M. J. "Mike" Foster, Jr.
GOVERNOR

Louisiana Morbidity Report

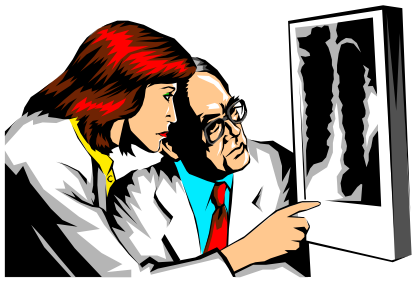
Louisiana Office of Public Health - Infectious Disease Epidemiology Section
P.O. Box 60630, New Orleans, LA 70160 (504) 568-5005
www.dhh.state.la.us/OPH/infectepi/default.htm

David W. Hood
SECRETARY

Special Edition

November-December 2001 Volume 12 Number 6

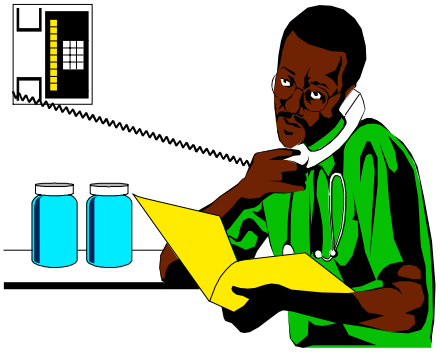
Early suspicion /intervention is our best chance at minimizing bioterrorism (BT) events



1-Suspect bioterrorism agents
2-Report to 504-568-5005
1-800-256-2748

Note: Calls to CDC are referred to state public health for preliminary investigation
Don't waste time! Call Louisiana Office of Public Health at 1-800-256-2748
An epidemiologist will answer the phone 24 hours a day. The epidemiolgist has immediate access to medical and laboratory experts to help you out

3.Establish diagnosis
4.Start treatment
5.Take isolation precautions



The Office of Public Health provides
- **Epidemiologic investigation**
- **Lab diagnostic support**
- **Intervention**
- **Training programs**

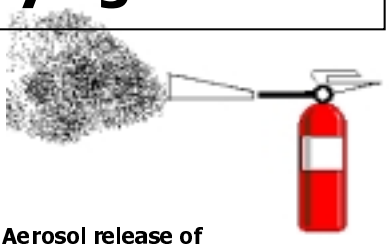
The most likely agents

Highest probability:

1. **Anthrax**
2. **Botulism**
3. **Plague**
4. **Smallpox**
5. **Tularemia**
6. **Hemorrhagic Fevers**
   Ebola, Marburg, Lassa Fever

Secondary list:

7. **Ricin**
8. **Staphylococcal Enterotoxin B (SEB)**
9. **Brucella**
10. **Q Fever**
11. **Glanders**



Most probable scenario = Aerosol release of

- **Anthrax spores (Bacillus anthracis)**
- **Crystalline Botulism toxin (Clostridium botulinum)**
- **Plague bacteria (Yersinia pestis)**
- **Smallpox virus**
- **Tularemia bacteria (Pasteurella tularensis)**

Less likely water:

- **Botulism toxin rapidly inactivated by water treatment (chlorination, aeration)**
- **Slow turn over of large capacity reservoirs**

Less likely food:

- **Limited outbreaks**
- **Slow progression**

Crop dusters are not great danger

Crop duster nozzles designed for heavy, concentrated mist with large 100 μ particles, BT needs fine mist for 1 to 5 μ particles

Why these agents?

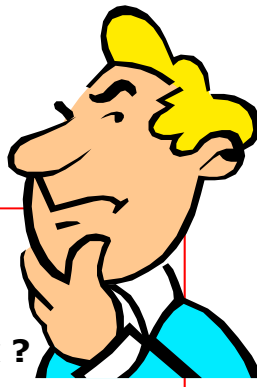
- Infectious via aerosol
- Organisms fairly stable in aerosol
- Susceptible civilian populations
- High morbidity and mortality
- Person-to-person transmission
- (smallpox, plague, VHF)
- Difficult to diagnose and/or treat
- Previous development for BW
- Some are easier to "weaponize" than others

It takes many germs to cause an infection

- Anthrax: 5,000 to 10,000 spores
  (For example workers in Pennsylvania goat hair mill inhaled 510 anthrax spores /8hr shift, day after day and no one caught anthrax)
- Botulism: 0.7-0.9 μg by inhalation, 70 μg orally
- Smallpox: unknown but ≃ few virions

- **What is an aerosol ?**
  An aerosol is a very tiny droplet (1 to 5 microns) that may contain a germ
- **Why are we so concerned about aerosols?** Because aerosols are so small they can actually be inhaled and reach deep into the lungs. From there, the germs may get into the blood stream rapidly and cause a generalized infection, commonly called blood poisoning
- Except for smallpox, the other germs do NOT occur naturally as aerosols. A bioterrorist has to grow these germs, and process the culture so that the germs remain stable in aerosols. **This is not easy!**
- If germs are not stable in aerosol form, they will not be able to reach a very large number of persons, but they still may be very dangerous to a few exposed people.
- Some action is necessary to disperse the aerosol in the air: agitation, propellent gas…
- Particles in the aerosols have no feet and no wings: they do NOT jump or fly by themselves

Suspect bioterrorism agent when…



1. Acute Respiratory Distress + Fever (ARDF)
+ chest Xray with widened mediastinum & NO pneumonia
+ NO trauma + NO hx of chronic disease……..=Anthrax ?

2. ARDF + pneumonia +GI symptoms + hemoptysis ……. = Plague ?

3.ARDF+ Pulmonary edema + NO hx of chronic disease…….= Ricin toxin ?

4. ARDF+ Normal chest Xray …….. = Staph toxin B ?

5. Eruptive Fever: vesiculo-pustular rash……..= Smallpox ?

6. Eruptive Fever: hemorrhagic eruption……..= Hemorrhagic fever ?

7. Severe sepsis of unexplained etiology……= Tularemia, Brucellosis ?

8. Acute bilateral descending flaccid paralysis…… = Botulism ?

9. Blistering syndromes…….. = Mycotoxin
= Staph enterotoxin B
=Chemical agents

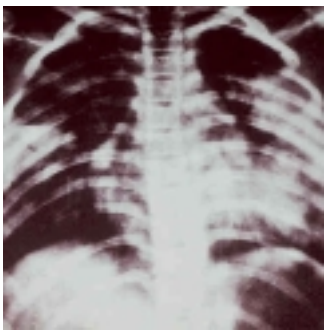
also suspect and report

- **Apparent infectious disease AND**
- **unusual number of patients with similar symptoms**
- **unusual presentation of symptoms**
- **patients presenting with a similar set of exposures**
- **unexplained case of a previously healthy individual with an apparently infectious disease?**

Acute Respiratory Distress +Fever

- Fever + chest pain, abrupt onset, acute respiratory distress,
- NO pneumonia on chest Xray,
- ⇨ Shock, death 24 hrs
- **ANTHRAX**
- **Differential Diagnosis :**
  - Dissecting aortic aneurysm
  - Pulmonary embolism

Blood Culture: Bacillus spp grows in 6hr
DO NOT assume B.cereus, identify Bacillus anthracis
Sputum unlikely to show B.anthracis
Detection by PCR or ELISA only from reference labs



- Severe pneumonia
- Hemoptysis
- GI symptoms
- ⇨ Shock
- PLAGUE
- Differential:
  - Community acquired pneumonia
  - Hantavirus Pulmonary syndrome
  - Meningococcemia

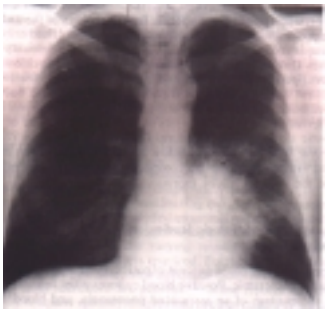
Sputum smear: Gram neg coccobacilli, bipolar staining

Blood Culture: growth in 24hr; may be missed; incubate also at 28C

IgM EIA, , PCR at reference labs

- Fever + cough ± hemoptysis, abrupt onset,
- Pleuro-pneumonitis severe
- Acute respiratory distress
- Pneumonia on chest Xray
- ⇨ Shock, death 24 hrs
- TULAREMIA
- Differential Diagnosis :
  - Atypical pneumonia, influenza, adenovirus, mycoplasma
  - Most difficult to differentiate from other "natural" outbreaks

MUST BE SUSPECTED CLINICALLY. Missed in routine microbiologic diagnosis tests. ID in smears with Fluorescent labeled antibodies (reference labs)
Culture of pharyngeal, fasting gastric washing, sputum, ±blood in enriched media
Antigen detection by PCR or ELISA only from reference labs



- Fever + chest pain + cough
- Acute respiratory distress, hypoxemia
- chest Xray: Normal, Pulmonary edema, pneumonia
- ⇨ death in 36-72 hrs
- RICIN toxin, STAPHYLOCOCCAL ENTEROTOXIN B
- Differential Diagnosis : Atypical pneumonia

Must be suspected clinically.
ELISA antigen detection in nasal swab, blood,

Severe Sepsis / Flu-like Illness

- Fever, chills, rigors
- Anorexia, nausea, vomiting
- Coryza, sore throat
- Headache, arthralgias, myalgia
- Fatigue, weight loss
- BRUCELLOSIS, TULAREMIA, QFEVER
- Differential Diagnosis: Numerous infectious diseases

MUST BE SUSPECTED CLINICALLY. Missed in routine microbiologic diagnosis tests. ID in smears with Fluorescent labeled antibodies (reference labs)

Culture of pharyngeal, fasting gastric washing, sputum, ±blood in enriched media

Antigen detection by PCR or ELISA only from reference labs

Hemorrhagic Fever

- Severe febrile illness
- Petechiae, hemorrhagic diathesis, Hypotension, thrombopenia,
- Disseminated intravascular coagulation (DIC)
- Organ system involvement
  - Headache, photophobia
  - Pharyngitis, cough
  - Nausea, vomiting, diarrhea
  - Hyperesthesia, confusion, tremors
  - AST elevation
- EBOLA, MARBURG, LASSA
- Differential Diagnosis : Malaria, typhoid, rickettsia, leptospira, Fulminant hepatitis, Yellow fever, Meningococcemia, Dengue HF

Petechial rash

Must be suspected clinically.

RT-PCR, Antigen capture ELISA.IgM ELISA

No viral culture without BL4 level lab

•bilateral mild ptosis
•dilated pupils
•disconjugate gaze
•absent periorbital smile symmetric facial muscles

Acute symmetric descending flaccid paralysis: Inhalational botulism ?

- Acute symmetric descending flaccid paralysis
- ++ cranial nerve involvement: ptosis, diplopia, blurred vision, dilated pupils, dysarthria, dysphonia, dysphagia (4D = difficulty seeing, speaking, swallowing)
- Progress to loss of head control, hypotonia, generalized weakness,
- Dysphagia and loss of gag reflex > intubation
- Airway obstruction (dysphagia & upper airway muscle paralysis) and inadequate tidal volume (diaphragm and accessory respiratory muscle paralysis) >> death
- No fever

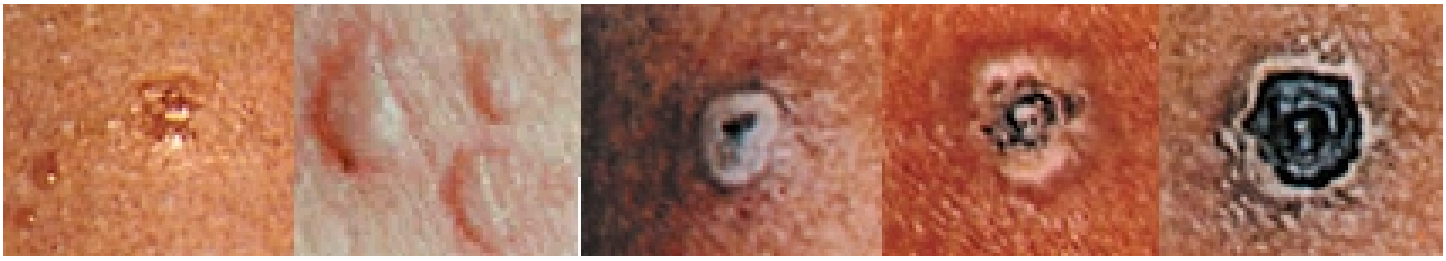
CDC: Stool, gastric aspirate, ±serum, vomitus

Mouse bioassay

Blistering Syndromes

- Abrupt onset of muco cutaneous airway irritation
  - Skin: pain and blistering
  - Eye: pain, tearing
  - GI: vomiting, bleeding, diarrhea
  - Airway: dyspnea, cough
- Differential Diagnosis: Thrichothecene mycotoxin, Staphylococcal enterotoxin B, Mustard agents

Eruptive Fever: Vesiculo-pustular rash Smallpox?



- High fever, malaise, prostration, headache, backache, severe abdominal pain, delirium
- Rash on mucosa of mouth & pharynx
  ➔face
  ➔ forearms
  ➔ trunk
  ➔ legs
- Evolution of lesions:
  ➔ Maculopapular
  ➔ Vesicular (1-2 day)
  ➔ pustular: pustules round, tense, deeply embedded
  ➔ Crusts (8-9th day); scabs
  ➔ pitted scarring

Clinical differentiation between Smallpox and Chickenpox (Varicella)		
	Smallpox	**Chickenpox**
Incubation	**7-17 days**	**14-21 days**
Prodrome	**2-4 days**	**minimal**
Rash distribution	**centrifugal**	**centripetal**
denser on	**face/extremities**	**trunk**
Palms/Soles	**Yes**	**Never**
Lesions appear	**all in 1-2day**	**new q.few days**
Depth of lesion	**dense base**	**superficial**
Evolution	**same age**	**different stages**
vesicles, pustules, scabs	**all synchronous**	**asynchronous**
Scab formation	**10-14 days**	**4-7 days**

Establish diagnosis

Anthrax, Inhalational

Sputum and blood: smear and culture

Blood: Bacillus spp grows in 6-24hr, identify by subculture on sheep blood agar

India ink test shows capsule in clinical specimens

Detection by PCR or ELISA only from reference labs

No antibody testing useful for diagnosis

Smear: short 2-4 cells chain encapsulated Gram+ rod, box cars

Anthrax, cutaneous

Liquid from vesicle, side of eschar

In 6-24hr ground glass Medusa head colonies Not hemolytic Not motile

Botulism

Serum: identification of toxin by mouse bioassay;10 ml;asap after onset, before antitoxin administration;

Feces, gastric aspirates: identification of C.botulinum & toxin production; 15-25g; Store and ship at 4°C; do NOT freeze; No preservative;

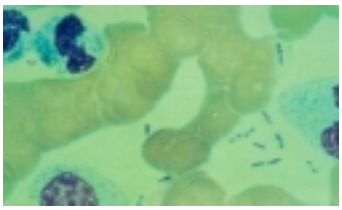
Food: identification of C.botulinum & toxin production; ½ Cup; in original container, then sterile unbreakable container then in leak proof bag; Store and ship at 4°C; if frozen food, keep frozen

toxin production confirmed by mouse bioassay

Nasal mucosa: ELISA identification of botulinum toxin in swabs within 24 hrs of inhalation (Reference lab)

Plague

Y.pestis in lymph node aspirate (from buboes), blood (all clinical forms), in sputum or tracheal wash (pneumonic cases), CSF



Gram stain: plump bipolar gram negative bacilli (closed safety pin morphology)

Direct fluorescent assay (FA)

Cultures to confirm: Cary-Blair transportation, sheep blood agar,

brain heart infusion broth or Mc Conkey

Hemagglutination inhibition: 4-fold ↑ @ 8 wks = recent infection

ELISA IgM to detect anti-F1 antibodies: not very sensitive,

Smallpox

Rule out atypical chickenpox: Collect serum

Tularemia

Pharyngeal washings, sputum (not too useful), fasting gastric aspirates, blood or biopsy specimens

direct examination w direct fluorescent antibody or immunohistochemical stains in reference lab

Culture in cysteine-enriched broth, thioglycollate broth, cysteine heart blood agar, buffered charcoal-yeast agar, chocolate agar

Small opalescent colonies: 3 to 5 mm in 96 hrs

Antigen detection assays, PCR, ELISA, immunoblotting, PFGE in reference labs

Serology:

- **tube agglutination or microagglutination tests**
- **detect combined IgM +IgG**
- **4fold ↑ titer (acute /convalescent serum)**
- **single titer ≥ 1:160 tube agglutination or 1:128 microagg**

Hemorrhagic Fever

Rule out dengue hemorrhagic fever, malaria, typhoid, rickettsia, leptospira, fulminant hepatitis, yellow fever, meningococcemia

Collect serum to send to reference lab for RT-PCR, Antigen capture ELISA, IgM ELISA

www. bt. cdc. gov – click on agent/disease left banner then on lab protocol

Start Treatment

Anthrax IV	Initial Rx	Optimal if suscep	Duration
Adult	Cipro 400mg IV q12h	Peni G 4MUnit IV q4hr	60 days
Child >12yrs	Cipro 10-15mg/kg iv q12h	Peni G 4MU IV q4hr	60 days
Child <20kg	same	Peni G 50,000U/kg IV q6hr	60 days
Pregnant, Immunosuppressed		same as other adult	

Anthrax Oral	Initial Rx	Optimal if suscep	Duration
Adult	Cipro 500mg po q12h	Amoxicillin 500mg po q8hr	60 days
Child >20kg	Cipro 10-15mg/kg po q12h	Amoxicillin 500mg po q8hr	60 days
Child <20kg	Cipro 10-15mg/kg po q12h	Amoxicillin 15mg/kg po q8hr	60 days
Pregnant	Cipro 500mg po q12h	Amoxicillin 500mg po q8hr	60 days
Immunosuppressed		same as other adult	

Botulism

Ventilatory assistance and supportive care

Botulinum antitoxin: Most effective if given early

- Trivalent equine product against types A,B, and E currently available from CDC
- Human hyperimmune globulin

Antibiotics for infant/wound botulism: penicillin

Plague

Adult	Streptomycin	1g	IM	2/day
	Gentamicin	5mg/kg	IM/IV	qd
	Doxycycline	100mg	IV	2/day
	Ciprofloxacin	400mg	IV	2/day
Child	Streptomycin	15mg/kg	IM	2/day
	Gentamicin	2.5mg/kg	IM/IV	2/day
	Doxycycline	2.2mg/kg	IV	2/day
	Ciprofloxacin	15mg/kg	IV	2/day
Preg-nant	Gentamicin	5mg/kg	IM/IV	qd
	Doxycycline	2.2mg/kg	IV	2/day
	Ciprofloxacin	15mg/kg	IV	2/day

Adult	Doxycycline	100mg	po	2/day
	Ciprofloxacin	500mg	po	2/day
Child	Doxycycline	2.2mg/kg	po	2/day
	Ciprofloxacin	15mg/kg	po	2/day
Preg-nant	Doxycycline	100mg	po	2/day
	Ciprofloxacin	500mg	po	2/day

Smallpox: Supportive treatment

Tularemia

Adults Streptomycin 1g IM 2/day (? preg) 48hr response
Gentamicin 5mg/kg IV /day
Doxycycline 100mg IV /day
Ciprofloxacin 400 mg IV 2/day

Children Streptomycin 15mg/kg IM 2/day(max 2g)
Gentamicin 2.5mg/kg IM or IV 3/day
Doxycycline 100mg IV /day; weight<45kg 2.2mg/kg 2/day
Ciprofloxacin 15 mg/kg IV 2/day

Hemorrhagic Fevers: Supportive treatment

JAMA Consensus Statements

- Anthrax as a biological weapon. 1999; 281: 1735-1745
- Botulism toxin as a biological weapon. 2001; 285: 1059-1070
- Plague as a biological weapon. 2000; 283: 2281-2290
- Smallpox as a biological weapon. 1999; 281: 2127-2137
- Tularemia as a biological weapon. 2001; 285: 2763-2773

What can Public Health do for you ?
Educate, Advise, Watch:
Surveillance system

Many professionals have already been trained

Professional Associations have done a lot of education: websites, recommendations, guidelines

OPH supplement these programs and tries to identify and fill in all the gaps

OPH tracks, investigates suspicious illnesses for early identification

- **Educate**
  - **Physicians, Nurses, Lab personnel**
  - **Medical personnel**
  - **Emergency Medical Services personnel**
  - **Emergency Response Personnel**
- **Advise when you have a problem**
  - **Call to OPH 800-256-2748 reach a live epidemiologist 24 hours a day**
  - **Call Regional Medical Directors**
- **Watch: Surveillance system**
  - **Hospitals, Emergency rooms**
  - **Physicians**
  - **Emergency Medical Services**

Also
- **Coroners**
- **Death Certificate**
- **Hospital Discharges**

Report to OPH

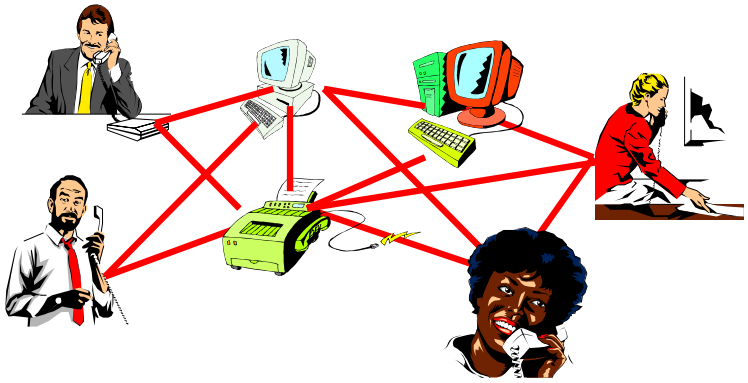
Investigation

If BT: Intervention

OPH Laboratory & Confirmation BT Agents

- Identify infection /Diseases of public health importance
- In case of outbreaks:
  - Most results available in 24hrs except if cultures are required
  - Samples processed 7 days /week
- Confirmation through CDC laboratories

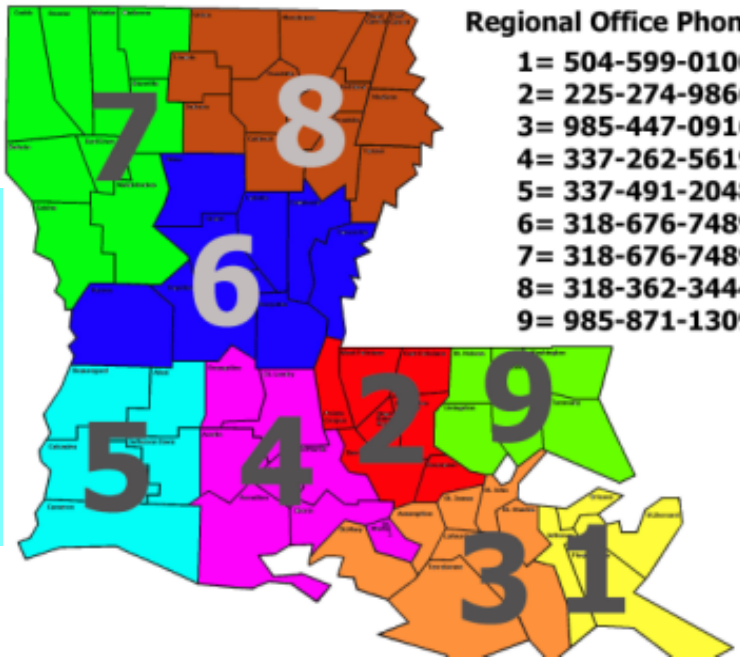
OPH participates in the Health Alert Network



During a BT event or health emergency OPH

- Provides medical staff with Louisiana specific recommendations and updates on the situation
- Relay national (CDC) alerts

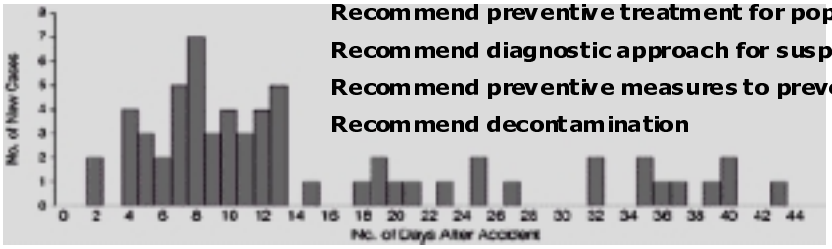
OPH has a Rapid Response Team in every region



Regional Office Phones

1= 504-599-0100
2= 225-274-9866
3= 985-447-0916
4= 337-262-5619
5= 337-491-2048
6= 318-676-7489
7= 318-676-7489
8= 318-362-3444
9= 985-871-1309

OPH Role in the Response



- Investigate to understand how the germs were spread
- Find out who may have been infected (population at-risk)
- Map cases
- Plot epidemic curve
- Determine the risk
- Recommend preventive treatment for population at risk
- Recommend diagnostic approach for suspects
- Recommend preventive measures to prevent the spread of in
- Recommend decontamination

Inform your Infection Control Practitioner

for institution of isolation precautions

for collection of preliminary epidemiologic information

Secondary Transmission

None	Anthrax
	Botulism
	Tularemia
Droplet	Pneumonic plague
Airborne	Smallpox

Isolation Precautions

Anthrax	Standard
Botulism	Standard
Tularemia	Standard
Pneumonic plague	Droplet
Smallpox	Airborne

Incubation Period

	Usual	Extremes
Anthrax	1-7 days	1-60 days
Botulism	12-72 hrs	2hrs-8days
Plague	1-6 days	
Smallpox	12-14 days	7-17 days
Tularemia	3-5 days	1-14 days

Transmissibility Period

Plague

Cough >>Duration of symtoms

SmallPox

Onset of rash >> 7-10 days

- JAMA Consensus Statements
  - Anthrax as a biological weapon. 1999; 281: 1735-1745
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  - Smallpox as a biological weapon. 1999; 281: 2127-2137
  - Tularemia as a biological weapon. 2001; 285: 2763-2773
- JAMA articles available at www. Hopkins-biodefense. org
- CDC: www. cdc.gov
  www. bt.cdc.gov /Agent /Agentlist.asp
- APIC: www. apic.org /bioterror/
- Michigan DOH: www mappp.org /epi /info
- Military: ccc. Apgea.army.mil /documents /html restricted /index 2htm
- Textbook of military medicine downloadable at www. nbc-med. Org
- http://www.biohazardnews.net/

LIST OF REPORTABLE DISEASES/CONDITIONS

REPORTABLE DISEASES

Acquired Immune Deficiency Syndrome (AIDS)
Amebiasis
Arthropod-borne encephalitis (Specify type)
Blastomycosis
Botulism[1]
Campylobacteriosis
Chancroid[2]
Chlamydial infection[2]
Cholera[1]
Cryptosporidiosis
Diphtheria
Enterococcus (infection; resistant to vancomycin)
Escherichia coli 0157:H7 infection
Gonorrhea[2]
Haemophilus influenzae infection[1]
Hemolytic-Uremic Syndrome
Hepatitis, Acute (A, B, C, Other)
Hepatitis B carriage in pregnancy
Herpes (neonatal)
Human Immunodeficiency Virus (HIV) infection[3]
Legionellosis
Lyme Disease
Lymphogranuloma venereum[2]
Malaria
Measles (rubeola)[1]
Meningitis, other bacterial or fungal
Mumps
Mycobacteriosis, atypical[4]
Neisseria meningitidis infection[1]
Pertussis
Rabies (animal & man)
Rocky Mountain Spotted Fever (RMSF)
Rubella (German measles)
Rubella (congenital syndrome)
Salmonellosis
Shigellosis
Staphylococcus aureus (infection; resistant to methicillin/ oxacillin or vancomycin)
Streptococcus pneumoniae (infection; resistant to penicillin)
Syphilis[2]
Tetanus
Tuberculosis[4]
Typhoid fever
Varicella (chickenpox)
Vibrio infections (excluding cholera)[1]

OTHER REPORTABLE CONDITIONS

Cancer
Complications of abortion
Congenital hypothyroidism*
Severe traumatic head injury**
Galactosemia*
Hemophilia*
Lead Poisoning
Phenylketonuria*
Reye's Syndrome
Severe under nutrition (severe anemia, failure to thrive)
Sickle cell disease (newborns)*
Spinal cord injury**
Sudden infant death syndrome (SIDS)
Traumatic Brain Injury

Case reports not requiring special reporting instructions (see below) can be reported by Confidential Disease Case Report forms (2430), facsimile, phone reports, or electronic transmission.

[1] Report suspected cases immediately by telephone. In addition, all cases of rare or exotic communicable diseases and all outbreaks shall be reported.

[2] Report on STD-43 form. Report cases of syphilis with active lesions by telephone.

[3] Report on EPI-2430 card. Name and street address are optional but city and ZIP code must be recorded.

[4] Report on CDC 72.5 (f. 5.2431) card.

All reportable diseases and conditions other than the venereal diseases, tuberculosis and those conditions with *'s should be reported on an EPI-2430 card and forwarded to the local parish health unit or the Epidemiology Section, P.O. Box 60630, New Orleans, LA 70160, Phone: 504-568-5005 or 1-800-256-2748 or FAX: 504-568-5006.

* Report to the Louisiana Genetic Diseases Program Office by telephone (504) 568-5070 or FAX (504) 568-7722.

** Report on DDP-3 form; preliminary phone report from ER encouraged (504-568-2509). Information contained in reports required under this section shall remain confidential in accordance with the law.

Numbers for reporting communicable diseases

1-800-256-2748 Local # 568-5005 FAX # 504-568-5006

Web site: http://www.dhh.state.la.us/oph/infectepi/default.htm

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OFFICE OF PUBLIC HEALTH
P.O. BOX 60630 NEW ORLEANS LA 70160