



# ANISAKIASIS

1. **Agent:** Larval nematodes of the subfamily *Anisa-kinæ*, genera *Anisakis*, and *Pseudoterranova*.
2. **Identification:** A parasitic disease of the human gastrointestinal tract resulting from the ingestion of uncooked or under treated marine fish containing larval nematodes. The motile larvae burrow into the stomach wall producing acute ulceration with nausea, vomiting and epigastric pain, sometimes with hematemesis. They may migrate upward and attach in the oropharynx, causing cough. In the small intestine, they cause eosinophilic abscesses, and the symptoms may mimic appendicitis or regional enteritis. At times they perforate into the peritoneal cavity; they rarely involve the large bowel. Infection is usually manifested by cramping, abdominal pain, and vomiting. Other symptoms include nausea, diarrhea, blood and mucus in the stool, and mild fever. Diagnosis is made by recognition of the 2 cm long larva invading the oropharynx or by visualizing the larva by gastroscopic examination or in surgically removed tissue.
3. **Incubation period:** Gastric symptoms may develop within a few hours after ingestion. Symptoms referable to the small and large bowel occur within a few days or weeks, depending on the size and location of larvae.
4. **Reservoir:** *Anisakinae* are widely distributed in nature, but only certain of those that are parasitic in sea mammals constitute a major threat to humans. The natural life cycle involves transmission of larvae by predation through small crustaceans to squid, octopus or fish, then to sea mammals, with humans as incidental hosts.
5. **Source:** The disease occurs in individuals who eat uncooked and inadequately treated (frozen, salted, marinated, smoked) saltwater fish, squid or octopus. This is common in Japan (sushi and sashimi), the Netherlands (herring), Scandinavia (gravlax) and Latin America (ceviche).
6. **Transmission:** The infective larvae live in the abdominal mesenteries of fish; often after death of their host they invade the body

muscles of the fish. When ingested by people and liberated by digestion in the stomach, they may penetrate the gastric or intestinal mucosa.

7. **Communicability:** Direct transmission from person to person does not occur.
8. **Specific Treatment:** Gastroscopic removal of larvae; excision of lesions. While evidence is limited, albendazole (400-800 mg daily for 6-21 days) has been used successfully as treatment.
9. **Immunity:** None.

## REPORTING PROCEDURES

1. **Reportable:** (Title 17, Section 2500, *California Code of Regulations*). Report within 1 working day of identification of a case or suspected case.
2. **Report Form:** **OUTBREAK / UNUSUAL DISEASE REPORT (CDPH 8554)** If anisakiasis infection is associated with a foodborne illness, see also foodborne illness reporting. If a prepared commercial food item is the LIKELY source of this infection, a **FOODBORNE INCIDENT REPORT** should be filed. For likelihood determination and filing procedures, see Part 1, Section 7 - Reporting of a Case or Cluster of Cases Associated with a Commercial Food: Filing of Foodborne Incident Reports.
3. **Epidemiologic Data:**
  - a. History of food items eaten during the suspect incubation period, and location, where food was consumed.
  - b. Listing of all individuals with opportunity to consume suspect food items, whether ill or not. Obtain individual food histories.
  - c. For ill individuals: symptoms, onset date and hour, duration, medical treatment and laboratory results.
  - d. For suspected food(s): source, date and hour of purchase, when consumed,



method of preparation, availability of sample(s).

## **CONTROL OF CASE, CONTACTS & CARRIERS**

**CASE:** No restrictions.

**CONTACTS:** Examination of others possibly exposed at the same time may be productive.

## **PREVENTION-EDUCATION**

1. Avoid ingestion of inadequately cooked marine fish. To kill the larvae, heat seafood to an internal temperature of 63 °C (145 °F). Larvae can also be killed by blast-freezing to

-35 °C (-31 °F) or below until solid and then storing at either -35 °C (-31 °F) or below for 15 hours or at -4 °C (-20 °F) or below for 24 hours. Freezing by regular means at -20 °C (-4 °F) or below for at least 7 days also kills the larvae. Irradiation effectively kills the parasite.

2. Cleaning (evisceration) of fish as soon as possible after they are caught reduces the number of larvae penetrating into the muscles from the mesenteries.

## **DIAGNOSTIC PROCEDURES**

Consult Public Health Laboratory, Parasitology Section.