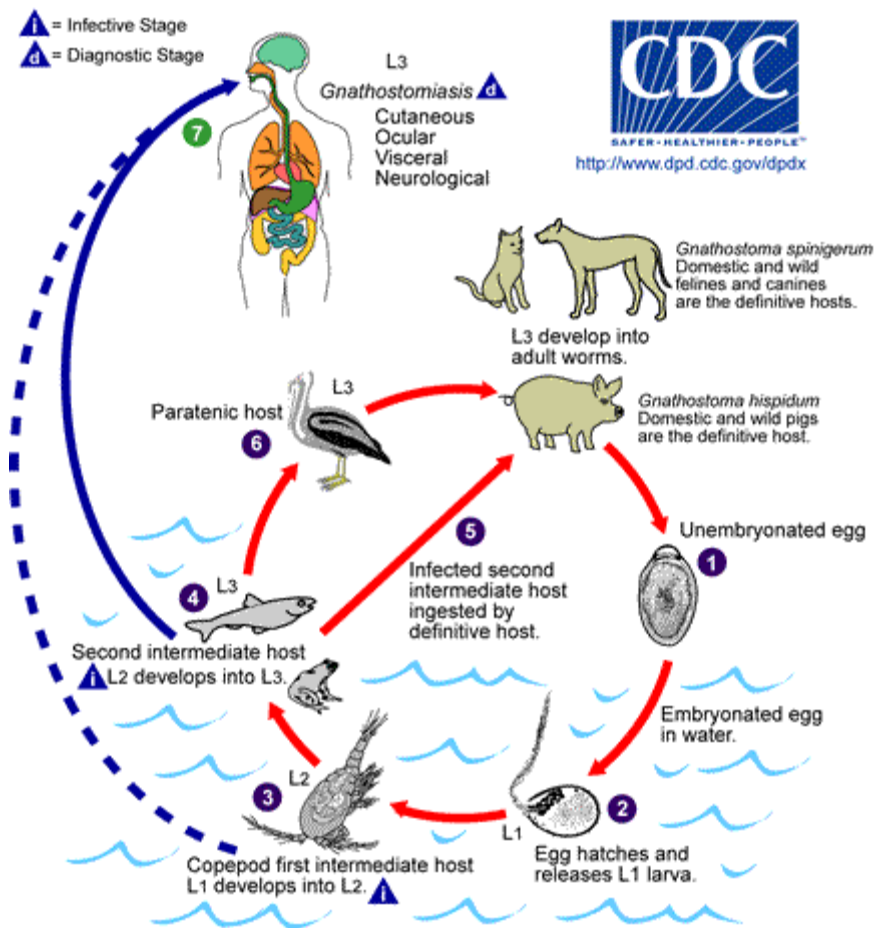


# Gnathostomiasis

## Causal Agent:

The nematode (roundworm) *Gnathostoma spinigerum* and *Gnathostoma hispidum*, which infects vertebrate animals. Human gnathostomiasis is due to migrating immature worms.

## Life Cycle:



In the natural definitive host (pigs, cats, dogs, wild animals) the adult worms reside in a tumor which they induce in the gastric wall. They deposit eggs that are unembryonated when passed in the feces **1**. Eggs become embryonated in water, and eggs release first-stage larvae **2**. If ingested by a small crustacean (*Cyclops*, first intermediate host), the first-stage larvae develop into second-stage larvae **3**. Following ingestion of the *Cyclops* by a fish, frog, or snake (second intermediate host), the second-stage larvae migrate into the flesh and develop into third-stage larvae **4**. When the second intermediate host is ingested by a definitive host, the third-stage larvae develop into adult parasites in the stomach wall **5**. Alternatively, the second intermediate host may be ingested by the paratenic host (animals such as birds, snakes, and frogs) in which the third-stage larvae do not develop further but remain infective to the next predator **6**. Humans

become infected by eating undercooked fish or poultry containing third-stage larvae, or reportedly by drinking water containing infective second-stage larvae in *Cyclops* 7.

### **Geographic Distribution:**

Asia, especially Thailand and Japan; recently emerged as an important human parasite in Mexico.

### **Clinical Features:**

The clinical manifestations in human gnathostomiasis are caused by migration of the immature worms (L3s). Migration in the subcutaneous tissues causes intermittent, migratory, painful, pruritic swellings (cutaneous larva migrans). Migration to other tissues (visceral larva migrans), can result in cough, hematuria, and ocular involvement, with the most serious manifestations eosinophilic meningitis with myeloencephalitis. High eosinophilia is present.

### **Laboratory Diagnosis:**

Removal and identification of the worm is both diagnostic and therapeutic.

- Microscopy

### **Treatment:**

Surgical removal or treatment with albendazole\* or ivermectin\* is recommended.

\* This drug is approved by the FDA, but considered investigational for this purpose.