

## Recurrent Thread Worm infection/Enterobiasis

### Frequently asked questions

1. [What is Threadworm infection \(Enterobiasis\)?](#)
2. [How are threadworms transmitted?](#)
3. [What factors contributes to re-occurrence of infection or clinical picture?](#)
4. [How to assess suspected threadworm infection?](#)
5. [What personal and environmental practices must be implemented to cease the infection?](#)
6. [What Anthelmintic medications are available to treat Threadworm infections?](#)
7. [When should I be cautious about treating with Anthelmintics \(pregnant women and children less than 2 years of age\)?](#)
8. [Is there any known resistance to Anthelmintic therapy?](#)
9. [Who should I contact for further advice?](#)

#### 1. What is Threadworm infection (Enterobiasis)?

*Enterobius* (syn. *Oxyuris*) *vermicularis*, synonymous with thread worms and Pinworms are gastrointestinal parasitic worms of the Nematode species that commonly causes infection among children but can also include adults [1,2,3].

#### 2. How are threadworms transmitted?

The eggs of thread worms enter the digestive system of the human host via faecal-oral route. Hands or objects that have been in contact with peri-anal region become contaminated with the infective eggs. Once ingested, the eggs hatch in the small intestine and the thread worms copulate. The male worms soon die while the females reside in large numbers in the caecum, appendix, and ascending colon. While the host is at rest typically at night, the female thread worms migrate out of the anus and lays eggs in the peri-anal region. The resulting pruritis leads to scratching of the peri-anal region thereby contaminating the hands with eggs and supporting faecal-oral transmission [1,2].

#### 3. What factors contributes to re-occurrence of infection or clinical picture?

Although the cure rate is high, the re-occurrence of infection is common, especially among children [3,4]. These are due to the following:

- Pruritis can induce the action of scratching promoting the life cycle.
- The transmission is made more robust because the eggs are very adherent to the hands and fingernails [2,5].
- Inhalation of the eggs following certain household activities such as shaking bedding that leads to eggs spreading in the atmosphere [1].
- Re-current pruritis can occur in the absence of infection resulting in re-presentations in clinical settings without active infection [5].
- The lifecycle spans between 1 to 3 months so any shortcomings in adhering to the treatment plan during this time could result in re-infection [1,5].

#### 4. How to assess suspected Threadworm infection?

The characteristic feature is peri-anal nocturnal pruritis though up to a third of infected individuals can remain asymptomatic. Females can develop vulval pruritis, vaginal discharge or urinary tract infections if the thread worms migrate to the genitalia. The pruritic nature can lead to excoriation and sometimes secondary bacterial infection due to breakage of skin [1,2,5].

Asymptomatic individuals may present with findings of visible white thread-like worms on their peri-anal skin, clothing, or stool [1,4]. In some cases, the worms can block the appendix lumen leading clinical features of appendicitis [2,4].

At RDE/NDHT we request you send a moistened (in saline) early morning peri-anal cotton swab placed in a specimen pot (rather than the transport media), and we perform microscopy on this. This method has 90% sensitivity of detecting the eggs if done on 3 consecutive days (similar sensitivity to Sellotape slide which you might be more familiar with but which we don't accept anymore) [2,5,6].

#### 5. What personal and environmental practices must be implemented to cease the infection?

Strict hygiene measures mentioned below should be adhered to for 2 weeks if treated with medication or 6 weeks if using hygiene measures alone. Consider treating all household contacts (unless contraindicated) as threadworms are highly transmissible [1].

##### Personal hygiene: [1,5]

- Always wash hands well with soap and warm water after using bathroom, changing nappies, and before eating or handling food.
- Ensure nails are short and clean underneath with a brush once a day and after defaecation.
- Avoid biting nails and scratching around the anus.
- Wash/shower every morning to remove eggs on skin.
- Wear pants, or tightfitting nightwear in bed. A 'onesie' can be useful to prevent scratching and reinfection during the night – and change daily washing at 40°C or above.
- Consider wearing cotton gloves at night to avoid scratching.
- Do Not share towels
- Do Not co-bathe.

##### Environmental: [1,5]

- "Hot wash" (>60°C) sheets initially and then at least weekly, do not shake before washing. Change nightwear daily for several days after treatment.
- Vacuum the whole bedroom including the mattress once a week to reduce egg burden.
- Regularly change bath towels.
- Regularly clean surfaces.
- Fluffy toys in bed should be hot washed

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## 6. What Anthelmintic medications are available to treat Threadworm infections?

**Table 1** - illustrates the step wise approach to managing threadworm infections using anthelmintics for an adult patient [5].

	Patient	Household/sexual partners
<b>1st line treatment:</b>	Mebendazole 100mg* stat dose and repeat 100mg* stat in two weeks (in case some eggs swallowed after taking initial dose).	Mebendazole 100mg* stat, and repeat at two weeks, and then only if symptomatic thereafter.
<b><i>For persistent or recurrent infection or complex cases please discuss with your local Microbiology Department regarding further management</i></b>		

\*dosing for (non-pregnant or breastfeeding) adults and children over 6 months as per BNF and BNFC.

## 7. When should I be cautious about treating with Anthelmintics (pregnant women and children less than 2 years of age)?

Children under the age of 6 months and pregnant or breastfeeding women should be treated with hygiene measures alone for 6 weeks as Mebendazole and Albendazole should be avoided in the first trimester of pregnancy and children younger than one year of age [1,4]. It may be worth treating the other members of the household as well to reduce cross-infections.

Treatment of *Enterobius* infection in pregnancy should be reserved for patients who have significant symptoms, and if above measures fail. In such patients, mebendazole could be offered after a careful discussion of the risks, and if deferred beyond the 1<sup>st</sup> trimester. There is a reported risk of teratogenicity but it is unquantifiable – lots of experience of treating women in the developing world for hook worm though outcome data is probably incomplete. An alternative is pyrantel pamoate (if you can get it) [4].

Mebendazole is not licensed for the treatment of threadworm in children under the age of 2 years [1].

## 8. Is there any known resistance to Anthelmintic therapy?

Humans are the only natural host of *Enterobius vermicularis* [4]. There is no conclusive evidence of drug resistance among *Enterobius vermicularis* though there are well known resistant mechanisms of other Nematode species found among animals to Benzimidazole drug classes [5,7].

## 9. Who should I contact for further advice?

For complicated cases or further queries, contact the Royal Devon University Hospital Microbiology Team via email [rduh.microconsultants@nhs.net](mailto:rduh.microconsultants@nhs.net) (for use by local Health Professionals only)

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