

Clinical Features and Management of Biothreat Agents

Disease	Signs & Symptoms	Incubation Time (range)	Person-to-Person Transmission	Isolation	Diagnosis ¹	Post-Exposure Prophylaxis ¹	Treatment ²
Anthrax (<i>Bacillus anthracis</i>) A. Inhalation B. Cutaneous C. Gastrointestinal	A. Flu like symptoms including fever and chills, shortness of breath, cough, sweats, fatigue, and myalgias. May also have confusion, headache, nausea, vomiting or stomach pain. B. Initially a group of small blisters or bumps that may inch. Swelling may occur around the sore. Blisters develop into a painless skin sore (ulcer) with a necrotic (black) center. Lesions most commonly on face, neck, arms, or hands C. Fever and chills, lymphadenopathy (neck), pharyngitis, dysphagia, nausea and vomiting (may be bloody), diarrhea, headache, abdominal pain, and flushing and conjunctivitis	A. 1-43d (range, up to 60d) B. 5-7d (range, 1-12d) C. 1-6d	A. None B. Rarely person-to-person via contact C. None	A. Standard B. Contact C. Standard	A. CxR with widened mediastinum; cultures of sputum and blood B. Cultures of blood and lesion (swab) C. Cultures of blood and stool Comments: Alert lab, if patient has meningeal symptoms obtain spinal fluid culture	Antibiotics, vaccine	Antibiotics, vaccine, antitoxin
Botulism (<i>Clostridium botulinum</i> toxin) via inhalation	Double or blurred vision, ptosis, dysarthria, dysphagia, dysphonia, shortness of breath, dry mouth, muscle weakness; ascending flaccid paralysis Suggested by absence of fever, symmetric neurologic deficits, patient responsive, normal or slow heart rate with normal blood pressure, and no sensory deficits with exception of blurred vision	12-72hr (2hr-8d)	None	Standard	Presumptive based on clinical findings. Identification of toxin in serum stool, or vomitus. Culture of stool, wound, or food source.	None	Antitoxin, botulinum immune globulin
Pneumonic Plague (<i>Yersinia pestis</i>)	Fever, headache, weakness, and a rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery mucous. Septicemic plague may develop.	1-4d	Person-to-person via respiratory droplets	Droplet	Cultures of blood (usually positive), sputum, bronchial washings	Antibiotics	Antibiotics
Smallpox (Variola)	Initial stage (2-4d): High fever, prostration, myalgias, vomiting ² Rash: Starts as small red spots on tongue and in mouth, changes to sores that rupture, then rash on face that spreads to arms and legs, and then to hands and feet	10-14d (7-19d)	Person-to-person via airborne spread	Contact, Airborne (special precautions required) ²	PCR of clinical specimens (i.e., skin lesions, NP swab, blood), isolation of small virus, serology Comments: Alert lab, Public Health Department, and CDC as soon as diagnosis suspected	Vaccine	Vaccine, antivirals

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Pneumonic Tularemia (<i>Francisella tularensis</i>)	Cough, chest pain, and shortness of breath.	3-5d (1-14d)	None	Standard	Culture of skin lesions (swab or scrapings), lymph node (aspirate or biopsy), pharynx (swab), or sputum.	Antibiotics	Antibiotics
VHF ⁴ : Ebola virus	Fever, severe headache, myalgias, weakness, fatigue, diarrhea, vomiting, abdominal pain, unexplained hemorrhage (bleeding or bruising)	8-10d (2-21d)	Person-to-person via contact (direct, indirect)	Contact (special precautions required) ²	PCR of clinical specimens (blood) Comments: Alert lab, Public Health Department, and CDC as soon as diagnosis suspected	Vaccine ³	Supportive, antivirals ³ , convalescent fluid or blood ³
VHF ⁴ : Marburg	Sudden onset of fever, chills, headache, myalgias. Around 5 th day after onset of symptoms, maculopapular rash on trunk; then nausea, vomiting, chest pain, pharyngitis, abdominal pain, diarrhea. Progression may occur with jaundice, delirium, shock, liver failure, massive hemorrhage, and multi-organ dysfunction	5-10d	Person-to-person via contact (direct, indirect)	Contact (special precautions required) ²	PCR of blood or tissue, ELISA and IgM-capture ELISA. Comments: Alert lab, Public Health Department, and CDC as soon as diagnosis suspected	None	Supportive
VHF ⁴ : Lassa	Mild disease: slight fever, malaise, weakness and headache. Serious disease: hemorrhage (gums, eyes, nose), respiratory distress, vomiting, pain in chest and abdomen, and shock.	6-21d	Person-to-person via contact (direct, indirect)	Contact (special precautions required) ²	ELISA (IgM, IgG), RT-PCR of clinical specimens, viral culture Comments: Alert lab, Public Health Department, and CDC as soon as diagnosis suspected	Antivirals	Antivirals

CxR, chest radiograph; CDC, Centers for Disease Control and Prevention; d, days; ELISA, enzyme-linked immunosorbent assay; NP, nasopharyngeal; PCR, polymerase chain reaction; VHF, viral hemorrhagic fever; WHO, World Health Organization

¹Always alert lab before sending specimens for diagnosis

²Consult infectious disease physician, infection prevention, health department, review current guidelines (e.g., CDC, WHO)

³Investigational (contact Health Department, and Food and Drug Administration)

⁴Other viral hemorrhagic fevers could be used as a biothreat agent and present with similar findings such as Junin (Argentine hemorrhagic fever) and Machupo virus (Bolivian hemorrhagic fever)

Chart adapted from: Centers for Disease Control and Prevention (CDC: www.cdc.gov); Control of Communicable Diseases Manual, 20th edition, 2015; World Health Organization (www.who.org)