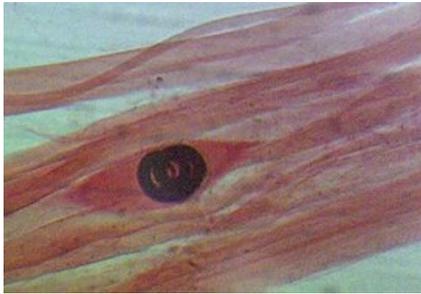


# Trichinellosis

<b>Trichinella spiralis</b>	
Adenophorea	
Trichinellidae	
 <p>Larva in muscle</p>	
<b>Occurrence</b>	temperate belt
<b>Disease</b>	trichinosis
<b>Infectious stage and method of infection</b>	the infection occurs by ingesting larvae in the muscle of the intermediate host
<b>Diagnostics</b>	antibody detection, microscopy, detection of parasitic DNA
<b>Therapy</b>	fresh infections: laxative + albendazole; muscle phase: albendazole + anti-inflammatory treatment
<b>MeSH ID</b>	D017160 ( <a href="https://www.medvik.cz/bmc/link.do?id=D017160">https://www.medvik.cz/bmc/link.do?id=D017160</a> )

**Trichinellosis** is a disease caused by the parasite *Trichinella spiralis*. It belongs to **Nematoda** - nematodes and is widespread cosmopolitanly. The parasite spreads **alimentary**. The cause of the infection is a larva in the muscle of the intermediate host. *Trichinella* has no wild or outward stage, so it is always in the host - so-called **intracellular parasitism**. To get to the final host, the current intermediate host must look at the future host. The larva is very resistant, survives in the carcass and in the dead organism. Trichinosis is a **life-threatening condition** that requires hospitalization.

The parasite itself has a large number of species that have adapted to external conditions and their intermediate hosts - the so-called **interspecies biological variability** :

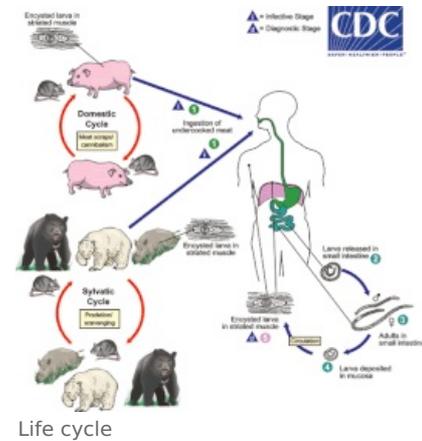
- **Geographical resolution** (cosmopolitan x localized): specific adaptation by geography. Some species are able to withstand long-term freezing (freezing elimination does not work for them) or adapt to changes in fauna or host numbers.
- **Wide host range** : pig, bear, horses, foxes, walrus in the Nordic areas, crocodiles in the subtropics (change! Cold-blooded animal)
- **Different pathogenicity** of individual species
- **Pathogenesis** : forms x does not form a collagen cyst
- **Larval resistance** to external factors

## Occurrence

In the Czech Republic there are mainly species *T. spiralis*, *T. britovii* and *T. pseudospiralis*. Epidemics in Europe: Italy (1998), Slovakia and France (1998), United Kingdom and Germany (1999), Spain (2002).

## Life cycle

The infection is spread **alimentary** - by ingesting imperfectly processed infested meat, most often pigs (in humans). The parasite larva is released in the GIT . The larvae mature in 1-2 days. Then the parasites reproduce sexually. The fertilized female then burrows into the wall of the small intestine and produces **live larvae** , approximately 1000 - 1500 larvae as early as 4 days after ingesting the infected meat. The larvae **actively penetrate the intestinal wall** and travel through the blood or lymphatic system to various organs. The larvae disrupt the cell membrane and nest in the cytoplasm. Here, it twists and causes specific morphological changes in the host cell as needed by the parasite - it affects metabolism, DNA biosynthesis, increases collagen and EGF production. The result is the formation of a collagen casing. All these changes lead to the protection of the larva from the body's immune cells and also ensure the nutrition of the parasite larva. The cell thus changed is then called a **nurse cell** . After about 6-12 months, the **larvae calcify in the muscle** , but only in humans. The lifespan of larvae in humans is up to **30 years**.



## Clinical signs

It depends on the number of larvae eaten and on the phase in which the parasite is located. Mild infections can be asymptomatic .

### Intestinal phase

- Difficulties in 5-10% of patients.
- Diarrhea, nausea, vomiting.
- Hemorrhagic ulcers - ileum, stomach, duodenum, jejunum, large intestine.
- 8-10 days after infection is the peak of inflammatory reactions.
- At the end of this phase, the larvae are drilled through the intestinal spine and then the GIT problems disappear.



Eye changes in trichinosis

### Migration and muscle phase

- Fever .
- Maculopapular rash on the torso and limbs .
- Facial edema .
- Muscle pain.
- Dysfunction or reduction of muscle function, including respiratory.
- Vision disorders and eosinophilia .

**Severe cases:** Bleeding even under the nail beds.

## Diagnostics

- Detection of antibodies against E \ S antigens.
- Microscopy: detection of larvae (histology) in stool.
- Detection of parasitic DNA.

## Therapy

In the case of a completely fresh infection, a stronger laxative and albendazole are given every other day for the first 10 days after eating the meat . In the next phase of the parasite (muscle phase), albendazole alone is used . In addition, anti-inflammatory treatment with relatively high doses of corticosteroids should be instituted . These substances suppress the immune system, which reacts violently to the dead bodies of the parasite. Corticosteroids provide symptomatic relief and may avert patient death. Unfortunately, if adult worms stay in the small intestine for a long time, they can give birth to more larvae and thus worsen the treatment itself.

## Prevention

- Czech regulations: obligation to check whether the meat does not contain muscle larvae.
- Basic method: examination of meat by compressor.
- Alternative digestion method: trypsin digestion, sensitivity 1 larva per 1 g of meat.
- In the USA, they rely on deep and long-term freezing of meat (−15 ° C for 20 days), which destroys the larvae.
- Heat kills larvae at up to 60 ° C, so grilling is insufficient to destroy larvae.

## Links

### Related articles

- Diarrheal diseases : Viral gastroenteritis ■ Bacterial gastroenteritis ■ Gastrointestinal parasitosis
- Differential diagnosis of diarrheal diseases
- Therapy of diarrheal diseases

### Resources

- CHANOVÁ, Marta. *Nákazy vyvolané hlísticemi* [přednáška k předmětu Parazitologie, obor Všeobecné lékařství, 1. LF Univerzita Karlova]. Praha. 12. 10. 2015.

### References

- BEDNÁŘ, Marek, A SOUČEK a V FRAŇKOVÁ, et al. *LÉKAŘSKÁ MIKROBIOLOGIE : Bakteriologie, virologie, parazitologie*. 1. vydání. Triton, 1996. 560 s. ISBN 859-4-315-0528-0.

Parasites			
Protozoa (Protozoa)	Amoeboid protozoa	Exchange offices <i>Acanthamoeba spp.</i> • <i>Balamuthia mandrillaris</i> • <i>Naegleria fowleri</i>	
	Whips	Leishmania	<i>Leishmania braziliens</i> • <i>Leishmania donovani</i> • <i>Leishmania infantum</i> • <i>Leishmania major</i> • <i>Leishmania tropica</i>
		intestinal parasites	<i>Dientamoeba fragilis</i> • <i>Entamoeba histolytica</i> • <i>Giardia intestinalis</i>
		Trichomonads	<i>Trichomonas vaginalis</i>
		Trypanosomes	<i>Trypanosoma cruzi</i> • <i>Trypanosoma gambiense</i> • <i>Trypanosoma rhodensiense</i>
	Rinning	<i>Balantidium coli</i>	
	Sporozoa	Babesie	<i>Babesia bovis</i> • <i>Babesia divergens</i> • <i>Babesia microti</i>
		Coccidia	<i>Cryptosporidium parvum</i> • <i>Cyclospora cayetanensis</i> • <i>Isospora belli</i>
		Microsporidia	<i>Enterocytozoon bienersi</i> • <i>Encephalitozoon spp.</i>
		interhost	<i>Toxoplasma gondii</i>
Plasmodia		<i>Plasmodium falciparum</i> • <i>Plasmodium malariae</i> • <i>Plasmodium ovale</i> • <i>Plasmodium vivax</i>	

Helmint	Trematoda (Motolice)	liver and lung mites	<i>Clonorchis sinensis</i> • <i>Fasciola hepatica</i> • <i>Opistorchis spp.</i> • <i>Paragonimus spp.</i>
		Schistosomes	<i>Schistosoma haematobium</i> • <i>Schistosoma japonicum</i> • <i>Schistosoma intercalatum</i> • <i>Schistosoma mansoni</i> • <i>Schistosoma mekongi</i>
		intestinal tapeworm	<i>Fasciolopsis buski</i> • <i>Heterophyes heterophyes</i> • <i>Metagonimus yokogawai</i>
	Nematode (Nematode)	Filaria	<i>Brugia malayi</i> • <i>Dirofilaria immitis</i> • <i>Dirofilaria repens</i> • <i>Loa loa</i> • <i>Mansonella perstans</i> • <i>Onchocerca volvulus</i> • <i>Wuchereria bancrofti</i>
		intestinal nematodes	<i>Ancylostoma duodenale</i> • <i>Ascaris lumbricoides</i> • <i>Enterobius vermicularis</i> • <i>Necator americanus</i> • <i>Strongyloides stercoralis</i> • <i>Trichuris trichuria</i>
		tissue nematodes	<i>Dracunculus medinensis</i> • <i>Toxocara spp.</i> • <i>Trichinella spiralis</i>
	Cestoda (Tasemnice)	intestinal cestodes	<i>Diphyllobothrium latum</i> • <i>Dypilidium caninum</i> • <i>Hymenolepis nana</i> • <i>Taenia saginata</i> • <i>Taenia solium</i>
		tissue cestodes	<i>Echinococcus granulosus</i> • <i>Echinococcus multilocularis</i> • <i>Taenia solium</i>
	Arthropods	Insect	<i>Anoplura</i> (lice) • <i>Diptera</i> (diptera) • <i>Cimex lectularius</i> • <i>Siphonaptera</i> (fleas)
Spiders		<i>Ixodes ricinus</i> • <i>Sarcoptes scabiei</i>	
Intracellular parasites	Chlamydia	<i>Chlamydia pneumoniae</i> • <i>Chlamydia psittaci</i> • <i>Chlamydia trachomatis</i>	
Portal: Microbiology			