

Rationale for Additional Post-Exposure Prophylaxis Options

Bradley A. Perkins, M.D.
Meningitis & Special Pathogens Branch,
Division of Bacterial and Mycotic Diseases, NCID, CDC

**Speaker 1 of 4 for program “CDC Responds: Update on
Options for Preventive Treatment for Persons at Risk for
Inhalational Anthrax,” broadcast December 21, 2001**



Additional Options for Those Exposed to *Bacillus anthracis* spores

- Earlier Recommendation - 60 days of antibiotics + medical monitoring
- Additional Option 1 - 40 additional days of antibiotic treatment + medical monitoring
- Additional Option 2 - 40 additional days of antibiotic treatment + 3 doses of anthrax vaccine over 4 weeks + medical monitoring

Advisory Committee on Immunization Practices (ACIP) Recommendations

- “Use of Anthrax Vaccine in the US: Recommendations of the [ACIP]” MMWR, December 15, 2000
- Post-exposure prophylaxis (PEP) is recommended following a aerosol exposure to *B. anthracis* spores
- Antibiotics \geq 30 days if used alone, & longer therapy (upto 42 to 60 days) might be indicated
- If anthrax vaccine is available, antibiotics can be discontinued after 3 doses of vaccine (0, 2, and 4 weeks)

Epidemiologic Investigations

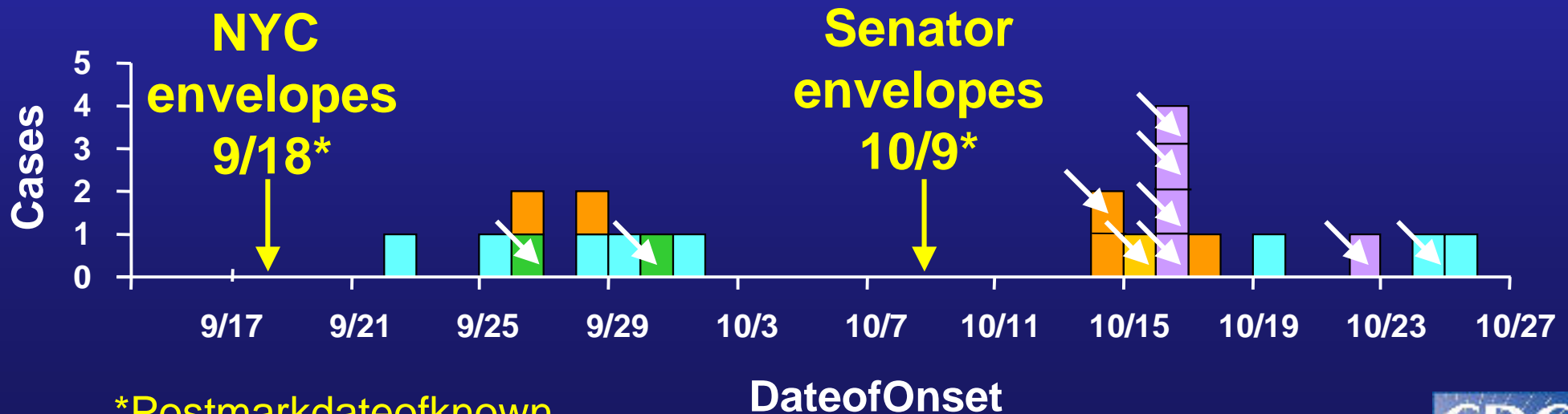


Public Health Decisions, Actions, & Options Regarding Post-Exposure Prophylaxis

- Investigational new drug (IND) application filed with FDA to use anthrax vaccine for PEP
- 60 days of antibiotics recommended for PEP
- ACIP Pre - convened & endorsed routine use of 60 days of antibiotics for PEP
- 217,000 doses of anthrax vaccine obtained by DHHS from DoD
- ACIP encourages provision of anthrax vaccine under IND to exposed persons

Bioterrorism-associated Anthrax: Inhalational and Cutaneous Cases

CT inhalational anthrax case, date of onset - 11/14



*Postmark date of known contaminated envelopes



Post-Exposure Prophylaxis for Prevention of Inhalational Anthrax

- Approximately 10,000 individuals recommended to take 60 days of antibiotic therapy
- Initiated October 8 – November 25, 2001
- Primarily occupational exposures (media outlets, postal workers, congressional staffers)

One of the main factors in the therapy of
inhalational anthrax is the

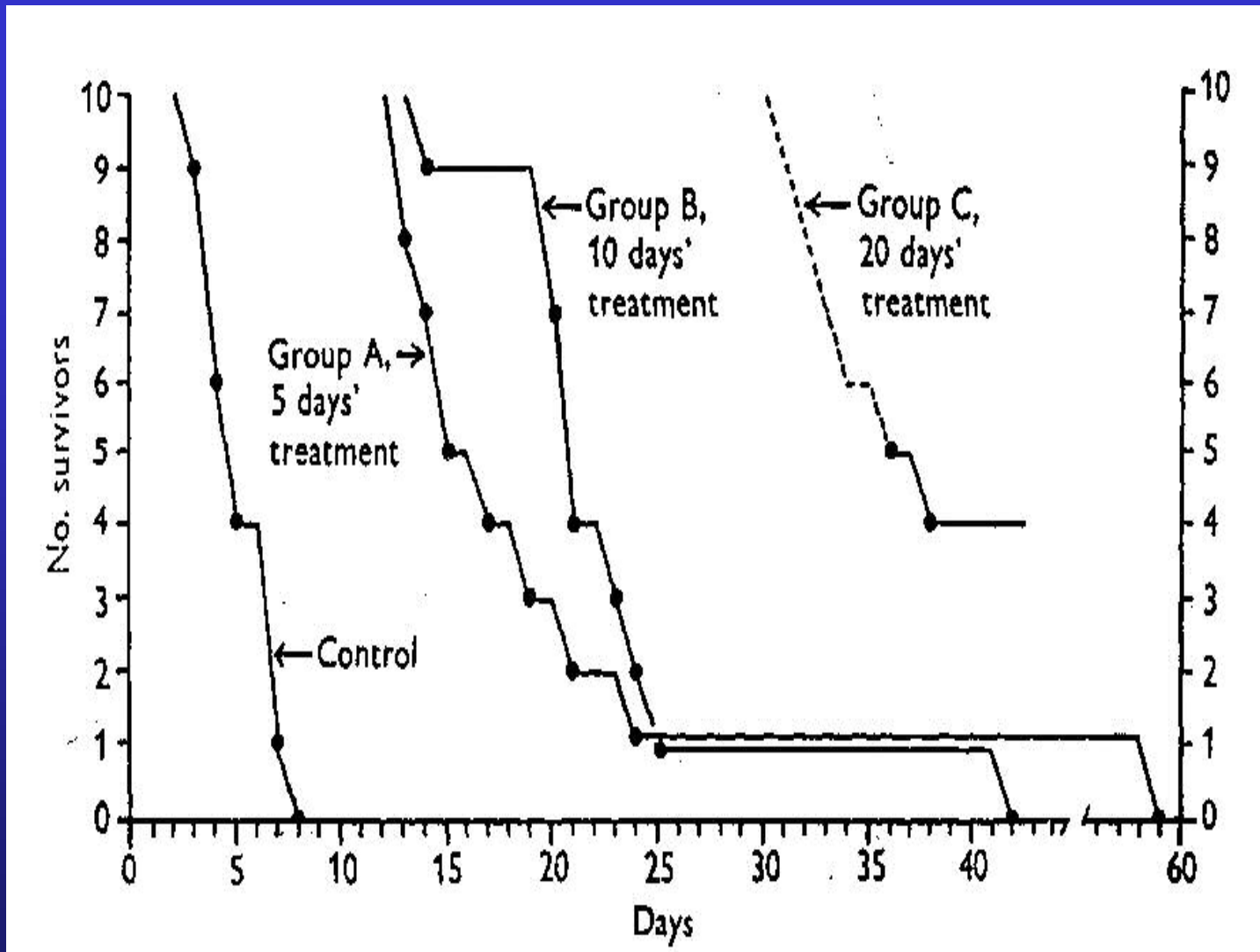
“...persistence of spores in the tissues and
their germination after the blood-penicillin
level has fallen...”

J. M. Barnes

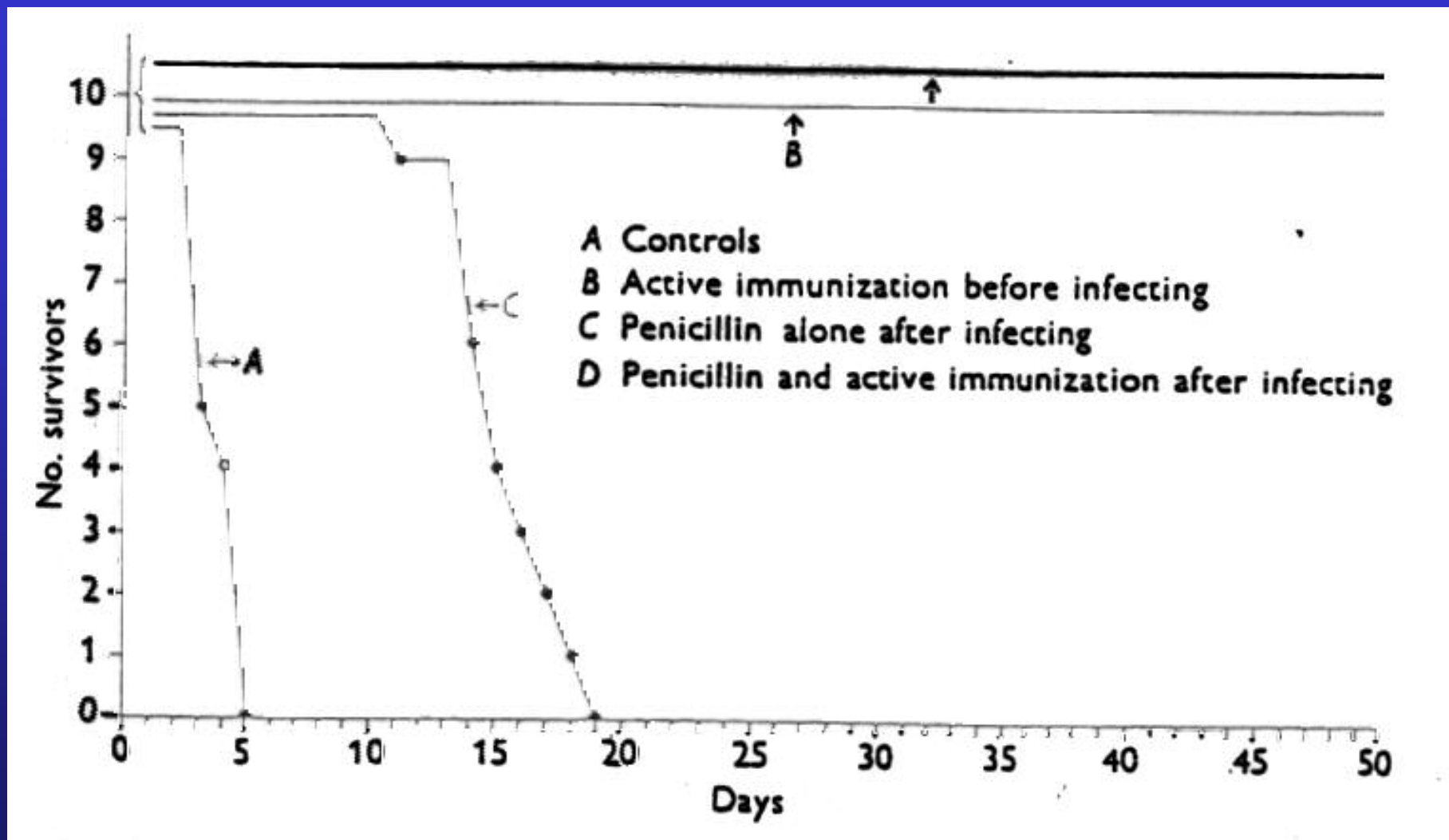
J. Path. Bact. 59:113(1947)

Key Non-Human Primate Studies

- **Henderson DW, Peacock S, Belton FC. Observations on the prophylaxis of experimental pulmonary anthrax in the monkey. *J Hygiene* 1956;54:28 -36.**
 - **Aerosol challenge: 4 & 8 LD₅₀ (1 LD₅₀ = 50,000 spores)**
- **Friedlander AM, Welkos SL, Pitt ML, et al. Postexposure prophylaxis against experimental inhalational anthrax. *J Infect Dis* 1993;167:1239 -42.**
 - **Aerosol challenge: 8 LD₅₀**

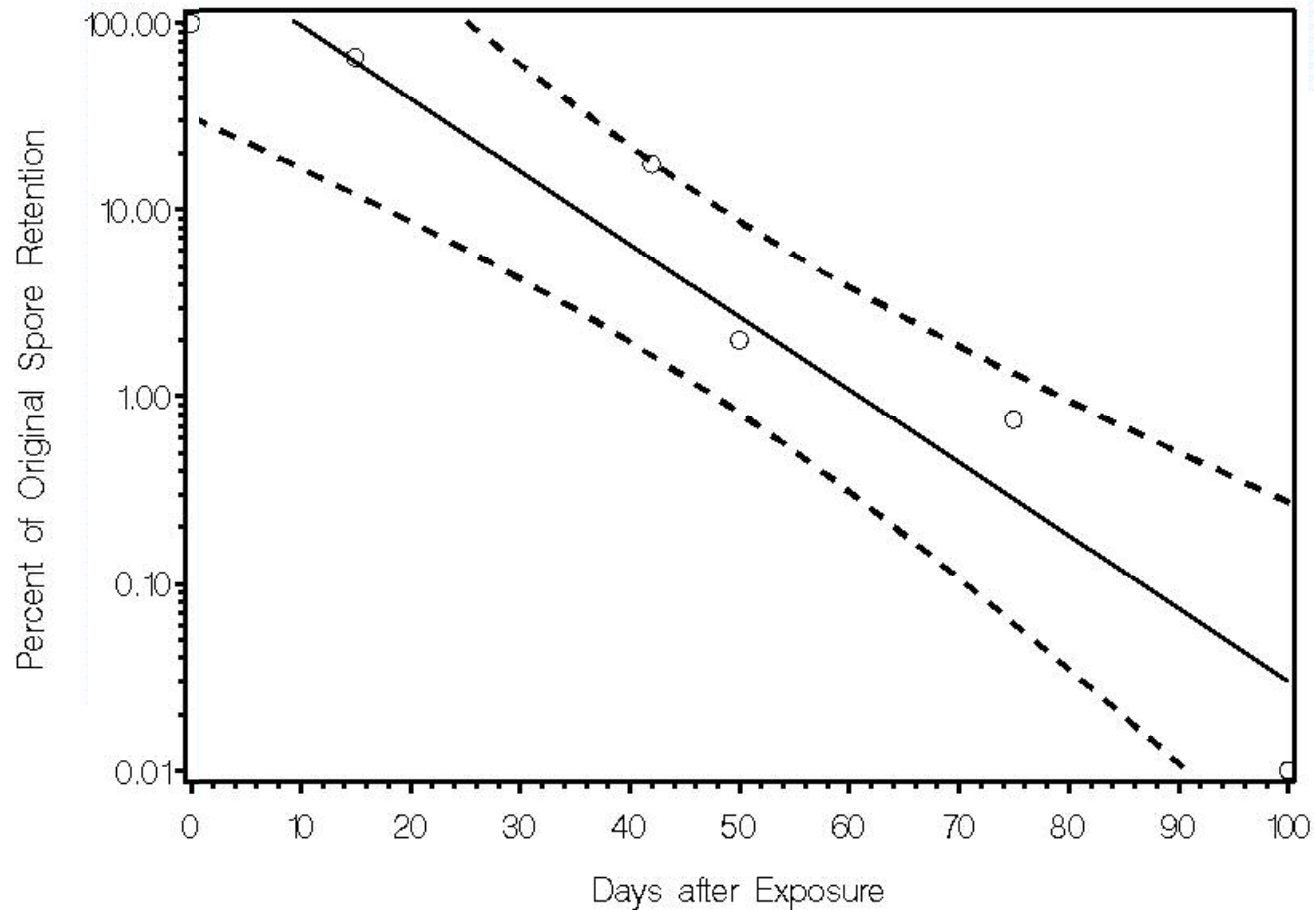


Henderson DW, Peacock S, Belton FC. Observations on the prophylaxis of experimental pulmonary anthrax in the monkey. *J Hygiene* 1956; 54:28 -36.



Henderson DW, Peacock S, Belton FC. Observations on the prophylaxis of experimental pulmonary anthrax in the monkey. *J Hygiene* 1956; 54:28 -36.

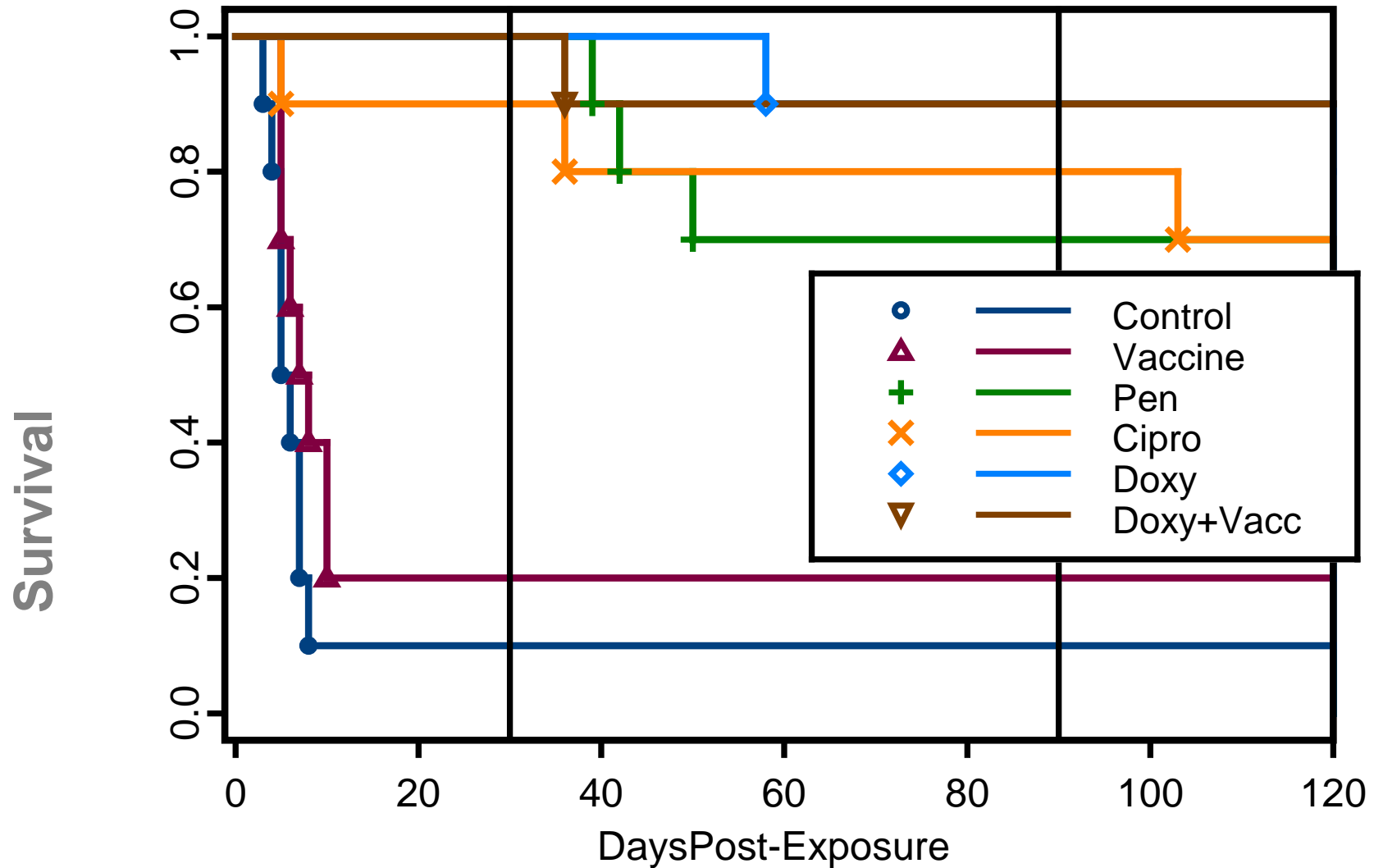
B. anthracis Spore Clearance



Data adapted from Henderson D Wetal

JHygiene 1956; 54:28 -36.

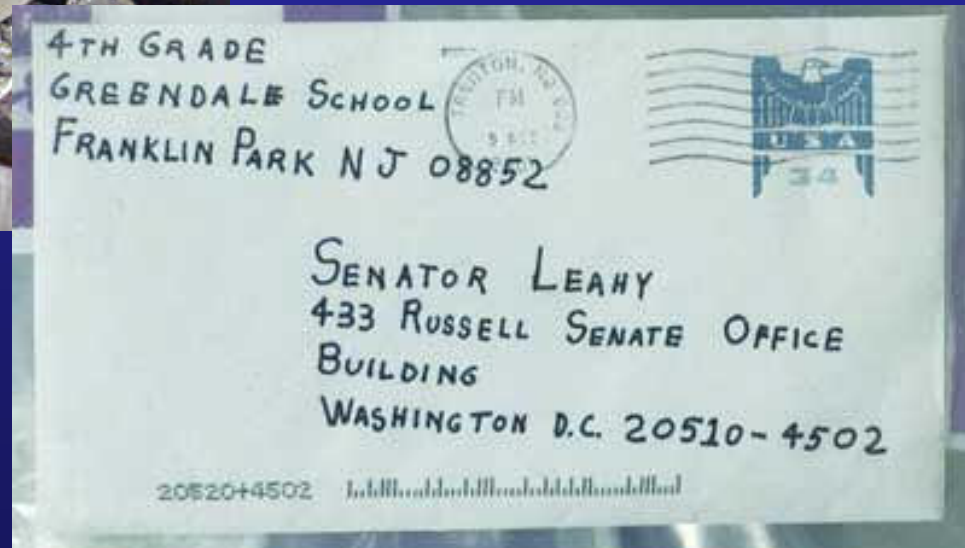
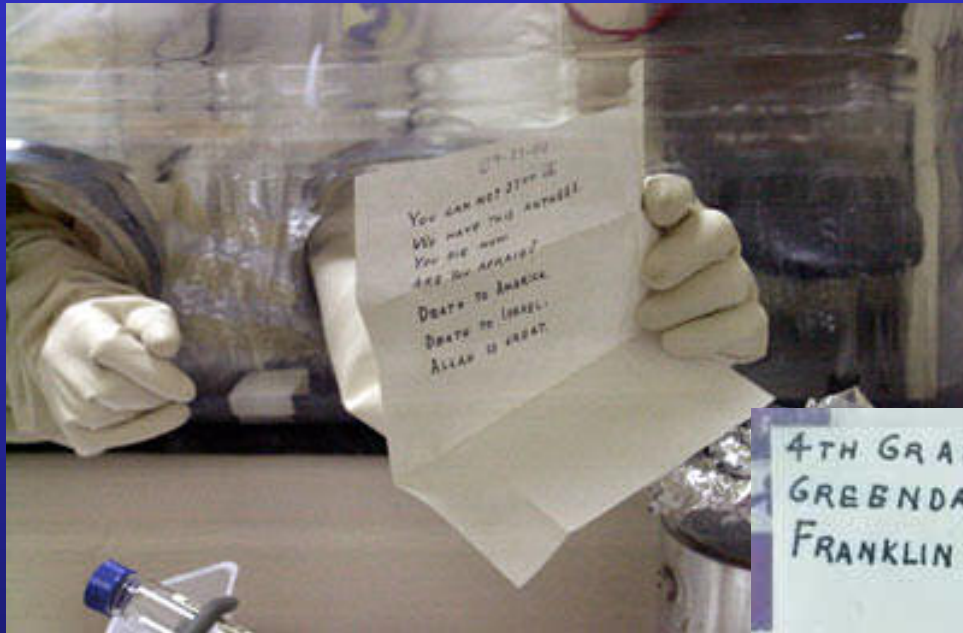




Friedlander AM, Welkos SL, Pitt ML, et al. Postexposure prophylaxis against experimental inhalational anthrax. *J Infect Dis* 1993;167:1239-42.



Senator Daschle & Leahy Envelopes: Postmarked 10/9/01



Risk Assessment of Anthrax Threat Letters*

- Feb-April, 2001 @ Defence Research Establishment Suffield (DRES), Canada
- Weapons-grade *B. globigii* spores used to simulate an envelope release of *B. anthracis*
- 18x10x10 foot “office -size” chamber for release
- Extensive sophisticated aerosol sampling
- Estimated 480 - 3,080 LD₅₀ in 10 min exposure

Conclusions

- Among persons with heavy exposure to *B. anthracis* spores, 60 days of antibiotics alone may eliminate risk for inhalational anthrax
- Additional antibiotics, or antibiotic & vaccine, may benefit persons who remain at risk for inhalational anthrax after 60 days of antibiotics alone