

# How to Identify Parasites



## Roundworm *Ascaris Lumbricoide*

- The roundworm (*Ascaris*) is a parasite that lives in the small intestine. They reproduce sexually. Most nematode species have separate sexes, but some species are hermaphrodites.
- Nematodes reproduce rapidly, a single female can lay up to 200,000 eggs a day. This parasite is very common, especially in humid conditions and when hygiene measures are inadequate.
- It can affect the entire population, but mainly children, seriously altering their development and growth. It is so contagious that the WHO estimates that there are close to 700 million people infected worldwide, of which around 60,000 cases end in death each year, mainly children.



**A parasitic infection or reinfection can be acquired through one or more of the following ways:**

**More or less direct contact with an infected person (faecal or sexual).**

**Auto-infection, for example, anus-hand-mouth. Because when scratching the anal area, the eggs can lodge under the nails.**

**From mother to fetus.**

**From contaminated commonly used objects.**

**From soil contaminated with human or animal feces.**

**By eating raw or undercooked contaminated meat. Eating raw fish.**



Pinworm is the most common human worm infecting more children than adults.

Adult female worms can grow to over 12 inches in length, adult males are smaller.

Most people have no noticeable symptoms, but infection in children can cause slow growth and slow weight gain.

If you are badly infected, you may have abdominal pain. Sometimes, while the immature worms migrate through the lungs, you may cough and have shortness of breath (asthma).

If you have a severe worm infection, your intestines may become blocked.



It is a big mistake to think that we currently get infected by eating worms; we actually ingest the microscopic eggs which then hatch in our bodies.



It is very important to do a thorough cleaning of fruits and vegetables, and not to eat anything raw or straight from or off the ground, even if it looks healthy



# Tapeworm

## *Taenia saginata*

There are basically four types of Tapeworms.

1. **Pork Tapeworms:** They are transported in undercooked pork. They can affect the eyes and the brain. Once inside the body, the tapeworm egg penetrates the intestine, travels through the bloodstream and can cause an infection in the muscles, brain and eyes.

The signs and symptoms of the infection will depend on where in the body they are found. In the brain, they can cause headaches and seizures, as well as inattention, confusion, balance difficulties, and brain swelling. Serious infections can cause sudden death.

It can incubate in the human body for up to 30 years before reproducing.



Pork tapeworm

# Tapeworm

**Fish Tapeworms:** This is the largest of the species, it can grow up to 33 feet long inside the human body. This causes anemia, water retention and weight gain, as it makes the host feel uncontrollably hungry.

**Dog Tapeworms:** They are passed to us through dogs and cats by petting and grooming. The Tapeworm itself can be 428 inches (35.6ft.) long and each segment is about the size of a grain of rice. The segments look like grains of rice, corn kernels or peanuts and are hard. They have a white / slightly yellowish color. These segments are about 2 mm long and are where the tapeworm egg is contained. As the adult matures within the intestines, these segments break off and are passed in the feces.





Meat Tapeworms: They can be between 4m to 10m in length, but can reach more than 12m in length in some situations. The body is whitish in color, which is made up of four powerful suckers and can also have a lifespan of 25 years in a human intestine.

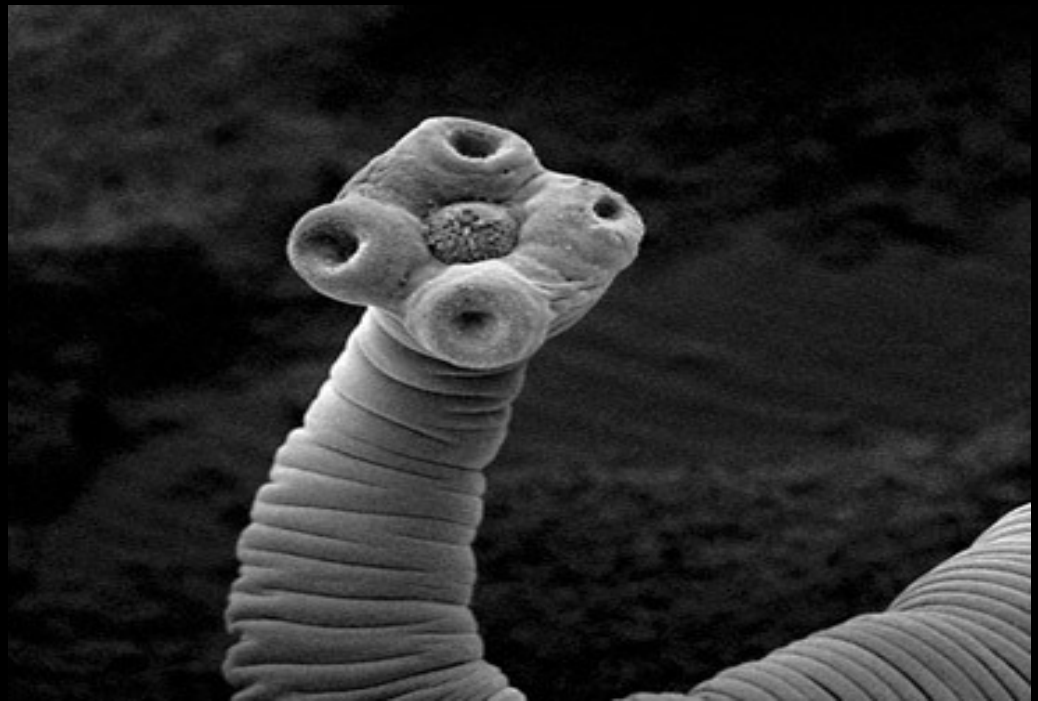
People get the infected larvae by eating undercooked meat (beef). The life cycle is indirect and complicated, and is completed with humans as the definitive host and cattle as the intermediate host. The adult worm lives in the small intestine of humans.



Once anchored to the host's intestinal wall, the Tapeworm absorbs nutrients through its skin from the host's digested food and flows through it and begins to grow a long tail. Each segment contains a separate digestive system and reproductive tract.

Older segments are pushed toward the tip of the tail as new segments are formed at the neck. Eventually, when the segment has reached the end of the tail, only the reproductive tract is left. It then falls, carrying the Tapeworm eggs to the next host.

A tapeworm produces an average of 720 thousand eggs per day



They are called rope worms because they look like twisted fibers of a rope. The color of the rope worm depends on the food the person eats and varies from white to black.



The rope parasite has only recently been discovered, and has not yet been classified. Unlike other parasites, the rope worm does not have intermediate stages outside the body, it lives and dies inside the person. These anaerobic parasites resemble human feces, and dry out when they are out of the human body and come into contact with air.



The adult rope worm reaches more than a meter in length. Greater than the regular length of the fecal contents.



## Ropeworm *funis parasitus*

**Phylum:**  
unknown

They twist like a corkscrew, increasing their cross section, blocking the lumen of the intestine. This is also how rope worms squeeze the juice out of fecal matter and feed on it by osmosis. They are most active at night, between 1 and 6 in the morning.



5th stage: Adult Stage

**Phylum:** unknown



Rope parasites have five growth stages:

- First stage: viscera mucus
- Second stage: Viscera mucus (w / bubbles)
- Third stage: Jellyfish type, branched form
- Fourth stage: Long and thin body
- Fifth stage: Slimy - fully formed adult with head and tail (see following pages)

Once washed with the water from the feces, they produce a very strong and distinctive odor.



They adhere to the wall of the intestine by suction cups located on the head. They move by jet propulsion thanks to the gas bubbles they emit. This process manifests itself in humans through flatulence and distention of the stomach during or after enemas.

They participate in the digestion process by consuming the fecal content, depriving the person of vital nutrients and generating toxins through their own waste. They also produce toxic slime and fecal stones.



## 4th Stage

Fourth Stage: Rope parasites resemble fifth stage adults but have a softer, thinner body. Those of the fourth and fifth stage feed on blood. They can emit bubbles to form future attachment heads. They also feed on human blood.



The third stage: Branch Jellyfish. Rope parasites are often mistaken for the remains of other decaying parasites, such as Ascaris worms, or the intestinal lining. Rope parasites release toxins into the intestinal tract and bloodstream, suppressing the immune system and causing multiple symptoms in humans. Once an adult parasite attaches to the intestinal wall, the human body has no mechanisms to get rid of it. This substance helps parasites adhere to the walls of the intestines and protects them from proteolytic enzymes.

3rd Stage Branch Jellyfish Form



## Ropeworm *funis parasitus*

Second Stage Viscous  
Mucus with Bubbles

The second stage resembles viscous mucus and emits bubbles, which are then used as attachment points to adhere to the intestinal wall.



The first stage of rope parasites is mucus. They can lodge in any part of the human body.

First stage  
viscous mucus





On the right, you will see a photo showing a viscous toxic substance that has a characteristic odor. This occurs when they get irritated by spicy, hot or cold food, etc. It is quite possible that this slime protects the parasites from the immune response of the human body. This slime release is seasonal, and can travel up the intestinal tract, reaching the lungs and respiratory tract.

Adult rope parasites also produce fecal stones. The stones have bright spots that resemble sesame seeds. At this time it is not clear what the function of fecal stones is. This could be reproductive or simply a source of food storage for the future.



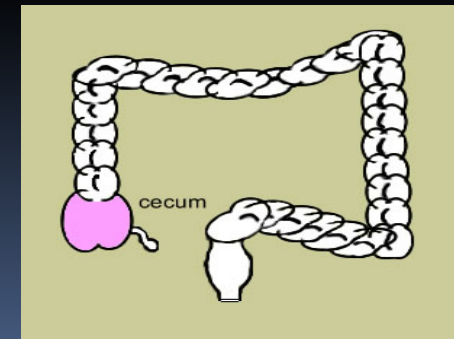
Fecal Stone

The Bright Stains are Fecal Stones



## Whipworm *Trichuris trichiura*

The whipworm can cause an infection in the cecum, appendix, colon, and rectum of humans. In its shape it resembles a whip with wide "handles" at the rear end. The infection is caused by ingestion of eggs (normally found in dry products such as beans, rice and various grains) and is more common in warm areas. They attach to the host through their thin anterior end and feed on tissue secretions rather than blood. The eggs hatch in the small intestine and upon reaching adulthood, the thinner end (the front part of the worm) penetrates the large intestine and the thicker end hangs down into the lumen and mates with nearby worms.



**Cecum: Pouch that marks the beginning of the Large Intestine**

Each female produces 2,000 - 10,000 eggs per day and each adult can live for several years. When the eggs are passed through their feces (invisible), they are able to live for three weeks without a host. If you touch an object (market basket, salt shaker, doorknob, etc.) that has an egg on it, and then put your fingers in your mouth, you are already infected. The life cycle from the time of ingestion of the eggs to the development of mature worms takes approximately three months. Females can reach up to 50mm (2 inches) long, with the smallest males being 30 - 45mm in length.



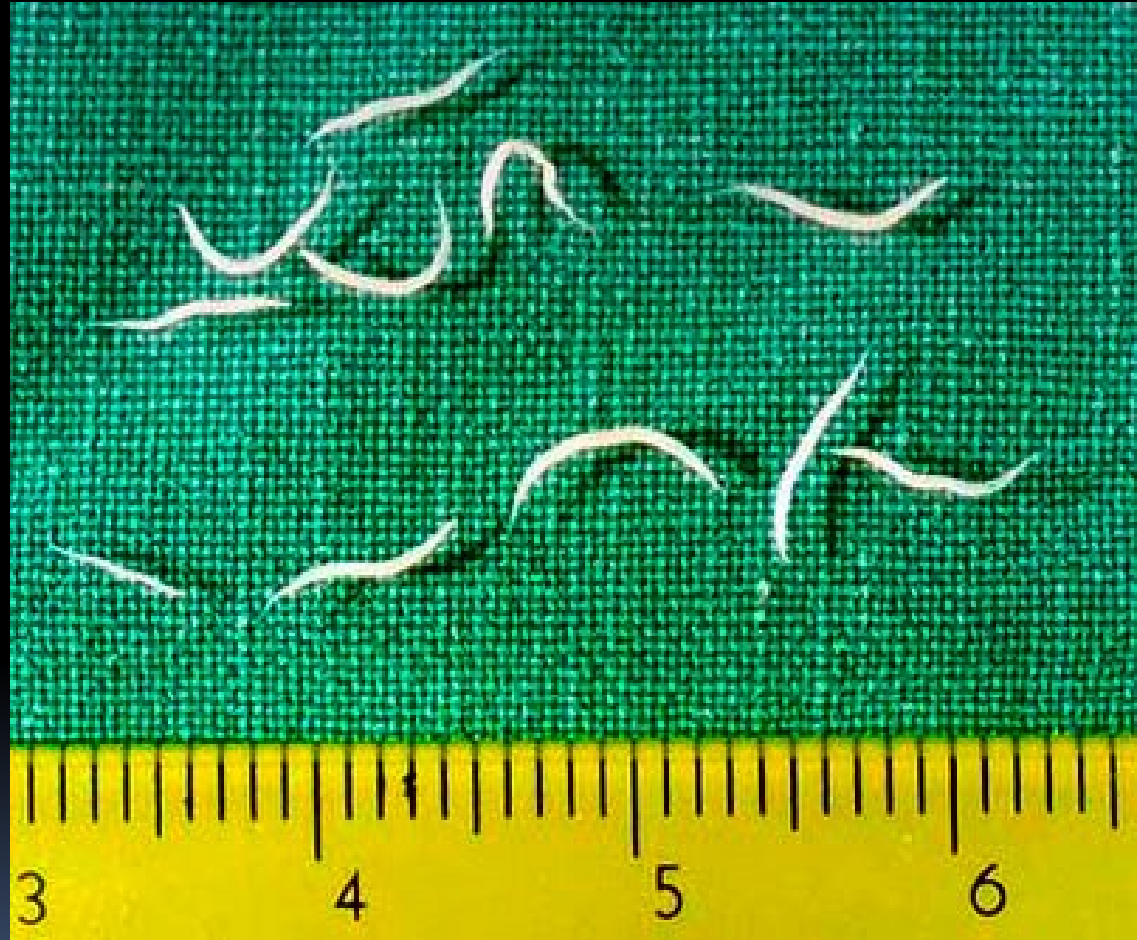
## pinworms

Pinworms are also known as roundworms (in the UK) or seatworms in the US.

Pinworms are elongated in shape, white in color, and about a half-inch long. Humans are the only hosts for pinworms. It is common for children to be re-infected in schools through contact with other people, or from the anus-hand-mouth because when scratching the anal area the eggs can lodge under the nails. They inhabit the large intestine of humans.

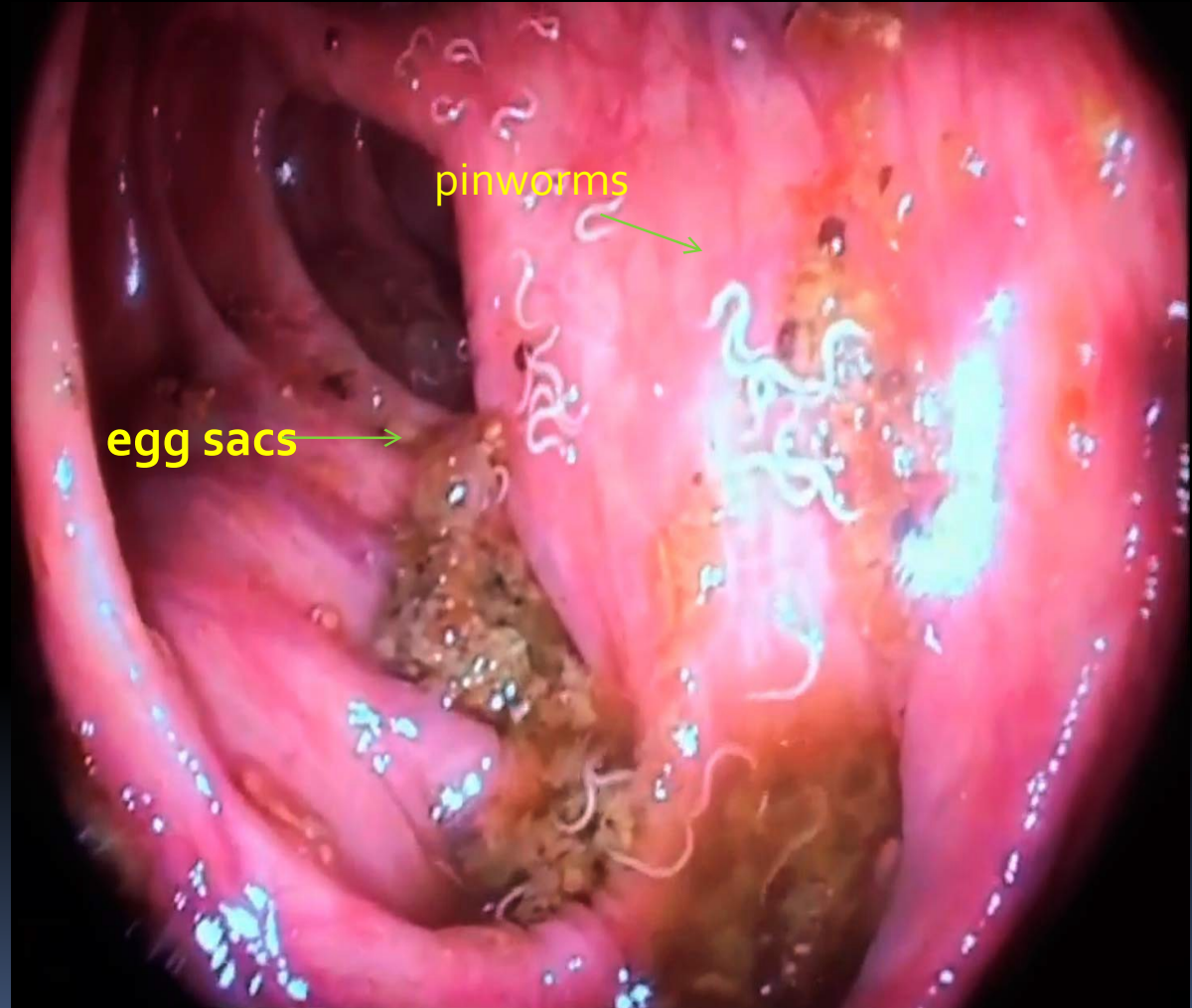
Female pinworms lay eggs around the anus. The eggs are laid between the folds of the anus. Once laid, the eggs are infectious for up to 20 days. Once in the intestine, it takes five to eight weeks to develop into adult worms.

## Pinworm *Enterobius Vermicularis*



## 58-year-old male patient, egg sacs and pinworms can be seen

The most important symptom is intense itching that occurs in the anal area, especially at night. In women, swelling of the vulva area is very common. A pinworm infection, generally speaking, is not very serious. Person-to-person transmission is through handling clothing, bedding, towels, and environmental surfaces (such as curtains, rugs) contaminated with pinworm eggs, which are so light they are able to move in the air. A small number of eggs can be integrated into airborne particles which, when inhaled, follow the same developmental process as ingested eggs..



## Hookworms

Hookworms come from contaminated food and water. The eggs hatch in the intestines and then migrate through the bloodstream to the lungs, where they are then coughed up and swallowed. They then travel back to the small intestine to reproduce. In the lungs they can cause pneumonia. In the intestines, they latch onto the intestinal walls, where they each drink up to 1cc of blood per day causing bleeding and tissue death, not to mention anemia and weakness. Dog and cat hookworms penetrate human skin and stay there causing skin problems and rashes, including edema. We acquire them from licking of pets on our skin or by petting them.



The male hookworm is generally 5 to 9mm long and the female about 1cm long.

Hookworms can also cause asthma, eye pain, insomnia, and dry skin and hair. Once in the host intestine, they can cause prolonged infection and many die within a year or two of infection, although some adult worms have been recorded to live for 15 years or more.

They mate within the host. Females lay up to 30,000 eggs per day and about 18 to 54,000,000 eggs during their lifetime, which are passed through feces.

It is now widely accepted that children suffering from chronic hookworm infection suffer from growth delay as well as intellectual and cognitive impairments.



## Trematodes (Flukes)

There are 4 types of Trematodes:

### 1. Liver flukes:

(*Clonorchis sinensis*): Currently, this species eats the liver and blood causing problems with fat metabolism and systemic inflammation. The longer they live in the liver, the darker their color becomes because blood from the liver stains their skin.

### 2. Pulmonary flukes

(*Paragonimus westermani*):

It causes irritation and inflammation in the upper respiratory tract, the symptoms mimic that of a bacterial or viral infection (asthma).

### 3. Blood flukes

(*Schistosoma*): They travel throughout the human body and to all organs, including the brain and spinal cord. They can cause seizures and destroy red blood cells.





#### 4. Intestinal flukes (Fasciolopsis buski):

A mature trematode might be as little as 2 cm long, but the body can reach a length of 7.5 cm and a width of 2.5 cm. It is a common parasite in humans and pigs. They generally inhabit the intestine rather than the liver, and generally occupy the upper region of the small intestine.

Flukes are the most difficult parasites to eliminate, so much so that they can remain in the human body for 10 - 20 years with each adult fluke living for one year.

Flukes come from raw fish, raw water plants (such as watercress), and are carried by dogs, cats, and other fish-eating animals. They are also found in beef, chicken, pork, and unwashed vegetables.



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