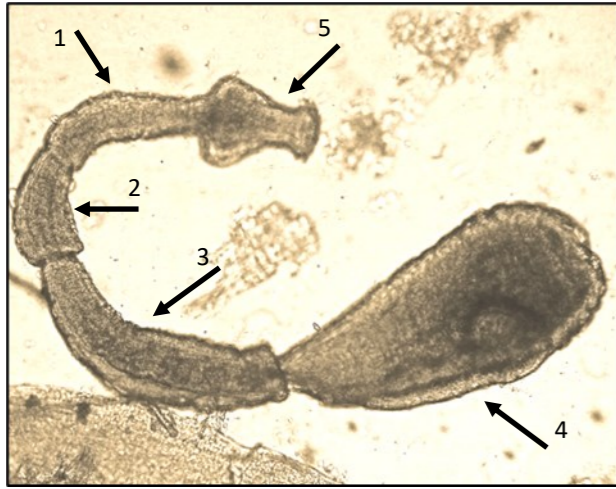


# Life cycle of *Echinococcus multilocularis*

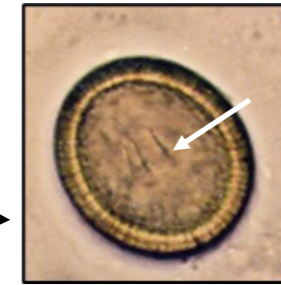
*Echinococcus multilocularis* is primarily a zoonotic tapeworm of wild canids in Tundra/subarctic regions where rodents such as voles and lemmings serve as intermediate hosts for the larval stages or multilocular cysts. The parasite has now become widely distributed in the northern hemisphere and in Europe, the main life cycle involving the Red fox in a sylvatic (wildlife) cycle but domestic dogs and occasionally cats can also acquire the parasite. *E. multilocularis* has become a serious zoonotic agent in parts of Europe where an increasing population of infected wild foxes visit urban areas. This parasite is not endemic in the UK or Ireland, but its introduction would pose a serious threat to public health.



1. This minute adult tapeworm is found in mucosal villi of the fox lower small intestine. It is only approx. 2-4 mm long, and comprises the scolex (S) or head and 4 or 5 segments, the so-called 'proglottids' labelled above. When mature the final segment is packed with several hundred eggs and breaks away releasing the contents into the environment via the faeces. One mature segment is shed each week. Eggs are identical to those of *E. granulosus* in appearance.



Fox scat



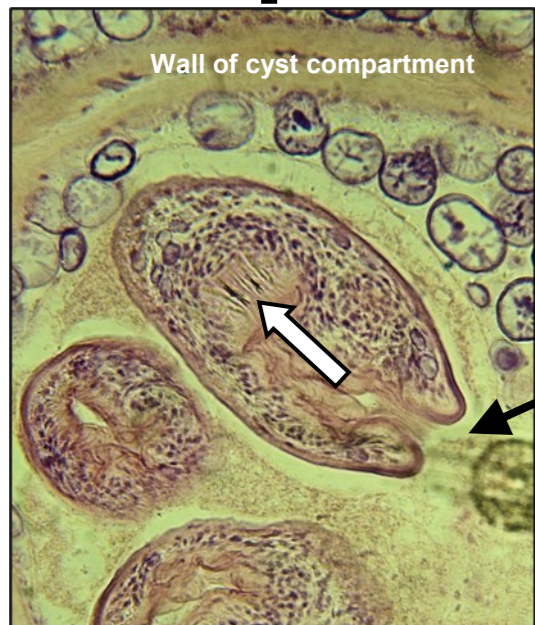
2. Eggs are dark, round and with a thick striated shell, approx. 40 µm in size. They contain the 'hexacanth' embryo, a juvenile form of the tapeworm. There are 6 tiny hooks present (arrow).



3. When ingested by a rodent, the embryo migrates to the liver where the larval 'alveolar' cysts develop; some larger mammals, including man, can become infected. Cysts rapidly reproduce.

**HUMAN ALVEOLAR ECHINOCOCCOSIS**  
Humans are aberrant intermediate hosts through accidental ingestion of eggs shed by foxes or other canids. *Echinococcus multilocularis* mainly affects the liver as a slow growing destructive tumour, capable of systemic metastases into other organs. A high percentage of infected foxes within an increasing urban fox population represents an emerging threat to public health in parts of Europe.

**Foxes become infected through predation on infected rodents**  
The prepatent period is approx. 5 weeks



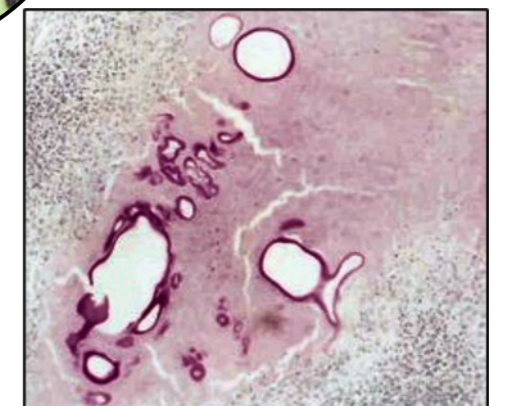
7. An *E. multilocularis* protoscolex at high power reveals the invaginated head and hooks (arrow)



6. This is a stained section of a cyst to demonstrate the compartmented structure and numerous protoscolices within these areas



5. The image shows numerous cysts whose structure is one of a germinative gelatinous matrix and multiple compartments. Scolices (juvenile tapeworms) continually bud off from the germinal layer of the cyst. Image courtesy of CDC



4. This PAS (Periodic Acid-Schiff) stained section through a cyst highlights the infiltrative and diffusive nature of growth within a solid gelatinous (light pink-staining) matrix. Expansion of alveolar echinococcosis in the liver produces aggregates of small gelatinous cysts.