

## Foodborne parasitic infections

# PARAGONIMIASIS

(Lung fluke)



### Introduction

Paragonimiasis, or lung fluke disease, is caused by infection with several species of trematodes belonging to the genus *Paragonimus*.

The most common species in Asia are *P. westermani*, *P. heterotremus* and *P. philippinensis*.

*Paragonimus spp.* is a **common parasite of crustacean-eating mammals** such as dogs, cats, tigers, mongooses and monkeys. (reservoir definitive hosts).



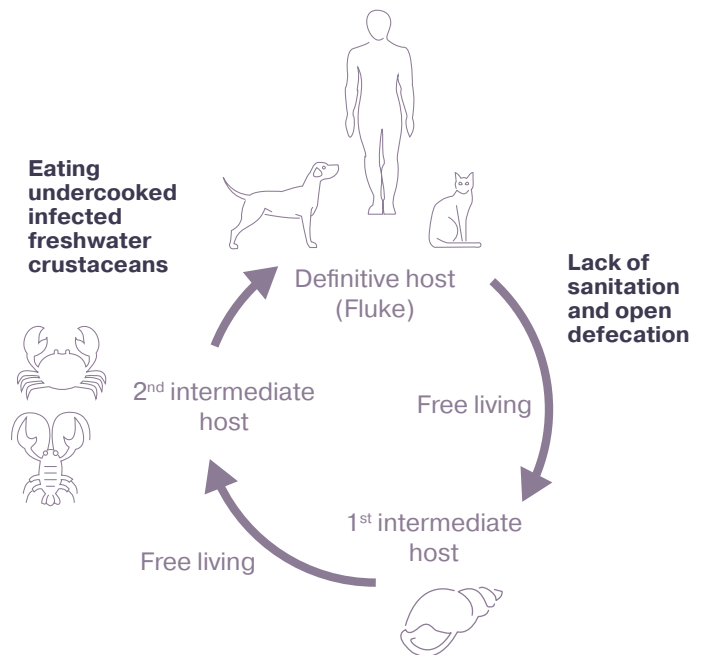
### Transmission and risk factors

The adult flukes live in the lungs of infected mammals and lay eggs that are coughed up through the airways and **either expectorated in the sputum or swallowed and defecated**.

When the eggs reach freshwater, they develop into miracidia that will inhabit various species of **aquatic snails** where they will asexually reproduce and eventually give rise to more developed larvae called cercariae.

The cercariae will then further inhabit various **freshwater crustaceans**, which act as second intermediate hosts, such as crabs and crayfish but also shrimp and even frogs.

**When the crustaceans are eaten raw or undercooked**, the metacercariae that is the infective stage for several mammals will excyst in the intestine and penetrate their way through the intestinal wall, peritoneum, diaphragm and pleura - eventually reaching the lungs and completing the cycle. The incubation period is 65 to 90 days.



### Signs and symptoms

When worms reach the lungs, symptoms in humans may include chronic cough with blood-stained sputum, chest pain with difficult breathing and fever; pleural effusion and pneumothorax are possible complications.

**Symptoms and signs mimic those of tuberculosis or lung cancer**, and paragonimiasis should always be suspected in patients with tuberculosis who are non-responsive to treatment.

Usually, parasites in the lungs of cats and dogs are not of great importance and respiratory signs are comparatively rare. Some parasites might lodge in the brain or other organs causing more severe damage.

Individual diagnosis is made based on the clinical picture, on the recall of consuming raw crustaceans, on the detection of eosinophilia and on the typical findings of ultrasound, X-ray, computed tomography or magnetic resonance imaging scans. Tests to rule out tuberculosis should always be conducted.

Confirmation of diagnosis and monitoring of interventions rely on parasitological, immunological, and molecular techniques.

Diagnosis in animals is mainly based on microscopy.



### Treatment

**Triclabendazole** and **praziquantel** are both WHO-recommended medicines for treatment of paragonimiasis in humans.

Triclabendazole is preferred for the simplicity of its regimen, which ensures higher compliance with treatment.

Praziquantel can be used in animals.



### Public health prevention and control

**1. Preventive chemotherapy** with a single oral dose of triclabendazole in communities where cases of paragonimiasis appear to be significantly clustered

**2. Prevention and control in animals**

Treatment of domestic animals, such as pigs, cats and dogs

**3. Water, sanitation and hygiene (WASH)**

Reduce contamination of freshwater streams with faeces and sputum by improving sanitation and promoting toilet use in endemic areas

**4. Risk communication** proper cooking of crustaceans and food handling



### Detection and diagnosis