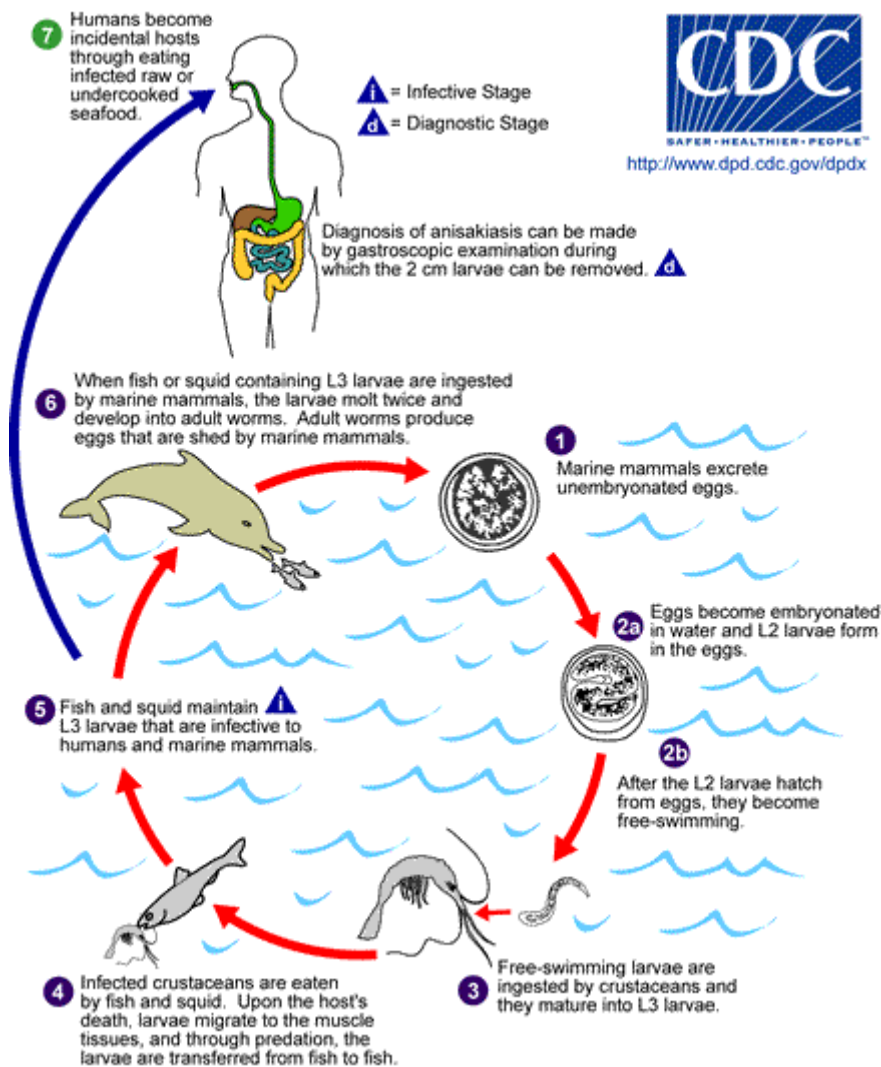


Anisakiasis

Causal Agents:

Anisakiasis is caused by the accidental ingestion of larvae of the nematodes (roundworms) *Anisakis simplex* and *Pseudoterranova decipiens*.

Life Cycle:



Adult stages of *Anisakis simplex* or *Pseudoterranova decipiens* reside in the stomach of marine mammals, where they are embedded in the mucosa, in clusters. Unembryonated eggs produced by adult females are passed in the feces of marine mammals **1**. The eggs become embryonated in water, and first-stage larvae are formed in the eggs. The larvae molt, becoming second-stage larvae **2a**, and after the larvae hatch from the eggs, they become free-swimming **2b**. Larvae released from the eggs are ingested by crustaceans **3**. The ingested larvae develop into third-stage larvae that are infective to fish and squid **4**. The larvae migrate from the intestine to the tissues in the peritoneal cavity and grow up to 3 cm in length. Upon the host's death, larvae

migrate to the muscle tissues, and through predation, the larvae are transferred from fish to fish. Fish and squid maintain third-stage larvae that are infective to humans and marine mammals ⁵. When fish or squid containing third-stage larvae are ingested by marine mammals, the larvae molt twice and develop into adult worms. The adult females produce eggs that are shed by marine mammals ⁶. Humans become infected by eating raw or undercooked infected marine fish ⁷. After ingestion, the anisakid larvae penetrate the gastric and intestinal mucosa, causing the symptoms of anisakiasis.

Geographic Distribution:

Worldwide, with higher incidence in areas where raw fish is eaten (e.g., Japan, Pacific coast of South America, the Netherlands).

Clinical Features:

Within hours after ingestion of infected larvae, violent abdominal pain, nausea, and vomiting may occur. Occasionally the larvae are coughed up. If the larvae pass into the bowel, a severe eosinophilic granulomatous response may also occur 1 to 2 weeks following infection, causing symptoms mimicking Crohn's disease.

Laboratory Diagnosis:

Diagnosis can be made by gastroscopic examination during which the 2 cm larvae are visualized and removed, or by histopathologic examination of tissue removed at biopsy or during surgery.

Treatment:

The treatment of choice is surgical or endoscopic removal.