California Hospital Bioterrorism Response Planning Guide

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California Hospital Bioterrorism Response Planning Guide

TABLE OF CONTENTS

ACKNOWLEDGEMENTS ..... **iv**

INTRODUCTION ..... **v**

Purpose v
Disclaimer v
Organization of the Planning Guide v

SECTION 1 – BIOTERRORISM RESPONSE OVERVIEW **1**

What is Bioterrorism? 1
Recognizing a Bioterrorist Event 1
Federal Response to Bioterrorism 2
Role of the California Department of Health Services (CDHS) 3
Role of Local Health Departments 5
Required Reporting 6
The Hospital Emergency Incident Command System (HEICS) 7
Role of the Infection Control Practitioner (ICP) 7
Role of Employee Health Service 8
Training and Education 9
Preparing for a Large Influx of Patients 9
Managing the Psychological Aspects of Bioterrorism 10
Laboratory Support 10
Pharmacy Support 11
Discharge Planning 12
Evidence Collection 12
Decontamination of Patients and Environment 12
Post-mortem Care 13
The Media 13

SECTION 2 – BIOTERRORISM AGENTS BY CDC RECOMMENDATIONS FOR ISOLATION **14**

STANDARD PRECAUTIONS **14**

CONTACT PRECAUTIONS **18**

ANTHRAX (BACILLUS ANTHRACIS) **19**

OVERVIEW *19*
Table 1: Anthrax – Antibiotic Therapy for Contained Casualty Settings 23
Table 2: Anthrax – Antibiotic Therapy for Mass Casualty Settings or Post-Exposure Prophylaxis 24

ANTHRAX – QUICK REFERENCE *25*

ANTHRAX – FREQUENTLY ASKED QUESTIONS (FAQ) *26*

ANTHRAX – HOME CARE INSTRUCTIONS *28*

ANTHRAX – SCREENING FORM *29*

BRUCELLOSIS (*BRUCELLA SPECIES*)..... 30

OVERVIEW..... *30*

BRUCELLOSIS – QUICK REFERENCE..... *33*

BRUCELLOSIS – FREQUENTLY ASKED QUESTIONS (FAQ)..... *34*

BRUCELLOSIS – HOME CARE INSTRUCTIONS..... *36*

BRUCELLOSIS – SCREENING FORM..... *37*

BOTULISM (CLOSTRIDIUM BOTULINUM)..... 38

OVERVIEW..... *38*

BOTULISM – QUICK REFERENCE..... *42*

BOTULISM – FREQUENTLY ASKED QUESTIONS (FAQ)..... *43*

BOTULISM – HOME CARE INSTRUCTIONS..... *45*

BOTULISM - SCREENING FORM..... *46*

Q FEVER (COXIELLA BURNETII)..... 47

OVERVIEW..... *47*

Q FEVER – QUICK REFERENCE..... *49*

Q FEVER – FREQUENTLY ASKED QUESTIONS (FAQ)..... *50*

Q FEVER – HOME CARE INSTRUCTIONS..... *52*

Q FEVER – SCREENING..... *53*

TULAREMIA (FRANCISELLA TULARENSIS)..... 54

OVERVIEW..... *54*

Table 1: Tularemia – Antibiotic Therapy for Contained Casualty Settings..... 57

Table 2: Tularemia – Antibiotic Therapy for Mass Casualty Settings and Post-exposure Prophylaxis..... 57

TULAREMIA – QUICK REFERENCE..... *59*

TULAREMIA – FREQUENTLY ASKED QUESTIONS (FAQ)..... *60*

TULAREMIA – HOME CARE INSTRUCTIONS..... *62*

TULAREMIA – SCREENING FORM..... *63*

DROPLET PRECAUTIONS..... 64

PLAGUE (YERSINIA PESTIS) –..... 65

OVERVIEW..... *65*

Table 1: Plague – Antibiotic Therapy for Contained Casualty Settings..... 67

Table 2: Plague – Antibiotic Therapy for Mass Casualty Settings and Post-exposure Prophylaxis..... 67

PLAGUE – QUICK REFERENCE *69*
PLAGUE – FREQUENTLY ASKED QUESTIONS (FAQ) *70*
PLAGUE – HOME CARE INSTRUCTIONS *72*
PLAGUE – SCREENING FORM *73*
SMALLPOX (VARIOLA) **74**
RECOMMENDATIONS FOR ISOLATION *74*
SMALLPOX (VARIOLA) – OVERVIEW *80*
SMALLPOX – QUICK REFERENCE *86*
SMALLPOX – FREQUENTLY ASKED QUESTIONS (FAQ) *87*
SMALLPOX - HOME CARE INSTRUCTIONS *89*
SMALLPOX – SCREENING FORM *90*
SMALLPOX – SPECIMEN COLLECTION *91*
SMALLPOX – INFORMATION ABOUT VACCINATION *93*
SAMPLE SMALLPOX VACCINATION CONSENT FORM *97*
SMALLPOX VACCINATION INSTRUCTIONS *98*
VIRAL HEMORRHAGIC FEVER (VHF): **101**
RECOMMENDATIONS FOR ISOLATION *101*
OVERVIEW *107*
Table 1: VHF Differential Diagnostic Variables 111
VIRAL HEMORRHAGIC FEVER (VHF) - QUICK REFERENCE *112*
VIRAL HEMORRHAGIC FEVER (VHF) – FREQUENTLY ASKED QUESTIONS (FAQ) *113*
VIRAL HEMORRHAGIC FEVERS (VHF) – HOME CARE INSTRUCTIONS *114*
VIRAL HEMORRHAGIC FEVERS (VHF) – SCREENING FORM *115*
SECTION 3 ATTACHMENTS **116**
ATTACHMENT 1A: BIOTERRORISM (BT) COMMUNICATION PLAN *116*
ATTACHMENT 1B: EXTERNAL BT NOTIFICATION MATRIX *119*
ATTACHMENT 1C: INTERNAL BT RESPONSE TEAM NOTIFICATION MATRIX *120*
ATTACHMENT 2: MEDICAL RECORD REVIEW FORM *121*
ATTACHMENT 3: SUMMARY OF POTENTIAL BT DISEASE SYNDROMES *122*
ATTACHMENT 5: TEXT REFERENCES *126*
ATTACHMENT 6: INTERNET REFERENCES *127*

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INTRODUCTION

Purpose

The California Hospital Bioterrorism Response Planning Guide was developed by the Department of Health Services to assist hospitals in preparing for a possible bioterrorism event. Reducing the transmission of infectious agents such as plague, smallpox and viral hemorrhagic fevers to staff, patients, and the community will depend on how rapidly victims, including the worried-well, can be triaged, diagnosed, isolated when necessary, and treated. Early verbal or electronic communication with local health departments is essential in identifying, controlling and preventing disease transmission. Maintenance or transfer of other ongoing, essential hospital functions is also important, and will depend to a large degree on the effectiveness of planning for and implementation of response to a bioterrorist event.

This bioterrorism-planning guide should be modified to fit each hospital's structure, function, and patient population and should be integrated into the hospital's existing emergency management plan. As information related to recognizing, diagnosing, treating, and preventing bioterrorist related diseases is updated at the federal, state and local levels, hospitals should revise existing response plans accordingly.

Disclaimer

The recommendations contained in this document are intended to be advisory only. Hospital infection control and safety committees should review the recommendations and use them to develop facility specific policies to guide activities during a bioterrorism event or an outbreak of an infectious disease such as influenza or gastroenteritis.

Organization of the Planning Guide

The planning guide is organized in three primary sections as follows:

? Section 1 provides an overview of aspects of bioterrorism response relevant to hospitals, including the role of various hospital departments, government agency response roles, disease reporting, the systems used to manage emergency response, working with the media, and similar topics.

? Section 2 provides detailed information on bioterrorism agents. This section is organized by the current Centers for Disease Control and Prevention (CDC) *Guideline for Isolation Precautions in Hospitals*, 1996. Additionally special isolation recommendations have been developed for smallpox and late-stage viral hemorrhagic fevers, based in part upon CDC and Canadian recommendations for these diseases. In the event that a bioterrorist disease is suspected, the specific section on that disease can be removed and copied.

  The sections on each bioterrorism agent have five (5) subsections:

- Disease Overview;
- Quick Reference;
- Frequently Asked Questions;
- Disease Screening Forms; and
- Home Care Instructions

The section on smallpox contains additional information related to smallpox vaccination and includes

- Smallpox specimen collection;
- Information about vaccination;
- Sample smallpox vaccination consent form; and
- Smallpox vaccination instructions

- Section 3 contains the attachments to the planning guide, including a Communication Plan with internal and external contact flow charts, a form for Medical Record review, a chart listing bioterrorism disease syndromes, and a summary listing of text and internet references on bioterrorism.

California Hospital Bioterrorism Response Planning Guide

SECTION 1 – BIOTERRORISM RESPONSE OVERVIEW

What is Bioterrorism?

Bioterrorism is the deliberate release of pathogenic microorganisms (bacteria, viruses, fungi or toxins) into a community for the purpose of creating civil disruption. According to the Centers for Disease Control and Prevention (CDC) the most likely diseases to be associated with bioterrorism event include smallpox, anthrax, botulism, plague, and tularemia. Additionally viral hemorrhagic fever (VHF) viruses such as Lassa, Marburg, and Ebola rarely, if ever, identified in North America, may be deliberately introduced. Other potential agents include brucellosis, western and eastern equine viruses that cause encephalitis, Q fever, glanders, and toxin-producing *Staphylococcus aureus*. With the exception of small pox, VHF, and the encephalitis viruses, all bioterrorism agents can be treated with antibiotics or toxin antagonists if promptly diagnosed. The above-mentioned diseases are not meant to be inclusive, as there are many food - or water-borne agents that could potentially be used in a bioterrorist event.

Recognizing a Bioterrorist Event

The key to rapid intervention and prevention is to maintain a high level of vigilance. The early clinical symptoms of infection for most bioterrorism agents may be similar to common diseases seen by health care professionals every day. The principles of epidemiology should be used to distinguish cases of a disease currently circulating in the community from those representing an unusual event. The most common features of an outbreak caused by a bioterrorist agent include:

- A rapid increase (hours, days, or weeks) in the number of previously healthy persons with similar symptoms seeking medical treatment;
- A cluster of previously healthy persons with similar symptoms who live, work, or recreate in a common geographical area;
- An unusual clinical presentation;
- An increase in reports of dead animals;
- Lower rates of illness in those persons who are protected (e.g., confined to home; no exposure to large crowds);
- An increased number of patients who expire within 72 hours after admission to the hospital;
- Any person without a history of recent (within the past 2-4 weeks) travel to a foreign country who presents with symptoms of high fever, rigors, delirium, rash (not characteristic of measles or chick pox), extreme myalgias, prostration, shock, diffuse hemorrhagic lesions or petechiae; and/or extreme dehydration due to vomiting or diarrhea with or without blood loss.

Federal Response to Bioterrorism

At the Federal level there are many government agencies charged with developing a coordinated bioterrorism response plan. The Department of Health and Human Services (HHS) is the primary federal agency responsible for the nation's health and medical response. Within HHS, the Office of Emergency Preparedness (OEP) coordinates activities and works with other federal agencies including the Federal Emergency Management Agency (FEMA) and the Departments of Justice (DOJ) and Defense (DOD). Other agencies within HHS that play a key role in bioterrorism preparedness and response include the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA) and the National Institutes of Health (NIH).

The DOJ, acting through the Federal Bureau of Investigation (FBI) is the lead federal agency for coordinating federal response and is tasked with the responsibility for crisis management during a terrorist event or credible threat to public safety. Crisis management is primarily a law enforcement function that focuses on measures to identify and plan for resources necessary to anticipate, prevent, and or resolve a terrorist threat or incident. The FEMA is the lead federal agency in charge of consequence management. Consequence management includes measures to protect public health, rescue and medical treatment of casualties, evacuation of people at risk, protection of first responders, and preventing the transmission of infection. This agency also focuses on restoring essential government services and providing relief to governments, businesses, and individuals affected by the consequences of terrorism.

The National Pharmaceutical Stockpile (NPS)

The CDC has established the National Pharmaceutical Stockpile (NPS) program as a repository of antibiotics, chemical antidotes, life support medications, IV administration sets, airway maintenance supplies including ventilators, and other medical/surgical supplies. The California Department of Health Services (CDHS) and the Governor's Office of Emergency Services (OES) are the lead state agencies for obtaining access to the NPS. The NPS is designed to supplement and re-supply state and local public health and medical response teams in the event of a biological and/or chemical terrorism incident anywhere in the U.S.

There are 2 phases within the NPS program. First, there are 12 separate, yet identical caches of pre-packaged medical supplies called 12-hour Push Packages that are fully stocked, stored in environmentally controlled and secured warehouses, and ready for immediate deployment to any affected geographical area within 12 hours of the federal decision to release the assets. These Push Packages have been pre-positioned regionally throughout the United States.

Second, if the incident requires a larger or multi-phased response, Vendor Managed Inventories (VMI) will be shipped to arrive within 24 to 36 hours after the initial Push

Package. The VMI package will be comprised of pharmaceuticals and supplies "tailored" to a specific type of suspected or confirmed agent or combination of agents. The CDC has contractual agreements with manufacturers and vendors, throughout the United States, for each of the items in the VMI formulary. Should an event occur which exceeds the demands of any one or all 12 Push Packages, CDC will immediately notify its designated contract manufacturers to begin pulling stock and stand ready to transport VMI re-supply packages.

Currently, the NPS is activated through the normal Medical and Health Mutual Aid System. Initially, the NPS Push Package will be received by CDHS and OES personnel at an air terminal near an affected community. Distribution of the Push Package to affected communities involves coordination with local, state and federal agencies. The CDHS and OES are charged with developing an NPS response plan to distribute assets to local operational staging facilities. Local governments are responsible for coordinating the distribution of NPS assets to distribution sites.

It is not anticipated that healthcare facilities will be directly involved with the distribution of NPS assets. However, administrative personnel and infection control practitioners should be informed of local level plans and what role, if any, they might be expected to play in the distribution of assets to the community.

Disaster Medical Assistance Teams (DMAT)

The National Disaster Medical System (NDMS), through the U.S. Public Health Service, has developed teams of professional and paraprofessional medical personnel designated to provide emergency medical care during a disaster or other event. Each team is composed of about 100 volunteers who are trained to deal with a variety of medical conditions including burns and mental health. Other specialty DMAT teams include Disaster Mortuary Operational Response Teams, Veterinary Medical Assistance Teams and National Medical Response Teams. Each team is equipped and trained to provide medical care to victims of weapons of mass destruction.

DMAT deploy to disaster sites with sufficient supplies and equipment to sustain themselves for a period of 72 hours while providing medical care at a temporary or fixed medical site. In mass casualty situations, their responsibilities include triaging patients, providing medical care and preparing patients for evacuation. DMAT are designed to be a rapid-response element to supplement local medical care until other state and federal resources can be mobilized, or the situation resolved.

Role of the California Department of Health Services (CDHS)

CDHS is the lead state agency for public health surveillance and response to a bioterrorist incident or threat. The primary objectives of CDHS are to determine the etiology and source of the outbreak and to identify the most effective and efficient interventions to protect the public. In order to meet this objective, CDHS has published

a Bioterrorism Surveillance and Epidemiologic Response Plan (www.dhs.ca.gov) that includes the following elements:

CDHS Role and Responsibilities in Bioterrorism Surveillance

- Support local health departments to increase awareness of clinicians and laboratorians about bioterrorism threat agents and diseases;
- Strengthen existing disease surveillance systems;
- Utilize and/or develop surveillance systems that might be useful in detecting illnesses resulting from bioterrorist threat agents;
- Provide technical assistance to local health jurisdictions;
- Implement pilot surveillance systems for detecting bioterrorist events; and
- Coordinate expanded surveillance in the affected jurisdictions in the event of a suspected bioterrorist event or other biologic disaster.

CDHS Activities to Enhance Bioterrorism Surveillance

- Revise state disease reporting regulations to make all suspected and confirmed cases of bioterrorism diseases immediately reportable;
- Implement a rapid electronic laboratory disease reporting and alert system;
- Develop educational tools for increasing awareness about bioterrorism;
- Implement informal inter- and intra- departmental notification of unusual health events detected by existing surveillance systems (e.g., veterinary surveillance, botulinum antitoxin requests, influenza surveillance project);
- Provide technical assistance to local health departments piloting systems or mechanisms that could be useful in the detection of a bioterrorist event.

CDHS Role and Responsibilities in Bioterrorism Response

- Confirmation, by consensus agreement, that the disease scenario is moderately or strongly suggestive of a bioterrorism event;
- Notification of local, state, and federal bioterrorism response partners and, when deemed necessary, activation of the Bioterrorism Surveillance and Epidemiologic Response Team;
- Coordination with local, state, and federal public health leaders;
- Communication with other bioterrorism response partners such as the Office of Emergency Services (OES) and the Emergency Medical Services Authority (EMSA).
- Epidemiologic investigation to include developing a case definition, case finding, case interviews, data collection and analysis;
- Contact tracing;
- Surveillance for non-human diseases;
- Develop recommendations for treatment and post-exposure prophylaxis;
- Support and technical assistance for local immunization and prophylactic distribution, or quarantine efforts;
- Provide assistance for laboratory surveillance of biological agents.

Additionally, in accordance with the Standardized Emergency Management System (SEMS), during a suspected or confirmed biological terrorism event, CDHS personnel would staff the Joint Emergency Operations Center (JEOC) along with EMSA staff. The JEOC responsibilities are as follows:

- Acquire public health and medical personnel upon request from an affected region;
- Acquire medical supplies, pharmaceuticals, and equipment upon request of an affected region;
- Ensure coordination and information flow with local health departments, emergency management organizations, and providers of medical care, facilities, and supplies.

CDHS Surrogate Indicator Monitoring

How rapidly local and state health departments can respond to the crisis will depend on how rapidly they are notified of a possible outbreak. CDHS has proposed monitoring several surrogate markers that may indicate a bioterrorist event. The proposed markers include:

- Emergency department diversions;
- Emergency department visits and diagnosis;
- Nurse advise call centers;
- Over-the-counter pharmacy sales;
- Hospital admissions, diagnoses, and deaths; and
- Critical care unit admissions (CCU) and diagnoses.

Role of Local Health Departments

The local health department has the lead role in the early detection and identification of a bioterrorist event. In a multi-jurisdictional bioterrorist event, local, state, and federal public health leaders would participate in the epidemiologic investigation under a joint command structure.

Several counties in California have developed bioterrorist response plans and could implement these plans on very short notice. It is highly recommended that infection control practitioners, hospital epidemiologists, safety officers and administrators participate in city and county bioterrorism surveillance and response planning. Each local community should establish a process for strategic leadership, direction, coordination and assessment of activities to ensure local readiness, interagency collaboration and preparedness for bioterrorism, infectious disease outbreaks and other public health threats and emergencies. A local advisory committee should include representatives from the local health department, law enforcement agencies, fire departments, emergency rescue workers, occupational health workers, health care providers, community health centers, volunteer organizations, hospitals, emergency medical services, offices of emergency services and emergency management agencies.

In collaboration with federal, state and other local agencies, the readiness of local hospitals and healthcare systems should be assessed. The local community should be prepared to receive the NPS and procedures should be developed for the mass distribution of antibiotics, vaccines and other medical supplies. The plan should identify personnel to be trained for these functions.

Required Reporting

Communicable Disease Reporting

Immediate reporting of all bioterrorist threat diseases is critical for limiting the impact of a bioterrorist event. Emergency amendments to the California Code of Regulations (Title 17), effective November 5, 2001 (http://www.dhs.ca.gov/regulations) made those diseases that pose a significant threat as agents of biological terrorism immediately reportable by health care providers to the local health department. Health care providers include physicians, surgeons, veterinarians, podiatrists, physician assistants, registered nurses, nurse midwifes, school nurses, infection control practitioners, medical examiners, coroners and dentists. The regulations require health care providers to immediately report by telephone all suspected and confirmed cases of anthrax, botulism, brucellosis, plague (animal and human), smallpox, tularemia, varicella (deaths only), viral hemorrhagic fevers and outbreaks of any disease. In addition, unusual diseases defined as rare diseases or a newly apparent or emerging disease or syndrome of uncertain etiology that a health care provider has reason to believe could possibly be caused by a transmissible infectious agent or by a microbial toxin are also immediately reportable.

The regulation now requires local health officers to immediately report by telephone any suspected or confirmed bioterrorist threat diseases to the CDHS. The amendments also expand the reporting responsibilities of clinical, public health and veterinary laboratories. The regulations now require laboratories to report results indicative of a specified bioterrorist agent to the local health department within one hour of reporting to the physician.

Furthermore, the regulations now require that whenever a laboratory receives a request for diagnostic testing of suspected human anthrax, botulism, brucellosis, plague or tularemia, the CDHS Microbial Disease Laboratory (510 540 2242) must immediately be contacted. Similarly, any laboratory request for smallpox or viral hemorrhagic fever agents must be communicated immediately by telephone to the CDHS Viral and Rickettsial Disease Laboratory (510 307 8575).

Reporting to Licensing and Certification

Title 22, Section 70737(a) of the California Code of Regulation requires that “Any occurrence such as epidemic outbreak, poisoning, fire, major accident, disaster, other catastrophic or unusual occurrence which threatens the welfare, safety or health of patients, personnel or visitors shall be reported as soon as reasonably practical, either

by telephone or by telegraph, to the local health officer and to the Department. The hospital shall furnish such other pertinent information related to such occurrences that the local health officer or the Department may require."

The Hospital Emergency Incident Command System (HEICS)

The Incident Command System (ICS) was developed in the early 1970's by the fire service in order to allow agencies to respond to emergencies in an efficient, coordinated manner. Since its development, ICS has evolved into an "all-risk" system that can be utilized for all types of emergencies. The Hospital Emergency Incident Command System (HEICS) is based on ICS and, over the years, HEICS has been adapted for use by health care facilities. A feature of this system is the task-oriented Job Action Sheets (job descriptions) that inform those who participate in an emergency situation what they should do, when they should do it, and to whom they will report. On review of the job descriptions included in the HEICS, there is no Job Action Sheet for the ICP or the Hospital Epidemiologist (HE). It is essential that these two positions be identified in HEICS if the bioterrorism response plan is to be successfully integrated into the existing emergency management plan. Some of the tasks that may be assigned to the ICP or HE include:

- Collaborate with members of the Bioterrorism Response Team (See Section 3 - Communication Plan);
- Provide initial notification to the local health department;
- Communicate with the local health department as the number of victims increase or the number of patients exceed the number of available resources (staffing and beds);
- Estimate the number of victims likely to require health care in a bioterrorist event;
- Coordinate hospital admissions of patients who require isolation (smallpox, plague, and viral hemorrhagic fever);
- Coordinate hospital discharge of patients currently in negative pressure rooms with non-bioterrorist related infectious diseases such as tuberculosis;
- Determine the need for additional personal protective equipment including N-95 respirators;
- Communicate information to staff, visitors, current patients, and the media;
- Coordinate the procurement of additional life support equipment such as adult, pediatric, and neonate respirators;
- Coordinate the procurement of antibiotics and antitoxins;
- Brief the Incident Commander;
- Develop the incident status report; and
- Participate in scheduled meetings.

Role of the Infection Control Practitioner (ICP)

The ICP is responsible for managing the day-to-day activities of the hospital-wide infection surveillance, prevention, and control program. Because the role is highly visible in the hospital and surveillance for infections is a primary function, the ICP is in a

unique position to detect rapid or subtle increases in patients admitted with unusual clinical presentations.

Frequent rounds and surveillance in Critical Care Units (CCU), the Emergency Department (ED), and other patient care units is vital to the early recognition of a bioterrorism event. The medical record of patients admitted with unusual infectious disease symptoms should be reviewed. The ICP should, at a minimum, review microbiology reports and ED discharge diagnoses several times each week. It is essential that the ICP develop a syndrome or disease monitoring system for those departments that are likely to be the first affected by a bioterrorism event. The monitoring system should include a method of communicating with the ICP when a threshold of the following events is exceeded:

- Emergency room diversions due to increase utilization or CCU bed unavailability;
- Increase in the number of patients with influenza-like illness, rash with fever, gastroenteritis (vomiting and/or diarrhea), and acute asthma attack;
- Unexplained deaths occurring in otherwise healthy persons, especially if there is clinical evidence suggestive of an infectious disease process; and
- Increase in the number of persons with sepsis or septic shock.

The ICP should be specifically educated in the epidemiology, diagnosis, and treatment of all bioterrorism related diseases. Additionally the ICP should receive training in the hospital's emergency management plan and the local health department's surveillance and response plan and should be prepared to assume a leadership role in the hospital's response to a bioterrorist event. The ICP should always have a trained backup professional who can assume the role in the absence of the primary ICP.

Role of Employee Health Service

Employees exposed to bioterrorist agents that are communicable from person to person such as pneumonic plague, smallpox or viral hemorrhagic fever will require immediate and sustained medical follow-up for a prolonged period of time. The employee health service should be prepared to identify, educate, treat and provide emotional support to employees and their families.

A system to assess employees should be developed and implemented to help facilitate monitoring for clinical symptoms as well as exposures. In addition to the usual demographics the system should document:

- Place in the facility where exposure occurred (e.g., ED, CCU);
- Date of exposure;
- Family members sick with similar symptoms;
- Specific symptoms of employee;
- Date of onset of symptoms;
- Type of personal protective equipment worn, if exposure occurred in the hospital;
- Referral for medical assessment or treatment;

- Treatment recommended (e.g., hospitalization, quarantine at home, vaccination, or antibiotic prophylaxis;
- Notification of the local health department.

Employees should be instructed to seek medical treatment for a fever of greater than 100.4 degrees F and/or any symptoms of pneumonic plague, smallpox or viral hemorrhagic fever. The minimum criteria for employee exposure assessment should include:

- Pneumonic plague - unprotected contact with an infected case (no surgical mask worn within 3 feet of the infected patient); offer antibiotic prophylaxis and monitor the employee's temperature twice daily for 7 days following the last exposure date including days on antibiotic therapy.

- Smallpox - unprotected contact with an infected case (no N-95 Respirator worn within 7 feet and/or no gloves worn for contact with lesions); monitor employee's temperature twice daily for 17 days following the last exposure date (including vaccination days); consult with the local health department about vaccination.

- Viral hemorrhagic fever - unprotected contact with an infected case (no N-95 Respirator worn and patient was coughing and/or employee reports an exposure to blood or other body fluids); monitor employee's temperature twice daily for 21 days following the last exposure date.

Training and Education

Physicians, nurses, technicians, and administrative personnel should be trained in all aspects of the hospital bioterrorism response plan during new employee orientation and at least annually. Drills and exercises should be conducted periodically to assess the level of staff preparedness. The hospital bioterrorism response plan should be evaluated and revised annually, based on the results of internal and external drills and as new information becomes available.

Preparing for a Large Influx of Patients

No hospital is ever fully prepared for an immediate and sustained influx of patients who may require life support systems. When the number of patients exceeds the number of available beds and staffing, decisions will have to be made as to whether alternative, off-site facilities should be opened, who will staff these facilities, and how they will be supplied.

Some of these decisions include:

- Implementing the hospital emergency management plan and bioterrorism response plan;
- Canceling non-emergency surgeries and other elective procedures;

- Discharging patients to other acute care facilities out of the affected geographical area, or to long-term care or home care and assuring that the level of care required by these patients can be met;
- Increasing stock supplies of personal protective equipment including N-95 respirators, if required;
- Increasing stock supplies of antibiotics (oral and parenteral);
- Determining the availability and sources of additional medical equipment such as ventilators and IV pumps and other equipment normally rented;
- Deciding when it is safe to discharge patients with communicable diseases and developing specific discharge instructions;
- Determining the maximum capacity of the morgue.

Managing the Psychological Aspects of Bioterrorism

Following a bioterrorism event, anxiety and alarm can be expected from infected patients, their families, healthcare workers, and the worried well. Psychological responses may include anger, fear, panic, unrealistic concerns about infection, fear of contagion, paranoia, and social isolation. Infection control practitioners should include mental health workers (psychiatrists, psychologists, social workers, and clergy) when developing facility-specific bioterrorism response plans. The following are some points to consider:

- Communicate clear, concise information about the infection, how it is transmitted, what treatment and preventive options are currently available, when prophylactic antibiotics, antitoxin serum or vaccines will be available, and how prophylaxis or vaccination will be distributed;
- Provide counseling and possible anxiety-reducing medications to the worried well and victims' family members;
- Provide educational materials in the form of frequently asked questions (FAQ);
- Provide home care instructions;
- Provide information on quarantine and isolation;
- Information released to the public should be coordinated with local and state health officials.

Laboratory Support

With the possible exception of *Yersinia pestis* (plague) and some food- or water-borne disease agents, most hospital clinical laboratories are not equipped to confirm the identity bioterrorist pathogens. However, they can make presumptive identification of early cases, rule out the presence of many agents, and refer specimens to higher-level laboratories for more definitive identification. Each clinical laboratory should develop specific policies and procedures for collecting, packaging, and transporting specimens to the next level of expertise. Infection control practitioners should consult with local law enforcement and the FBI to determine what information should be included in chain-of-custody documents. Laboratories collecting blood specimens for serology testing

should retain an aliquot for a short time to accommodate lost specimens. The retained blood specimens should be kept in a secure locked cabinet.

Laboratory personnel should take maximum precautions when handling clinical specimens at all times. Laboratory personnel should wear appropriate personal protective equipment and all specimens should be opened, plated, or aliquotted in a biosafety hood.

The CDC Laboratory Response Network for Bioterrorism (LRN) has grouped laboratories according to their ability to support the diagnostic needs associated with a bioterrorist event.

? Level A: consists of hospital and most small health department laboratories. These laboratories use Biosafety Level (BSL)-2 precautions. The role of the level - A laboratory is to rule out the presence of bioterrorism agents or to package and ship specimens to level B or C laboratories as instructed by the local health department.

? Level B: consists of county laboratories with limited special diagnostic testing capability. These laboratories use BSL-3 precautions, if available. The role of the level - B laboratory is to perform susceptibility testing, isolate agents, provide agent confirmation, when possible, and package and ship specimens to level C or D laboratories.

? Level C: consists of state health department laboratories (for CDHS, the Microbial Diseases Laboratory or Viral and Rickettsial Diseases Laboratory) and other laboratories with advanced testing capabilities such as molecular technology. These laboratories use BSL-3 precautions. Level - C laboratories provide rapid agent specific confirmation.

? Level D: consists of CDC or select Department of Defense laboratories such as the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID). These laboratories use BSL-4 precautions. Level – D laboratories provide the highest level of agent characterization, and conduct research and development on laboratory methods to enhance bioterrorism agent identification.

Pharmacy Support

The pharmacy should maintain a reasonable, daily inventory of antibiotics currently recommended for the treatment of patients with suspected or diagnosed bacterial bioterrorist agents. These antibiotics include, but are not limited to, aminoglycosides, fluoroquinolones and doxycycline. Hospitals should develop criteria for stopping the non-essential use of prophylactic and therapeutic antibiotics until the NPS arrives at the local destination and preparations are made to distribute the stockpile assets.

Discharge Planning

In all probability, patients in the hospital at the time that a bioterrorist event is evolving will have to be evaluated for discharge. If patients require continued acute care, hospitals may have to make arrangements to transfer patients to other hospitals, or if stable, to home or long-term care facilities.

Patients with bioterrorist-related infections should not be discharged until they are deemed non-infectious (plague, smallpox, and viral hemorrhagic fever). For each bioterrorist disease included in the Planning Guide, there are home care instructions. These were developed primarily to care for patients who cannot be admitted to the hospital because maximum bed capacity and staffing levels had been reached or exceeded. These instructions can be modified to provide information for patients recuperating from an infectious disease.

Evidence Collection

In a bioterrorist event the primary goal is to protect and preserve the life and safety of the public, and all else is secondary. By the time the first patients seek treatment and a bioterrorist event is suspected, there may be no evidence to collect. Policies and procedures for evidence collection should be developed in consultation with the local FBI field office. In collaboration with local law enforcement and regional FBI representatives, hospitals should establish lines of authority about who will be responsible for evidence collection.

At a minimum, hospitals should have a supply of plastic bags, marking pens, and ties to secure the bags. Each individual bag should be labeled with the patient's name, medical record number, and date of collection. Forms should be developed to inventory valuables and provide documentation of the person responsible for the valuables. If valuables are to be transported to the FBI or local law enforcement agency, the facility should document who received them, where they were taken, and how the valuables will be returned to the owner.

Decontamination of Patients and Environment

In most cases, patient decontamination will not be necessary. The incubation period of biological agents makes it unlikely that victims of a bioterrorist event will present immediately following the exposure event. The one exception may be an announced release of a bioterrorist agent, with gross surface contamination of victims with a confirmed agent or material such as raw sewage. In the rare cases where decontamination may be warranted, simple washing with soap and water is sufficient. If necessary, environmental surfaces can be decontaminated with an U.S. Environmental Protection Agency (EPA) registered sporicidal disinfectant or with a 0.5% hypochlorite solution (1 part household bleach added to 9 parts water). Bleach solution should NOT be used to decontaminate patients or pets.

Post-mortem Care

Hospitals should assess the maximum number of cadavers that can be stored in the facility morgue at any one time. In the event that many people expire within a short period, the local or state government should assume responsibility for providing adequate refrigeration and disposal of deceased victims through the coroner's mutual aid system. Deceased persons should not be released to funeral homes until the local health department authorizes the disposition. Hospital pathologists should not perform autopsies unless the local health department explicitly authorizes the procedure.

The Media

The media should be informed about bioterrorism and the potential disease agents. Following the identification of a bioterrorist event the local or state health department should assume responsibility for contacting the media. Hospitals with assistance from the local health department should prepare a statement that details the number of victims, the symptoms, and where to obtain further information.

SECTION 2 – BIOTERRORISM AGENTS BY CDC RECOMMENDATIONS FOR ISOLATION

STANDARD PRECAUTIONS

Standard Precautions, as defined by the Centers for Disease Control and Prevention (CDC), are designed to reduce the risk of transmission of most disease causing microorganisms in any type of health care setting regardless of the patient's presumed or diagnosed infectious status. With the exception of smallpox, viral hemorrhagic fevers, and pneumonic plague, most infectious diseases caused by bioterrorism agents are rarely, if ever, transmitted from person-to-person. Standard Precautions should be integrated into all healthcare worker/patient care interactions that include contact with:

- Blood
- Non-intact skin
- Body fluids regardless of the presence or absence of visible blood (urine, feces, vomitus, wound and lesion drainage, pulmonary secretions including nasal and salivary secretions and tears)
- Skin soiled with visible blood or other body fluids
- Mucous membranes

The following bioterrorist agents - diseases require Standard Precautions.

Bioterrorism Agents – Diseases Requiring Standard Precautions Only

- *Bacillus anthracis* – Anthrax (See contact Precautions)
- *Brucellae* species – Brucellosis
- *Clostridium Botulinum* - Botulism
- *Coxiella burnetii* - Q fever
- *Francisella tularensis* – Tularemia (See Contact Precautions)

OSHA Bloodborne Pathogens Standard

Healthcare workers should follow facility specific policies and procedures for reducing the risk of occupational exposure to blood and other potentially infectious materials as required by the California Occupational Safety and Health Administration's (CAL-OSHA) Bloodborne Pathogens Standard.

Patient Placement

Place patients in an available bed on any nursing unit. Patients with similar syndromes may also be cohorted (grouped) in semi-private or multiple-bed rooms. Special ventilation is not required. Consider placing patients who consistently soil the immediate environment with visible blood or body fluids (e.g., incontinence, wound drainage not contained by a dressing or poor hygienic habits) in a private room.

Visitors

Limit visitors to immediate family members and significant others. Instruct visitors to wash their hands before and after patient contact and before leaving the patient's room.

Personal Protective Equipment (PPE)

Gloves

Wear disposable gloves when contact with visible blood and body fluids is anticipated. Gloves should also be worn when touching environmental surfaces and patient care articles visibly soiled with blood or body fluids. Gloves should be put on just prior to performing a patient care task that involves contact with blood or body fluids and removed immediately, without touching non-contaminated surfaces, when the task is complete. When performing multiple procedures on the same patient, gloves should be changed after contact with blood and body fluids that contain high concentrations of microorganisms (e.g., feces, wound drainage or oropharyngeal secretions) and before contact with a clean body site such as non-intact skin and vascular access sites.

Facial Protection

Wear disposable, fluid-resistant masks and eye shields (goggles with side-shields) or a face shield if the patient is coughing or when performing patient care tasks likely to generate splashing or spraying of blood and body fluids onto the mucous membranes of the face.

Gowns

Wear disposable, fluid-repelling gowns to protect skin and clothing when performing procedures likely to generate splashing or spraying of blood and body fluids. Plastic aprons may be worn for procedures likely to soil clothing but are unlikely to generate splashing or spraying of blood or body fluids (e.g., cleaning incontinent patients). The material composition of the gown should be appropriate to the amount of fluid penetration likely to be encountered. Remove soiled gowns after patient contact. Reusable cloth gowns may be used for patient contacts, if splashing or spraying of blood and body fluids is unlikely. Disposable or reusable gowns should be worn once and then discarded.

Handwashing

Wash hands with soap (antimicrobial or non-antimicrobial) and water after protected (gloved) and unprotected (ungloved) contact with visible blood, body fluids (secretions, excretions [urine and feces], wound drainage and skin visibly soiled with blood and body fluids). Wash hands before leaving the immediate vicinity of patient contact (patient room, cubicle, or bathroom). After handwashing, avoid touching the patient and surfaces or items in the immediate vicinity of the patient (bedpans, bed rails, and bedside tables). Decontaminate hands with an alcohol or quaternary ammonium-based ("quat") product after contact with invisible soil (protected or unprotected hands have not been in contact with visible blood or body fluids) and after prolong contact with the clean, dry intact skin of the patient (lifting, turning, ambulating).

Transporting Patients

Transport patients to diagnostic services according to facility procedure.

Laboratory Specimens

Transport specimens to the laboratory according to facility procedure. Specimens should not be sent to the laboratory by a tube system. Laboratory personnel should adhere to the chain of custody protocols developed by CDHS and the FBI.

Dietary Trays

Transport dishes and utensils to the kitchen for routine dishwashing. Disposable equipment is not necessary.

Patient Care Equipment

Equipment such as bedpans, urinals, and emesis basins should be cleaned in a manner that prevents splashing and spraying of blood and body fluids onto the healthcare worker's clothing, skin and mucous membrane. Reusable equipment that requires cleaning and disinfection or sterilization should be sent to central service in covered containers for reprocessing. Disposable equipment not intended for reuse should be discarded.

Housekeeping

Clean environmental surfaces daily, when visibly soiled with blood and body fluids, and after the patient is discharged from the room with an Environmental Protection Agency (EPA) registered disinfectant.

Soiled Linen

Place soiled linen in leak-proof bags and seal. Transport and process according to facility procedure.

Patient's Clothing

Bag patient's clothing if visibly soiled with blood or body fluids and send home with a family member with instructions to use warm water and a commercial laundry product. If no family member is available, follow the facility procedure for washing and drying patient's clothes. Before washing or sending the patient's clothes home, determine whether the FBI wants to retain the clothes as evidence.

Biohazard waste

Follow facility specific biohazard waste management procedures.

Deceased Patient

Place the deceased patient in a leak-proof body bag and transfer to the facility morgue.

CONTACT PRECAUTIONS

Cutaneous anthrax and tularemia can be transmitted to healthcare workers by contact with the infected patient's wound or lesion drainage. In addition to Standard Precautions, Contact Precautions should be followed.

Patient Placement

Place patients with open draining lesions in a private room, if available. Patients with the same diagnosis may be cohorted (grouped) in semi-private rooms. When a private room or cohorting is not achievable, separate infected patients at least three (3) feet away from non-infected patients.

Visitors

Limit visitors to immediate family members or significant others. Instruct visitors to wash their hands their hands before and after patient contact and before leaving the patient's room.

ANTHRAX (BACILLUS ANTHRACIS)

OVERVIEW

Any suspected case of anthrax (*Bacillus anthracis*) MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Naturally Occurring Anthrax

Anthrax, a gram-positive spore-forming rod, is a zoonotic disease rarely seen in the United States. In humans, anthrax has three somewhat clinically distinct syndromes: cutaneous, inhalation and gastrointestinal. The cutaneous form occurs most frequently on the hands, forearms, neck and face of persons working with infected livestock (cattle, sheep, goats and horses). Gastrointestinal anthrax is transmitted to humans by ingesting insufficiently cooked meat from infected animals. Inhalation anthrax, also known as Woolsorter's disease, results from the inhalation of spores and occurs primarily in persons who handle contaminated hides, wool, and furs.

Bioterrorism Epidemiology

Anthrax bacteria are easy to cultivate and spore formation is readily induced. The spores are highly resistant to sunlight heat and disinfectants. As a bioterrorism agent, anthrax can be delivered as a bioaerosol. Anthrax is not transmitted from person to person. If anthrax spores are released intentionally as a bioaerosol, there will be a sudden influx of many persons with severe flu-like symptoms seeking treatment in the hospital's emergency rooms. Most likely, these persons will require assisted ventilation and immediate antibiotic support. The mortality rate will be high even in the setting of modern medical technology.

Until October 4, 2001 inhalation anthrax had not been reported in the U.S. since 1976. Between October 4 and November 2, 2001, 10 confirmed cases of inhalation anthrax caused by the intentional release of *Bacillus anthracis* in major mail sorting facilities on the East coast were identified. These 10 cases provided a wealth of knowledge about diagnosing and treating the disease. (Jernigan JA, Stephens DS, et al. Bioterrorism-Related Inhalation Anthrax: The First 10 cases Reported in the United States. Emerging Infectious Diseases. 2001;7:933-944.) Cutaneous anthrax also occurred in the 2001 mail-related incidents. Most of these cases occurred in mail handlers, presumably as the result of direct cutaneous contact with mail or environmental surfaces contaminated with anthrax spores. Detailed information on the diagnosis and treatment of anthrax is available at the CDC bioterrorism web site (www.bt.cdc.gov)

Incubation Period

The incubation period for inhalation anthrax is normally 1 – 6 days but may be as long as 60 days after spores are released. During an outbreak of inhalation anthrax in the Soviet Union in 1979, exposed persons became ill up to six weeks after the aerosol release. The incubation periods after exposure in the 2001 cutaneous anthrax cases ranged from 1 to 10 days.

Clinical Presentation

Cutaneous Anthrax

Infections of the skin, commonly exposed hands, forearms and head, occur when the spore enters a cut or abrasion on the skin. Skin infection begins as a raised, pruritic bump or papule that resembles an insect bite. Within 1-2 days, the bump fills with fluid and then ruptures to form a painless ulcer (eschar) with a characteristic black necrotic area in the center. There is no associated rash. After about 1 – 2 weeks, the lesion dries and the eschar separates from the skin leaving a permanent scar. There is pronounced edema associated with the ulcer due to the release of edema toxin by *B. anthracis* resulting in swelling of the lymph glands in the adjacent area. These stages occur regardless of antibiotic therapy. Patients with cutaneous anthrax may have fever, extensive edema, and other systemic signs. Approximately 20% of untreated cases result in death, either because the disease becomes systemic or because of respiratory distress caused by edema in the cervical or upper thoracic region. The 2001 cases all responded to antibiotic therapy. The differential diagnosis of cutaneous anthrax includes brown recluse spider bite, ecthyma, ulceroglandular tularemia, accidental vaccinia, and necrotic herpes simplex.

Gastrointestinal Anthrax

There are two possible clinical presentations: abdominal and oropharyngeal. Abdominal symptoms include nausea, loss of appetite, vomiting and fever followed by abdominal pain, vomiting of blood and possibly severe, bloody diarrhea. Lesions may be seen in the colon.

The oropharyngeal form generally presents with edema and tissue necrosis in the cervical area. The primary clinical presentation would be sore throat, dysphagia, fever, and regional lympadenopathy in the neck and toxemia.

Inhalation Anthrax

Initially the disease onset is insidious with non-specific flu-like symptoms including fever, chills, dyspnea, malaise, fatigue, headache, nausea and vomiting, abdominal discomfort and drenching sweats. The person may also develop a non-productive

cough and mild chest discomfort. These initial symptoms may be followed by a short period (several hours to 2 – 3 days) of improvement followed by an abrupt onset of severe respiratory distress with dyspnea, diaphoresis, stridor (high-pitched whistling respirations) and cyanosis. Septicemia, shock and death occur within 24 - 36 hours after the onset of respiratory distress and mortality approaches 40 - 100%. Approximately 50% of cases will develop hemorrhagic meningitis.

Diagnosis

Radiological

Chest X-ray and CT scans show mediastinal widening which is classic for the inhalation form of the disease. Pleural effusion is usually present and is hemorrhagic. Infiltrates or consolidation may also be seen.

Laboratory

The white blood cell (WBC) count may initially be normal or only slightly elevated. Later in the disease the WBC increases markedly. Serum transaminases may also be elevated. Blood cultures, drawn prior to the administration of any antibiotics, may turn positive within 24 hours. Pneumonia generally does not occur; therefore, organisms may not be identified on Gram stain or culture of the sputum. Pleural fluid is generally bloody with a high protein concentration.

Autopsy

On autopsy hemorrhagic necrotizing mediastinitis, thoracic hemorrhagic necrotizing lymphadenitis, and hemorrhagic meningitis may be observed.

Treatment (See tables 1 and 2)

Penicillin-resistant strains of anthrax exist naturally. Induced antibiotic resistance by laboratory manipulation may be possible. To be effective, antibiotic therapy must be started as soon as the diagnosis is suspected. Combination antibiotic treatment including a fluoroquinolone in addition to drainage of the pleural effusions may increase chances for survival.

Vaccination

An anthrax vaccine is available; however, it is currently limited to military personnel. Should vaccination be recommended following the release of anthrax, the United States Public Health Service may change the recommendations to allow vaccination of the civilian population.

Isolation

Standard Precautions are recommended. In addition to Standard Precautions, Contact Precautions are recommended for cutaneous anthrax, and for gastrointestinal anthrax if diarrhea is not controlled.

Table 1: Anthrax – Antibiotic Therapy for Contained Casualty Settings

Contained casualty setting: assumes a limited number of persons seeking treatment. Start IV therapy as soon as diagnosis suspected.		
Patient Category	**Antibiotic**	**Comment**
Adults: In vitro studies suggest that ofloxacin 400 mg IV q 12 hours or levofloxacin 500 mg IV q 24 hours can be substituted for ciprofloxacin however these antibiotics will, most likely not be included in the National Pharmaceutical Stockpile.	**Preferred Therapy:** *Ciprofloxacin [1] 400 mg IV q 12 hours *Doxycycline 200 mg IV loading, then 100 mg IV q 12 hours, or Erythromycin 15 – 20 mg/kg/day in divided doses **Therapy if stain is susceptible:** *Penicillin [2] G 20 MU/day IV in divided doses (if susceptible)	Give IV antibiotics until clinically stable then switch to an oral antibiotic to complete 60 days of treatment. Switch IV penicillin to Amoxicillin 500 mg PO q 8 hours when clinically stable to complete 60 days treatment.
Children: The use of tetracyclines and fluoroquinolones in children has well known adverse effects. These risks must be weighed carefully against the risk of developing life-threatening disease. If a release of *B anthracis* is confirmed, children should be treated initially with ciprofloxacin or doxycycline but therapy should be changed to penicillin as soon as penicillin susceptibility is confirmed.	**Preferred Therapy:** *Ciprofloxacin [1, 3] 15 mg/kg q 12 hours, or *Doxycycline [4] ✍ **If >8 years and > 45 kg:** give 200 mg loading dose, then 100 mg q 12 hours; ✍ **If > 8 years and = 45 kg:** give 4.4mg/kg loading dose then 2.2 – 4.4 mg/kg/day in 2 divided doses; ✍ **If = 8 years:** same as > 8 years and = 45 kg, **Therapy if stain is susceptible:** *Penicillin G [2] 400,000 units/kg/day in divided doses (if susceptible)	Give IV antibiotics until clinically stable then switch to an oral antibiotic to complete 60 days of treatment. Switch IV penicillin to PO Amoxicillin: ✍ **If = 20 kg:** give 500 mg PO q 8 hour; or ✍ **If < 20 kg**: give 40 mg/kg divided into 3 doses to be taken q 8 hours To complete 60 days of treatment.
Pregnancy: [5] High mortality rate from the infection outweighs the risk posed by antibiotics.	Same as for non-pregnant adults Oral doxycycline not recommended for more than 14 days	
Immunocompromised	Same as adults and children	

* Antibiotics supplied as part of the National Pharmaceutical Stockpile (NPS)

1. Therapy with ciprofloxacin may be initiated either as intravenous or oral dosage. The pharmacokinetics are such that oral ciprofloxacin is rapidly absorbed in the GI tract with no substantial loss by first-pass metabolism. Maximum serum concentrations are attained 1 – 2 hours after oral dosing.
2. If tested for susceptibility, therapy should be changed to IV penicillin.
3. Ciprofloxacin dose should not exceed 1 gram/day in children.
4. In 1991 the American Academy of Pediatrics amended their recommendation to allow treatment of young children with tetracyclines for serious infections such as Rocky Mountain Spotted Fever for which doxycycline may be indicated. Doxycycline is preferred for its twice-a-day dosing and low incidence of gastrointestinal side effects.
5. Although tetracyclines are not recommended during pregnancy, its use may be indicated for life-threatening infections. Adverse affects on developing teeth and bone are dose related, therefore, doxycycline might be used for short course therapy (7 – 14 days) prior to the 6th month of gestation. After the 6th month, professional consultation should be obtained.

Table 2: Anthrax – Antibiotic Therapy for Mass Casualty Settings or Post-Exposure Prophylaxis

Mass Casualty Setting or Post-Exposure Prophylaxis		
Patient Category	**Antibiotic**	**Comment**
Adults, including pregnant women and immunocompromised	**Preferred treatment:** *Ciprofloxacin 500 mg PO q 12 hours, or *Doxycycline[1] 100 mg PO q 12 hours **Therapy if strain is susceptible:** Amoxicillin 500 mg PO q 8 hours	Duration of therapy is 60 days
Children The use of tetracyclines and fluoroquinolones in children has well known adverse effects. These risks must be weighed carefully against the risk of developing life-threatening disease. If a release of *B anthracis* is confirmed, children should be prophylaxed initially with ciprofloxacin or doxycycline but therapy should be changed to amoxicillin as soon as penicillin susceptibility is confirmed.	**Preferred treatment:** *Ciprofloxacin 15 – 20 mg/kg PO q 12 hours (not to exceed 1 gm/day), or *Doxycycline [2] ✍ **> 8 years and > 45 kg**: give 200 mg loading dose, the 100 mg q 12 hours; ✍ **> 8 years and = 45 kg**: give 4.4mg/kg loading dose then 2.2 – 4.4 mg/kg/day in 2 divided doses; ✍ **= 8 years:** same as > 8 years and = 45 kg, **Therapy if strain is susceptible:** Amoxicillin ✍ If = 20 kg: give 500 mg PO q 8 hour; or ✍ If < 20 kg: give 40 mg/kg divided into 3 doses to be taken q 8 hours	Duration of therapy is 60 days

* Antibiotics supplied as part of the National Pharmaceutical Stockpile (NPS)

1. Although tetracyclines are not recommended during pregnancy, its use may be indicated for life-threatening infections. Adverse affects on developing teeth and bone are dose related, therefore, doxycycline might be used for short course therapy (7 – 14 days) prior to the 6th month of gestation. After the 6th month, professional consultation should be obtained.
2. In 1991, the American Academy of Pediatrics amended their recommendation to allow treatment of young children with tetracyclines for serious infections for which doxycycline may be indicated such as Rocky Mountain Spotted Fever. Doxycycline is preferred for its twice-a-day dosing and low incidence of gastrointestinal side effects.

ANTHRAX – QUICK REFERENCE

Any suspected case of anthrax (*Bacillus anthracis*) MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Bioterrorism Epidemiology:

- Inhalation anthrax: most likely disease presentation if bacilli intentionally aerosolized
- Person to person transmission does not occur

Incubation Period:

- Average 1 – 6 days
- Up to 6 weeks following a bioaerosol release

Clinical Disease:

- Gastrointestinal: abdominal pain, bloody diarrhea, hematemesis
- Cutaneous: pruritic skin lesion with black eschar and tissue edema,
- Inhalation: Biphasic illness
  - Initial phase: flu-like symptoms, low grade fever, non-productive cough, malaise, fatigue, myalgias, mild chest discomfort followed by a short period (several hours to days) of improvement
  - Acute phase: abrupt onset of respiratory distress with dyspnea, stridor, cyanosis, high fever, drenching sweats, shock and death within 24 – 36 hours.

Diagnosis:

- Presumptive diagnosis based on characteristic skin lesion (cutaneous), intestinal bleeding (gastrointestinal) and respiratory failure with widening mediastinum (inhalation).

Treatment: (See overview)

- Early antibiotic treatment is critical to survival

Prophylaxis: (See overview)

- Early antibiotic prophylaxis is critical to preventing disease

Isolation:

- Inhalation: Standard Precautions
- Cutaneous and gastrointestinal: Standard and Contact Precautions (if lesions are draining)

ANTHRAX – FREQUENTLY ASKED QUESTIONS (FAQ)

What is anthrax?

The bacteria (germs) that cause anthrax are generally transmitted (spread) to humans by contact with infected animal hides (cows and sheep). If the bacteria are intentionally released into the air, they could be inhaled (breathed) into your lungs and cause severe respiratory distress.

Is anthrax spread from person to person?

The infection is not spread from person to person.

How will I know if I was exposed to the bacteria?

It will depend on how the bacteria are released, where they were released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Symptoms may start from 1 – 6 days after exposure to the bacteria. Since the bacteria can live for a long time in the environment, symptoms may not start for up to 60 or more days after the bacteria were released into the air.

What are the symptoms of infection?

If the bacteria invades your lungs, you will have a fever, possibly a non-productive cough, and severe shortness of breath. If the skin is contaminated, an itchy, black spot with swelling may appear. If the bacteria are eaten, you may develop a stomachache, vomiting, and diarrhea that may be bloody.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health officer determines that you were exposed to the bacteria, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If you develop symptoms such as fever or shortness of breath while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

You may have to take the antibiotic for a long time. The local health officer will make frequent announcements to give you the most current information. Do not give your antibiotic to another person.

What should I do if I do not have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please do not go to the hospital emergency room unless you have a fever or you develop shortness of breath.

How can I get more information?

The local health department will make frequent public announcements about who should receive the antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

ANTHRAX – HOME CARE INSTRUCTIONS

In the event of an intentional release of the bacteria (germs) that causes anthrax, many people may require hospitalization within a few days. Hospitals may become overcrowded and it may become necessary for many sick people to be cared for in their home by relatives or friends. The following information may be helpful in providing care to sick persons at home.

- Wash your hands with soap and water before you eat or drink, after using the bathroom and after contact with the sick person.
- Wear gloves (vinyl or latex) when you have contact with the sick person's blood and other body fluids (urine, feces, vomit, wound drainage, mucous or saliva). Wash your hands after removing the gloves. If gloves are not available, wrap your hands in plastic bags and secure with a rubber band. Discard the bags after each use and wash your hands with soap and water.
- Wash the sick person's hands after using the bathroom, before eating or drinking and after contact with pets.
- If an antibiotic is recommended, give it exactly as prescribed by the doctor or nurse. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least twice a day. If the temperature goes above 100.4° F, give Tylenol® (if not allergic) or other medicine such as Motrin® or Advil®. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse) or take the person to the nearest designated emergency center or hospital.
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Change the sick person's clothes and bed linens frequently especially if soiled with blood or other body fluids.
- Wash soiled clothes and bed linens in warm water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day or when surfaces become soiled with blood or other body fluids.
- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently, and eat a healthy diet. Even if you are not taking an antibiotic, take your temperature in the morning and afternoon for 3 weeks. If you develop a fever above 100.4° F or if have shortness or breath, seek medical attention immediately.

ANTHRAX – SCREENING FORM

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 6 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 6 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Have you been camping in past 6 weeks?	**NO**	**YES**
Have you had any insect bites in the past 6 weeks?	**NO**	**YES**
Have you had contact with sick animals within the past 6 weeks?	**NO**	**YES**

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO** **YES** If yes, what medicine(s) are you allergic to?

_____

Over the past 6 weeks, have you had any of the following symptoms or ailments? (Check all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Trouble breathing	
Upset stomach (nausea)		Sweating excessively	
Headache		Pain or tightness in the chest	
Dry cough		Very tired	
Sore muscles		Pain in the stomach	
Bloody diarrhea		Vomiting blood	
Pain in stomach		Black scab on skin	
Itchy skin		Sore throat	
Trouble swallowing		Pain in the neck	

BRUCELLOSIS (*BRUCELLA SPECIES*)

OVERVIEW

Any suspected or confirmed case of brucellosis (*Brucellae* species) must be reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Naturally Occurring Brucellosis

Brucellosis, also known as "undulant fever", is a formerly common veterinary disease caused by one of six *Brucella species.* It is now rare in the United States, with 44 States, including California, being declared free of brucellosis as of June 30, 2000. Four species (*B abortis*, *B melitensis*, *B suis*, and *B canis*) are pathogenic to humans. In the United States, most of the 100 - 200 cases of human brucellosis that occur each year are associated with the ingestion of unpasteurized dairy products, primarily milk and cheese. Laboratory workers are at increased risk from inhalation exposure due to the ease of aerosolization of the organism in culture. In animals, the disease primarily involves the reproductive tract causing septic abortion and orchitis.

Bioterrorism Epidemiology

Exposure to as few as 10 – 100 organisms may result in clinical infection. Person to person transmission does not occur. Large numbers of temporally clustered persons presenting to a clinic or an emergency room with similar symptoms should be reported to the local health department immediately.

Incubation Period

The incubation period ranges from 5 to 60 days.

Clinical Manifestations

The clinical manifestations are extremely variable and include several forms. In the acute form (< 8 weeks from illness onset), the person generally presents with non-specific complaints resembling influenza, including fever, sweats, malaise, anorexia, headache, myalgia, back pain, chills, and generalized weakness. Cough and pleuritic chest pain may occur in about 20% of the cases. Gastrointestinal symptoms include anorexia, nausea, vomiting, diarrhea and constipation. In the undulant form of the disease (< 1 year), symptoms include undulant fevers, arthritis, and orchiepididymitis in males. Neurologic symptoms may occur acutely in up to 5% of cases. In the chronic form (>1 year from onset), symptoms may include chronic fatigue syndrome-like, depressive episodes, and arthritis.

Complications

Persons infected with *Brucella* have a low mortality rate but the disease can be relatively prolonged and incapacitating. The disease is systemic and may affect many organs and tissues. Ileitis, colitis, and granulomatous or mononuclear infiltrative hepatitis may occur in 45 - 65% of cases. Lumbar pain and tenderness can occur in up to 60% of cases and may be due to various osteoarticular infections of the axial skeleton. Vertebral osteomyelitis, intervertebral disc space infection, paravertebral abscess and sacroiliac infection occur in a minority of cases. Joint involvement may vary from pain to immobility and effusion. Although the sacroiliac joints are most commonly involved, the peripheral joints of the hips, knees, and ankles may be affected. Meningitis, encephalitis, peripheral neuropathy, radiculoneuropathy and meningovascular syndromes have been observed in rare instances. Behavioral disturbances and psychoses appear out of proportion to fever elevation or central nervous system disease. Endocarditis occurs in about 2% of the cases and accounts for the majority of brucellosis-related deaths.

Diagnosis

Radiological

The chest x-ray is generally normal but may show lung abscesses, single or miliary nodules, bronchopneumonia, enlarged hilar lymphadenopathy and pleural effusions.

Laboratory

The leukocyte count may be low to normal and anemia and thrombocytopenia are common. *Brucella* may be recovered from blood, bone marrow, or other tissue cultures. Rapid isolation methods (Bactec) may identify *Brucella* from the blood if the culture is maintained for a long period (? 30 days). The biphasic culture method for blood (Castaneda bottle) may increase the chance of recovering the microorganism. A serum agglutination test (SAT) is available to detect both IgM and IgG antibodies. A titer of 1:160 or greater is indicative of infection.

Treatment

Oral antibiotic therapy is sufficient in treating most cases of brucellosis.

- Doxycycline 200 mg/day PO plus rifampin 600 mg/day PO is generally recommended for at least six weeks.
- Doxycycline 200 mg/day PO plus gentamicin 3 –5 gm/kg/day IV or IM (3 divided doses) is an acceptable alternative.

Other treatments include TMP/SMX plus gentamicin, and ofloxacin plus rifampin. Long-term, triple-drug therapy with rifampin, a tetracycline, and an aminoglycocide is recommended by some experts for patients with meningoencephalitis or endocarditis.

Prophylaxis

A three to six week course of prophylactic therapy with one of the oral regimes discussed above should be considered following a bioaerosol exposure.

Isolation

Standard Precautions are recommended.

BRUCELLOSIS – QUICK REFERENCE

Any suspected or confirmed case of brucellosis (*Brucellae* species) must be reported to the infection control practitioner (*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Bioterrorism Epidemiology:
- Exposure to 10 – 100 organisms can result in clinical disease
- Brucellosis is not transmitted from person to person
- If Brucellosis is suspected, alert the laboratory

Incubation Period:
- Average 5 – 60 days

Clinical Disease:
Symptoms are generally non-specific flu-like symptoms including fever (undulant pattern if untreated), headache, myalgias, arthralgias, back pain, sweats, chills, malaise, cough, pleuritic chest pain, anorexia, nausea, vomiting and diarrhea. Some patients may complain of malodorous sweat and a peculiar taste in mouth.

Diagnosis:
- Routine laboratory tests are generally not suggestive of an infectious process.

Treatment: (See overview)
- Doxycycline 200 mg/day plus rifampin 600 mg/day PO for six weeks (recommended).
- Doxycycline 200 mg/day plus gentamicin 3 – 5 mg/kg/day IV or IM (3 divided doses) (alternative).

Prophylaxis: (See overview)

Isolation:
- Standard Precautions

BRUCELLOSIS – FREQUENTLY ASKED QUESTIONS (FAQ)

What is Brucellosis?

The bacteria (germs) that cause brucellosis are generally transmitted (spread) to humans by contact with infected animals (cows and sheep) or by drinking unpasteurized (contaminated) milk products. If the bacteria are intentionally released into the air, they could be inhaled (breathed) into your lungs and cause flu-like symptoms.

Is brucellosis spread from person to person?

The infection is not spread from person to person.

How will I know if I was exposed to the bacteria?

It will depend on how the bacteria were released, where they were released and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will the symptoms develop (incubation period)?

The symptoms may start from 5 - 60 days after you were exposed to the bacteria.

What are the symptoms of infection?

Not all persons exposed to the bacteria will get sick. The symptoms may include fever, headache, back pain, tiredness, chills, sweats, sore muscles, cough, pain in the lungs when you take a deep breath, loss of appetite, nausea, vomiting and diarrhea.

How is the infection treated?

If you have symptoms of the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health department determines that you were exposed to the bacteria, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If any symptoms of the infection develop while you are taking the antibiotic, you should see your health care provider (doctor or nurse) immediately.

How long should I take the antibiotic?

It is important that you take the antibiotic exactly as directed. The dose and the number of treatment days will differ depending on the antibiotic prescribed. If you develop side

effects (reaction) to the antibiotic, call your health care provider (doctor or nurse) immediately. Do not give your antibiotic to another person.

What should I do if I do not have symptoms?

If you do not have any symptoms of the infection, you should continue with your routine daily activities. Please do not go to the hospital emergency room unless you are feeling sick.

How can I get more information?

The local health department will make frequent public announcements about who should receive an antibiotic, how to take the antibiotic and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

BRUCELLOSIS – HOME CARE INSTRUCTIONS

In the event of an intentional release of the bacteria (germs) that causes brucellosis, many people may require hospitalization within a few days. Hospitals may soon become overwhelmed and unable to care for every person who seeks treatment. It may become necessary for many sick people to be cared for in their home by relatives or friends. The following information may be helpful in providing care to sick persons at home.

- Wash your hands with soap and water before you eat or drink, after using the bathroom and after contact with the sick person.
- Wear gloves (vinyl or latex) when you have contact with the sick person's blood and other body fluids (urine, feces, vomit, wound drainage, mucous or saliva). Wash your hands after removing the gloves. If gloves are not available, wrap plastic bags over your hands and secure with a rubber band. Discard the bags after each use and wash your hands with soap and water.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- If an antibiotic is recommended, give it exactly as prescribed by the doctor or nurse. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least twice a day. If the temperature goes above 100.4° F, give Tylenol® (if not allergic) or other medicine such as Motrin® or Advil®. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse) or take the person to the nearest designated emergency center or hospital.
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Change the sick person's clothes and bed linens frequently especially if soiled with blood or other body fluids.
- Wash soiled clothes and bed linens in warm water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day or when surfaces become soiled with blood or other body fluids.
- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently, and eat a healthy diet. Even if you are not taking an antibiotic, take your temperature in the morning and afternoon for 4 weeks. If you develop a fever above 100.4° F or if you have flu-like symptoms, seek medical attention immediately.

BRUCELLOSIS – SCREENING FORM

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 3 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 3 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Have you been camping in past 3 weeks? **NO** **YES**

Have you had any insect bites in the past 3 weeks? **NO** **YES**

Have you had contact with sick animals within the past 3 weeks? **NO** **YES**

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO** **YES** If Yes, what medicine(s) are you allergic to?

_____

Over the past 3 weeks, have you had any of the following symptoms or ailments? (Check all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Pain or tightness in the chest	
Headache		Feel cold all over or shiver/shake	
Cough		Pain in the joints	
Sore muscles		Very tired	
Diarrhea (loose or runny stool)		Vomiting	
Diarrhea		Upset stomach (nausea)	
Pain in stomach		Lost of appetite	
Constipation		Bad taste in the mouth	
Short of breath		Stiff neck	
Pain in the lumbar area			

BOTULISM (CLOSTRIDIUM BOTULINUM)

OVERVIEW

Any suspected case of botulism (*Clostridium botulinum*) MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Naturally Occurring Botulism

Botulism is a neuroparalytic illness caused by a potent neurotoxin produced from *Clostridium botulinum,* an anaerobic, spore-forming bacterium. *C. botulinum* produces seven (7) different, but related, toxins (A through G). Only toxins A, B, E and F cause disease in humans. The toxin exerts its effect by blocking the release of acetylcholine at cholinergic synapses. The spores are ubiquitous and are found throughout the world in soil and marine sediments. In 1999, 174 cases of botulism were reported to the CDC. Of these, 26 were foodborne, 107 were infant botulism, and 41 were cases of wound botulism. Since the disease is caused by the distribution of toxin to nerves, the clinical manifestations are identical in all forms.

Botulism has historically been a foodborne disease. The most frequent source is home-canned foods, prepared in an unsafe manner. Wound botulism occurs when *C. botulinum* spores germinate within wounds. It can occur after gross trauma or surgery. Over recent years, wound botulism has increased in persons who are injecting drug users, primarily in California. It is seen predominately in drug users who subcutaneously inject (“skin pop”) so-called “black-tar” heroin. Inhalational botulism from aerosolized botulinum toxin does not occur in nature, but has been demonstrated experimentally in primates and has occurred in a laboratory accident.

Bioterrorism Epidemiology

Botulinum toxin is the most poisonous substance known. A single gram of crystalline toxin, evenly dispersed and inhaled, would kill more than 1 million people, although technical factors would make such dissemination difficult. A bioterrorist attack could involve either an aerosol or food or water contamination. Botulism is not transmitted from person to person. All materials initially contaminated by the toxin must be handled with extreme care. The toxins are detoxified in the air within 12 hours. Sunlight inactivates the toxins with 1 - 3 hours. Heat destroys the toxins in 30 minutes at 80°C and in several minutes at 100°C.

Incubation Period

The typical incubation period following the ingestion of contaminated food is 12 – 72 hours but may be as short as 6 hours or as long as 10 days depending on the size of the inoculum ingested. Recent primate studies indicate the symptoms may not appear for several days when a low dose of toxin is inhaled.

Clinical Presentation

Botulism is an acute, afebrile, symmetric, descending flaccid paralysis that always begins in the bulbar musculature. It is not possible to have botulism without having multiple cranial nerve palsies. Disease manifestations are similar regardless of botulinum toxin type. However, the extent and pace of paralysis may vary considerably among patients. Some patients may be mildly affected.

Patients with botulism typically present with difficulty seeing, speaking, and/or swallowing. Eye symptoms such as blurred vision are due to mydriasis, diplopia, ptosis, and photophobia. Other cranial nerve symptoms include dysarthria, dysphonia, and dysphagia. Flaccid skeletal muscle paralysis follows in a symmetrical, descending, and progressive manner. Collapse of the upper airway may occur due to weakness of the oropharyngeal muscles. As the descending motor weakness progresses, the diaphragm and accessory muscles lead to respiratory failure.

The autonomic effects of botulism are manifested by typical anticholinergic signs and symptoms. These include dry mouth, ileus, constipation, and urinary retention. Nausea and vomiting may occur as nonspecific sequelae of an ileus. Dilated pupils (mydriasis) are seen in approximately 50% of cases.

Sensory symptoms do not occur with the exception of circumoral and peripheral paresthesias from hyperventilation as the patient becomes frightened by onset of paralysis. The toxins do not cross the blood/brain barrier and do not cause central nervous system disease. However, patients often appear lethargic and have communication difficulties because of bulbar palsies. The psychological sequelae of botulism may be severe and require specific intervention.

On physical examination, the patient is generally afebrile, alert, and oriented. Postural hypotension may be present. The mucous membranes may be dry and crusted and the patient may complain of a sore throat, difficulty swallowing and speaking. The gag reflex may be absent and the pupils may be dilated and even fixed. Ptosis and extraocular muscle palsies may be present. Variable degrees of skeletal muscle weakness may be observed depending on the degree of progression in the individual patient. Deep reflexes may be present or absent. Cyanosis or narcosis from CO_2 retention may be evident as the respiratory muscles become paralyzed.

Individual cases might be confused clinically with other neuromuscular disorders such as Guillian-Barré syndrome, myasthenia gravis, or tick paralysis. The edrophonium or Tensilon® test may be transiently positive in botulism so it may not distinguish botulism

from myasthenia. The cerebrospinal fluid in botulism is normal and the paralysis is generally symmetrical, which distinguishes it from enteroviral myelitis. Mental status changes are generally seen in viral encephalitis but not generally with botulinum intoxication. Other diseases to consider would be stroke, chemical intoxication (e.g., carbon monoxide, barium carbonate, methyl chloride, organic phosphorus compound or atropine), mushroom poisoning, medication reactions (e.g., neomycin, streptomycin, kanamycin and gentamicin), and poliomyelitis.

Diagnosis

Routine laboratory studies are of little diagnostic value. The occurrence of several afebrile patients with progressing symmetrical descending flaccid paralysis strongly suggests botulism. Foodborne outbreaks tend to occur in small clusters. An unusual number of cases within a defined geographical area should alert hospital emergency department and the infection control personnel that a bioterrorist event could be evolving.

Serum specimens should be drawn and sent to the laboratory capable of performing a mouse neutralization bioassay. Currently in California only the CDHS Microbial Diseases Laboratory (MDL) and the Los Angeles County Health Department Public Health Laboratory perform botulism bioassays. However, the decision to treat (see below) should not await laboratory confirmation, which takes 2 days or more to complete. Tests to rule other diseases include spinal fluid protein, Tensilon® test, electromyography and computerized tomographic scans.

Treatment

Respiratory failure due to paralysis of the respiratory muscles is the most serious complication of botulinum intoxication and is generally the cause of death. Prolonged ventilator assistance is almost always required for survival. Intensive and prolonged nursing care is required for most patients. Without administration of antitoxin, it may be as long as three months before there are any signs of improvement, and up to one year for complete resolution of symptoms. In the recent epidemic of wound botulism in California mild cases have occurred not requiring ventilation or antitoxin administration.

Early administration of botulinum antitoxin can be critical to survival. Antitoxin neutralizes circulating toxin, but not toxin that has already effected cholinergic synapses. Antitoxin will minimize subsequent nerve damage and severity of disease but will not reverse existent paralysis. Therefore, antitoxin should be administered to patients upon initial diagnosis or in patients with symptoms that continue to progress. The decision to treat is based upon clinical diagnosis and should not await laboratory confirmation. When symptom progression ceases, no circulating toxin remains and the antitoxin is no longer effective. Antitoxin may be withheld only if a patient has been clearly improving from point of maximal paralysis, or if clearly stable with no respiratory impairment. Antitoxin may be effective in foodborne cases where presumably toxin continues to be absorbed through the gut wall, and in wound botulism cases where

toxin continues to be absorbed from organisms multiplying in the wound. Wounds should not be manipulated until after administration of antitoxin, since manipulation may result in a sudden increase in circulating toxin. Animal studies show that after aerosol exposure, botulinum antitoxin is very effective if given before the onset of symptoms. If antitoxin is delayed until after the onset of symptoms, it does not protect against respiratory failure.

A licensed trivalent antitoxin (types A, B, and E) is available for cases of foodborne botulism. This product is a horse serum product and the risks of administration include anaphylaxis and serum sickness. This antitoxin requires skin testing for horse serum sensitivity prior to administration. Skin testing is performed by injecting 0.1 ml of a 1:10 dilution (in sterile physiologic saline) of antitoxin intradermally in the patient's forearm with a 26 or 27-gauge needle. The injection site is observed for 20 minutes. The test is positive if any of these allergic reactions occur: hyperemic areola at the site of injection of > 0.5 cm, fever or chills, hypotension (> 20 mm Hg drop in systolic or diastolic pressures), skin rash, respiratory difficulty, nausea or vomiting, or generalized itching. If no allergic reaction is observed, 10 ml of the antitoxin should be administered as a single dose intravenously in a normal saline solution over a period of 20 minutes. With a positive skin test desensitization can be attempted by administering 0.01 – 0.1 ml of antitoxin subcutaneously, doubling the previous dose every 20 minutes until 1.0 – 2.0 ml can be sustained without any marked reaction. It is recommended that desensitization be performed by an experienced allergist. Medical personnel administering the antitoxin should be prepared to treat anaphylaxis with epinephrine, intubation and vascular access. Additional antitoxin may be required if further deterioration or relapse occurs days after administration of the first dose. All patients should have pre- and post-administration sera tested by bioassay.

Isolation

Standard Precautions are recommended.

BOTULISM – QUICK REFERENCE

Any suspected case of botulism (*Clostridium botulinum*) MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and local health department [*insert telephone number*] immediately.

Bioterrorism Epidemiology:

- Botulinum toxins are considered the most lethal substances known to man.
- Intentional exposure could occur through contaminated food or water or by bioaerosol.
- Person to person transmission does not occur.

Incubation Period:

12–36 hours following exposure, may be as long as several days, depending on the size of the inoculum and route of exposure

Clinical Disease:

Foodborne: Acute bilateral cranial nerve impairment, blurred or double vision, ptosis, dysphagia, dry mouth, slurred speech, afebrile, alert and oriented

- Cranial nerve palsies, dilated pupils (50%), urinary retention
- Symptoms may progress to a symmetrical flaccid paralysis in which sensation is completely preserved and result in respiratory failure

Inhalation: Symptoms would be similar to foodborne illness

Diagnosis:

- Presumptive - based on symptoms
- Tensilon test may be slightly positive
- Brain imaging (CT or MRI), lumbar puncture and edrophonium chloride tests normal
- Electromyography may show decreased amplitude of action potentials in involved muscle group

Treatment: (See overview)

- Botulism antitoxin – must be obtained through the local health department
- Most effective if administered early in disease
- Mechanical ventilation

Isolation:

- Standard Precautions

BOTULISM – FREQUENTLY ASKED QUESTIONS (FAQ)

What is botulism?

The bacteria (germs) that cause botulism release a powerful toxin that causes the muscles to become paralyzed. The bacteria are normally found in the soil and in ocean or lake-water sediment or silt. Most people get botulism from eating (ingesting) improperly cooked or preserved food. Airborne botulism does not occur naturally. However, if the toxin is intentionally released into the air it could be absorbed into the skin and lungs and cause the same symptoms as ingested botulism.

Is botulism spread from person-to-person?

Neither the bacteria nor the poisonous toxin released by the bacteria are spread from person to person.

How will I know if I was exposed to the toxin that causes botulism?

It will depend on how the toxin was released, where it was released, and where you were in relation to the release site. The toxin could be released into the air or in food or water.

How soon will symptoms of botulism develop (incubation period)?

Normally the symptoms start within 12 – 36 hours but the incubation period may be as short a 6 hours or as long as 10 days depending on how the toxin was released.

What are the symptoms of botulism?

The early symptoms include blurred vision, double vision, and dry mouth. As the toxin spreads in the body, the symptoms become more intense and include sore throat, trouble speaking and swallowing, droopy eyelids, muscle weakness, and trouble breathing.

How is botulism treated?

It may become necessary to put a tube in your throat that is attached to a breathing machine (ventilator) to help you breath. You may be paralyzed and require hospitalization for a long time. As time passes, most persons with botulism recover full use of their muscles.

How is botulism prevented?

The local health department will provide you with information about food and water contamination. If the toxin is released into the air, the local health department may tell you to stay inside and close all the windows and doors for a short time.

What should I do if I have symptoms of botulism?

If you have any symptoms such as difficulty eating or drinking, blurred or double vision, dry mouth, or difficult breathing you should go to the nearest emergency room immediately. If you do not have any symptoms, you should continue with your routine daily activities. Please do not go to the hospital emergency room unless you are feeling sick.

How can I get more information?

The local health department will make frequent public announcements. It is important that you listen to the radio or television for more information.

BOTULISM – HOME CARE INSTRUCTIONS

In the event of an intentional release of the toxin that causes botulism, many people require hospitalization. If you or any member of your family have any of the following symptoms, go to the nearest hospital emergency room immediately:

- Blurred vision
- Double vision
- Trouble swallowing food or liquids
- Dry mouth
- Trouble speaking
- Trouble breathing

BOTULISM - SCREENING FORM

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 2 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 2 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Have you been camping in past 2 weeks? **NO** **YES**

Have you had any insect bites in the past 2 weeks? **NO** **YES**

Have you had contact with sick animals within the past 2 weeks? **NO** **YES**

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO** **YES** If Yes, what medicine(s) are you allergic to?

_____

Over the past 2 weeks, have you had any of the following symptoms or ailments? (Check all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Droopy eyelids	
Blurred vision		Double vision	
Dry mouth		Sore throat	
Trouble swallowing		Trouble breathing	
Constipation		Vomiting	
Diarrhea			

Q FEVER (COXIELLA BURNETII)

OVERVIEW

Naturally Occurring Q Fever

Q fever caused by the rickettsia, *Coxiella burnetii,* commonly infects animals such as cattle, sheep, and goats. Other mammals, birds, and ticks are also reservoirs. Animals do not develop clinical disease but can shed large numbers of organisms in placental tissue and in body fluids including milk, urine, and feces. Reactivation of infection occurs in female mammals during pregnancy, and high concentrations of *C. burnetii* are found in the placenta. Humans acquire the disease by inhalation of *C burnetii* that have been aerosolized from environmental reservoirs such hay, straw, manure, dust, or dirt contaminated during birth, directly from aerosols from newborn animals or the placenta during birth, and from consumption of raw milk. Sexual transmission has been demonstrated in mice. Human-to-human transmission has occurred following contact with an infected parturient woman and has been suspected to occur by direct aerosol transmission during procedures such has autopsies. Transmission via blood transfusion has occurred.

Bioterrorism Epidemiology

A single inhaled organism may produce clinical illness in some persons. Following a bioaerosol release, air samples may be positive for up to two weeks and viable organisms may be re-aerosolized into the environment from contaminated soil for up to 150 days. Significant numbers of persons who present to a clinic or an emergency room with a non-specific febrile illness associated with pulmonary symptoms should be reported to the local health officer immediately.

Incubation Period

The incubation period is from 2 – 14 days.

Clinical Manifestations

As a bioterrorism agent, Q fever would cause symptoms similar to naturally occurring disease. Q fever is generally a self-limiting, febrile disease lasting 2 – 14 days. Prominent symptoms include fever and severe headache. Other symptoms may include fatigue, chills, sweats, myalgias, nausea, vomiting, diarrhea, and pleuritic chest pain. Pneumonia occurs in about one half of persons infected with Q fever. Pneumonia can be atypical, rapidly progressive or present with fever but no pulmonary symptoms. Physical examination of the chest may be normal. About 33% of persons infected with Q fever develop acute hepatitis with jaundice. Splenomegaly may also be present.

Complications

Complications may include acute hepatitis in the absence of pulmonary symptoms, culture-negative endocarditis, aseptic meningitis, encephalitis, and osteomyelitis.

Differential Diagnosis

Other organisms to consider include *Mycoplasma pneumoniae*, *Legionella pneumophila*, *Chlamydia psittaci*, and *Chlamydia pneumoniae*. More progressive forms of pneumonia may resemble bacterial pneumonia, tularemia, or plague.

Diagnosis

Radiological

Chest x-ray abnormalities may include pleural effusions, consolidation, atelectesis, hilar adenopathy, non-segmental and segmental pleural-based opacities, and multiple rounded opacities.

Laboratory Diagnosis

Leukocytosis is present in about one-third of infected persons. Routine bacterial cultures of the blood and sputum are generally negative. The hepatic transaminase levels may be elevated 2 – 3 times normal however the bilirubin is generally normal. The compliment fixation (CF) test is diagnostic if there is a fourfold rise in titer between the acute and convalescent serum samples.

Treatment

Although most cases of Q fever resolve without antibiotic treatment, all cases of infection should be treated for at least 5 – 7 days to reduce the risk of complications such as endocarditis. The antibiotics of choice include:

- Tetracycline 500 mg q 6 hours for 5 – 7 days
- Doxycycline 100 mg q 12 hours for 5 – 7 days
- A quinolone such as ciprofloxacin may be given in place of tetracycline or doxycycline if the former antibiotics are not tolerated.

Prophylaxis

If prophylaxis is recommended, antibiotic therapy with tetracycline, doxycycline or a quinolone should be started 8 – 12 days following initial exposure.

Isolation

Standard Precautions are recommended.

Q FEVER – QUICK REFERENCE

Any suspected or confirmed case of Q fever (*Coxiella burnetii*) must be reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Bioterrorism Epidemiology:
- Exposure to a single inhaled organism can result in clinical disease.
- Person to person transmission does not occur.

Incubation Period:
- Average 2 –14 days.

Clinical Disease:
Symptoms may include fever, non-productive cough, severe headache, fatigue, and myalgias. Less prominent symptoms include chills, sweats, nausea, vomiting, diarrhea and pleuritic chest pain and neurological manifestations. Pneumonia may be rapidly progressive especially in persons who are immunosuppressed.

Diagnosis:
Laboratory tests are generally unremarkable. The WBC and hepatic transaminase levels may be elevated. The bilirubin is generally normal.

Treatment: (See overview)
- Tetracycline 500 mg q 12 hours for 5 –7 days
- Doxycycline 100 mg q 12 hours for 5 – 7 days.

Prophylaxis: (See overview)
Antibiotics, if given too early following exposure, may delay but not prevent the onset of symptoms.
- Tetracycline
- Doxycycline

Isolation:
- Standard Precautions

Q FEVER – FREQUENTLY ASKED QUESTIONS (FAQ)

What is Q fever?

The bacteria (germs) that cause Q fever are normally transmitted (spread) to humans by contact with infected animals or by inhaling (breathing) dust particles that have been contaminated by the manure of infected animals or by skinning killed animals such as rabbits. Ingesting contaminated raw milk can also transmit the infection. If the bacteria were intentionally released into the air they could be inhaled (breathed) into your lungs causing an infection such as pneumonia.

Is Q fever spread from person to person?

The infection is not spread from person to person.

How will I know if I was exposed to the bacteria?

It will depend on how the bacteria were released, where the bacteria were released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will the symptoms develop (incubation period)?

The symptoms may start from 2 – 14 days after you were exposed.

What are the symptoms of infection?

Not all persons exposed to the bacteria will get sick. The symptoms may include fever, dry cough, severe headache, tiredness, chills, sweats, sore muscles, nausea, vomiting, diarrhea, and pain when taking a deep breath.

How is the infection treated?

If you have symptoms of the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health officer determines that you were exposed to the bacteria, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If any symptoms of the infection develop while you are taking the antibiotic, you should see your health care provider (doctor or nurse) immediately.

How long should I take the antibiotic?

It is extremely important that you take the antibiotic exactly as directed. The dose and number of treatment days will differ depending on the antibiotic prescribed. If you develop side effects (reaction) to the antibiotic, call your health care provider (doctor or nurse) immediately. Do not give your antibiotic to another person.

What should I do if I do not have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please no not go to the hospital emergency room unless you are feeling sick.

How can I get more information?

The local health officer will make frequent public announcements about who should receive an antibiotic, how to take the antibiotic and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

Q FEVER – HOME CARE INSTRUCTIONS

In the event of an intentional release of the bacteria that cause Q fever, many people may require hospitalization within a few days. Hospitals may become overcrowded and it may become necessary for many sick people to be cared for in their home by relatives or friends. The following information may be helpful in providing care to sick persons at home.

- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after contact with the sick person.
- Wear gloves (vinyl or latex) when you have contact with the sick person's blood and other body fluids (urine, feces, vomit, wound drainage, mucous, or saliva). Wash your hands after removing the gloves. If gloves are not available, wrap plastic bags over your hands and secure with a rubber band. Discard the bags after each use and wash your hands with soap and water.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- If an antibiotic is recommended, give it exactly as prescribed by the doctor or nurse. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least twice a day. If the temperature goes above 100.4°F, give Tylenol® (if not allergic) or other medicine such as Motrin® or Advil®. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse) or take the person to the nearest designated emergency center or hospital.
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Change the sick person's clothes and bed linens frequently especially if soiled with blood or other body fluids.
- Wash soiled clothes and bed linens in warm water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day or when surfaces become soiled with blood or other body fluids.
- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently and eat a healthy diet. Even if you are not taking an antibiotic, take your temperature in the morning and afternoon for 2 weeks. If you develop a temperature above 100.4°F or if you have flu-like symptoms, seek medical attention immediately.

Q FEVER – SCREENING

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 2 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 2 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Have you been camping in past 2 weeks? **NO** **YES**

Have you had any insect bites in the past 2 weeks? **NO** **YES**

Have you had contact with sick animals within the past 2 weeks? **NO** **YES**

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO** **YES** If Yes, what medicine(s) are you allergic to?

_____

Over the past 2 weeks, have you had any of the following symptoms or ailments? (Check all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Sore throat	
Headache		Feel cold all over or shiver/shake	
Dry cough		Short of breath	
Sweating		Pain or tightness in the chest	
Sore muscles		Very tired	
Diarrhea		Vomiting	
Swollen fingers		Upset stomach (nausea)	
Lost of appetite		Rash on the skin	
Change in mental status		Confusion	

TULAREMIA (FRANCISELLA TULARENSIS)

OVERVIEW

Any suspected or confirmed case of tularemia (*Francisella tularensis*) must be reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Naturally Occurring Tularemia

Tularemia, also know as rabbit fever and deer fly fever, is a zoonotic disease typically acquired by humans after skin or mucous membrane contact with infected animals. Ticks, deer flies and mosquitoes can also transmit the infection. Less commonly, inhalation of contaminated dust or ingestion of contaminated food or water may result in clinical disease.

Bioterrorism Epidemiology

Exposure to as few as 10 – 50 aerosolized organisms may result in clinical disease. Person to person transmission does not occur. Large numbers of temporally clustered persons presenting to a clinic or an emergency room with similar symptoms should be reported to the local health officer immediately.

Incubation Period

The average incubation period is 3 – 5 days (range 1 – 21 days).

Clinical Presentation

Tularemia may present as one of six indistinct, overlapping clinical syndromes: pneumonic, systemic, ulceroglandular, glandular, oculoglandular, and oropharyngeal. The symptoms range from asymptomatic to acute sepsis leading to rapid death.

Pneumonic tularemia

Pneumonic tularemia would presumably be the most likely clinical presentation of an intentional bioaerosol release of *F. tularensis*. The onset of symptoms may be abrupt and include:

- Fever, non- to minimally productive cough, substernal tightness, pleuritic chest pain, occasional hemoptysis (rare), chills, headache, malaise, anorexia, and fatigue
- Chest x-ray (CXR) may show infiltrates without symptoms. Other CXR findings may include subsegmental/lobar infiltrates, hilar adenopathy, pleural effusion, or miliary infiltrates (may mimic tuberculosis)
- Pleural fluid is usually exudative with more than 1000 leukocytes/mm^3

- Granulomas may develop and occasionally caseate and may be confused with tuberculosis
- Secondary skin rashes can occur within the first two weeks of illness in up to 35% of cases

Systemic tularemia

- Febrile illness without typical clinical features of other forms of tularemia,
- Non descript symptoms also include fever, chills, headache, myalgias, cough, sore throat, nausea, vomiting, watery diarrhea (rarely bloody), and abdominal pain,
- More common in persons with chronic diseases and may lead to rapid death or protracted illness.

Oropharyngeal, Ulceroglandular, Glandular, and Oculoglandular Tularemia (unlikely bioaerosol release presentations)

- Oropharyngeal tularemia results from the direct invasion of the oropharynx (contaminated food and water) causing a sore throat with exudative tonsillitis and pharyngitis with the formation of ulcer(s); also may involve cervical, preparotid, and retropharyngeal lymph nodes with possible abscess formation.
- Ulceroglandular and glandular tularemia generally present with enlarged, local tender lymph nodes. Skin lesions can appear before, simultaneously, or after lymphadenopathy. The ulcers start as red, painful papule(s) that progress to necrotic draining ulcers with raised borders.
- Glandular tularemia is the same as ulceroglandular without the skin lesions.
- Oculoglandular tularemia results from the inoculation of bacteria onto the eye resulting in photophobia and excessive lacrimation, swollen eyes, painful infected conjunctiva and yellowish conjunctival ulcers.

Laboratory

Initial laboratory findings are generally nonspecific. Peripheral white blood cell count ranges from 5,000 – 22, 000 cells per microliter with a normal differential count. Lymphocytosis may occur late in the disease. Hematocrit, hemoglobin, and platelet counts are generally normal. Mild elevations in lactic dehydrogenase, serum transaminases and alkaline phosphatase are common. Rhabdomyolysis may be associated with elevations in serum creatine kinase and urinary myoglobin levels. Cerebral spinal fluid is generally normal although mild abnormalities in protein, glucose and blood cell count may be seen.

Tularemia can be diagnosed by recovery of the organism from blood, ulcers, conjunctival exudates, sputum, gastric washings, and pharyngeal exudates. The organism grows poorly on standard culture media and requires cysteine-enriched media. Most diagnoses of tularemia are made serologically.

Complications

Complications include dehydration, hypotension, renal failure, disseminated intravascular coagulation (DIC), jaundice, hepatitis, meningitis, encephalitis, pericarditis, peritonitis, splenic rupture, rhabdomyolysis, suppuration of lymph nodes, and pleural effusion. Treatment delay and pre-existing medical conditions may contribute to death.

Differential Diagnosis

Other organisms to consider include *Mycoplasma pneumoniae*, *Legionella pneumophila*, *Chlamydia psittaci*, *Chlamydia pneumoniae* and *Mycobacterium tuberculosis*.

Treatment (See Tables 1 and 2)

Prophylaxis

Antibiotic prophylaxis is not commonly used to prevent naturally acquired tularemia.

Isolation

Standard Precautions are recommended. In addition to Standard Precautions, Contact precautions are recommended for patients with ulceroglandular or oculoglandular tularemia, if lesion drainage is not contained with a dressing.

Recommendations[1] for the treatment of patients with tularemia in contained and mass casualty settings and for post-exposure prophylaxis[2] are as follows:

Table 1: Tularemia – Antibiotic Therapy for Contained Casualty Settings

Contained Casualty Setting: assumes a limited number of persons seeking treatment. Start IV antibiotic therapy as soon as diagnosis is suspected.	
Patient Category	**Recommended Therapy**
Adults	**Preferred Therapy** *Gentamicin 5 mg/kg IM or IV 1 time daily[3] or *Gentamicin 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily[3] **Alternative Choices** *Doxycycline 100 mg IV 2 times daily *Ciprofloxacin 400 mg IV 2 times daily[4] Chloramphenicol 25 mg/kg IV 4 times daily[5]
Children[6]	**Preferred Therapy** *****Gentamicin 2.5 mg/kg IM or IV 3 times daily[3] **Alternative Choices** *****Doxycycline = 45 kg give adult dose < 45 kg give 2.2 mg/kg IV 2 times daily *Ciprofloxacin 15 mg/kg 2 times daily[4] Chloramphenicol 15 mg/kg IV 4 times daily[5]
Pregnant Women[7]	**Preferred Therapy** *****Gentamicin 5mg/kg IM or IV 1 time daily[3] or *Gentamicin 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily[3] **Alternative Choices** *Doxycycline 100 mg IV 2 times daily *Ciprofloxacin 400 mg IV 2 times daily[5]

*Antibiotic supplied as part of the National Pharmaceutical Stockpile (NPS)

Table 2: Tularemia – Antibiotic Therapy for Mass Casualty Settings and Post-exposure Prophylaxis

Mass Casualty Setting and Post-exposure Prophylaxis[8]	
Adults	**Preferred Choices** *****Doxycycline 100 mg orally 2 times daily[9] *Ciprofloxacin 500 mg orally 2 times daily[4]
Children[6]	**Preferred Choices** *Doxycycline[9] If = 45 kg give adult oral dose If < 45 kg give 2.2 mg/kg orally 2 times daily Ciprofloxacin 15 mg/gm orally 2 times daily[4]
Pregnant Women[7]	**Preferred Choices** *Ciprofloxacin 500 mg orally 2 times daily[4] *Doxycycline 100 mg orally 2 times daily[9]

*Antibiotic supplied as part of the National Pharmaceutical Stockpile (NPS)

1. These recommendations are adapted from the consensus recommendations of the Working Group on Civilian Biodefense and are not necessarily approved by the Food and Drug Administration. In non-bioterrorism response situations, routine treatment guidelines should be followed. Refer to the original publication (Dennis DT, Inglesby TV, Henderson DA, et al. Tularemia as a biological weapon: Medical and public health management, JAMA, in press) for explanations and further discussion.
2. One antimicrobial agent should be selected. Therapy with gentamicin or ciprofloxacin should be continued for 10 days. Treatment with doxycycline or chloramphenicol should be continued for 14 – 21 days. Persons beginning treatment with parenteral doxycycline, ciprofloxacin or chloramphenicol can be switched to oral antibiotics when clinically indicated.
3. Aminoglycosides must be adjusted according to renal function. Neonates up to 1 week of age and premature infants should receive gentamicin 2.5 mg/kg 2 times daily.
4. Other fluoroquinolones can be substituted at doses appropriate for age. Ciprofloxacin dosage should not exceed 1 g daily in children.
5. Concentration should be maintained between 5 and 20 ug/mL. Concentrations greater than 25 ug/mL can cause reversible bone marrow suppression. Children younger than 2 years should not receive chloramphenicol.
6. In children, ciprofloxacin does should not exceed 1 g daily, chloramphenicol should not exceed 4 g daily. Children younger than 2 years should not received chloramphenicol. In neonates, gentamicin-loading dose of 4 mg/kg should be given initially.
7. Alternatives to breastfeeding may be required while the mother is taking certain antibiotics. Consult specific antibiotic package insert for information on breastfeeding.
8. One antibiotic, appropriate for the patient's age, should be chosen among the alternatives. Duration of prophylaxis in mass casualty situations is 14 days. Duration of treatment with doxycycline or chloramphenicol is 14 – 21 days.
9. Tetracycline may be substituted for doxycycline.

TULAREMIA – QUICK REFERENCE

Any suspected or confirmed case of tularemia *(Francisella tularensis)* must be reported to the infection control practitioner [*insert telephone number]* and the local health department [*insert telephone number*] immediately.

Bioterrorism Epidemiology:

- Exposure to 10 – 50 organisms can result in clinical disease.
- Pneumonic tularemia is not transmitted from person to person.
- Laboratory personnel are at high risk for infection.

Incubation Period:

- Average 3 to 5 days (range 1 to 21 days).

Clinical Disease: (Six classic forms of tularemia that may overlap)

- Pneumonic (most likely presentation): abrupt onset of fever, chills, headache, malaise, anorexia, cough (little or no sputum production), myalgias, pleuritic chest pain, substernal tightness, and rarely hemoptysis. Pneumonia may be primary or secondary to bacteremic dissemination from other tularemia syndromes.
- Systemic: fever, chills, myalgias, sore throat, nausea, anorexia, vomiting, abdominal pain, and loose or watery diarrhea.
- Oropharyngeal, ulceroglandular, oculoglandular or glandular – (See tularemia overview).

Diagnosis:

- Laboratory: elevated WBC, lactic acid dehydrogenase, serum transaminase, alkaline phosphatase, and possibly serum creatine kinase and urinary myoglobin levels. Pleural fluid generally exudative with >1000 leukocytes/$mm^{3.}$
- Radiology: Chest x-ray may show infiltrates without symptoms; subsegmental/lobar infiltrates, hilar adenopathy, pleural effusion, granulomas, or miliary infiltrates (may mimic tuberculosis).

Treatment: (See overview)

- Gentamicin, Ciprofloxacin, or Doxycycline

Prophylaxis: (See overview)

- Doxycycline (may substitute tetracycline) or Ciprofloxacin

Isolation:

- Standard Precautions

TULAREMIA – FREQUENTLY ASKED QUESTIONS (FAQ)

What is tularemia?

The bacteria (germs) that cause tularemia are normally transmitted (spread) to humans by contact with dead, infected animals (rabbits, squirrels and birds), by flea and tick bites and by inhaling (breathing) dust or soil that has been contaminated by infected animals. The infection can also be transmitted by drinking contaminated water or by eating undercooked meat. If the bacteria were intentionally released into the air it could be inhaled (breathed) into your lungs and cause an infection such as pneumonia.

Is tularemia spread from person-to-person?

The infection is not spread from person to person.

How will I know if I was exposed to the bacteria?

It will depend on how the bacteria were released, where the bacteria were released, and where you were in relation to the release site. The further away you were from the release site the less likely it will be that you were exposed.

How soon will symptoms develop (incubation period)?

Normally the symptoms start 3 - 5 days after exposure to the bacteria, but the incubation period may be as short a 1-day or as long as 21 days depending on how close you were to the site where the bacteria were released into the air. Not all persons exposed to the bacteria will develop symptoms.

What are the symptoms of infection?

The symptoms of pneumonia are generally flu-like and may include a sudden onset of fever, chills, headache, tiredness, sore muscles, loss of appetite, cough, and chest pain. You may also develop vomiting, stomach pain, and watery diarrhea. Although rare, you may develop a sore throat with painful, swollen glands or an ulcer on your face, neck or arms with painful, swollen glands.

How is the infection treated?

If you have symptoms of the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health officer determines that you were exposed to the bacteria, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If

any of the following symptoms develop while you are taking the antibiotic, you should see your health care provider (doctor or nurse) immediately:

How long should I take the antibiotic?

It is important that you take the antibiotic exactly as directed. The dose and number of treatment days will differ depending on the antibiotic prescribed. If you develop side effects (reaction) to the antibiotic, call your health care provider (doctor or nurse) immediately. Do not give your antibiotic to another person.

What should I do if I do not have symptoms?

If you do not have any symptoms of the infection, you should continue with your routine daily activities. Please do not go to the hospital emergency room unless you have a fever or other symptoms of the infection.

How can I get more information?

The local health department will make frequent public announcements about who should receive an antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

TULAREMIA – HOME CARE INSTRUCTIONS

In the event of an intentional release of the bacteria (germs) that causes tularemia, many people may require hospitalization within a few days. Hospitals may become overcrowded and it may become necessary for many sick people to be cared for in their home by relatives or friends. The following information may be helpful in providing care to sick persons at home.

- Wash your hands with soap and water before you eat or drink, after using the bathroom, and after contact with the sick person.
- Wear gloves (vinyl or latex) when you have contact with the sick person's blood and other body fluids (urine, feces, vomit, wound drainage, mucous, or saliva). Wash your hands after removing the gloves. If gloves are not available, wrap plastic bags over your hands and secure with a rubber band. Discard the bags after each use and wash your hands with soap and water.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- If an antibiotic is recommended, give it exactly as prescribed by the doctor or nurse. If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least twice a day. If the temperature goes above 100.4°F, give Tylenol® (if not allergic) or other medicine such as Motrin® or Advil®. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse) or take the person to the nearest designated emergency center or hospital.
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Change the sick person's clothes and bed linens frequently especially if soiled with blood or other body fluids.
- Wash soiled clothes and bed linens in warm water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day or when surfaces become soiled with blood or other body fluids.
- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently and eat a healthy diet. Even if you are not taking an antibiotic, take your temperature in the morning and afternoon for 3 weeks. If you develop a fever above 100.4°F or if you have flu-like symptoms, seek medical attention immediately.

TULAREMIA – SCREENING FORM

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 3 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 3 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Have you been camping in past 3 weeks? **NO** **YES**

Have you had any insect bites in the past 3 weeks? **NO** **YES**

Have you had contact with sick animals within the past 3 weeks? **NO** **YES**

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO** **YES** If yes, what medicine(s) are you allergic to?

_____

Over the past 3 weeks, have you had any of the following symptoms or ailments? (Check all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Sore throat	
Headache		Feel cold all over or shiver/shake	
Dry cough		Cough up blood	
Sore muscles		Pain or tightness in the chest	
Diarrhea (loose or runny stool)		Very tired	
Bloody diarrhea		Vomiting	
Pain in stomach		Upset stomach (nausea)	
Lost of appetite		Swollen glands	
Short of breath		Red, painful bumps on the skin	

DROPLET PRECAUTIONS

Pneumonic plague can be transmitted to healthcare workers when the infected patient coughs, sneezes, or speaks. Transmission requires close contact (within 3 feet) between the infected patient and the healthcare worker. In addition to Standard Precautions, Droplet Precautions should be followed for patients with suspect or diagnosed pneumonic plague.

Patient Placement

Place the patient in a private room, if available. Patients with the same diagnosis or similar syndrome may be cohorted (grouped) in semi-private rooms. When a private room or cohorting is not achievable, spatially separate the infected patient three (3) or more feet away from a non-infected patient. Negative pressure isolation rooms or HEPA filtration units are not required. The door to the patient's room can remain open.

Respiratory Protection

Wear a surgical mask over the nose and mouth when entering the patient's room or within 3 feet of the infected patient.

Transporting Patients

Transport infected patients only when necessary. Place a surgical mask over the patient's nose and mouth, if tolerated. If an elevator is used, all occupants should be masked.

Visitors

Limit visitors to immediate family members or significant others. Instruct visitors to wash their hands before and after patient contact and to wear a surgical mask when within three feet of the infected patient.

PLAGUE (YERSINIA PESTIS) – OVERVIEW

Any suspected case of plague (*Yersinia pestis*) MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Naturally Occurring Plague

The most common form of plague, bubonic, occurs in humans who have been bitten by plague-infested fleas. The bacteria migrate to regional lymph nodes where they rapidly multiply and form a painful swollen lymph node (bubo). Another form of the disease, septicemic plague, can also result from a fleabite and is not normally associated with a bubo. Both forms of plague can result in secondary pneumonic plague by hematogenous spread of the bacteria to the lungs. Up to 80% of persons with bubonic plague can also become septicemic and about 15% will develop pneumonic plague. Pneumonic plague has occurred in persons who have had face-to-face contact with pet animals (e.g., cats) with pneumonic plague.

Bioterrorism Epidemiology

Pneumonic plague would be the most likely result of an intentional bioaerosol release. Numerous, previously healthy persons would require immediate emergency care including antibiotic therapy and life support systems. Pneumonic plague is transmitted by close, face-to-face (within 3 feet) contact with infectious respiratory droplets generated when the person coughs or talks.

Incubation Period

The range of time between a bioaerosol exposure and the development symptoms ranges from 1-6 days (average 2 - 4 days).

Clinical Presentation

The onset is generally fulminant and the person generally presents with a high fever, chills, malaise, headache, hypotension, myalgias and a productive cough. The sputum is generally bloody and, less commonly, watery or purulent. The pulmonary symptoms may progress rapidly to dyspnea, stridor, and cyanosis. Gastrointestinal symptoms may include nausea, vomiting, abdominal pain and diarrhea. Cervical buboes, although rarely seen in primary pneumonic plague, may be identified.

Complications

Plague septicemia can produce thromboses in the acral (distal) vessels, with necrosis and gangrene. Black necrotic appendages and purpuric lesions caused by endotoxemia may be present. Plague meningitis occurs in about 6% of the septicemic and pneumonic cases. If treatment is delayed beyond 18 hours, the mortality rate for bubonic plague approaches 60% and for pneumonic plague about 100%.

Diagnosis

Radiological

The chest x-ray commonly shows patchy or consolidated bronchopneumonia, mediastinitis, and/or pleural effusions.

Laboratory

The WBC is generally elevated to 20,000 cells per mm^3 or higher (leukemoid reaction) with an increased number of bands. Toxic granulations may be seen on blood smear. Blood platelets may be low to normal and coagulation abnormalities may indicate a low-grade DIC. The BUN, creatinine, ALT, AST, and bilirubin may also be elevated, consistent with multi-organ failure.

Gram, Wright, Giemsa, or Wayson-stained smears of the sputum, blood, CSF, or bubo (if present) may demonstrate coccobaccillus. Automated or semi-automated bacterial identification systems may misidentify *Y pestis*. The organism grows optimally on blood or MacConkey agar at 28?C. After 48 hours, very small colonies barely visible to the naked eye may be identified. Antibiotic testing should be performed at the state reference laboratory.

Treatment (See Tables 1 and 2)

Early administration of antibiotics is crucial to survival, as pneumonic plague is invariably fatal if therapy is delayed.

Supportive therapy includes IV crystalloids and hemodynamic monitoring. Although a low-grade DIC may occur, clinically significant hemorrhage is uncommon, as is the need for heparin. Endotoxic shock is also common, but rarely requires pressor agents. Buboes, if present, rarely require incision and drainage, and will recede with systemic antibiotic therapy. If required for diagnostic purposed, buboes should be aspirated to avoid contact with *Y pestis*

Isolation

Standard and Droplet Precautions are recommended until the patient has been on antibiotic therapy for 72 hours and is clinically improved. If buboes are draining, Contact Precautions may be necessary in addition to Standard and Droplet Precautions.

Recommendations[1] for the treatment of patients with pneumonic plague in a contained and mass casualty setting and for post-exposure prophylaxis.[2]

Table 1: Plague – Antibiotic Therapy for Contained Casualty Settings

Contained casualty setting: assumes a limited number of persons seeking treatment. Start IV therapy as soon as diagnosis is suspected	
Patient Category	**Recommended Therapy**
Adults	**Preferred Therapy** *Gentamicin 5 mg/kg IM or IV 1 time daily or *Gentamicin 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily[3] **Alternative Choices** *Doxycycline 100 mg IV 2 times daily *Ciprofloxacin 400 mg IV 2 times daily[4] Chloramphenicol 25 mg/kg IV 4 times daily[5]
Children[6]	**Preferred Therapy** *Gentamicin 2.5 mg/kg IM or IV 3 times daily[3] **Alternative Choices** *Doxycycline = 45 kg give adult dose < 45 kg give 2.2 mg/kg IV 2 times daily (Maximum 200 mg daily) *Ciprofloxacin 15 mg/kg 2 times daily[4] Chloramphenicol 15 mg/kg IV 4 times daily[5]
Pregnant Women[7]	**Preferred Therapy** *Gentamicin 5mg/kg IM or IV 1 time daily or *Gentamicin 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV 3 times daily[3] **Alternative Choices** *Doxycycline 100 mg IV 2 times daily *Ciprofloxacin 400 mg IV 2 times daily[4]

Table 2: Plague – Antibiotic Therapy for Mass Casualty Settings and Post-exposure Prophylaxis

Mass Casualty Setting and Post-exposure Prophylaxis[8]	
Adults	**Preferred Choices** *Doxycycline 100 mg orally 2 times daily[9] *Ciprofloxacin 500 mg orally 2 times daily[4] **Alternate Choice** Chloramphenicol 25 mg/kg orally 4 times daily[5]
Children[6]	**Preferred Choices** *Doxycycline[9] If = 45 kg give adult oral dose If < 45 kg give 2.2 mg/kg orally 2 times daily *Ciprofloxacin 20 mg/kg orally 2 times daily[4]
Pregnant Women[7]	**Preferred Choices** *Ciprofloxacin 500 mg orally 2 times daily[4] *Doxycycline 100 mg orally 2 times daily[9] **Alternate choice** Chloramphenicol 25 mg/kg 4 times daily[5]

* Antibiotic supplied as part of the National Pharmaceutical Stockpile (NPS)

1. These recommendations are adapted from the consensus recommendations of the Working Group on Civilian Biodefense and are not necessarily approved by the Food and Drug Administration. In non-bioterrorism response situations, routine treatment guidelines should be followed. Refer to the original publication (Inglesby TV, Dennis DT, Henderson DA, et al. Plague as a Biological Weapon: Medical and Public Health Management, JAMA. 2000;283: 2281-2289) for explanations and further discussion.
2. One antimicrobial agent should be selected. Therapy with gentamicin or ciprofloxacin should be continued for 10 days. Treatment with doxycycline or chloramphenicol should be continued for 14 – 21 days. Persons beginning treatment with parenteral doxycycline, ciprofloxacin, or chloramphenicol can be switched to oral antibiotics when clinically indicated.
3. Aminoglycosides must be adjusted according to renal function. Evidence suggests that gentamicin 5 mg/kg IM or IC one time daily would be efficacious in children, although this is not yet widely accepted in clinical practice. Neonates up to 1 week of age and premature infants should receive gentamicin 2.5 mg/kg 2 times daily.
4. Other fluoroquinolones can be substituted at doses appropriate for age. Ciprofloxacin dosage should not exceed 1 g daily in children.
5. Concentration should be maintained between 5 and 20 ug/mL. Concentrations greater than 25 ug/mL can cause reversible bone marrow suppression. Children younger than 2 years should not receive chloramphenicol.
6. In children, ciprofloxacin does should not exceed 1 g daily, chloramphenicol should not exceed 4 g daily. Children younger than 2 years should not received chloramphenicol. In neonates, gentamicin-loading dose of 4 mg/kg should be given initially.
7. Alternatives to breastfeeding may be required while the mother is taking certain antibiotics. Consult specific antibiotic package insert for information on breastfeeding.
8. Duration of treatment for plague in mass casualty situations is 10 days. Duration of post-exposure prophylaxis to prevent plague infection is 7 days.
9. Tetracycline may be substituted for doxycycline.

PLAGUE – QUICK REFERENCE

Any suspected case of plague (*Yersinia pestis*) MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Bioterrorism Epidemiology:
- Pneumonic plague: most likely disease presentation if bacilli intentionally aerosolized.
- Bubonic plague: most likely disease presentation if infected fleas released.

Transmission:
- Person to person exposure to respiratory droplets (within 3 feet)
- Contact with infected animals
- Contact with infected, draining buboes

Incubation Period:
- Pneumonic: 1 – 3 days; Bubonic 2 - 10 days.

Clinical Disease:
- Pneumonic: acute onset high fever, chills, headache, myalgias, malaise, cough (hemoptysis) progressing rapidly to dyspnea, stridor, cyanosis, and death; gastrointestinal symptoms may be present.
- Bubonic: high fever, malaise, painful lymph nodes common in groin
- Septicemic: 80% of persons with bubonic become septic; 5 – 15% develop pneumonia.

Diagnosis:
Presumptive diagnosis: gram-negative coccobacilli with "safety-pin" bipolar staining on Gram, Wright, Giemsa, or Wayson stain of blood, sputum, CSF, or lymph node aspirates (if present).

Treatment: (see overview)
- Early antibiotic treatment is critical to survival.

Prophylaxis: (see overview)
- Early antibiotic prophylaxis is critical to preventing disease.

Isolation:
- Pneumonic: Standard and Droplet Precautions
- Bubonic: Standard and Contact Precautions. Droplet Precautions if bubonic progresses to pneumonia.

PLAGUE – FREQUENTLY ASKED QUESTIONS (FAQ)

What is plague?

The bacteria (germs) that cause plague are normally transmitted (spread) to humans by infected fleas. If the bacteria were intentionally released into the air they could be inhaled (breathed) into your lungs and cause a severe infection such as pneumonia.

Is plague spread from person-to-person?

The infection is spread from person-to-person by close contact (with 3 feet) with the infected person who coughs the bacteria from the lungs into the air.

How will I know if I was exposed to the bacteria?

That will depend on how the bacteria were released into the air, where the bacteria were released, and where you were relative to the release site. The further away you were from the release site, the less likely it will be that you were exposed. If you have close contact with an infected person (within 3 feet), the local health department may determine that you have been exposed.

How soon will symptoms develop (incubation period)?

The symptoms may start within 1 - 6 days after you breathe the bacteria into your lungs.

What are the symptoms of infection?

The symptoms include sudden onset of high fever, chills, headache, extreme fatigue, muscle aches, and a cough that may be bloody.

How is the infection treated?

If you have the infection, your health care provider (doctor or nurse) will give you an antibiotic.

How is the infection prevented?

If the local health department determines that you were exposed to the bacteria, you will be offered an antibiotic. Even if you take the antibiotic, you may develop the infection. If you develop symptoms of the infection such as fever or bloody cough while you are taking the antibiotic, you should go to the nearest emergency service center or hospital immediately.

How long should I take the antibiotic?

It is extremely important that you take the antibiotic exactly as directed. The dose and the number of treatment days will differ depending on the antibiotic prescribed. If you develop side effects (reaction) to the antibiotic, call your health care provider (doctor or nurse) immediately. Do not give your antibiotic to another person.

What should I do if I develop symptoms of infection while I am taking the antibiotic?

Take your temperature daily. If you have a fever of greater that 100.4?F or if you develop flu-like symptoms (cough, fatigue, muscle aches), or a headache, go immediately to the nearest emergency medical service or hospital.

What should I do if I do not have symptoms?

If you do not have symptoms of the infection, you should continue with your routine daily activities. Please do not go to the hospital emergency room unless you are feeling sick. The local health officer may suggest that you wear a mask over your nose and mouth if you have to go to public places.

How can I get more information?

The local health department will make frequent public announcements about who should receive an antibiotic, how to take the antibiotic, and where you can obtain the antibiotic. It is important that you listen to the radio or television for more information.

PLAGUE – HOME CARE INSTRUCTIONS

In the event of an intentional release of the bacteria that causes plague, many people may require hospitalization within a few days. Hospitals may soon become overcrowded and it may become necessary for many sick people to be cared for in their home by relatives or friends. The following information may be helpful in providing care to sick persons at home.

- Listen closely to the local radio or television for special instructions.
- Advise friends and relatives not to visit until the sick person is feeling better.
- Wash your hands with soap and water before you eat or drink, after using the bathroom and after contact with the sick person.
- Wash the sick person's hands after using the bathroom, before eating or drinking and after contact with pets.
- Wear gloves (vinyl or latex) when you have contact with the sick person's blood and other body fluids (urine, feces, vomit, wound drainage, mucous or saliva). Wash your hands after removing the gloves. If gloves are not available, wrap plastic bags over your hands and secure with a rubber band. Discard the bags after each use and wash your hands with soap and water.
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- If an antibiotic is recommended, give it exactly as prescribed by the health care provider (doctor or nurse). If an allergic reaction develops, seek medical advice immediately.
- Take the person's temperature at least twice a day. If the temperature goes above 100.4?F, give Tylenol® (if not allergic) or other medicine such as Motrin® or Advil®. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse) or take the person to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Change the sick person's clothes and bed linens frequently especially if soiled with blood or other body fluids.
- Wash soiled clothes and bed linens in warm water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day or when surfaces become soiled with blood or other body fluids.
- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently and eat a healthy diet. If you are taking an antibiotic, take your temperature in the morning and afternoon for 3 weeks. If you develop a fever above 100.4?F or if you have flu-like symptoms see a doctor or nurse immediately.

PLAGUE – SCREENING FORM

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 3 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 3 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Have you been camping in past 3 weeks? **NO** **YES**

Have you had any insect bites in the past 3 weeks? **NO** **YES**

Have you had contact with sick animals within the past 3 weeks? **NO** **YES**

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO** **YES** If yes, what medicine(s) are you allergic to?

_____

Over the past 3 weeks, have you had any of the following symptoms or ailments? (Check all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Headache	
Trouble breathing		Cough	
Cough up blood		Pain or tightness in the chest	
Sore muscles		Very tired	
Lump in the groin, arm pit, or neck		Pain in the groin, arm pit or neck	
Upset stomach		Vomiting	
Diarrhea		Confusion or disorientation	

SMALLPOX (VARIOLA)

RECOMMENDATIONS FOR ISOLATION

Any suspected or confirmed case of smallpox MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [insert telephone number] immediately.

Introduction

Smallpox is a viral disease unique to humans. To sustain itself, the virus must pass from person to person in a continuing chain of infection. Smallpox (variola) was eradicated globally in the late 1970's and routine vaccination was discontinued worldwide following a declaration by the World Health Organization (WHO) that the world was free of smallpox in 1980. Today there is concern that the smallpox virus may exist in laboratories other that those designated by WHO. If an outbreak of smallpox were to occur today several factors would contribute to the rapid transmission of this infection. These factors include: (1) virtual global population susceptibility, (2) inability of health care workers to immediately recognize and report symptoms associated with infection, and (3) increased population mobility and crowding. Because of these factors a single case of smallpox would require an immediate and coordinated public health and medical response to contain the outbreak.

OSHA Bloodborne Pathogens Standard

Patients with smallpox may be viremic, so that blood should be considered potentially infectious for smallpox. Healthcare workers should follow facility specific procedures related to reducing the risk of occupational exposure to blood and other potentially infectious materials as required by the California Occupational Safety and Health Administration's (CAL-OSHA) Bloodborne Pathogens Standard.

Training

Healthcare workers expected to provide direct and indirect patient care should be specifically trained in methods to reduce the risk of exposure to patients infected with smallpox.

Vaccination

Health care workers should be vaccinated as soon as the vaccine is available from the Centers from Disease Control and Prevention (CDC). Health care workers should be instructed to report any symptoms of infection or vaccination reaction to the Employee Health Service.

Isolation Recommendations

Recommendations for smallpox isolation were developed to assist infection control practitioners in developing a rational approach to reducing the risk of transmission of this highly contagious virus to healthcare workers and the community. Isolation should be maintained until the local health officer informs healthcare facilities that isolation is no longer necessary.

Room Placement

Although patients with smallpox should be isolated in negative pressure rooms with adjoining anterooms these facilities may be limited or, in some hospitals, non-existent. Several options for isolating patients with smallpox are presented. Plan A or B is the best approach when only a limited number of cases are anticipated. If the outbreak escalates, plan C or D may have to be implemented to accommodate increasing numbers of patients.

Plan A: - Negative Pressure Isolation Room

Place the patient in a private room that has (1) monitored negative air pressure in relation to the exterior surrounding areas, (2) 6-12 air changes per hour (ACH), and (3) appropriate venting of contaminated air to the outside. If 6 – 12 ACH cannot be achieved, place a HEPA filtration unit in the room. The windows and doors should remain closed and the patient should remain in the room.

Plan B: – No Negative Pressure Room

If no negative pressure room is available, place the patient in a private room. The room should be equipped with a HEPA filtration unit. The windows and doors should remain closed and the patient should remain in the room.

Plan C: – Designated Nursing Unit

As the number of smallpox patients requiring hospitalization and isolation increases, consider designating a wing of a nursing unit or, preferentially, an entire nursing unit. It may be necessary to create a barrier between the designated nursing unit (wing) and other areas of the hospital. Infection control practitioners should develop a plan consistent with the structure of the hospital and the ability to effectively isolate infected patients from non-infected patients. These barriers may include, but are not limited to, sealing off the existing ventilation system to prevent contaminated air from circulating to other areas of the hospital, closing all windows and doors, including fire doors, and limiting access to the unit to trained personnel.

Plan D: – Designated Health Facility

The county or state emergency medical service agencies may designate a specific facility such as a hospital or gymnasium to accommodate increasing numbers of cases that require medical support.

Visitors

Visitors should be limited to immediate family or significant others. Unvaccinated visitors should be encouraged to remain at home until vaccinated. If this is not an option, visitors should be instructed to wear PPE.

Personal Protective Equipment (PPE)

The physical properties of PPE should be appropriate to the degree of exposure and the task(s) to be performed. Infection control practitioners should evaluate existing PPE to determine if the physical properties maximize protection.

Respirators

Disposable, NIOSH-approved, fit-tested N-95 respirators should be worn when entering the room and removed after leaving the room. If patients cannot be placed in negative pressure or HEPA filtered rooms, N-95 respirators should be worn at all times when entering a designated smallpox unit.

Facial Shields or Eye Protectors

Face shields or eye protectors with side shields should be worn when entering the room.

Gowns

Disposable, long sleeve, ribbed or elastic-cuffed gowns or coveralls should be worn when entering the room and removed before leaving the room. After removal, clothing should not have contact with the patient or potentially contaminated surfaces or equipment.

Gloves

Disposable gloves should be worn when entering the room. Gloves should cover the rib or elastic cuffs of the gown. All jewelry including rings should be removed. Reinforced or double gloves should be worn for procedures that involve handling sharp devices (e.g., phlebotomy). Gloves should be removed prior to leaving the room and hands should be washed.

Shoe and Head Covers

Disposable shoe and head covers should be worn if there is evidence of extensive hemorrhaging and blood visibly soils the environment.

Handwashing

Hands should be washed with soap (antimicrobial or non-antimicrobial) and water after protected (gloved) and unprotected (ungloved) contact with visible blood, body fluids (secretions, excretions [urine and feces], wound drainage and skin visibly soiled with blood and body fluids. Wash hands before leaving the immediate vicinity of patient contact (patient room, cubicle, or bathroom). After handwashing, avoid touching the patient and surfaces or items in the immediate vicinity of the patient (bedpans, bed rails, bedside tables). Decontaminate hands with an alcohol or quaternary ammonium-based ("quat") product after contact with invisible soil (protected or unprotected hands have not been in contact with visible blood or body fluids).

Transporting Patients

Patients should not be transported to other areas of the hospital unless absolutely necessary. If patients must be transported, place a surgical mask over patient's nose and mouth. Place a sheet or blanket over the patient completely covering the body from the neck to and including the feet. Cover the head and face (except the nose and mouth) with a towel. If an elevator is used to transport patients, all occupants should wear PPE including N-95 respirators.

Laboratory Specimens

Specimens should be placed in double, zip-lock bags that are tightly sealed and properly labeled. Specimens should be hand carried to the laboratory. Laboratory personnel should adhere to the chain of custody protocols developed by local health department and the FBI.

Patient Care Equipment

Patient care equipment (e.g., thermometers, blood pressure cuffs, stethoscopes and commodes) should be kept in the patient's room. Use disposable equipment whenever possible. Reusable equipment should be placed in an appropriately labeled container, sealed and transported to central service for reprocessing.

Environmental Services

Daily Cleaning

Disinfect environmental surfaces in the patient's room and bathroom with a properly diluted, Environmental Protection Agency (EPA) approved disinfectant such as a

quaternary ammonium compound or a phenolic. Allow all surfaces to air dry. The disinfecting solution and a supply of cleaning materials should be kept in the patient's room. Privacy curtains should be changed when visibly soiled. Floors should be cleaned using a single-bucket procedure of wet mopping. The contents of the bucket should be emptied into the toilet. After each use, the mop head should be removed and disposed in the linen hamper. Disposable mop heads and cleaning cloths should be used, if available. The bucket and the mop handle should remain in the patient's bathroom.

Terminal Cleaning

Terminal cleaning should be performed using similar procedures described for daily cleaning. If the room is under negative pressure or is HEPA filtered and there are at least 6 - 12 ACH, allow the room to air for at least 2 - 12 hours (depending on the number of ACH) before admitting a non-infected patient to the room.

Soiled Linen

Soiled linen should be placed in leak proof bags. When removed from the room, the bag should be placed in a second leak proof bag and clearly identified as "isolation" or "contaminated". The bag should be carefully secured and removed from the nursing unit in covered carts to a designated holding area. Chutes should not be used.

Facility Operated Laundry

Soiled linen should be autoclaved prior to transport to the laundry facility. If the linen is not autoclaved, facility laundry workers should wear PPE including N-95 respirators.

Commercial Service

Infection control practitioners should consult with the commercial laundry service to determine special requirements, if any, for labeling, transporting and processing soiled linen. As an alternative, linen should be autoclaved prior to transport to a commercial laundry service.

Patient's Clothing

Bag patient's clothing if visibly soiled with blood or body fluids and send home with a family member with instructions to use warm water and a commercial laundry product. If no family member is available, follow the facility procedure for washing and drying patient's clothes. Before washing or sending the patient's clothes home, determine whether the FBI wants to retain the clothes as evidence.

Biohazard Waste

Disposable items removed from the patient's room should be considered biohazard waste. Waste receptacles should be lined with red biohazard bags. When removed from the room, biohazard waste should be placed in a second red bag and secured. Biohazard waste should be removed in a covered cart to a designated biohazard-waste holding area. Infection control practitioners should consult with the contracted waste hauler service for special instructions, if any, on transporting biohazard waste. As an alternative, biohazard waste can be autoclaved and removed as non-biohazard waste.

Deceased Patient

Place the deceased patient in a leak-proof body bag and transfer to the facility morgue. The body should not be embalmed. If an autopsy is requested, the California Department of Health Services should be notified.

SMALLPOX (VARIOLA) – OVERVIEW

Naturally Occurring Smallpox

Smallpox is a viral disease unique to humans. To sustain itself, the virus must pass from person to person in a continuing chain of infection. Smallpox (variola) was eradicated globally in the late 1970's and routine vaccination was discontinued worldwide following a declaration by the World Health Organization (WHO) that the world was free of smallpox in 1980.

Bioterrorism Epidemiology

The most likely method of introducing variola or smallpox virus is by intentional aerosolization. The release of smallpox virus into the non-immune population could result in multiple primary exposures with a subsequently large number of secondarily exposed persons if the disease is not recognized quickly. The introduction of one or more deliberately infected infectious persons into a population has also been mentioned as a possibility for a bioterrorist event.

The virus can survive in the environment for up to 6 hours when subjected to high temperatures (31 – 33 degrees C) with a relative humidity of 80%. Cooler temperatures and a lower humidity will increase the length of time that the virus will remain viable in the environment.

Incubation Period

The incubation period ranges from 7-17 days (average is 12-14 days).

Transmission

Smallpox is transmitted when infectious particles contained in ulcerating lesions in the mouth (tongue, pharynx, larynx and upper part of the esophagus) of an infected person become aerosolized (coughing, breathing or speaking) and are deposited onto the nasal, oral or pharyngeal membranes of a susceptible person. Airborne transmission requires direct face-to-face contact (within 7 feet) with an infected individual and can occur when the infected patient is in the earliest stages of rash development. This stage may be difficult to recognize, therefore, hospitalized patients with presumed or confirmed smallpox should be isolated at the time of admission. Although the virus generally does not travel more than 7 feet from the infected person there have been several reports of more widespread dissemination in hospital settings, presumably by shared ventilation systems. Transmission decreases significantly after the 2nd week as the oral lesions heal and the viral titers in oral secretions decrease. However transmission may still be possible until all the scabs have separated from the skin. Patients who are coughing may transmit the disease more readily because oral secretions contain a high titer of viral particles. Viral particles are also shed from

vesicles on the skin. Any unprotected (ungloved) contact with an infected person's skin, clothing, bed linens, or other contaminated surfaces or articles may result in transmission.

Clinical Presentation

Three clinical forms of smallpox: ordinary, flat or hemorrhagic, may occur in unvaccinated individuals. An additional, modified type, is seen most frequently in individuals with previous vaccination. Although the case fatality rate varied with the different clinical forms of smallpox, it was approximately 30% in unvaccinated individuals during the smallpox era.

Ordinary Presentation (Variola major)

An asymptomatic viremia occurs within 2-4 days following the first exposure date. During this phase, the virus multiplies and spreads to the bone marrow, lymph nodes, and spleen. The person is asymptomatic and not infectious at this time.
About 5 - 8 (up to 13) days following the first exposure date, a secondary viremia occurs which carries the virus to the basal layer of the oropharynx and the epidermis of the skin. The prodromal symptoms include high fever (38.5 - 40.5 degrees C), fatigue, headache, backache, abdominal pain, vomiting, and possibly delirium, and lasts for about 4 days. In pale-skinned persons there may be an erythematous rash, or rarely a petechial rash during the prodromal stage. As the fever pattern begins to decline from its peak, the eruptive phase begins with the development of lesions in the oropharynx followed by the development of skin lesions that spread to the face, forearms and hands including the palms. The lesions then spread to the legs and feet, including the soles, and to the truck. The rash is centrifugal in distribution, i.e., more dense on the face and extremities than on the trunk. On any given part of the body, the lesions are generally at the same stage of development. Within 1 - 2 days, the rash becomes vesicular and, later, pustular. The pustules are round and tense, and deeply embedded in the dermis. Crusts begin to form about the 8^{th} or 9^{th} day after the appearance of the rash. At least 90% of all cases are clinically characteristic.

Flat-type or Malignant Smallpox

A deficient cellular immune response to the variola virus may be responsible for this manifestation that occurs in about 2 - 5% of smallpox cases. It is characterized by intense toxemia and occurs more frequently in children. The skin lesions develop slowly, become confluent, and remain flat and soft, almost velvety, never progressing to the pustular stage. Most cases are fatal but if the patient survives, the lesions gradually disappear without forming scabs.

Hemorrhagic Smallpox

In patients with severe compromised immune systems, there is extensive multiplication of the virus in the spleen and bone marrow. Megakaryocyte destruction in the bone

marrow is believed to lead to defective blood coagulation. A high level of viremia is maintained in this type of smallpox. The incubation period may be shorter with more severe prodromal symptoms. Soon after the onset of illness, the patient develops a dusky erythema followed by petechiae and bleeding from the conjunctiva and mucous membranes. Death generally occurs about the 6th day of the rash often before lesions characteristic for smallpox rash develop. There are two forms of hemorrhagic-type smallpox, early and late. These forms are differentiated by the occurrence of hemorrhages after the appearance of the rash in the late form. Hemorrhagic-type smallpox occurs among all ages and in both sexes but is more common in adults. Pregnant women seem more susceptible to developing this type of smallpox. Differential diagnosis includes meningococcemia and acute leukemia.

Modified-type Presentation

This form of smallpox generally occurs in previously vaccinated persons. The modification relates to the character and development of the rash with more rapid progression and resolution of the lesions. The prodromal stage is similar to typical smallpox however the duration of prodrome may be shorter and fever may be lower or in some cases absent. Once the lesions begin to appear, they generally evolve more quickly with crusting completed by 10 days. The lesions may be fewer in number and more superficial than those seen with ordinary smallpox.

Diagnosis

Tentative diagnosis is based on the characteristic rash and other symptoms. The usual method of diagnosis is the demonstration of virions on electronic microscopy from vesicular scrapings. Initial laboratory confirmation should not be attempted in clinical laboratories**.**

Differential Diagnosis

The differential diagnoses include chicken pox, allergic contact dermatitis, erythema multiforme with bullae, secondary syphilis, and atypical measles. Chickenpox eruptions are generally more numerous on the trunk than on the face and extremities and lesions occur in crops that are in different stages of development.

Treatment

There is no known antiviral therapy. The only therapy known to date is supportive and includes hydration and medication for fever and pain. Sedation may help the patient to rest more comfortably. Antibiotics should only be prescribed for secondary skin infections.

Fluid and Electrolyte Balance

During the vesicular and pustular stages of smallpox, patients may experience significant fluid losses and become hypovolemic or develop shock. Fluid loss results from fever, vomiting, decreased fluid intake due to pharyngeal lesions, fluid shifts from the vascular bed to subcutaneous tissue and massive skin desquamation in patients with extensive skin lesions. Fluid and electrolyte balance should be monitored and appropriate oral and intravenous fluids administered.

Skin Care

The skin should be kept clean with warm water or normal saline and efforts should be made to avoid rupturing the vesicles and pustules. No creams or slaves should be applied.

Hemorrhage

Minor hemorrhages, especially conjunctival occur commonly in smallpox patients and no specific therapy is recommended. If signs of more extensive hemorrhage are evident such as mucosal bleeding, bleeding into the lesions, ecchymosis, hematemesis, or hematuria the patient should be evaluated for disseminated intravascular coagulopathy (DIC) and treated appropriately. Patients with hemorrhagic smallpox have a poor prognosis and, because of the sustained viremia coupled with mucosal hemorrhaging, these patients are highly infectious.

Secondary Bacterial Infection

Bacterial superinfections can include abscesses of skin lesions, pneumonia, osteomyelitis, joint infections and sepsis. Blood and other cultures including sensitivities should be obtained to guide in appropriate therapy.

Corneal ulceration and/or Keratitis

These complications occur more frequently in hemorrhagic-type smallpox but may also be associated with ordinary smallpox. The ulcerations generally occur about the 2nd week of illness and begin at the corneal margins. The ulcer may heal rapidly, leaving a minor opacity or, on occasion, severe corneal scarring.

Respiratory

Viral bronchitis and pneumonitis are common complications and are considered part of the normal disease syndrome. Treatment is symptomatic with measures to treat hypoxemia with supplemental oxygen or intubation and mechanical ventilation as indicated. Secondary bacterial pneumonia should be treated with appropriate antibiotics. Pulmonary edema is common in the severe forms of smallpox and should

be treated with careful monitoring of oxygenation, fluids, blood pressure and diuretics as indicated. Patients who have a cough during the first 2 weeks of the infection are highly contagious.

Encephalitis

This complication occurs in about 1 out of every 500 cases of smallpox. The symptoms generally appear between the 6th and 10th day of illness when the rash is still in the papular or vesicular stage.

Vaccination

With the exception of the military and persons currently working with smallpox virus in a controlled setting, vaccination of the general public is not recommended in the absence of endemic disease. Because a single vaccination does not confer life-long immunity, persons previously vaccinated are no longer considered immune to the disease. Persons vaccinated multiple times may have some residual immunity.

In the event that smallpox is intentionally released, federal, state and local health departments would coordinate vaccination programs. Vaccination is most effective if given before or within 3 - 4 days after the first exposure date. Some experts say that vaccination up to 7 days after the first exposure date may be effective in preventing or, at the vary least, ameliorating the disease.

Unless assessed by a physician, vaccination is contraindicated for persons and their household, sexual or other close physical contacts if they have any of the following conditions:

- Current or past history or eczema,
- Current burns, impetigo, atopic dermatitis, contact dermatitis, varicella zoster or other skin conditions,
- Pregnancy (all trimesters),
- Current treatment for cancer (chemo/radiation therapy), receiving large doses of corticosteroids; altered immune system,
- HIV infection or AIDS,
- Allergies to polymixin B, streptomycin, tetracycline, neomycin.

Passive immunoprophylaxis with vaccinia immune-globulin (VIG) is available in a limited supply and is generally indicated for treatment of severe complications related to smallpox vaccination. The dose of VIG is 0.6 mL/kg of body weight given intramuscularly. Due to the large volume (42 ml in a 70 Kg person), the dose should be divided and given over a period of 24 – 36 hours. Post-vaccination complications for which VIG may be indicated include:

- Eczema vaccinatum;

- Progressive vaccinia (vaccinia necrosum)
- Severe generalized vaccinia if the patient is toxic or has serious underlying disease; and
- Inadvertent inoculation of the eye or eyelid without keratitis.
- VIG is not indicated for the treatment of post-vaccination encephalitis and is contraindicated for keratitis.

Isolation

Special isolation procedures should be initiated and maintained for any suspected or confirmed case of smallpox. In the community, exposed persons should be quarantined at home, when possible. A reasonable alternative following exposure would be to require exposed contacts to check their temperature daily. Any fever above 38?C (100.4?F) during the 17-day period would suggest infection. The contact should be isolated immediately, preferably at home, until smallpox is either confirmed or ruled out.

SMALLPOX – QUICK REFERENCE

Any suspected or confirmed case of smallpox MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [insert telephone number] immediately.

Bioterrorism Epidemiology:
Transmission: highly contagious; person-to-person contact with respiratory secretions; coughing patients most contagious; contact with lesions and fomites (clothes and bed linens). Persons vaccinated prior to 1972 do not have immunity. Persons vaccinated multiple times (military prior to 1990 and foreign travelers prior to 1972) may have some residual immunity.

Incubation Period:
Average 12 – 14 days; range 7-17 days.

Clinical Disease:
Acute onset of malaise, rigors, vomiting, headache, backache, possible delirium; high fever (up to 40.5 degrees C) prior to onset of rash, rash predominate on face and mucous membranes of mouth and pharynx migrating to forearms, legs, palms and soles then to trunk.

Diagnosis:
Presumptive diagnosis based on signs and symptoms.

Differential Diagnosis:
Chicken pox, allergic contact dermatitis, erythema multiforme with bullae, secondary syphilis, atypical measles (Chickenpox eruptions are more numerous on trunk than on face and extremities. Lesions occur in crops in different stages of development and are superficial with rare scar formation).

Treatment:
Provide supportive care, pain and fever control, sedation for delirium; maintain hydration; antibiotics for secondary infection.

Prophylaxis:
See Smallpox Vaccination Recommendations

Isolation:
See Smallpox Isolation Recommendations.

SMALLPOX – FREQUENTLY ASKED QUESTIONS (FAQ)

What is smallpox?
Smallpox is a virus (germ) that causes a high fever and a rash with draining lesions over the whole body. No person in the world has been diagnosed with smallpox since1977. For that reason, vaccination programs were discontinued in all countries including the U.S. in 1980. Adults vaccinated prior to 1980 have no immunity.

Is smallpox spread from person-to-person?
The infection is very contagious. When the infected person breathes or coughs the viral particles are forced out of the mouth into the air. A non-infected or susceptible person can get infected by inhaling (breathing) the virus into their lungs. The infection can also be spread by skin-to-skin contact with the infected person's draining lesions or by contact with contaminated items such as sheets, towels, and clothes.

How will I know if I was exposed to the virus?
You may have been exposed at the location where the virus was intentionally released. The further away you were from the original release site, the less likely it is that you were exposed. You could also be exposed to a person who is infected and you could catch the virus if you had close contact with that person (within 7 feet).

How soon will the symptoms develop (incubation period)?
The symptoms may start within 7 - 17 days after exposure. Infected persons are not infectious until the rash appears.

What are the symptoms of the infection?
For about 2 - 4 days after the person breathes the infected air, there will be no symptoms. After about 4 days, the infected person will begin to feel very sick with a high fever, severe tiredness, headache, backache, stomachache, and vomiting. Over the next several days, the fever may increase and the person may become confused and disoriented. As the fever begins to decrease, a rash (raised, discolored spots) may be seen on the face. The rash will then spread to the neck, arms, legs and the soles of the feet and palms of the hands. The rash will progress from fluid-filled vesicles to pus-filled pustules. Scabs will begin to form on the skin about 8 - 9 days after the onset of the rash. Smallpox is no longer infectious once all the scabs have fallen off the skin.

How is the infection treated?
There is no medicine such as an antibiotic to treat smallpox infection. The doctor may order medicine to control the fever and to keep the person calm (sedative).

How is the infection prevented?
There is a limited supply of vaccine available in the U.S. If a smallpox outbreak is confirmed the federal government will release the vaccine.

How will I know if I need to be vaccinated?
If you were in the location where the virus was originally released or if you were exposed to a person who developed symptoms (fever and rash) of the infection, you will be offered the vaccination.

How will I know where to go to get the vaccination?
When the vaccine becomes available, the local health department will provide information about the locations of the vaccination sites in your city or county. You should listen to the radio or television for this information.

Do people get sick from the vaccination?
Complications are not common but they do occur. An information sheet has been developed that will give you information about how to care for your vaccination and what complications to expect. You will be given this information when you report to the designated vaccination location. You will also be requested to sign a consent form before you receive the vaccine.

What can I do to keep from getting infected?
In the event that a smallpox outbreak is identified, the most important thing you can do is stay at home. The local health officer may ask you to wear a mask over your nose and mouth if you have to go to the store. Listen to the local radio or television for special instructions from the local health officer. Do not go to a hospital emergency room unless you are sick.

SMALLPOX - HOME CARE INSTRUCTIONS

In the event of an intentional release of the virus that causes smallpox, many people may require hospitalization within a few days. Hospitals may become overcrowded and it may become necessary for many sick people to be cared for in their home by relatives or friends. The following information may be helpful in providing care to sick persons at home.

- Listen closely to the local radio or television for special instructions about vaccination from the local health department.
- Advise friends and relatives not to visit.
- Wear a mask over your nose and mouth when you are within 7 feet of the infected person.
- Wash your hands with soap and water before you eat or drink, after using the bathroom and after any physical contact with the sick person.
- Wash the sick person's hands after using the bathroom, before eating or drinking, and after contact with pets.
- Wear gloves (vinyl or latex) when you have contact with the sick person's skin, blood, and other body fluids (urine, feces, vomit, drainage, mucous, or saliva). Discard the gloves after each use and wash your hands. If gloves are not available, wrap plastic bags over your hands and secure with a rubber band. Discard the bags after each use and wash your hands with soap and water.
- Wear a plastic apron or gown to protect clothes from becoming soiled with drainage from the skin lesions.
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- Take the person's temperature at least twice a day. If the temperature goes above 100.4?F, give Tylenol® (if not allergic) or other medicine such as Motrin® or Advil®. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse) or take the person to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Rinse the person's mouth several times each day with warm tap water.
- Wash the person's skin several times each day with warm tap water.
- Change the person's clothes, bed linens, towels and wash cloths frequently. Do not use the sick person's towels, wash cloths, bed clothes or other items until after they have been washed with hot water and soap.
- Wash soiled linens in hot water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day or when surfaces become soiled with blood or other body fluids.
- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently, and eat a healthy diet. Take your temperature in the morning and afternoon for 3 weeks. If you develop a fever above 100.4?F or if you have flu-like symptoms see a doctor or nurse immediately.

SMALLPOX – SCREENING FORM

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 3 weeks, have you had contact with any person with a high fever and a rash?

NO YES

In the past 3 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 3 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO YES** If yes, what medicine(s) are you allergic to?

_____

Over the past 3 weeks, have you had any of the following symptoms or ailments? (Check "yes" to all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Backache	
Headache		Feel cold all over or shiver/shake	
Cough		Sore muscles	
Very tired		Vomiting	
Pain in the stomach		Rash on the face	
Sore mouth/bumps in the mouth		Rash of the arms or legs	
Change in mental status		Confusion	
Bleeding from eyes, nose, skin			

SMALLPOX – SPECIMEN COLLECTION

Contact the Department of Health Services, Viral and Rickettsial Disease Laboratory Branch (510 307 8575) prior to shipping any Biosafety Level IV specimens. Clinical laboratories should follow procedures for packaging, labeling and transporting requirements as defined by the Viral and Rickettsial Disease Laboratory and the CDC.

Safety Recommendations

- Wear personal protective equipment including N-95 respirators.
- Use safety blood-collection equipment.
- Use plastic vials or tubes, when possible.
- Dispose of needles, scalpel blades, and other sharp objects in sharps disposal container.
- Deposit waste in biohazard red bag.
- Seal all specimens with Parafilm.
- Transport all specimens in sealed, plastic zip-lock bags.

Pustule/Vesicle Specimens

- Open the top of a vesicle or pustule with a scalpel or 26-gauge needle and remove the top of the vesicle or pustule.
- Place the vesicle skin into a 1.5 - 2 mL labeled, screw-capped, plastic tube and let the material dry.
- Scrape the base of the vesicle or pustule with the blunt edge of a scalpel or wooden applicator stick and apply the vesicular fluid to a labeled, microscope slide multiple times (touch prep) on the same slide. Allow the fluid to air-dry without smearing. Place the slide into a dry, plastic slide holder and seal.
- Alternately, swab the base of the vesicle or pustule with a polyester or cotton dry swab. Place the swab into a labeled, plastic, screw capped container.
- Obtain at least three (3) slides or swabs.
- Do not place the slides from more than one patient in the same container.

Scabs Specimens

- Remove the top of the vesicle, pustule or scab with the blunt edge of a scalpel blade or 26-gauge needle.
- Deposit 2 - 4 scabs in 2 labeled dry, plastic, screw-capped containers.

Biopsy Specimens

- Specimens for biopsy should be obtained with a 3.5. or 4.0 mm punch biopsy kit.
- One biopsy specimen should be placed in formalin.
- The second biopsy should be placed in a dry screw capped container.
- Label containers as instructed below.

Blood Specimens

- Draw 10 cc of blood into a labeled, plastic marble-topped tube or a plastic yellow-topped serum separator tube.
- Allow blood to clot then separate serum from the clot.
- Remove serum from collection tube and pour into a plastic, clean, screw-topped vial.
- If a plastic serum separator tube is used, serum may be left in the tube.
- If plastic tubes are not available draw the blood into a glass marble-topped or yellow topped serum separator tube. Place glass tubes into a styrofoam container for transportation to the clinical laboratory.
- Biopsy specimens placed in formalin should not be frozen prior to transportation.

Autopsy Specimens

Hospital pathologists should not perform autopsies on any suspected or confirmed smallpox patient unless specifically authorized to do so by the local health officer. The CDC-NCID Division of Healthcare Quality (404.639.6413) or Pathology Activity (404.639.3133) should be contacted for special instructions prior to performing any autopsy procedures. Autopsy specimens for viral isolation should be frozen (shipped with dry ice). Formalin-fixed tissue for histopathology, immunohistochemistry and PCR should not be frozen and should be packaged separately from other autopsy specimens. After specimen collection, all non-disposable equipment and instruments used during the procedure should be placed in a disinfecting solution before cleaning and sterilizing. Disposable equipment should be used, if available. The autopsy suite should be cleaned and disinfected with an EPA-registered disinfectant. All disposable sharps should be placed in an appropriate disposal container and all other disposable waste should be placed in double red, biohazard waste bags.

Labeling

Label specimen containers with the patient's name, medical record number, social security number, facility name, date and time the specimens were collected, physician's name and telephone number.

SMALLPOX – INFORMATION ABOUT VACCINATION

The risk of smallpox occurring as a deliberate bioaerosol release is considered low. Therefore, pre-exposure vaccination is not recommended for any group other than laboratory or medical personnel working directly with the variola virus (research personnel). Currently smallpox vaccine is only available from the Centers for Disease Control and Prevention (CDC). Initial deployment of smallpox vaccine and vaccine components will occur by request from the state Governor's Office of Emergency Services through the CDC to the Surgeon Generals Office. Once the request for distribution of vaccine is approved the CDC will deploy a team to the affected area to work with state and local health officials in developing an effective strategy for containing the outbreak. Containment measures include, but are not limited to, surveillance, vaccination, isolation or quarantine, and contact identification and tracing.

The information contained in this section has been developed for distribution to persons who are to receive the smallpox vaccination.

Vaccine Effectiveness

The vaccine is a live virus vaccine that can prevent or decrease the severity of clinical disease if administered before the outbreak or within 3 – 4 days after the first exposure date. The effectiveness of the vaccine in preventing infection if given more than 7 days after the first exposure date is not known.

Target Populations

Healthcare workers and persons who have unprotected face-to-face contact (within 7 feet) with a confirmed smallpox case will probably be the first to receive the vaccine. Other groups include:

- Persons exposed at the original release site;
- Persons who have face to face, household or other close contact with a confirmed or suspect case at any time after the onset of the infected persons fever until all the scabs have separated from the skin;
- Other persons at risk such as emergency medical services and law enforcement personnel.
- Laboratory personnel responsible for collecting and processing clinical specimens.

Previous Vaccination

Persons vaccinated one time prior to 1972 have no residual immunity. Persons who have had multiple (2 or more) vaccinations (military, foreign travelers) may have some residual immunity however this is unknown.

Vaccine Contraindications

The risk of vaccination should be weighed against the likelihood of acquiring smallpox. To decrease the risk of vaccine complications, newly vaccinated household members who live with persons who have contraindications to vaccination (defined below) should consider removing themselves from the household until the vaccination site has completely healed.

Unless concurrently assessed by a physician, vaccination should **not** be administered to exposed persons **or their household contacts** if there is a history of any of the following conditions:

- Current or past history of eczema even if the condition is mild or not presently active;
- Persons with other acute or chronic skin conditions such as impetigo, atopic dermatitis, contact dermatitis, varicella zoster, or other skin conditions
- Pregnancy (all trimesters)
- Persons with immunodeficient conditions such as current treatment for cancer (chemo/radiation therapy), receiving large doses of corticosteroids; or altered immune systems such agammaglobulinemia
- HIV infection or AIDS
- Allergies to polymixin B, streptomycin, tetracycline, neomycin

Vaccine Administration

The vaccine is administered using a special needle and multiple-skin punctures. The skin is punctured 15 times and a small amount of blood will be seen at the puncture site.

Vaccine Response

The vaccination is successful if the puncture site has a visible pimple with an area of redness surrounding the pimple within 2 – 5 days after vaccination. The pimple will become bigger over the next several days and eventually a dark colored scab will form. Primary vaccination may be associated with fever for a few days and enlarged, tender lymph nodes in the axilla of the vaccinated arm.

Major or Primary (first) Vaccine Response

- Days 2 - 5: A red papule (pimple) is visible at the vaccination site; the papule progresses to a fluid-filled vesicle then to a pustule over the next few days;
- Days 8 -10: The pustule reaches maximum size and contains turbid (cloudy) fluid (pus) surrounded by a red area. The red area may get bigger over the next 3 days.
- Days 14 –21:The pustule dries, forms a scab, and eventually falls off.

Previously Vaccinated Response

? Revaccination is considered successful if a pustular lesion is present or an area of definite induration or congestion surrounding the scab is visible upon examination 6 - 8 days after revaccination. If the response peaks at 48 hours (hypersensitivity reaction), the person should be re-vaccinated.

Equivocal Reaction

? Equivocal reactions are defined as all responses other than major reactions. If an equivocal reaction is observed, vaccination procedures should be checked and the vaccination repeated using vaccine from a different vial or from a different lot, if available. Difficulty in determining if the reaction was blunted could be caused by immunity, insufficient potent vaccine, or vaccination technique failure. If the repeat vaccination using vaccine from a different vial or lot fails to elicit a major reaction providers should consult with the local health officer before attempting another vaccination.

Vaccination Site Care

Complications associated with smallpox vaccination can be reduced when careful site care is practiced from the time vaccination is administered until the scab falls off the vaccination site.

? Wash hands with soap and water before and after any contact with the vaccination site (e.g. dressing change, accidental scratching) or contact with any fluid or pus that might seep through the dressing. Do not touch the vaccination site (fluid or pus) with items such as cloth towels that may be used by another household member.
? Cover the vaccination site loosely with gauze dressing at all times. Secure the gauze loosely with tape. Occlusive dressings should not be used routinely because it may cause maceration at the vaccination site.
? Soiled dressings should be sealed in a plastic bag before disposal. If the scab has fallen off the skin, the scab should also be sealed in a plastic bag.
? Keep the vaccination site dry at all times. When bathing, place gauze dressing over the vaccination site and then cover the site with a watertight dressing. To make a watertight dressing, cut a piece of plastic (Saran (R)) wrap large enough to extend 2 - 3 inches beyond the vesicle. Place the wrap over the gauze and secure with tape. Remove the plastic wrap after bathing and apply clean, dry, gauze dressing, if necessary.
? Clothes that become soiled with fluid or pus from the drainage site should be removed and washed in hot water.
? Report all vaccination complications to a health care worker (nurse or physician).
? Monitor your temperature daily. If a fever occurs, take Tylenol (R) as directed on the package label.

Vaccinated Health Care Workers

Newly vaccinated health care workers may continue to have patient contact, including contact with immunosuppressed patients, as long as the vaccination site is covered with a water-tight seal at all times. Cover the vaccination site with a gauze dressing reinforced with a semi-permeable dressing such as Opsite (R) or Tegaderm (R) during the work shift. Remove the semi-permeable dressing at the end of the work shift. Practice meticulous handwashing before contact with all patients. Hands should be thoroughly washed after contact with fluid or pus that may accumulate under the semi-permeable dressing.

Complications:

- Fever
  Low-grade (100F – 102F) fever and enlarged lymph nodes; occurs most commonly in children.
- Autoinoculation
  Vaccinia virus is transferred from the site of vaccination by contaminated hands or articles such as clothes, sheets or towels. The most common sites involve the face, eyelid, nose, mouth genitalia and rectum.
- Encephalitis
  Occurs 8 - 15 days after the vaccination; symptoms include fever, headache, vomiting, drowsiness, spastic paralysis, coma, and convulsions.
- Progressive vaccinia
  Pustules fail to heal and spreads to surrounding tissue that becomes black and necrotic.
- Eczema vaccinatum
  Lesions spread to areas of skin afflicted by eczema or other chronic or exfoliative skin conditions; symptoms may be mild to severe but may be fatal.
- Generalized vaccinia
  Lesions spread to cover part or all of the body 6-9 days after vaccination.

SAMPLE SMALLPOX VACCINATION CONSENT FORM

I, _____(print name)
do hereby give my written consent to be vaccinated.

I have had the opportunity to read and I understand that complications can occur after receiving the vaccination. I understand the instructions for caring for the vaccination site. I have had the opportunity to ask questions related to smallpox vaccination and have had my questions answered to my satisfaction.

By my signature below, I accept the smallpox vaccination.

Patient (Parent or Guardian) Signature: Date:
_____

Lot Number: _____ **Expiration Date:** _____

Distribution center location: _____

Date: ____/____/____

Name title of person administering vaccination:
_____

SMALLPOX VACCINATION INSTRUCTIONS

The current vaccine is no longer licensed because of required changes in the diluent preparation for vaccine reconstitution. The changes in diluent do not effect the ability of the vaccine to produce immunity to smallpox. However because the vaccine is no longer licensed it must be labeled as an Investigational New Drug (IND).

Supplies

- Vaccination Informed Consent
- Vaccination Consent
- Gloves
- Alcohol wipes
- Alcohol foam or gel (handwashing)
- Vaccinia vaccine
- Bifurcated needle (sterile)
- Gauze pads
- Tape (non-allergic)
- Waste receptacle lined with a red bag and syringe disposal container

Administrative Requirements

- Distribute smallpox vaccination information and smallpox vaccination consent.
- Collect signed consent and answer questions about vaccine administration.
- Document date vaccination given, lot number, expiration date, and person administering vaccine on the consent form.

Reconstitution of Vaccine with Commercially Packaged Diluent

Diluent is required for the reconstitution of smallpox vaccine prior to administration. The diluent to be utilized in this protocol is similar in formulation to the licensed diluent except that it lacks the 0.005% brilliant green. This change in formulation does not effect the ability of the vaccine to produce immunity to smallpox.

Directions for Reconstitution

Reconstitution of a single vial of smallpox vaccine with 0.25 mL of diluent would yield approximately 100 doses.

- Remove the vaccine vial from refrigerated storage and allow the vial to come to room temperature.
- Lift up the tab of the aluminum seal on the vaccine vial. DO NOT BREAK OFF OR TEAR THE DOWN TAB.
- Wipe the vial stopper with an alcohol pad AND ALLOW TO DRY.
- Place the vaccine vial upright on a hard, flat surface.
- Wear disposable gloves when reconstituting the vaccine.

- Remove the cap from the pre-filled syringe. Take a 1.0 cc syringe and withdraw 0.25 mL from the opening in the pre-filled diluent syringe. Inject 0.25 mL of diluent in the 1.0cc syringe into the vaccine vial.
- Withdraw the needle and syringe and discard in a sharps disposal container.
- Allow the vaccine vial to stand undisturbed for 3-5 minutes and then, if necessary swirl the vial gently to effect complete reconstitution.
- Label the vaccine vial with the date and time the diluent was placed into the vaccine vial.
- Reconstituted vaccine may be used for up to 3 months if stored at 2 - 8 degrees C.
- The vaccine vial, stopper, diluent syringe and needle and all other material used to reconstitute the vaccine should be disposed of in a sharps disposal container or a red, biohazard bag.

Administration of Reconstituted Vaccine

- Gloves should be worn on both hands when handling open vaccine vials and when administering and evaluating the vaccination site.
- Remove aluminum seal from vaccine vial by pulling down the "tear off" tab.
- Remove the rubber stopper from the vaccine vial and place in a sterile container (stopper will be used to reseal vial vial).
- Chose a site that is accessible for both vaccination and evaluation of the vaccine take on post-vaccination day 7. The outer aspect of the upper arm over the insertion of the deltoid muscle should be used.
- Clean the site with an alcohol pad if soil is visible. Allow the alcohol to dry thoroughly to avoid inactivation of the vaccine deposited on the skin.
- Dip the bifurcated point of a sterile bifurcated needle into the vial of reconstituted vaccine and withdraw the needle holding it perpendicular to the floor. Do not redip the needle into the vaccine vial if the needle has touched the skin.
- Holding the skin of the upper arm taut, the vaccinator should place their wrist firmly on the recipient's arm. Holding the needle at a 90 degree angle (perpendicular) to the skin apply 15 up and down strokes within a 5 mm diameter area. The strokes should be made rapidly and be sufficiently vigorous to draw a trace of blood at the site. If a trace of blood does not appear the strokes have not been sufficiently vigorous and the procedure should be repeated.
- Dispose of the bifurcated needle in the syringe disposal container. These needles can be reprocessed. Consult instructions for reprocessing below.
- Cover the vaccination site with a porous bandage such as gauze until the scab has separated and the underlying skin is healed. Consult vaccination site care instructions.
- Recap the vial with the sterile cap and store the vaccine for subsequent use at 2 -8 degrees C.

Reprocessing Bifurcated Needles

Bifurcated needles may arrive from the manufacturer sterilized and individually wrapped or in bulk, requiring subsequent sterilization prior to use. These needles are intended to be single use only. However, because supplies may be limited, especially during mass vaccination programs, it may be necessary to reprocess and reuse these needles.

The procedures described below are restricted to cleaning and sterilizing bifurcated needles only. Procedures for reprocessing bifurcated needles must address:

- Preventing healthcare worker and patient exposure to bloodborne pathogens (i.e., hepatitis B and C viruses and HIV virus);
- Preventing of occupational sharps injuries.

The following procedures are designed to protect patients and the health care workers from exposure to bloodborne pathogens as well as other infections:

- Place used needles in a plastic, screw top container or other sealable transport device and secure the container for transport to a healthcare facility.
- Handle needles as little as possible during processing. Use tongs, hemostats, forceps or other devices to transfer the needles to a shallow container.
- Place needles in an enzyme solution or other approved soaking solution used to clean surgical instruments. Do not use alcohol, glutaraldehyde, formaldehyde, or other oxidizing solutions such as hypochlorites, peroxides, or peracetic acids because these may damage the needle tip.
- Rinse the needles with tap water and allow to air dry on a clean surface
- Package the needles individually or in groups of 10 - 15 in plastic or peal packages. The bifurcated end of the needle should point downward toward the bottom of the package.
- Sterile the needles at 121 degrees C for 30 minutes or 133 degrees C for 4 minutes.
- The needles can also be placed in a dry-heat oven and baked at 170 degrees C for 60 minutes, 160 degrees C for 120 minutes, or 150 degrees C for 150 minutes
- Boiling and flaming are alternative methods for sterilizing bifurcated needles, but should be used only when other options are not available.

Frequency of Reuse

Bifurcated needles should not be resterilized and reused more than 50 times.

Multi-dose Vials

Patient to patient transmission of bloodborne viruses has been reported. To prevent transmission a contaminated needle should never be allowed to reenter the vaccine vial. Preparation of vaccine and reprocessing of needles should be physically separated.

VIRAL HEMORRHAGIC FEVER (VHF):
RECOMMENDATIONS FOR ISOLATION

Any suspected case of viral hemorrhagic fever MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and local health department [*insert telephone number*] immediately.

Introduction

The term viral hemorrhagic fever (VHF) refers to a group of diseases caused by several distinct families of viruses. The Centers for Disease Control and Prevention (CDC) has issued isolation recommendations that apply to four viruses that cause VHF: Lassa, Marburg, Ebola, and Congo-Crimean hemorrhagic fever. Health Canada has issued recommendations that also apply Junin, Sabia and Machupo viruses, found in South America.

Blood, body secretions and excretions, semen, and tissue specimens from infected patients contain the virus responsible for VHF. Evidence suggests that the risk of person-to-person transmission increase as the patient's condition deteriorates. Persons at highest risk for secondary transmission are those who are in closest contact with the blood and body fluids of the infected person toward the end of the incubation period and into the acute phase of the illness. Such persons include those with prolonged or close physical contact with infected persons such as family members, those providing direct medical and nursing care, and laboratory workers handling the patient's specimens. Healthcare workers in Africa are at great risk of acquiring VHF due to inappropriate barriers to protect them from exposure to blood and body fluids. The risks associated with various body fluids have not been well defined as most health care workers in Africa who acquire the infection have had multiple unprotected contacts with multiple body fluids over a relatively short period.

OSHA Bloodborne Pathogens Standard

Healthcare workers (HCW) should follow facility specific procedures related to reducing the risk of occupational exposure to blood and other potentially infectious materials as required by the California Occupational Safety and Health Administration's (CAL-OSHA) Bloodborne Pathogens Standard. Extreme vigilance is required to prevent needle sticks or other sharp injuries. Parenteral exposure has been associated with a high risk of transmission, a short incubation period and severe disease. Whenever possible, needleless intravenous systems, safety syringes and phlebotomy equipment should be used. If an exposure occurs, wash the skin with copious amounts of antimicrobial soap (not bleach) and water and flush the mucous membranes of the eyes, nose, and mouth

with copious amounts of fresh water. Exposed persons should receive an immediate medical evaluation and follow-up.

Training

Health care workers expected to provide direct and indirect patient care should be specifically trained in methods to reduce the risk of exposure to patients infected with VHF.

Isolation Recommendations

These recommendations were developed to assist infection control practitioners (ICP) in preparing for a bioterrorist event. It is assumed that most patients requiring hospitalization are at or near end-stage disease and have diarrhea, vomiting, prominent cough or hemorrhage. Given the unpredictability of VHF infection and the potential for rapid progression to end-stage disease without warning, it may be prudent to implement the following recommendations at the time of hospital admission.

Room Placement

Plan A: Negative Pressure Room

Place the patient in a private room that has (1) monitored negative air pressure in relation to the exterior surrounding areas, (2) 6-12 air changes per hour (ACH), and (3) appropriate venting of contaminated air to the outside. The windows and doors should remain closed and the patient should remain in the room.

Plan B: No Negative Pressure Room

If no negative pressure room is available, place the patient in a private room. The room should be equipped with a HEPA filtration unit. The windows and doors should remain closed and the patient should remain in the room.

Plan C: Designated Area or Unit

As the number of VHF patients requiring isolation increases, consider designating a wing of a nursing unit or, preferentially, an entire nursing unit. Infection control practitioners should develop a plan consistent with the structure of the hospital and the ability to effectively isolate infected patients from non-infected patients and the public.

Plan D: – Designated Health Facility

The county or state emergency medical service may designate an alternate facility such as a closed hospital or gymnasium to accommodate increasing numbers of cases that require medical support.

Visitors

Visitors should be limited to immediate family or significant others. Family members should be instructed to wear PPE appropriate to the potential risk of blood and body fluid exposure.

Personal Protective Equipment (PPE)

The physical properties of PPE should be appropriate to the degree of exposure and the task(s) to be performed. Infection control practitioners should evaluated existing PPE to determine if the physical properties maximize protection.

Respirators

Disposable, NIOSH-approved, fit-tested N-95 respirators should be worn when entering the room and removed after leaving the room. If the respirators become soiled with blood they should be removed and disposed of before leaving the room.

Face Shields

Disposable, face shields, in addition to N-95 respirators, should be worn when entering the room. If face shields become soiled with blood they should be removed and disposed of before leaving the room.

Gowns

Disposable, long sleeve, fluid-proof (impervious) gowns or coveralls with rib or elastic cuffs should be worn when entering the room. The gown should be removed before leaving the patient's room. After removal, clothes should not have contact with the patient or potentially contaminated surfaces or equipment. Fluid-resistant gowns or coveralls can be worn if there is little or no soiling of the environment.

Gloves

Disposable gloves should be worn when entering the room. All jewelry including rings should be removed. Gloves should completely cover the cuff of the gown or coverall. Reinforced or double gloves should be worn for procedures that involve handling of sharp devices (e.g. phlebotomy). Gloves should be removed before leaving the room and hands should be washed immediately.

Shoe and head covers

Fluid-proof, ankle or calf high shoe covers should be worn when blood or body fluids visibly soil the floor. Shoe covers should be removed before leaving the room.

Head covers should be worn if spraying or splashing of blood or other body fluids onto the hair is anticipated. Head covers should be removed before leaving the room.

Handwashing

Hands should be washed with soap (antimicrobial or non-antimicrobial) and water after protected (gloved) and unprotected (ungloved) contact with visible blood, body fluids (secretions, excretions [urine and feces], wound drainage and skin visibly soiled with blood and body fluids. Wash hands before leaving the immediate vicinity of patient contact (patient room, cubicle, or bathroom). After handwashing, avoid touching the patient and surfaces or items in the immediate vicinity of the patient (bedpans, bed rails, bedside tables). Decontaminate hands with an alcohol or quaternary ammonium-based ("quat") product after contact with invisible soil (protected or unprotected hands have not been in contact with visible blood or body fluids).

Transporting Patients

Patients who have a prominent cough, bloody diarrhea, vomiting or hemorrhage should not be transported to other areas of the hospital unless absolutely necessary. If patients must be transported, place a surgical mask over patient's nose and mouth, if tolerated. Confine and contain blood and body fluids that might soil the environment during transport. If an elevator is used all occupants should wear PPE including N95 respirators.

Laboratory Specimens

Specimens should be placed in double, zip lock bags that are tightly sealed and labeled. Specimens should be hand carried to the laboratory. Laboratory personnel should adhere to the chain of custody protocols developed by local health department and the FBI.

Patient Care Equipment

Patient care equipment (e.g., thermometers, blood pressure cuffs, stethoscopes and commodes) should be kept in the patient's room. Use disposable equipment whenever possible. Reusable equipment should be placed in an appropriately labeled container, sealed and transported to central service for reprocessing.

Environmental Services

<u>Daily Cleaning</u>

Disinfect environmental surfaces in the patient's room and bathroom with a properly diluted, Environmental Protection Agency (EPA) approved disinfectant such as a quaternary ammonium or phenolic compound. Allow all surfaces to air dry. The disinfecting solution and a supply of cleaning materials should be kept in the room.

Privacy curtains should be changed when visibly soiled. Floors should be cleaned using a single-bucket procedure of wet mopping. The contents of the bucket should be emptied into the toilet. After each use, the mop head should be removed from the handle and disposed in the linen hamper. Disposable mop heads and cleaning cloths should be used, if available. The bucket and the mop handle should remain in the patient's bathroom.

Terminal Cleaning

Terminal cleaning should be performed using similar procedures described for daily cleaning. If the room is under negative pressure or HEPA filtration allow the room to air for 2 hours or longer after terminal cleaning before admitting a non-infected patient.

Management of Blood and Body Fluids

Blood and Body Fluid Spills

Blood and body fluid spills should be confined and contained with a biohazard fluid solidification treatment product when possible. Following the removal of the solid waste, decontaminate the area with an EPA-approved disinfectant.

Containerized Liquid Blood and Body Fluids

Containerized liquid blood, gastric secretions, and pulmonary secretions should be treated with a biohazard fluid solidification treatment product before disposal. The contents of bedpans, urinals and emesis basins should be carefully emptied into the toilet. Several ounces of household bleach should be poured into the toilet and left standing for about 5 minutes before flushing.

Soiled Linen

Soiled linen should be placed in leak proof bags. When removed from the room, the bag should be placed in a second leak proof bag and clearly identified as "isolation" or "contaminated". The bag should be carefully secured and removed from the nursing unit in covered carts to a designated holding area. Chutes should not be used.

Facility Operated Laundry

Soiled linen should be autoclaved prior to transport to the laundry facility. If the linen is not autoclaved, facility laundry workers should wear PPE including N-95 respirators.

Commercial Service

Infection control practitioners should consult with the commercial laundry service to determine special requirements, if any, for labeling, transporting and processing soiled

linen. As an alternative, linen should be autoclaved prior to transport to a commercial laundry service.

Patient's Clothing

Bag patient's clothing if visibly soiled with blood or body fluids and send home with a family member with instructions to use warm water and a commercial laundry product. If no family member is available, follow the facility procedure for washing and drying patient's clothes. Before washing or sending the patient's clothes home, determine whether the FBI wants to retain the clothes as evidence.

Biohazard Waste

Disposable waste should be placed in receptacles lined with red biohazard bags. When removed from the room biohazard waste should be placed in a second red bag and secured. Biohazard waste should be removed in a covered cart to a designated biohazard waste holding area. Infection control practitioners should consult with the contracted waste hauler for special instructions, if any, on removing and transporting biohazardous waste. As an alternative, biohazardous waste can be autoclaved.

Deceased Patient

Place the deceased patient in leak-proof body bag and transfer to the facility morgue. The body should not be embalmed. If an autopsy is requested, the California Department of Health Services should be notified.

VIRAL HEMORRHAGIC FEVER (VHF) – OVERVIEW

Any suspected case of viral hemorrhagic fever MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Naturally Occurring VHF

The viral hemorrhagic fevers are a diverse group of naturally occurring illnesses caused by viruses from four different families: *Arenaviridae, Bunyaviridae, Filoviridae,* and *Flaviviridae*.

- The arenaviruses include Argentine (Junin virus), Bolivian (Machupo virus), Brazilian (Sabia virus) and Venezuelan (Guanarito virus) and Lassa (Lassa) hemorrhagic viruses. These viruses are transmitted from rodent reservoirs to humans by inhalation of dust contaminated with rodent feces.

- The bunyaviruses include Rift Valley fever (Phlebovirus), Crimean-Congo fever (Nairovirus), and Hantaviruses (hantavirus renal syndrome [HFRS] and hantavirus pulmonary syndrome [HPS]). These viruses are transmitted to humans from a variety of reservoirs including mosquito and domestic animal slaughter (Rift Valley fever), ticks and domestic animal slaughter (Crimean-Congo fever) and rodents (Hantavirus).

- The filoviruses include Marburg and Ebola viruses. Their natural reservoir is unknown.

- The flaviviruses include yellow fever and dengue fever. Both viruses are mosquito-borne.

Each of these viral families share a number of common features:

- They are all RNA viruses covered or enveloped in a fatty (lipid) coating.
- Their survival is dependent of an animal or insect host, called a natural reservoir.
- The viruses are geographically restricted to the areas where their host species live.
- Humans are not the natural reservoir for any of these viruses. Humans are infected when they are exposed to infected hosts. However, after accidental transmission from the host, humans can transmit some of these viruses to other humans.
- Human cases or outbreaks of hemorrhagic fevers occur sporadically and irregularly and outbreaks cannot be predicted.
- With a few noteworthy exceptions, there is no cure or established drug treatment for VHF.

Bioterrorism Epidemiology

All of the VHF viruses (except dengue virus) are infectious by aerosol and could conceivably be used by an adversary as a bioterrorism agent.

Incubation Period

The incubation period for each of the VHF varies from 5 – 42 days depending on the virus.

Clinical Presentation

The VHF syndrome develops to varying degrees in persons infected with these viruses and exposure does not necessarily result in clinical disease. The target organ is the vascular bed and the dominant clinical features are generally a consequence of microvascular damage and changes in vascular permeability. Common presenting complaints include fever, myalgias, and prostration. On physical examination conjunctival injection, mild hypotension, flushing and petechial hemorrhages may be evident. The disease often progresses to shock and generalized mucous membrane hemorrhage accompanied by neurological, hematological and pulmonary manifestations. Renal insufficiency is proportional to cardiovascular compromise. Some of the clinical characteristics of the various VHF are variable as demonstrated in table 1.

Diagnosis

A detailed travel history and a high index of suspicion are essential in making the diagnosis of VHF. Patients with arenavirus and hantavirus may recall having seen rodents during the incubation period. Since these viruses are transmitted to humans by aerosolized excreta or environmental contamination, actual contact with the reservoir is not necessary. Large mosquito populations are common in areas where Rift Valley fever or flavavirus transmission occurs. Any patient presenting with VHF syndrome in the United States should be regarded as a possible bioterrorist event and reported to the local health officer immediately.

VHF should be suspected in any patient presenting with severe febrile illness and evidence of vascular involvement (subnormal blood pressure, postural hypotension, petechiae, hemorrhagic diathesis, flushing of the face and chest, and non-dependent edema. Symptoms of additional organ involvement may include headache, photophobia, pharyngitis, cough, nausea, vomiting, diarrhea, constipation, abdominal pain, hyperesthesia, dizziness, confusion and tremor.

Laboratory findings will vary from disease to disease. White blood cell counts may be normal or elevated. Thrombocytopenia is a component of most VHF, but to a varying extent. Platelet counts may be normal and platelet function tests may be required to

explain the bleeding diathesis. Proteinuria and hematuria are both common in VHF and their absence rules out Argentine and Bolivian HF and hantaviral infections. Hematocrit is generally normal or increased due to dehydration. Liver enzymes (AST) are generally elevated.

Differential Diagnoses

The major differential diagnosis is malaria. Other diagnoses include typhoid fever, rickettsial and leptospiral diseases, non-typhoidal salmonellosis, shigellosis, relapsing fever, fulminant hepatitis and meningococcemia. Conditions leading to DIC such as acute leukemia, lupus erythematosus, idiopathic or thrombic thrombocytopenia purpura and hemolytic uremic syndrome may lead to the misdiagnosis of VHF.

Definitive diagnosis is made by specific virologic testing performed at a biosafety level IV laboratory.

Medical Management

Patients with VHF syndrome require intensive supportive care. Transporting patients, especially by air, should be avoided because of the effects of changes in ambient pressure on lung water balance. Restlessness, confusion, myalgia, and hyperesthesia occur frequently and should be managed by reassurance and other supportive measures, including the judicious use of sedative, pain-relieving, and amnestic medications. Aspirin and other antiplatelet or anticlotting-factor drugs should be avoided. Secondary infections are common and should treated aggressively. Intravenous lines, catheters, and other invasive devices should be avoided unless clearly indicated for the appropriate management of the patient.

Treatment of Bleeding

The management of bleeding is controversial. Uncontrolled clinical observations support vigorous administration of fresh frozen plasma, clotting factor concentrates, and platelets, as well as the early use of heparin for prophylaxis of disseminated intravascular coagulation (DIC). In the absence of definitive evidence, mild bleeding manifestations should not be treated. Severe hemorrhage indicates that appropriate replacement therapy is required. When definitive laboratory evidence of DIC becomes available, heparin therapy should be initiated if appropriate laboratory support is available.

Treatment of Hypotension and Shock

Management of hypotension and shock is difficult. Patients often are modestly dehydrated due to heat, fever, anorexia, vomiting and diarrhea, in any combination. There are losses of intravascular volume through hemorrhage and increased vascular permeability. These patients often respond poorly to fluid infusions and develop pulmonary edema. Colloid or crystalloid solutions should be given cautiously. Although

not evaluated, dopamine would seem to be the agent of choice for patients with shock who are unresponsive to fluid replacement. Adrenergic vasoconstricting agents, although not clinically evaluated, may be useful in the treatment of profound hypotension. Vasodilators have not been clinically evaluated. Pharmacological doses of corticosteroids (e.g., methylprednisolone 30 mg/kg) provide another possible but untested therapeutic modality in treating shock.

Specific Antiviral Therapy

The investigational antiviral drug ribavirin is available by compassionate use protocols for treatment of Lassa fever, HFRS, Congo-Crimean HF, and Rift Valley fever. Separate Phase III efficacy trials have indicated that parenteral ribavirin reduces morbidity in HFRS and lowers both morbidity and mortality of Lassa fever. In an HFRS field trail, treatment was effective if started during the first four days of fever and continued for seven days. A compassionate-use protocol, utilizing intravenous ribavirin as a treatment for Lassa fever, is sponsored by the CDC. Doses are slightly different and continued for a 10-day course. The only significant side effect of ribavirin is a modest anemia due to a reversible inhibition of erythropoiesis and mild hemolysis. Ribavirin is teratogenic in laboratory animals and the potential benefits must be weighed against the potential risks in pregnant women with serious illness due to one of the VHF. Safety in infants and children has not been established. Ribavirin has poor *in vitro* and *in vivo* activity against filoviruses (Ebola and Marburg) and flaviviruses (dengue and yellow fever).

Isolation

The viruses that cause hemorrhagic fever pose special challenges for hospital ICP. With the exception of dengue (virus present, but no secondary transmission occurs) and hantavirus (virus not present in the blood or body fluids at the time of clinical illness), VHF patients generally have significant quantities of virus in blood, excretions and secretions. Health care workers must handle all sharps with extreme safety to avoid percutaneous exposure.

Lassa, Congo-Crimean HF, Ebola and Marburg viruses may be prone to aerosol nosocomial transmission. Secondary infections among medical personnel who were not parenterally exposed (but still might have had blood contact with non-intact skin or mucosal membranes) are well documented in countries where these diseases occur naturally.

Table 1: VHF Differential Diagnostic Variables

Viral Hemorrhagic Fever (HF)	Prominent Clinical Variables
Argentine and Bolivian HF	Epigastric, retroorbital and low back pain, vesicles on palate, hyporeflexia with gait abnormalities, tremors of tongue and upper extremities, hematuria, proteinuria
Lassa fever	Retrosternal chest pain, back pain, sore throat, peripheral edema, proteinuria, hemorrhage uncommon, hearing loss, elevated AST
Rift Valley fever	Retinitis, loss of vision (delayed), jaundice, DIC
Crimean-Congo fever	DIC, thrombocytopenia, jaundice
Hantavirus HF with Renal Syndrome	Renal failure, proteinuria, hematuria, oliguria, polyuric, blanching erythemic rash
Hantavirus Pulmonary Syndrome	Pulmonary vascular permeability, ARDS, hypoxia, dyspnea, hemorrhage and renal failure rare
Marburg and Ebola HF	Photophobia, lymphadenopathy, jaundice, pancreatitis, delirium, coma, maculopapular rash on truck, DIC
Yellow fever	Jaundice

VIRAL HEMORRHAGIC FEVER (VHF) - QUICK REFERENCE

Any suspected case of Viral Hemorrhagic Fevers (VHF) MUST BE TREATED AS A PUBLIC HEALTH EMERGENCY and reported to the infection control practitioner [*insert telephone number*] and the local health department [*insert telephone number*] immediately.

Bioterrorism Epidemiology:

Transmission: Except for Hantaviruses, all VHF viruses are highly contagious especially in the terminal stages of the disease; person to person contact with blood, all body fluids and tissue; coughing patients may aerosolize virus into the air may result in transmission.

Incubation Period:

Varies with each virus; range is 5 – 42 days.

Clinical Disease:

Varies slightly with each virus. The target organ is the vascular bed and the dominant clinical features are the result of microvascular damage and changes in vascular permeability. Common symptoms include fever, myalgias, prostration, conjunctival injection, hypotension, flushing, petechial hemorrhages, shock and generalized hemorrhage.

Diagnosis:

Presumptive based on clinical signs and symptoms.

Treatment:

Supportive care, pain and fever control, sedation, and hydration.

Prophylaxis:

None

Isolation:

See Recommendations for Isolation.

VIRAL HEMORRHAGIC FEVER (VHF) – FREQUENTLY ASKED QUESTIONS (FAQ)

What are viral hemorrhagic fevers?

The viruses that cause viral hemorrhagic fevers are common in Africa and in South America but very rare in the United States.

Is VHF spread from person-to-person?

VHF are commonly spread from person to person by contact with infected blood and other infected body fluids such as urine, feces, vomitus, and droplets coughed into the air by the infected person.

How soon will symptoms develop (incubation period)?

Normally the symptoms start 5 days or longer after exposure to the virus. Not all persons exposed to the virus will develop symptoms.

What are the symptoms of infection?

The symptoms of VHF generally include high fever, sore muscles and extreme weakness. The eyes may become red and the skin may appear to be red (flushed). In the advanced stages of the infection there may be bleeding from the nose, mouth, bowel or bladder.

How is the infection treated?

There is no medication available to treat VHF infection.

What should I do if I DO NOT have symptoms?

If you do not have any symptoms of the infection, you should continue with your routine daily activities. Please do not go to the hospital emergency room unless you have a fever or other symptoms of the infection.

How can I get more information?

The local health department will make frequent public announcements. It is important that you listen to the radio or television for more information.

VIRAL HEMORRHAGIC FEVERS (VHF) – HOME CARE INSTRUCTIONS

In the event of an intentional release of a virus that causes a viral hemorrhagic fever, many people may require hospitalization within a few days. Hospitals may soon become overwhelmed and unable to care for every person who seeks treatment. It may become necessary for many sick people to be cared for in their home by relatives or friends. The following information may be helpful in providing care to sick persons at home.

- Listen closely to the local radio or television for special instructions from the local health department.
- Advise friends and relatives not to visit.
- Wear a mask when you are in close contact with an infected person who is coughing or bleeding from any site.
- Wear disposable gloves (vinyl or latex) when you have contact with the infected person's blood and other body fluids (urine, feces, vomit, drainage, mucous or saliva). Place the gloves in a waste receptacle after each use. Do not wash or reuse gloves. If disposable gloves are not available, place plastic bags on your hands and secure with an elastic band. Wash your hands with soap and water after removing the gloves.
- Wear a plastic apron or gown to protect clothes from becoming soiled with blood or other body fluids
- Wash your hands with soap and water before you eat or drink, after using the bathroom and after contact with the sick person.
- Wash the sick person's hands after using the bathroom, before eating or drinking and after contact with pets.
- After the sick person uses the toilet or after pouring blood or other body fluids into the toilet, pour 1-cup of household bleach into the toilet, wait for 5 minutes and then flush the toilet.
- If the person is having trouble breathing, go immediately to the nearest designated emergency center or hospital.
- Take the person's temperature at least twice a day. If the temperature goes above 100.4?F, give Tylenol® (if not allergic). Do not give the person aspirin. Follow the instructions on the package insert. If the temperature is not controlled by the medicine, call your health care provider (doctor or nurse) or take the person to the nearest designated emergency center or hospital.
- Give the person plenty of fluids such as water or juice. Allow the person to eat solid food as tolerated.
- Change the sick person's clothes and bed linens frequently especially if soiled with blood or other body fluids. Wear gloves and gowns if the linen is soiled.
- Wash soiled clothes and bed linens in hot water using any commercial laundry product.
- Disinfect the bathroom and kitchen with a disinfectant such as Lysol® every day and when any surface becomes soiled with blood or other body fluids.
- As a caregiver, you must take care of yourself. Get plenty of rest, drink fluids frequently and eat a healthy diet. Take your temperature in the morning and afternoon for 3 weeks. If you develop a fever above 100.4?F or if you begin to bleed from the mouth, bladder or bowel see a doctor or nurse immediately.

VIRAL HEMORRHAGIC FEVERS (VHF) – SCREENING FORM

Current Date: _____/_____/_____ Medical Record Number: _____

Last Name: _____First Name: _____MI: _____

Street Address: _____ City: _____ State: _____ Zip Code: _____

Home Phone Number: (____) _____ Occupation: _____

Work Address: _____ City: _____ State: _____ Zip Code: _____

Age: ___Date of Birth: ____/____/____ Sex: ____ Date Symptoms Started: _____/____/_____

In the past 3 weeks, have you traveled to other USA cities? If yes, identify city(s):

_____

In the past 3 weeks, have you traveled to a foreign country(s)? If yes, identify city(s)/country(s)?

_____

Have you been camping in past 3 weeks? **NO** **YES**

Have you had any insect bites in the past 3 weeks? **NO** **YES**

Have you had contact with sick animals within the past 3 weeks? **NO** **YES**

Are you currently taking any medicine(s)? (Identify all prescription/over-the-counter medicines)

_____

Are you allergic to any medicine(s)? **NO** **YES** If yes, what medicine(s) are you allergic to?

_____

Over the past 3 weeks, have you had any of the following symptoms or ailments? (Check all that apply).

Symptoms	Yes	Symptoms	Yes
Fever		Bleeding from the nose or mouth	
Headache		Bleeding from the rectum or bladder	
Cough		Cough up blood	
Sore muscles		Extreme weakness	
Trouble walking		Very tired	
Bloody diarrhea		Vomiting blood	
Red eyes		Red spots of the skin	
Yellow eyes		Change in mental status	
Reduced urination		Excessive urination	
Pain in the eyes		Low back pain	
Chest pain		Loss of vision	
Difficulty breathing		Light hurts the eyes	
Swelling of legs, fingers, hands			

SECTION 3 ATTACHMENTS

ATTACHMENT 1A: BIOTERRORISM (BT) COMMUNICATION PLAN

Internal Communication

Bioterrorist (BT) Event Suspected

- Notify a department supervisor, manager or director and
- Notify a member of the Primary BT Response Team (e.g., Administrator, Infection Control Practitioner (ICP) or Chairperson, Infection Control Committee) immediately.

A bioterrorist event may be suspected by a physician, staff nurse, laboratory technologist, radiologist, infection control practitioner (ICP) or other hospital personnel. During normal business hours, the first person to suspect that an event is evolving should immediately communicate their suspicion to a direct line supervisor, department manager or director and to a member of the Primary BT Response Team (e.g., hospital administrator, ICP, Hospital Epidemiologist or Chairperson, Infection Control Committee). After normal business hours including weekends and holidays, administrative personnel such as the nursing supervisor or the administrative officer of the day (AOD) should be contacted. This person should assume responsibility for notifying the appropriate members of the Primary Team (See Internal BT Response Team Notification Matrix).

Information and notification

- Develop tentative case definition
- Review medical records (case finding)
- Designate a BT leader
- Discuss information with Primary Team
- Notify Local Health Department (LHD)
- Document and discuss LHD recommendations

The goal is to communicate credible information about the evolving event to the local health department (LHD) within two (2) hours of the initial suspicion. A tentative case definition should be developed by the ICP in consultation with the Chairperson, Infection Control Committee or Hospital Epidemiologist. The medical record of patient(s) with similar symptoms currently seeking treatment should be reviewed and the clinical information documented. (See Medical Record Review Form) This information may assist the LHD in determining if the event is bioterrorism-related or due to a clinical syndrome occurring concurrently in the community such a viral gastroenteritis or influenza. The clinical information should be discussed with members of the Primary Team. If, at this time, an event is suspected, the administrator should designate a leader, preferably a physician or the ICP, to communicate with the LHD. The

recommendations of the LHD should be documented and discussed with the Primary Team.

Internal Preparation

- Activate "Log of Events"
- Monitor Emergency Department (ED) admissions
- Report new cases to LHD
- Initiate isolation precautions, if necessary
- Inform and assure staff

Confirmation that the definition of a bioterrorism event has been met will require consultation among local, state and federal public health officials. This may take several hours. Unless the number of patients seeking treatment increases beyond the capabilities of the current staffing levels and bed availability, the hospital may want to delay implementation of the emergency management plan until the LHD confirms that an event is in progress.

The Primary Team should activate a "Log of Events". The "Log" (notebook) should document any unusual events (e.g., telephone threat, media inquiry or increase number of persons seeking medical care).

New patients with similar clinical syndromes should be triaged as soon as possible. If patients require hospital admission, the ICP should work with the nursing supervisor and the admitting department to appropriately place patients, if isolation is required. As the number of admissions increase staff may require support. Frequent communication in the form of email updates (if available) and rounds on nursing units and other affected departments may help to assess the anxiety level of the staff so that appropriate interventions can be implemented. Staff should be counseled not to communicate with the media.

After the LHD confirms that the disease scenario meets the definition of a credible event, the hospital should notify members of the Secondary Bioterrorism Response Team. (See Internal BT Response Team Notification Matrix) A decision must be made as to whether the emergency management plan should be partially of fully implemented. A meeting should be convened immediately to review current information and LHD recommendations. At this time responsibilities should be assigned and clarified. Team members should be briefed at least every 2 hours or more frequently as the number or patients and the intensity of the event escalates. As soon as the emergency management plan is partially or fully implemented, the bioterrorism leader or hospital administrator should notify local law enforcement agencies and as the situation requires, request additional security for traffic and crowd control. The Department of Health Services, Licensing and Certification District Office should be notified of this reportable event. (See External BT Notification Matrix)

Local Health Department Investigation

After the LHD confirms that an event is evolving, a team of public health investigators may be dispatched to the hospital to collect information from affected patients. A coordinated epidemiological investigation must be conducted by the LHD as soon as possible to determine the source of the exposure and identify and implement the most effective and efficient interventions.

External Communication

The hospital is responsible for notifying the law enforcement agencies in the their city and/or county and the DHS Licensing and Certification District Office.

The LHD is responsible for notifying the Governor's Office of Emergency Preparedness (OES), the Department of Health Services (DHS) Division of Communicable Disease Control (DCDC) Duty Officer of the Day, the DHS Emergency Response Duty Officer and the Federal Bureau of Investigation (FBI).

The Department of Health Services, DCDC is responsible for notifying the CDC who will assume responsibility for notifying all other federal agencies such as USAMRIID.

ATTACHMENT 1B: EXTERNAL BT NOTIFICATION MATRIX

Chain of External Communication

- Hospital notifies the Local Health Department (LHD) and local law enforcement
- LHD notifies Department of Health Services (DHS), Division of Communicable Disease Control (DCDC)
- LHD notifies FBI if BT event confirmed or highly probable.
- DCDC notifies Office of Emergency Services (OES) (916.262.1621) **AND** Emergency Preparedness Office (EPO).
- DCDC notifies Centers for Disease Control and Prevention (CDC) (707.488.7100)
- CDC notifies USAMRIID (301 619 2833)

LHD (insert the telephone numbers of local health department)	**Note: Telephone numbers are subject to change**	**DCDC telephone numbers**	**Note: Telephone numbers are subject to change**
Business hours number		Business hours number	510.540.2566
LHD pager number		DOD pager number	800.9719631
LHD cell phone number		Other emergency numbers	510.540.2308
Other emergency numbers			

If a BT Event is **suspected** during normal business hours, hospitals should first notify the LHD and then notify the Licensing and Certification (L&C) District Office by telephone.	If a BT event is **suspected** after normal business hours, hospitals should notify L&C through the DHS Emergency Response Duty Officer. Contact the Office of Emergency Services (OES) Warning Center at 916.262.1621, or by the duty officer pager at 916.328.3605.

DHS L&C Field Offices	**Telephone numbers**	**FBI California Field Offices**	**Telephone numbers**
Alameda Office	510.883.6881		
Bakersfield Office	661.336.0543	Los Angeles	310.477.6565
Chico Office	530.895.6711	Sacramento	916.481.9110
Contra Costa Office	510.540.2417	San Diego	619.565.1255
Daly City Office	670.301.9971	San Francisco	415.553.7400
Fresno Office	559.437.1500		
Los Angeles Office	323.869.8500		
Orange County Office	714.456.0630		
Redwood Coast Office	707.576.2380		
Riverside Office	909.388.7170		
Sacramento Office	916.229.3400		
San Bernardino Office	909.383.4777		
San Diego Office South	619.688.6190		
San Diego Office North	619.278.3700		
San Jose Office	408.277.1784		
Santa Rosa Office	707.576.2380		
Ventura Office	805.604.2926		
		Viral and Rickettsial Lab	510.307.8575
		Microbial Disease Lab	510.540.2242

ATTACHMENT 1C: INTERNAL BT RESPONSE TEAM NOTIFICATION MATRIX

Primary BT Response Team	Name	Office Number	Cell/Beeper Number	E-mail Address
Chief Executive Officer (CEO), or				
Chief Operations Officer (COO), or				
Chief Financial Officer (CFO), or				
Chief Nursing Officer (CNO), or				
Nursing Supervisor, **AND**				
Chair, Infection Control Committee				
Infection Control Practitioner				

Secondary BT Response Team	Name	Office Number	Cell/Beeper Number	E-mail Address
Pharmacy				
Laboratory/Pathology				
Emergency				
Critical Care				
Admission, Transfer & Discharge				
Public Relations				
Materials Management				
Facilities Management				
Social Services				
Security				
Other				

ATTACHMENT 2: MEDICAL RECORD REVIEW FORM

Actions:

- ✍ **Record age, name and medical record number**
- ✍ **Record fever at time of admission**
- ✍ **Check the number (1, 2 and/or 3) in the appropriate columns corresponding to the sign or symptom**
- ✍ **If patient returned from a foreign country within the past 3 weeks, identify country**
- ✍ **If patient was exposed to rodents, insects or animals with the past 3 weeks, identify potential place of exposure (camping, home yard, etc.) and potential source of exposure (tick, fleas, domestic or exotic animals)**
- ✍ **If patient has any of the following, call the local health department immediately:**
  Chest x-ray with. widening mediastinum
  Rash suspicious for smallpox, or
  Bloody sputum suspicious for pneumonic plague

AGE	Name	Medical Record No.	Fever time of admit	Cough =1 Sore throat=2 Pneumonia=3			Rash 1= Yes	Shock 1=Shock 2=Sepsis 3=bleeding			Death 1= yes	Nausea=1 Vomit=2 and/or Diarrhea=3			Comments 1=Travel to foreign country in past 3 weeks (identify country) 2=Insect, rodent, animal exposure and source of exposure	
				1	2	3	1	1	2	3	1	1	2	3	1 (identify)	2 (identify)

ATTACHMENT 3: SUMMARY OF POTENTIAL BT DISEASE SYNDROMES

Disease	Symptoms	Physical Exam	Diagnostic Tests	Key Differential Diagnosis	Incubation Period	Duration of Illness
Inhalation Anthrax	Fever, malaise, cough, mild chest discomfort, possible short recovery phase then onset of dyspnea, diaphoresis, stridor, cyanosis, shock. Death 24-36 hours after onset of severe symptoms, Hemorrhagic meningitis in up to 50%	Non-specific physical findings.	Serology (acute & convalescent samples); gram stain & culture of the blood; polymerase chain reaction (PCR); CXR - widened mediastinum. Rarely pneumonia.	Hantavirus pulmonary syndrome (HPS), Dissecting aortic aneurysm (no fever)	1-6 days (up to 45 days)	3-5 days
Pneumonic plague	High fever, chills, headache, hemoptysis, and toxemia, rapid progression to dyspnea, stridor, and cyanosis. Death from respiratory failure, shock, and bleeding.	Rales, hemoptysis, purpura	Gram stain & culture of blood and target tissue, serum immunoassay for capsular antigen, Serology to confirm; PCR, immunohistochemical stains (IHC)	HPS, TB, community acquired pneumonia (CAP), meningococcemia, rickettsioses	2-3 days	1-6 days
Tularemia	Fever, headache, malaise, chest discomfort, anorexia, non-productive cough. Pneumonia in 30-80%. Oculoglandular from inoculation of conjunctiva with periorbital edema.	No adenopathy with typhoidal illness.	Serology; culture of blood, sputum, or skin lesions; PCR; IHC; CXR - pneumonia, mediastinal lymphadenopathy, or pleural effusion.	Atypical community acquired pneumonia, Q fever, Brucellosis	1-10 days (average 3-5 days	>2 weeks
Smallpox	Fever, back pain, vomiting, malaise, headache, rigors, delirium. Papules 2-3 days later, progressing to pustular vesicles. Abundant on face and extremities initially.	Papules, pustules, or scabs of similar stage, many on face/extremities, palm/soles.	Clinical diagnosis; Guarnieri bodies on Giemsa or modified silver stain, virions on electron microscopy, PCR, viral isolation, IHC	Varicella, vaccinia, monkeypox, cowpox, disseminated herpes zoster.	7-17 days (average 12 days)	4 weeks
Botulism	Ptosis, blurred vision, diplopia, generalized weakness, dizziness, dysarthria, dysphonia, dysphagia 24 - 36 hours after exposure followed by symmetrical descending flaccid paralysis and respiratory failure.	No fever, patient alert, postural hypotension, pupils unreactive, normal sensation, variable muscle weakness.	Diagnosis – clinical. Serology, toxin assays/ anaerobic cultures of blood/stool; electromyography studies.	Guillian-Barré, myasthenia gravis, tick paralysis, Mg++ intoxication, organophosphate poisoning, polio	1-5 days	Death 24-72 hours or ventilator support for months
Filoviruses (Marburg, Ebola)	Fever, severe headache, malaise, myalgia, maculopapular rash day 5; progression to pharyngitis, hematemesis, melena, uncontrolled bleeding; shock/death days 6-9.	Petechiae, ecchymoses, conjunctivitis, uncontrolled bleeding.	Serology (antigen capture ELISA, IgM Elisa or PCR during acute phase), viral isolation (requires containment facility), IHC; leukopenia, thrombocytopenia, proteinuria.	Meningococcemia, malaria, typhus, leptospirosis, borreliosis, thrombotic thrombocytopenic purpura (TTP), rickettsiosis, hemolytic uremic syndrome (HUS), arenaviruses.	2-19 days (average 4-10 days)	Days to weeks

ATTACHMENT 3: SUMMARY OF POTENTIAL BT DISEASE SYNDROMES (CONTINUED)

Disease	Symptoms	Physical Exam	Diagnostic Tests	Key Differential Diagnosis	Incubation Period	Duration of Illness
Arenaviruses (Lassa, Junin, Sabia, Machupo, Guanarito)	Fever, malaise, myalgia, headache, nausea, vomiting, pharyngitis, cough, retrosternal pain, bleeding, tremors of tongue and hands (Junin), shock, aseptic meningitis, coma, hearing loss in some.	Conjunctivitis, petechia, ecchymoses, flushing over head and upper torso.	Serology, viral isolation, PCR, IHC; leukopenia, thrombocytopenia, proteinuria	Leptospirosis, meningococcemia, malaria, typhus, borreliosis, rickettsiosis, TTP, HUS, filoviruses.	5-21 days Lassa; 7-16 days Sabia, Junin, Machupo, Guanarito	7-15 days
Brucellosis	Irregular fever, chills, sweating, myalgias, cough and arthritis lasting for weeks. Profound weakness and fatigue, depression and mental status changes.	Chest x-ray may be normal or show lung abscesses, single or military nodules, bronchopneumonia, enlarged hilar nodes & pleural effusion.	Serology, cultures of blood, liver or bone marrow.	Influenza, Infectious mononucleosis, malaria, tuberculosis, Hodgkin's disease, and lymphoblastoma	5-60 days	Undulant form < 1 yr. Chronic form > 1 year
Q-Fever	Fever, chills, headache early, pleuritic chest pain. Weight loss, myalgia and cough appearing late during course.		Abnormal liver function tests, normal WBC with thrombocytopenia. Serology – IFA or ELISA (2-3 wks after presentation. CXR consolidation	Mycoplasma pneumoniae, Legionella pneumophila, Chlamydia psittaci & Chlamydia pneumoniae.	2-14 days	2 days to 2 weeks
Venezuelan Equine Encephalitis	Generalized malaise, spiking fever, rigors, severe headache, photophobia & myalgias in the legs and lumbosacral area. Nausea, vomiting, cough, sore throat and diarrhea may follow.	Non-specific	Serum for IgM ELISA indirect FA, hemagglutination inhibition, complement fixation and neutralization. White blood count often – leukopenia & lymphopenia		1-5 days	1 – 2 weeks
Staphylococcal Enterotoxin B	Fever, myalgia, nausea, diarrhea and cough.		Clinical diagnosis. Serology and urine toxin levels are useful retrospectively.	Influenza, adenovirus, mycoplasma	3–12 hours	Days to weeks
Cholera	Vomiting, headache, intestinal cramping with little or no fever and soon painless voluminous diarrhea.	Rice water diarrhea & dehydration.	Clinical diagnosis. Darkfield or phase-contrast microscopy of the stool – darting motile vibrio	Acute bacillary dysentery, food poisoning, heat exhaustion and some forms of malaria.	4 hours – 5 days	3 – 5 days

ATTACHMENT 3: SUMMARY OF POTENTIAL BT DISEASE SYNDROMES (CONTINUED

Disease	Symptoms	Physical Exam	Diagnostic Tests	Key Differential Diagnosis	Incubation Period	Duration of Illness
Ricin	Weakness, fever, progressive cough, pulmonary edema, cyanosis, chest tightness, dyspnea, nausea & arthralgias.	Respiratory distress and death	Specific serum ELISA. Acute and convalescent sera should be collected.	Staphylococcal enterotoxin B, Q fever, tularemia, plague, some chemical warfare agents such as phosgene.	4 – 8 hours	Death 36 –72 hours
Mycotoxins (T-2)	Skin – burning pain, redness, tenderness, blistering. Nasal itching and pain, sneezing, epistaxis and rhinorrhea. Pulmonary/tracheobronchial – dyspnea, wheezing, and cough. Eyes – pain, tearing, redness, foreign body sensation and blurred vision may occur	Skin blisters, epistaxis, blood tinged saliva and sputum.	Blood, tissue and environmental samples – chromatography-mass spectrometry	Mustard agent, staphylococcal Enterotoxin B	Minutes to hours	Death in minutes, hours or days

ATTACHMENT 4: LABORATORY PACKAGING AND TRANSPORTING REQUIREMENTS

Precautions

- Use Standard Precautions when collecting clinical specimens. (Exception: See recommendations for isolation for smallpox and viral hemorrhagic fevers)
- Use biological safety cabinets to prevent the release of aerosols. Masks, gowns gloves and eye protectors should be use in addition to biological safety hoods when handling all suspected bioterrorism agents.

Packaging

- Place biohazard label on each specimen container (culture or blood specimen).
- Wrap specimen container with absorbent material and place in a leak proof container with a tight cover.
- Place a biohazard label on primary container.
- Place wrapped specimen container in the primary container.
- Place primary container into a second leak proof container and seal tightly.
- Place biohazard label on second container.
- Place dry ice or ice pack (not ice) in the second container if required. If the specimen is a paper or powder form, ice should be omitted.
- Place the second container in a third container.
- The third container should meet the state and federal regulations for shipping of hazardous materials and be properly labeled.

Transporting

- Transportation of clinical specimens to the local health or state health department should be coordinated with the local FBI or law enforcement agency.

ATTACHMENT 5: TEXT REFERENCES

Inglesby TV. Working Group on Civilian Biodefense. Anthrax as a Biological Weapon, Medical and Public Health Management. JAMA, May 12,1999:281:18

Inglesby TV, Working Group on Civilian Biodefense. Smallpox as a Biological Weapon, Medical and Public Health Management. JAMA, June 9, 1999:281:22

APIC Bioterrorism Task Force & CDC Hospital Infections Program Bioterrorism Working Group. Bioterrorism Readiness Plan: A Template for Healthcare Facilities, April 13,1999

Kaiser Permanente, Plan Development Work Group. Bioterrorism Preparation and Response Guidance: A Biological Exposure Readiness Plan, November, 1999

State of California Publications

The State of California Emergency Plan. Governor's Office of Emergency Services. May, 1998

Authority and Responsibility of Local Health Officer in Emergencies and Disasters. California Department of Health Services, Emergency Preparedness Office. September 30, 1998

The Local Planning Guidance of Terrorism Response: A Supplement to the Emergency Planning Guidance for Local Government. Governor's Office of Emergency Services. December, 1998

The California Terrorism Response Plan: An Annex to the State Emergency Plan. Governor's Office of Emergency Services. March, 1999

California Influenza Pandemic Response Plan. California Department of Health Services, Division of Communicable Disease Control, Immunization Branch. May, 2000

ATTACHMENT 6: INTERNET REFERENCES

Association for Professionals in Infection Control and Epidemiology (APIC) Bioterrorism Working Group http://www.apic.org/

APIC/CDC Bioterrorism Readiness Plan: A Template for Healthcare Facilities
http://www.cdc.gov/ncicoc/hip/Bio/13apr99APIC-CDCBioterrorism.PDF

Saint Louis University School of Public Health, Center for the Study of Bioterrorism and Emerging Infections
http://www.bioterrorism.slu.edu/

Centers for Disease Control and Prevention (CDC)
http://www.cdc.gov/

CDC Bioterrorism Preparedness and Response Program
http://www.bt.cdc.gov/

Biological and Chemical Terrorism: Strategic Plan for Preparedness and Response – Recommendations of the CDC Strategic Planning Work Group
ftp://ftp.cdc.gov/pub/Publications/mmwr/RR/RR2904.pdf

CDC Division of Healthcare Quality Promotion (DHQP)
http://www.cdc.gov/ncidod/hip/

CDC Morbidity and Mortality Weekly Report
http://www.cdc.gov/mmwr/

Johns Hopkins University Center for Civilian Biodefense Studies
http://www.hopkins-biodefense.org

U.S. Army Medical Research Institute of infectious Diseases (USAMRIID) Medical Management of Biological Casualties Handbook
http://ccc.apgea.army.mil/Documents/HandbookonBioCas/Handbook.htm

U.S. Army Medical Research Institute for Chemical Defense - USAMRIID
http://chemdef.apgea.army.mil

U.S. Army's Office of the Surgeon General, Medical NBC On-Line Information Server
http://www.nbc-med.org/

U.S. National Archives and Records Administration
http://www.nara.gov/