Toxoplasmosis is a preventable disease caused by the parasite *Toxoplasma gondii*. An infected individual can experience fever, malaise, and swollen lymph nodes, but can also show no signs or symptoms. A small number of infected persons may experience eye disease, and infection during pregnancy can lead to miscarriage or severe disease in the newborn, including developmental delays, blindness, and epilepsy. Once infected with *T. gondii*, people are generally infected for life. As a result, infected individuals with weakened immune systems—such as in the case of advanced HIV disease, during cancer treatment, or after organ transplant—can experience disease reactivation, which can result in severe illness or even death. In persons with advanced HIV disease, inflammation of the brain (encephalitis) due to toxoplasmosis is common unless long-term preventive medication is taken. Researchers have also found an association of *T. gondii* infection with the risk for mental illness, though this requires further study.

Although *T. gondii* can infect most warm-blooded animals, cats are the only host that shed an environmentally resistant form of the organism (oocyst) in their feces. Once a person or another warm-blooded animal ingests the parasite, it becomes infectious and travels through the wall of the intestine. Then the parasite is carried by blood to other tissues including the muscles and central nervous system.

Humans can be infected several ways, including:

- Eating raw or undercooked meat containing the parasite in tissue cysts (usually pork, lamb, goat, or wild game meat, although beef and field-raised chickens have been implicated in studies).
- Ingesting food, soil, or water contaminated by cat feces (for example, from eating unwashed fruits and vegetables, gardening, or cleaning a cat’s litter box).
- When a pregnant woman is newly infected during or just prior to her pregnancy and transmits the infection to her child.
- When a previously uninfected person receives an organ transplant or blood transfusion from an infected donor.

Who is most at risk for *Toxoplasma gondii* infection and toxoplasmosis?

The *T. gondii* parasite is present throughout the United States and the world; individuals are at higher risk for infection if they eat undercooked meat, drink untreated water, or are exposed to contaminated cat feces or soil. People at most risk of serious complications from toxoplasmosis are pregnant women (who can transmit the parasite to their child) and those with severely weakened immune systems.
Why be concerned about toxoplasmosis in the United States?

- Toxoplasmosis is a leading cause of foodborne illness-related death and hospitalization in the U.S.—causing hundreds of deaths and thousands of hospitalizations each year.
- The *T. gondii* parasite infects over 800,000 persons each year in the United States. An estimated 3,600 individuals each year develop symptomatic eye disease from *T. gondii* infection leading to vision loss.
- There are an estimated 300–4,000 cases of congenital (mother-to-child) toxoplasmosis each year.
- Individuals whose immune systems are severely compromised can develop encephalitis, or have further spread of disease, which can be fatal.

What is CDC doing to address toxoplasmosis?

- Assessing physician knowledge and practices regarding congenital toxoplasmosis (mother-to-child transmission) and ocular toxoplasmosis (infection in the eye) by collaborating with professional organizations (for example, the American College of Obstetricians and Gynecologists).
- Educating health care professionals and the public about prevention of toxoplasmosis through the Web, response to telephone inquiries, and publications in targeted journals.
- Identifying the rates of *T. gondii* infection in the United States by analyzing samples and information collected through the National Health and Nutrition Examination Study (NHANES).
- Tracking toxoplasmosis-related hospitalizations in the United States to identify trends in severe disease.
- Collaborating with the U.S. Department of Agriculture to determine the risk of *T. gondii* infection from undercooked meat ingestion.
- Identifying further risk factors for *T. gondii* infection in the United States, including those for severe and fatal toxoplasmosis in immunosuppressed persons.

What more needs to be done?

- Develop a cost-effective *T. gondii* vaccine for cats to prevent shedding of the organism in feces.
- Determine the number of children infected by mother-to-child transmission nationally to guide screening and treatment strategies for congenital toxoplasmosis.
- Improve diagnostic tests for toxoplasmosis, including polymerase chain reaction (PCR)—a technology used for amplifying DNA to better detect and study infectious diseases—and improve tests to help determine the time of infection in pregnancy.
- Evaluate the efficacy of treatments to prevent or treat eye disease, infection in pregnant women, and infection in immunosuppressed persons.
- Improve ways to prevent *T. gondii* contamination of meat, especially field-raised meat.
- Further assess the impact of toxoplasmosis on health, including mental health.
- Improve preventive health education for the public.

For more information on Neglected Parasitic Infections, please visit [www.cdc.gov/parasites/npi.html](http://www.cdc.gov/parasites/npi.html)
What role do cats play in the spread of toxoplasmosis?

Cats get *Toxoplasma* infection by eating infected rodents, birds or other small animals, or anything contaminated with feces from another cat that is shedding the microscopic parasite in its feces. After a cat has been infected, it can shed the parasite for up to two weeks. The parasite becomes infective one to five days after it is passed in the feces of the cat. The parasite can live in the environment for many months and contaminate soil, water, fruits and vegetables, sandboxes, grass where animals graze for food, litter boxes, or any place where an infected cat may have defecated.

What is toxoplasmosis?

Toxoplasmosis is an infection caused by a microscopic parasite called *Toxoplasma gondii*. More than 30 million people in the United States carry the *Toxoplasma* parasite. Toxoplasmosis can cause severe illness in infants infected before birth (when their mothers are newly infected just before or during pregnancy), or in persons with a weakened immune system.

How are people infected with *Toxoplasma*?

**People become infected with toxoplasmosis several ways:**

- Eating food, drinking water, or accidentally swallowing soil that has been contaminated with infected cat feces.
- Eating raw or undercooked meat from animals (especially pigs, lamb, or wild game) that have been infected with *Toxoplasma*.
- Directly from a pregnant woman to her unborn child when the mother becomes infected with *Toxoplasma* just before or during pregnancy.

What are the symptoms of toxoplasmosis?

**Individuals with healthy immune systems:**

Most people who become infected with *Toxoplasma* do not know it and have no symptoms. However, when illness occurs, it is usually mild. Some may feel like they have the "flu," with swollen lymph glands, or muscle aches and pain that last for several weeks or more. Rarely, eye disease occurs.

**Individuals with weakened immune systems:**

People with weakened immune systems may experience severe symptoms. The most common symptoms in people with HIV infection are headache, confusion, and fever. Other symptoms include seizures, poor coordination, and nausea or vomiting.

**Infants infected before birth:**

Most infants infected with *Toxoplasma* before birth show no symptoms at birth. However, many are likely to develop symptoms later in life. These include vision loss, mental disability, and seizures.
How can I protect myself from toxoplasmosis?

Several steps can be taken to protect yourself and others from toxoplasmosis:

Change cat litter boxes daily. *Toxoplasma* takes more than one day to become infectious. If you are pregnant or have a weakened immune system, ask someone else to change the litter box. If this is not possible, wear disposable gloves and wash your hands thoroughly with soap and water afterwards.

Cover any outdoor sandboxes when not in use to keep cats from defecating in them.

Avoid adopting stray cats, especially kittens. Younger cats are more likely to release *Toxoplasma* in their feces.

Do not eat undercooked meat. Cook whole cuts of meat to at least 145°F (63°C) with a 3-minute rest, and ground meat and wild game to at least 160°F (71°C).

Wash all kitchen supplies (such as knives and cutting boards) that have been in contact with raw meat.

If you have a weakened immune system, it is important to talk to your healthcare provider about getting a blood test to determine if you have been infected with *Toxoplasma*.

How can I protect my cat from toxoplasmosis?

Protecting your cat from toxoplasmosis may also help to protect you from toxoplasmosis.

Feed your cat commercial dry or canned food.

Never feed cats raw meat because this can be a source of *Toxoplasma* infection.

Keep indoor cats indoors so they do not become infected by eating small animals.

Do I have to get rid of my cat?

No, you do not have to give up your cat. Owning a cat does not mean you will be infected with the parasite. It is unlikely that you would be exposed to the parasite by touching an infected cat because cats usually do not carry the parasite on their fur. In addition, cats kept indoors (that do not hunt prey or are not fed raw meat) are not likely to be infected with *Toxoplasma*. But, if you are pregnant, planning on becoming pregnant, or have a weakened immune system, it is important to protect yourself from infection.

Can toxoplasmosis be treated?

Yes. There is treatment for toxoplasmosis. In an otherwise healthy person, mild symptoms typically go away within several weeks to months and treatment is not needed. However, treatment may be recommended for an otherwise healthy person with eye disease due to toxoplasmosis. A woman who becomes infected during pregnancy can be treated with medication that may protect her unborn baby from toxoplasmosis. Mother and baby should be monitored closely during the pregnancy and after the baby is born.

For more information on toxoplasmosis, visit [www.cdc.gov/parasites/toxoplasmosis](http://www.cdc.gov/parasites/toxoplasmosis)
Preventing Infection with Toxoplasma gondii

Toxoplasma gondii is a parasite that can be transmitted to humans through various means. Infection is most commonly acquired through the ingestion of undercooked meat, particularly pork or veal, which contains the oocysts of the parasite. Other routes of transmission include the consumption of raw or undercooked cat feces, maternal-fetal transmission, and ingestion of contaminated water or soil. Infected cats can excrete the parasite in their feces, and transmission to humans can occur through contact with these feces, especially when handling cat litter or gardening near infected cats.

Preventive Measures

1. Cook meat thoroughly to 70°C (-158°F) for 10 minutes.
2. Avoid raw or undercooked meat, particularly pork and veal, and wash hands and utensils after handling.
3. Avoid contact with cat feces and wear gloves when handling cat litter.
4. Ensure that water is pure and uncontaminated; it should be filtered and treated before consumption.
5. Avoid contact with marine and freshwater animals; their tissues may contain oocysts.
6. Consult a healthcare provider if you have symptoms of toxoplasmosis.

References