

## Laboratory Safety--

Opportunity for Collaboration between  
Sentinel Laboratories and  
Bureau of Clinical Laboratories, Alabama  
Department of Public Health

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July 23, 2008

## Background

- **Laboratorians**
  - Serve critical role in clinical medicine and public health
  - Are essential for detecting agents or their markers
  - Have potential exposures to

## Background

- **Pathogens**
- **Noxious reagents**
- **Need to maximize**
  - Proficiency
  - Safety

## How Labs Serve Public Health

- **First line of detection of agents/markers of concern**
- **Agents**
  - **Communicable diseases**
    - Modes of transmission
    - Virulence
    - Frequency of occurrence

## How Labs Serve Public Health

- Chemical agents
- Ionizing radiation
- **Notifiable diseases/conditions**
  - Currently
    - Group A (within 24 hours)
    - Group B (within 7 days)
  - Plan for real-time notification

## Alabama Notifiable Diseases/Conditions

**Group A Diseases/Conditions –**  
REPORT TO THE COUNTY (OR STATE) HEALTH DEPARTMENT  
BY TELEPHONE, FAX, ELECTRONICALLY, OR IN PERSON  
WITHIN 24 HOURS OF DIAGNOSIS.

- **Anthrax, human**
- **Botulism**
- **Cholera**
- **Diphtheria**
- **H. influenzae, invasive diseases (FN1)**

### **Alabama Notifiable Diseases/Conditions**

#### **Group A Diseases/Conditions –**

- Hepatitis A
- Listeriosis
- Measles (rubeola)
- N. meningitidis, invasive diseases (FN2)
- Pertussis
- Poliomyelitis, paralytic
- Rabies, human and animal

### **Alabama Notifiable Diseases/Conditions**

#### **Group A Diseases/Conditions –**

- Severe Acute Respiratory Syndrome (SARS)
- Trichinosis
- Tuberculosis
- Typhoid fever
- Yellow fever
- Outbreaks of any kind

### **Alabama Notifiable Diseases/Conditions**

#### **Group A Diseases/Conditions –**

- Cases related to nuclear, biological, or chemical terroristic agents
- Cases of potential public health importance FN(3)

#### **GROUP B DISEASES/CONDITIONS – REPORT IN WRITING TO THE COUNTY (OR STATE) HEALTH DEPARTMENT WITHIN 7 DAYS OF DIAGNOSIS**

- Brucellosis
- Campylobacteriosis
- Chancroid\*
- Chlamydia trachomatis\*
- Cryptosporidiosis
- Dengue Fever
- E. coli 0157:H7

#### **GROUP B DISEASES/CONDITIONS – REPORT IN WRITING TO THE COUNTY (OR STATE) HEALTH DEPARTMENT WITHIN 7 DAYS OF DIAGNOSIS**

- (Including HUS and TTP)
- Ehrlichiosis
- Encephalitis, viral
- Giardiasis
- Gonorrhea\*
- Granuloma inguinale\*
- Hepatitis, B,C, and other viral

#### **GROUP B DISEASES/CONDITIONS – REPORT IN WRITING TO THE COUNTY (OR STATE) HEALTH DEPARTMENT WITHIN 7 DAYS OF DIAGNOSIS**

- Histoplasmosis
- Human Immunodeficiency Virus infection\*
- (including asymptomatic infection, ARC, and AIDS)
- Lead, elevated blood levels (>10 mcg/dl)

**GROUP B DISEASES/CONDITIONS –  
REPORT IN WRITING TO THE COUNTY (OR STATE)  
HEALTH DEPARTMENT WITHIN 7 DAYS OF DIAGNOSIS**

- Legionellosis
- Leprosy
- Leptospirosis
- Lyme Disease
- Lymphogranuloma venereum\*
- Malaria
- Mumps

**GROUP B DISEASES/CONDITIONS –  
REPORT IN WRITING TO THE COUNTY (OR STATE)  
HEALTH DEPARTMENT WITHIN 7 DAYS OF DIAGNOSIS**

- Psittacosis
- Q Fever
- Rocky Mountain Spotted Fever
- Rubella
- Salmonellosis
- Shigellosis
- Syphilis\*

**GROUP B DISEASES/CONDITIONS –  
REPORT IN WRITING TO THE COUNTY (OR STATE)  
HEALTH DEPARTMENT WITHIN 7 DAYS OF DIAGNOSIS**

- Tetanus
- Toxic shock syndrome
- Tularemia
- Varicella
- Vaccinia virus infection or disease other than the expected response to smallpox vaccination
- Vibriosis
- Yersiniosis

### **Outbreak versus Single Case**

- Outbreaks of any kind are reportable
  - May be evident at the testing laboratory
  - May be identified by collation of reports at health department

### **Outbreak versus Single Case**

- Single cases of notifiable agents are reportable
  - Urgency depends on
    - Threat of contagion
    - Uniqueness of the agent
    - Likelihood of intentional transmission

### **Important Phone Numbers**

- ADPH On-call Duty Officer Pager  
334.519.0040
- ADPH BCL  
334.260.3400 (24-hour answering service)
- ADPH Epidemiology  
800.338.8374 (24-hour answering service)

## Laboratory Response Network

- Hierarchical system
  - Sentinel Laboratories
    - “First responders”
    - Rule out or forward specimens that do not rule out
  - State Health Laboratory (LRN Reference Lab)
  - CDC

## Ongoing Training and Proficiency Testing

- ADPH BCL
  - Provides training in procedures and safe practices
  - Can provide list of external resources
  - Conducted follow-up in the aftermath of RB51 episode
- What was the RB51 episode?

## RB51 Episode

- College of American Pathologists Laboratory Preparedness Survey
- October 15, 2007 Shipment B
  - Contained RB51 vaccine strain of *Brucella abortus*
    - Less pathogenic than previous strains
    - BUT has led to human illness

## Vaccine. 2004 Sep 3; 22(25-26):3435-9

- Accidental exposure to RB51 occurred by needle stick injury in 21 people (81%), conjunctival spray exposure in four (15%), and spray exposure of an open wound in one (4%) individual

## Vaccine. 2004 Sep 3; 22(25-26):3435-9

- At least one systemic symptom was reported in 19 (73%) people, including three (12%) who reported persistent local reactions with systemic involvement

## Vaccine. 2004 Sep 3; 22(25-26):3435-9

- One case required surgery, and *B. abortus* strain RB51 was isolated from the wound of that individual. Seven cases reported no adverse event associated with accidental exposure

**Vaccine. 2004 Sep 3;  
22(25-26):3435-9**

- Nine cases reported previous exposure to Brucella vaccines, including one case who also reported a previous diagnosis of brucellosis following exposure to S19 vaccine

**Vaccine. 2004 Sep 3;  
22(25-26):3435-9**

- Accidental needle stick injuries and conjunctival or open wound exposures of humans with the RB51 vaccine are associated with both local and systemic adverse events in the United States that are consistent with brucellosis; however, it remains undetermined if strain RB51 vaccine can cause systemic brucellosis in humans.

**RB51 Episode—cont'd.**

- December 2007
  - CDC/APHL alerted State Health Departments that a possible laboratory exposure to RB51 had occurred in another state because of breach in best practices

**RB51 Episode—cont'd.**

- December 2007
  - CAP alerted all labs that received LPS samples of possible exposure due to mislabeled specimen sent to LRN Reference Lab

**RB51—Alabama Experience**

- ADPH queried 44 AL sentinel labs that received shipment B
- 17 labs indicated at least one potential exposure, later clarified to
- 15 labs had 42 persons with possible exposure

**RB51—Alabama  
Experience cont'd.**

- Exposures classified as
  - High-risk
    - For individual
      - Sniffed plate
      - Mouth pipetted
      - Worked in BSC w/out using BSL-3 practices

### **RB51—Alabama Experience cont'd.**

- Exposures classified as
  - High-risk
    - Within 5-foot radius
      - Manipulated cultures on open bench but no aerosol-generating procedures

### **RB51—Alabama Experience cont'd.**

- Exposures classified as
  - High-risk
    - Within lab room
      - Manipulated cultures on open bench using aerosol-generating procedures

### **RB51—Alabama Experience cont'd.**

- Exposures classified as
  - Low-risk
    - Present in the lab room at time of open bench manipulations but without high-risk exposures as defined above

### **RB51—Alabama Experience cont'd.**

- Prophylaxis treatment
  - CDC recommended doxycycline 100 mg PO BID x 21 days
    - Should be taken by those at high risk
    - Should be discussed and offered to those at low risk

### **RB51—Alabama Experience cont'd.**

- Of 42 exposures,
  - 15 persons began prophylaxis
  - 11 persons completed 21-day course
  - 4 persons did not complete
    - Side effects
    - Self-determination they were not at risk
- ADPH not aware of any resultant illness irrespective of exposures or use of doxycycline

### **ADPH Role in Exposure Incidents**

- Liaison between CDC and hospital laboratories
- Public Health advises and guides laboratorians exposed to agents of public health importance
- Treatment guidelines are issued from CDC to State Health Departments

## **Lessons**

- **Hazards are continuously present**
- **Laboratorians must**
  - **Be trained in handling infectious materials**
  - **Follow the CDC and ASM protocols**

## **Lessons**

- **If suspect agent identified by Gram stain**
  - **Subsequent manipulations must be in a biological safety cabinet**
  - **Suspend use of rapid methods**
- **If worrisome agents are suspected, call ADPH BCL for guidance and consultation (334.206.3400)**