

## Toxoplasmosis Fact Sheet

**Agent:** *Toxoplasma gondii* is a single-celled parasite that is found world-wide. The organism can infect humans and many species of animals, including birds. It is also very stable in the environment and may be transported in contaminated soil and water.

**Brief Description:** Most people are familiar with toxoplasmosis in relation to risks associated with it during pregnancy. Pregnant women are advised to take precautions by avoiding undercooked meat and cat feces (e.g., litter boxes and garden areas). According to the Centers for Disease Control and Prevention (CDC), however, some 60 million people in the United States may be infected with *Toxoplasma*. Most of them do not even know it, because infections are either not associated with any signs at all or are characterized by symptoms common to other illnesses.

**Reservoir:** *Toxoplasma* parasitizes the intestines of members of the cat family (definitive host). Cysts are shed in feces and can infect a wide range of mammalian species and birds (intermediate hosts). In intermediate hosts the organism infects various tissues, including muscle, but is not shed in feces.

**Mode of Transmission:** People can become infected by several mechanisms, including:

- Accidentally ingesting infected cat feces (cats get the infection from eating infected rodents, birds, or other small animals) by cleaning the litter box and gardening in contaminated soils.
- Eating raw or undercooked meat from infected intermediate hosts.
- Eating uncooked, unwashed fruits or vegetables that have been contaminated by cat feces or contaminated water.
- Being infected prior to birth (a woman who gets a toxoplasmosis infection while pregnant may pass the parasite on to her unborn child through the bloodstream).
- Receiving an organ transplant from an infected person.

**Incubation Period:** Signs of acute infection usually occur within 5 to 23 days of ingestion of cysts. Reactivation of latent infection can occur years later if the patient becomes immune-compromised.

**Signs and Symptoms:** Signs associated with toxoplasmosis in people fall into five categories:

- Toxoplasmosis in an immunocompetent person. Only 10-20% of toxoplasma infections in immunocompetent people will be associated with signs of illness. Most commonly, enlarged lymph nodes (often in the neck) may be the only sign. Other symptoms can include fever, malaise, night sweats, sore muscles, a maculopapular rash, and sore throat.
- Toxoplasmosis in a person with a weakened immune system. Among those with an immune-compromising condition (e.g., patients with AIDS, cancer, or on immune suppressing medications) clinical illness can represent activation of a previously latent infection or an acute infection with the organism. In



these patients, infection can involve the brain and nervous system, causing encephalitis with signs that include fever, headache, seizures, and problems with vision, speech, movement, or thinking. Other manifestations of illness include pulmonary disease, causing fever, cough or trouble breathing, and myocarditis which can cause signs of heart disease such as arrhythmias.

- Ocular toxoplasmosis. *Toxoplasma* is the most frequently reported cause of uveitis, and can infect the retina of both immunocompetent and immune compromised patients. Signs of ocular toxoplasmosis include blurred vision, pain, photophobia, and partial or complete loss of vision. Recurrence of signs is frequent.
- Toxoplasmosis in pregnant women. Most women infected during pregnancy show no signs of illness. Only women with no prior infection can transmit infection to an unborn child. The probability of illness in the newborn baby (congenital toxoplasmosis) depends upon the stage of pregnancy when infection of the mother occurred. On rare occasions, infection of women during pregnancy causes spontaneous abortion, stillbirth, and premature births.
- Congenital toxoplasmosis. Babies who become infected during the first or second trimester of their mother's pregnancy are most likely to show severe symptoms following birth. These signs can include: fever; swollen lymph nodes; jaundice (yellowed skin and eyes); an unusually large or small head; rash; bruises or bleeding under the skin; anemia; and enlarged liver or spleen. Those infected during the last trimester usually do not show signs of infection at birth, but may show signs of ocular toxoplasmosis or developmental delays later in life.

#### Diagnostic Testing:

##### A. Identification of *T. gondii* in body fluids or tissues

1. Isolation of *T. gondii* in blood or body fluids (e.g., CSF, amniotic fluid or BAL) by mouse or tissue culture inoculation.
2. Fluorescent antibody or immunoperoxidase staining of tachyzoites
3. Polymerase chain reaction (PCR) detection of *T. gondii* DNA

##### B. Serology

1. ELISA detection of IgG, IgM, IgA or IgE antibodies
2. IFA detection of IgG or IgM
3. Immunoglobulin G Avidity Test
4. Immunosorbant Agglutination Assay for IgM or IgA

##### C. Radiologic imaging

1. Computed Tomography (CT) or radiology may demonstrate calcifications or dilated ventricles in the brain of a newborn
2. CT or MRI may show multiple, bilateral contrast enhancing ("ring-lesions") in the brain

#### Laboratory Criteria for Diagnosis:

##### Presumptive

- Elevated serum IgG, IgM, IgA, or IgE antibodies



#### Confirmatory

- Isolation of *T. gondii* from blood or body fluids
- Demonstration of tachyzoites in histologic tissue sections
- Detection in body fluids or tissues using polymerase chain reaction (PCR)

#### Case Classification:

- *Probable*: a clinically compatible case with laboratory results indicative of presumptive infection (e.g., elevated IgM, IgA, or IgE titers).
- *Confirmed*: a clinically compatible case with confirmatory laboratory results.

**Treatment:** Unless someone is at risk for severe disease (e.g., immune-compromised or pregnant), there's usually no need to treat a toxoplasmosis infection, as symptoms usually go away on their own in a few weeks or months. For those at risk of severe disease, trimethoprim/ sulfamethoxazole can be used for prevention of infection and a combination of pyremethamine and sulfadiazine can be used to treat acute infections.

**Reporting:** Report all cases (i.e., probable or confirmed) of ACUTE (e.g., ocular, congenital, or new infections) *Toxoplasma* infections within 7 days to your local health department, District Health Office, or the Epidemiology Branch at 404-657-2588. Alternatively, the Toxoplasmosis Case Report can be faxed or mailed to GA Notifiable Disease Epidemiology Section. Case information can also be submitted electronically through the State Electronic Notifiable Disease Surveillance System (SendSS) at <http://sendss.state.ga.us>.

#### References:

1. Montoya JG, Kovacs JA, and Remington JS. *Toxoplasma gondii*. In: Mandell's Principles and Practice of Infectious Diseases. Part III Infectious Diseases and their Etiologic Agents, Sixth Ed. Churchill-Livingston. Elsevier 2005: 3170-3191
2. Heymann DL. Toxoplasmosis. In: Control of Communicable Diseases Manual. 18<sup>th</sup> Ed. Washington, DC: American Public Health Association, 2004: 538-541.

#### Links:

- CDC - <http://www.cdc.gov/parasites/toxoplasmosis/index.html>
- Women's Health Information - <http://www.womenshealth.gov/hiv-aids/opportunistic-infections-and-other-conditions/toxoplasmosis-and-hiv-aids.html>

