

22CEO01 – DISASTER MANAGEMENT

YEAR,CLASS: IV YEAR OPEN ELECTIVE

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MODULE 5 - APPLICATIONS IN DISASTER MANAGEMENT

- Statistical seismology
- Quick reconstruction technologies
- Role of media in disasters
- Management of epidemics
- **Bio-Terrorism**
- Forecasting and Management of casualties.

BIOTERRORISM

- **"Bioterrorism"** -The unlawful use, or threatened use, of microorganisms or toxins derived from living organisms to produce death or disease in humans, animals, or plants.
- The act is intended to create fear and intimidate governments or societies in the pursuit of political, religious, or ideological goals.
- The use of biological agents to intentionally produce illness or intoxication in a susceptible population



BIOLOGICAL AGENTS RANKING SYSTEM

Public Health impact criteria based on:

- Morbidity and mortality
- Delivery potential
- Public perception (fear, civil disruption)
- Public health preparedness needs

BIOTERRORISM AGENT CLASSIFICATION

SYSTEM CDC

The Centers for Disease Control (2004) have placed agents in one of three priority categories for initial public health preparedness efforts: A, B, or C. Agents

Classification of agents of bioterrorism

Category A

High priority agents include organisms that pose a risk to national security because they are:

- Easily disseminated
- Cause high mortality
- Cause public panic and social disruption
- Require special action for public health preparedness.

Category B

Second highest priority agents include those that are:

- Moderately easy to disseminate
- Cause moderate morbidity
- Require enhanced disease surveillance and public health diagnostic capacity

Category C

Third highest priority agents include emerging pathogens:

- That could be engineered for mass dissemination in the future
 - Have potential for high morbidity, mortality and major health impact
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Agents of Bioterrorism

Category A agents	Category B agents	Category C agents
<ul style="list-style-type: none">• Bacillus anthracis (anthrax)• Clostridium botulinum toxin (botulism)• Francisella tularensis (tularemia)• Variola major (smallpox)• Yersinia pestis (plague)• Filo viruses• Ebola virus (Ebola hemorrhagic fever)• Marburg virus (Marburg haemorrhagic fever)• Arena viruses• Junin virus (Argentinian haemorrhagic fever) and related viruses• Lassa virus (Lassa fever)	<ul style="list-style-type: none">• Alpha viruses• Eastern and western equine encephalomyelitis viruses (EEE, WEE)• Venezuelan equine encephalomyelitis virus (VEE)• Brucella species (brucellosis)• Burkholderia mallei (glanders)• Coxiella burnetii (Q fever)• Epsilon toxin of Clostridium perfringens• Ricin toxin from Ricinus communis• Staphylococcal enterotoxin B <p>A subset of Category B agents includes pathogens that are food or waterborne.</p> <p>These pathogens include but are not limited to:</p> <ul style="list-style-type: none">• Cryptosporidium parvum• Escherichia coli O157: H7• Salmonella species• Shigella dysenteriae• Vibrio cholerae	<ul style="list-style-type: none">• Hanta viruses• Multidrug-resistant tuberculosis• Nipah virus• Tickborne encephalitis viruses• Tickborne haemorrhagic fever viruses• Yellow fever

Bacillus anthracis, the bacteria that causes **anthrax**, is one of the most likely agents to be used in a biological attack.

Anthrax:

- Anthrax is an infection caused by bacteria.
- Anthrax most commonly occurs in cattle and sheep. It is rare in humans.
- It is usually seen only in people who have contact with infected animals or who work with animal products such as wool, or hides.
- Anthrax can be a form of bioterrorism if someone deliberately spreads the bacteria in public places.

Anthrax takes 3 forms in humans, all of which are caused by the same bacteria. The form of anthrax infection depends on how the bacteria enter the body:

- Cutaneous (skin) infection caused by touching infected animal products, contaminated soil containing anthrax bacteria or the bacteria itself. It is the most common form of anthrax.
- Gastrointestinal (stomach and intestine) infection is caused by eating undercooked meat that is contaminated with anthrax bacteria.
- Inhalation infection is caused by breathing in anthrax bacteria.

SYMPTOMS:

- Cutaneous anthrax starts as a red area on the skin, similar to an insect or spider bite. It may itch. Over a few days, the area becomes larger. Blisters may form, followed by a deep, black scab. The area is usually painless.
- Gastrointestinal anthrax typically causes vomiting, nausea, fever, and loss of appetite. It is followed by severe stomach pain, bloody diarrhea, and vomiting with blood.
- Inhalation anthrax starts out like the flu, with a fever, sore throat, dry cough, and muscle aches. Inhalation anthrax does not cause a runny nose. The symptoms are usually mild for a few days (and may even get better). The symptoms get much worse. People who have inhalation anthrax often have stomach pain. Within a few days, they will have difficulty breathing and go into shock.

PREPARATION FOR BT ATTACK

- Familiarize medical staff with BT agents
- Incorporate into Disaster Planning
 - Decontamination & Infection Control
 - Communications with key agencies
 - Laboratory, Respective health authorities of the Nation.
- Contacts to obtain stockpiled supplies: antibiotics, immune, vaccines, etc.
- Security preparations



WHAT TO DO IF YOU SUSPECT A **BIOTERRORIST DISEASE**

IMMEDIATELY NOTIFY:

- Hospital Infection Control
 - Isolation: Smallpox, plague, hemorrhagic fevers
- Laboratory
- Hospital Administration
- Local Public Health Department

WHAT DOES **PUBLIC HEALTH** DO IN A **BIOTERRORIST** EVENT?

- Assess health impacts in the community
- Environmental health assesses water safety and sanitation
- Public health nurses coordinate with Shelter Operations
- Acute communicable disease tracks infectious diseases
- Injury program tracks injuries and fatalities
- Health Officer coordinates information for the public and health care providers
- Public Health Laboratories identify agents (either in-house or through referral to State governments or health authorities)

SPECIAL PROBLEMS WITH BT

- Identifying a covert attack
- Social disruption
- Prophylaxis for large populations
- Decontamination
- Specialized labs needed for some agents
- Risks to laboratory workers
- Limited resources
- Communication between agencies

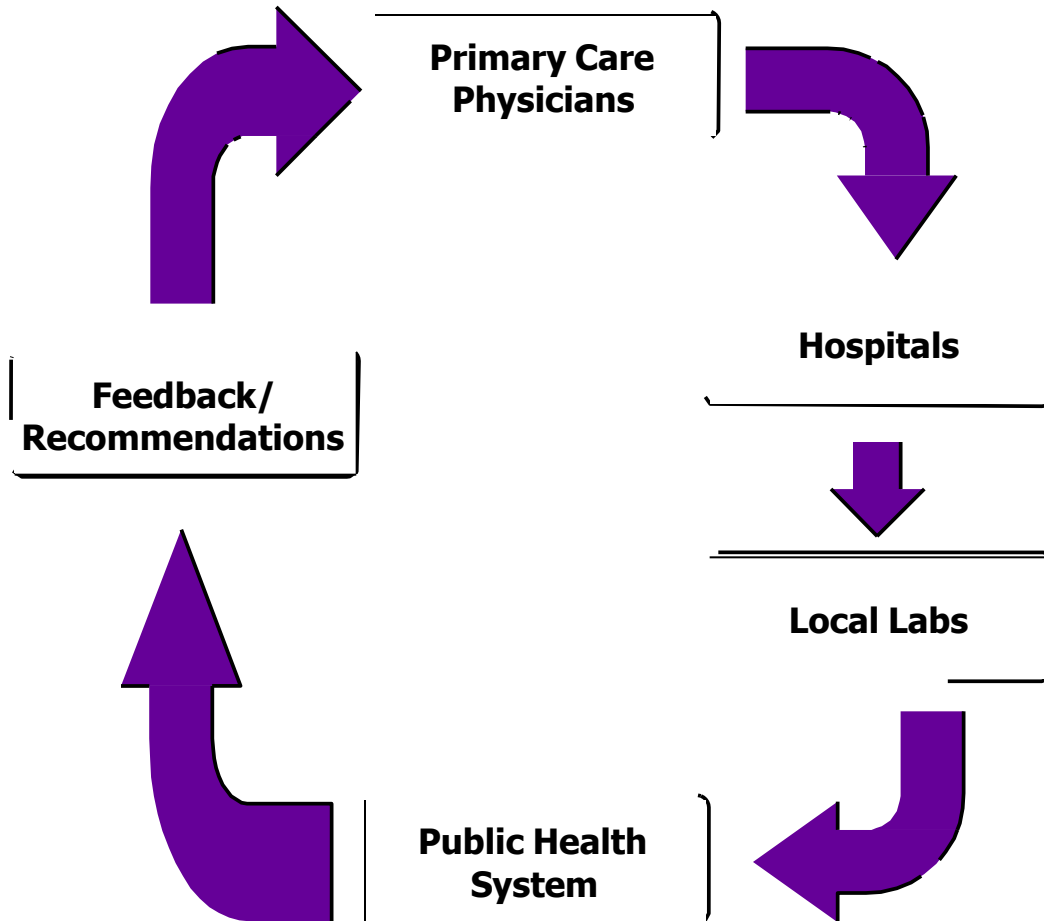
IMPACT OF TECHNOLOGY

- Forensic teams work hard to identify biological agents, their origins and effects
- Labs are working on advanced detection systems to detect early attacks, identify at-risk areas, and to give proper treatment
- **Bio surveillance:** Real- Time-Outbreak Disease Surveillance system made its debut in 1999.
- This collects data from labs, hospitals, and environmental studies in order to detect bioterror attacks as early as possible.

PREPARDNESS

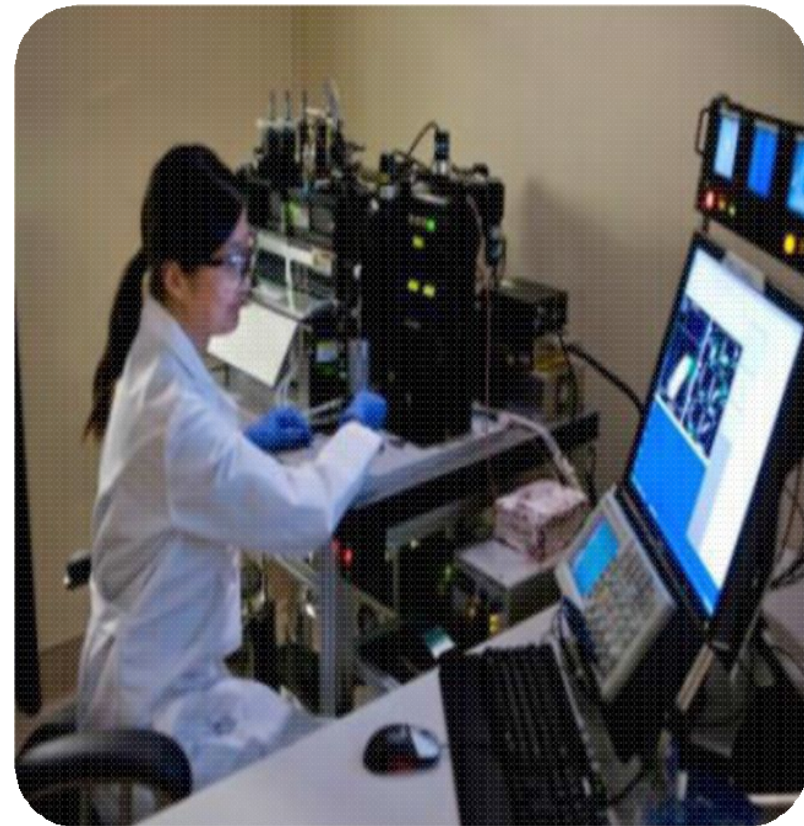
- Familiarize medical staff with BT agents
- Incorporate into Disaster Planning
 - Decontamination & Infection Control
 - Communications with key agencies
 - Laboratory, CDC, Police, FBI, etc.
- Contacts to obtain stockpiled supplies: antibiotics, immune sera, vaccines, etc.
- Security preparations

COORDINATING WITH SYSTEM IS PRIORITY



WHAT WE NEED TO PREPARE FOR BIOTERRORISM

- More trained epidemiologists to speed detection
- Increased laboratory capacity
- Health Alert
- Network
- Medical professionals “back to school”
- National Pharmaceutical Stockpile



HOW CAN HOSPITALS PREPARE?

- Familiarize medical staff and lab with bioterrorist threat agents
- Incorporate BT planning into disaster planning
 - Infection control
 - Notification procedures and contact numbers
 - Daily surveillance and reporting
 - Security preparations
 - Media
 - Personal Protective Equipment (PPE)

STEPS IN PREPARING PUBLIC HEALTH AGENCIES FOR BIOLOGICAL ATTACKS

- Enhance epidemiologic capacity to detect and respond to biological attacks.
- Supply diagnostic reagents to state and local public health agencies.
- Establish communication programs to ensure delivery of accurate information.
- Enhance bioterrorism-related education and training for health-care professionals.