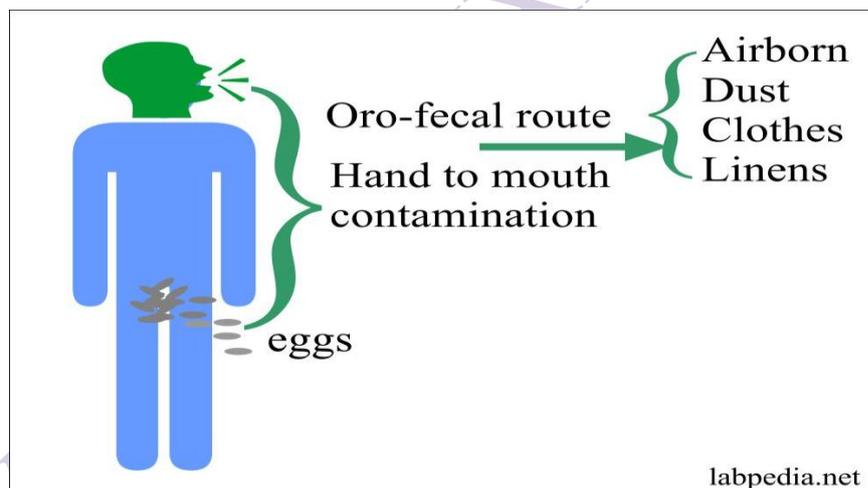


## Enterobius Vermicularis (Pinworm)

The pinworm (species *Enterobius vermicularis*), also known as threadworm (in the United Kingdom and Australia) or seatworm, is a parasitic worm. It is a nematode (roundworm) and a common intestinal parasite or helminth, especially in humans. The medical condition associated with pinworm infestation is known as pinworm infection (enterobiasis) (a type of helminthiasis) or less precisely as oxyuriasis in reference to the family Oxyuridae.

### Epidemiology

1. The member of the Oxyurida is called pinworms.
2. This is a cosmopolitan parasitic infestation and is more prevalent in the temperate climate region.
3. These are common in the orphanage and mental hospitals where the spread is easy.
4. This is the disease of school children.
5. Route of spread is oro-fecal through contaminated foods or fomites.
6. If inhaled then followed by ingestion of airborne ova. Larva hatch and migrate back into the intestine.
7. This is very common in the USA.

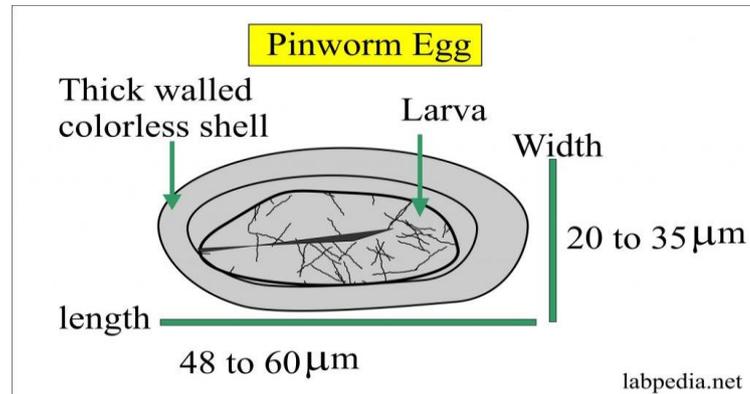


Mode of the spread of pinworm (threadworm)

### Morphology

1. *Enterobius vermicularis* also called pinworm, seatworm infection, or oxyuriasis.
2. Male measures 1 to 4 mm in length and have the posterior end curved ventrally.
3. **Egg *E. vermicularis*** measures:
  1. Eggs are oval in shape and flattened on the side.
  2. 40 to 60  $\mu\text{m}$  in length.
  3. 20 to 35  $\mu\text{m}$  in width.

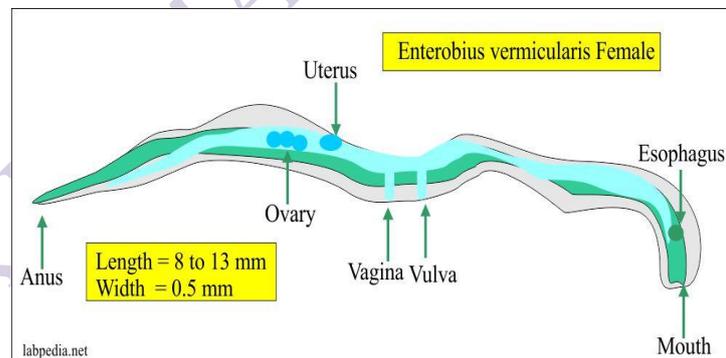
- The egg contains the developing larva surrounded by the thick-walled colorless shell.
- It contains various stages of the larva, unembryonated and embryonated eggs.



### Pinworm egg structure

#### 4. Female *E. vermicularis* (larva stage):

- 8 to 13 mm in length.
- Up to 0.5 mm in width.
- The posterior end extended into a long slender pointed end and give it the name of pinworm.
- The female has a vagina, vulva, ovary, uterus, and oviduct.
- There is a digestive and intestinal tract.
- There are mouth and anus.



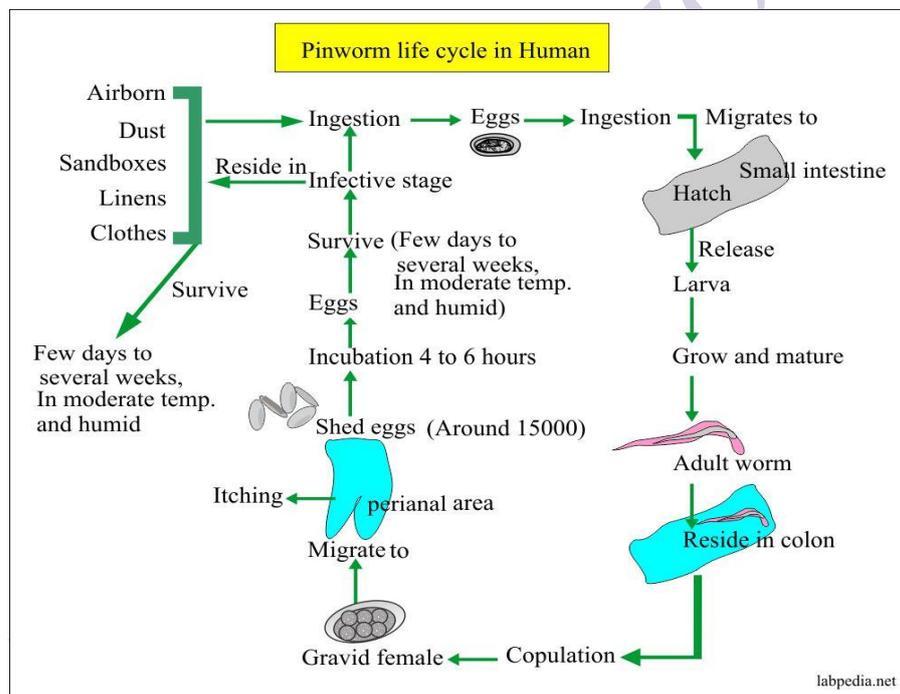
#### 5. Male *E. vermicularis* (larva stage):

- These are smaller in size than the female.
- 2 to 4 mm in length.
- 0.3 mm or less in width.

#### 1. Human cycle:

- Human is the only host of the *Enterobius vermicularis* (Pinworms).

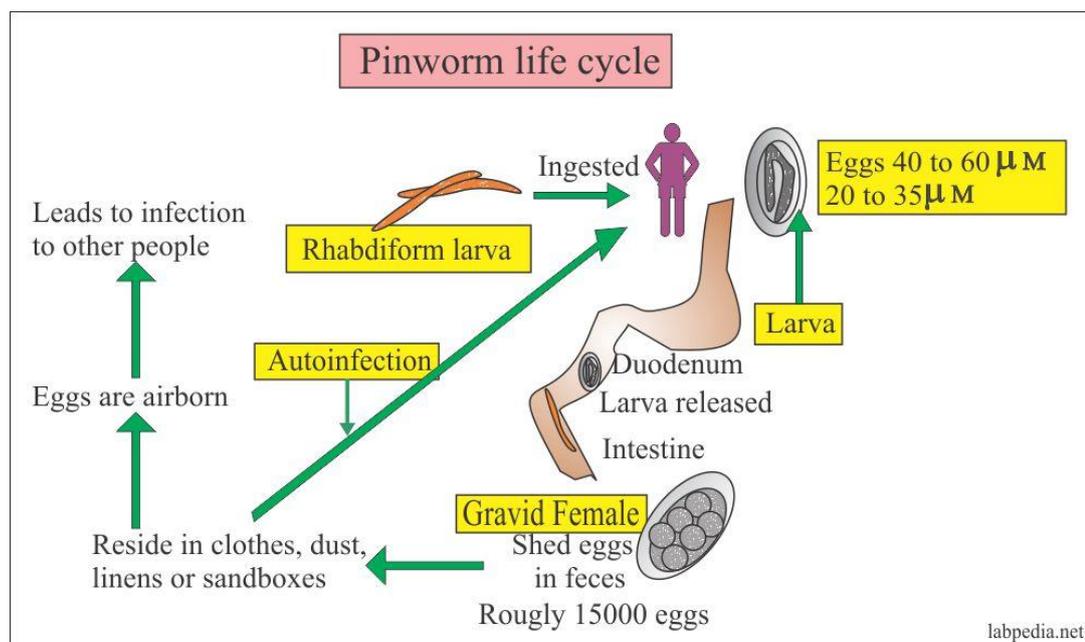
2. Infective ova contains rhabdiform larva (infective eggs) which is ingested by the human.
3. The larvae are released into the duodenum, then migrate to the lower intestine.
4. These worms attached to the mucosa of the intestine, feeding on the epithelial cells and bacteria.
  1. Habitat is the cecum and colon.
5. The copulation of the mature adults takes place in the cecum.
6. The gravid female migrates to the perianal area. It sheds ova mostly at night.
  1. The female migrates to the anus and lays the eggs on the perianal area. There may be eggs around 15,000.
  2. Following incubation of 4 to 6 hours, eggs become infective.
  3. There may be:
    1. Autoinfection.
    2. Retroinfection.



### Pinworm life cycle in the humans

2. **Non-human cycle:** Now these ova are shed into the stool and surrounding area.
  2. These ova leads to infection of other people.
  3. The ova (eggs) are present in:
    1. Dust.
    2. Sandboxes.

3. Linens.
4. Clothes.
5. Airborn.



### Clinical Symptoms

1. Children are the most common victim of pinworms.
2. It is a self-limited disease.
3. **Asymptomatic** group:
  1. Some of the patients may not have any clinical symptoms.
4. **Symptomatic** group:
  1. The most common symptoms are perianal itching and it is very intense (pruritus ani).
  2. The child may have restless sleep due to perianal itching.
  3. There may be pain, rashes or skin irritation around the anal area.
  4. The patient may have intermittent abdominal pain and nausea.
  5. In the female, there may be vaginal itching.

### Control of the Disease

1. Personal hygiene is very important.
  1. Washing of the hands and applying ointment to the perianal area to stop the spread of the eggs.
  2. Avoid scratching the infected area.
2. All bedding should be washed with hot water and clean the whole house to stop the spread of disease.
3. Children should wear tight-fitting diapers and pajama pants to prevent their contact with the perianal area. This will prevent reinfection.

## Laboratory Diagnosis

### 1. Procedure:

1. Put the cellophane tape around the anal area in cases of children. The eggs attach to the tape. Then this tape can be seen under the microscope. Perform this test for three days.
2. Or touch the slide with the tape.
3. 50% of the time tap will show ova and if you repeat this procedure three times then positivity is 90%.

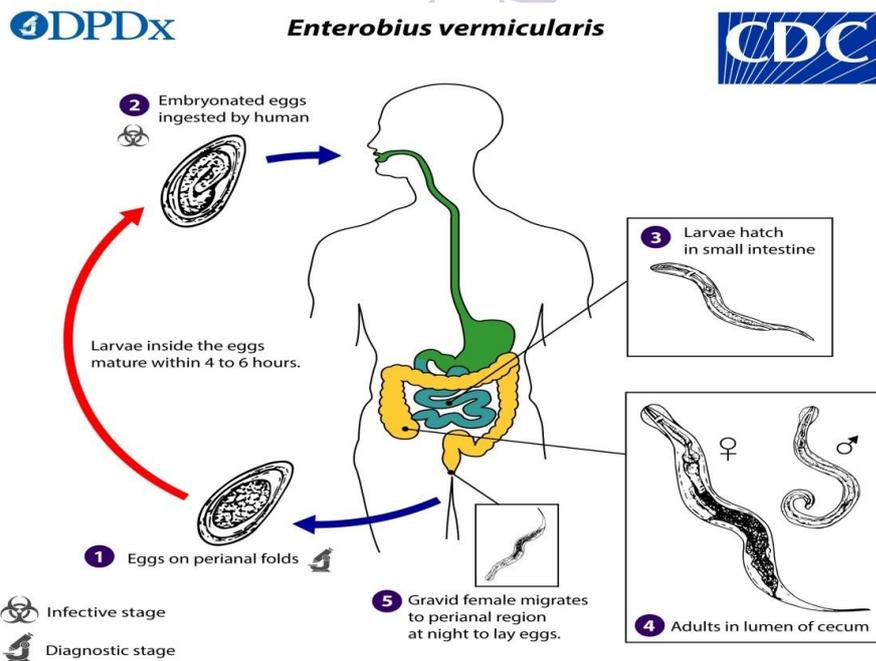
### 2. Stool examination can show ova.

## Treatment

### 1. The most commonly used drugs are:

1. Mebendazole.
2. Albendazole.
3. Pyrantal pamoate.
4. Piperazine.

## LIFE CYCLE IN BRIEF



Gravid adult female *Enterobius vermicularis* deposit eggs on perianal folds **1**. Infection occurs via self-inoculation (transferring eggs to the mouth with hands that have scratched the perianal area) or through exposure to eggs in the environment (e.g. contaminated surfaces, clothes, bed linens, etc.) **2**. Following

ingestion of infective eggs, the larvae hatch in the small intestine <sup>3</sup> and the adults establish themselves in the colon, usually in the cecum <sup>4</sup>. The time interval from ingestion of infective eggs to oviposition by the adult females is about one month. At full maturity adult females measure 8 to 13 mm, and adult males 2 to 5 mm; the adult life span is about two months. Gravid females migrate nocturnally outside the anus and oviposit while crawling on the skin of the perianal area <sup>5</sup>. The larvae contained inside the eggs develop (the eggs become infective) in 4 to 6 hours under optimal conditions <sup>1</sup>.

Rarely, eggs may become airborne and be inhaled and swallowed. Retroinfection, or the migration of newly hatched larvae from the anal skin back into the rectum, may occur but the frequency with which this happens is unknown.

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