Infectious Disease Epidemiology Section
Office of Public Health, Louisiana Dept of Health & Hospitals
(504) 219-4563 or 800-256-2748 (after-hours emergency)
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ANTHRAX

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Anthrax is an acute infectious disease caused by the bacterium *Bacillus anthracis*. *Bacillus anthracis* is a gram-positive, spore-forming bacillus that can cause acute infection in both animals and humans. It is primarily a disease of herbivores, which acquire infection after coming into contact with soil-borne spores.

There remains concern regarding the possibility of terrorist use of biological agents to threaten either military or civilian populations. Anthrax spores were weaponized by several countries starting in the 1950's. Anthrax bacterium is easy to cultivate and spore production is readily induced. Spores are highly resistant to heat, sunlight and disinfections – properties which could be advantageous when choosing a bacterial weapon. Although production of mass quantities of anthrax is relatively easy, weaponizing to obtain stable microscopic particle requires skills and experience that are difficult to obtain outside a well organized bioweapon program. In October 2001, the anthrax mailings to the U.S. Senate building sparked an increase in the attention that this organism has received as a potential threat to the public's health.

Epidemiology

Anthrax is a zoonotic disease, one which usually occurs in animals but can be transmitted to humans. Humans can become infected following contact with infected animals or their contaminated products.

Reservoir: *B.anthracis* spores can live in the soil for 40 years or more. Spore forms of the organism are found in infected soil and have been found in soil in rural farming regions in several areas of the United States. Spores are found in hides, carcasses, hair, wool, bone meal, and other animal by-products of domesticated and wild animals, such as goats, sheep, cattle, swine, horses, buffalo, or deer. Imported dolls and toys decorated with infected hair or hides have been a source of infection. Infected animals are rare in the U.S.

Transmission: There are three forms of anthrax: cutaneous (skin), inhalation, and gastro-intestinal each caused by different transmission modes:

- Cutaneous anthrax, which occurs principally in agricultural and industrial employees, results from contact with infected animals, carcasses, hair (especially goat), wool, hides, and soil.
- Pulmonary (inhalation) anthrax results from inhalation of spores, coming from infected animal skins and hair. Although the soil in farms with infected animals contains anthrax spores, dust particles from the soil have not caused inhalational anthrax among farmers.
- Gastrointestinal anthrax results from ingestion of contaminated meat.
- No form of anthrax is transmitted from person to person.

Only two cases have been reported in Louisiana since 1960. Those two cases were reported in 1971 from Ascension Parish. Two men, both veterinarians, were involved in an investigation of 485 animal deaths from anthrax in Ascension Parish.

The incubation period for anthrax ranges from 2 to 60 days.

Clinical Description

Cutaneous anthrax
The spores deposited under the skin germinate and multiply. They produce a toxin responsible for lesions and tissue necrosis. If the bacilli are picked up by the lymphatic system, the infections may spread. These lesions occur in the exposed parts of the body: arms, then face and neck. A pruritic papule develops in a vesicle after a few days. The vesicle eventually becomes an ulcer. Several vesicles may coalesce to form a ring. The center becomes necrotic while the vesicles rupture. The lesion dries up and an eschar forms. Lesions are 1-3 cm in diameter. It is accompanied by regional lymphadenitis and mild systemic symptoms. Antibiotic therapy does not change the evolution of the lesion.

Malignant edema is a severe form of infection with large bullae, spreading edema with induration, chills and fever. Lesions of the face may become quite severe with necrosis of the eyelids.

Inhalation anthrax

The spores must be deposited in the alveoli where they are phagocytized by macrophages. They germinate and produce their toxin which causes necrosis and hemorrhage in the lungs. The pathological picture is hemorrhagic mediastinitis with destruction of the normal architecture.

The initial phase is a non specific illness, flu-like, with mild fever, dry cough, myalgia and chest pain. After 2-3 days a severe respiratory distress develops with severe dyspnea, cyanosis, high fever, pleural effusion, and in some cases, edema of the chest and neck. The only characteristic sign on the chest Xray is the widening of the mediastinum. Death can occur within 24 hours after onset of the severe phase. Inhalation anthrax is almost always fatal.

Gastrointestinal anthrax

Disease affecting the distal gastrointestinal tract results in nausea, anorexia and fever followed by abdominal pain, ascites and bloody stool. Symptoms may be so acute as to be mistaken for an "acute abdomen". Toxemia will cause death in a few days. The case fatality rate among reported cases ranges from 25%-60%.

Other: Meningitis, septicemia are rare complications of anthrax.

Laboratory

B.anthracis is a gram positive bacillus with a typical microscopic appearance. It forms long chains of large rectangular bacilli (each bacillus being 3 to 10 μ long and 1 μ wide) referred to as "boxcars". Spore stains show central or paracentral spores. It grows on ordinary media in 12 hrs to form grayish white convex colonies.

The diagnosis of anthrax relies in the identification of the bacilli. The bacilli are found easily in the vesicles and the pus. Their morphology and culture are easily recognized. The diagnosis of inhalation anthrax is more difficult if the infection is not suspected on epidemiologic information.

Bacillus anthracis is detected in capsule–stained (McFadyean–stained) smears and readily isolated in pure culture on blood or nutrient agar plates. With occasional exceptions, it is generally easy to identify *B.anthracis* and to distinguish it from other Bacillus species, including *B.cereus*. For all practical purposes, an isolate with the characteristic colonial morphology on nutrient or blood agar (matt appearance, fairly flat, similar to *B.cereus* but generally rather smaller, more tacky, white or grey–white on blood agar, and often having curly tailing at the edges), and which is non–hemolytic or only weakly hemolytic, non–motile, sensitive to the gamma–phage and penicillin, and able to produce the capsule in blood or on anaerobic culture on bicarbonate media is *B.anthracis*.

Blood culture contamination rates of 5 percent are not uncommon. In some institutions, contamination rates have run as high as 10 percent, which is not acceptable. Three percent is generally considered achievable. The majority of blood culture contaminants are Staphylococcus sp., usually coagulase-negative. Bacillus spp. are probably the second most common contaminant. Most of these would be *B.cereus*.

The OPH laboratory uses PCR testing to identify anthrax in environmental samples. Processing the tests takes approximately 2 to 3 hours. A positive PCR test provides a strong suspicion for the presence of *B.anthracis* but still needs culture for full confirmation.

Currently accepted as the best serological procedure, the ELISA in microtitre plates coated with the Protective Antigen (PA) component of the anthrax toxin in high pH (9.5) carbonate coating buffer. The toxin antigens appear to be truly specific for *B. anthracis*, although there is at present no commercial source of these. This tends to mean that anthrax serology is currently confined to a few specialist laboratories. Various versions of the ELISA exist and can be found in standard laboratory manuals; any version will do for anthrax serology.

Treatment

Natural B anthracis strains are resistant to extended-spectrum cephalosporins. Erythromycin, chloramphenicol, clindamycin, first-generation cephalosporins, aminoglycosides, and vancomycin are effective in vitro. The preferred treatment for anthrax is:

- IV penicillin G, 4 million units every 4 to 6 hours, for 10 days
- Some suggest addition of streptomycin (or gentamicin)
- Ciprofloxacin, 400 mg IV every 8 to 12 hours,
- Doxycycline, 200 mg IV and then 100 mg IV every 8 to 12 hours

Surveillance

Anthrax is a reportable condition. It should be reported immediately by phone because of concern about bioterrorism as a cause. Furthermore, all of the syndromic surveillance systems currently deployed by the Infectious Disease Epidemiology Section utilize sets of clinical signs and symptoms that have been crafted to capture cases of anthrax prior to the availability of laboratory test results.

Case Definition

A case of anthrax is defined as a clinically compatible case that is laboratory confirmed. The illness has an acute onset and can be characterized by several distinct clinical forms including:

1. Cutaneous: A skin lesion that evolves during a period of two to six days from a papule, through a vesicular stage, to a depressed black eschar
2. Inhalation: A brief prodrome resembling a mild upper respiratory illness, followed by development of hypoxia and dyspnea, with radiographic evidence of mediastinal widening
3. Intestinal: Severe abdominal distress followed by fever and signs of septicemia
4. Oropharyngeal: Mucosal lesion in the oral cavity or oropharynx, cervical adenopathy and edema, and fever.

Case investigation

The purpose of the case investigation is to

- Identify and confirm cases,
- Trace the source of infection with particular attention to the possibility of bioterrorism,
- Search for other exposed individuals,
- Assist the U. S. Department of Agriculture (by source identification) with the eradication of anthrax in cattle, swine, and other animals.

The public health and medical response to the threat or use of biological weapons differs from the typical epidemiologic case investigation for isolated anthrax cases only by the increased collaboration with law enforcement and emergency management agencies.

- Upon receipt of a report of anthrax immediately contact the Infectious Disease Epidemiology Section.
- Contact the physician and/or hospital to confirm the diagnosis.
- Obtain clinical details.
- Ask if any anthrax specific laboratory tests were performed. Request that an isolate be submitted to the state lab for confirmation.
- Attempt to identify
    - History of exposure to infected animals or animal products. Cases have occurred in industrial settings, probably related to the processing of batches of highly contaminated imported animal fibers, particularly goat hair.
    - History of travel because anthrax remains a problem in developing countries, animal products imported from these areas continue to pose a risk.
    - Occupation: occasional cases occur in industrial settings, related to the processing of batches of highly contaminated imported animal fibers, particularly goat hair.
    - Farming: skinning and cutting meat of an animal alleged to have shown symptoms of anthrax, eating contaminated meat, and handling contaminated meat in the process of selling it, and caring for a sick animal.
    - History of exposure to suspicious powders or other substances that are unusual.

Post-Exposure prophylaxis (PEP)

Antibiotic prophylaxis immediately after exposure suppresses clinical disease. Effectiveness depends on how early the PEP was instituted.

IV penicillin G, 4 million units every 4 to 6 hours, for 10 days.
Some suggest addition of streptomycin (or gentamicin).
Ciprofloxacin, 400 mg IV every 8 to 12 hours.
Doxycycline, 200 mg IV and then 100 mg IV every 8 to 12 hours.
Indications for prophylaxis are:

•Consumption of contaminated meat
No evidence supports the existence of persistent spores associated with gastrointestinal forms of the disease; however, if consumed meat is highly contaminated with *B.anthracis*, infection may occur. Although possible interventions range from close observation to antibiotics alone to antibiotics with vaccination, because of the family for anthrax infection, management consists of an extended course of ciprofloxacin combined with administration of anthrax vaccine.

Federally-inspected and state-inspected animal processing facilities are required to perform intensive cleaning after contact with anthrax-infected carcasses; veterinary inspection is not provided at custom meat processors. Slaughter house workers who may be exposed to an anthrax-contaminated carcass should receive medical evaluation for symptoms and for possible treatment

•Exposure to live spores: caring for a sick animal, exposure to fur, material woven with contaminated fibers.

•Post attack intervention

Oral fluoroquinolones are the drugs of choice for adults, including pregnant women. If fluoroquinolones are not available or are contraindicated, doxycycline is acceptable. Children should receive prophylaxis with oral ciprofloxacin.

Drug	Adults	Children
Oral fluroquinolones		
Ciprofloxacin	500 mg bid	20-30 mg/kg /d divided q 12hrs
Levofloxacin	500 mg once daily	Not recommended
Ofloxacin	400 mg bid	Not recommended
If fluoroquinolones are not available or are contraindicated		
Doxycycline	100 mg bid	5 mg /kg /day divided q 12 hr

• Prophylaxis should continue until exposure to *B.anthracis* has been excluded. If exposure is confirmed, prophylaxis should continue for 4 weeks and until three doses of vaccine have been administered or for 8 weeks if vaccine is not available.
• Use of tetracyclines and fluoroquinolones in children has well-known adverse effects; these risks must be weighed carefully against the risk for developing life-threatening disease. If a release of *B.anthracis* is confirmed, children should receive oral amoxicillin 40 mg per kg of body mass per day divided every 8 hours (not to exceed 500 mg three times daily) as soon as penicillin susceptibility of the organism has been confirmed.

Immunization

Immunization of high-risk persons such as veterinarians and others handling potentially contaminated carcasses or industrial raw materials may be warranted.

Postexposure vaccination with an inactivated, cell-free anthrax vaccine (Bioport Corporation, formerly Michigan Biologic Products Institute) is indicated in conjunction with chemoprophylaxis following a proven biologic incident Postexposure vaccination consists of three injections: as soon as possible after exposure and at 2 and 4 weeks after exposure. Anthrax

vaccine can be requested through CDC. Although this vaccine is now being administered routinely to U.S. military personnel, routine vaccination of civilian populations is not recommended. This vaccine has not been evaluated for safety and efficacy in children aged less than 18 years or adults aged greater than 60 years.

Prevention

Hospital precaution and isolation:

Standard precautions should be used for the duration of the illness for both cutaneous and inhalation anthrax. Anthrax is not transmitted from person to person. Therefore neither droplet nor airborne precautions are indicated.

Contaminated dressings and bedclothes should be burned or steam-sterilized to destroy spores.

Occupational anthrax: Disinfection of contaminated animal skins and hairs, industrial hygiene progress in reducing exposure of workers, dust-collecting equipment during the initial processing cycle and the institution of effective environmental clean-up procedures have reduced the risk in industrial settings. Employees should be educated about the disease and the recommendations for working in a contaminated environment and for reducing the risk of developing the disease. Medical consultation services should be available to employees. Adequate clean-up facilities and clothes-changing areas should be available so that workers do not wear contaminated clothes home.

Foodborne anthrax: Gastrointestinal anthrax can be prevented by forbidding the sale for consumption of meat from sick animals or animals that have died from disease. Depending on the circumstances, it may be important to alert persons who may come in contact with contaminated meat about the disease and about the need to cook all meats thoroughly.

Agricultural anthrax: Control of the disease in humans ultimately depends on control of the disease in animals. Effective animal vaccines are available, and all cases should be reported to state veterinary authorities. Management of anthrax in livestock should include

- quarantine of the herd;
- removal of the herd from the contaminated pasture, if possible;
- vaccination of healthy livestock: Immunization of animals repeated every year is effective in eradicating the disease. Immunizations of exposed individuals is useful in preventing human cases, but is rarely done on a large scale;
- treatment of symptomatic livestock; and
- disposal of infected carcasses, preferably by burning. Bedding and other material found around the carcass (e.g., soil) should be incinerated with the carcass and buried.

Veterinarians notified of sudden death in an animal or of an animal unable to rise should consider anthrax as a diagnosis, especially in areas where anthrax is endemic. However the potential risk for animal anthrax exists in all areas of the United States. Vaccination of livestock in areas where anthrax is endemic is the most effective method of prevention in animals and humans. Cases of anthrax in animals and cases of suspected human exposure should be reported immediately to the Louisianan Department of Health Infectious Disease Epidemiology Section at the number listed above.

Laboratory anthrax: spills, splashes, accidents have caused cases of anthrax in the laboratories.

Chlorine solutions. Commercially–prepared hypochlorite frequently takes the form of stock solutions having approximately 10% available chlorine (100 000 ppm). Thus, what is familiarly referred to in laboratories as "10% hypochlorite solutions" is a 1:10 dilution of the stock solution containing 10,000 ppm available chlorine.

Chlorine solutions are not highly stable and stock solutions should be titrated periodically to ensure that the correct level of available chlorine is. Since the stability of chlorine solutions is affected by concentration (and also by temperature and pH), subsequent dilutions should be made only as needed. Additionally, chlorine solutions should be changed frequently (at least weekly). It should be remembered that chlorine solutions corrode metals and perish rubber and that chlorine is rapidly neutralized by organic materials, including wood (as in wooden benches), soil, or specimens of blood or tissues.

Simple chlorine solutions are slow to kill spores. The sporicidal rate can be increased by using 50% methanol or ethanol to make the dilutions of the stock solution.

Rapid turnover items such as pipettes, disposable loops, microscope slides, sampling spoons, etc., should be immersed overnight in hypochlorite solutions with 10,000 ppm available chlorine and then transferred to an autoclave bin or bag for autoclaving, or to a bag for incineration.

Benches should be wiped down after use with hypochlorite solutions containing 10,000 ppm available chlorine. Because of their neutralizing effect on chlorine, wooden benches should be replaced by more suitable materials or covered with plastic or laminated sheeting, or with a proprietary covering designed for the purpose, such as Benchcote T (Whatman International Ltd, Maidstone, UK).

Spills and splashes on surfaces. Some thought must be given to the nature of the material spilled. For example, freshly growing *B. anthracis* cultures will have few, if any, spores and these will be incompletely dormant and more susceptible to disinfection procedures than, at the opposite extreme, purposely prepared spore suspensions.

In general, spills and splashes on floor, bench or apparatus should be flooded with hypochlorite solution containing 10,000 ppm available chlorine and vertical surfaces should be washed or wiped down thoroughly with cloths soaked in this solution (*the operator should wear gloves and safety spectacles while doing this*). Spills and splashes from fresh cultures can be mopped up with toweling after 5 minutes; the toweling should be placed in an autoclave bin or bag and autoclaved or in a bag for incineration. Spills or splashes of spore suspensions should be left for 30–60 minutes before mopping up unless the area can be sealed off and fumigated, in which case mopping up can be done after a few minutes and fumigation carried out immediately.

An alternative approach is to cover the contaminated area with absorbent material and wet this with an excess of disinfectant. Solutions of 10% formalin, 4% glutaraldehyde or 1% peracetic acid may be more appropriate than hypochlorite, but the choice must be weighed against the greater personal protection needed when using these.

Infectious Disease Epidemiology: Epidemiologic Response Checklist

Consultation/ Confirmation

☑ Discuss bioterrorism event definitions with key public health personnel (health officer, communicable disease control staff, laboratorians, etc.)

Laboratory Confirmation

☑ Identify point of contact (POC) at appropriate state public health Laboratory in a potential bioterrorist event

Notification

☑ Establish local notification network to be activated in case of a possible bioterrorist event; disseminate contact information and notification protocol

☑ Establish relationships with local Office of Emergency Preparedness and FBI contacts to be notified in a suspected bioterrorist event and maintain up-to-date contact information

Coordination

☑ Establish Epidemiologic Response as a part of local Incident Command System

☑ Identify personnel available for epidemiologic investigation and perform inventory of skills and duties

☑ Establish contacts at regional and Parrish health units identify potential personnel resources available for epidemiologic "mutual aid"

☑ Establish contacts at the local FBI office for coordination with epidemiologic/ criminal Investigation

Communication

☑ Identify epidemiologic investigation spokesperson and Public Information Officer (PIO)

☑ Establish communication protocol to be implemented during an epidemiologic investigation between PIO and epidemiologic investigation spokesperson

☑ Establish a plan for rapid dissemination of information to key individuals: FAX, Email, website on the internet (if capability exists)

Epidemiologic Investigation

A. Case Finding

☑ Establish plans/ capacity to receive a large number of incoming telephone calls

☑ Develop telephone intake form

☑ Identify individuals available to perform telephone intake duties

☑ Identify potential reporting sources (persons/ facilities) to receive case definition

☑ Establish a plan for rapid dissemination of case definition to potential reporting sources

B. Case Interviews

☑ Obtain appropriate case investigation questionnaires

☑ Identify personnel available to conduct case interviews

☑ Establish a protocol for training case interviewers

☑ Obtain template outbreak disease-specific investigation questionnaires

C. Data Analysis

☑ Obtain template database for data entry

☑ Assure Epi Info software is installed on data entry computers

☑ Identify personnel available for data entry

☑ Identify personnel with skills to perform descriptive and analytic epidemiologic analysis

☑ Develop/ obtain data analysis plan

☑ Develop/ obtain outbreak investigation monitoring tool

Contact Tracing

☑ Establish a system for locating contacts and familiarize personnel with contact tracing protocol(s)

☑ Obtain Contact Tracing Forms

☑ Obtain contact management algorithms for diseases that are communicable from person-to-person

☑ Obtain treatment/ prophylaxis guidelines

☑ Develop local drug and vaccine distribution plan

☑ Establish a system for daily monitoring of all contacts under surveillance

Public Health Recommendations

☑ Obtain treatment and prophylaxis recommendations for bioterrorist threat agents

☑ Develop or obtain bioterrorist disease-specific fact sheets

☑ Establish contact with key health care providers/ facilities and establish protocol for rapid dissemination of recommendations regarding treatment, prophylaxis, personal protective equipment, infection control, and isolation/ quarantine

Consultation / Confirmation

☑ Disease scenario meets the bioterrorist event definition

Laboratory Confirmation

☑ Lab specimens are en route to the local public health laboratory/ Laboratory Response Network

Notification

☑ Department of Health and Human Services
State Medical Officer
(225)342-3417 (regular business hours)
☑ (800)990-5366 pin 6710 (pager for evenings, weekends, holidays)
☑ State Epidemiologist (504)458-5428 Mobile
☑ Public Health Lab (504)568-5371
☑ Public Health Lab Pager (800)538-5388
☑ OPH Regional Offices (Internal Notification Network)
☑ Louisiana EOC (225)-925-7500
☑ Louisiana State Police (800)469-4828 (Crisis Management Center)
☑ Louisiana Department of Agriculture- Office of Animal Health
State Veterinarian Office: (225)935-2168 Mobile: (225)933-8121

Coordination

☑ Epidemiology personnel identified for investigation

☑ Additional epidemiology personnel support requested (From other regions) Investigation activities coordinated with FBI

Communication

☑ Epidemiology investigation spokesperson identified

☑ Communication protocol established between epidemiologic investigation spokesperson and Public Information Officer (PIO)

Epidemiologic Investigation

☑ Hypothesis-generating interviews conducted

☑ Preliminary epidemiologic curve generated

☑ Case definition established

A. Case finding

☑ Telephone hotline established

☑ Telephone intake form distributed

☑ Case definition disseminated to potential reporting sources
- Hospitals
- Physicians
- Laboratories
- EMS
- Coroner
- Media

B. Case interviews

☑ Interviewers trained

☑ Uniform multi-jurisdictional outbreak investigation form(s) obtained

C. Data Analysis

☑ Uniform multi-jurisdictional database template for data entry obtained

☑ Epidemiologic curve generated

☑ Cases line-listed

☑ Case descriptive epidemiology completed

- Age
- Gender
- Illness onset
- Clinical profile
- % Laboratory confirmed
- Hospitalization rate
- Case fatality rate
- Case geographic distribution mapped (GIS mapping if available)

Analytic epidemiology completed

- Disease risk factors identified
- Mode of transmission identified
- Source of transmission identified
- Population at continued risk identified

Contact Tracing

☑ Contact tracing forms distributed

☑ Health education materials available

☑ Contact management triage algorithm reviewed with staff

☑ Treatment/ prophylaxis guidelines available

☑ Treatment/ prophylaxis distribution plan in place

☑ System in place for locating contacts

☑ Tracking system in place to monitor contacts' trends/ gaps

Laboratory

☑ Establish point of contact (POC) at appropriate Level A and/ or Level B public health laboratory to refer queries regarding specimen packaging, storage and shipping guidelines in a potential bioterrorist event [See Laboratory Section's Bioterrorism Plan]

Public Health Recommendations

☑ See Medical Response Section Bioterrorism Plan.

ANTRHAX

Case investigation form

ID NUMBER:_____

INTERVIEWER:_____ JOB TITLE:_____

DATE OF INTERVIEW:_____/_____/____

PERSON INTERVIEWED: □ Patient □ Other

IF OTHER, NAME OF PERSON _____

TELEPHONE _____- _____- _____

DESCRIBE RELATIONSHIP _____

DEMOGRAPHIC INFORMATION

LAST NAME: _____ FIRST NAME: _____

DRIVER LICENCE OR SOCIAL SECURITY NUMBER (Circle one): _____

SEX: □Male □Female DATE OF BIRTH: ____/____/____ AGE____

RACE: □White □Black □Asian □Other, specify _____ □Unknown

ETHNICITY: □Hispanic □Non-Hispanic □Unknown

HOME PHONE: ( ) _____-_____ WORK/OTHER PHONE: ( ) _____ - _____

HOME ADDRESS STREET: _____
CITY:_____ STATE:_____ZIP:_____
EMPLOYED: □Yes □No □Unknown
BRIEF DESCRIPTION OF JOB:_____
SCHOOL/PLACE OF EMPLOYMENT:_____
DEPARTMENT_____ FLOOR:_____
ROOM:_____
WORK/SCHOOL ADDRESS: _____ CITY: _____
STATE:_____ZIP:_____

ARE YOU A:

LAB WORKER/TECHNICIAN:	☐Yes	☐No	☐Unknown
TAXIDERMIST:	☐Yes	☐No	☐Unknown
VETERINARIAN:	☐Yes	☐No	☐Unknown
FARMER:	☐Yes	☐No	☐Unknown
ABATTOIR:	☐Yes	☐No	☐Unknown
BUTCHER:	☐Yes	☐No	☐Unknown
OTHER FOOD PREPERATION:	☐Yes	☐No	☐Unknown

HOBBY:

Do you work with fibers/wool/animal skin/or other animal product?	☐Yes	☐No	☐Unknown
Have you been camping in past two months?	☐Yes	☐No	☐Unknown
Have you stayed in cabins in the past two months?	☐Yes	☐No	☐Unknown
Have you been hunting?	☐Yes	☐No	☐Unknown
Have you skinned or dressed and animal?	☐Yes	☐No	☐Unknown
Have you had an animal stuffed or mounted?	☐Yes	☐No	☐Unknown

HOW MANY PEOPLE RESIDE IN THE SAME HOUSEHOLD? _____

LIST NAME(S), AGE(S), AND RELATIONSHIPS (use additional pages if necessary):

	PERSON 1	PERSON 2	PERSON 3	PERSON 4	PERSON 5	PERSON 6
Name						
Age						
Relationship						

HOUSEHOLD PETS:

Does your household have any pets (indoor or outdoor)? ☐Yes ☐No ☐Unknown

If so what type of pet: _____

Have any of the pets been ill or died recently? ☐Yes ☐No ☐Unknown

If so describe: _____

CLINICAL INFORMATION (as documented in admission history of medical record or from case/proxy interview)

CHIEF COMPLAINT: _____

DATE OF ILLNESS ONSET: ____/____/____

Briefly summarize History of Present Illness:

_____
_____
_____
_____
_____
_____

SIGNS AND SYMPTOMS

Cough	☐Yes	☐No	☐Unknown
If yes, sputm production	☐Yes	☐No	☐Unknown
If yes, any blood	☐Yes	☐No	☐Unknown
Chest Pain	☐Yes	☐No	☐Unknown
Shortness of breath	☐Yes	☐No	☐Unknown
Stridor or wheezing	☐Yes	☐No	☐Unknown
Cayanosis	☐Yes	☐No	☐Unknown
Conjunctivitis	☐Yes	☐No	☐Unknown
Tender or enlarged lymph nodes	☐Yes	☐No	☐Unknown
Fever	☐Yes	☐No	☐Unknown
If yes, Maximum temperature _____ ☐°F			
Antipyretics taken	☐Yes	☐No	☐Unknown
Headache	☐Yes	☐No	☐Unknown
Stiff neck	☐Yes	☐No	☐Unknown
Muscle aches	☐Yes	☐No	☐Unknown
Fatigue	☐Yes	☐No	☐Unknown
Joint pains	☐Yes	☐No	☐Unknown
Altered mental status	☐Yes	☐No	☐Unknown
Unconscious/unresponsive	☐Yes	☐No	☐Unknown
Sore throat	☐Yes	☐No	☐Unknown
Nausea	☐Yes	☐No	☐Unknown
Diarrhea	☐Yes	☐No	☐Unknown
Vomiting	☐Yes	☐No	☐Unknown
Rash	☐Yes	☐No	☐Unknown

If yes, describe:_____

Other Symptom or abnormality:_____

PAST MEDICAL HISTORY:

Do you have a regular physician? □Yes □No □Unknown
If yes, Name:_____ Phone Number: (_____) _____-_____

Are you allergic to any medications? □Yes □No □Unknown
If yes, list: _____

Are you currently taking any medication: □Yes □No □Unknown
If yes, list:_____

Have you had any wound or lesion in the past several months?
□Yes □No □Unknown
If yes, where:_____ Appearance: _____

Hypertension	□Yes	□No	□Unknown
Neurologic Condition	□Yes	□No	□Unknown
Diabetes	□Yes	□No	□Unknown
Cardiac disease	□Yes	□No	□Unknown
Seizures	□Yes	□No	□Unknown

Other Pulmonary Disease □Yes □No □Unknown
If yes, describe:_____

Malignancy □Yes □No □Unknown
If yes, specify type: _____

Currently on treatment: □Yes □No □Unknown

HIV infection □Yes □No □Unknown

Currently pregnant □Yes □No □Unknown

Other immunocompromising condition (e.g., renal failure, cirrhosis, chronic steroid use)
□Yes □No □Unknown
If yes, specify disease or drug therapy:_____
_____
_____

Other underlying condition(s):
_____
_____
_____
Prescription medications:
_____
_____
_____

SOCIAL HISTORY:

Current alcohol abuse:	□Yes	□No	□Unknown
Past alcohol abuse:	□Yes	□No	□Unknown
Current injection drug use:	□Yes	□No	□Unknown
Past injection drug use:	□Yes	□No	□Unknown
Current smoker:	□Yes	□No	□Unknown
Former smoker:	□Yes	□No	□Unknown
Other illicit drug use:	□Yes	□No	□Unknown

If yes, specify:_____

HOSPITAL INFORMATION:

HOSPITALIZED: □Yes □No

NAME OF HOSPITAL:
_____

DATE OF ADMISSION: ____/____/____ DATE OF DISCHARGE ____/____/____

ATTENDING PHYSICIAN:
LAST NAME:_____ FIRST NAME:_____

Office Telephone: ( )____- _____ Pager: ( ) ____-_____ Fax: ( ) ____-_____

MEDICAL RECORD ABSTRACTION:

MEDICAL RECORD NUMBER: _____

HOSPITAL NAME: _____

WARD/ROOM NUMBER: _____

ADMISSION DIAGNOSIS(ES): 1) _____

2) _____

3) _____

PHYSICAL EXAM:

Admission Vital Signs:

Temp:____ (□Oral / □Rectal □F / □C) Heart Rate:_____ Resp. Rate:_____ B/P:___/___

Mental Status: □Normal □Abnormal □Not Noted
If abnormal, describe:_____

Respiratory status: □ Normal spontaneous □ Respiratory distress □ Ventilatory support
If abnormal, check all that apply:
□ Rales □ Stridor/wheezin □ Decreased or absent
Other (specify:_____)

Skin: □Normal □Abnormal □Not Noted
If abnormal, check all that apply:
□ Edema □ Chest wall edema □ Cyanosis □ Erythema
□ Petechiae □ Sloughing/necrosis □ Purpura □ Rash

If rash present, describe type and location on body :_____
_____

Other abnormal physical findings (describe): _____
_____
_____
_____

DIAGNOSTIC STUDIES:

Test	**Results of tests done on Admission (___/___/___)**	**Abnormal test result at any time (specify date mm/dd/yyyy)**
Hemoglobin (Hb)		(____/____/____)
Hematocrit (HCT)		(____/____/____)
Platelet (plt)		(____/____/____)
Total white blood cell (WBC)		(____/____/____)
WBC differential:		(____/____/____)
% granulocytes (PMNs)		(____/____/____)
% bands		(____/____/____)
% lymphocytes		

		(____/____/____)
Renal function: BUN/Cr		(____/____/____)
Liver enzymes: ALT/AST		(____/____/____)
Blood cultures:	□ positive (specify_____) □ negative □ pending □ not done (____/____/____)	□ positive (specify_____) □ negative □ pending □ not done (____/____/____)

Respiratory secretions: Specimen Type:	□ expectorated sputum □ induced sputum □ bronchial alveolar lavage (BAL) □ tracheal aspirate	□ expectorated sputum □ induced sputum □ bronchial alveolar lavage (BAL) □ tracheal aspirate (____/____/____)
Respiratory secretions: Gram Stain (Check all that apply)	□ PMNs □ epithelial cells □ gram positive cocci □ gram negative cocci □ gram positive rods □ gram negative coccobacilli □ gram negative rods □ gram negative rods with bipolar staining (safety pins) □ other_____	□ PMNs □ epithelial cells □ gram positive cocci □ gram negative cocci □ gram positive rods □ gram negative coccobacilli □ gram negative rods □ gram negative rods with bipolar staining (safety pins) □ other_____ (____/____/____)
Respiratory secretions analysis: Bacterial culture	□ positive (specify_____) □ negative □ pending □ not done	□ positive (specify_____) □ negative □ pending □ not done (____/____/____)
Respiratory secretions analysis: Viral culture	□ positive (specify_____) □ negative □ pending □ not done	□ positive (specify_____) □ negative □ pending □ not done (____/____/____)
Respiratory secretions analysis: Influenza antigen	□ positive □ negative □ pending □ not done	□ positive □ negative □ pending □ not done (____/____/____)
Test	**Results of tests done on Admission (___/___/___)**	**Abnormal test result at any time (specify date mm/dd/yy)**

Respiratory secretions: Other test (e.g., DFA, PCR, etc)		(____/____/____)
Chest radiograph	□ normal □ unilateral, lobar/consolidation □ bilateral, lobar/consolidation □ interstitial infiltrates □ widened mediastinum □ pleural effusion □ other _____	□ normal □ unilateral, lobar/consolidation □ bilateral, lobar/consolidation □ interstitial infiltrates □ widened mediastinum □ pleural effusion □ other _____ (____/____/____)
Legionella urine antigen	□ positive □ negative □ pending □ not done	□ positive □ negative □ pending □ not done (____/____/____)
Other pertinent study results (e.g., chest CT, pleural fluid)		(____/____/____)
Other pertinent study results (e.g., toxin assays)		(____/____/____)

PULMONOLOGY CONSULTED: □ Yes □ No □ Unknown

Date of Exam:__/__/__

Name of neurologist: Last Name _____ First Name _____

Telephone or beeper number ( ) _____ - _____

INFECTIOUS DISEASE CONSULT: □ Yes □ No □ Unknown

Date of Exam:___/___/___

Name of ID physician: Last Name _____ First Name _____

Telephone or beeper number ( ) _____ - _____

H0SPITAL COURSE:

A. antibiotics: □ Yes □ No □ Unknown
If yes, check all that apply:

- □ Amoxicillin
- □ Ampicillin
- □ Ampicillin and sulbactum (Unasyn)
- □ Augmentin (amoxicillin and clavulanate)
- □ Azithromycin (Zithromax)
- □ Cefazolin (Ancef, Kefzol)
- □ Cefepime (Maxipime)
- □ Cefixime (Suprax)
- □ Cefotentan (Cefotan)
- □ Cefotaxime (Claforan)
- □ Cefoxitin (Mefoxin)
- □ Ceftazidime (Fortaz, Tazicef, Tazidime)
- □ Ceftizoxime (Cefizox)
- □ Ceftriaxone (Rocephin)
- □ Cefuroxime (Ceftin)
- □ Cefalexin (Keflex, Keftab)
- □ Ciprofloxacin (Cipro)
- □ Clarithromycin (Biaxin)
- □ Doxycycline (Doryx, Vibramycin)
- □ Erythromycin (E-Mycin, Ery-Tab, Eryc)
- □ Gentamicin (Garamycin)
- □ Levofloxacin (Levaquin)
- □ Nafcillin
- □ Ofloxacin (Floxin)
- □ Streptomycin
- □ Ticarcillin and clavulanate (timentin)
- □ Trimethaprim-sulfamethoxazole (Bactrim, Cotrim, TMP/SMX)
- □ Vancomycin (Vancocin)
- □ other_____

B. antivirals : □ Yes □ No □ Unknown
If yes, check all that apply:

- □ Acyclovir (Zovirax)
- □ Amantadine (Symmetrel)
- □ Oseltamivir (Tamiflu)
- □ Rimantidine (Flumadine)
- □ Zanamivir (Relenza)
- □ other _____

C. Did patient require intensive care: □ Yes □ No □ Unknown
If patient was admitted to Intensive Care Unit:

a. Length of stay in ICU, in days:_____
b. Was patient on mechanical ventilation: □ Yes □ No □ Unknown

WORKING OR DISCHARGE DIAGNOSIS(ES) :

1) _____

2) _____

3) _____

OUTCOME:
□ Recovered/discharged
□ Died
□ Still in hospital: □ improving ? □ worsening ?

Risk Exposure Questions

The following questions pertain to the 2 week period prior to the onset of your illness/symptoms:

Occupation (provide information for all jobs/ volunteer duties)
1. Please briefly describe your job/ volunteer duties:_____

2. Does your job involve contact with the public? : □ Yes □ No
If "Yes", specify_____

3. Does anyone else at your workplace have similar symptoms?
□ Yes □ No □ Unknown
If "Yes", name and approximate date on onset (if known)_____
_____

Knowledge of Other Ill Persons
4. Do you know of other people with similar symptoms? : □ Yes □ No □ Unknown
(If Yes, please complete the following questions)

Name of ill Person	AGE	Sex	Address	Phone	Date of Onset	Relation To you	Did they seek Medical care? Where	Diagnosis

Travel*
*Travel is defined as staying overnight (or longer) at somewhere other than the usual residence

8. Have you traveled anywhere in the last two weeks? : □ Yes □ No □ Unknown

Dates of Travel: ____/____/____ to ____/____/____

Method of Transportation for Travel: _____

Where Did You Stay? _____

Purpose of Travel? _____

Did You Do Any Sightseeing on your trip? : □ Yes □ No
If yes, specify: _____

Did Anyone Travel With You? : □ Yes □ No
If yes, specify: _____

Are they ill with similar symptoms? : □ Yes □ No □ Unknown
If yes, specify: _____

Information for Additional Trips during the past two weeks:

Category	**Y/ N/ U**	**Description of Activity**	**Location of Activity**	**Date of Activity**	**Time of Activity** (start, end)	**Others ill? (Y/N/U)**
9. Airports						

10. Beaches						
11. Bars/Clubs						
12. Campgrounds						
13. Carnivals/Circus						
14. Casinos						
15. Family Planning Clinics						
16. Government Office Building						
17. Gym/Workout Facilities						
18. Meetings or Conferences						
19. Movie Theater						
20. Museums						
21. Parks						
22. Parties (including Raves, Prom, etc)						
23. Performing Arts (ie Concert, Theater, Opera)						
24. Picnics						
25. Political Events						
26. Religious Gatherings						
27. Shopping Malls						
28. Sporting Event						
29. Street Festivals, Flea Markets, Parades						
30. Tourist Attractions (ie French Quarter, Aquarium)						

Public Functions/Venues (during 2 weeks prior to symptom onset)

Transportation

Have you used the following types of transportation in the 2 weeks prior to onset?

31. Bus/Streetcar: □Yes □No □Unknown
Frequency of this type of transportation: □Daily □Weekly □Occasionally □Rarely
Bus Number: _____ Origin:_____

Any connections? □Yes □No (Specify: Location_____ Bus#_____)
Company Providing Transportation: _____ Destination:_____

32. Train: □Yes □No □Unknown
Frequency of this type of transportation: □Daily □Weekly □Occasionally □Rarely
Route Number: _____ Origin:_____
Any connections? □Yes □No (Specify: Location_____ Route #_____)
Company Providing Transportation: _____ Destination:_____

33. Airplane: □Yes □No □Unknown
Frequency of this type of transportation: □Daily □Weekly □Occasionally □Rarely
Flight Number: _____ Origin:_____
Any connections? □Yes □No (Specify: Location _____ Flight #_____)
Company Providing Transportation: _____ Destination:_____

34. Ship/Boat/Ferry: □Yes □No □Unknown
Frequency of this type of transportation: □Daily □Weekly □Occasionally □Rarely
Ferry Number: _____ Origin:_____
Any connections? □Yes □No (Specify: Location_____ Ferry #_____)
Company Providing Transportation: _____ Destination:_____

35. Van Pool/Shuttle: □Yes □No □Unknown
Frequency of this type of transportation: □Daily □Weekly □Occasionally □Rarely
Route Number: _____ Origin:_____
Any connections? □Yes □No (Specify: Location_____ Route #_____)
Company Providing Transportation: _____ Destination:_____

Food & Beverage
36. During the 2 weeks before your illness, did you eat at any of the following ***food establishments or private gatherings with food or beverages***?

Food Establishment	**Y/**	**Name of Establishment**	**Location of**	**Date of**	**Time of Meal**	**Food and Drink items consumed**	**Others ill?**

	N/U		Meal	Meal	(start, end)		(Y/N/U)
Cafeteria at School, hospital, or other							
Casino or mall food court							
Grocery Store or Corner Store							
Concert, movie, or other entertainment							
Dinner party, birthday party or other celebration							
Gas station or convenience store							
Plane, boat, train, or other							
Picnic, Barbecue, Crawfish boil, or potluck							
Outdoor farmers market, festival, or swap meet							
Restaurant, fast-food, or deli							
Sporting event or snack bar							
Street vended food							
Other food establishment							
Other Private Gathering							

37. During the 2 weeks before your illness, did you consume any free ***food samples*** from……..?
Grocery store? □Yes □No □Unknown
Race/competition? □Yes □No □Unknown
Public gathering? □Yes □No □Unknown
Private gathering? □Yes □No □Unknown

If "YES" for any in question #37, provide date, time, location and list of food items consumed:
Date/Time: _____
Location (Name and Address): _____
Food/drink consumed: _____
Others also ill? □Yes □No □Unknown
(Explain): _____

38. During the 2 weeks before your illness, did you consume any of the following ***products***?
Vitamins □Yes □No □Unknown
Specify (Include Brand Name):_____

Herbal remedies □Yes □No □Unknown
Specify (Include Brand Name):_____

Diet Aids □Yes □No □Unknown
Specify (Include Brand Name):_____

Nutritional Supplements □Yes □No □Unknown
Specify (Include Brand Name):_____

Other Ingested non-food □Yes □No □Unknown
Specify (Include Brand Name):_____

39. During the 2 weeks before your illness, did you consume any unpasteurized products (ie milk, cheese, fruit juices)? □Yes □No □Unknown
If yes, specify name of item:_____
Date/Time: _____
Location (Name and Address):_____
Others also ill?: □Yes □No □Unknown
(Explain): _____

40. During the 2 weeks before your illness, did you purchase food from any internet grocers?
□Yes □No □Unknown
If yes, specify date / time of delivery:_____ Store/Site:_____
Items purchased:_____
_____
_____
_____

41. During the 2 weeks before your illness, did you purchase any mail order food? □Yes □No □Unknown
If yes, specify date/time of delivery:_____
Store purchased from:_____ Items purchased:_____
_____
_____
_____

42. Please check the routine sources for drinking water (check all that apply):
□ Community or Municipal
□ Well (shared)
□ Well (private family)
□ Bottled water (Specify Brand:_____)
□ Other (Specify:_____)

Aerosolized water
43. During the 2 weeks prior to illness, did you consume water from any of the following sources (check all that apply):
□ Wells
□ Lakes
□ Streams
□ Springs
□ Ponds

□ Creeks
□ Rivers
□ Sewage-contaminated water
□ Street-vended beverages (Made with water or ice and sold by street vendors)
□ Ice prepared w/ unfiltered water (Made with water that is not from a municipal water supply or that is not bottled or boiled)
□ Unpasteurized milk
□ Other (Specify:_____)

If "YES" for any in question #43, provide date, time, location and type of water consumed:
Date/Time: _____
Location (Name and Address):_____
Type of water consumed: _____
Others also ill?: □Yes □No □Unknown
(Explain):_____

44. During the 2 weeks prior to illness, did you engage in any of the following recreational activities (check all that apply):
□ Swimming in public pools (e.g., community, municipal, hotel, motel, club, etc)
□ Swimming in kiddie/wading pools
□ Swimming in sewage-contaminated water
□ Swimming in fresh water, lakes, ponds, creeks, rivers, springs, sea, ocean, bay (please circle)
□ Wave pools? Water parks? Waterslides? Surfing?
□ Rafting? Boating? Hot tubs (non-private)? Whirlpools (non-private)?
□ Jacuzzis (non-private)? Other (Specify:_____)

If "YES" for any in question #44, provide date, time, location and type of activity:
Date/Time: _____
Location (Name and Address):_____
Type of water consumed: _____
Others also ill?: □Yes □No □Unknown
(Explain):_____

45. During the 2 weeks prior to illness, were you exposed to aerosolized water from any of the following non-private (i.e., used in hospitals, malls, etc) sources (check all that apply):
□ Air conditioning at public places
□ Vaporizers
□ Misters
□ Hot tub
□ Creek and ponds
□ Respiratory devices
□ Humidifiers
□ Whirlpool spas
□ Spa baths
□ Decorative fountains
□ Other (Explain) _____

If "YES" for any in question #45, provide date, time, and location of exposure to aerosolized water:
Date/Time: _____
Location (Name and Address):_____
Explanation of aerosolized water:_____
Others also ill?: □Yes □No □Unknown
(Explain):_____

Recreation (Activities that are not related to work)

46. In the past two weeks, did you participate in any outdoor activities?

. □Yes . □No □Unknown

(If "yes", list all activities and provide locations)

_____
_____
_____
_____

47. Do you recall any insect or tick bites during these outdoor activities?

. □Yes . □No □Unknown

(If "yes", list all activities and provide locations of activities)

_____
_____
_____
_____

48. Did you participate in other <u>indoor</u> recreational activities (i.e. clubs, crafts, etc that did not occur in a private home)?

. □Yes . □No □Unknown

(List all activities and provide location)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Vectors

49. Do you recall any insect or tick bites in the last 2 weeks?

□Yes . □No □Unknown

Date(s) of bite(s):_____ Bitten by: □Mosquito □Tick □Flea □Fly □Other:

Where were you when you were bitten? _____

50. Have you had any contact with wild or domestic animals, including pets?

. □Yes . □No □Unknown

Type of Animal: _____
Explain nature of contact:_____
Is / was the animal ill recently: □Yes . □No □Unknown
If yes please describe the animal's symptoms:
_____
_____
_____

Date / Time of contact:_____
Location of contact:_____

51. To your knowledge, have you been exposed to rodents/rodent droppings in the last 2 weeks?
. □Yes . □No □Unknown

If yes, explain type of exposure:_____
Date/Time of exposure:_____
Location where exposure occurred: _____