staff exposures

*Banach, et al., 2011

= Symptomatic for ILI
Improvised Isolation Area

- Improvising isolation area
  - Physically separate the pt
  - Building or area outside can be used
  - Best if room/area has walls & a door
  - Makeshift walls/doors
    - Plastic or other barrier material
  - Hang isolation sign near entrance
May Need
Negative Pressure
Surge Capacity
Discontinuing Isolation

• Do not D/C isolation until anti-infective therapy sensitivity is verified
Exposure to patient with anthrax: alcohol-based gels/foams are OK

Exposure to Anthrax spores: Need soap & water
Cohort Staff

• Assign dedicated staff
• Use vaccinated staff
Social Distancing Principles

Bed/stretcher/cot configuration in surge areas
Hand Hygiene

NEJM: Med student tied to MRSA outbreak
- Failure to wash hands
Need PPE

- Adequate amounts
- Teach healthcare personnel how to use it

“Wait a minute! ... McCallister, you fool! This isn’t what I said to bring!”
## PPE Estimates for Planning & Stockpiling

<table>
<thead>
<tr>
<th>Category of Staff</th>
<th>Respirator</th>
<th>Gown (disposable)</th>
<th>Gloves (disposable)</th>
<th>Goggles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little to no exposure</td>
<td>1 disposable per contact/exposure</td>
<td>1 per exposure</td>
<td>1 per contact</td>
<td>None</td>
</tr>
<tr>
<td>Prolonged exposure</td>
<td>1 <strong>reusable</strong> per outbreak (plus 2 cartridges/month*)</td>
<td>1 per exposure</td>
<td>1 per contact</td>
<td>1 per outbreak</td>
</tr>
<tr>
<td>Infrequent exposure(s)</td>
<td>1 <strong>reusable</strong> per outbreak (plus 2 cartridges/month*)</td>
<td>1 per shift</td>
<td>1 per contact</td>
<td>1 per outbreak</td>
</tr>
</tbody>
</table>

*Disposable respiratory cartridges are needed for reusable respirators.*

*Radonovich et al. (2009)*
Remove Mask/Respirator

Don’t

Do: Remove from behind
Hard to be compliant with N95s over long periods of time
Not considered respiratory protection.....
Not yet tested for safety.....
Might not get the supplies we need

- Respirators during H1N1
Extending the Use/Reusing Respirators

- APIC Guidance
  - APIC website
  - Free
Linen Management

- Laundry staff need PPE
- Consider using disposable linens
- Bag at point of use

Smallpox is a major risk for laundry personnel
Need Rapid Mass Distribution of Medical Countermeasures

- **Meds**: 48 hours
- **Vaccine**: 4 – 6 days

**Push:**
Mail carriers

**Pull:**
PODs
Innovative POD Design

If you build it, they will come…

Drive through vaccine program

No adverse events in 15 years
(> 50,000 shots & 2,000 intranasal vaccines administered)

Carrico et al. (2012)
Innovative Mass Immunization Program

Slowly he would cruise the neighborhood, waiting for that occasional careless child who confused him with another vendor.
We have great medicines & vaccines, but we have to convince people to take them.

Technology advances; people stay the same.
Infection Prevention in PODs

• Published in AJIC
Need liberal sick leave policy for disasters

HCW role in disease spread

True or False: 25% of unvaccinated HCWs claim they don’t have a role in disease tx
SARS Outbreak in Taiwan

Infected laundry worker

137 Secondary Cases
Planning Documents

- Free of charge on APIC Website

www.apic.org
More Free Planning Products

Infection Prevention for Alternate Care Sites

Prepared by:
2009 APIC Emergency Preparedness Committee
Chair: William Wagner, ScD, CHCM, CHSP, CHEP
Co-Chair: Barbara Russell, RN, MPH, CIC

Lead Authors:
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Infection Prevention for Ambulatory Care Centers During Disasters

November, 2009

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# Assessing Hospital Plans (in AJIC)

## Table 1 Infection Prevention Components of a Hospital Emergency Management Plan

<table>
<thead>
<tr>
<th>Hospital Emergency Management Plan and Biological Annex</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Addresses all biological events, including bioterrorism, emerging infectious diseases, and pandemic influenza(^1)-(^7),(^9),(^10),(^12),(^14),(^16),(^18)-(^31)</td>
</tr>
<tr>
<td>- Identifies contact names and numbers for local and state health dept, state health association, and tribal health association(^4)</td>
</tr>
<tr>
<td>- Is coordinated with local, state, and federal emergency management plans(^1),(^3),(^5),(^7),(^9),(^12),(^13),(^23),(^31)-(^29),(^32),(^33)</td>
</tr>
<tr>
<td>- Identifies the person(s) authorized to implement/activate the biological annex plan and the organizational structure that will be used, including the delegation of authority to carry out the plan (^24),(^27)</td>
</tr>
<tr>
<td>- Describes the responsibilities of key personnel and departments (and back-ups for key personnel) within the facility related to executing the biological annex component of the Plan(^3),(^37)</td>
</tr>
<tr>
<td>- Defines how biological events are different from other types of MCEs(^1),(^11),(^24),(^27)</td>
</tr>
<tr>
<td>- Has planning committee focusing on biological events that includes an infection preventionist and/or hospital epidemiologist(^3),(^5),(^7),(^8),(^11),(^12),(^14),(^24),(^25),(^29)</td>
</tr>
<tr>
<td>- Stratifies implementation of specific actions on the basis of the WHO Pandemic Phases, US Government Pandemic Stages, and the pandemic severity index level worldwide, in the US, and at the local level(^4),(^24)</td>
</tr>
<tr>
<td>- Stratifies implementation of specific actions for a bioterrorism attack on the basis of whether the attack is overt or covert, and on the basis of high-risk syndromes or suspected routes of disease transmission(^5),(^24),(^27)</td>
</tr>
<tr>
<td>- Describes the epidemiological signs of a potential bioterrorism attack(^2),(^24)</td>
</tr>
<tr>
<td>- States how often the annex will be updated and by whom, including contact names/information, incorporating lessons learned from exercises/drills, and changes in recommendations related to managing biological events(^3),(^5),(^7),(^10),(^14),(^21),(^27)</td>
</tr>
</tbody>
</table>

### Assessing Hospital Readiness for MCE

- States how and when a facility assessment will be performed that addresses infection prevention issues, such as location and amounts of hand hygiene products, isolation rooms/areas, etc.\(^5\),\(^7\),\(^8\),\(^24\),\(^27\) |
- Incorporates biological scenarios, such as pandemic influenza or bioterrorism, into a disaster exercise; whenever possible, this exercise should be community-wide\(^3\),\(^5\),\(^7\),\(^10\),\(^14\),\(^16\),\(^19\)-\(^22\),\(^24\),\(^25\)-\(^31\),\(^34\)-\(^36\) |

### Infection Prevention Policies and Procedures

- Has a protocol for providing 24/7 infection prevention and control coverage, including coverage for outpatient facilities or alternate care sites owned/operated by the hospital\(^2\),\(^5\),\(^7\),\(^9\),\(^11\),\(^14\),\(^16\),\(^26\) |
- Has a protocol for authorizing the hospital epidemiologist, Infection Control Committee or its designee to rapidly implement
Infection Prevention Components of a Home Health Emergency Management Plan

<table>
<thead>
<tr>
<th>Home Health Agency Emergency Management Plan</th>
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<tr>
<td>□ - Addresses all biological events, including bioterrorism, emerging infectious diseases, and pandemic influenza</td>
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<tr>
<td>□ - Describes the responsibilities of key personnel and departments (and back-ups for key personnel) within the agency related to executing the Plan</td>
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Assessing Agency Readiness for MCE

□ - States how and when an agency assessment will be performed that addresses infection prevention issues, such as location and amounts of hand hygiene products and PPE, how to implement home isolation, etc.

□ - Incorporates biological scenarios, such as pandemic influenza or bioterrorism, into a disaster exercise; whenever possible, this exercise should be community-wide

Infection Prevention Policies and Procedures

□ - Identifies an infection preventionist and/or hospital epidemiologist who will serve as the point-of-contact for questions or consultation related to infection prevention during an MCE

□ - Has a protocol for personal protective equipment (PPE) use and hand hygiene

□ - Includes policies for modifying admission criteria on the basis of current agency capacity and disease status, including procedures for closing the agency to admissions of potentially infectious patients or non-infectious patients
Practice Makes…. Better

Public Health POD drill

Bioterrorism scenario tests coordination with law enforcement
Infectious Disease Scenarios

Smallpox moulage

Measles moulage
Disaster Planning Never Ends
- Keep working at it

“We've made it, Warren! ... The moon!”
Conclusions

• Risk of disease spread during IDDs is high

• Disaster planning r/t infection prevention is essential

• We need to test our plans
References


Questions

OK, folks.... it's a wrap!