

General Information

- Cat scratch disease (CSD) is an infection caused by a bacterium called ***Bartonella henselae***, which is often carried in the bloodstream of healthy cats.
- In people, the signs of CSD typically occur within 1-2 weeks of being exposed to the bacterium - usually by being bitten or scratched by a cat - and can include swollen painful lymph nodes, low-grade fever and flu-like symptoms.
 - More severe illness frequently occurs in individuals who are immunocompromised.
- In otherwise healthy individuals, CSD often does not require treatment but it can take weeks to months for illness to resolve.
- Good flea prevention and proper training and animal handling to prevent cat scratches and bites are key to preventing CSD.



How common is cat scratch disease?

Humans

- Approximately 22 000 individuals in the US are affected by CSD every year. It is likely that many more cases occur but are not diagnosed. The condition is **more common in children less than 10 years of age**, possibly because they are more likely to be scratched by a cat than older children or adults.
- In the general population, 2-6% of people carry antibodies to *B. henselae*, indicating that they were exposed to the bacterium at some point. This percentage can be much higher among veterinary personnel (7-51%) who frequently handle cats and are exposed to fleas. Only a small percentage of people who get exposed to *B. henselae* ever get CSD.

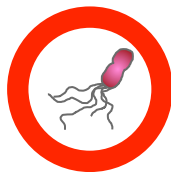
Animals

- Cats are the most common carriers of *B. henselae*. **Bacteremia** (i.e. having *B. henselae* in the bloodstream) may be present in 3-68% of even healthy cats, and is more common in younger animals, strays, and those with fleas.
 - ▶ After a cat is infected, bacteremia typically lasts 5-8 months, but sometimes it lasts for over a year. After clearing on strain of *B. henselae*, cats can be infected again with other strains.
- The percentage of cats that have been exposed to *B. henselae* varies considerably by region, from 1-81%, and exposure is more common in older animals and those from warmer, more humid regions.
- Dogs can also carry *B. henselae*, but this is uncommon (typically less than 1% of dogs). Dogs may also have antibodies to other kinds of *Bartonella* that cause false-positive test results for *B. henselae*.

How is cat scratch disease transmitted?

- Transmission of *B. henselae* occurs when the bacterium enters the body tissues, typically through broken skin such as from a bite, scratch or other wound.
- The most common source of *B. henselae* is **blood from a bacteremic cat**, but direct contact with cat blood is uncommon, with the possible exception of certain people such as veterinary staff and lab workers
 - ▶ **Exposure to flea feces** (also called "flea dirt") is more likely. Feces from fleas that have fed on the blood of a bacteremic cat may contain *B. henselae*, which can be transmitted to people if the flea feces contaminate an open wound.
 - ▶ Fleas are also very important for transmission of *B. henselae* between cats, as the bacterium is **not transmitted between cats living together if there are no fleas present**.





- **Risk factors for CSD** in people include **contact with a cat** less than one year of age, a history of a **cat scratch or bite**, and **contact with fleas**.
- There is no evidence that *B. henselae* can be transmitted by mosquitoes

What are the signs of cat scratch disease?

- In people, signs of cat scratch disease typically occur within 1-2 weeks of being exposed to the bacterium - usually by being bitten or scratched by a cat. The onset of illness is often slow and insidious, and signs can include:
 - ▶ **Swollen painful lymph nodes**, particularly near the site of the bite or scratch. Swelling may last for 2-4 months, and sometimes pus may form in the lymph nodes.
 - ▶ **Low-grade fever** lasting several days
 - ▶ **General malaise**, fatigue, headache, sore joints and sore throat
- Infection with *B. henselae* **rarely causes any signs of illness in cats**, unless they are severely stressed or immunocompromised for another reason (e.g. FIV or FeLV infection)
- In dogs, *B. henselae* most commonly causes infection of the heart valves (endocarditis).



What other signs of disease can occur with *Bartonella* infection?



- When *B. henselae* reaches the bloodstream, it can spread to any part of the body. It can cause infection of the heart valves (**endocarditis**), and less commonly it may cause inflammation of the liver, spleen, lungs, eyes, bones, and in and around the brain.
- Infection with *B. henselae* can also result in conditions such as **bacillary angiomatosis** and **bacillary peliosis**, which cause signs that include red-to-purple bumps or plaques on or in the skin, or blood-filled blisters in other organs such as the liver, spleen or lymph nodes. These conditions typically only develop in individuals who are immunocompromised, such as HIV/AIDS patients.
- Recent research has suggested that *B. henselae* infection may play a role in some chronic neurological and neurocognitive disorders, but whether or not a link truly exists remains unclear.

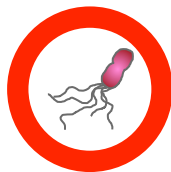
How is cat scratch disease diagnosed?

- Signs of CSD often develop very gradually, and because the signs are non-specific (i.e. they are the same as those of many other diseases), CSD is often not considered for some time unless the physician knows the patient was bitten or scratched by a cat. If you are sick, **it is always important to tell your physician if you have been injured by an animal** (even if it seemed minor).
- *Bartonella henselae* can be very difficult to culture from patient samples.
- Testing the blood for antibodies to *B. henselae* (i.e. serology) used to be the most common test used, but it can be problematic because antibodies to other *Bartonella* species (such as *B. quintana* which only infects humans) may cause false-positive results. Positive serology only indicates exposure at some point in the past, not active infection.
- New PCR-based tests that detect *Bartonella* DNA are now available in some regions, and should help make the diagnosis of *B. henselae* infection much easier.



How is cat scratch disease treated?

- Often no specific treatment is necessary in mild-to-moderate cases of CSD in individuals with a normal immune system. The body clears the infection on its own in a few weeks to a few months.



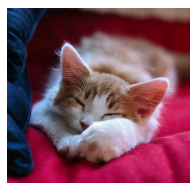
- Individuals with severe CSD, those who develop complications from the infection, and those whose immune systems is impaired (e.g. HIV/AIDS or cancer patients) are typically treated with antibiotics for at least a month. Treatment for 2-3 months may be needed in some individuals to prevent a relapse of the condition.



Should I have my cat tested for *B. henselae*?

No. Testing of cats for *B. henselae* is **not** recommended for the following reasons:

- **Serology:** This kind of test looks for antibodies to *B. henselae* in the blood. If your cat is positive (as many are) it only tells you that your cat was exposed to bacterium at some point in its life. It does not tell you if the bacterium is actually still present.
- **PCR or blood culture:** Even with a negative test result of this kind, your cat may still be carrying *B. henselae*, because the amount of bacteria in the bloodstream fluctuates and at times may be too low for these tests to detect. Also, your cat may be exposed and develop bacteremia anytime after the test is performed, so it is best essentially assume your cat is positive, and follow the simple precautions below for preventing transmission of *B. henselae*.
- Even if your cat is carrying *B. henselae*, treatment is not recommended.



Why are cats carrying *B. henselae* NOT treated?

- Treatment of healthy animals to try to help eliminate the bacterium is not recommended because it is often doesn't work, the vast majority of cats will clear the infection on their own anyway, and other measures such as flea control and bite prevention are more important for preventing transmission to people and other animals.

Do I need to get rid of my cat if someone in my household is immunocompromised?

- No. Individuals who are immunocompromised do NOT need to get rid of their cats, nor do they need to have their cats tested or treated for *B. henselae*.
 - ▶ However, high-risk individuals should be extra diligent with regard to the prevention measures listed below (e.g. safe handling to avoid bites and scratches, good flea control and preventative care)
 - ▶ If adopting a new cat, choose one that is over 1 year of age, and preferably one with a known medical history and not from a shelter.



How can I prevent cat scratch disease?

There are two major components to preventing CSD:

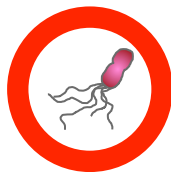
1. Avoid cat scratches and bites

- As much as possible, train your cat properly from a young age not to bite or scratch people.
- Make sure anyone handling your cat knows how to do so properly, so that the cat feels safe and secure, and does not feel frightened or threatened.
- Avoid rough play, and always use a toy or other object when playing with your cat so you are not accidentally bitten or scratched. Never "play" using just your hands or feet.
- This is important for preventing other kinds of infections from bites as well, not just CSD

2. Flea (and tick) prevention

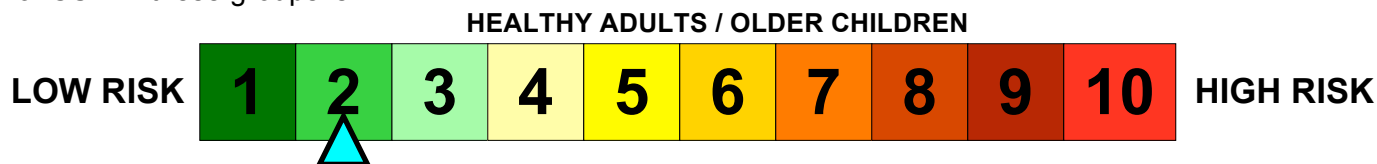
- Talk to your veterinarian about flea prevention for all of your pets, as fleas can be transmitted between dogs and cats, and between indoor-only and indoor-outdoor animals that live together.
- It is unknown if ticks may also be able to transmit *B. henselae* between cats or between cats and people, therefore tick avoidance and tick bite prevention should also be considered.

Declawing of cats is NOT recommended and has not been shown to decrease the risk of CSD.

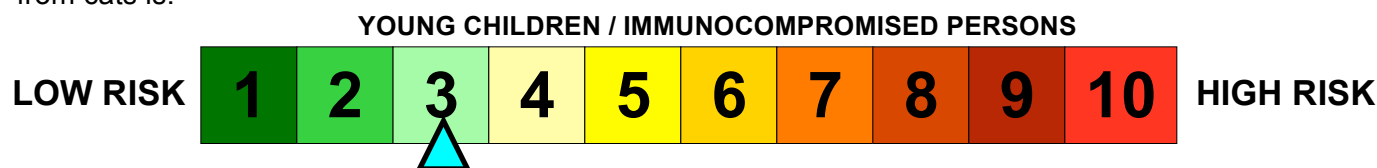


What Is The Risk?

For **healthy adults and older children**, the risk of getting CSD from a pet cat is low, but may be higher for individuals who work in shelters or veterinary clinics where exposure to cats and fleas is higher. The risk may also be slightly higher in warmer regions where more cats may carry the bacterium. In general, the risk of CSD in these groups is:



Cat scratch disease is more common in **young children**, and for **people who are immunocompromised** (e.g. HIV/AIDS patients, transplant recipients, cancer patients) the risk of severe disease or complications following infection are considerably higher, making preventing exposure using the simple measures listed above very important. Nonetheless, if appropriate precautions are used, for these groups the risk of CSD from cats is:



Additional reading:

CDC (2011) – Cat Scratch Disease (*Bartonella henselae* Infection). Accessed April 2013. Available online at: <http://www.cdc.gov/healthypets/diseases/catscratch.htm>

What about other kinds of *Bartonella*?

There is still a lot that is not known about *Bartonella* species and what role they may play in various diseases. Scientists continue to learn more about *B. henselae* and related bacterial species as molecular diagnostics and means of detecting and differentiating various kinds of *Bartonella* improve. For example, it appears that only certain types of *B. henselae* cause infection in humans, and it is now possible to tell apart many more species of *Bartonella*.

After *B. henselae*, the two most well-known species of *Bartonella* are:

- *B. quintana*: This species is found worldwide, is carried only by humans, and is transmitted primarily by human lice, but possibly also by fleas and ticks. It is the cause of **trench fever**, which was very common among troops in World Wars I and II. Similar to *B. henselae*, it can also cause heart valve infection (endocarditis) and bacillary angiomatosis.
- *B. bacilliformis*: This species is carried by humans, but not pets, and is transmitted by sand flies. It is only found in a small area of South America.



Other *Bartonella* species that can be carried by pets (with or without *B. henselae*) and possibly transmitted to people include:

- *B. clarridgeiae*: This species has been found in up to 42% of cats in specific areas, and may cause CSD just like *B. henselae* in a small percentage of cases. It is also spread by cat fleas, therefore recommended control measures are the same.
- *B. vinsonii* subsp. *berkhoffii*: This species seems to be carried primarily by dogs, and transmitted mostly by ticks, but there is still much to learn about it. It has been implicated in a variety of conditions in dogs and a very small number of cases of human illness, but it is unclear if it can be transmitted directly between dogs and people.

