

Just the Facts...

Rocky Mountain Spotted Fever

Q. What is Rocky Mountain spotted fever?

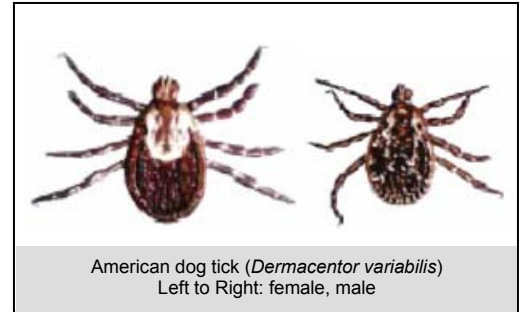
A. Rocky Mountain spotted fever (RMSF) is a serious tick-borne illness that is caused by the bacterial organism *Rickettsia rickettsii*.

Q. How does a person get Rocky Mountain spotted fever?

A. You can get RMSF if you are bitten by a tick that is infected with *Rickettsia rickettsii*. Bacteria in the tick's saliva are transmitted to you while the tick is feeding. An infected tick must be attached to you for at least several hours in order for transmission to take place.

Q. Do all ticks transmit Rocky Mountain spotted fever?

A. No. Only certain species of ticks are capable of transmitting *Rickettsia rickettsii*. There are two major vectors (transmitters) of *R. rickettsii* to humans in the United States, the American dog tick (*Dermacentor variabilis*) and the Rocky Mountain wood tick (*Dermacentor andersoni*). The American dog tick is responsible for transmitting the majority of RMSF cases. This tick is widely distributed throughout the eastern two-thirds of the U.S., as well as in limited areas along the Pacific Coast. The Rocky Mountain wood tick is only found in the western U.S. Both tick species are very similar in appearance.



Q. How prevalent is Rocky Mountain spotted fever?

A. According to the Centers for Disease Control and Prevention (CDC), approximately 500 cases of RMSF have been reported annually in the United States since 1990. Although the disease was first recognized in 1896 in Idaho, and was a serious illness in the Rocky Mountain states in the early 1900s, it soon became apparent that RMSF is widely distributed throughout most of the United States. Today, the majority of cases occur in the southeastern seaboard and south central states. North Carolina and Oklahoma report the highest incidences of RMSF. *R. rickettsii* only exists in the western hemisphere, and outside of the U.S., RMSF has been documented in southern Canada, Central America, Mexico, and parts of South America. Closely related organisms cause other types of spotted fever illnesses in other parts of the world.

Q. How serious is Rocky Mountain spotted fever?

A. Prior to the discovery of tetracycline and chloramphenicol antibiotics in the late 1940s, approximately 30% of persons infected with *R. rickettsii* died. Today, despite modern advances in medical care and the availability of effective drug treatments, the disease still has a fatality rate of 3% to 5%. Severe or fatal illness is linked to advanced age, male gender, African-American race, chronic alcohol abuse, and glucose-6-phosphate dehydrogenase (G6PD) deficiency (a sex-linked condition affecting approximately 12% of the U.S. African-American male population). The majority of patients with RMSF must be hospitalized.

Q. What are the symptoms of Rocky Mountain spotted fever?

A. Following an incubation period of 5-10 days after a tick bite, symptoms usually begin suddenly and quickly worsen. Initial symptoms can include moderate to high fever, severe headache, nausea, vomiting, muscle pain, chills, and extreme exhaustion. Within 2-5 days after the onset of fever, a red spotted rash often appears, first on the extremities (wrists, forearms, ankles, soles and palms), and then quickly spreads to cover much of the body, including the face. Abdominal pain, diarrhea, and joint pain may also develop. Since *R. rickettsii* invade and cause the death of cells that line blood vessels throughout the body, blood leaks through tiny holes in the vessel walls into adjacent tissues. This is the process that causes the rash associated with RMSF, and which can also result in severe damage to the heart, lungs, brain, kidneys, and other major organs and organ systems. Absence, delayed appearance, or failure to detect the typical rash, especially in dark-skinned individuals, and difficulty in distinguishing this illness from other infectious and non-infectious conditions, may contribute to more severe illness due to delayed diagnosis and treatment.

Q. How is Rocky Mountain spotted fever diagnosed?

A. There is no widely available laboratory test that provides rapid confirmation of early RMSF. Therefore, **treatment decisions should be based on symptoms and should never be delayed while waiting for confirmation by laboratory results.** Epidemiological clues may strengthen an early decision to administer antibiotics (e.g. history of tick bite, residence in/travel to an area where RMSF is present, or recent activity in tick habitat, etc.). A blood test known as an indirect immunofluorescence assay (IFA) is the standard test generally used by the Centers for Disease Control and Prevention (CDC) and most state public health laboratories. Blood samples taken early (acute) and late (convalescent) are necessary in order to demonstrate a fourfold rise in antibody level (titer) to *R. rickettsii*. Other blood findings suggestive of RMSF may include low platelet count, low sodium level, elevated liver enzyme levels, and normal white blood cell count.

Q. What is the treatment for Rocky Mountain spotted fever?




A. Treatment should be initiated immediately when there is suspicion of RMSF and should NOT be delayed until laboratory confirmation is obtained. Prompt treatment lessens the likelihood of severe illness or death. Doxycycline (100 mg every 12 hours for adults or 4 mg/kg body weight per day in two divided doses for children under 100 lbs) is the drug of choice for patients with RMSF, including children of all ages. Therapy is continued for at least 3 days after fever subsides and there is definite evidence of improvement. Total treatment duration is generally 5 to 10 days, except in the case of severe or complicated disease, which may require longer therapy. Chloramphenicol is an alternative drug that can be used to treat RMSF. However, because of the wide range of possible side effects associated with this drug, it is usually not prescribed except for pregnant women. Doxycycline is also the drug that is used to treat different types of ehrlichiosis, tick-borne illnesses whose symptoms may be confused with RMSF.


Q. Is there a vaccine against Rocky Mountain spotted fever?

A. No.

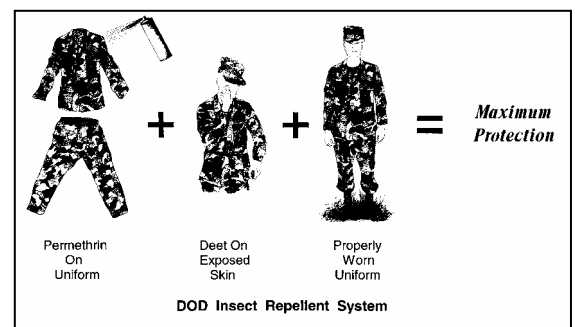
Q. What can I do to reduce my risk of becoming infected with Rocky Mountain spotted fever?

A. Help prevent RMSF, and other tick-borne diseases, by protecting yourself from ticks. When in tick habitat (tall grass and weeds, scrubby areas, woods and leaf litter), follow these precautions:

-  Wear proper clothing as a physical barrier against ticks – long pants tucked into boots or tightly-woven socks; long sleeve shirt; shirt tucked into pants; and light-colored clothing so as to more easily spot ticks.
-  Check your skin and clothing periodically for ticks.
-  Use both skin and clothing repellents that have been approved by the Environmental Protection Agency (EPA). They are safe and effective.
 - For your skin, use a product that contains 20-50% **DEET** (N,N-diethyl-meta-toluamide). **DEET** in higher concentrations is no more effective.
 - Use **DEET** sparingly on children, and don't apply to their hands, which they often place in their eyes and mouths.
 - Apply **DEET** lightly and evenly to exposed skin; do not use underneath clothing. Avoid contact with eyes, lips, and broken or irritated skin.
 - To apply to your face, first dispense a small amount of **DEET** onto your hands and then carefully spread a thin layer.
 - Wash **DEET** off when your exposure to ticks, mosquitoes, and other arthropods ceases.
- For your clothing, use a product that contains **permethrin**. **Permethrin** is available commercially as 0.5% spray formulations.
- **Permethrin** should only be used on clothing, never on skin.
- When using any insect repellent, always FOLLOW LABEL DIRECTIONS.
- Do not inhale aerosol formulations.

 For optimum protection, soldiers should utilize the **DOD INSECT REPELLENT SYSTEM**. In addition to proper wear of the battle dress uniform (BDUs)(pants tucked into boots, sleeves down, undershirt tucked into pants), this system includes the concurrent use of both skin and clothing repellents:

- Standard military skin repellent: 33% **DEET** lotion, long-acting formulation, one application lasts up to 12 hours, NSN 6840-01-284-3982.
- Standard military clothing repellents: either aerosol spray, 0.5% **permethrin**, one application lasts through 5-6 washes, NSN 6840-01-278-1336; or impregnation kit, 40% **permethrin**, one application lasts the life of the uniform (at least 50 washes), NSN 6840-01-345-0237.



Q. What should I do if I find a tick attached to my skin?

A. Remove attached ticks as soon as they are found. Use tweezers to firmly grasp the tick's mouthparts up against the skin, and pull back firmly and steadily. Be patient – the tick's central mouthpart called the hypostome is covered with sharp barbs, sometimes making removal difficult. Don't pull back sharply, as this may tear the mouthparts from the body, leaving them embedded in the skin. If the mouthparts do break off, don't panic – the mouthparts alone cannot transmit disease because the infective body of the tick is no longer attached. However, to prevent secondary infection, remove the mouthparts as you would a splinter. Never squeeze the body of the tick or use such things as petroleum jelly, fingernail polish remover, or a lighted match: these methods could force more infective fluid into the skin. After removal, wash the wound site, and apply an antiseptic. Preserve the tick by placing it in a clean, dry jar, or other well-sealed container, and keeping it in your freezer. Should you develop disease symptoms, take the tick with you to the physician's office; identification of the tick species may assist the physician with your diagnosis and treatment. Discard the tick after a month; all known tick-borne diseases will generally display symptoms within this time period.