

**University of Tikrit**  
**College of nursing**  
**Basic Nursing Sciences**



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**Parasitology**

*Toxoplasma gondii*

**By:**

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## Toxoplasmosis

**Geographical distribution:** Is wide world distribution.

### **Life cycle:**

*T.gondii* occurs in three forms; trophozoite, tissue cyst and oocyst.

The trophozoite is crescent – shaped, with one end pointed and the other end rounded, nucleus is ovoid.

Tissue cyst vary in size, young tissue cyst may be as small as 5  $\mu\text{m}$  in diameter and contain only two bradyzoite while older ones may contain hundreds of organisms. Oocysts develop only in definitive hosts – in the intestine of cats, which is spherical or ovoid

*T. gondii* has a complex life cycle. Felids (domestic cats and their relatives) are **the definitive hosts**, which are the only place where the parasites can undergo sexual replication to generate oocysts. A large amount of unsporulated oocysts are shed in the cat's feces; however, oocyst shedding occurs for only 1-2 weeks. Within 1-5 days, oocysts in the environment sporulate and become infective. All warm-blooded vertebrates (Humans and other mammals) can serve as **intermediate hosts**, which acquire infection through ingesting soil, water or plant contaminated with oocysts. Parasites in an intermediate host undergo asexual replications. First, oocysts transform into tachyzoites shortly after ingestion.

Then, tachyzoites develop into tissue cyst bradyzoites, which often localize in neural and muscle tissue. While cats may be infected through ingestion of sporulated oocysts, the infection to cats is much more effective through consuming intermediate hosts containing tissue cysts. Note that cats develop immunity to the parasites after the first infection and the immunity may lose after a few years. Humans can be infected by ingesting undercooked meat containing tissue cysts or from food/water contaminated by sporulated oocysts.

Humans can also be infected through blood transfusion or organ transplantation. In addition, infection can be transmitted from

mother to fetus. In the human host, tissue cysts may remain throughout the life of the host and are most commonly found in skeletal muscle, myocardium, brain, and eyes.

## **Clinical features:**

### **Healthy people (nonpregnant)**

Healthy people who become infected with *Toxoplasma gondii* often do not have symptoms because their immune system usually keeps the parasite from causing illness. When illness occurs, it is usually mild with "flu-like" symptoms (e.g., tender lymph nodes, muscle aches, etc.) that last for several weeks and then go away. However, the parasite remains in their body in an inactive state. It can become reactivated if the person becomes immunosuppressed.

### **Mother-to-child (congenital)**

Generally if a woman has been infected before becoming pregnant, the unborn child will be protected because the mother has developed immunity. If a woman is pregnant and becomes newly infected with *Toxoplasma* during or just before pregnancy, she can pass

the infection to her unborn baby (congenital transmission). The damage to the unborn child is often more severe the earlier in pregnancy the transmission occurs.

Potential results can be

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- a miscarriage
- a stillborn child
- a child born with signs of toxoplasmosis (e.g., abnormal enlargement or smallness of the head)

Infants infected before birth often show no symptoms at birth but may develop them later in life with potential vision loss, mental disability, and seizures.

**Diagnosis:**

The diagnosis of toxoplasmosis is typically made by serologic testing (immunofluorescence assay for detection of antibody is used). Microscopic examination of Giemsa-stained preparations shows crescent-shaped trophozoite. Cysts may be seen in the tissue.

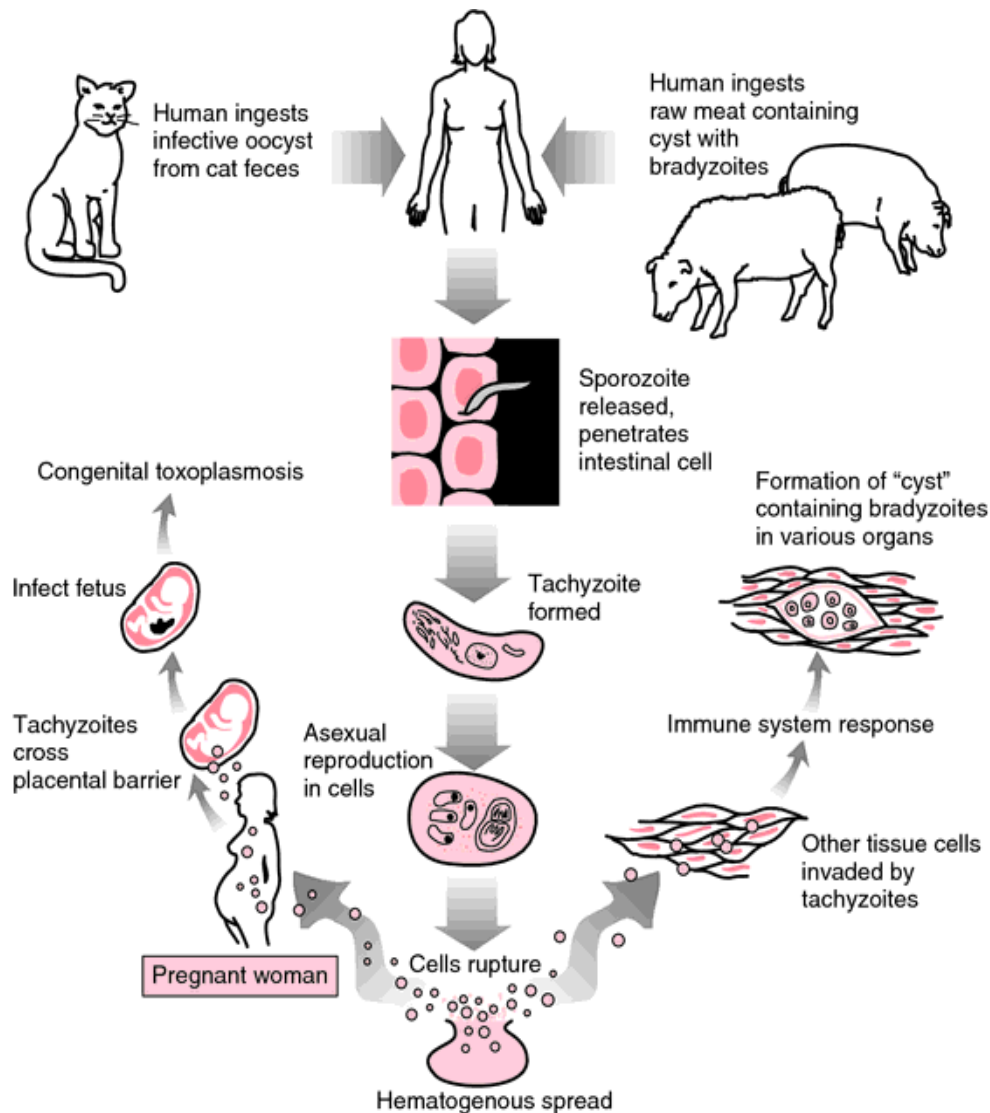
**Treatment:**

Can be treated with a combination of sulfadiazine and pyrimethamine.

Pregnant women, newborns, and infants can be treated, although the parasite is not eliminated completely. The parasites can remain within tissue cells in a less active phase; their location makes it difficult for the medication to completely eliminate the

**Prevention & Control:**

- 1- Cook food and meat to safe temperatures.
- 2- Wash hands with soap and warm water after gardening or contact with soil or sand.
- 3- Feed cats only canned or dried commercial food or well-cooked table food, not raw or undercooked meats.
- 4- Do not get a new cat while you are pregnant.



## Nematodes Worms

### *1-Ascaris lumbricoides*

Common name: Round worm

Habitat: Adult worm reside in the small intestine, particularly the jejunum of man. Morphology:

Male adult worm measures 15-30 cm in length and 3-4 mm in diameter. The posterior end is curved ventrally to form a hook.

Female worm is longer than male worm, measures 25-40 cm in length and 5 mm in diameter. Its posterior end is straight.

Egg: Fertilized eggs are round in shape, they are surrounded by a thick, transparent shell, consisting of internal layer, middle and an outermost coarsely mammillated albuminoid layer.

Infective stage: Embryonated egg containing larvae. Diagnostic stage: Unembryonated egg. modes of infection: Man acquires infection by ingestion of food, water or raw vegetables contaminated with embryonated egg.

**Pathogenesis and clinical features:**

Adult worms in the intestine cause abdominal pain and may cause intestinal obstruction especially in children. Larvae in the lungs may cause inflammation of the lungs (Loeffler's syndrome) – pneumonia-like symptoms.

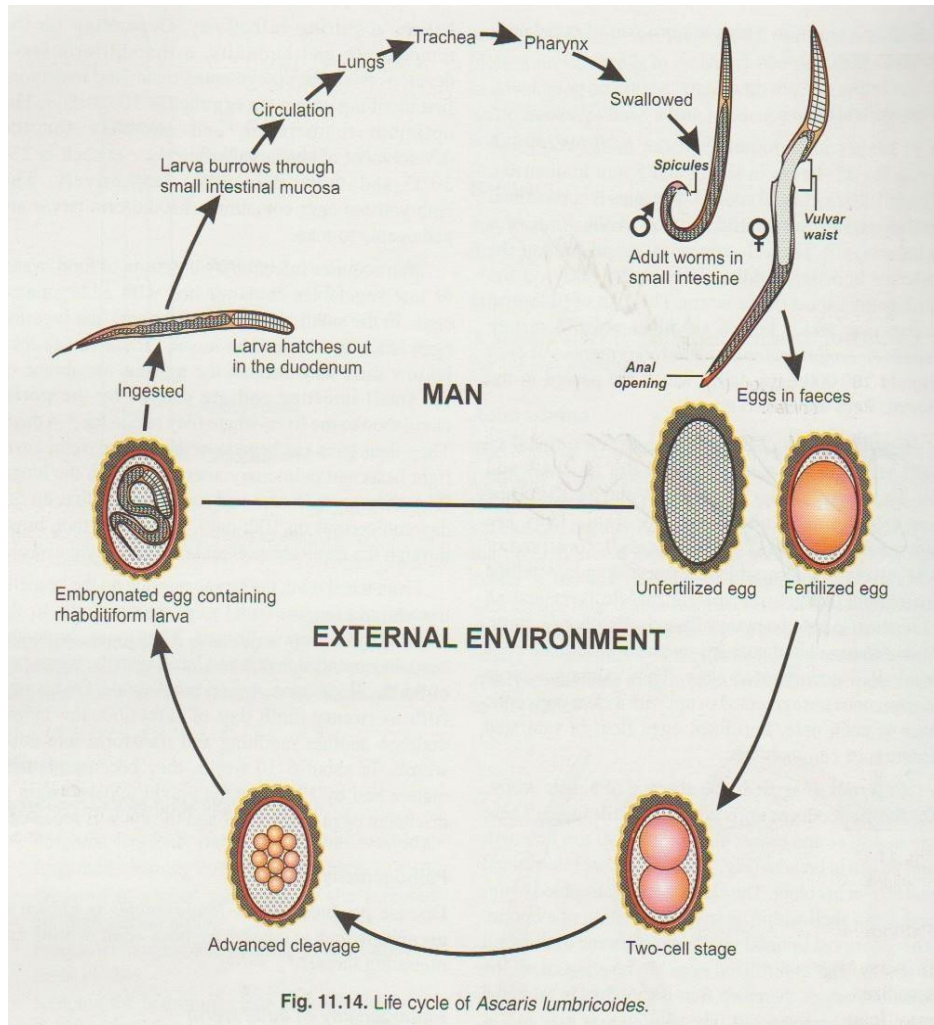
Diagnosis:

1. Examination of stool for eggs by direct saline smear method. The egg is ovoidal, covered by albuminous mamillatins.
2. Demonstration of adult worms.
3. Demonstration of larvae .

Treatment: Mebendazole, Albendazole and Piperazine.

**Life cycle:**

Ingested eggs hatch in the duodenum. The larvae penetrate the intestinal wall and circulate in the blood. From the heart they migrate to the lungs, ascend to the trachea, descend to the esophagus and finally reach the small intestine to become adult. The female pass immature eggs which pass to the soil and mature in 2 weeks.



Life cycle of *Ascaris lumbricoides*