Members of the cat family are definitely hosts of Toxoplasma. The parasite replicates in the cat’s intestine. Millions of oocytes are shed in a cat’s feces during its first infection. The oocytes become infectious when they are ingested by mammals and develop into tachyzoites. This form of the parasite is disseminated in blood and infects all tissues, mainly the central nervous system, eyes, muscles, and placenta. Some infected mammals have clinical manifestations. The cysts can remain in infected mammals for life in the skeletal muscles and brain. Development of the tachyzoite form can cause reactivation of disease in immunocompromised people infected with the cysts.

Humans can be infected through undercooked or raw meat (lamb, pork) infected with cysts or through food or water contaminated with oocysts excreted by cats (eg, unwashed vegetables). Transmission of Toxoplasma has also been reported through contaminated drinking water.1 The infection usually has no symptoms or very mild symptoms (fever, malaise, lymphadenopathy, hepatosplenomegaly); in immunocompromised patients, the infection can be very serious.

The incidence of positive serology for Toxoplasma varies in various regions and cultures. In North America, about 23% of the adult population is estimated to be seropositive.2 According to a recent Motherisk report, incidence in Canada could be somewhat lower.3

Women who contract Toxoplasma infections before pregnancy usually do not transmit it to their fetuses. If a mother becomes infected during pregnancy, the pathogen can be transmitted to her fetus across the placenta. Incidence of congenital Toxoplasma is about 1/10000 live births in the New England region1 (but it is not mandatory to report it), but other reports suggest it could be up to 1/1000. This ratio would
translate into 40 to 400 cases annually in Canada and would pose a major public health problem.

Effects on a fetus
Clinical manifestations of toxoplasmosis in fetuses and neonates vary. The typical triad of hydrocephalus, chorioretinitis, and intracranial calcifications does not always occur. Hepatosplenomegaly, thrombocytopenia, microcephaly, convulsions, fever, and small-for-gestational-age newborns all suggest Toxoplasma. Nevertheless, most neonates are asymptomatic at birth on routine pediatric examination. Deafness, mental retardation, and learning difficulties are often detected only later in life.

Risk of congenital toxoplasmosis is somewhat lower if infection occurs during the first trimester (10% to 25%) than if it occurs during the third trimester (60% to 90%). But the severity of congenital infection is substantially higher if infection occurs during the first trimester. These risks should be communicated clearly to women and their families.

Prevention
Efforts to control Toxoplasma infection during pregnancy are often successful and greatly reduce the incidence of congenital toxoplasmosis. Health care providers should make preconception and prenatal education about toxoplasmosis a standard of care for pregnant women. Some preventive measures are listed in Table 1.

Screening
Some countries in Europe where the incidence of Toxoplasma is high (France, Belgium) have screening programs for Toxoplasma for all pregnant women. If results of the screen are negative, serologic testing is done every month or trimester thereafter. In most countries where incidence is low, no screening is recommended. For example, the Royal College of Obstetricians and Gynaecologists in the United Kingdom and the American College of Obstetricians and Gynecologists do not recommend universal screening.

Diagnosis
Diagnosis of toxoplasmosis is usually based on clinical symptoms and serologic tests. During acute infection, IgM and IgG are detected in serum within 1 to 2 weeks. In pregnant women, dating the likely start of infection is critical. If only IgG is detected and no IgM is detected, infection likely took place 6 to 12 months before. If IgM and IgG are detected, then a more thorough workup should be performed to try to determine the time of infection.

Testing for IgM for Toxoplasma can have false-positive results because some commercial kits are not sufficiently specific and because IgM antibodies can be detected more than a year after an acute infection. For these reasons, the United States Food and Drug Administration has issued guidelines for Toxoplasma antibody testing. When serum tests positive for IgM, an additional confirmatory assay should be performed at a reference laboratory. Another test that can aid in dating infection is IgG avidity. If the avidity is high, infection occurred 3 to 5 months before testing.

Testing for in utero infection
The most common way to test for in utero infection is a polymerase chain reaction test of amniotic fluid for Toxoplasma. Fetal blood sampling (cordocentesis) is not usually done because the fetal risk is higher than with amniocentesis, and cordocentesis is less sensitive. If results are positive, sonographic follow up is indicated. Signs such as calcifications, microcephaly, hydrocephalus, and severe in utero growth restriction strongly suggest in utero infection in the presence of documented maternal infection.

Table 1. Recommendations for preventing Toxoplasma infection during pregnancy

| Wash vegetables and fruit thoroughly |
| Wash your hands and utensils after touching unwashed vegetables or uncooked meat |
| Avoid direct contact with soil and sand |
| Avoid changing cat litter. If you have to, use gloves and wash your hands |
| Eat only well cooked meat. Pork, lamb, beef, veal, and poultry should be cooked until the meat reaches 80°C in the centre |

Adapted from Lopez et al.
Treatment

Spiramycin, a macrolide antibiotic, is one of the drugs of choice for toxoplasmosis. It is approved for use during pregnancy in Europe, but in the United States it can be purchased only from the manufacturer. The adverse effects of spiramycin are usually mild and mainly produce gastrointestinal symptoms. Sulfonamides may also be used, but they have been associated with neonatal jaundice. Pyrimethamine is an antagonist of folic acid and is generally not recommended for use during pregnancy, but several reports have mentioned use of this agent among pregnant women.11

There are few data and no randomized clinical trials on the effectiveness of treatment in the presence of seroconversion during pregnancy. A European multicentre study suggested that treatment during pregnancy decreases the severity of congenital Toxoplasma in newborns but does not affect transmission rates.11,12

References