

# Bioterrorism 101



# Objectives

- Define bioterrorism
- List the biological agents that are of greatest concern for public health officials
- Illustrate some of the challenges medical personnel are likely to face during a bioterrorist attack
- Identify the major local, state, and federal health-related resources available in the event of an attack
- Identify specific steps that health professionals can take if there is suspicion/confirmation of an attack
- Identify the role of local, state and the federal government in an attack
- Identify ways to prepare for bioterrorist attacks

# Bioterrorism Defined

- The deliberate use of microorganisms or toxins to cause death, disease and fear in a population.
- Other types of terrorist attacks can include:
  - Chemical
  - Nuclear
  - Radiation

# Other Types of Attacks

- Chemical attacks involve injury from toxic chemicals like chlorine or mustard gas usually dispersed with explosives
- Nuclear attacks involve blast and radiation injuries from a massive explosion
- Radiological attacks involve dispersion of radioactive material from an explosion
  - i.e. Dirty Bomb

# Categories of Biological Agents

- Biological agents assigned to categories by the Centers for Disease Control and Prevention (CDC)
  - Assignment based on agents' likelihood to cause disease, death, public fear and their relative ease of spread in the population
- **Category A Agents**
  - **Greatest threat to public health and greatest potential to cause widespread fear, illness or death**
- **Category B Agents**
  - **Generally lower public health impact than Category A because of lack of person-to-person transmission, lower virulence, etc.**
- **Category C Agents**
  - **Not currently believed to present a high risk to public health but may emerge as threats in the future**

# Highest Risk Agents: Category A

- AGENT

- Variola major\*
- Bacillus anthracis
- Yersinia pestis\*
- Clostridium botulinum
- Francisella tulereusis
- Filo and Arenaviruses (i.e. Ebola)\*

- DISEASE

- Smallpox\*
- Anthrax
- Plague\*
- Botulism
- Tularemia
- Viral Hemorrhagic Fevers\*

\*Agents/diseases that can spread via person-to-person contact

# Agents: Category B

- AGENT

- *Coxiella burnetii*
- *Brucella* spp.
- *Burkholderia mallei*
- *Burkholderia pseudomallei*
- Alphaviruses (equine encephaloviruses)
- *Rickettsia prowazekii*
- Toxins (i.e. Ricin, Staph enterotoxin B)
- *Chlamydia psittaci*
- Food Safety Threats (*Salmonella* and *Escherichia* species)
- Water Safety Threats (*Vibrio*, and *Cryptosporidium* species)

- DISEASE

- Q Fever
- Brucellosis
- Glanders
- Melioidosis
- Encephalitis
  
- Typhus Fever
- Toxin Syndromes
  
- Psittacosis
- Multiple conditions
  
- Multiple conditions

# Agents: Category C

- AGENT

- Emerging threat agents (i.e. Nipah virus, hantavirus)

- DISEASE

- Multiple conditions



# Special Risk Agents

- Three important diseases to think about that can be spread person-to-person
  - Smallpox (Category A)
  - Plague (Category A)
  - Viral Hemorrhagic Fevers (Category A)

# Challenges for Medical Workers

- Challenges depend on the *type* of attack launched
- Two general categories of attacks:\*
  - OVERT- announced or identified attack
    - Unique challenges:
      - Large volume of “worried well” patients
      - Chaos and fear in the local population
  - COVERT- unannounced or insidious attack
    - Unique challenges (prior to identifying attack):
      - Possibly difficult to differentiate initially from common diseases
      - Possibility of widespread dissemination prior to detection

\*From: <http://www.ph.ucla.edu/cphdr/bioterrorism>

# Resources for Medical Personnel

- **Local Health Department**

- Expertise in identifying and managing acute outbreaks

- **State Health Department**

- Specialized laboratories to identify many biological agents
- Expertise in outbreak management
- Depending on state laws, may have quarantine powers during public health emergencies

- **Federal Agencies**

- CDC—experts in identifying and managing outbreaks
  - Manage strategic national stockpile
  - Most sophisticated laboratories in the country
  - Maintain the ability to quickly communicate with medical providers nationwide
- FBI—lead federal agency in response to domestic attacks
- FEMA--first responder training, emergency response



# Identifying an Attack

- Look for things that seem out of place
  - Multiple observations off the following list should raise your index of suspicion

# Keys to Early Detection

- Things that should appear out of place:\*
  - Unusual clusters of disease
    - Geographic clusters
    - Time-related clusters
  - Unusual age distribution
    - Varicella vs. Variola
  - Larger than expected caseloads of a disease
  - More severe pattern of disease than expected
  - Diseases outside their normal seasonality
    - Influenza outbreak during the summer

\*From: <http://www.ph.ucla.edu/cphdr/bioterrorism>

# Keys to Early Detection

- Things that should appear out of place:\*
  - Simultaneous epidemics of different diseases
    - Simultaneous outbreaks of pneumonia-like diseases in addition to diseases that cause a severe rash
  - Clusters of sick or dead animals
    - Multiple dead birds in the parks
  - Unusual strains or unusual antimicrobial resistance patterns
    - Immediate and widespread appearance of multidrug-resistant microbes



\*From: <http://www.ph.ucla.edu/cphdr/bioterrorism>

# Early Response

- What to do if bioterrorism is suspected:
  - Notify Supervising Physician
  - Notify Hospital Infection Control
    - Take isolation precautions immediately if suspected disease can be transmitted person-to-person
      - Smallpox
      - Plague
      - Viral Hemorrhagic Fevers
  - Notify the Hospital Laboratory
  - Notify the Hospital Administration
  - Notify the Local Public Health Department

# What Happens Next?



Physicians or Laboratories  
Suspect or Detect Bioterrorism

Suspicion or Confirmation  
Reported to local  
Health Department

Local Health Department  
Contacts FBI and  
Local Law Enforcement

Local Health Department  
Notifies State Health Department

State Health Department  
Notifies CDC

# Local Health Department Response

- **Early incident identification—how they identify problems**
  - Active Surveillance—mandatory reporting requirements
    - Applies to both labs and physicians
  - Passive surveillance of other diseases
  - Reports of suspected incidents
- **Early incident response—what they will do**
  - Risk Communication- establish a spokesperson for the media
  - Coordinate with law enforcement
  - Contact and brief state health officials on situation
  - Begin to identify and isolate the source of the incident
  - Establish incident command organization (responsibility system)
- **Interagency Coordination—who they work with**
  - Directly with the State Health Department
  - Directly with local law enforcement officials

# State Response

- State-level Activities

- Contact and brief the CDC
- State laboratories may be used to identify the pathogen and cases
- Coordinate with state law enforcement agency
- Governor can request assistance from the *Strategic National Stockpile* if necessary

# Federal Response

- **Department of Justice**

- Federal Bureau of Investigation

- Overall lead agency
    - Directs the law enforcement response

- **Department of Health and Human Services**

- Centers for Disease Control

- Send technical experts to area of attack
    - Alert health care providers nationwide
    - Comprehensive laboratory to identify any agent used in an attack
    - Coordinates the delivery of supplies from the Strategic National Stockpile *if requested by the Governor*

- Food and Drug Administration

- Can be authorized to bypass normal drug approval process in certain national emergencies

- **Federal Emergency Management Agency**

- FEMA takes the lead on consequence management



# Strategic National Stockpile

- **Stockpile organized in “push packages”**
  - Pre-packaged equipment and supplies
  - Stored in secure warehouses around the country
- **Materials in stockpile packages**
  - Antibiotics, chemical antidotes, antitoxins, life-support medications, IV supplies, airway supplies and medical/surgical items
- **Response timeline**
  - Governor requests release from Stockpile
  - First push packages on-site within 12 hours
  - Incident-specific push packages within 24-36 hours
- **CDC responsible to be prepared to deliver supplies to multiple large cities areas simultaneously**

# Medical Student and Resident Preparedness

- Know your infectious diseases—for more reasons than just the boards
- Look for unusual patterns of illness
- Protect yourself and your family
  - Go to [www.ready.gov](http://www.ready.gov) and consider putting together a plan for your family in the event of an emergency
- Get your local AMA chapter involved

# Local AMA Chapter Ideas

- Distribute bioterrorism “cheat” cards  
[http://www.acponline.org/bioterro/bio\\_pocketguide.pdf](http://www.acponline.org/bioterro/bio_pocketguide.pdf)
- Review major agents likely to be used  
<http://www.ama-assn.org/ama1/pub/upload/mm/415/quickreference0902.pdf>
- Send for the AMA’s *free* resource guide CD on managing public health emergencies  
[http://www.ama-assn.org/ama1/pub/upload/mm/415/cd\\_rom\\_ad.pdf](http://www.ama-assn.org/ama1/pub/upload/mm/415/cd_rom_ad.pdf)
- Invite local/state/federal public health officials to speak at chapter meetings

# AMA and Bioterrorism

- Center for Public Health Preparedness and Disaster Response (CPHPDR)
  - Operated by the AMA to train physicians and medical students on their response roles
  - Excellent resource for preparedness and bioterrorism information
  - National Disaster Life Support training available for medical students and physicians
  - Check out their Web site at:
    - <http://www.ama-assn.org/ama/pub/category/6206.html>



# Additional Resources

- The American Medical Association Bioterrorism Resource List:
  - <http://www.ama-assn.org/ama/pub/category/6215.html>
- AMA Center for Public Health Preparedness and Disaster Response (CPHPDR)
  - <http://www.ama-assn.org/ama/pub/category/6206.html>
- The National Disaster Medical System homepage
  - <http://ndms.dhhs.gov/>
- CDC Emergency Preparedness and Response webpage:
  - <http://www.bt.cdc.gov/>
- FDA Counterterrorism Information:
  - <http://www.fda.gov/oc/opacom/hottopics/bioterrorism.html>
- National Institute of Allergy and Infectious Disease (NIH)
  - <http://www2.niaid.nih.gov/biodefense/>
- The Infectious Disease Society of America Bioterrorism Resources:
  - <http://www.idsociety.org/Template.cfm?Section=Bioterrorism&Requesttimeout=600>
- The American College of Physicians' Bioterrorism Resources
  - <http://www.acponline.org/bioterro/>
- The UCLA Center for Public Health and Disasters:
  - <http://www.cphd.ucla.edu/>
- The American College of Family Physicians Bioterrorism Resources:
  - <http://www.aafp.org/btresponse.xml>
- The University of Pittsburgh Center for Biosecurity
  - <http://www.upmc-biosecurity.org/>
- The University of Minnesota Center for Infectious Disease Research and Policy
  - <http://www.cidrap.umn.edu/>



