ANTHRAX: DIAGNOSIS, CLINICAL STAGING, AND RISK COMMUNICATION

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HONG KONG 1987-2017:
MY GRATITUDE TO YOU

- 1987: first visit to Hong Kong

- 2003: May (SARS), Sept (talks on anthrax & on SARS in Toronto)
- 2003 Nov: Smallpox symposium DH: use of bifurcated needle

- 2004-2017: SARS, Health Crises, H5N1 avian flu, MERS (July 2014), Ebola (Nov 2015 at CHP), Anthrax and Smallpox 2017.

PRACTICAL LESSONS FROM THE ANTHRAX RESPONSE IN WASHINGTON, DC 2001 EXPERIENCE

- 3 miles from the U.S. Capitol (where spores released)
- 3 miles from Postal Facility (where spores released)
- Washington Hospital Center: Largest Hospital in Washington, DC

SEPT. 11, 2001: THE VALUE OF PREPAREDNESS FOR BIOTERRORISM

- 11:50 am: Bioterrorism Diagnosis & Rx algorithm distributed to over 100 persons in the Hospital.

- As Chief of Infectious Disease Service, in 1999 I helped create a Bioterrorism Plan. On Sept., 11, 2001 this Plan had much value because it was ready to be adapted for use.

- Doxycline stockpile ordered Sept 14, arrives Sept 17.
- (1st known anthrax letter postmarked Sept 18, then Oct 9).

DOXYCYCLINE -VS- CIPROFLOXACIN

- Anthrax
- Plague
- Tularemia
- Brucella
- Q-fever
- Ornithosis
- Cholera
- Typhus

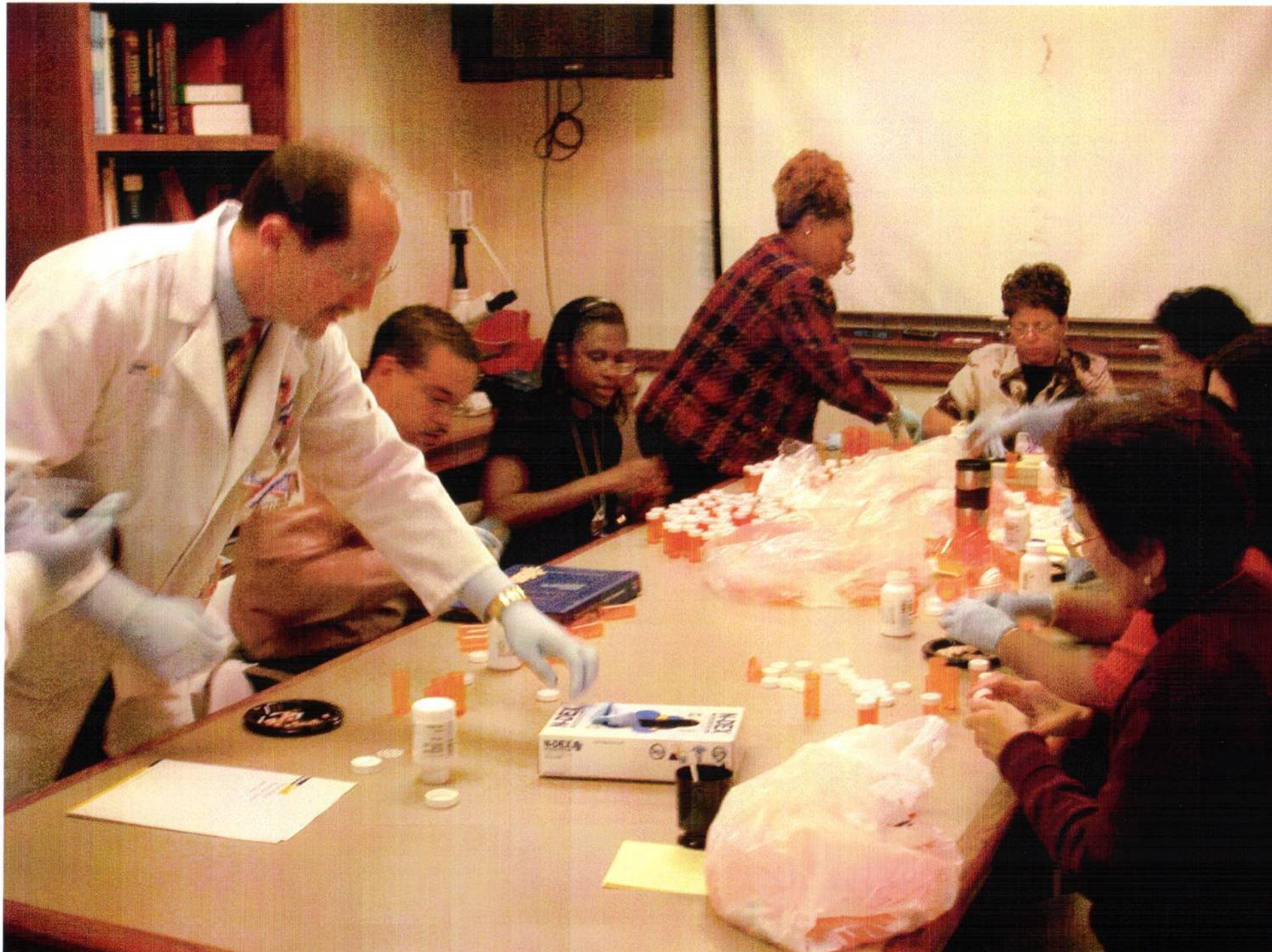
Anthrax

Plague

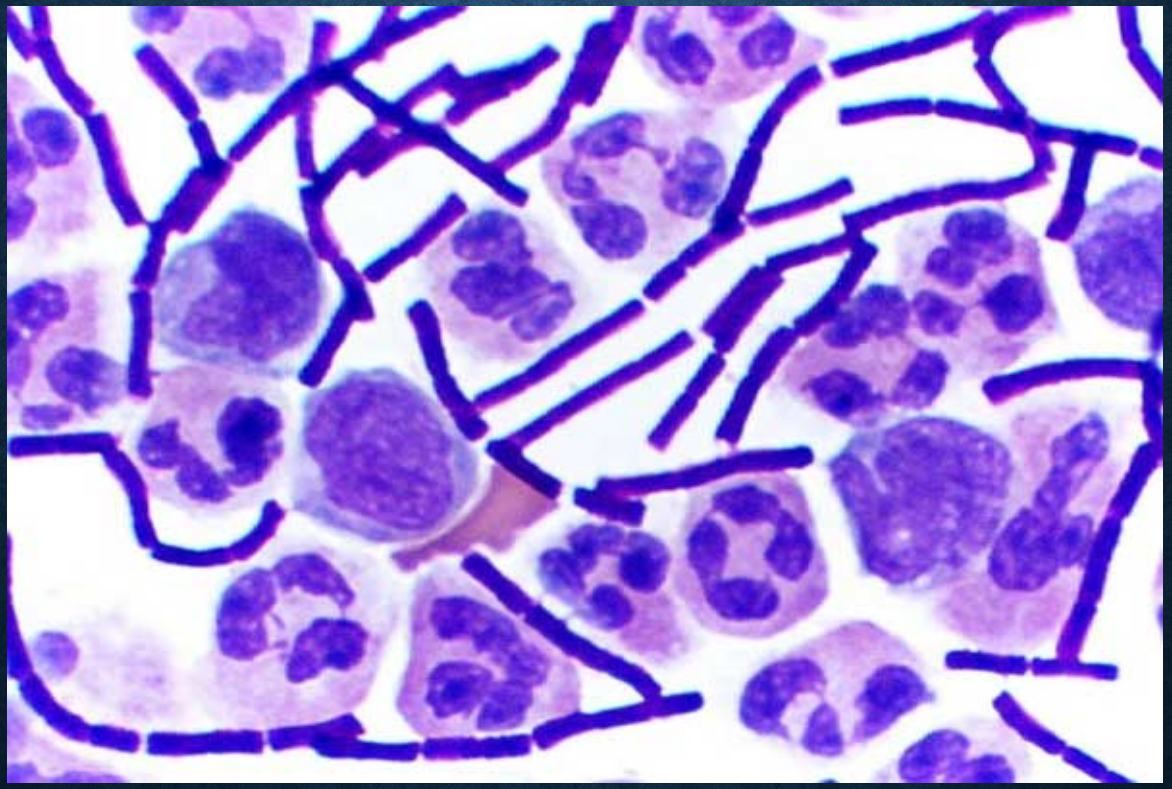
Tularemia

Shigella

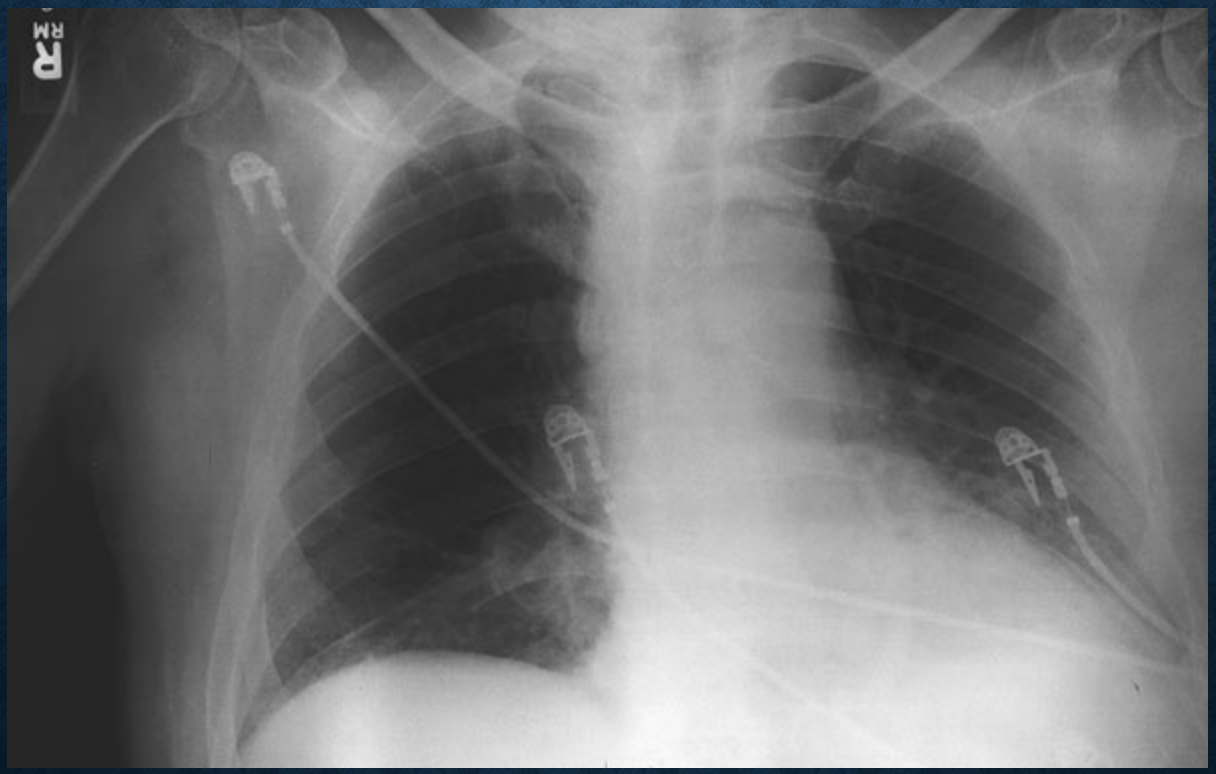
Typhoid fever

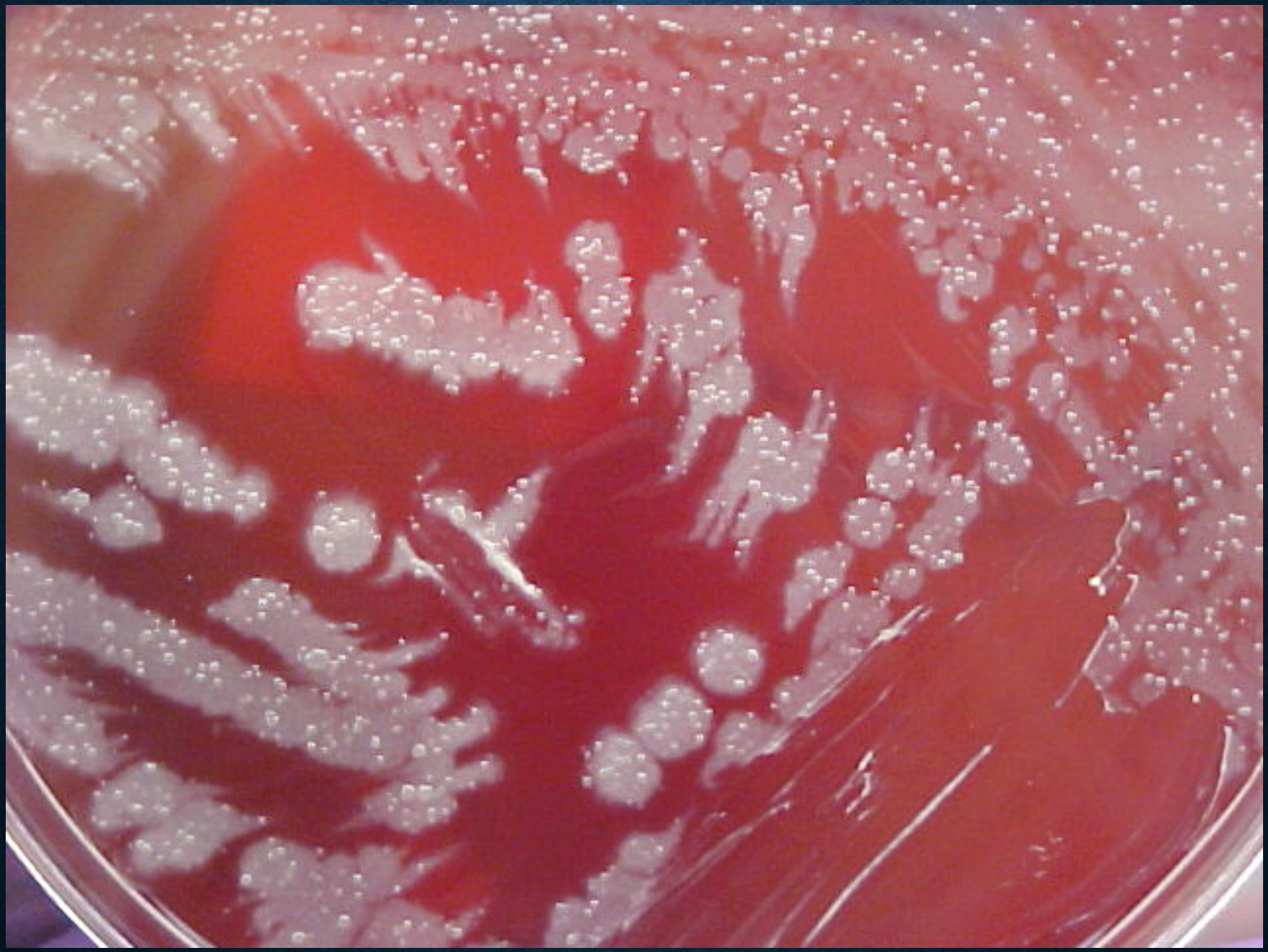


2 OCT. 2001 INHALATIONAL ANTHRAX WITH MENINGITIS IN FLA.: IS THIS BIOTERRORISM? (“NO”)… THEN “YES” WHEN RECOGNIZED ON OCT 12

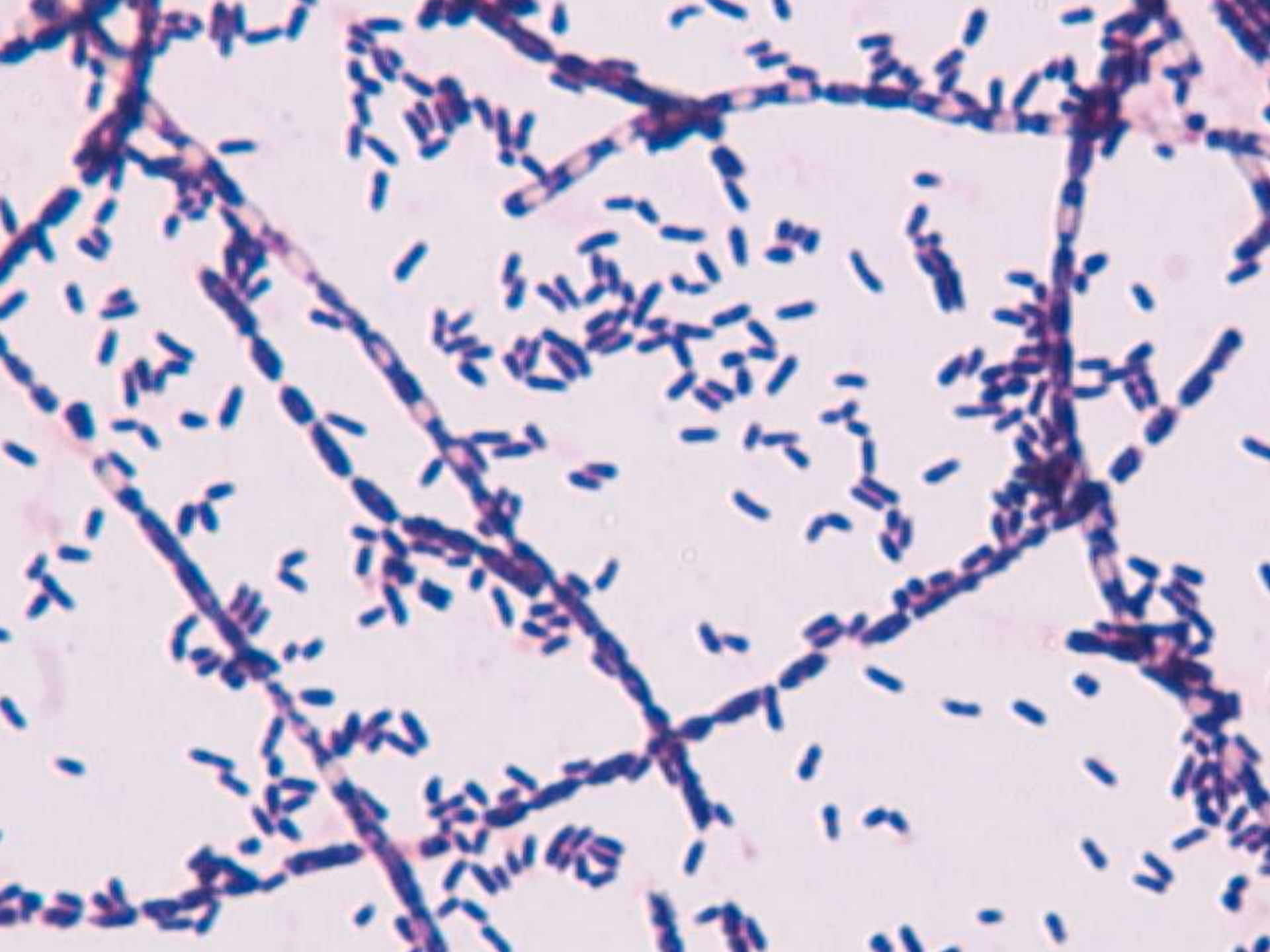


FLORIDA: 1ST PATIENT CHEST X-RAY SHOWING CHANGES OF INHALATIONAL ANTHRAX (OCT 2)

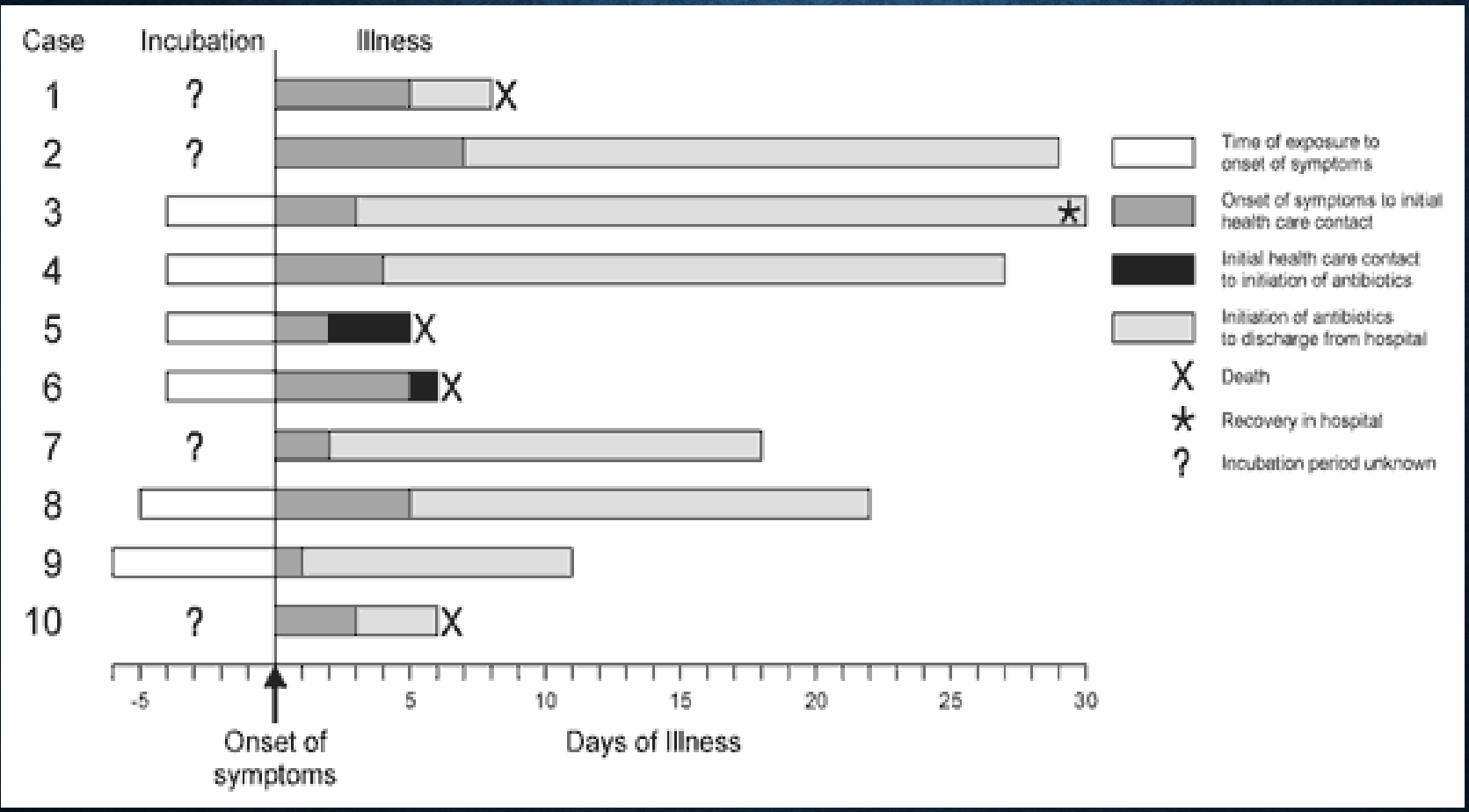




Culture of B. Anthracis on SBA agar Bethesda, MD



SHORT INCUBATION PERIOD FOR ANTHRAX 2001:
JERNIGAN ET AL.. EID J 2001;7 (6) NOV-DEC.



DIAGNOSIS: EPI-LINK, CLINICAL, MICROBIOLOGIC

- Clinical suspicion AND "Epidemiological (Epi) Link"
- "Epi-Link" is important as Anthrax is NOT contagious

- Draw Blood cultures BEFORE any antibiotics
- Blood cultures turn positive in < 24 hours
- One dose of antibiotic: blood cultures turn negative

- Nasal cultures not helpful for patients already ill.
- CSF, Skin, and pleural fluid can also show *B. anthracis*

DIAGNOSIS: CHEST CT SCAN WITHOUT CONTRAST, OR CHEST X-RAY

- Chest x-ray and the more sensitive Chest CT scan can show mediastinal widening due to adenopathy
- In 2001 we used Chest CT without contrast to scan quickly for typical bloody mediastinal adenopathy
- Chest CT was done in A & E for rapid assessment

MORE LESSONS FROM 2001 ANTHRAX

- Event was bioterrorism = a crime. Involve Police immediately.
- Cutaneous anthrax can be due to and clue to Bioterrorism.
- Rapidly search for ill patients to Diagnose and Treat ASAP.
- Cannot wait for an Index Case to be confirmed by lab testing
- Need to decontaminate environment and prevent more exposure

TOKYO: JULY 1, 1993 PHOTO OF ATTEMPTED AEROSOLIZED ANTHRAX

- Spraying of anthrax (Sterne 3F2, non-encapsulated strain) from a rooftop of by Aum Shinryko).

- Emerg Infect Dis Journal. January 2004.

A NEW STAGING SYSTEM FOR INHALATIONAL ANTHRAX: ADDING AN "INTERMEDIATE" STAGE BETWEEN "EARLY" AND "LATE"

- Old system had 2 stages: "Early" vs "Late"
- New system has 3 stages*:
- 1. "Early-Prodromal"
- **2. "Intermediate-Progressive"**
- 3. "Late-Fulminant"

- *Lucey D. Principles and Practices of Infectious Diseases 2005. Cecil's Medicine. 2007, 2011, 2015. CIDRAP IDSA anthrax website 2006-

EARLY-PRODROMAL STAGE (1)

- Non-specific: Can include fever, fatigue, headache, nausea, vomiting, cough.

- Can last from hours to a few days

INTERMEDIATE-PROGRESSIVE STAGE (2) ALL SIX PATIENTS CURED IN 2001

- Any 1 of the following three (3) findings are inclusion criteria:

- (A) Positive blood cultures (usually in < 24 hours), OR
- (B) Mediastinal adenopathy, OR
- (C) Pleural effusions (bloody, can recur, and need drainage)

- Can progress in hours to days to late-fulminant stage & death

LATE-FULMINANT STAGE (3): ALL FIVE PATIENTS WHO DIED IN 2001

- Inclusion criteria include any one (1) of:
- (A) Meningitis, OR
- (B) Respiratory failure requiring a ventilator, OR
- (C) Shock: Insufficient blood to organs

High risk of death even with antibiotics, but a few patients in later years have survived this late-fulminant stage with antibiotics, antitoxin,& ICU

RISK COMMUNICATION:
THE PUBLIC, THE MEDIA, THE PATIENTS

- Anthrax is not contagious. Epi-Link locations of spores is key.
- Work closely with Health Departments, other Hospitals, & Colleagues especially Microbiology, A & E, Nursing Supervisors, Media Relations, & Hospital Administration.
- Identify spokesperson to talk with the Media. They can be an ally!
- Explain importance of taking all prescribed antibiotics, & ? vaccine.
- Update written guidelines and Epi-Links twice daily if needed.

IF "DAY ONE" SCENARIO IS 17 FEB 2017 HOW WILL WE RESPOND TO ANTHRAX?

- Training Exercises Become Reality if a "Day One" Scenario becomes "Day One" of a bioterrorism attack.

- "Day One" Scenario is a test of: "Are We Prepared?"

- On "Day One" what more would we wish we had done to prepare better before "Day One"?

THANK YOU

- Questions and Comments?

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