



**COUNTY OF ORANGE
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**PUBLIC HEALTH
EPIDEMIOLOGY & ASSESSMENT
Paragonimiasis (Lung Fluke)**

What is paragonimiasis?

Paragonimiasis is a disease caused by parasites called flukes, most commonly *Paragonimus westermani*. There are other *Paragonimus* species that can cause disease in humans. The major forms of disease are pulmonary (lung) and extrapulmonary (outside of the lung, such as in the abdomen or brain).

How does infection with *Paragonimus* species occur?

These parasites have a complicated life cycle with many stages involving freshwater snails, freshwater crustaceans (crabs or crayfish), and humans or other mammals. The only stage that is infectious to humans is the one that is found in freshwater crustaceans. Humans most commonly become infected by eating raw, undercooked, salted, or pickled freshwater crabs or crayfish that contain the parasite inside a cyst. From the intestine, the parasites come out of the cyst, go into the abdomen and then into the lungs. In the lungs, the parasites mature and then start making eggs. The eggs in the lungs are either coughed up or swallowed and excreted in the feces.

What are the signs and symptoms of paragonimiasis?

This disease comes on slowly and symptoms may continue for years, sometimes as long as 20 years. In the first three weeks after ingestion, symptoms may include diarrhea, abdominal pain, cough, fever, and hives while the worms are migrating from the intestines to the lungs. The chronic symptoms of paragonimiasis are caused by the body's immune system reaction to the worms and eggs. The incubation period, or time from infection until symptoms, varies, but it usually takes about 6-10 weeks for the parasites to start making the eggs in the lungs.

The pulmonary or lung form often has no or mild symptoms. There can be chronic cough and difficulty breathing. Infection with a large number of the parasites can lead to coughing fits with blood-tinged sputum; the sputum may be brown because of the *Paragonimus* eggs being coughed up. Other complications include fluid in the lining of the lung (pleural effusion), air leak (pneumothorax) in the space surrounding the lung, and chronic lung inflammation and scarring. The infection can also affect the liver, spleen, abdomen, skin, and brain. This is called **the extrapulmonary form**. When the skin is affected, there are raised areas (nodules) that can move around; these are caused by young parasites in the worm or larval stage.

How is paragonimiasis diagnosed?

The eggs of this parasite are characteristic and may be seen under a microscope in stool, sputum, lung fluid, cerebrospinal fluid (fluid covering the brain and spinal cord), and tissue specimens from infected patients. However, the eggs may not be present until 2-3 months after infection. A blood test is also available that looks for antibodies against *Paragonimus*. Early on, blood counts may show an increase in a certain type of cell, called an eosinophil, which often is associated with parasitic infections.

How is paragonimiasis treated?

There is a drug available called praziquantel that is effective for treatment of this infection in the lungs. The usual treatment course is 2 days. Another drug, bithionol, is also available.

How can I prevent infection with *Paragonimus* species?

These types of infections are rare in the United States and are much more common in Asia. Some species do occur in the Americas and Africa. Cooking of freshwater crabs and crayfish until the flesh is pearly and opaque will kill the infectious form of the parasite.