Florida Response to 2001 Anthrax Letters

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Association of Public Health Laboratories
Annual Meeting, St. Louis, MO
June 5, 2019
Laboratory Response Network (LRN)

Prior to September 11, 2001:
81 Confirmatory Laboratories
- United States
- Canada
LRN Past

Established in Florida March 2000
Training October 2000

- Georgia SPHL

Agents of Bioterrorism Level B Laboratory Training

October 1 - 6, 2000
Atlanta, Georgia

SUNDAY
7:00 pm Meet at Holiday Inn, Decatur, for light supper
7:30-9:00 pm Orientation

MONDAY ➡ OCTOBER 2, 2000
7:45 am Shuttle departs Holiday Inn for GA Public Health Lab
8:30-8:45 Welcome ➡ Bob Martin
8:45-9:15 BT Overview & Laboratory Response Network ➡ Richard Kellogg
9:15-10:15 Collection and Preservation of Hazardous Biological Evidence ➡ Doug Anders
10:15-10:30 Break
10:30-12:15 Bacillus anthracis lectures ➡
- Introduction (10 minutes)
- Historical background and epidemiology overview (10 minutes)
- Overview of taxonomy and genetics (15 minutes)
- Pathogenesis and clinical presentation, collection and transport of clinical samples (20 minutes)
- 5 minute stretch break
- Isolation and identification from clinical specimens (20 minutes)

Judy Delany
Louise Barden
Diane Luck
Diane Luck & Shoolah Escott

Florida HEALTH
2001 Anthrax Index Case

October 2, 2001
Palm Beach County

63-year-old man hospitalized
Symptoms of meningitis
Lumbar puncture and blood cultures performed
Sentinel Laboratory Analysis (Level A Laboratory)

Integrated Regional Laboratories (IRL), Fort Lauderdale, FL

Cerebrospinal fluid:
- 4750 WBC/mm³
- 1375 RBC/mm³
- Glucose 57 mg/dl
- Protein 666 mg/dl


WBC = white blood cells
RBC = red blood cells
IRL Microbiological Results

- Gram-positive bacillus
- Non-hemolytic on 5% sheep blood agar
- Non-motile

Unable to Rule-out *Bacillus anthracis* (BA)

- Isolate sent to Florida Department of Health (FDOH) Bureau of Public Health Laboratories (BPHL) - Jacksonville
BPHL-Jacksonville

- October 3, 2001, ~12:00 p.m.
- Agar slant: Morphology?

Photo: CDC PHIL # 1898
2001 LRN BA Algorithm

- Gamma Phage Lysis
- Direct Fluorescent Antibody (DFA)
  - Two-component
    - Capsule polypeptide antigen
    - Cell wall polysaccharide antigen
- Confirmation of *Bacillus anthracis*
  - Gamma phage
  - DFA Cell Wall
  - DFA Capsule

Must be positive for all 3

No PCR
DFA Analysis

Capsule DFA

Cell Wall DFA
2001 Confirmatory Results

- October 4, 2001, 8:30 a.m.
  - Gamma Phage positive
- Confirmed *Bacillus anthracis* from Index patient
- Centers for Disease Control and Prevention (CDC) corroborated results that afternoon
  - Including real-time PCR

Photo: CDC PHIL # 1893
Inhalation Anthrax
Epidemiological Investigation

FL DOH Bureau of Epidemiology and CDC

- **Index Patient**
  - Locations visited 60 days prior to onset of symptoms
    - Home, recreation and travel destinations (North Carolina), retail businesses, workplace (American Media, Inc. [AMI])

- **Environmental Sampling**
  - 56 Samples obtained for culture
  - Analyses performed at BPHL-Miami Laboratory

- **Other cases clinically resembling anthrax?**
Suspect Patient Identified

- 73-year-old male
- Co-worker of index patient
- Workplace mail distributor
- Hospitalized October 1
- Respiratory infection
- Blood culture negative
- *Bacillus anthracis* isolated from nasal swab
Critical Results

*B. anthracis* isolated from index patient’s computer keyboard
Source of Exposure

Mechanism: Intentional Release
Intervention Clinic

- Palm Beach County Health Department
- 1,114 employees and visitors treated with Cipro from National Pharmaceutical Stockpile
- 1,075 nasal swab cultures performed
  - *B. anthracis* isolated from 1 nasal swab
  - Asymptomatic 36-year-old female mail-sorter
Environmental Sampling

- Assess workplace contamination
  - Environmental cultures
  - Sample collection by Environmental Protection Agency
- American Media, Inc. (AMI)
  - 3-story building
  - 68,000 square feet
Environmental Sampling Results

- Widespread contamination of all floors
- Company mail van used by second case patient
Workplace Contamination
Conclusions

- *Bacillus anthracis* transmitted through mail
- Contamination extended beyond workplace to mail van
- U.S. Postal Service involvement
- Leaking envelopes with possible cross-contamination
Samples, Samples, Samples

Surge capacity testing:
• All internal

October 2001 - June 2002:
Jacksonville, Miami, Tampa
10,690 total samples
Evidence Preservation: Sample Security

Chain of Custody requirements
Types of Samples Tested

• The Obvious
  • Powders
  • Suspicious letters
  • Bulk mail from post offices
The Obscure

- Thermostat boxes
- Bottles of laxatives
- Suitcase with white scuff marks
- Residential mailbox
- Part of a dead bird
- Teddy bear
- Box of disposable underpants
December 12, 2001

- Suspicious letter in mailbox
- Threat on front of envelope
- Recipient called 911
- Letter delivered to Bureau of Public Health Laboratories for testing
December 12, 2001

- Letter was approximately ½ inch thick
  - Sealed envelope
  - Could not determine whether letter had been screened for explosives
- So...
December 12, 2001

Building Evacuated
December 12, 2001

• Bomb Squad findings:
  • No wires
  • No power supply
  • No explosive capability

• Therefore letter opened by laboratory personnel for biological analysis...
Summary

2001 Anthrax Investigation

- Value of the LRN – Proactive, Decentralized
- Confirmed cases
- Identified human exposure
- Directed investigations
  - Public health
  - Law enforcement
- Indicated source and mode of transmission
- Determined environmental contamination

Early Detection + Intervention = Health Protection
## Summary

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<td>CDC Level A protocols</td>
<td>ASM Sentinel Level Guidelines</td>
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<tr>
<td>Mostly culture/conventional</td>
<td>Rapid Methods: ✅ TAT</td>
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<tr>
<td>Ad hoc surge capacity</td>
<td>Surge capacity modeling and plans</td>
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<tr>
<td>Non-standard sample types</td>
<td>Standardized sample types</td>
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<tr>
<td>• e.g., body bag, powdered donuts</td>
<td>• ASTM E2458-17</td>
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<tr>
<td>Rudimentary field screening</td>
<td>Standardized field screening</td>
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<td>• Little first responder training</td>
<td>• ASTM E2770-17</td>
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<td>Individual spreadsheets or databases</td>
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Acknowledgements

- Florida Department of Health
  - Bureau of Public Health Laboratories
    - Jacksonville
    - Miami
    - Tampa
  - Bureau of Epidemiology
  - Palm Beach County Health Department
- Integrated Regional Laboratories
- JFK Medical Center, Atlantis, FL
- American Society for Microbiology
- Centers for Disease Control and Prevention
- Laboratory Response Network Program Office
- Association of Public Health Laboratories
- Federal Bureau of Investigation
- Environmental Protection Agency
- U.S. Postal Service
- U.S. Army Medical Research Institute of Infectious Diseases
Questions?

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Remembering 9/11 and Anthrax:
PUBLIC HEALTH’S VITAL ROLE IN NATIONAL DEFENSE

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