



Caution: Fox tapeworm!

The fox tapeworm (scientific name: *Echinococcus multilocularis*) lives in the small intestine of foxes, rarely also in dogs (= final hosts) (1). In Switzerland, the parasite is found throughout the country. In the Alps, 0-10 % of the foxes are infected, in the Pre-alps, Swiss Plateau and Jura Mountains 30 to 60 % of foxes are infected.

In average, 0.3 % of the dogs in Switzerland are infected with the fox tapeworm.

In cats, the tapeworm develops only poorly, and the eggs shed are often not infectious.

In feces of foxes and other final hosts, tapeworm subunits (2) and eggs (3) are shed, and taken up by rodents (= intermediate hosts, 4).

In the liver of these intermediate hosts, a tumor-like larval stage of the parasite will form (5).

When infected intermediate hosts are eaten by foxes or dogs, the life cycle is closed. In the intestine of the final host, a new generation of adult tapeworms will be formed (6).

Also humans can accidentally get infected with the fox tapeworm, and a tumor-like larval stage will develop. This disease is called **alveolar echinococcosis**.

Alveolar echinococcosis is a rare disease: In Switzerland, an average of 20-40 new cases are diagnosed each year.

In humans, the larval stages of the fox tapeworm mainly infect the liver. Only many years after the infection, unspecific symptoms of disease will appear (stomach pain, icterus, etc.). For treatment, surgical removal of the larval stages or long-term treatment with drugs are available. With these measures, the disease can be well controlled in most of the cases.

Even though the number of human alveolar echinococcosis cases has slightly increased over the last years, there is no need for diagnostic screening of the healthy population. For immunocompromised people, the below described precautions are highly recommended.

Precautions are important! (Page 2)

Recommended precautions:

- Fox feces from gardens and playgrounds should be disposed in a garbage bag (not in the compost).
- If your garden or playground is regularly contaminated with fox feces, the local authorities should be contacted (local game warden).
- Outdoor shoes and boots should not be worn indoors and hands should be washed regularly.
- Field-grown vegetables, salad and berries, as well as windfall («Fallobst») and mushrooms should be thoroughly washed or boiled prior to consumption. Note, the eggs of the fox tapeworm are not killed by freezing to -20 °C. Only at -80°C they lose their infectivity.
- After doing yard work, or after contact with dogs, hands should be washed thoroughly.
- Foxes that are found dead or were hunted should only be touched with gloves, and the animals should be transported in plastic bags.
- Precautions for dog owners: see page 3.

If you have been in contact with foxes or dogs, do not panic. The risk for acquiring the disease is very low. If you had contact with *Echinococcus multilocularis* eggs (confirmed by molecular analysis), we recommend the following:

Preventive serological testing via your family doctor:

- 1) Blood sample taken by family doctor within 2 weeks after contact with eggs, and subsequent analysis by the Institute of Infectious diseases (IFIK) of the University of Bern, or the Institute of Parasitology of the University of Zürich (initial serology)
If positive → further examinations
If negative → continue with step 2)
- 2) After 6 months, follow-up serology
- 3) After 18 months, last follow-up serology

The serological examination allows to detect a possible infection early on, before symptoms appear. As the parasite is still at an early stage of infection, chances for complete cure are very high as the parasite usually can be removed completely by surgery.

Information for dog owners

Examination of dogs for fox tapeworm egg shedding

- Leave a fecal sample of your dog at your veterinarian, or send a fecal sample directly to the Institute of Parasitology in Bern or Zürich.
- If eggs and / or parasite antigen are detected in the dog feces, see below.

Measures to take if a dog is infected with *E. multilocularis* tapeworms

- Wash hands thoroughly after every contact with the dog and its feces.
- Treat the dog on two consecutive days with praziquantel or epsiprantel.
- Strict collection and disposal of feces for four days after deworming.
- Shower the dog thoroughly after treatment.
- Disinfect insensitive surfaces with Javel water (final concentration app. 2% sodiumhypochlorite): spray surfaces, let dry, and then clean with water.
- Alternatively, clean surfaces with steam cleaner.
- Wash textiles and toys at 60°C minimum.

Measures to take if you had contact to an infected dog

- Do not panic. **The risk of infection is very small.** If you want, you can get yourself tested according to the scheme on page 2.

Preventive measures for dogs (especially dogs that hunt for mice)

- Monthly deworming (for example every first day of the month) with a medication containing praziquantel or epsiprantel (e.g. Cestex, or others).
- Prevent your dog from hunting mice.
- Dogs that often roll in feces should be showered regularly.

General recommendation of deworming of dogs and cats: www.esccap.ch

Further information:
Institute of Parasitology, University of Bern
Länggasstrasse 122, 3012 Bern
Tel. +41 31 684 24 18 / +41 31 684 24 15

<http://www.ipa.vetsuisse.unibe.ch>