

Potential Biological Agents of Bioterrorism

Agent or disease	Symptoms	PPE	Treatment
Anthrax (inhalation)	Fever, chills, chest discomfort, shortness of breath, cough, confusion, dizziness, nausea/vomiting/abdominal pain, headache, drenching sweats, extreme fatigue, general malaise (develop app 1 wk post-exposure) 55% survival rate with tx	N95 Masks, gowns, gloves—full protection	PCN, doxycycline, or ciprofloxacin—given IV Treatment lasts 60 days because it may take spores that long to germinate
Botulism	Symmetric cranial neuropathies (diplopia, drooping eyelids, difficulty swallowing, dry mouth, altered voice), descending flaccid paralysis in proximal to distal pattern, possibly: abdominal pain, N/V/D, respiratory muscle paralysis	Standard precautions Those with flaccid paralysis should be on droplet precautions until meningitis is ruled out	Botulism antitoxin Monitoring and support of respiratory function
Brucellosis (risk from unpasteurized dairy products, those who work in slaughterhouses, meat packing, veterinarians)	Fever, sweats, malaise, anorexia, headache, muscle/joint/back pain, fatigue Chronic: recurrent fevers, arthritis, swelling of male genitalia, endocarditis, lingering neurological symptoms, depression, hepatomegaly, splenomegaly Survival rate 98% with treatment	Standard precautions Standard disinfectants	Doxycycline, rifampin—in combination for 6-8 weeks
Cholera (<i>vibrio cholerae</i>)	Profuse watery diarrhea, vomiting, tachycardia, dry mucous membranes, loss of skin elasticity, hypotension, thirst, muscle cramps, restlessness or irritability, acute renal failure, severe electrolyte imbalance, coma.	Standard precautions Strict handwashing Chlorine solutions for disinfection	Rehydration-oral or IV Antibiotic treatment-doxycycline, azithromycin for children and pregnant women Zinc treatment
Q fever (<i>Coxiella burnetii</i>) Worldwide disease Cattle, sheep and goats	High fever (104-105), severe headache, general malaise, myalgia, chills/sweats, dry cough, N/V/D, abdominal pain, chest pain	Standard precautions	Antibiotics-doxycycline or other tetracyclines

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<p>are primary reservoir Hardy, resistant to heat Infection is usually inhalation-barnyard dust Tick bites, ingestion of unpasteurized milk, human to human—rare</p>	<p>Chronic: endocarditis reported in 60-70% of cases</p> <p>Survival rate 98% with treatment Highest risk: pregnant women, immunosuppressed individuals, those with pre-existing heart valve defects</p>		
<p>Ebola</p>	<p>Fever, severe headache, myalgia, malaise, fatigue, weakness, N/V/D, abdominal pain, unexplained hemorrhage</p> <p>Average incubation: 8-10 days</p> <p>Chronic: joint, vision problems Virus antibodies remain present for possibly 10 years Virus remains present in bodily fluids, including semen, for 3-9 months</p>	<p>Impermeable gown or coverall, single-use PAPR or N95 mask, full-face covering and head-shroud Single-use exam gloves with extended cuff, 2 pair Single-use boot covers that extend to at least mid-calf Single-use apron that covers the torso to the level of mid-calf</p>	<p>Rehydration Oxygen Experimental vaccines and treatments pending Antibiotics if secondary infections occur</p>
<p>Lassa fever (Viral illness occurs in west Africa, animal- borne)</p>	<p>Low-grade fever, general malaise, weakness, headache. In 20% of individuals disease may progress to serious symptoms such as hemorrhage (gums, eyes, nose), respiratory distress, vomiting, facial swelling, pain in chest/back/abdomen, hearing loss, tremors, encephalitis</p> <p>99% survival rate, 15-20% of those hospitalized for Lassa fever die of the disease 95% mortality in fetuses of infected pregnant mothers</p>	<p>Mask with face shield or goggles Impervious gown Gloves</p>	<p>Ribavirin (antiviral drug) Rehydration Electrolyte balance Oxygenation Antibiotics for secondary infections</p>

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	<p>Rash appears on skin as lesions in mouth break open, starts on face, spreads to arms and legs, then to hands and feet. Fever drops and patient feels better.</p> <p>Day 3 of rash: lesions become popular</p> <p>Day 4: lesions drain thick, opaque drainage, has trademark depression in center of lesion; fever rises again at this time and remains elevated until lesions develop scabs</p> <p>Pustular rash: sharply raised, round/firm to the touch, feel like BB pellet</p> <p>Scabs form</p> <p>Scabs fall off, pitted scars remain, patient is contagious until ALL scabs have fallen off.</p> <p>Overall fatality rate of 30%</p>		<p>Antipyretics</p> <p>Hydration</p>
<p>Tularemia (bacterial, Francisella tularensis, spread by rabbits/hares/rodents, contact with infected animal, tick and deer fly bites)</p>	<p>Ulceroglandular: skin ulceration with regional lymph node involvement</p> <p>Glandular: without ulcer</p> <p>Oculoglandular: eye infection (mucous membrane transmission, irritation and inflammation of eye and preauricular lymph node)</p> <p>Oropharyngeal: spread by contaminated food/water, symptoms include sore throat, oral ulcers, tonsillitis, swelling of lymph nodes in neck</p> <p>Pneumonic (most serious): contracted through dusts/aerosols containing the organism. Symptoms include cough, chest pain, difficulty breathing</p> <p>Typhoidal: any combination of the general symptoms without the localized symptoms of the other syndromes.</p>	<p>Standard precautions</p>	<p>Streptomycin</p> <p>Gentamicin</p> <p>Tetracyclines may be used as an alternative</p> <p>Cipro/other fluoroquinolones are not FDA approved but have shown good efficacy in trials</p>
<p>Typhoid fever</p>	<p>Sustained high fever (103-104), fatigue,</p>	<p>Contact precautions</p>	<p>Antibiotics: fluoroquinolones, ceftriaxone,</p>

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<p>(bacterial, Salmonella typhi)</p>	<p>malaise, myalgia, abdominal pain, headache, anorexia, macular rash (rose-colored), mild vomiting, diarrhea</p> <p>Chronic carrier state (excretion of the organism for more than a year) occurs in 5% of infected persons 20% of patients die from complications of the infection</p>		<p>azithromycin</p>
<p>Eastern equine encephalitis (Viral, spread by mosquitos)</p>	<p>Headache, high fever, chills, vomiting, disorientation, seizures, coma 33% mortality, significant brain damage in most survivors</p>	<p>Droplet precautions prior to identification of agent Standard precautions once EEEV has been definitively diagnosed</p>	<p>Supportive care Fluids Anticonvulsants Possibly antivirals Corticosteroids (trials)</p>