Enterobius vermicularis (Pinworm)

The pinworm of man, Enterobius vermicularis (Linnaeus, 1758) Leach, 1853, has been known since ancient times. It has a cosmopolitan distribution, but it is more common in persons living in a cool temperate zones than in strictly tropical areas.

Morphology, Biology and Life Cycle
The adult male worm of E. vermicularis measures up to 5 mm long and has a maximum width of 0.1 to 0.2 mm with its strongly curved posterior end, the lateral view of the worm forms an inverted question mark. The female worm is considerably larger than the male, having a length of up to 13 mm and a maximum width of 0.3 to 0.5 mm.

The characteristic habitat of these worms is the cecum and appendix. Gravid female migrate down the bowel and out of the anus onto the perianal and perineal skin; in female subjects they may reach the vulva and wander up the genital tract. Eggs in utero are not fully embryonated when the female worms migrate to the
lower levels of the colon. Eggs laid within the bowel are relatively immature. Each female discharges about 10,000 eggs.

The eggs discharged on the skin are essentially mature and within a few hours contain a fully developed infective-stage larva. The eggs are flattened on one side, measure 50 to 60 by 20 to 30 microns, and have an outer albuminous layer which causes them to stick to each other and to clothing and other subjects. Thus, some of the eggs almost invariably are swallowed by persons in the contaminated environment. When swallowed the eggs hatch and the larva, which measure 140 to 150 by 10 microns, mature in the cecal area, and complete the life cycle in 15 to 28 days.

**Pathogenesis and Symptomatology**

Commonly the first recognizable symptom is pruritus as the worms emerge from the rectum and crawl over the perianal and perineal skin. Itching is followed by scratching with adds to the irritation, with scarification or weeping eczema of the areas, allowing bacteria to enter the lesion. As worm in various stages of development frequently are seen in the appendix, and occasionally are found deep in the inflamed mucosa, pinworms often are suspected of causing appendicitis. Infection of the female genital tract has been well reported. At times worms enter the female genital tract and become encapsulated within the uterus or fallopian tubules, or wander into the peritoneal cavity and become encapsulated on the peritoneum.

The common symptoms in children, in addition to pruritus, consist of restless sleep, and tiredness during the daytime. Often the patient will complain insomnia due to disturbed sleep, or even abdominal pain or appendicitis. The blood picture in pinworm infection is not remarkably altered. There may be low-grade eosinophilia.

**Diagnosis**

The specific diagnosis may be made on the recovery of the worms from the perianal area, more frequently on demonstration of the eggs. Only occasionally are eggs found in the feces.
Treatment
The medications used for the treatment of pinworm are either Mebendazole, or Albendazole. Any of these drugs are given in one dose initially, and then another single dose of the same drug two weeks later. The medication does not reliably kill pinworm eggs. Therefore, the second dose is to prevent re-infection by adult worms that hatch from any eggs not killed by the first treatment. Patients and parents must be made aware of the probability of recurrent infection, which should not be regarded as a treatment failure.

Repeated infections should be treated by the same method as the first infection. In households where more than one member is infected or where repeated, symptomatic infections occur, it is recommended that all household members be treated at the same time. In institutions, mass and simultaneous treatment, repeated in 2 weeks, can be effective (CDC).
1. Eggs on perianal folds. Larvae inside the eggs mature within 4 to 6 hours.

2. Embryonated eggs ingested by human

3. Larvae hatch in small intestine

4. Adults in lumen of cecum

5. Gravid female migrates to perianal region at night to lay eggs.

- i = Infective Stage
- d = Diagnostic Stage