Emerging Infectious Hazards and Exposure Control

Protecting Deployed Scientists, Epidemiologists and Public Health Responders

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Sparking Tradition With Invention

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Overview

- Occupational Health at CDC in 2007
- Strategies for protecting public health workers in the field environment
  - Vital Role of the Risk Assessment
  - Pre-Deployment Interventions
  - Comprehensive Medical Surveillance
  - Incident Management
  - Post-exposure management issues
  - Special in-patient management issues
Occupational Health at CDC in 2006

A Review of Current Activities and Challenges
Today’s CDC workplace looks like this…
But it also looks like this...
and this…
and this...
and this...
and this...
and this...
and this...
and this...
and this...
and this...
Occupational Infectious Hazards
Numerous
Defining Deployment’s Safety Challenges

- **Deployment**: The period of time that a worker is carrying out official duties at a physical location that is not owned or leased by CDC.

- **CDC Emergency Deployment**: A response to accomplish a mission or objective in relation to a declared or undeclared public health emergency, other important incident of public health significance or the significant threat of same.
Challenges in Deployment-Related Exposure Prevention

- Inherent Risks of the “Urgent” Response
- Inability to Fully Mitigate or Substitute Hazards
- Few Engineering Controls Available
- Limitations in Other Infrastructure
- Communication Challenges
- Supervisory Ambiguity
- Greater Reliance on PPE
What will deployment be like?

- Long hours with limited control of sleep/wake/work cycles
- Strong reliance on others for assistance, teaming, logistics
- Absence from family, friends for prolonged periods of time
- Varied pace of work (very busy, prolonged delays)
- Environmental extremes (hot, cold, humid, dry, work at high altitudes)
- High Ambient Noise Levels
- Limited Access to Medical Care or Certain Medical Treatments
- Work in Enclosed, Confined or Restricted Space
- Work in Areas with Extremes of Security
- Limited Variety and Quality of Food
- Personal Security Risks
- Exposure to human suffering, mass casualties
Is field response the “right fit” for me?

Successful Responders Are:

- Self-Aware
- Knowledgeable of Own Abilities and Limitations
- Well-Screened and Well-Informed
- Working to Optimize Own Medical Conditions
- Committed to Personal Fitness and Routine Physical Activity
- Comfortable with Change and Uncertainty
- Flexible (Deployable within 2 hours for up to 2-4 weeks or more)
- Team-Oriented
Meeting the Challenge: Worker Protection in the Field

- Administrative Controls
- Engineering Controls
- Work Practices
- PPE
- Other Protections
- Medical Surveillance
- Post-Incident Capacity
Hierarchy of Risk Reduction

- Engineering Controls
- Administrative Controls
- Work Practice Controls
- Personal Protective Equipment
- Active Surveillance
  - Initial and Recurring Interventions
  - Awareness and Vigilance
  - Trigger Reporting
Administrative and Engineering Controls in the Field Setting

- Requires Creativity
- Risk Assessment Process Informs
- Simple More Desirable than Complex
- Keen Sense of Limitations
- Explicit Mission
- Well Established Team Structure
  - Incident Command
  - Clearly Defined Roles
  - Communication
Work Practice Controls

- Awareness of Limitations
- Hand Washing
- Separation of Work and Activities of Daily Living
- Clothing Changes
- Hygiene and Showering
Personal Protective Equipment

- Gloves
- Field Gear and Clothing
- Respiratory Protection
- Face and Eye Protection
- Shoes
Other Protections

- Baseline Serum Obtained
- Immunizations
- Prophylaxis
- Personal Health Optimization
- Mental Health and Resiliency Issues Addressed
Immunizations Decrease Deployment Risks

- All ACIP-recommended adult immunizations
- Hepatitis A vaccine
- Hepatitis B vaccine if applicable
- Travel-related immunizations for those deploying internationally
- Response-specific immunizations/interventions
- Smallpox*
- Anthrax*
Specific Hazards of International Responses

- Transportation
- Personal Security
- Fatigue/Jet Lag
- Water and Food Related Risks
- Endemic Infectious Disease Risks
- Deployment-specific Risks
Surveillance Can Lower Exposure Risk

What is surveillance?
Collection, analysis and dissemination of data.

What is medical surveillance?
Surveillance that continuously monitors for the potential or occurrence of disease in a given population.
Medical Surveillance

- Pre-deployment Considerations
- General Surveillance in the Field
- Incident-based Surveillance
- Post-response Surveillance
Pre-Deployment Considerations

- **Optimization of Personal Health**
  - Underlying chronic conditions
  - Mental Health
  - Family and Support

- **Fitness for Duty**

- **Medical Screening and Clearance**
  - Medical, surgical, social and family history
  - Allergies and sensitivities (latex, dander, drugs, foods)
  - Previous occupational history and activity
  - Medications and other treatments
  - Active conditions and review of major body systems
  - Review and record past immunization history
General Field Surveillance

- Should be incident specific and risk assessment based
- Daily self assessment
- Symptoms check list
- Temperature monitoring
- Quick report outs if necessary
- Active vs. Passive
Enhanced Surveillance

- Additional vigilance and interventions are added as level of risk increases
  - Novel work, unknowns
  - No immunization or prophylaxis available
  - Limited treatment options exist
  - Risk for 2º / environmental exposures is great
  - Societal, political risks are involved
  - Imminent evacuation necessary
Enhancing Surveillance after an Incident

- Mandatory reporting
- Clinical consultation
  - Team leader or reach back via phone
  - 24/7 to medical guidance needed
- Diagnostics or serum storage
- Shift to active monitoring at increased frequency
- Manage post-exposure interventions and assure compliance/acceptability
Post-response Surveillance

- Additional clinical follow-up if indicated
- Post-deployment serology or additional serum for storage
- Symptom check list or questionnaire

- “Hot Wash”
  - Did you have what you needed during the response?
  - Do you have any current needs or concerns?
  - How can we make the next deployment safer for you?
Note to Field Responders: Never Hesitate to Raise a Red Flag

- Always maintain a high index of suspicion for exposure and lower your threshold for action
- Pay attention to work absences
- Illness clustering should lead to prompt evaluation
- Fever and other atypical symptoms should trigger immediate medical evaluation
- Understand incubation periods, modes of transmission and clinical symptoms
- Know that symptoms of work-acquired infection and natural infection may differ
Infection Control in the Field Setting

- Case Studies
  - CDC Response to Avian Influenza H5N1
  - Lessons Learned from SARS
  - Norovirus
Special In-Patient Management Issues

- Plan for seamless transition to in-patient management post-exposure or post-illness
- Must be pre-planned and practiced
- Specialized in-patient units for high-risk agent exposures likely to be increasingly common
- Infection control in hospital setting is not new
- Communication planning is essential
In-patient Management Unit
Summary

- Comprehensive medical surveillance and intervention plan is key to protect workers
- Risk assessments continue to be cornerstone in planning appropriate protections and necessary medical surveillance
- Pre-placement, routine, and post-incident interventions important
- Forethought, planning and training lower risks
Questions