Toxoplasmosis
Toxoplasma gondii
http://www.cdc.gov/ncidod/dpd/parasites/toxoplasmosis/default.htm

What is toxoplasmosis?
Toxoplasmosis is an infection caused by a single-celled parasite named Toxoplasma gondii. It is found throughout the world. More than 60 million people in the United States probably are infected with the Toxoplasma parasite, but very few have symptoms because the immune system usually keeps the parasite from causing illness.

Once infected with Toxoplasma is my cat always able to spread the infection to me?
No. Cats can only spread Toxoplasma in their feces for a few weeks after they are first infected with the parasite. Like humans, cats rarely have symptoms when first infected, so most people don't know if their cat has been exposed to Toxoplasma. There are no good tests available to determine if your cat is passing Toxoplasma in its feces.

http://www.thebody.com/nmai/toxo.html

Toxoplasmosis
July 27, 2002
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What Is Toxoplasmosis?
Toxoplasmosis (toxo) is an infection caused by the parasite Toxoplasma gondii. A protozoa is a single-celled animal. A parasite lives inside another living organism (the host) and takes all of its nutrients from the host.

The toxo parasite is very common in cat feces, raw meat, raw vegetables, and the soil. It can get into your body when you breathe in dust. Up to 50% of the population is infected with toxo. A healthy immune system will keep toxo from causing any disease. It does not seem to spread from person to person.
The most common illness caused by toxo is an infection of the brain (encephalitis).Toxo can also infect other parts of the body. Toxo can lead to coma and death. The risk of toxo is highest when your T-cell (CD4+) counts are below 100.
The first signs of toxo include fever, confusion, headache, disorientation, personality changes, tremor, and seizures. Toxo is usually diagnosed by testing for antibodies to Toxoplasma gondii.
The toxo antibody test shows whether you have been exposed to toxo. A positive test does not mean that you have toxo encephalitis. However, a negative antibody test means that you are not infected with toxo.
Brain scans by computerized tomography (CT scan) or magnetic resonance imaging (MRI scan) are also used to diagnose toxo. A CT scan for toxo can look very similar to scans for other opportunistic infections. An MRI scan is more sensitive and can make it easier to diagnose toxo.

How Is Toxo Treated?
Toxo is treated with a combination of pyrimethamine (Daraprim(r)) and sulfadiazine. Both drugs can cross the blood-brain barrier.
The toxoplasma protozoa needs vitamin B to live. Pyrimethamine stops toxo from getting vitamin B. Sulfadiazine prevents toxo from using it. The normal dosage of these drugs is 50 to 75mg of pyrimethamine with 2 to 4 grams per day of sulfadiazine.
These drugs both interfere with vitamin B and can cause anemia. People with toxo usually take Leucovorin, a form of folic acid (a B vitamin), to prevent anemia.
This combination of drugs is very effective against toxo. Over 80% of people show improvement within 2 to 3 weeks.
Toxo usually comes back after the first episode. People who have had toxo should keep taking the anti-toxo drugs at a lower, maintenance dose.

How Do I Choose a Treatment for Toxo?

If you are diagnosed with toxo, your doctor will probably prescribe pyrimethamine and sulfadiazine. This combination can cause a drop in white blood cells, and kidney problems.
Also, sulfadiazine is a sulfa drug. Almost half the people who take it have an allergic reaction. This usually is a skin rash, sometimes a fever.
Allergic reactions can be overcome using a desensitization procedure. Patients start with a very small amount of the drug. They get increasing amounts until they can tolerate the full dose.
People who cannot tolerate sulfa drugs can use clindamycin (Cleocin(r)) instead of sulfadiazine in the combination.

Can Toxo Be Prevented?

The best way to prevent toxo is to take strong anti-HIV medications. You can be tested to see if you have been exposed to toxo. If not, you can reduce your risk of infection by not eating undercooked meat or fish, and by wearing gloves and a face mask and washing thoroughly if you clean a cat box.
If you have less than 100 T-cells, you should take medication to prevent toxo. People with less than 200 T-cells usually take Bactrim or Septra to prevent pneumocystis carinii pneumonia (PCP). These drugs also protect you against toxo. See Fact Sheet 512 for more information on PCP. If you can't tolerate Bactrim, your doctor can use other drugs.

The Bottom Line

Toxoplasmosis is a serious opportunistic infection. If you have not been exposed, you can reduce your risk of exposure by not eating undercooked meat or fish, and taking extra precautions if you clean a cat box.
You can take strong anti-HIV medications to keep your T-cell count up. If your T-cell count falls below 100, talk with your doctor about taking drugs to prevent toxo.
If you develop headaches, disorientation, seizures, or other possible signs of toxo, see your doctor immediately. With earlydiagnosis and treatment, toxo can be treated effectively.
If you do develop toxo, you should continue to take the anti-toxo drugs to prevent another episode.

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http://web.vet.cornell.edu/Public/FHC/toxo.html

Toxoplasmosis in Cats

Toxoplasmosis, a disease of cats and other mammalian species, is caused by a parasitic protozoan, Toxoplasma gondii. Protozoa are single-celled organisms that are among the simplest creatures in the animal kingdom. Although infection with Toxoplasma is fairly common, actual disease caused by the parasite is relatively rare.

The Life Cycle of Toxoplasma

Cats, domestic and wild, are the definitive host (host in which the adult, or sexually mature stage, of the parasite is produced) and are the parasite's primary reservoir of infection. Domestic cats are important in transmission of Toxoplasma to other animals and human beings, which become involved only as intermediate hosts of the parasite. Consumption of raw meat tissues is another important means of transmission.

Cats acquire Toxoplasma infection by eating any of the three infective stages of the parasite: cyst, oocyst, or tachyzoite. Following ingestion of cysts in infected prey (rodents or birds), the intraintestinal infection cycle begins. This cycle occurs only in members of the cat family. The organisms multiply in the wall of the small intestine and produce oocysts, which are then excreted in great numbers in the feces for two to three weeks. Within five days the shed oocysts may sporulate, becoming infectious to other animals and to humans. Sporulated oocysts are highly resistant to environmental conditions and can survive in moist shaded soil or sand for many months.

During the intraintestinal infection cycle in the cat, some Toxoplasma organisms released from the ingested cysts penetrate more deeply into the wall of the intestine and multiply as tachyzoite forms. Very soon these forms spread out from the intestine to other body sites, starting the extraintestinal infection cycle. Eventually the cat's immune system restrains this stage of the organism, which then enters a dormant or "resting" stage by forming cysts in muscles and

brain. Most cysts probably remain dormant for the life of the host. The extraintestinal infection cycle occurs not only in cats but also in the intermediate hosts (including humans).

Most healthy exposed cats shed oocysts during acute infection with Toxoplasma, but will not shed them after the acute infection. Even in those few cats that do re-excrete oocysts after another exposure to Toxoplasma, the number of oocysts shed is smaller and may even be insufficient to transmit the parasite effectively.

Ingestion of tissue cysts in infected prey or in other raw meat is probably the most common route by which cats are exposed to Toxoplasma. Congenital infection (transmission from mother to fetus) occurs in sheep, goats, and humans, but is much less common in cats.

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Signs

Most cats show no clinical signs of infection with Toxoplasma. Occasionally, however, clinical disease-toxoplasmosis-occurs, kittens and young adult cats being more often affected than older animals. Lethargy, depression, loss of appetite, and fever are typical early nonspecific signs. Pneumonia, manifested by respiratory distress of gradually increasing severity, is the outstanding sign in many cats. Hepatitis (inflammation of the liver) may cause vomiting, diarrhea, prostration, and jaundice (yellowing of the mucous membranes). Inflammation of the pancreas and enlargement of lymph nodes also occur.

Toxoplasmosis can also affect the eyes and central nervous system, producing inflammation of the retina or anterior ocular chamber, abnormal pupil size and responsiveness to light, blindness, incoordination, heightened sensitivity to touch, personality changes, circling, head pressing, twitching of the ears, difficulty in chewing and swallowing food, seizures, and loss of control over urination and defecation.

In some cases, coinfection with feline leukemia virus (FeLV) or feline immunodeficiency virus (FIV) may predispose a cat to develop toxoplasmosis.

Diagnosis

Toxoplasmosis may be strongly suspected by the history, signs of illness, and the results of supportive laboratory tests. A presumptive diagnosis may be made by demonstration of a fourfold or greater increase in antibody titers to

Toxoplasma (indicating a recent infection) over a three- or four-week period in a cat showing signs suggestive of toxoplasmosis. A definitive diagnosis requires either microscopic examination of tissues or tissue impression smears for distinctive pathologic changes and the presence of tachyzoites or inoculation of suspect material into laboratory mice.

The presence of significant antibody levels in a healthy cat suggests that the cat has been previously infected and now is most likely immune and not excreting oocysts. The absence of antibody in a healthy cat suggests that the cat is susceptible to infection and thus would shed oocysts for one to two weeks following exposure.

Treatment and Prevention

The two drugs that are most often used-pyrimethamine and sulfadiazine-act together to inhibit Toxoplasma reproduction. Treatment must be started as soon as possible after diagnosis and continued for several days after signs have disappeared. In acute illness, treatment is sometimes started on the basis of a high antibody titer in the first test. If clinical improvement is not seen within two to three days, the diagnosis of toxoplasmosis should be questioned. Pyrimethamine may be unpalatable or toxic to some cats, even if given in small amounts. Recently, the antibiotic clindamycin has been reported to be effective in treating feline toxoplasmosis, with few side-effects observed.

No vaccine is as yet available to prevent either Toxoplasma infection or toxoplasmosis in cats, humans, or other species. Research in this area is in progress.

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Toxoplasma and Human Health

Although the incidence of toxoplasmosis among humans probably has not changed significantly over the years, awareness and concern about the disease have increased within the medical and veterinary communities. It has been estimated that 30 to 50 percent of the world's human population has been infected with Toxoplasma and harbors the clinically inapparent cyst form. This encysted form is important because, if given the opportunity, it can produce disease in immunocompromised patients. For this reason veterinarians are often called on to clarify the role that cats play in the transmission of Toxoplasma to humans. Contact with oocyst-contaminated soil is probably the major means by which many

different species-rodents, ground-feeding birds, sheep, goats, pigs, and cattle, as well as humans living in developing countries-are exposed to Toxoplasma. In the industrialized nations most transmission to humans is probably due to eating undercooked infected meat, particularly lamb and pork (in many areas of the world, approximately 10 percent of lamb and 25 percent of pork products contain Toxoplasma cysts). The organism may also on occasion be present in some unpasteurized dairy products, such as goat's milk.

Congenital infection is of greatest concern in humans. About one-third to one-half of human infants born to mothers who have acquired Toxoplasma during that pregnancy are infected. In general, Toxoplasma infection of the fetus is least common (but disease is most severe) if the maternal infection occurs during the first trimester of pregnancy. Fetal infection is most common (but disease is least severe, often without symptoms) if the maternal infection occurs during the third trimester. The vast majority of women infected during pregnancy have no symptoms of the infection themselves.

It has been estimated that Toxoplasma is responsible for over three thousand human congenital infections in the United States each year, most of which are symptomless. Among symptomatic individuals, symptoms may be present at birth, or may first appear weeks, months, or even years later (the majority of clinical cases appearing at puberty, for example, are the result of congenital, rather than recent, infection). Ocular and central-nervous-system disturbances, deafness, fever, jaundice, rash, and respiratory disease, in varying combinations, are among the more common clinical manifestations in these patients. In immunocompromised persons-those undergoing immunosuppressive therapy (e.g., for cancer or organ transplantation) or those with an immunosuppressive disease such as AIDS-enlargement of the lymph nodes, ocular and central nervous-system disturbances, respiratory disease, and heart disease are among the more characteristic symptoms. In these patients-especially those with AIDS-relapses of the disease are common, and the mortality rate is high.

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Minimizing Exposure

Tissue cysts can be destroyed by thoroughly cooking meat to an internal temperature of 70°C (158°F) for at least 15 to 30 minutes. Freezing and thawing, salting, smoking, or pickling will not reliably destroy cysts in meat.

Restricting the access of pet cats to rodents and birds and offering them only cooked meat, commercially prepared cat food, and pasteurized dairy products should prevent most transmission. (Nor should humans eat uncooked meat or unpasteurized dairy products.) Scavenging can be discouraged by placing secure lids on all garbage cans.

Because excreted oocysts are highly resistant to environmental conditions and millions may be present in a single stool, contamination of garden soil, flower beds, children's sandboxes, cats' litter boxes, and other areas of loose, moist soil where cats defecate may be extensive. Under such conditions transmission of oocyts to humans can be minimized by the following measures:

* Avoid contact with potentially contaminated soil, or wear rubber gloves during contact, and follow by washing hands vigorously and thoroughly with soap and water.
* Cover children's sandboxes to prevent contamination by cats.
* Dispose of feces from litter boxes daily or every other day to remove oocysts before they sporulate and become infective.
* Disinfect potentially contaminated litter boxes with scalding water or with dry-heat sterilization (55°C, 131°F).
* Chemical disinfection does not reliably destroy oocysts.

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Specific Recommendations for Pregnant Women

A pregnant woman (or one who contemplates pregnancy) can minimize exposure to Toxoplasma by taking the following measures:

* Exclude rare or undercooked meat and unpasteurized dairy products from the diet.
* Test household cats for antibodies to Toxoplasma. Assuming that a cat is healthy, a positive antibody test indicates that the animal is most probably immune and not excreting oocysts and thus would be an unlikely source of infection. A healthy antibody-negative cat is most probably susceptible to infection and would shed oocysts for one to two weeks after exposure to Toxoplasma. If possible, the cat should be tested before the woman becomes pregnant.
* Have herself tested for antibodies, preferably before becoming pregnant. A positive test would indicate past infection that will not be transmitted to the

fetus. The presence of antibodies also lessens the likelihood that congenital transmission would occur should she be exposed again to the parasite during pregnancy. An antibody-negative woman would thus be at greater risk of transmitting Toxoplasma to the fetus should she become infected during pregnancy.

* Protect cats from infection (or reinfection) by preventing access to birds, rodents, uncooked meat, and unpasteurized dairy products.
* Avoid handling litter boxes. Even if a cat is antibody-positive and hence most likely immune, there exists a potential for reshedding of oocysts (although in much smaller numbers than during the initial infection). For safety, litter boxes should be changed daily or every other day by another person to eliminate any potential for accidental infection.
* Avoid handling free-roaming cats, because the fur or paws could be contaminated with oocysts, which might be transmitted by hand-to-mouth contact. Any cat allowed indoors should be kept off the bed, pillows, blankets, or other furnishings the woman uses.
* Avoid handling any cat showing signs of illness.
* Wear rubber gloves if working with garden soil. Uncooked vegetables, whether grown in a home garden or supplied commercially, should be washed thoroughly before ingestion, in case they have been contaminated by cat feces.
* Make a habit of vigorously and thoroughly washing hands with soap and water after contact with soil, cats, unpasteurized dairy products, or uncooked meat or vegetables.

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Prepared by the Cornell Feline Health Center, Cornell University, College of Veterinary Medicine, Ithaca, New York 14853-6401, and the American Association of Feline Practitioners. The ultimate purpose of the Feline Health Center is to improve the health of cats by developing methods to prevent or cure feline diseases and by providing continuing education to veterinarians and cat owners. Much of that work is made possible by the financial support of friends.

Questions or Comments ?
Last Revised on 8/2/02

Good summary of life cycle
Protozoa as Human Parasites

http://www-micro.msb.le.ac.uk/224/Parasitol.html

Will grape seed extract work
http://www.nutriteam.com/listeria.htm
Protozoa's yes

http://www.nutriteam.com/index2.html

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http://www.nutriteam.com/dosage.htm
NutriBiotic Grapefruit Seed Extract
Recommended Dosage
Grapefruit Seed Extract Stops Diarrhea, Gingivitis,
Candida Yeast, Parasites, and More.
This biologically active natural extract is being used to kill Strep, Staph, Salmonella, E. Coli, Candida, Herpes, Influenza, parasites, fungi and traveler's diarrhea. This has been proven in dozens of laboratory tests, and is supported by feedback from doctors and consumers from all over the world.

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NutriBiotic(r) GSE Products Shopping Place

Recommended Dosage for NutriBiotic Liquid Concentrate
"The Original GSE"
Internal Use
Note: Never use GSE full strength, may cause irritation.
Orally. Suggested Use: 5 to 15 drops mixed in 5 ounces of water or juice, 2 to 5 times daily, with or without meals. (Or, take one-two NutriBiotic CapsulesPlus(r) or one-two NutriBiotic(r) tablets 1 to 5 times daily).
Children(under 10 years): 1 to 6 drops mixed in 5 ounces juice, 2 to 3 times daily. Do not use full strength in mouth.
Dental Rinse. For Healthy Gums and Fresh Breath: Stir 3 drops of NutriBiotic into 2 oz. or more of water. Vigorously swish a small amount of the water for 10 seconds or more, 1 to 2 times daily. Also works as an additive for Waterpik(r) type units. Add 3 to 4 drops to the water reservoir. Always dilute.
Throat Gargle. Stir 3 drops of NutriBiotic into a small(3 ounces or so) glass of water. Gargle several times. Use as often as needed. Always dilute.
Ear Rinse. Thoroughly mix 3 to 6 drops of NutriBiotic into one ounce of glycerin or alcohol. Apply 1 to 2 drops of this solution in affected ear 1 to 2 times daily. Use as often as needed. Do not use full strength in ears.
Nasal rinse. Mix 1 drop NutriBiotic with 2 ounces of water. With your head tilted back, fill each nostril with a full eye-dropper of the mixed solution. Swing head forward and down(head is now upside down) to force the solution up into nasal passages. Return head to the normal upright position and allow nasal passages to drain. Do not inhale through the nose during this process. Always dilute.
Vaginal Rinse. Mix 5 to 10 drops of NutriBiotic in 6 to 8 ounces of water. Douche once daily for one week. Douche more often if desired. Always dilute

External Use

Facial Cleanser. Thoroughly moisten(splash) face with warm or cool water. With hands still wet, apply 2 to 3 drops of NutriBiotic to fingertips and gently massage facial area with circular motions. Rinse thoroughly with cool water and pat dry. A tingling sensation may follow. This is an indication of the deep cleansing properties of NutriBiotic. Always dilute.
Skin Rinse. (For minor skin irritations) Dilute NutriBiotic with water(5 to 10 drops/ tablespoon). Apply this solution directly to affected area twice daily. Do not use full strength on skin.
Nail Treatment.Dilute NutriBiotic with water or alcohol(5 to 10 drops/tablespoon). Apply this solution directly on surface of nail along the cuticle and underneath the front of nail, or soak nails, twice daily, for as long as desired. Do not use full strength on nails.
Scalp treatment. Add 5 to 10 drops of NutriBiotic to each shampooing(mix in hand or on head with shampoo). Massage into scalp and leave on for at least two minutes. Rinse off thoroughly with water. May also be used without shampoo.

GSE Household Use
Toothbrush Cleaner. Stir 5 to 10 drops of NutriBiotic into a glass of water. Submerge toothbrush for 15 minutes(or leave in between uses). Rinse toothbrush before using. Change water and remix every few days.
Vegetable/Fruit or Meat/Poultry Wash.
Sink washing: Add 30 or more drops of NutriBiotic to a sink full of cold water. Briefly soak any vegetables, fruit, meat, or poultry.
Spray washing: Add 20 or more drops of NutriBiotic to a 32 ounce pump sprayer filled with water. Spray on any vegetables, fruit, meat, or poultry.
Dish and Utensil Cleaning Additive. Add 15 to 30 drops of NutriBiotic to sink dishwashing water or to final rinse. Add 15 to 30 drops to automatic dishwasher with detergent or to final rinse.
Cutting Board Cleaner. Apply 10 to 20 drops of NutriBiotic to cutting board and work into entire board with a wet sponge or dish cloth. Leave on for at least 30 minutes. Rinse with water.
All Purpose Cleaner. Add 30 to 60 drops of NutriBiotic to any 32 ounce pump sprayer filled with water or cleanser. Use on all surfaces around the house.

For further information, please contact the office of
NutriTeam, Inc.
PO Box 71, Ripton, VT 05766, USA
1 802 388-0661 tel, 1 800 785-9791(toll-free), 1 815 377-2198 fax

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