

Echinococcus:

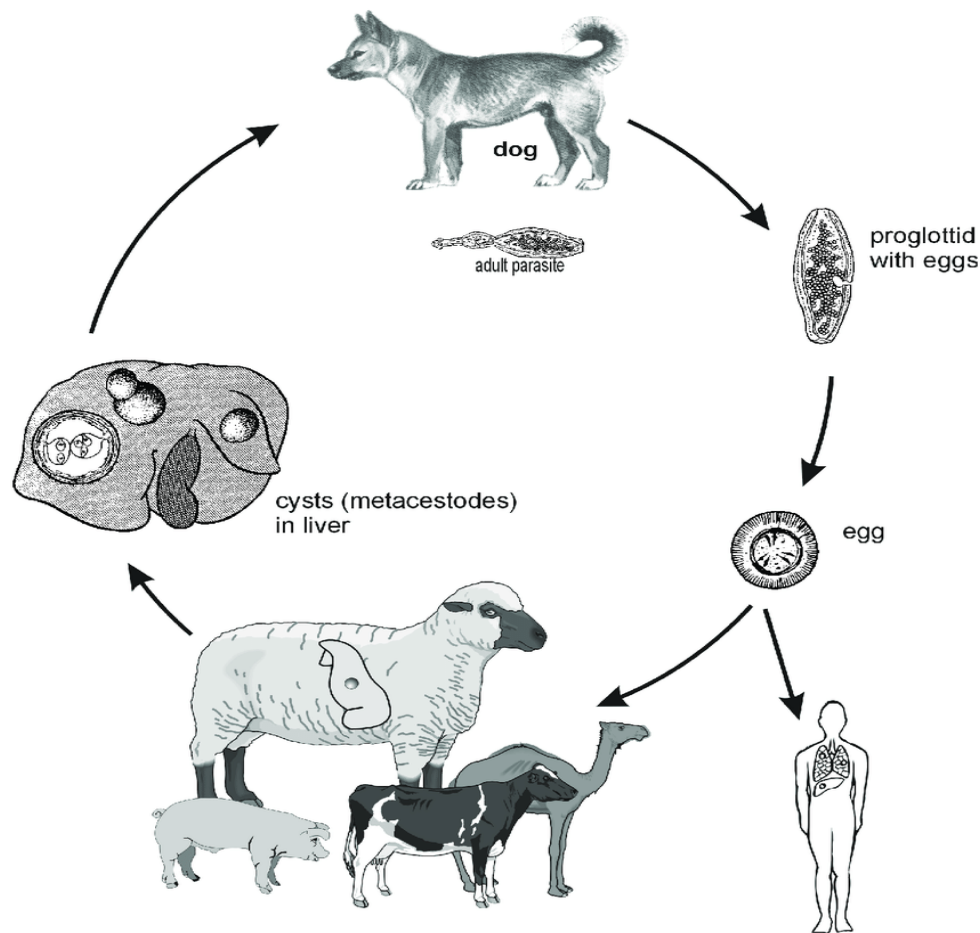
Echinococcus is a genus of tapeworms that includes two major species of medical importance: *Echinococcus granulosus* and *Echinococcus multilocularis*. These parasites have a complex life cycle, involving two hosts: definitive hosts (usually canids, such as dogs) and intermediate hosts (various herbivores, including humans).

Life Cycle of Echinococcus:

The life cycle begins when the definitive host (e.g., a dog) ingests the eggs shed by an infected intermediate host or contaminated environment.

Inside the dog's intestine, the eggs release oncospheres that penetrate the intestinal wall and migrate to various organs, particularly the liver and lungs.

In these organs, the oncospheres develop into hydatid cysts, which contain numerous protoscoleces, the infective stage for intermediate hosts.



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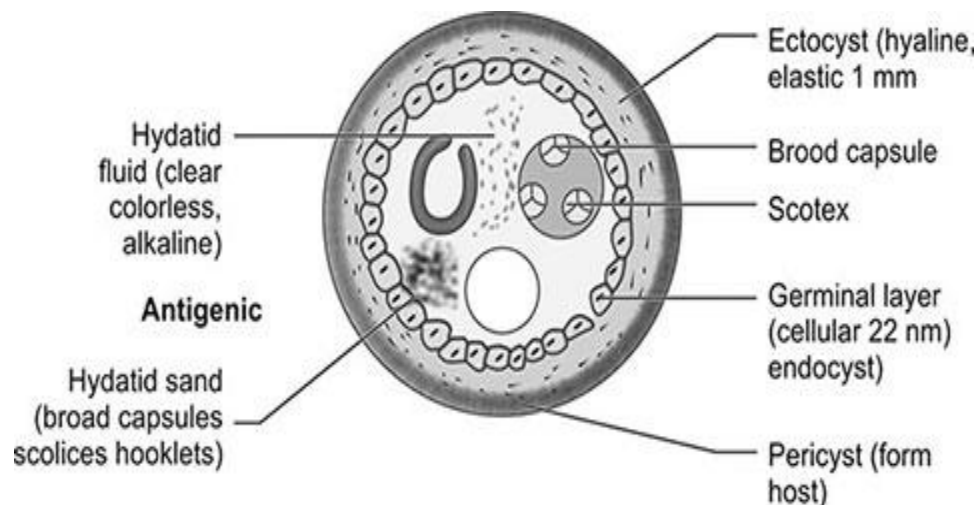
The intermediate host (e.g., a sheep) ingests the protoscoleces by consuming contaminated vegetation or water.

In the intermediate host's intestine, the protoscoleces attach to the intestinal wall and develop into hydatid cysts, primarily in the liver and lungs.

The life cycle completes when the definitive host consumes the organs of the infected intermediate host, allowing the tapeworm to mature and reproduce.

Properties of Hydatid Cysts:

Hydatid cysts are fluid-filled structures that form primarily in the liver and lungs of intermediate hosts, including humans. They consist of an outer fibrous layer (pericyst) and an inner germinal layer (endocyst).



The germinal layer continuously produces protoscoleces, which are small, invaginated larvae with hooklets.

Pathogenesis of Echinococcus Infection:

As hydatid cysts grow, they gradually enlarge the affected organ, causing pressure effects and displacement of surrounding structures.

In some cases, the cysts may rupture, leading to the release of protoscoleces into the host's body, triggering an immune response.

Ruptured cysts can lead to complications such as anaphylaxis, secondary bacterial infections, or dissemination of protoscoleces to other organs.

Diagnosis of Hydatid Cysts:

Imaging techniques, including ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI), are commonly used for the diagnosis and localization of hydatid cysts.

Serological tests, such as enzyme-linked immunosorbent assay (ELISA), can detect specific antibodies against *Echinococcus* and aid in the diagnosis.

Treatment of Echinococcus Infection:

The management of hydatid cysts typically involves a combination of surgical intervention and medical therapy.

Surgical removal of the cysts is the mainstay of treatment, aiming to completely remove the cysts and prevent recurrence.

Medical therapy using anthelmintic drugs, such as albendazole or mebendazole, may be prescribed before or after surgery to reduce the viability of the cysts and prevent dissemination