PARASITE IDENTIFICAION SLIDES

This chart was created for all the dedicated Mom's out there that are working hard to recover their children from Autism

Thank you!

Andreas Kalcker, Kerri Rivera and Jim Humble

for all your Dedication and hard work

Phylum:
Nematoda

Roundworm
Ascaris Lumbricoide

- **Roundworm** *(Ascaris)* **is a parasite that lives in the small intestine.** They reproduce sexually. Most species of roundworms have separate males and females, but a few species are hermaphrodites
- Roundworms reproduce quickly, **a single female can lay up to 200,000 eggs each day.** This parasite is very common, especially in damp conditions, & when hygiene measures are inadequate
- It can affect the entire population**, but mostly affects children, seriously disrupting their development and growth**
- It's so infectious that the WHO estimates **that there are about 700,000,000 people infected worldwide, of which around 60,000 cases end in death per year, mainly children**

Phylum:
Nematoda

Roundworm
Ascaris Lumbricoide

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

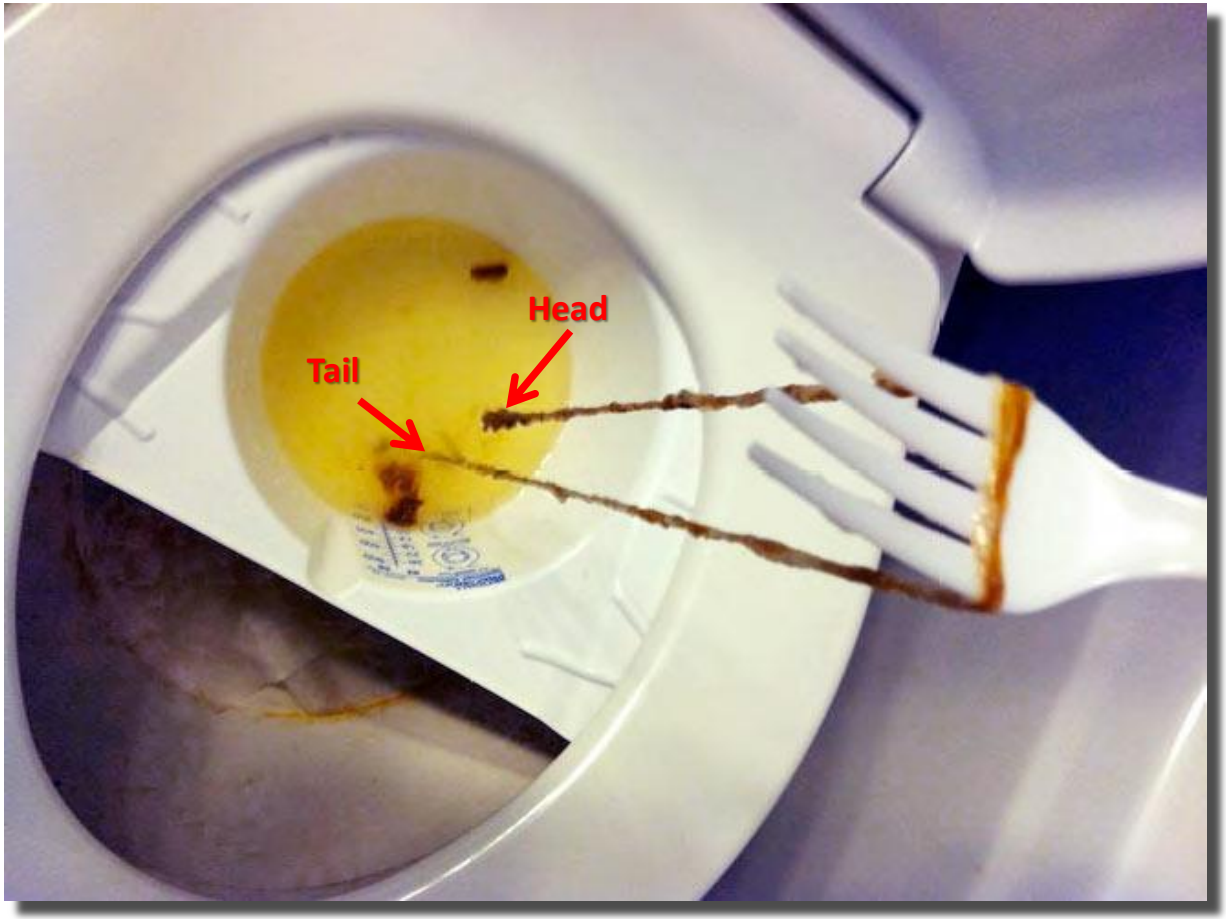
1) from more or less direct contact with an infected person (fecal or sexual)
2) from self-infection, for example, through anal to hand to mouth contact because by scratching the anal area, eggs can become lodged under the fingernails.
3) from mother to fetus
4) from commonly contaminated objects
5) from soil contaminated by human or animal feces
6) from eating contaminated raw or undercooked meat
7) from eating raw fish

A Roundworm that came out in pieces

Phylum:
Nematoda

Roundworm
Ascaris Lumbricoide

- **The roundworm is the most common human worm that infects more children than adults**
- Adult female Roundworms can grow to over 12” in length, adult males being smaller. Most people have no symptoms that are noticeable, but infection in children may cause slower growth and slower weight gain
- **If you are heavily infected, you may have abdominal pain**
- Sometimes, while the immature worms migrate through the lungs, you may cough and have difficulty breathing (Asthma)
- If you have a very heavy worm infection, your intestines may become blocked



Phylum:
Nematoda

Roundworm
Ascaris Lumbricoide

It is a big misconception that we actually eat worms to become infected – we actually ingest the microscopic eggs which then hatch in our bodies

Phylum:
Nematoda

Roundworm
Ascaris Lumbricoide

It is very important to do a thorough cleaning of fruits and vegetables, and never eat anything raw and straight from the ground, however healthy it may seem

Phylum:
Platyhelminthes

Tapeworm
Taenia saginata

There are Basically 4 Types of Tapeworms

1. **Pork Tapeworms:** are carried by undercooked pork. They can affect the eyes and the brain. Once inside the body, the tapeworm egg hatches, penetrates the intestine, travels through the bloodstream and may develop an infection in the muscles, brain or eyes.
- Signs and symptoms of infection will depend on where in the body they are located. In the brain, they cause headaches and seizures as well as lack of attention, confusion, balance difficulties and swelling of the brain. Heavy infections can cause sudden death.
- **They can incubate in the human body for up to 30 years before reproducing**

Pork Tapeworm

Phylum:
Platyhelminthes

Tapeworm
Taenia saginata

2. **Fish Tapeworms:** this is the largest of the species**, it can grow to 33 feet in length inside the human body.** It causes anemia, water retention and weight gain as it makes the host uncontrollably hungry
3. **Dog Tapeworms:** are passed along to us from cats and dogs through petting and grooming. **The tapeworm itself can measure 428 in. (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 2mm long and are what contains the tapeworm eggs
- As the adult matures inside the intestines, these segments break off and pass in the stool

Fish Tapeworm

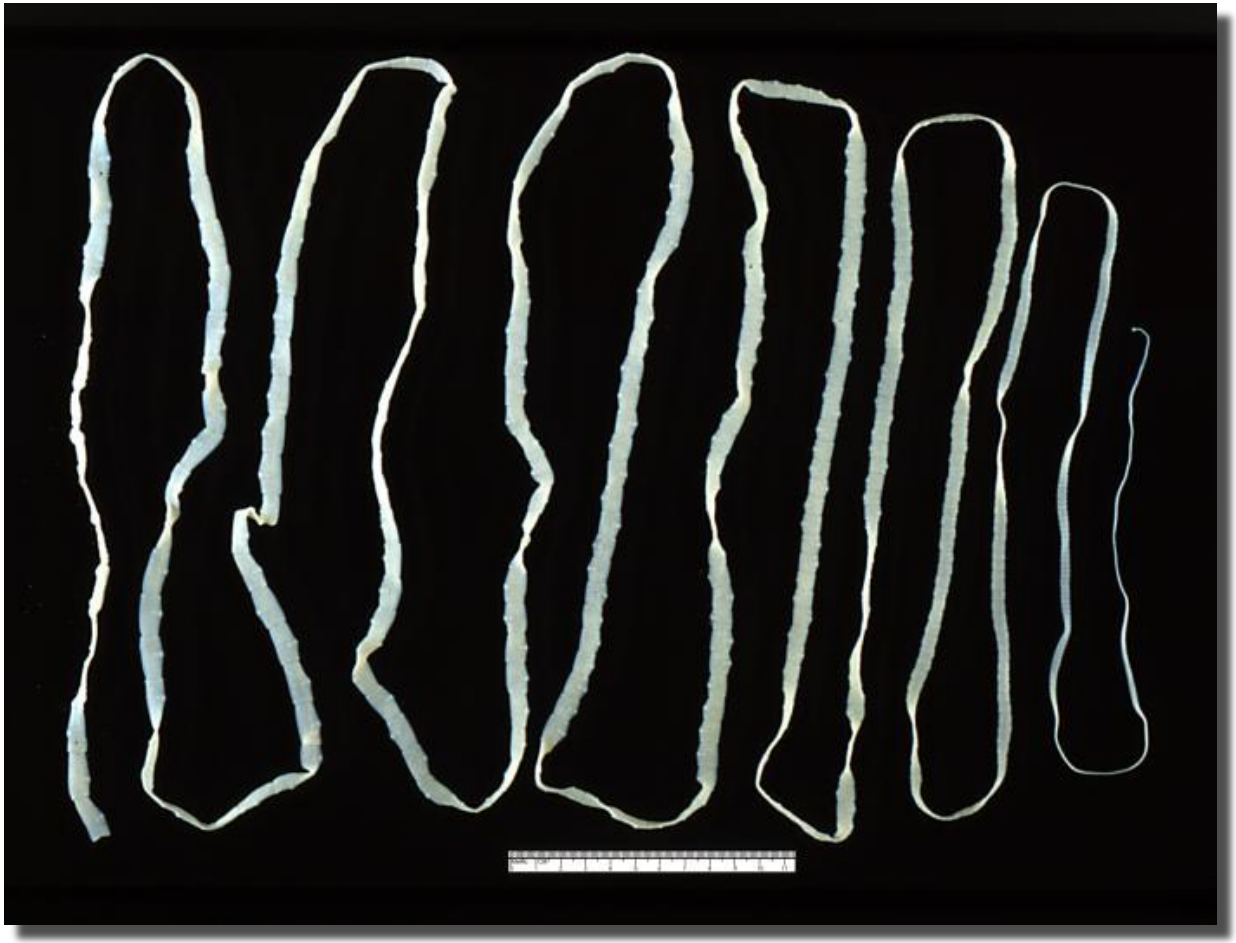
Phylum:
Platyhelminthes

Tapeworm
Taenia saginata

4. Beef Tapeworms –are **4 m to 10 m in length,** but can become very large measuring over 12 m long in some situations. The body is whitish in color, It is composed of four powerful suckers and can also **have a lifespan of 25 years in a human intestine.** People acquire the infective larvae from eating undercooked meat (beef)

- The life cycle is indirect and complicated, and is completed in humans as the definitive host and cattle as the intermediate host.
- **The adult worm inhabits the small intestine of humans**

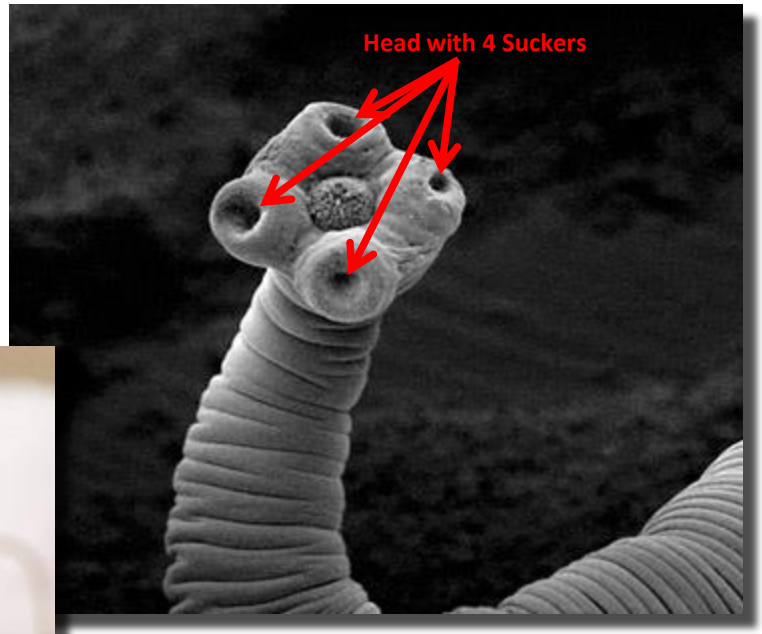
Beef Tapeworm



Phylum:
Platyhelminthes

Tapeworm
Taenia saginata

- Once anchored to the host's intestinal wall, the tapeworm absorbs nutrients through its skin as the food being digested by the host flows past it and it begins to grow a long tail, with **each segment containing an independent digestive system and reproductive tract.** Older segments are pushed toward the tip of the tail as new segments are made by the neckpiece. By the time a segment has reached the end of the tail, only the reproductive tract is left. It then drops off, carrying the tapeworm eggs to the next host
- **A tapeworm produces an average of 720,000 eggs per day**



Phylum:
unknown

Ropeworm
funis parasitus

- They are called rope worms because they look like twisted fibers of a rope. **A Ropeworms color depends on the food a person eats, and varies from white to black.**
- The Ropeworm parasite has just recently been discovered, and it has yet to be classified. Unlike other parasites, the Ropeworm doesn't have intermediate stages outside the body, it lives and dies within the human. These anaerobic parasites resemble human feces, and dry out outside the human body in air.
- **Adult Ropeworms reach over a meter in length,** exceeding a typical length of the fecal contents

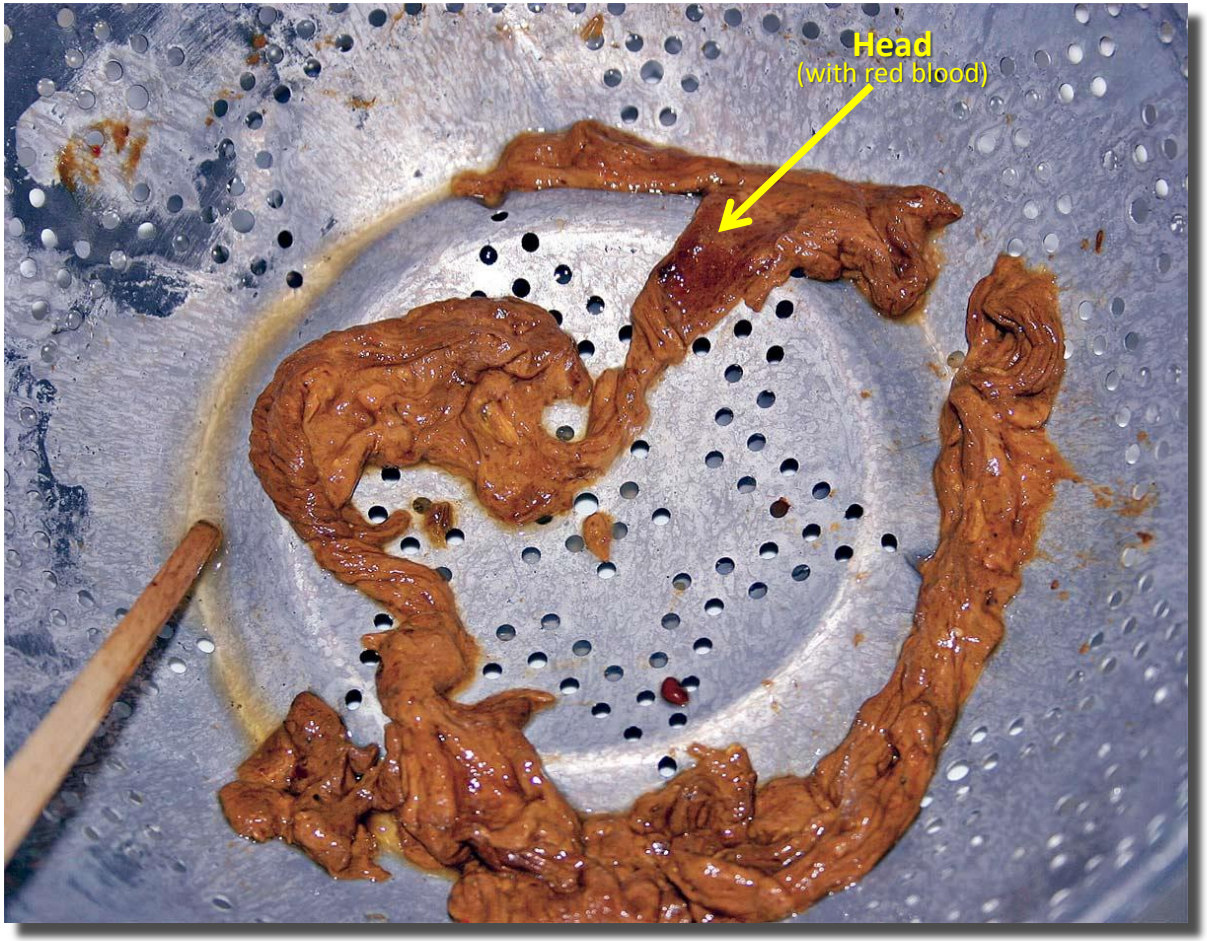
5th Stage Adult

Phylum:
unknown

Ropeworm
funis parasitus

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

5th Stage Adult



Phylum:
unknown

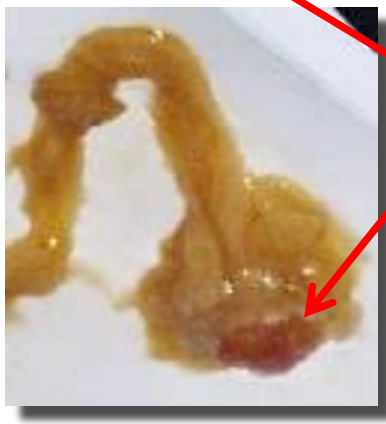
Ropeworm
funis parasitus

Rope Parasites Have 5 Stages of Growth

1st stage – Viscus Mucus
2nd stage – Viscus Mucus (w/bubbles)
3rd stage – Branched Jellyfish shape
4th stage – Longer body, slimy
5th stage – Fully formed adult with head & tail
(see following pages)

- Once washed with water from feces, they produce a very strong distinct scent
- They attach to the wall of the intestine using suction cups positioned at the head
- They move by jet propulsion emitting gas bubbles . This process is manifested in humans by flatulence and stomach bloating during or after enemas
- They participate in the digestion process by consuming fecal contents, striping humans of vital nutrients, and generating toxins as their own waste in return
- They also produce toxic slime and fecal stones (see page 17)

5th Stage Adult

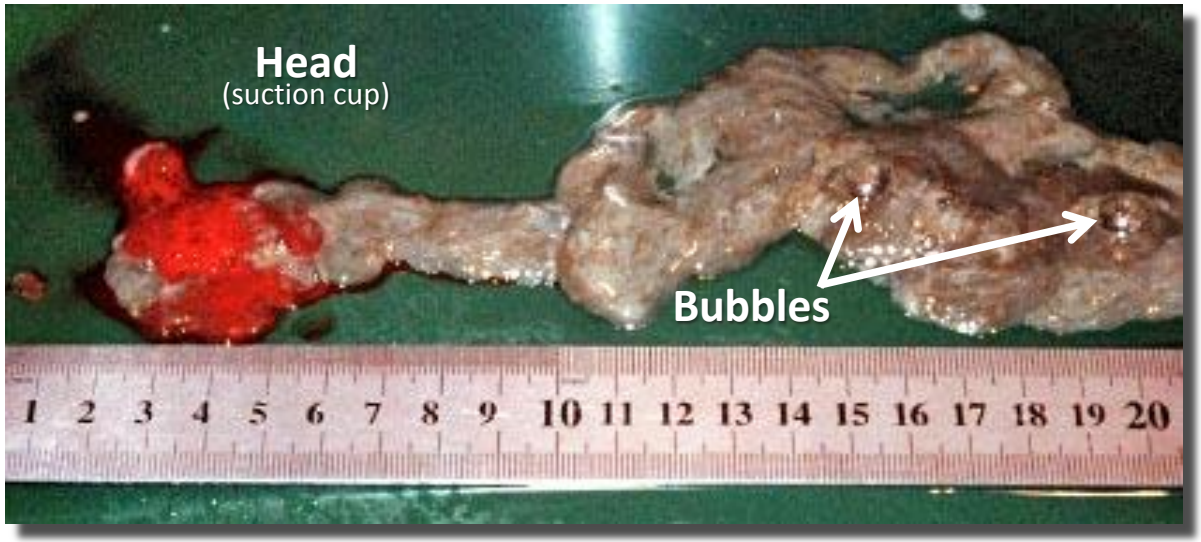


Phylum:
unknown

Ropeworm
funis parasitus

- **4th stage** Rope Parasites look similar to 5th Adult Stage, but, they have a softer, slimier body
- Both 4th & 5th stage feed on blood. They can emit bubbles to form future attachment heads
- **They also feed on human blood**

4th Stage



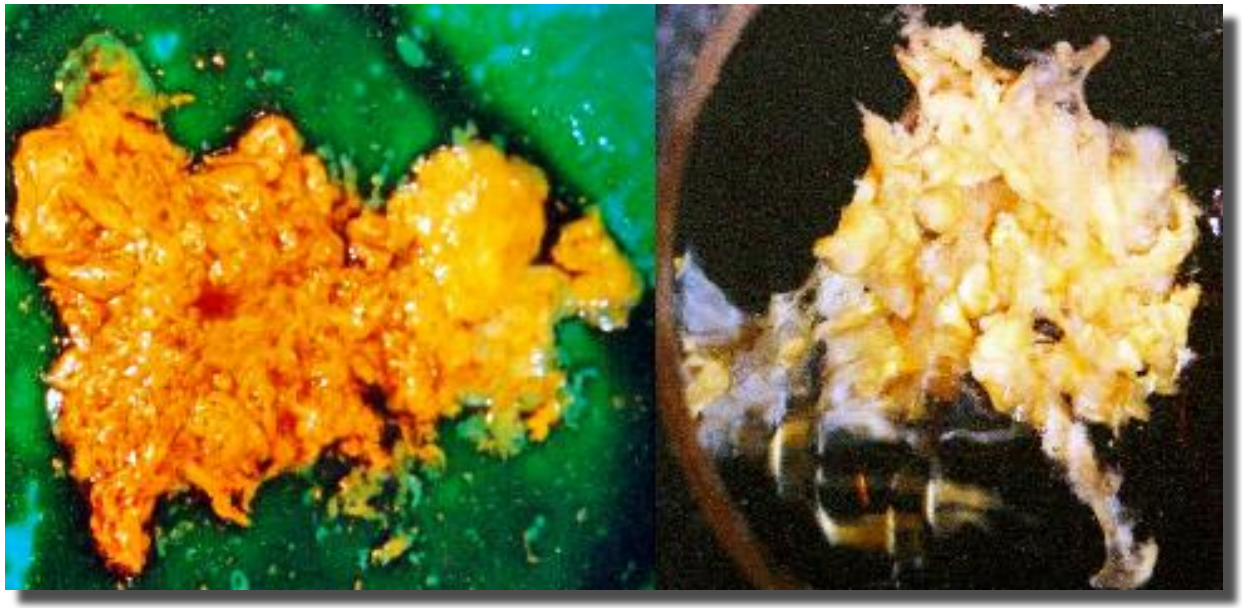
Phylum:
unknown

Ropeworm
funis parasitus

The 3rd Stage:
Branched Jellyfish

- Often the rope parasites are mistaken for the remains of other decayed parasites, such as Ascaris worms, or the intestinal lining
- Rope parasites release toxins in the intestinal tract, and the blood stream, suppressing immune system and causing multiple symptoms in humans
- **Once an adult parasite is attached to the intestinal wall, the human body doesn't have mechanisms to get rid of it**
- This substance helps parasites attach to the lining of the intestines and protects them from proteolytic enzymes

3rd Stage
Branched Jellyfish Shape



Phylum:
unknown

Ropeworm
funis parasitus

- **The 2nd stage** resembles slimy viscous mucus, and emits bubbles, which are later used as attachment points to adhere to the intestinal wall
- **The 1st stage** of the rope parasites is mucus. It can be hosted almost anywhere in the human body

2nd Stage
Viscous Mucus with Bubbles

1st Stage
Viscous Mucus

Phylum:
unknown

Ropeworm
funis parasitus

- On the right, you will see a photo showing a toxic, slimy, acrid substance, which has a distinct smell. This happens when they are irritated by spicy food, heat or cold, etc.
- It is quite possible that this slime protects the parasites from the human body's immunological response
- **This slime release is seasonal, and can travel up the intestinal tract, reaching lungs and airways**
- Adult Rope Parasites also produce fecal stones. The stones have bright spots, which resemble sesame seeds
- At this point, it's not clear what the function of the fecal stones are, which could be reproductive or simply future food source storage

Ropeworm Parasite
Releases Toxic Slime & Fecal Stones

Phylum:
Nematoda

Whipworm
Trichuris trichiura

- The Whipworm can cause an infection in the cecum, appendix, colon & rectum in humans. It ‘s shape looks like a whip with wider "handles" at the posterior end
- Infection occurs through ingestion of **eggs (which are usually found in dry goods such as beans, rice, and various grains)** and is more common in warmer areas.
- They attach to the host through their slender anterior end and feed on tissue secretions instead of blood.
- The eggs hatch in the small intestine and on reaching adulthood, the thinner end (the front of the worm) burrows into the large intestine and the thicker end hangs into the lumen and mates with nearby worms

Phylum:
Nematoda

Whipworm
Trichuris trichiura

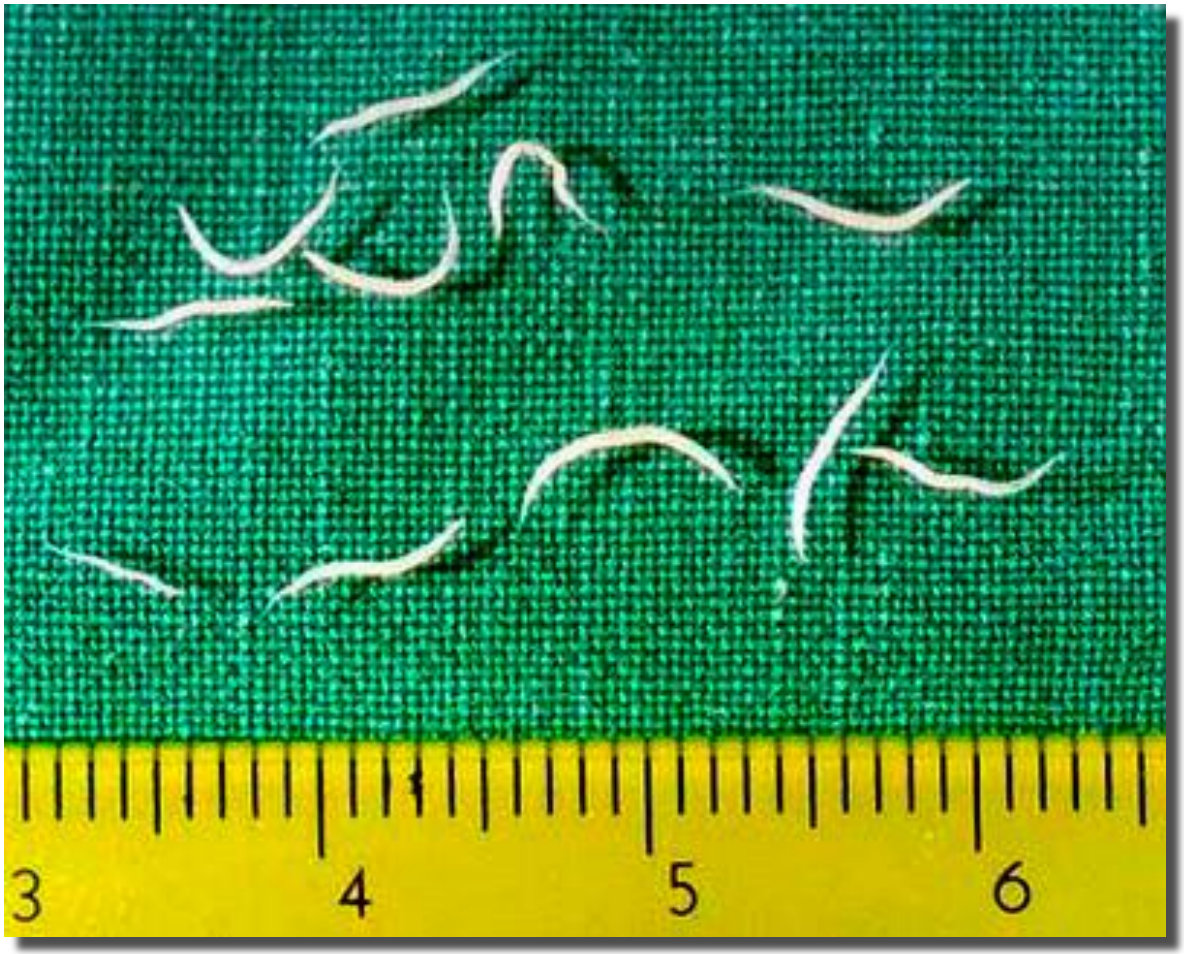
- **Each female produces 2,000 - 10,000 eggs per day** and each adult can live for several years.
- When the eggs are passed out through your feces, (unseen) they are able to live for three weeks without a host. If you touch an object (public shopping cart, salt shaker, doorknob, etc.) that has an egg on it, then put your finger in your mouth – you are infected.
- The life cycle from time of ingestion of eggs to development of mature worms takes roughly three months.
- **The females can grow to 50 mm (2 inches) long, and the smaller males are 30 – 45mm in length.**

Phylum:
Nematoda

Pinworm
Enterobius Vermicularis

Pinworms are also known as a Threadworm (in the UK) or Seatworm in United States

- Pinworms have an elongated shape, **are white, and about ½" long**
- Humans are considered the only host of Pinworms
- It is common for children to become re-infected in schools, through contact with others, or through anal to hand to mouth contact because by scratching the anal area, eggs can become lodged under the fingernails
- **They inhabit the large intestine of humans**
- Female pinworms leave eggs around the anus. Eggs are laid between the folds of the anus. Once deposited, the eggs are infectious for a period of up to 20 days. Once in the intestine, it takes between five and eight weeks to develop into adult worms

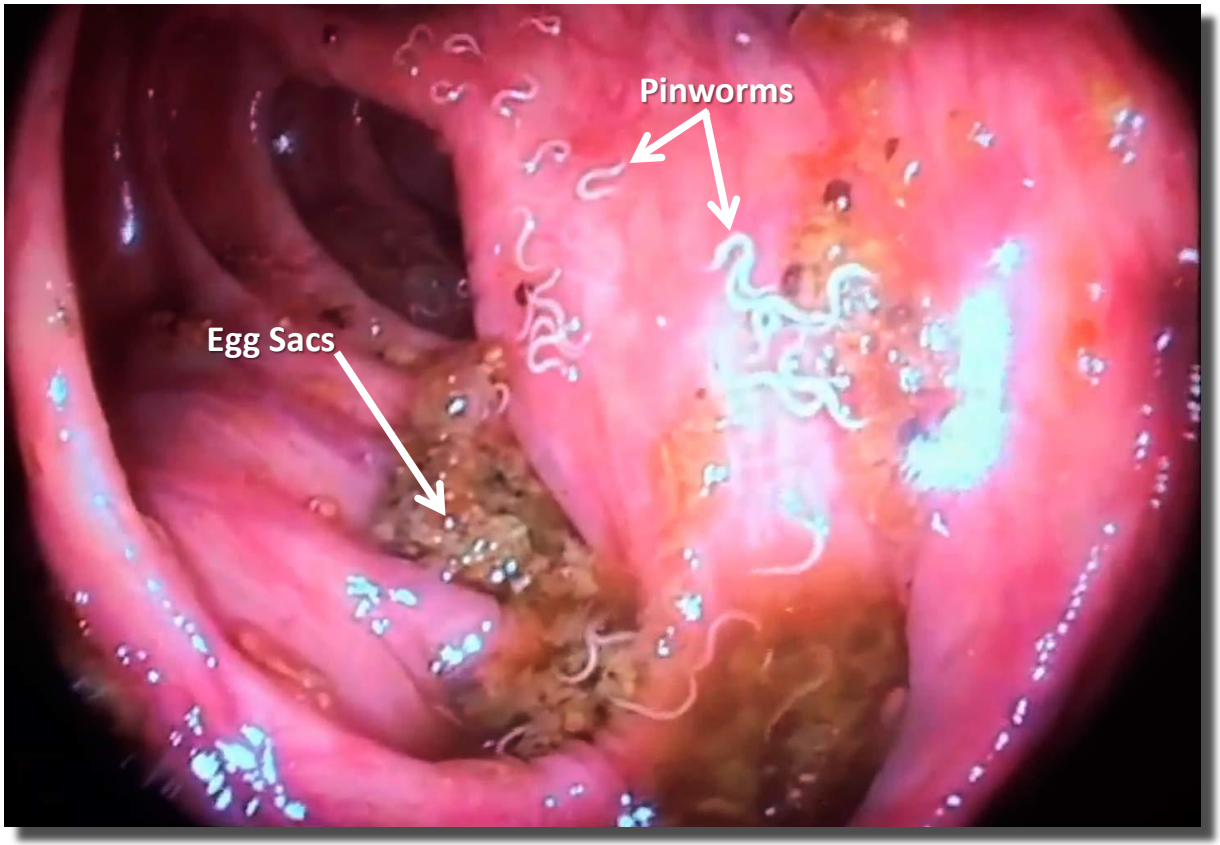


Phylum:
Nematoda

Pinworm
Enterobius Vermicularis

- The most important symptom is intense itching that occurs in the anal area, especially at night. In women, inflammation of the vulvar area is very common
- A pinworm infection is, generally speaking, not very serious
- Transmission from person-to-person happens by handling clothing, bed sheets, towels, and environmental surfaces (such as curtains, carpeting) contaminated with pinworm eggs, which are so light that they are able to become airborne
- A small number of eggs can be integrated into air particles that when inhaled follow the same developmental process as ingested eggs

58 Year old male with pinworms & egg sacs



Phylum:
Nematoda

Hookworm
Necatar Americanus

- Hookworms come from contaminated food and water. The eggs hatch in the intestines then migrate to the lungs through the bloodstream where they are 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 hook themselves into the intestinal walls where **each one drinks up to 1cc of blood per day causing bleeding and tissue death**, not to mention anemia and weakness
- Hookworms from dogs and cats penetrate human skin and stay there causing skin problems and rashes including edema. **We get these from pets licking us or us petting or grooming them**

Phylum:
Nematoda

Hookworm
Necatar Americanus

- The male Hookworm is usually 5 to 9 mm long and females about 1 cm long
- Hookworms also cause asthma, eye pain, insomnia, and dry skin and hair. Once in the host gut, they tend to cause a prolonged infection, and many die within a year or two of infecting, though **some adult worms have been recorded to live for 15 years or more**
- They mate inside the host, **females laying up to 30,000 eggs per day and some 18 to 54 million eggs during their lifetime**, which pass out in their feces
- It is now widely accepted that children who suffer from chronic hookworm infection can suffer from growth retardation as well as intellectual and cognitive impairments

Phylum:
Platyhelminthes

Flukes
Clonorchis sinensis

There are 4 Types of Flukes:

1. **Liver Flukes**
   (Clonorchis sinensis)
   This species actually eats your liver and blood causing problems with fat metabolism and systemic inflammation. The longer they live in the liver, the darker in color they become because the blood from the liver stains their skin
2. **Lung Flukes**
   (Paragonimus westermani)
   Causes irritation and inflammation in the upper respiratory tract; symptoms closely mimic that of a bacterial or viral infection (Asthma?)
3. **Blood Flukes** *(Schistosoma)*
   They travel all over the human body and into all organs including the brain and spinal cord. They can cause seizures and they destroy red blood cells

Phylum:
Platyhelminthes

Flukes
Clonorchis sinensis

4. **Intestinal Fluke**
   (Fasciolopsis buski)
   A mature Fluke might be as little as 2 cm long, but the body may grow to a length of 7.5 cm and a width of 2.5 cm. It is a common parasite of humans and pigs. They generally inhabit the gut rather than the liver and generally occupy the upper region of the small intestine

- The flukes are the hardest parasites to get rid of as **they can stay in the human body for 10 – 20 years** with each adult fluke living for one year
- Flukes come from raw fish, undercooked water plants (such as watercress) and are also carried by dogs, cats and other fish eating animals. They are also found in beef, chicken, pork and unwashed vegetables