Virginia Department of Health
Plague: Overview for Healthcare Providers

Organism	*Yersinia pestis*: gram-negative, bipolar-staining, nonmotile, pleomorphic bacillus
Reporting to Public Health	Suspected or confirmed cases require immediate notification to the local health department (LHD). See www.vdh.virginia.gov/LHD/index.htm.
Infectious Dose	~100 to 500 organisms by inhalation
Occurrence	Plague occurs worldwide but primarily in sub-Saharan Africa. It occurs rarely in the western US (5-15 cases/year), but does not occur naturally in Virginia.
Natural Reservoir	Rodents (e.g., ground squirrels, prairie dogs, chipmunks, wood rats, deer mice and voles) and their fleas. Rabbits, hares, wild carnivores, or domestic cats may also be infection sources.
Route of Infection	• Bite of infected fleas • Unprotected handling of infected animal tissues or laboratory specimens • Respiratory droplets from people or animals with plague pharyngitis or pneumonia • Aerosolized plague bacteria can be used for bioterrorism attack, leading to primary pneumonic plague.
Communicability	• Infected fleas may remain infectious for months. • Bubonic plague is not usually transmitted from person to person unless there is direct contact with pus from suppurating buboes. • Pneumonic plague is usually highly communicable by respiratory droplets in close distance (< 6 feet) when patient is symptomatic and has had less than 48 hours of antibiotic therapy • Patients are usually no longer infectious after receiving 48–72 hours of appropriate antibiotic treatment.
Risk factors	• Traveling to plague-endemic areas (e.g., sub-Saharan Africa) • Handling infected domestic cats (e.g., veterinarians) or plague cultures (e.g., laboratorians) • Camping, hunting or hiking in areas where plague-infected animals reside.
Case-Fatality Rate	• ~11% in U.S. with treatment. Fatality rate might be higher in developing countries. • Fatality rate for bubonic plague is lower than the rate for septicemic or pneumonic plague.
Incubation Period	1–6 days for primary pneumonic plague and 2–8 days for bubonic plague
Clinical Description	• Bubonic: acute onset of fever and painful swollen lymph nodes (buboes), most commonly in the inguinal region. Headache, weakness, chills, nausea, vomiting, and diarrhea are common. • Pneumonic: fever, chills, headache, malaise, and productive, bloody cough. Rapid development of dyspnea, stridor, cyanosis, and respiratory failure. • Septicemic: fever, respiratory distress, purpuric skin lesions; may progress rapidly to septic shock, intravascular coagulopathy, meningitis, or coma.
Differential Diagnosis	• Bubonic: cat scratch disease (*Bartonella*), ulceroglandular tularemia, adenitis due to staphylococcal, streptococcal, or filarial infection, tuberculosis, nontuberculosis mycobacterial infection, lymphogranuloma venereum, *Capnocytophaga canimorsus* infection, chancroid, strangulated inguinal or femoral hernia, lymphadenopathy due to nonspecific infections, appendicitis, cellulitis • Pneumonic: Other bacterial pneumonia (*Mycoplasma, Legionella, Staphylococcus, Streptococcus, Haemophilus, Klebsiella*) and viral pneumonia (influenza, respiratory syncytial virus, hantavirus, severe acute respiratory syndrome), Chlamydia infection, Q fever, inhalation anthrax, tularemia • Septicemic: Other gram-negative sepsis and gram-positive sepsis (*Staphylococcus*),

For additional guidance, refer to VDH Plague: Guidance for Healthcare Providers, available at: http://www.vdh.virginia.gov/OEP/Agents/ or CDC at http://www.cdc.gov/plague/.

	meningococcemia, rickettsial infections, malaria
Radiography	Pulmonary infiltrates or consolidation on chest radiograph for pneumonic plague
Specimen Collection and Laboratory Testing[†]	• Bronchial/tracheal wash or induced sputum (5-10 mL) for pneumonic; lymph node aspirate (1-2 mL) for bubonic; blood (5-10 mL) for septicemic. • [†]If plague is suspected, notify LHD immediately to discuss the case and laboratory testing. Specimens should be sent to Division of Consolidated Laboratory Services (DCLS) after LHD has been consulted and testing has been approved by LHD/DCLS. The DCLS Emergency Duty Officer can be reached 24/7 at (804) 335-4617.
Treatment*	The drugs of choice are streptomycin or gentamicin, but tetracyclines, fluoroquinolones and chloramphenicol are also effective. Information on choice of drugs, dosing and duration of treatment is available at http://www.cdc.gov/plague/healthcare/clinicians.html. *For additional information on dosing, please consult the package inserts.
Post-Exposure Prophylaxis (PEP)	PEP is indicated in persons with known exposure to plague, such as close contact with a pneumonic plague patient or direct contact with infected body fluids or tissues. Information on PEP is available at: http://www.cdc.gov/plague/healthcare/clinicians.html.
Vaccine	A vaccine for plague is not commercially available in the U.S.
Infection Control	• Use standard precautions for all types of plague • For pneumonic plague, isolate the patient and follow droplet precautions until patient has received at least 48 hours of antibiotics and has improved clinically.