

What is Rat Lungworm Disease?



The rat lungworm, *Angiostrongylus cantonensis*, can cause a disease called angiostrongyliasis, which can affect the brain and spinal cord.

Symptoms may include severe headache, stiffness of the neck and back, skin tingling, pain and sensitivity, sensitivity to light, hallucinations, nausea, vomiting and sometimes coma and death. *Symptoms will vary from person to person.*



Cuban Slug



Semi Slug

Foods such as raw produce, raw or undercooked snails, freshwater prawns, crabs and frogs can be contaminated by an unseen parasite *Angiostrongylus cantonensis* (*rat lungworm*). Fish are not known to carry this parasite. The rat lungworm is found most often in snails and slugs and has also been found in the flatworm. The worm infects rats, which pass the parasite to snails, slugs, freshwater prawns, crabs and frogs. Humans become infected by ingesting an infected host.



Baby Semi Slug on nickel



Giant African Snail

Prevention

DO NOT eat raw foods contaminated with the slime from snails or slugs or visible snail or slugs. **RINSE PRODUCE** in potable water completely, and boil snails, freshwater prawns, crabs, and frogs for **AT LEAST 3-5 MINUTES**. Do not handle snails and slugs with bare hands. Control slugs and snails at your residence.

Cover your catchment tanks to prevent slugs and snails from having access. Controlling rodents can also help control the rat lungworm. Visit our website for more prevention methods

If you think you may have angiostrongyliasis, see your health care provider and let him/her know of your exposures.

For more information call the Hawai'i District Health Office Disease Investigations office: 808-933-0912 or see CDC website: <https://www.cdc.gov/dpdx/angiostrongyliasis/index.html>



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Angiostrongyliasis (Rat Lungworm)

What is angiostrongyliasis?

Angiostrongyliasis, also known as rat lungworm, is a disease that affects the brain and spinal cord. It is caused by a parasitic nematode (roundworm parasite) called *Angiostrongylus cantonensis*. The adult form of *A. cantonensis* is only found in rodents. However, infected rodents can pass larvae of the worm in their feces. Snails, slugs, and certain other animals (including freshwater shrimp, land crabs, and frogs) can become infected by ingesting this larvae; these are considered intermediate hosts. Humans can become infected with *A. cantonensis* if they eat (intentionally or otherwise) a raw or undercooked infected intermediate host, thereby ingesting the parasite. For more information on the life-cycle of *A. cantonensis*, go [here](#).

What are its signs and symptoms?

This infection can cause a rare type of meningitis (eosinophilic meningitis). Some infected people don't have any symptoms or only have mild symptoms; in some other infected people the symptoms can be much more severe. When symptoms are present, they can include severe headache and stiffness of the neck, tingling or painful feelings in the skin or extremities, low-grade fever, nausea, and vomiting. Sometimes, a temporary paralysis of the face may also be present, as well as light sensitivity. The symptoms usually start 1 to 3 weeks after

exposure to the parasite, but have been known to range anywhere from 1 day to as long as 6 weeks after exposure. Although it varies from case to case, the symptoms usually last between 2–8 weeks; symptoms have been reported to last for longer periods of time.

How do you get it?

You can get angiostrongyliasis by eating food contaminated by the larval stage of *A. cantonensis* worms. In Hawaii, these larval worms can be found in raw or undercooked snails or slugs. Sometimes people can become infected by eating raw produce that contains a small infected snail or slug, or part of one. It is not known for certain whether the slime left by infected snails and slugs are able to cause infection. Angiostrongyliasis is not spread person-to-person.

How is it diagnosed?

Diagnosing angiostrongyliasis can be difficult, as there are no readily available blood tests. In Hawaii, cases can be diagnosed with a polymerase chain reaction (PCR) test, performed by the State Laboratories Division, that detects *A. cantonensis* DNA in patients' cerebrospinal fluid (CSF) or other tissue. However, more frequently diagnosis is based on a patient's exposure history (such as if they have history of travel to areas where the parasite is known to be found or history of ingestion of raw or

undercooked snails, slugs, or other animals known to carry the parasite) and their clinical signs and symptoms consistent with angiostrongyliasis as well as laboratory finding of eosinophils (a special type of white blood cell) in their CSF.

How is it treated?

There is no specific treatment for the disease. The parasites cannot mature or reproduce in humans and will die eventually. Supportive treatment and pain medications can be given to relieve the symptoms, and some patients are treated with steroids. No anti-parasitic drugs have been shown to be effective in treating angiostrongyliasis, and there is concern that they could actually make the symptoms worse because of the body's response to potentially more rapidly dying worms. Persons with symptoms should consult their health care provider for more information.

Prevention and Control

To prevent angiostrongyliasis, don't eat raw or undercooked snails or slugs, and if you handle snails or slugs, be sure to wear gloves and wash your hands. Eating raw or undercooked freshwater shrimp, land crabs and frogs may also result in infection, although, there has not been any documented cases in Hawaii. You should also thoroughly inspect and wash fresh produce and vegetables, especially if eaten raw. Eliminating snails, slugs, and rats found near houses and gardens might also help reduce risk exposure to *A. cantonensis*.

When preparing food for cooking, any suspect food products should be boiled for at least 3 to 5 minutes, or frozen at 5°F (15°C) for at least 24 hours; this will kill the larval stage of the worm.

For more information, see CDC's website at:
<http://www.cdc.gov/parasites/angiostrongylus/index.html>