

Learn more about diagnosing and treating Ehrlichia, Anaplasma, and Rickettsia.



Get to Know the Acute Symptoms of Infection

(associated with severe disease)

- *Ehrlichiosis* (60% children, 30% adults): small red flat patches (macules) with small raised bumps (papules) in evenly distributed clusters. Rash mainly occurs with *E. chaffeensis* (it's less common with *E. ewingii* and *E. muris-like*). It should be noted that a similar rash can occur in many other viral and bacterial diseases, including measles, dengue fever, parvovirus B19, Epstein-Barr virus, cytomegalovirus (CMV), borrelia (Lyme disease), and many others. It can also occur as a reaction to drugs or toxins. A sunburn-like rash (erythroderma) is also possible with *E. chaffeensis*, but less common.
- *Rocky Mountain Spotted Fever* (90%): pink flat non-itchy small “spots” (macules) that are densely packed and widely distributed on the wrists, forearms, ankles, trunk, and sometimes the palms and soles of the feet. The rash is more characteristic in RMSF. It generally appears 2-5 days after fever starts, but can occur later in the course of illness, even after treatment is started. In later stages with progressive disease, the spots progress to red or purple (petechiae).
- *Anaplasmosis*: rash is rare
- High fever and chills
- Headache
- Muscle aches (myalgia)
- Maculopapular or petechial rash (trunk and extremities)
- Arthralgia (joint pain)
- Malaise
- Confusion

- Abdominal pain (can mimic appendicitis)
- Nausea / vomiting / diarrhea
- Cough (anaplasma)
- Conjunctivitis (ehrlichia, RMSF)
- Pharyngitis (sore throat)
- Anorexia / weight loss
- Difficulty breathing
- Pulmonary complications (lungs)
- Bleeding disorders (disseminated intravascular coagulation)
- Kidney failure
- Seizures
- Coma
- Death

These illnesses are more common in males than females, with a 2:1 ratio.

RMSF can cause long-term problems in children, including cognitive delay, fine motor impairment, and persistent foot drop.

Chronic infection with these types of microbes is categorized by subclinical phases (no symptoms) that can last months or years, followed by episodes of primary symptoms. Ehrlichia and anaplasma are more likely to be associated with relapsing disease than rickettsia. Relapses should be treated with antibiotic therapy like primary disease.

Risk factors for severe disease (and higher risk of dying) include:

- Age > 50 years
- HIV
- Depressed immune function (corticosteroids, other immunosuppressive drugs, cancer and cancer therapy, splenectomy)

Diagnosis

Diagnosis is a real challenge, because these diseases look alike on clinical presentation and also resemble more common infectious diseases. They mimic a severe flu.

A high index of suspicion is critical to initiate therapy early in the course of disease, especially with RMSF. Any person presenting with shaking chills, high fever, and low back pain should be considered for one of these diseases, especially in endemic areas (where infection is common), with or without knowledge of a tick bite. The following are methods for detecting such diseases:

- General labs, key findings in severe infection
- Decreased white blood cell count (leukopenia)
- Decreased platelets (thrombocytopenia)
- Abnormal liver function tests (increased AST, ALT)
- Decreased hemoglobin (only 50%)
- Low sodium (most common in children)
- *Direct visualization on blood smear* → giemsa blood stain with findings of morulae within white blood cells (ehrlichia, anaplasma). Not valuable for diagnosing rickettsia. Because only 0.1 to 0.2% of white blood cells are infected by ehrlichia and anaplasma, this is not generally an effective method of diagnosis.
- *Indirect Immunofluorescent Assay (IFA)*. Four-fold rise in antibody titer (IgG). The first sample should be taken as early in the disease process as possible, and the second sample should be taken 2-4 weeks later. IgM levels rise at about the same time as IgG and can stay elevated for a long time. IgG is more reliable for diagnosis. For ehrlichia, anaplasma, and *R. rickettsiae*, this does not detect early disease (therapy should be initiated before results are available if infection with one of these microbes is suspected).
- *PCR*. Detects microbe DNA in blood samples. It is species and microbe specific. This is the best test for acutely diagnosing these microbes, but a negative test should not prevent therapy if suspicion is high. PCR is 60-85% effective for diagnosing ehrlichia, and 70-90% effective for diagnosing anaplasma. PCR from a blood sample is less valuable for diagnosing RMSF, because concentration of microbes in the blood is so low. PCR for rickettsia done from a skin biopsy sample at a rash site, however, can be positive in up to 70% of cases.
- *Immunohistochemistry (IHC)*. This detects antigens of the microbe in tissue sections. The test requires a biopsy of spleen, lymph nodes, bone marrow, or liver. Results are reliable, but the test is not often used because it is very invasive.

Treatment

High index of suspicion is important for early diagnosis. These are not illnesses to mess around with. They should be treated aggressively with conventional antibiotics. Diagnosis is based on clinical signs and symptoms and confirmed by labs after treatment initiated. Labs are not helpful for the first two weeks when acute symptoms are most pronounced.

Serious complications are more apt to arise if infections are not recognized and antibiotic therapy is delayed. Herbal therapy should not be primary therapy, but it can be used as supportive therapy.

Standard treatment is 100 mg of doxycycline twice daily for 30 days or until 3 days after symptoms subside completely. Failure to respond to doxycycline (decreased fever) acutely is an indication that an acute tick-borne infection is not present (possibly a virus or babesia). Resistance is high with any other antibiotics.

The doxycycline dose in children is < 45 kg (100 lbs) 2.2 mg / kg twice daily.

Alternative for Ehrlichiosis/anaplasmosis: Rifampin 300 mg three times daily for 30 days or until 3 days after symptoms resolve.

Alternative for RMSF: Chloramphenicol 12.5 mg per kg body weight orally every 6 hours. It also can be administered intravenously. Use of this antibiotic is associated with a high potential for side effects.

Prophylactic treatment for an asymptomatic tick bite is not recommended by the CDC. It is considered ineffective and may simply delay onset of disease. This stance is controversial, especially because asymptomatic individuals can become chronic carriers and develop relapsing illness later if immune function falters.

A more severe course may require acute treatment with IV antibiotics.

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease. Always consult your qualified healthcare provider before beginning any diet or program.

RESOURCES

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- [The Restore Kit Resource Page](#) (Bookmark this to reference all the resources and tools you need to succeed with this program!)
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