Bug Out Isolation: Preparing for Emerging Pathogens

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Topics

Section I: Ebola and Emerging Infectious Diseases  
Section II: Initial Demands  
Section III: Shelter  
Section IV: Equipment (PPE)  
Section V: Health Care Workers & Training
Section I: From Ebola to emerging pathogens

Ebola created the need to assess local resources to respond to an acute need

- Manpower, including hyperacute concerns regarding staff safety
- Equipment – rapidly changing PPE requirements and availability
- Location of care – trying to minimize impact on hospital function

Using the Ebola experience for the future

Translating lessons learned from Ebola to next challenge

- 2014-15: Ebola
- 2015: MERS
- Future??

Recognized advantage of setting a system that could “plug and play” for future needs
Section II: Initial demands generated by Ebola

Rapid evolution of public interest and demand for solutions due to case fatality rate, media images, presence in the U.S. and impact on health care workers.

Whose guidelines to use?

CDC, health departments and infectious disease specialists were often at odds in messaging:

- Resulted in rapidly changing requirements for training and equipment
- Fear often overtook science, resulting in more extensive responses than might otherwise have been needed
Local plans vs. national requirements

Local efforts to develop a plan became subverted to national VA directives

- Similar to impact of varying CDC guidelines
- Focused first on ER and clinic screening

Patient care environment – how to minimize impact on hospital

In the meantime, discussions with executive team about location of care – how to minimize impact to entire hospital

- Many hospitals shutting down whole wings (usually ICUs)
- Recognize the psychological impact on staff and patients if patients were brought into the hospital
  - Decision made to use shelters
Equipment availability

Rapidly changing PPE guidelines made finalizing purchases and training difficult

- Impacted by supply chain issues due to international needs as well
- All hospitals essentially told to have a plan and equipment in place – huge impact on resources that might have been averted with regionalization of care
- Local emergency management (EM) preparedness meant we had gear and shelters already available

How we used current resources and built for the future

Will describe local experience for Ebola and how we will translate each to ongoing threats

- Shelter build
- PPE and training
- Management of workflow, manpower
Section III: Shelter

This section discusses:

- Choices of shelter
  - In situ vs. mobile trailer
  - Cost and availability (need to buy in advance or rapid purchase?), space requirements

- Location
  - Close to hospital vs. more remote
  - Local impact of construction zones
  - Structural support for shelters

VA Palo Alto Healthcare System: under construction …
Shelter – temp to “permanent”

Shelter – exterior
Shelter – interior

Shelter – interior (cont.)

Air system

Shower & toilet
Transport to shelter

Impact on patient transport and added need for transport gurneys, covering for patient/bubble

Challenges

Weather:
- Worst rainstorm in years turns Palo Alto into a mosh pit
- Untreated plywood warps in first two weeks
- Heat in spring and summer elevates temperatures well above 110-120° F
Challenges (cont.)

Internal transportation:
- Avoiding other patients and staff
- Passing through hallways with police escort
- Never-ending new construction – what was a good route today doesn’t exist tomorrow
- Who put the handrail in the way?

Shelter considerations

- Ability to destroy the structure when done if needed vs. try to decontaminate a unit (and imagine patients trusting us to come back in)
- Time needed to have patient in shelter if not in place vs. if built, but have to activate
- Coordination with other emergency management managers – share ideas and resources (including example of shelter for pandemic flu)
- How to use shelters once constructed (e.g., simulation and training sessions, continuity of operations [COOP]) and planning for future
Alternate uses for shelter

- Operating room fire
  - VA Palo Alto Health Care System uses Bullex smoke generator and fire extinguisher training device
- Continuity of operations (COOP)
- Med surge
- Evacuation
- Humanitarian
- Disaster Emergency Management Personnel System (DEMPS)

Section IV: Equipment (PPE)

Began with regular contact precautions, including face and eye protection, droplet. Rapidly evolved to respiratory isolation with full coverage and extensive processes for donning/doffing.
Sources of information

- CDC (yet not in field)
- International humanitarian organizations, but didn’t necessarily translate well from field to inpatient setting (and from finite group of trained health care workers (HCW) to large number across U.S.)
- 3 national centers: Emory, Nebraska, National Institutes of Health – also did not translate well from independent units and teams to large number of HCWs in hospital setting

PPE: Early resources
PPE: The good, the bad and the ugly

PPE options

Building enough resources
- Tried a variety of different equipment
Level C Tychem with N-95
- Did you feel safe?

Weapons of Mass Destruction (WMD)/Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE) Powered Air Purifying Respirators (PAPR) Level C suit
- Too bulky, limited dexterity
PPE: Testing the equipment

Donning and doffing
Acquiring appropriate supplies

Acquisition Delays
Final choices reflected real-life needs (e.g., impact on nursing if N95 x 4 hrs) and equipment can be used clinically and for other emergencies

PPE: Respiratory isolation
Section V: Health care workers and training

Highly charged due to risk and HCW infected

Recruiting manpower and training

Volunteer vs. Mandatory – many wanted to see full set-up to decide
- Some remarkable volunteering offers
Value added by having local emergency management decontamination trainers (supported and reassigned duties for training)
I just came back from Liberia …
Train, train and train some more

Tabletop Exercises
Dry run of transport from ED to shelter with gurney
- Recognized impact of weather (heat, rain)
- Need for runners and satellite stashes of gear/meds, etc.

More training
Ultimately had training for screening (ED, clinic) with just-in-time, if admitted
- Even if initially trained, difficult to maintain for entire staff
For future, hospital emergency response team (HERT) will train together
- Not pathogen-specific
Section VI: “Herding cats”

Organizational and infrastructure needs to make this work:

- Buy-in and support from leadership
- Manpower and time (man hours needed)
- Range of personnel coordinating (infection control, EM, ER, ICU, occupational health, EMS, etc.)

“Herding cats” (cont.)

- Communicating with local, regional and national entities
  - Coordinating with American Medical Response (AMR), UCSF
  - Who calls health department, etc.
- How to make the time spent be of best use for the future
  - "Plug and play" manual that isn't disease-specific, but rather event-focused with sections for disease specifics
Section VII: Wrap-up

- Advantages of off-site shelter
- Concept of using what you have to begin with and then purchase equipment that can be used for other purposes after the immediate crisis is over
- Highlights need for HERT system with ongoing training/maintenance
  - Not all can be an Emory or Nebraska with dedicated team and unit, but we can plan for the next one before it comes!

Review

We have discussed:
Ebola and emerging infectious diseases, initial demands, shelter needs, equipment (PPE), and health care workers and training
Questions?

Thank you

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