

# Echinococcus

## *in Dogs and Cats*

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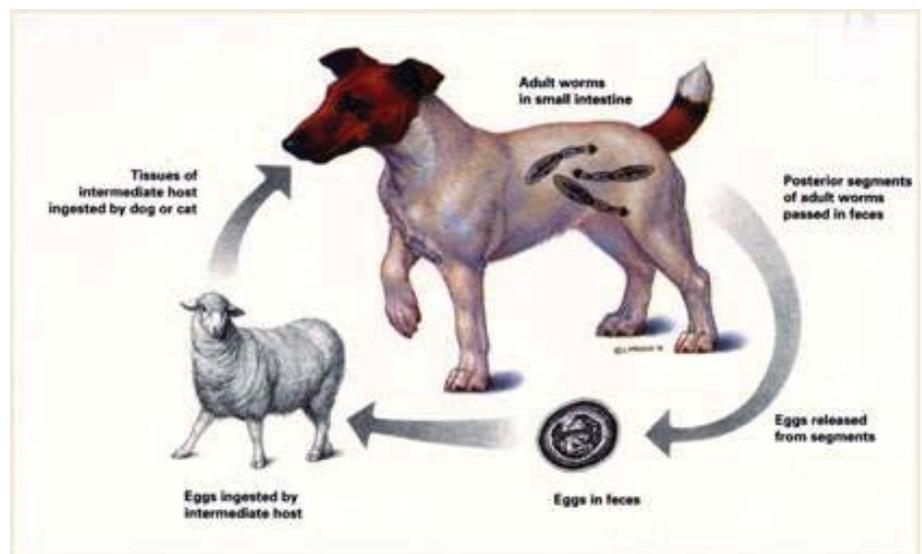
### Echinococcosis: An Important Tapeworm Infection in Humans

Echinococcosis is a disease caused by the infection of animals and humans with tapeworms belonging to the genus *Echinococcus*. An understanding of the parasite life cycle is important in reducing human and animal exposure.

In nature, the tapeworm life cycle (see the diagram) passes between domestic or wild carnivorous and herbivorous mammals. In the domestic animal cycle, *Echinococcus granulosus* is the parasite species of greatest importance.

The adult *Echinococcus* tapeworm, which is only about 3 to 7 millimeters long (roughly the width of a fingernail from side to side) and very difficult to see with the naked eye, lives in the intestine of dogs. Infective eggs are passed in dogs' fecal matter and then a domestic herbivore such as sheep or cow ingests them while grazing.

Once inside the herbivore, the tapeworm egg develops into a cyst containing larval tapeworms. In some cases, these cysts can become as large as a volleyball. Cysts are found most commonly in the liver and lungs, but can be anywhere in the body.



If the herbivore dies and the larval cyst is consumed by a dog, the life cycle is completed. The larval worm will develop into an adult worm in the dog.

This same basic cycle takes place among wild carnivores and herbivores as well. *Echinococcus multilocularis* is the species of tapeworm most often encountered in the wild animal cycle. This particular *Echinococcus* tapeworm grows by budding daughter cysts rather than growing a single large cyst like *E. granulosus*. In this way, *E. multilocularis* “takes over” an organ somewhat like a tumor. Again, the liver is the most commonly affected organ.

## **Echinococcosis: The Disease in Humans**

If a human inadvertently ingests the egg of an *Echinococcus* tapeworm, the larval form of the worm will develop in that human. This could occur when hands or food/water accidentally are contaminated with dog fecal matter. Once inside the human, the egg hatches and a larval cyst can form just as it does in the herbivore.

The presence of a developing cyst causes clinical disease when it compromises the function of the organ in which it is located. In the case of *Echinococcus granulosus*, disease situations are managed by drainage, treatment and surgical removal of the cyst. In the case of *Echinococcus multilocularis*, the rarer of the two infections, removal of the organ tissue and parasite may be necessary, along with chemotherapy.

## **Echinococcosis: The Disease in Animals**

Because the adult form of the tapeworm is found in the carnivore, no clinical disease is associated with this portion of the life cycle. The dog or wild carnivore simply supports the adult tapeworm and sheds eggs into the environment.

Herbivores develop disease much the way humans do. The larval tapeworm cyst or buds grow inside the herbivore until the organ in question is compromised and clinical signs result. Because the cyst/buds can be slow-growing, this may take some time: months, even years.

## **Diagnosis**

In humans, the diagnosis of echinococcosis is accomplished through the development of clinical signs of disease, imaging techniques and serology. Appropriate treatment then is pursued. Diagnosis in animals typically occurs at the time of a postmortem examination.

## **Risk of Exposure**

Individuals with the greatest risk of developing echinococcosis are those living in a rural setting where the domestic carnivore (farm dog)/herbivore (sheep, cow and goat) cycle can take place. In addition, people involved in the handling of wildlife, trappers, hunters, landscaping crews, etc., all have increased risk for contact with fecal material from wild carnivores.

To diminish the possibility of contaminating a food or water source or one’s hands with carnivore fecal matter, remember to wear gloves and wash hands immediately after any potential exposure occurs. Humans cannot contract this infection by eating the meat of a sheep or cow that has echinococcosis; they must ingest the egg, which is passed in dog feces.

**For more information on this and other topics, see [www.ag.ndsu.edu](http://www.ag.ndsu.edu)**

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