Biological Terrorism

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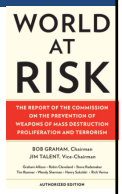
Chief Medical Officer
Ghent University Hospital, Belgium

Biological Terrorism

- Overview
- History
- Agents and Disease
- Detection and Response
- Physicians are the key to ongoing surveillance

Biological Proliferation and terrorism



- RECOMMENDATION 1: The United States should undertake a series of mutually reinforcing domestic measures to prevent bioterrorism:
  - conduct a comprehensive review of the domestic program to secure dangerous pathogens,
  - develop a national strategy for advancing bioforensic capabilities,
  - tighten government oversight of high-containment laboratories,
  - promote a culture of security awareness in the life sciences community,
  - enhance the nation's capabilities for rapid response to prevent biological attacks from inflicting mass casualties.

Biological Warfare

"*Biological warfare is the deliberate spreading of (infectious) diseases among humans, animals, and plants in order to cause incapacitation or death of the target population*."

Hon. Prof. Graham S. Pearson CB
Former Director General Chemical & Biological Defence Establishment
Porton Down, Salisbury, England

Biological Warfare Agents

- In October 2012, the select agent list was updated, and 13 tier 1 agents were identified.
- Tier 1 agents are those that are at higher risk for causing high-consequence events. The criteria are as follows:
  - ability to cause a mass casualty event or economic devastation,
  - communicability or dispersibility,
  - low infectious dose,
  - history of interest in weaponization.
- The 2012 update also added the SARS-associated coronavirus and Chapare and Lujo viruses (*Arenaviridae*) to the list.

Biological Warfare: tier 1

- Botulinum neurotoxins
- Botulinum neurotoxin-producing species of Clostridium
- Ebola virus
- Francisella tularensis
- Marburg virus
- Bacillus anthracis
- Burkholderia mallei
- Burkholderia pseudomallei
- Variola major virus (smallpox)
- Yersinia pestis
- Foot-and-mouth disease virus (aphthovirus)

THE LAST REMAINING VIAL OF VARIOLAVIRUS IN THE NETHERLANDS IS TRANSFERRED TO THE CENTERS FOR DISEASE CONTROL AND PREVENTION IN ATLANTA, USA, ON DECEMBER 2, 1981.

The New York Times | http://nyti.ms/1DdE7zN

The Opinion Pages | OP-ED CONTRIBUTOR

Resurrecting Smallpox? Easier Than You Think

By LEONARD ADLEMAN OCT. 15, 2014

Genome Sequence Diversity and Clues to the Evolution of Variola (Smallpox) Virus

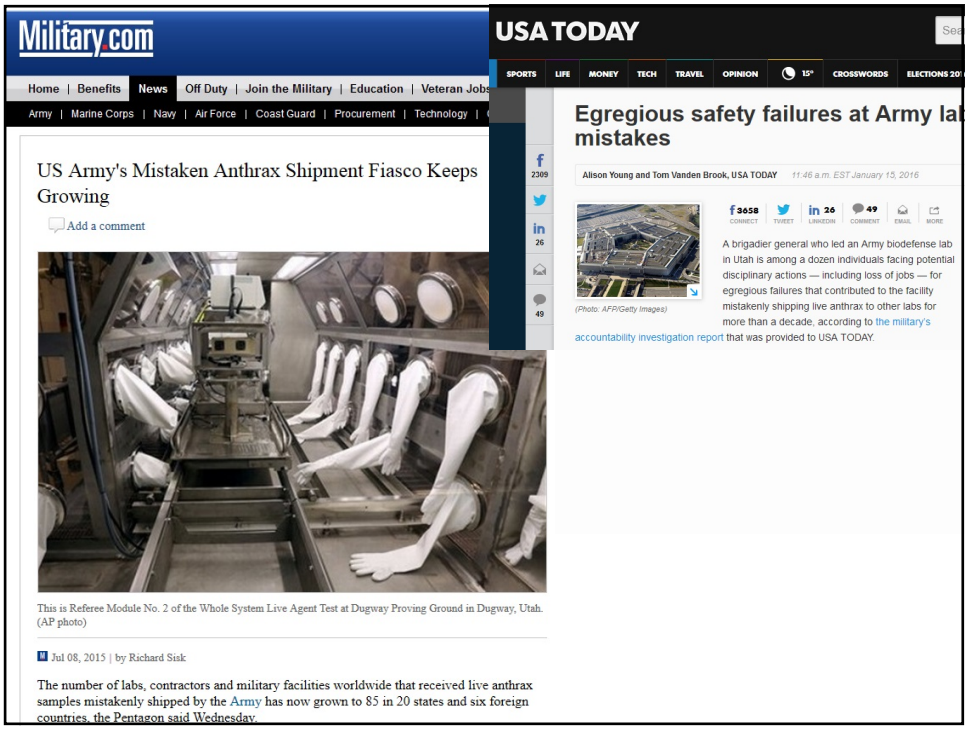
Joseph J. Esposito,[1*†] Scott A. Sammons,[1*] A. Michael Frace,[1*] John D. Osborne,[1*‡] Melissa Olsen-Rasmussen,[1*] Ming Zhang,[1§] Dhwani Govil,[1] Inger K. Damon,[2] Richard Kline,[2] Miriam Laker,[2‖] Yu Li,[2] Geoffrey L. Smith,[3] Hermann Meyer,[4] James W. LeDuc,[2] Robert M. Wohlhueter[1]

Comparative genomics of 45 epidemiologically varied variola virus isolates from the past 30 years of the smallpox era indicate low sequence diversity, suggesting that there is probably little difference in the isolates' functional gene content. Phylogenetic clustering inferred three clades coincident with their geographical origin and case-fatality rate; the latter implicated putative proteins that mediate viral virulence differences. Analysis of the viral linear DNA genome suggests that its evolution involved direct descent and DNA end-region recombination events. Knowing the sequences will help understand the viral proteome and improve diagnostic test precision, therapeutics, and systems for their assessment.

Before eradication was declared in 1980, the *Orthopoxvirus* (OPV) variola virus (VARV) caused from ~1 to 30% case-fatality rates (CFRs) of smallpox, a strictly human disease. The infection began with a prodrome of systemic aches and a fever that peaked in about a week. As the fever broke, an oropharyngeal enanthema developed, followed immediately by an exanthema, a skin rash constituting an end stage of centrifugally distributed virus-filled pustules that felt "shotty," as if each contained a

Biological Warfare: tier 1 unsafe

- Botulinum neurotoxins
- Botulinum neurotoxin-producing species of Clostridium
- Ebola virus, dec 2014 from Safety level 4 to level 2
- Francisella tularensis
- Marburg virus
- Bacillus anthracis, shipped to 86 labs: 7 countries, 20 states
- Burkholderia mallei, sep 2013: labaccident, 6 exposed
- Burkholderia pseudomallei
- variola major virus (smallpox), july 2014, 6 vials in NIH building 29A in Maryland
- Yersinia pestis
- foot-and-mouth disease virus (aphthovirus)



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US Army's Mistaken Anthrax Shipment Fiasco Keeps Growing

Add a comment

This is Referee Module No. 2 of the Whole System Live Agent Test at Dugway Proving Ground in Dugway, Utah. (AP photo)

Jul 08, 2015 | by Richard Sisk

The number of labs, contractors and military facilities worldwide that received live anthrax samples mistakenly shipped by the Army has now grown to 85 in 20 states and six foreign countries, the Pentagon said Wednesday.

USA TODAY

SPORTS | LIFE | MONEY | TECH | TRAVEL | OPINION | CROSSWORDS

Egregious safety failures at Army lab mistakes

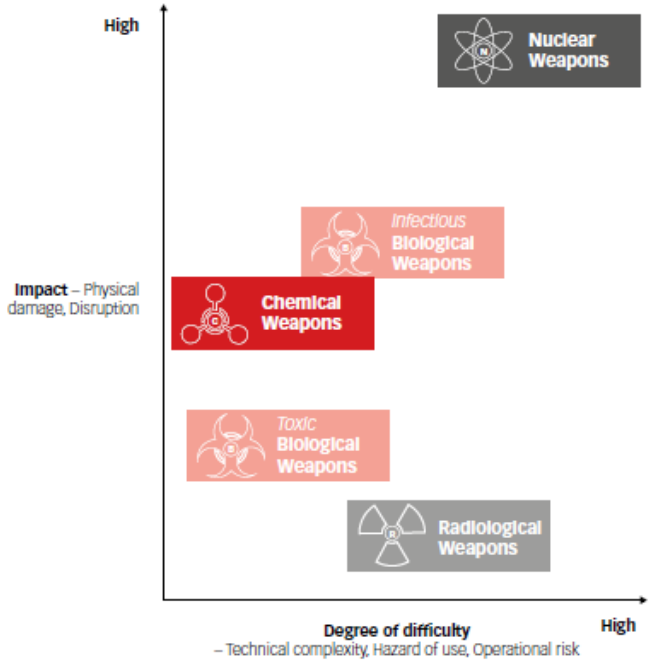
Alison Young and Tom Vanden Brook, USA TODAY 11:46 a.m. EST January 15, 2016

(Photo: AFP/Getty Images)

A brigadier general who led an Army biodefense lab in Utah is among a dozen individuals facing potential disciplinary actions — including loss of jobs — for egregious failures that contributed to the facility mistakenly shipping live anthrax to other labs for more than a decade, according to the military's accountability investigation report that was provided to USA TODAY.

Categories of Weapons Used by Terrorists

- Conventional
- Biologic
- Chemical
- Nuclear
- Cyber



Features of Bioterrorism

- Weapon: Microbe or Toxin
- Premeditation
- Goals: Political, Religious, Ideological
- Motivation: Fear, Disruption, Instability

Desirable Features of Biological Agents as Weapon

- Inexpensive
- Available
- Easily transported/concealed and dispersed
- Incubation period "*Hides Tracks*" of perpetrator
- Modifiable (resistance, virulence)

Uniqueness of Biological Attacks

- Biological
  - Onset - incubation, primary cases
  - Secondary Cases – contagion, contamination
- Responders - medical
- Response System - untested
- Medical System may be a target

Myths of Deterrence Against Bioterrorism

- Morally Repugnant
- Effective Treaties
- Consequences too numerous or terrible
- Science too difficult
- Not easily weaponized

COMMENTARY *(U.S. News & World Report)* December 28, 2015

The U.S. Needs to Exercise Leadership at the Biological Weapons Convention

- Biological warfare can no longer be considered the purview of only state actors.
- The democratization of biotechnology means that the world is literally one rogue microbiologist away from a potentially devastating biological attack.

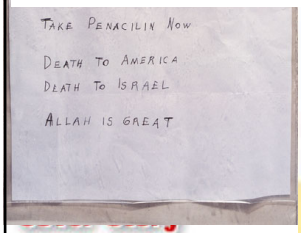
Properly prepared biological weapons do not act as naturally occurring disease

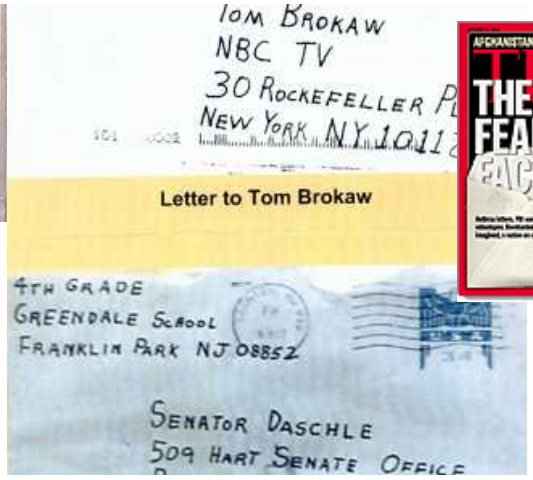
- biological pathogens could be prepared and deployed so that resulting infections have barely any semblance to the natural forms of the diseases.
- Overwhelming doses at the point of attack, and even at long distances downwind, as in the case of an aerosol delivery, could be thousands of times the "lethal dose."
- The resulting disease could be so severe that even medical countermeasures such as vaccines, antibiotics and antivirals could be rendered ineffective

The New York Times
nytimes.com

September 13, 2002

Vermont Senator Wants Study of Terror Link to West Nile Virus



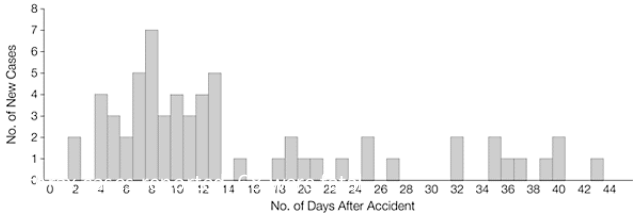


The New York Times
nytimes.com

September 9, 2002

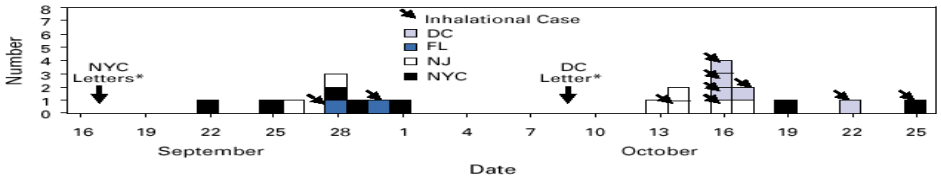
Many Worry That Nation Is Still Highly Vulnerable to Germ Attack

Anthrax as Bioterrorism Agent
The Reality



Anthrax in USA 2001

FIGURE 1. Number of bioterrorism-related anthrax cases, by date of onset and work location — District of Columbia (DC), Florida (FL), New Jersey (NJ), and New York City (NYC), September 16–October 25, 2001



* Postmarked date of known contaminated letters.

- 22 cases of anthrax cases reported, 5 were fatal

Keep Alert

- Early detection
- High index of suspicion
- Immediate reporting of suspected cases to authorithies

Clues to Bioterrorism

- Severe disease manifestations in previously healthy people
- Higher than normal number of patients with fever and respiratory/G.I. Complaints
- Multiple people with similar complaints from a common location
- An endemic disease appearing during an unusual time of year

Clues to Bioterrorism

- Unusual number of rapid fatal cases
- Greater number of ill/dead animals
- Rapid rising and falling epidemic curve
- Greater numbers of patients with:
  1) Severe pneumonia
  2) Sepsis
  3) Sepsis with coagulopathy
  4) Fever with rash
  5) Diplopia with progressive weakness

Standard Infection Control (I.C.) Precautions
(for all bio-terrorist threats)

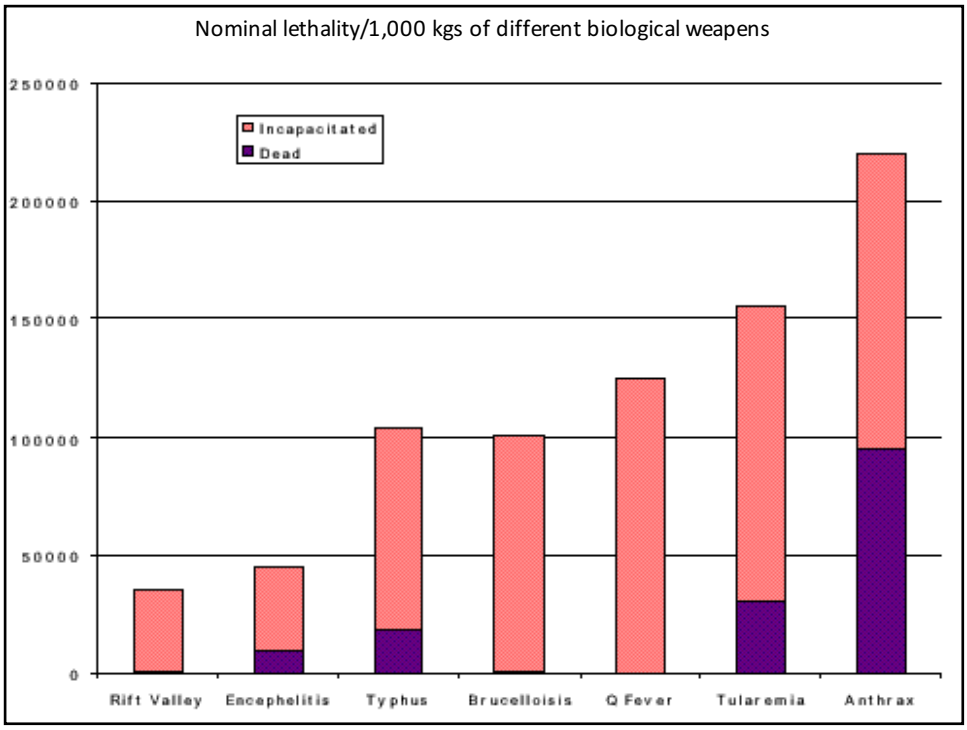
- Wash hands and Wear gloves
- Wear face shield
- Wear cap/gown
- Process contaminated equipment and linen
- Clean and disinfect environmental surfaces
- Adhere to occupational health and blood-borne pathogen requirements
- Place patients at risk for environmental contamination in private or cohort location

Airborne Infection Control (I.C.) Precautions
(Smallpox and Hemmorhagic Fever)

- Place patient in negative pressure room, when possible
- Apply high-intensity air filter respiratory protection
- Limit patient transport
- Place tight sealing mask on patient when transporting

Highest Concern CDC designated
"A" List of Biologic Agents

- Anthrax
- Plague
- Smallpox
- Botulism
- Tularemia
- Viral Hemorrhagic Fever

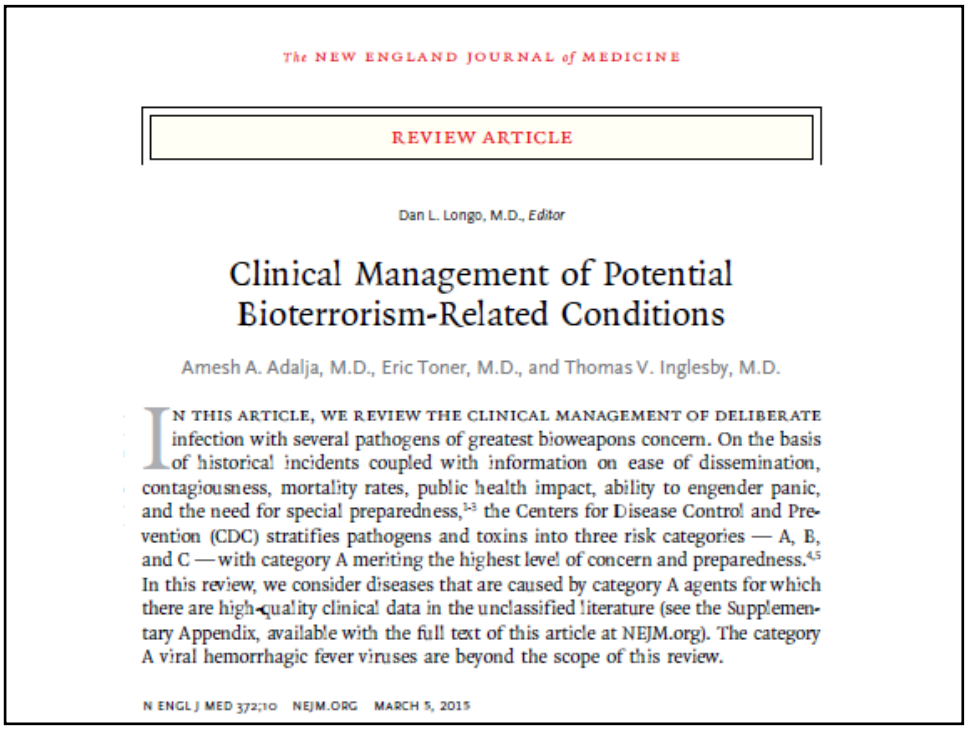


Knowledge required to Manufacture Biological Weapons

- The infective dose of the potential biological agent
- The method of attack on the target population (e.g., inhalation, ingestion, or by an insect vector)
- The means of dispersion of the biological agent
- The ability of the biological agent to survive until it reaches the target
- The time to effect or cause disease in the target population
- The biological agent needs to be producible

The Capability to Make Biological Weapons

- The methods for making aerosols stay airborne are widely available.
- The tools for making pathogens in high quantities in fermenters are on ebay.
- The recipes for making stable formulations of pathogens are on the internet.
- The equipment for disseminating these weapons is in hardware or agricultural supply stores.
- This information and technology is almost entirely dual use - in the sense that it has both legitimate and dangerous uses in the world.



The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

Dan L. Longo, M.D., *Editor*

Clinical Management of Potential Bioterrorism-Related Conditions

Amesh A. Adalja, M.D., Eric Toner, M.D., and Thomas V. Inglesby, M.D.

IN THIS ARTICLE, WE REVIEW THE CLINICAL MANAGEMENT OF DELIBERATE infection with several pathogens of greatest bioweapons concern. On the basis of historical incidents coupled with information on ease of dissemination, contagiousness, mortality rates, public health impact, ability to engender panic, and the need for special preparedness,[1-3] the Centers for Disease Control and Prevention (CDC) stratifies pathogens and toxins into three risk categories — A, B, and C — with category A meriting the highest level of concern and preparedness.[4,5] In this review, we consider diseases that are caused by category A agents for which there are high-quality clinical data in the unclassified literature (see the Supplementary Appendix, available with the full text of this article at NEJM.org). The category A viral hemorrhagic fever viruses are beyond the scope of this review.

N ENGL J MED 372;10 NEJM.ORG MARCH 5, 2015

Bacillus Anthrax Pathogenesis

- Spore enters skin, GI tract, or lung
  - Injectional (heroine epidemic Europe 2010)
- Germinates in macrophage locally or is transported to regional lymph nodes
- Local production of toxins leads to edema and necrosis
- Spread from node with bacteremia and toxemia

Anthrax (Bacillus anthracis)

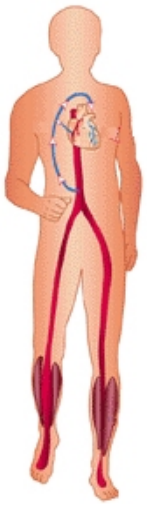
Syndromes
INFLUENZA
PULMONARY

Early Symptoms
Delayed Symptoms

Meningitis (Hemorrhagic CSF in 50%)
Stridor

Inhalational:
Pleural Effusions
Widened Mediastinum
Hemorrhagic Mediastinitis
Respiratory Distress
Septic Shock
Cyanosis

Elevated WBC
Edema



Fever, Malaise, Fatigue, Chills

Cough
Chest Pain
Dyspnea

(G.I.): Nausea
Bloody Diarrhea
Abdominal Pain

Myalgia

Cutaneous: Painless, Necrotic Ulcers with Black Base (direct dermal contact)

Anthrax (Inhalational) (bacillus anthracis)

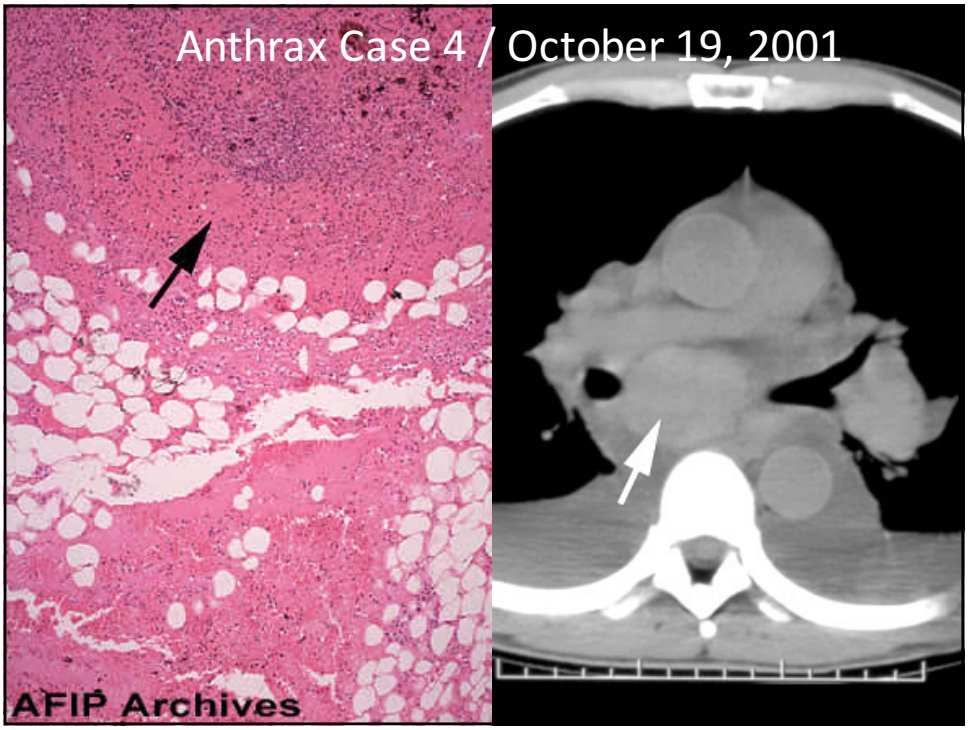
Characteristics

Bio-warfare Mode:	**Aerosol**
Incubation Period:	**1-6d (usually within 48hrs)** **Sverdlovsk up to 6wks**
Onset:	**Abrupt**
Duration:	**Days**
Lethality:	**High (80-90%)**
Transmission:	**Not transmissible person to person**

Anthrax (Inhalational) (bacillus anthracis)

Mediastinal Widening

Pleural Effusion



Anthrax (Inhalational) (bacillus anthracis)

Primary Therapy

1. ***Ciprofloxacin*** 400mg IV q 8-12h (Peds: 20-30mg/kg/d IV dosing up to 1 Gm). Consult ID for alternate quinolones.

OR

2. ***Doxycycline*** 200mg IV (1dose) then 100mg IV q 8-12h x 4wk (Peds: 2.5 mg/kg IV q 12h)

OR

3. ***Penicillin** G 4 million units IV q 4h (Peds: if<12y, PCN G 50,000U/kg IV q 6h; if > 12y, 4 million U IV q 4h)
   Amoxicilin 500mg q 8h in mass casualty setting

* Was the therapy of choice, but due to documented resistance, should be used only if cultures are PCN-sensitive.

Anthrax (Inhalational) (bacillus anthracis)

Alternate Therapy

Gentamicin, Erythromycin, Clindamycin, Chloramphenicol
Efficacy not evaluated by human or animal studies.

- Therapy should continue for 60 days
- Therapy may be decreased to 30-45 days if the full series of the vaccine has been given.
- In mass-casualty settings, oral therapy with standard doses of *Ciprofloxacin*, *Doxycycline*, *Amoxicillin* may be utilized.

Anthrax (Inhalational) (bacillus anthracis)

Prophylaxis

Ciprofloxacin	500mg PO bid x 4wk (8wk without vaccine) Peds: 20-30mg/kg/d bid dosing up to 1 Gm/d
Levofloxacin	500mg/d x 4-8wk (no Peds)
Ofloxacin	400mg/bid x 4-8wk (no Peds)
Doxycycline	100mg PO bid x 4wk (8wk without vaccine) Peds:5mg/kg/d bid dosing
Amoxicillin	40mg/kg/d up to 1500mg/d Peds: Use tid dosing once cultures return as PCN-sensitive
Vaccine	0.5cc SQ @ 0,2, 4wk, then 6, 12, 18mo Approved for patients between 18-65

Anthrax (Inhalational) (bacillus anthracis)

Isolation/Decon Precautions

1) Victim: Undress, soap/shower for gross or visible contamination

2) Responder/ Caregiver: See Standard Infection Control (I.C.) Precautions. To protect from spores, respirators are needed.

3) Environment: **New methods are under investigation**

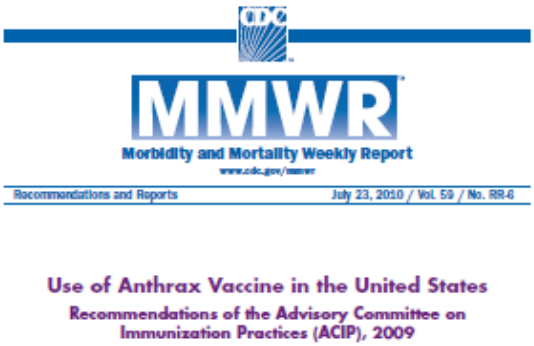
Equipment can be decontaminated with 1 part household bleach to 10 parts of water.

Anthrax (Inhalational) (bacillus anthracis)

Vaccination

Bio Thrax:

SC 0, 2, 4 wks post-exposure combined with antimicrobial therapy.



Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Recommendations and Reports / Vol. 64 / No. 4
December 4, 2015

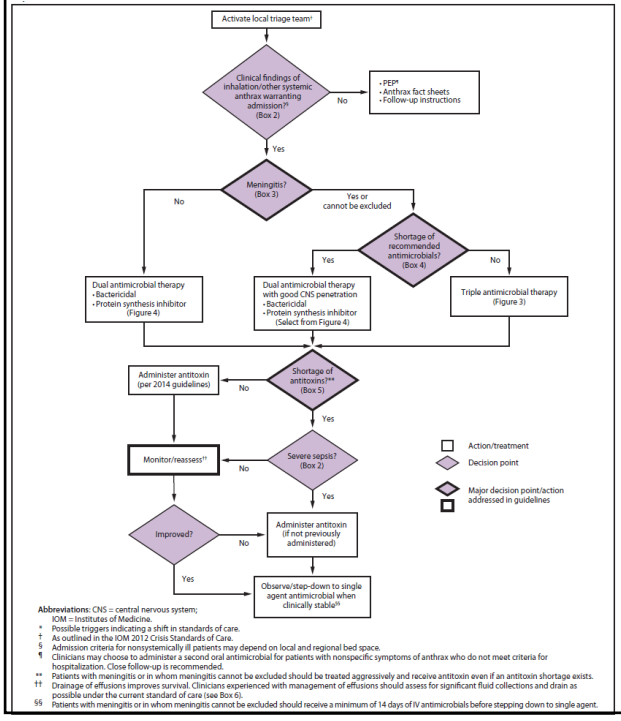
Clinical Framework and Medical Countermeasure Use During an Anthrax Mass-Casualty Incident

CDC Recommendations

- Aerosolized release over densely populated area
- Anthrax meningitis in 50% pat with inhalation anthrax

Continuing Education Examination available at http://www.cdc.gov/mmwr/cme/conted.html.

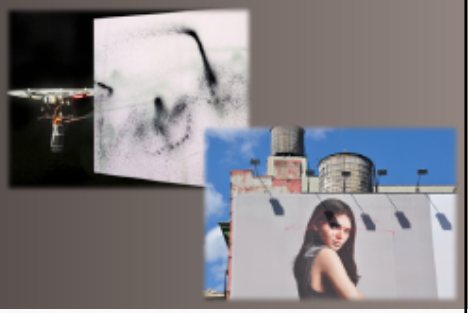
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention



Drone with contraband (Prisons)

Drone with Taser and Pepper Spray

Drone with spray canister



Incident met drone en Palestijnse vlag tijdens wedstrijd Rode Duivels

wo 14/10/2015 - 15:51 Gianni Paelinck, Chris Verhaeghe - Persinfo

In de aanloop naar de wedstrijd van de Rode Duivels tegen Israël gisteravond zijn twee pro-Palestijnse actievoerders opgepakt. Ze probeerden een drone met Palestijnse vlag aan over het Koning Boudewijnstadion te laten vliegen. Het zou gaan om een actie van Movement X, de actiegroep van Dyab Abou Jahjah, die aandacht wou vragen voor de Palestijnse zaak.

Pneumonic Plague Primary (Yersinia pestis)

Syndromes
INFLUENZA
PULMONARY
DERMATOLOGICAL

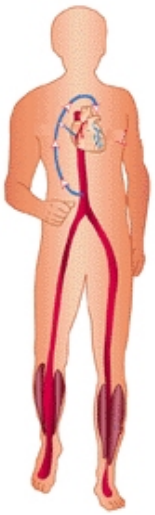
Early Symptoms
Delayed Symptoms
Classic Symptoms

Meningitis (6%) (rare, mostly in children)

Hemoptysis
Patchy/Consolidated Infiltrates (pneumonia)
Shock
Cyanosis

Hepatic Damage

Elevated WBC, DIC
Ecchymosis
Purpura
Petechiae



Fever, Chills, Malaise

Headaches

Stridor
Cough
Dyspnea

Vomiting
Cramps
Diarrhea

Myalgia
Bubo (dermal contact only)
Acral Gangrene

Pneumonic Plague Primary (Yersinia pestis)

Therapy

1. ***Streptomycin*** 15mg/kg bid IM x 10d (up to 1Gm bid) no pregnancy
OR
2. ***Gentamicin*** 5mg/kg IM or IV qd x 10d (Peds: 2.5mg/kg IM or IV tid)
OR
3. Alternates:

Doxycycline 100mg IV bid x 10d
(Peds: 2.2mg/kg IV bid, up to 200mg/d x 10d)

Ciprofloxacin 400mg IV bid x 10d
(Peds: 15mg/kg IV bid up to 1Gm/d x 10d)

Chloramphenicol 25mg/kg IV qid (may be added with Meningitis)
(Peds: 25mg/kg IV)

Therapy during Pregnancy

No streptomycin (same as non pregnant adults)

Pneumonic Plague Primary (Yersinia pestis)

Prophylaxis

1. ***Doxycycline*** 100mg PO bid x 7d
   (Peds: 5mg/kg/d bid dosing up to adult dose)
2. ***Ciprofloxacin*** 500mg PO bid x 7d
   (Peds: 20mg/kg PO bid)

OR

3. ***Tetracycline*** 500mg PO qid x 7d
   (Peds: 40mg/kg/d qid dosing)
4. **Alternates**
   Chloramphenicol 25mg/kg PO qid x 7d (available only outside US and only to children above 2yrs)
   TMP/SMX 20mg/kg Sulfa PO bid x 7d
   (no longer recommended by many experts)

Pneumonic Plague Primary (Yersinia pestis)

Isolation/Decon Precautions

1. Victim:	**U**ndress, soap/shower Contain/discard contaminated clothing
2. Responder/ Caregiver:	Standard Infection Control (I.C.) Procedures
3. Environment:	Normal cleaning, pest control for fleas and rodent activity

Smallpox (Variola virus) – Disease progression

Smallpox (Variola virus)

Characteristics

Bio-warfare Mode:	Aerosol
Incubation Period:	17d (10-12d)
Onset:	Abrupt
Duration:	4 weeks
Lethality:	Moderate (20-40% in unvaccinated; 3% in recently vaccinated)
Transmission:	High (person to person)

Smallpox (Variola virus)

Pre Exposure Prophylaxis

Smallpox vaccine

Post Exposure Prophylaxis

Smallpox vaccine within 4 days

Vaccinia Immune Globulin **(VIG) in some cases**

Smallpox (Variola virus)

Isolation/Decon

1. Victim	Undress, soap/shower
2. Responder/ Caretaker:	Standard and Airborne Infection Control (I.C.) Precautions (maintain until all scabs separate)
3. Environment:	Low-intermediate level chemical germicides

Smallpox Vaccine

- Vaccinia virus, not variola virus
- "Live"
- Low potential for spread to non-immune contacts
- Highly effective
- Generally safe

Benefit of Vaccine Following Exposure

- Within 3 days-prevent or significantly lessen severity of symptoms
- 4-7 days after exposure-some protection, may modify severity

Remember

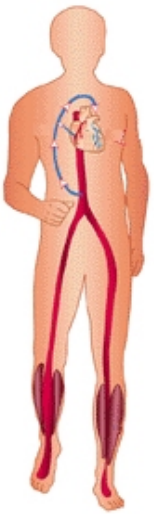
There are no contraindications to the smallpox vaccine if someone has been exposed to the smallpox virus!

Botulinum Toxin (Clostridium botulinum)

Syndromes
NEUROLOGICAL

Early Symptoms
Delayed Symptoms
Classic Symptoms

Alert
Mydriasis
Ptosis
Dysphonia
Dysarthria
Dysphagia
Respiratory Failure
Cyanosis
Postural Hypotension
Sensation Intac



Malaise, Weakness, Dizziness, No Fever

Double Vision
Photophobia
Dry Mouth
Sore Throat

Food-borne:
Nausea, Vomiting
Diarrhea, Cramping

Descending Symmetrical Paralysis
Paresis
DTR: decreased

Botulinum Toxin (Clostridium botulinum)

Characteristics

Analyzing a bioterror attack on the food supply: The case of botulinum toxin in milk
Lawrence M. Wein*[1] and Yifan Liu[2]

Bio-warfare Mode:	Aerosol or Food supply sabotage
Incubation Period:	1-5 days or within 24-36 hours if ingested, longer if toxin inhaled
Onset:	Gradual to progressive
Duration:	Death within 3 days, may last months if not fatal
Lethality:	High (60%) without rapid treatment or ventilatory support
Transmission:	No person-to-person transmission

Botulinum Toxin (Clostridium botulinum)

Therapy

1. ***Trivalent*** (A, B, E) ***Antitoxin**** (Equine: Skin Test)

**ONLY available from CDC through New Jersey Department of Health and Senior Services*

Botulinum Toxin (Clostridium botulinum)

Isolation/Decon Precautions

1. Victim:	Undress, soap/shower
2. Responder:	no decon necessary
3. Environment:	Normal housekeeping. Use EPA registered low-intermediate disinfectants. Gross contamination bleach solution as specific for anthrax

Viral Hemorragic Fever (VHF)

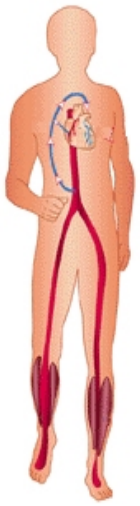
Syndromes
INFLUENZA
PULMONARY
HEPATIC
NEUROLOGICAL
DERMATOLOGICAL

Early Symptoms
Delayed Symptoms

Intracranial Hemorrhage
Conjunctival Hemorrhage
Confusion
Facial Flushing

Capillary Fragility
Disseminated
Intravascular
Coagulation
Shock
Pneumonia (Hanta)
Jaundice LFT
(RVF, MHF, EHF, YF)

Hematemesis
Melena
Renal Failure
(HFRS)
Thrombocytopenia
Leukopenia



Headache
Deafness
Visual Deficits (RVF)
Epistaxis
Sore Throat

Black Vomit (YF)
Nausea, Vomiting
Abdominal Pain
Diarrhea

Myalgia
Petecchiae
Purpura
Ecchymosis
Macular Rash (MHF, EHF)
Non-dependent
Swelling

Fever, Malaise, Prostration

Viral Hemorragic Fever (VHF)

Bunyaviridae
- Hantavirus (HFRS)
- Rift Valley Fever (RVF)
- Congo-Crimean (CCHF)

Arenaviridae
- Lassa Fever (LF)

Filofiridae
- Marburg (MHF)
- Ebola (EHF)

Flaviviridae
- Yellow Fever (YF)
- Dengue (DHF)
- Zika (ZF)

Viral Hemorragic Fever (VHF)

Therapy

1. Supportive
2. Ribavirin (CCHF, Arenavirus): 30mg/kg IV x 1 dose - 5mg/kg IV q 6h x 4d - 7.5mg/kg q 8h x 6d (caution: children/pregnancy)
3. Passive Antibody (Arenavirus, CCHF, BHF, and Lassa Fever)
4. Ribavirin (RVF): 30mg/kg q 6h x 4d - 7.5mg/kg/ q 8h x 6d

Viral Hemorragic Fever (VHF)

Prophylaxis

1. *YF vaccine*
2. *Ribavirin* (LF, HFRS, RVF, CCHF)
3. *Other vaccines (IND)*

Viral Hemorragic Fever (VHF)

Isolation/Decon

1. Victim: Undress, soap/shower
Contain contaminated clothing

2. Responder: Standard and Airborne Infection Control (I.C.) Procedures.

3. Environment: Intermediate level disinfectant

http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/vhf.htm

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Reference: FOI2014/06681

DST Strategy 03-03-01

[redacted]
Email: [redacted]

23 January 2015

Request for Information (RFI)

Title of request: Ebola within a bioterrorism context
Dstl reference: 20141001_Ebola within a bioterrorism c
Request from: [redacted]
Date of issue: 02/10/2014
Dstl author: [redacted]
Dstl reviewer: [redacted]

Dear [redacted]
Thank you for your email of 4th November requesting the following information:

"Please provide a copy/copies of all assessments made in relation to the potential for the Ebola virus being used as a weapon. By weapon I mean that the virus could be used to inflict bodily harm, physical damage or death to a human.
** Please provide a copy/copies of all MOD-specific strategy documents in relation to dealing with Ebola."*

I am treating your correspondence as a request for information under the Freedom of Information Act 2000 (FOIA).

Query:

From phone conversation: [redacted] guidance on the feasibility and potential impact of a non-state actor (NSA) exploiting the Ebola outbreak in West Africa for bioterrorism.

Tanya Bindra/AP

Executive Summary:
We have considered [redacted] scenarios that broadly encompass the spectrum of NSA capabilities with regard to exploiting Ebola for bioterrorism. These scenarios are not Intelligence driven; [redacted]

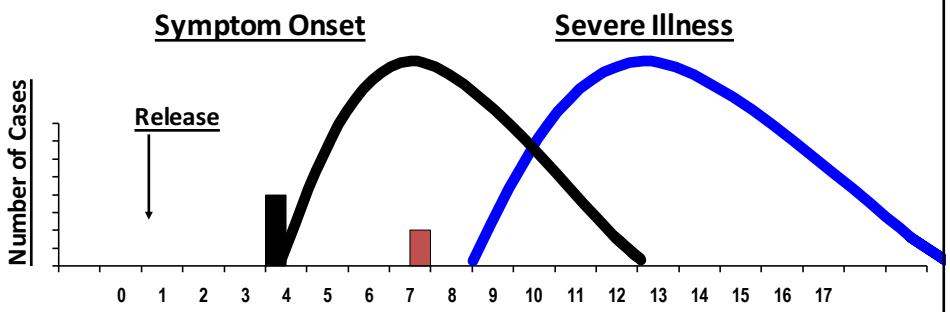
NSA Threat Assessments are provided by the Joint Terrorism Analysis Centre (JTAC). Threats to UK deployed forces are provided by Defence Intelligence (DI). [redacted]

Screening for bioterrorist attacks

- Syndromic surveillance: community-wide real-time assessment for "signals"
  - Fever
  - Respiratory illness
  - Diarrhea
  - Vomiting
- Increased incidence above threshold suggests event (outbreak, bioterrorism)

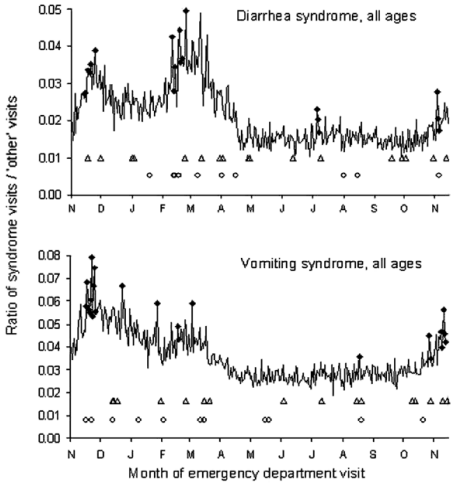
EID 2006 www.cdc.gov/ncidod/EID/vol10no5/03-0646.htm

Rationale for Syndromic Surveillance



Source: Marcy Layton, NYCDOH

Syndromic Surveillance: NYC 2001-02



EID 2006 www.cdc.gov/ncidod/EID/vol10no5/03-0646.htm

Syndromic Surveillance: NYC

- Enabled early detection of citywide influenza and norovirus outbreaks
- Did not detect several other localized outbreaks
- Offers promise for identification of bioterrorist events but utility unproven

EID 2006 www.cdc.gov/ncidod/EID/vol10no5/03-0646.htm

Detection and Response to Biological Attacks

- Confirmation
- Clean up
- Directed Prophylaxis
- Directed Therapy

Reminders

- Be alert and informed
- Practice Hand washing
- Administer Flu Vaccine

Do Not


THE CIPHER BRIEF

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EXPERT COMMENTARY

The Threat from Biological Weapons

JANUARY 17, 2018 | DR. BRETT EDWARDS

BRETT EDWARDS
LECTURER, UNIVERSITY OF BATH

Today, interest in the development of biological weapons is the mark of a desperate pariah state or terrorist group. International efforts have led to the de-legitimation of these weapons, improvements in defences, as well as improved processes of detection, attribution, and prosecution. Such efforts have also fostered the emergence of domestic legal frameworks worldwide. The centrepiece of this control regime is the Biological and Toxin Weapons Convention (BWC) which is over 40 years old. However, while this system stands as a testament to diplomacy and humanitarianism, it is worth remembering that the emergence of this regime and the norm it embodies was never guaranteed, and nor is its survival.

- Act on rumor
- Give antibiotics on demand - without medical indication
- Order nasal cultures - without medical indication

Emergency response to a bioterrorist event

- The following will overwhelm local health services very quickly:
  - Shortfalls of ICU beds, ventilators, critical care needs
  - Shortages of chemotherapeutic agents
  - Needs for ancillary or nontraditional treatment centers
  - High demand for mortuary and/or funeral services
  - High demand for social and counseling services
  - Shortages of health care workers due to absenteeism

Emergency response to a bioterrorist event

- Demands on medical care may last weeks to months after the initial onslaught.
- Essential community servants (eg, medical care personnel, police, firefighters, ambulance drivers, other first responders) may be affected.
- Elderly and other high-risk populations may be fearful of leaving their homes and seeking proper medical attention for chronic medical conditions and may require home visits for health care.

Mass fatality management

- A bioterrorist event is likely to produce significant numbers of fatalities, especially during the early phases of response.
- Issues involved with fatality management include the following:
  - Infection control
  - Victim identification and tracking
  - Establishment of temporary morgues
  - Disposal or release of remains

Baker DJ, Jones KA, Mobbs SF, Sepai O, Morgan D, Murray VSG: Safe management of mass fatalities following chemical, biological, and radiological incidents. *Prehospital Disast Med* 2009;24(3):180–188.

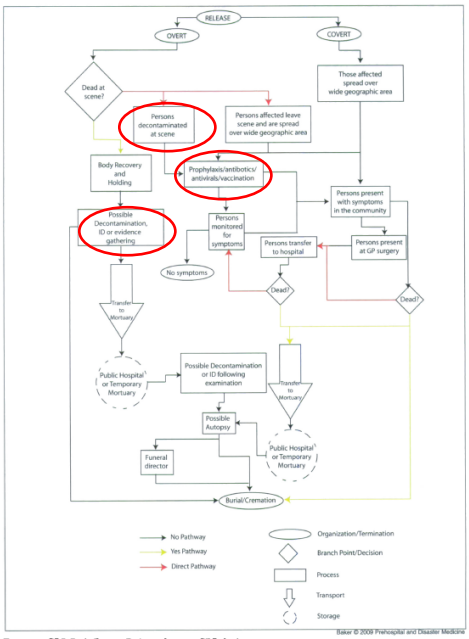
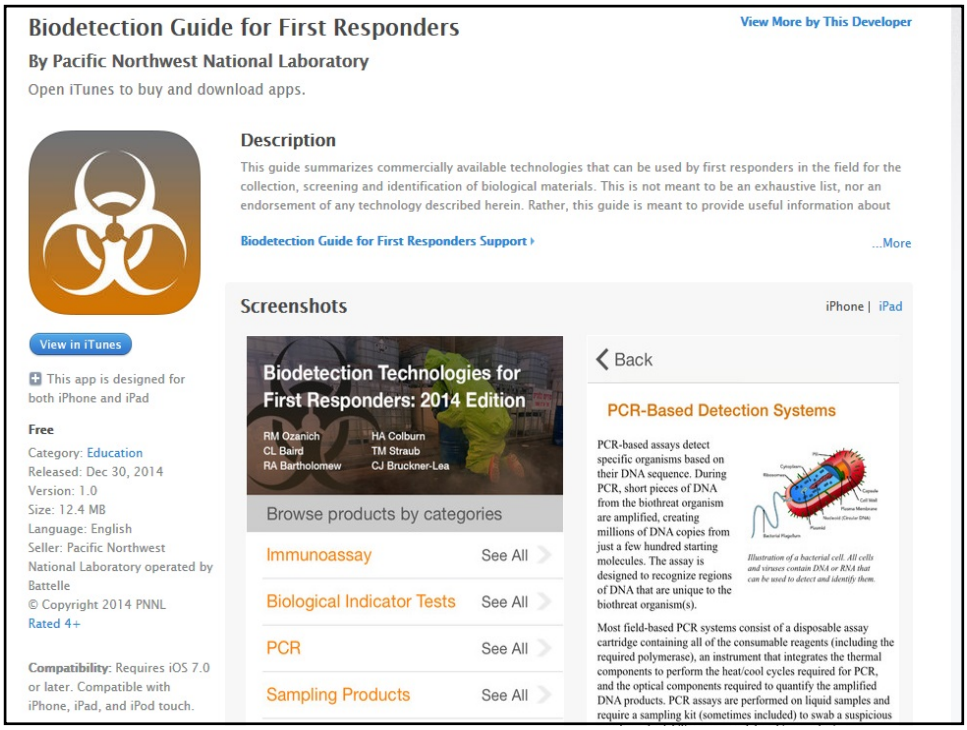


Figure 3—CBR Body Process Pathway for mass CBR fatalities

Bioterrorism: summary

- No events have occurred since the anthrax outbreak in 2001
- Technically difficult to disseminate an infectious agent or toxin, but possible
- Smallpox and anthrax are considered the greatest threats. Smallpox vaccine now stockpiled
- Response process requires a team approach
- Recognition may be challenging
- New computerized surveillance systems offer promise for early detection



Early information on "new and emerging infectious diseases"

- Early:
  - Emergency Preparedness and Response
    - Bioterrorism
      - » *emergency.cdc.gov/bioterrorism*
    - Bioterrorism Agents/Diseases
      - » *emergency.cdc.gov/agent/agentlist.asp*
  - BBC news world edition
    - » *http://www.bbc.com/news/world*
  - New York Times
    - » *http://www.nytimes.com/*
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