

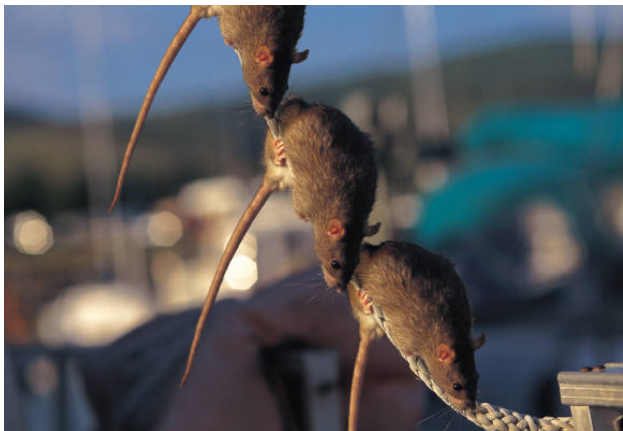


What Is Rat Bite Fever?

- Rat bite fever is a disease caused by infection with one of two different types of bacteria:
 - *Streptobacillus moniliformis* (in North America)
 - *Spirillum minus* (in Asia).
- These bacteria are found in the mouth, nose and respiratory tract of rodents (especially rats).
- People can become infected after handling rodents that carry these bacteria, particularly when **bites or scratches** occur.
- Rat bite fever is also sometimes called **Haverhill fever**, epidemic arthritic erythema, spirillary fever or sodoku (in Asia).
- While rat bite fever can be serious, **prompt treatment** can help prevent serious illness.
- **Simple steps** to help avoid contact with wild rodents, and to make contact with pet rodents safer, can help to prevent rat bite fever.



How Common Is Rat Bite Fever?

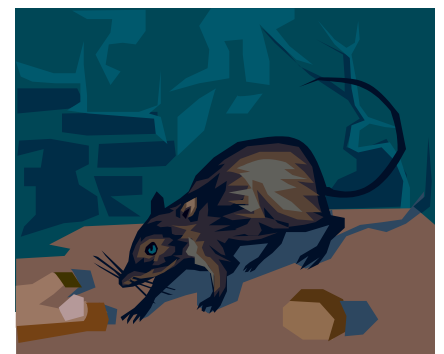


- ▶ Rat bite fever occurs worldwide but is **fairly rare**.
- ▶ An increasing number of people keeping rodents as pets, as well as the ongoing rise of dense urban housing, may be causing rat bite fever to become **more common**.
- ▶ People who live or work with rodents, such as pet store employees, laboratory workers, and pet rat owners, are at **higher risk**.
- ▶ Both *S. moniliformis* and *S. minus* are part of the normal bacteria found in the nose and respiratory tract of **almost all rats**, and sometimes in other rodents as well, such as mice. Most of these rodents are called *carriers* because the bacteria do not make them sick, but occasionally true infection can occur in mice.

- ▶ Some healthy **dogs** may also carry *S. moniliformis* in their mouths, particularly if they come into contact with rats.

How Do People Get Rat Bite Fever?

- People are most commonly infected via **bites or scratches** from a rodent. **Even minor bites** can lead to transmission of the bacteria.
- Infection can also occur after other **close contact** with rodents such as kissing or sharing food with a rat, or allowing a rat to smell or lick an open cut or other area of broken skin.
- Consuming food or drink that has been contaminated with the causative bacteria (e.g. unpasteurized milk) can also result in a form of rat bite fever called **Haverhill fever**.
- Rat bite fever cannot be transmitted from one person to another.





Animals generally do not get rat bite fever. Both *S. moniliformis* and *S. minus* are part of the normal bacteria found in the nose and respiratory tract of rats, so they do not make rats sick. These bacteria can cause some illness in mice (particularly joint infection) and guinea pigs, but this is very uncommon.

What Happens If A Person Gets Rat Bite Fever?

Humans: In people, the signs of illness depend on which bacteria is causing the infection:

Streptobacillus moniliformis

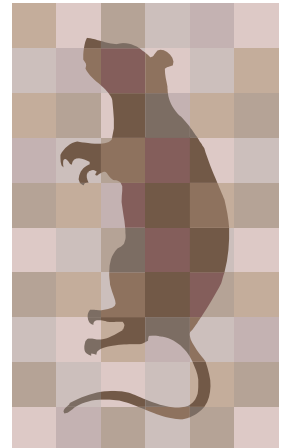
- ▶ The first signs of infection may be **headache, fever** and **nausea**.
- ▶ A **bumpy, red rash** that is not itchy may occur on the hands and feet 2-4 days after the fever, after which one or more **joints** may become swollen and painful.
- ▶ Illness generally occurs 3-10 days after a person becomes infected, but can occur up to 3 weeks later, even after the original scratch or bite from the rodent has healed.

Spirillum minus

- ▶ Signs of infection commonly include fever, **swollen lymph nodes**, swelling or additional **open sores** near the original bite or scratch. A rash may develop later.
- ▶ Illness usually develops 7-21 days after a person becomes infected.

Haverhill fever

- ▶ This form of rat bite fever occurs when the causative bacteria are swallowed, usually **after eating or drinking** something contaminated by rodents.
- ▶ Compared to typical rat bite fever, with Haverhill fever nausea and vomiting are often worse, and the person may develop a **sore throat**.



How Serious Is Rat Bite Fever?

- Without treatment, rat bite fever can lead to **severe complications**, including pneumonia, meningitis, infection of the heart (myocarditis, endocarditis) and infection of the blood (sepsis), leading to **death** in 7-10% of cases.
- **When treated promptly**, the prognosis is very good.

How Is Rat Bite Fever Diagnosed And Treated?



▶ Rat bite fever is suspected in people showing signs of illness following potential exposure to rodents. If you are sick, it is critical to **tell your doctor if you have been handling a rodent**, especially if you were bitten or scratched, so that rat bite fever is considered as a potential cause.

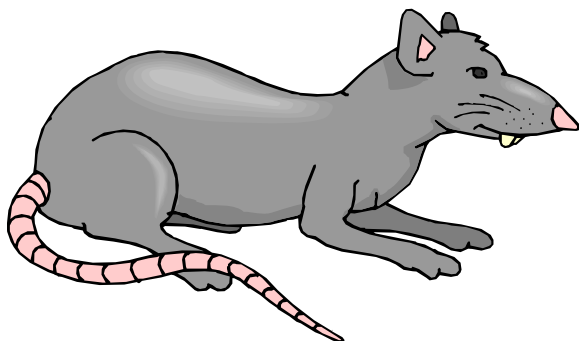
▶ The diagnosis can be confirmed by finding bacteria that look like *S. moniliformis* or *S. minus* in tissue or blood samples. Unfortunately these bacteria can be very difficult to culture, especially *S. minus*. A PCR test to detect bacterial DNA would be very useful, but is not widely available.

- ▶ The initial infection is **treated with antibiotics**, such as penicillin. Treatment is typically very effective if started before complications arise.



How Can I Prevent Rat Bite Fever?

- The best way to prevent rat bite fever is to avoid contact with rodents.
- For those who work with or keep rodents as pets, the most important measure is to prevent bites and scratches.
 - ➔ Learn how to handle your rodent(s) properly in order to avoid accidentally hurting or scaring them, as this will reduce the risk of bites and scratches.
 - ➔ Keep rodents away from your face or any cuts, sores or broken skin.
 - ➔ Wash your hands after handling any rodent or touching a rodent's enclosure.
 - ➔ Supervise children especially to ensure they handle rodents appropriately and safely.
 - ➔ Keep all rodents (including pets) out of food preparation areas such as the kitchen.
- **If you are bitten by a rodent**, wash the wound immediately and thoroughly with soap and water (use antibacterial soap if available). **Even small bites** can result in transmission of the causative bacteria, so take proper care of the wound even if it seems minor.
- Don't consume any food or drink that you believe has had contact with rodents.
- **Avoid contact with wild rodents** and places they may be found. Take appropriate precautions to **prevent rodent infestations** in your home by blocking holes through which rodents may get in and out, cleaning up clutter that may be used for nesting areas, and preventing rodent access to food sources (including garbage).



Should I Have My Rat Tested For Rat Bite Fever Bacteria?

No. The tests that are currently available are not good enough to be able to rule out the presence of *S. moniliformis* and *S. minus*, even if the results are negative. These bacteria are very difficult to culture. It should be assumed that **all rats are carrying at least one of the bacteria** that cause rat bite fever.

Can I Treat My Rat To Eliminate Rat Bite Fever Bacteria?

No. There is no evidence that treating a rat with antibiotics will eliminate the bacteria.

If Someone Living In Our House Has Rat Bite Fever, What Should We Do With Our Pet Rat?

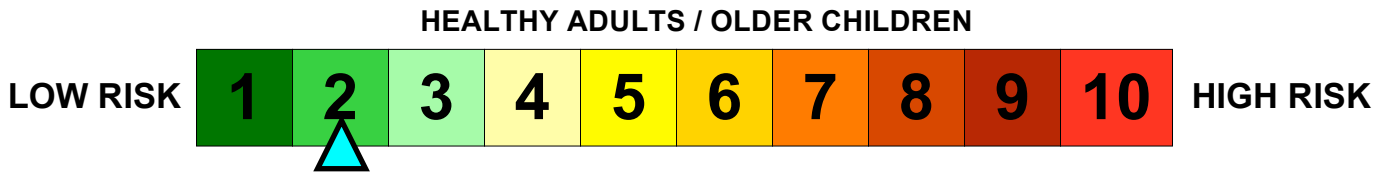
- **In most situations**, removing a pet rat from the home is not necessary
- It is important to determine how the infection may have occurred in order to reduce future risk:
 - If the person was bitten, was it because the rat was being aggressive or because the rat was not being handled properly?
 - If the person was not bitten, could infection have occurred from other kinds of close contact with the rat that should be avoided, or from eating or drinking something the rat had contaminated?
- You may want to **consider re-homing your rat if**:
 - The rat is aggressive.
 - Individuals in the household cannot/will not handle the rat properly.
 - If there is an individual in the household who is at particularly high risk for rat bite fever (this should be discussed with your family physician).



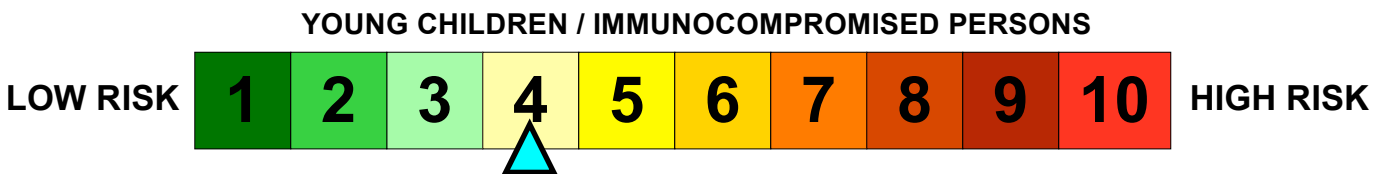


What Is The Risk?

For **healthy adults and older children**, the risk of rat bite fever is always present, but can be reduced by avoiding wild rodent contact, safe handling of pet rodents and careful attention to hand hygiene. For these groups, the **risk of rat bite fever from rodents** is:



Children seem to be at greatest risk of rat-bite fever, but it is unknown if this is because they are more susceptible to infection or because they are more frequently exposed to rodents, or both. **People who are immunocompromised** (e.g. HIV/AIDS patients, transplant recipients, cancer patients) are more likely to develop complications from any kind of infection, because their immune system cannot fight infections as efficiently, so they should also take extra precautions to avoid exposure to the bacteria that cause rat bite fever. For these groups, the **risk of rat bite fever from rodents** is:



Additional Information

Centers for Disease Control and Prevention (CDC) Rat Bite Fever webpage:
<http://www.cdc.gov/rat-bite-fever/>

