CONDITION

Black death

Learn how plague, the infection behind the historic Black Death, spreads and how its symptoms, diagnosis, treatment, complications, and prevention are managed today.

WHAT IT IS
Bacterial infection called plague

BODY SYSTEM
Lymph nodes, blood and lungs

MAIN SYMPTOMS
Sudden fever, painful swollen lymph nodes, weakness, cough

WHAT CAUSES IT
Yersinia pestis bacteria

HOW IT IS DIAGNOSED
Laboratory culture or molecular testing

MAIN TREATMENT
Antibiotics and supportive hospital care

CAN IT BE CURED?
Yes, antibiotics treat the bacterial infection

IS IT AN EMERGENCY?
Sometimes, with severe trouble breathing

LONG-TERM OUTLOOK
Much better with early antibiotics, severe if delayed

Overview

The Black Death was a major plague pandemic that affected Europe, Asia, and North Africa during the 14th century. Evidence from the remains of people who died during the pandemic confirms that it was caused by Yersinia pestis , a type of bacteria.

Today, health professionals usually call the infection plague , rather than Black Death. Plague still occurs in some parts of the world, including occasional cases in rural areas of the western United States. Modern sanitation, public health systems, and effective antibiotics like amoxicillin or doxycycline make the situation very different from the medieval pandemic.

Plague is uncommon, but it matters because it can become severe quickly if treatment is delayed. The infection can affect the lymph nodes, bloodstream, or lungs. These forms are known as bubonic, septicemic, and pneumonic plague.

A person with possible plague needs prompt medical assessment. Early antibiotic treatment greatly improves the chance of recovery. Health departments also investigate suspected cases to identify the source and protect people who may have been exposed.

Symptoms

Symptoms depend on which part of the body is affected. They often begin within several days of exposure, although the timing varies.

Bubonic plague is the most familiar form. The bacteria enter through the skin, often after the bite of an infected flea, and travel to nearby lymph nodes. Lymph nodes are small structures that help the immune system respond to infection.

Common features include:

Septicemic plague occurs when the bacteria multiply in the bloodstream. It may develop from untreated bubonic plague or begin without an obvious swollen lymph node.

Possible symptoms include fever, extreme weakness, abdominal pain, nausea, vomiting, and signs of poor circulation. Bleeding may occur under the skin or in internal organs. Severely reduced blood flow can damage fingers, toes, or other tissues, causing dark discoloration. However, the exact historical origin of the name "Black Death" is not certain.

Pneumonic plague affects the lungs. It can develop when infection spreads to the lungs or when a person breathes in infectious droplets.

Symptoms may include:

Possible plague exposure combined with sudden fever, a painful swollen lymph node, or a new cough requires same-day urgent medical assessment . Call the healthcare facility before arriving so staff can take appropriate precautions.

Call emergency services for severe trouble breathing, blue or gray lips, fainting, new confusion, inability to stay awake, or other signs of shock. These are emergency symptoms, regardless of the cause.

- Sudden fever, chills, headache, weakness, and body aches
- One or more very painful, swollen lymph nodes, called buboes
- Swelling that may appear in the groin, armpit, or neck
- Tender or warm skin over the affected lymph node
- Fever, headache, and marked weakness

- Cough, sometimes with bloody or watery mucus
- Chest pain
- Shortness of breath
- Rapidly worsening pneumonia

Causes and risk factors

Plague is caused by Yersinia pestis . The bacteria circulate naturally among some wild rodents and their fleas. Infection is not caused simply by poor hygiene, and a person cannot develop plague from reading about or visiting a historical Black Death site.

People can become infected through:

Person-to-person spread is mainly associated with pneumonic plague. It generally requires close exposure to respiratory droplets from someone who is coughing. Bubonic plague does not normally spread through casual contact, although the infection can become pneumonic if it reaches the lungs.

Risk is higher for people who live, work, camp, or hunt in places where plague occurs naturally. Activities involving rodents, rabbit-like animals, or their fleas may increase exposure. Handling or skinning a sick or dead animal without protection is another risk.

Cats can become seriously ill with plague and may expose people through droplets, bites, scratches, or infected fluids. Dogs are less likely to become severely ill but can carry infected fleas into homes. Consistent, veterinarian-recommended flea control reduces this risk.

A sudden increase in dead rodents can sometimes signal disease activity. Do not handle unexplained animal remains with bare hands. Local animal control or public health officials can advise on safe removal and whether testing is needed.

- The bite of an infected flea
- Direct contact with the blood, fluids, or tissues of an infected animal
- Breathing in infectious droplets from a person or animal with pneumonic plague
- Laboratory exposure, which is rare and managed through specialized safety procedures

Diagnosis

A clinician will ask about symptoms and possible exposures. Important details include recent travel, camping or outdoor work, flea bites, contact with rodents or sick animals, and close

contact with anyone who had suspected pneumonic plague.

Because plague is rare, its early symptoms may resemble more common conditions. A swollen lymph node can result from several infections. Fever and cough may have many causes. Medical evaluation and testing are needed rather than relying on symptoms alone.

Testing may use samples from:

A laboratory may try to grow the bacteria in a culture. Specialized laboratories can also use molecular tests, such as polymerase chain reaction, to look for bacterial genetic material. Public health laboratories are often involved in confirmation.

If clinicians strongly suspect plague, they generally begin treatment while testing is underway. Waiting for final laboratory confirmation could allow the infection to become more severe. Suspected and confirmed cases are reported promptly to public health authorities.

- Blood
- Fluid taken from a swollen lymph node
- Mucus or other material from the lungs
- Spinal fluid if infection around the brain and spinal cord is suspected

Treatment and management

Plague is treated with antibiotics that kill or stop the growth of Yersinia pestis . Treatment is most effective when started early.

The antibiotic selected depends on the form and severity of illness, the person's age and health, pregnancy status, possible medication interactions, and whether infection has affected the brain or spinal cord. Medicines used in appropriate circumstances may include an aminoglycoside, a fluoroquinolone, doxycycline, or another antibiotic active against the bacteria. These medicines have different risks and are not interchangeable without clinical guidance.

Treatment usually takes place in a hospital, especially when pneumonic or septicemic plague is possible. In addition to antibiotics, a person may need intravenous fluids, oxygen, breathing support, or treatment for low blood pressure and organ problems.

People with pneumonic plague are cared for using respiratory precautions. Healthcare workers may use masks and other protective equipment, and the patient may remain separated from others until effective treatment has reduced the risk of transmission.

Public health officials help identify anyone who had close, unprotected exposure to infectious droplets or contaminated tissues. Depending on the type and timing of exposure, these

contacts may be offered preventive antibiotics and asked to monitor for symptoms. People should not take leftover or veterinary antibiotics.

There is no plague vaccine routinely available to the general public in the United States. Prevention therefore focuses on reducing contact with infected fleas and animals and responding quickly to possible exposures.

Complications

Without prompt treatment, plague can spread or interfere with blood flow and organ function. Possible complications include:

Bubonic plague can progress to septicemic or pneumonic plague. Primary pneumonic plague may worsen especially quickly and can spread to close contacts through respiratory droplets.

These complications are reasons to seek prompt care, not a prediction of what will happen to any one person. The outlook is much better when appropriate antibiotics begin early.

- Sepsis, a dangerous whole-body response to infection
- Septic shock, in which blood pressure becomes critically low
- Severe pneumonia and respiratory failure
- Abnormal blood clotting and bleeding
- Tissue injury or gangrene caused by poor circulation
- Meningitis, an infection of the tissues surrounding the brain and spinal cord
- Kidney, liver, or other organ injury

Follow up

Follow-up after plague depends on the form and severity of the infection. A routine visit after treatment may review whether symptoms have resolved, whether blood tests or organ function need rechecking, and whether the person has medication side effects or lasting breathing problems.

Take prescribed antibiotics exactly as directed and complete the course unless the treating clinician changes the plan. Contact the care team promptly if symptoms return, worsen, or fail to improve as expected.

Public health staff may continue to check on the patient and close contacts for a limited period. This is a standard safety measure. Follow instructions about symptom monitoring,

temporary separation from others, and when it is safe to return to work, school, or shared living spaces.

Practical ways to reduce future exposure include:

Routine follow-up is appropriate for recovery checks and prevention planning. New fever, painful lymph-node swelling, cough, chest pain, or shortness of breath after a possible exposure requires urgent medical advice rather than waiting for a scheduled appointment.

- Avoid touching sick or dead wild animals with bare hands.
- Use an Environmental Protection Agency-registered insect repellent when fleas may be present.
- Use permethrin-treated clothing or gear only as directed on the label; do not apply clothing treatments directly to skin.
- Keep living areas and outdoor workspaces free of rodent food and shelter.
- Use veterinarian-recommended flea control for pets.
- Keep pets from hunting or roaming in areas with known rodent die-offs.
- Report unusual groups of dead rodents to local authorities rather than handling them.

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