DISEASE: Cutaneous larva Migrans

AGENT: ***Ancylostoma braziliense.*** Rarely, ***Ancylostoma caninum, Uncinaria stenocephala, Bunostomum phlebotomum,*** or ***Strongyloides stereoralis***

("larva currens")

RECOGNITION

Syndrome: Human: Papules at site of entry. Highly pruritic, erythematous, serpentine lesions, commonly accompanied by secondary bacterial infection resulting from scratching.

Animal: Primarily a disease of young animals. Anemia, diarrhea, malabsorption. In severe cases, prostration and death.

Incubation period: 2-3 days.

Mortality rate: Self-limiting in several weeks to months.

Confirmatory tests: Clinical diagnosis is based on syndrome. Results of skin biopsies are not reliable.

Occurrence: Most prevalent in areas with warm, moist climate and sandy soil.

Transmission: Direct contact with filariform larvae in soil contaminated with feces from dogs or cats. Most common in children and in adults with frequent soil contact, such as construction workers, gardeners and sun bathers on sandy beaches. Autoinfection can occur in persons infected with **S. *stercoralis***

CONTROL AND PREVENTION

Individual/herd: Treat with thiabendazole, antipruritics, and sedatives. Antibiotics may be indicated to control secondary infection. Protective clothing when working in contact with soil potentially contaminated with dog or cat feces. Periodioc anthelmintic treatment of dogs and cats.

Local/community Elimination of strays. Prohibition of dogs and cats **on** playgrounds and beaches.

National/international None.

DISEASE: Dioctophymiasis

AGENT: ***Dioctophyma renale***

RECOGNITION

Syndrome: Human: Renal dysfunction, hematuria, renal colic.

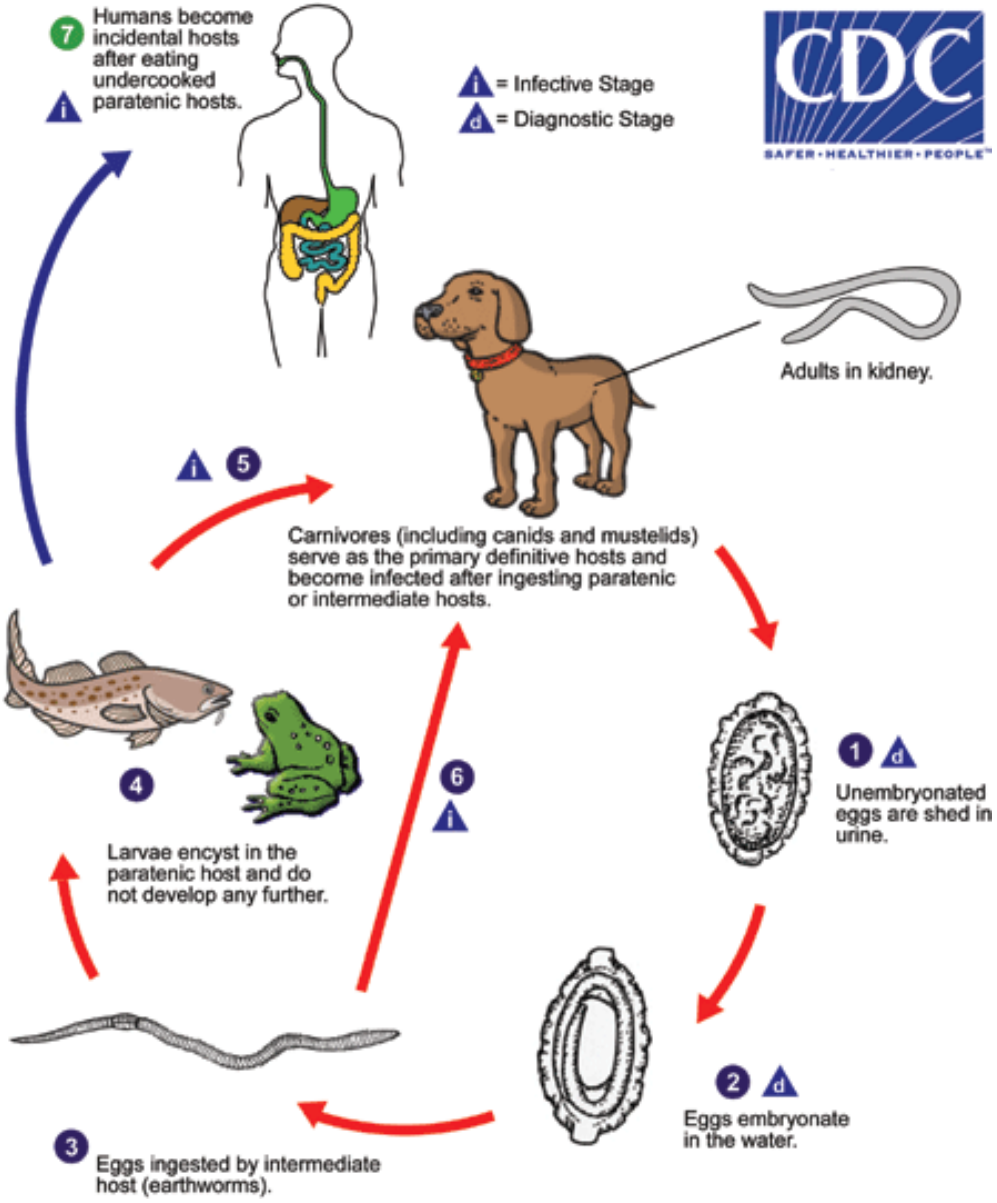
Incubation period 3-6 months.

Case fatality rate: If person is healthy and only one kidney is involved (which is usual), the case fatality rate is low. If the person is debilitated, or both kidneys are involved, the prognosis is poor.

Confirmatory tests: Microscopic examination of urine for ova of ***D. renale.*** If the parasite is in the abdominal cavity, or if it is a male (normally only one worm is present), **no** ova will be seen in urine and diagnosis can only be made by laparotomy.

Occurrence: Worldwide. Carnivores are the reservoir. The life cycle involves a free-living aquatic annelid. Fish, frogs, and crawfish can serve as paratenic hosts.

Transmission: Ingestion of the undercooked or raw mesentery or liver of infected fish, frogs, or crawfish.


7 Humans become incidental hosts after eating undercooked paratenic hosts.
i
i = Infective Stage
d = Diagnostic Stage
CDC
SAFER · HEALTHIER · PEOPLE™
Adults in kidney.
i 5
Carnivores (including canids and mustelids) serve as the primary definitive hosts and become infected after ingesting paratenic or intermediate hosts.
1 d
Unembryonated eggs are shed in urine.
2 d
Eggs embryonate in the water.
3
Eggs ingested by intermediate host (earthworms).
4
Larvae encyst in the paratenic host and do not develop any further.
6 i

CONTROL AND PREVENTION

Individual/herd: Treat by surgical removal. Cook freshwater fish, frogs, and crawfish before eating.

Local/community: Educate public about method of transmission. Abstain from feeding raw freshwater fish, frogs, or crawfish to carnivores.

National/international: None.

DISEASE: Dracunculiasis

AGENT: *Dracunculus medinensis*, *Dracunculus insignis*

RECOGNITION

Syndrome: Human: Prepatent period asymptomatic. Parasite erupts from blister most commonly located on lower extremity. Fever, nausea, diarrhea, and generalized urticaria precede formation of blister by several hours. Signs abate after blister ruptures, but sepsis is **common** in lesion.

Animal: Same as human.

Incubation period: 8-14 months.

Case fatality rate: Low, unless severe secondary bacterial infection develops.

Duration of disability is approximately one year.

Confirmatory tests: Parasite can only be identified after it appears but, in endemic areas, the hypersensitization reaction that immediately precedes the patent infection is usually sufficient for presumptive diagnosis. Larvae may be present in discharge from lesion.

Occurrence: Primarily in western Africa and western India. Small foci exist in the Mideast and Pakistan. **Dogs** are the major nonhuman host, but cats, bovines, equines, wild ungulates, and nonhuman primates may also harbor the parasite. A few cases of infection with ***D. insignis***, a parasite of dogs, wild carnivores, and raccoons have been reported in the eastern United States.

Transmission: When infected host enters water, the adult worm releases larvae which are ingested by the intermediate host, copepods of the genus ***Cyclops.*** Definitive host is infected when copepods are ingested with drinking water.

CONTROL AND PREVENTION

Individual/herd Treat with niridazole, diethylcarbamazine. Frequent flushing of exposed worm until parturition is completed, then remove worm through opening in skin. Great care must be exercised to avoid breaking the worm because secondary bacterial infection along the worm tunnel is common. Boil or filter potentially contaminated drinking water. Chlorine or iodine will destroy the copepods.

Local/community: Educate public regarding method of transmission. Eliminate step wells and provide safe water sources. Treat infected people to hasten removal of adult worm.

National/international None.

DISEASE: Filariasis

AGENT

Brugia malayi, Dirofiaria spp.(D. ***immitis, D. tenuis, D. repens), Lou loa, Onchocerca*** spp.(**O**. ***volvulus, O. cervicalis), Dipetalonema*** spp.(**D**. ***perstans, D. streptocerca)***

RECOGNITION

Syndrome: Human: Most infections produce painful subcutaneous swellings. B. ***malayi*** produces lymphangitis, lymphadenitis, orchitis, and fever. D. ***immitis*** produces "coin" lung lesions (visible **on** radiographs) that are usually asymptomatic.

Animal: B. malayi-unknown. ***D. immitis*** (dog)-fatique after moderate exercise, cough, ascites. Onchocerca and ***Dipetalonernu*** infections usually subclinical.

Incubation period: 8-9 month prepatent period.

Case fatality rate: Low.

Confirmatory tests: For ***B. rnalayi:*** microscopic examination of blood for presence of microfilaria. ***Also*** test paired sera for complement fixation, hemagglutination and immunofluorescent antibodies. Radiology for D. ***immitis*** infection. Because humans are aberrant hosts for other filariae, and adults do not reproduce, microfilariae will not be seen in blood.

Occurrence: ***B. malayi:*** Southeast Asia. Others are worldwide. The primary reservoirs of ***B. malayi*** are monkeys, cats, and wild carnivores. Dogs and wild canids are primary reservoir for ***D. immitis.*** Others utilize mainly wild animals.

Transmission: By many genera of anopheline and culicine mosquitoes. ***B. malayi*** utilizes primarily ***Mansonia*** spp. ***Onchocerca*** is transmitted by the female blackfly ***(Simulium*** spp.) rather than mosquitoes.

CONTROL AND PREVENTION

. IndividuaVherdTreat with diethylcarbamazine. Mosquito repellents and

Local/community: Institute vector control program. For ***D. immitis,*** treat and screen.

NationaVlnternationak None.

DISEASE: Strongyloidiasis

AGENT

Strongyloides spp. ***(S. stercoralis, S. fuellborni,* S. *ransomi,* S. *ratti, S. westeri,* S. *procyonis,* S. *myopotami)***

RECOGNITION

Syndrome: Human: Usually asymptomatic. Pruritis at point of entry. Coughing during lung migration. Nausea, vomiting, abdominal pain, tenesmus, and weight loss during intestinal phase.

Animal: In young dogs syndrome parallels that of humans.

Incubation period: **2-4** weeks until larvae appear in feces.

Case fatality rate: Low.

Confirmatory tests: Microscopic examination of fresh feces for motile rhabditiform larvae with **S. *stetcoralis*** infection, ova with **S. *fuellborni*** infection.

Occurrence: Common in warm, moist climates. Reservoir for **S. *stercoralis*** includes humans, dogs, foxes, **cats,** and nonhuman primates. Reservoir for ***S.fuellborni*** is in nonhuman primates. Other reservoirs include **S. *ratti*** in rodents, **S. *westri*** in equines, and ***S. procyonis*** in raccoons.

Transmission: Only female parasite is infective. Larvae penetrate skin in contact with fecal-contaminated soil. Interhuman transmission is more common than from animals **such** as dogs or **cats.** Autoinfection is possible, especially among immunocompromised individuals.

CONTROL **AND** PREVENTION

Indlvidual/herd Treat with thiabendazole or mebendazole.

Local/community: Treat infected animals. Institute proper disposal of human and animal fecal waste. Prevent fecal contamination of playground soil.

National/international None.

DISEASE: Thelaziasis

AGENT: ***Thelazia*** spp., especially ***T. callipaeda, T. californiensis***

RECOGNITION

Syndrome: Human: Conjunctivitis, photophobia, lacrimation. Corneal scarring may follow prolonged infection.

Animal: Same as human.

Incubation period: 2-6 weeks.

Case fatality rate: None.

Confirmatory tests: Microscopic identification of parasite after removal from eye.

Occurrence: Worldwide. Primary reservoirs for ***T. callipaeda*** are canids. Many mammals (deer, lagomorphs) serve as reservoirs for ***T. californensis.***

Transmission: Flies that feed on the lacrimal secretion of infected hosts serve as intermediate hosts and vectors.

CONTROL **AND** PREVENTION

Individual/herd Remove worm from conjunctival sac.

Local/community: Education regarding method of transmission.

Fly control

National/international: None.

DISEASE: Trichinosis

AGENT

Trichinella spp., primarily ***T. spiralis***

RECOGNITION

Syndrome: Human: Ranges from asymptomatic to mild febrile reaction to myalgia, diarrhea, ocular pain, palpebral edema, myocardial failure, **CNS** disturbance, and death. Prognosis is infective dose related.

Animal: Usually subclinical.

Incubation period: 5-15 days, average 10 days.

Case fatality rate: Low.

Conflrmatory tests: Paired sera for complement fixation, indirect fluorescent antibody, ELISA, or bentonite flocculation testing. Muscle biopsy for microscopic identification of larvae.

Occurrence: Worldwide. Reservoir exists in rats, swine, dogs, cats, and many wild animals. (Meat of bears and seals has been important for human exposure.) The trichinellae have been divided into eight distinct gene pools (each given tentative species names). Most are associated with a specific host species or geographic region.

Isolations from humans, however, have been primarily ***T. spiralis.***

Transmission: Ingestion of raw or undercooked meat containing viable larvae of ***T. spiralis.*** Larvae mature in intestine and, when adults, mate and produce larvae that penetrate intestinal wall.

CONTROL AND PREVENTION

Individual/herd: Treat with thiabendazole and corticosteroids. Cook or freeze to kill larvae in all meat from potentially infected sources (pork, pork products, bears, and seals) before eating.

Local/community: Sanitary disposal of garbage. Cook all garbage fed to swine. Rodent control.

National/international: None.

DISEASE: Trichostrongyliasis

AGENT: ***Trichostrongylus*** spp., ***Haemonchus contortus, Ostertagia*** spp.

RECOGNITION

Syndrome: Human: Usually asymptomatic. Occasionally diarrhea, abdominal pain, anorexia, weight loss.

Animal: Normally only a disease of young animals. Diarrhea, weight loss, emaciation, anemia, and death.

Incubation period: 3 weeks

Case fatality rate: None.

Confirmatory tests: Microscopic examination of fresh feces for ova.

Occurrence: Worldwide. Most cases reported in Asia and the Middle East.

Reservoir is **among** domestic and wild herbivores, especially ruminants.

Transmission: Ingestion of larvae on vegetation contaminated with feces of infected animals. In some areas of world, transmission is fecal-oral when preparing manure for use as fuel.

CONTROL AND PREVENTION

Individual/herd Treat with pyrantel pamoate. Personal hygiene-ash hands after handling manure.

Local/community: Cook vegetables potentially contaminated with feces of infected animals. Treat infected animals. Utilize pasture management.

National/international None

DISEASE: Visceral larva Migrans

AGENT

Toxocara canis, Toxocara cati, Baylisascaris procyonis, Gnathostoma spinigerum

RECOGNITION

Syndrome: Human: Usually mild. Heavy infection may produce fever, cough, **skin** rash. If eye is involved, it may simulate retinoblastoma with strabismus and blindness.

Animal: Usually only among young. Diarrhea, vomiting, pneumonitis, and general malaise.

Incubation period Weeks to months.

Case fatality rate: Low.

Confirmatory tests: Paired sera for ELISA, complement fixation, indirect hemagglutination. Liver biopsy for microscopic identification of larvae.

Occurrence: Worldwide. Primarily a childhood disease. Reservoirs of ***T. canis*** are dogs and wild canids and of ***T. cati*** cats and wild felids.

The reservoir of ***B. procyonis*** is the raccoon.

Transmission: Ingestion of larvae **in** dirt or percutaneous from poultices.

G. ***spinigenun*** is transmitted by ingestion of undercooked fish, poultry, or meat.

CONTROL **AND** PREVENTION

Individual/herd: Treat with diethylcarbamazine. Personal hygiene.

Local/community: Prevent contamination of soil with dog and cat feces. Treat dogs and cats beginning at 3 weeks of age. Avoid contact with raccoon feces. Cook meat, fish, and poultry before eating.

National/international None.