



It has caused pneumonia with acute respiratory distress syndrome (ARDS) and death in one half of infected individuals, and it is highly contagious.

Meningitis symptoms occur predominantly from enterovirus infections during summer months, although the symptom complex warrants urgent treatment of bacterial causes while the diagnostic process occurs. Febrile syndromes without meningitis are more common manifestations of enteroviral infections.

Arthropod-borne viruses such as California encephalitis virus; eastern, western, and Venezuelan equine encephalitis viruses; St. Louis encephalitis virus; and West Nile virus can produce self-limited febrile illnesses and encephalitis. Colorado tick fever is a biphasic illness seen after northwestern and southwestern tick exposures. It is characterized by high fevers and leukopenia. In New York State, a deer tick virus has been associated with numerous cases of fever and confusion.

Influenza causes sore throat, cough, myalgias, arthralgias, and headache in addition to fever, and it most often manifests in an epidemic pattern during winter months. It is unusual for fever to persist beyond 5 days in uncomplicated influenza. Prolonged fever in persons with diagnosed influenza warrants investigation and treatment of bacterial superinfection.

Early recognition of fever and dry cough led to the discovery and containment of the outbreak of severe acute respiratory syndrome (SARS). The epidemics of avian influenza and H1N1 pandemic strains in recent years are sobering reminders that influenza viruses have a remarkable ability to mutate, producing new immune-resistant strains on a regular basis. Preventive yearly influenza vaccination is important.

Mononucleosis syndromes of fever with detectable lymph node enlargement typify infections with Epstein-Barr virus (EBV), cytomegalovirus (CMV), primary human immunodeficiency virus (HIV), and *Toxoplasma gondii* (i.e., toxoplasmosis). Other manifestations of these infections include abnormal liver function test results, respiratory tract symptoms, and neurologic symptoms. Diagnosis of acute HIV infection, which can produce a mononucleosis-like syndrome, is an urgent issue.

Bacterial Infections

Pathogenic bacteria can infect all body parts and can cause a spectrum of localized illness warranting antibiotic therapy. For example, *Staphylococcus aureus* may cause skin abscesses or cellulitis. Highly pathogenic organisms may colonize individuals who have had contact with the health care system. Most concerning is the event of bacteria entering the bloodstream. Obtaining timely blood cultures before administering the antibiotics indicated for presumed bacterial infections in persons with common clinical syndromes can help to identify bloodstream pathogens and define the required course of treatment.

Fever may be the predominant clinical manifestation of *S. aureus* illness. This organism and the methicillin-resistant form (i.e., MRSA) frequently cause sepsis without an obvious primary site of infection. It should be considered in patients undergoing intravenous therapy or hemodialysis and in those who use intravenous drugs or who have severe chronic dermatitis. Bacteremia with staphylococci may cause hematogenous seeding of bones leading to osteomyelitis and heart valves leading to endocarditis in individuals; the bacteremia may also reflect these underlying

processes. Other common causes of bacteremia and their sources include *Streptococcus pneumoniae* (i.e., pneumonia), *Escherichia coli* (i.e., urinary tract and gastrointestinal sources), streptococci (i.e., skin), and anaerobes (i.e., gastrointestinal tract).

Listeria monocytogenes bacteremia is seen predominantly in persons with depressed cell-mediated immunity. It is the most common manifestation of listeriosis in these hosts. Many with listeriosis may have meningitis and warrant lumbar puncture for cerebrospinal fluid culture.

Typhoid and paratyphoid fever (i.e., enteric fever) are common in many low-income countries. Patients may have fever alone as the primary clinical manifestation. Travelers to six countries account for 80% of U.S. cases: India, Mexico, Philippines, Pakistan, El Salvador, and Haiti. Fever with headache and an insidious onset with an unremarkable physical examination is common, although a faint and transient rash (i.e., rose spots) may appear by the second week of illness. Symptoms may include diarrhea, constipation, vague abdominal discomfort, and sometimes dry cough. Diagnosis depends on the culture of blood or stool.

Fever with Localized Symptoms and Signs

Localized bacterial infection can be apparent, as in cases of abscess, cellulitis, or otitis media, or clinically occult. It can develop as an undifferentiated febrile syndrome. Careful inspection of mucous membranes and conjunctiva may reveal petechiae, which are clues to meningococcemia or infective endocarditis. Finding heart murmurs in the setting of fever may suggest endocarditis and warrant additional blood cultures. Pulmonary signs in pneumonia include rales and evidence of consolidation, but persons with cryptococcosis, coccidioidomycosis, histoplasmosis, psittacosis, legionellosis, or pneumocystis pneumonia may show few signs.

These infections should be suspected based on exposure history and the host's immune status. It is important to assess the size of the liver, spleen, and lymph nodes, particularly in cases of viral infection. A swollen joint may indicate septic arthritis. A complete neurologic examination, including cranial nerves and testing for meningeal signs, may indicate CNS infection.

Malaria, bacterial sepsis, and bacterial infections of the lung, urinary tract, CNS, and intestines with resultant bacteremia warrant urgent initiation of empirical treatment while awaiting final identification and sensitivities. For febrile patients with features suggesting a bacterial infection, evaluation should include complete blood counts with differential and platelet counts, blood smears for those at risk for malaria or babesiosis, urinalysis, throat and blood cultures, and a chest radiograph.

Fevers with rash as a prominent feature warrant exclusion of life-threatening infectious diseases, including meningococcemia, toxic shock syndrome (TSS), and Rocky Mountain spotted fever (RMSF). Characterization of the rash can help. Clues to some of the common infections exhibiting fever as the sole feature and those causing fever with rash are provided in [Tables 88-2, 88-3, and 88-4](#). [Tables 88-5 and 88-6](#) list common syndromes associated with imported fevers when assessing travelers.

FEVER OF UNKNOWN ORIGIN

Most febrile conditions resolve or are readily diagnosed and treated, but some fevers can persist and remain unexplained.