Parasitic Worms

Definition

Parasitic Worms/Helminths: A creature with long, slender soft bodies and no limbs, which draws nutrition from its human host.

Diagnosis

Patients with parasitic worms/helminths are often **asymptomatic**. There are four clinical presentations where parasitic worms are considered;

1. Children with iron deficiency +/- anaemia or growth faltering.
2. Symptoms suggestive of parasitic worms.
3. Eosinophilia not explained by other conditions.
4. Immunosuppressed patients or when immunosuppressive therapy is planned.

1) Children with iron deficiency +/- anaemia or growth faltering

- Parasitic worms can cause iron deficiency +/- anaemia and/or growth faltering.
- See KAHPF Guidelines "Anaemia in Children" and "Growth Faltering" for more information.

2) Symptoms suggestive of parasitic worms

- Itchy anus or vagina with visualized worms around anus or in stool should be treated as Enterobius Vermicularis. Stool MCS + OCP is not essential.
- In patients with unexplainable gastrointestinal symptoms (e.g. recurrent abdominal pains, persisting diarrhea or bloating) test with stool MCS + OCP.

3) Eosinophilia not explained by other conditions

- Raised eosinophils (a type of white blood cell on full blood count) above 0.5x10^9/L, not explained by other conditions.
- Organize strongyloides serology with yellow-top tube. Can add to previous blood test within 10 days.
- Treat if serology is positive. Consider treatment if serology equivocal, seek specialist advice.
- Stool MCS + OCP (Ova, Cyst and Parasites) is recommended but not essential.

4) Immunosuppressed patients or when immunosuppressive therapy is planned

- Patients in this group are highly susceptible to Strongyloides Hyperinfection.
- See "*Strongyloides Infection*" section below.

Principles of Management

- Any **acutely unwell** child or adult should be referred to the doctor immediately. This includes patients with **fever, rigors, blood in the stool or dehydration.**
- Discuss **all children under 6 months** with suspected parasite infection with the doctor.

Investigation

Faeces sample for Stool Microscopy, Culture and Sensitivity (MCS) + Ova, Cyst and Parasites (OCP)

- Single sample may be negative even when a parasite infection is present. Collect 2-3 samples if possible.
- Stools should be as fresh and solid as possible. If need to preserve, place in fridge. Sample can last up to 3 days.

2. Strongyloides Serology (IgG strongyloides ELISA test)

- Blood test for chronic strongyloides infection.
- May be falsely negative for acute or disseminated strongyloides infection.
- Will only test for strongyloides infection, not other parasitic worms or bacteria.

Treatment

Table1: Commonly Seen Worms and Specific Treatment	
Ancylostoma duodenale or *Necator americanus* (Hookworm)	Albendazole 400mg (≤ 10kg:200mg) once only. Not recommended for children <6 months old.
Enterobius vermicularis (Threadworm or Pinworm)	Albendazole 400mg (≤ 10kg:200mg) once only. Not recommended for children <6 months old. Treat household members. Personal and household hygiene measures – cut nails short and avoid scratching buttock, daily shower or baths, wash clothing/towels/bed linen in hot water.
Trichuris trichiuria (Whipworm)	Albendazole 400mg (≤10kg:200mg) once daily for 3 days. Not recommended for children <6 months old.
Hymenolepis nana (Dwarf Tapeworm)	Treatment not required if asymptomatic. However, treat if malnourished or subtle symptoms such as insomnia, restlessness and behavioural problems If symptomatic, give praziquantel 25mg/kg as a single dose.
Strongyloidiasis (*Strongyloides stercoralis)*	Ivermectin 0.2mg/kg orally for adults and children ≥5 years old or ≥15kg, orally with fatty food, 2 doses one to two weeks apart. For immunosuppressed patients, seek specialist advice. Standard course is Ivermectin 0.2mg/kg orally for adults and children <5 years old or <15kg, orally with fatty food, 4 doses (days 1,2,15 and 16).
Other Parasites/Protozoa and Treatment	
Giardia intestinalis (Giardiasis)	Treat symptomatic patients only. Tinidazole 2g (50mg/kg up to 2g) as a single dose.
Blastocystis hominis	No treatment required. Seek specialist opinion if no other cause of symptoms identified.
Cryptosporidium spp.	No treatment required for immunocompetent patients. Seek specialist advice if immunosuppressed.

Refer to the Therapeutic Guidelines or talk to the microbiologist at Path West (SCGH) tel 13 7284 for other pathogens not listed.

Consider the following

- Consider offering treatment to the household members, taking note of age, weight and pregnancy status of household members for correct medication choice.
- Consider providing "No Germs on Me" information sheet under Prevention section.

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Strongyloides Infection

Strongyloides infection is more complex than other worms.

- It has the ability to multiply within the host for years after first exposure (auto-infective cycle).
- It is endemic in Tropical and Central Australia, especially in remote Aboriginal Communities.
- It can be lethal if *strongyloides hyperinfection syndrome* develops.

Strongyloides Hyperinfection Syndrome

- Rare but life-threatening complication where strongyloides worm proliferates and disseminates throughout the body.
- Patients will be septic, along with gastrointestinal features of worm infection. They may develop dermatological, respiratory, cardiac, hepatic, genitourinary or neurological features.
- Often occurs when the patient infected with strongyloides is significantly immunosuppressed. (See Table 2)

Prevention in significantly immunosuppressed patients

For significantly immunosuppressed patients or commencing immunosuppressive therapy, the following is recommended to prevent strongyloides hyperinfection syndrome.

- Initial test with strongyloides serology & stool MCS + OCP.
  - If positive, treat with specialist advice as per Table 1.
  - If negative and patient is from an endemic area, give primary prophylaxis - single dose ivermectin 0.2 mg/kg orally with fatty food.
  - If equivocal, treatment may be required. Discuss with a specialist.
- Regular 3 monthly primary prophylaxis (single dose ivermectin 0.2 mg/kg orally with fatty food) while immunosuppressed and living or frequently visiting endemic areas.
- Regular 6 monthly testing with strongyloides serology & stool MCS + OCP while immunosuppressed and living or frequently visiting endemic areas.

Table 2: Patients regarded as significantly immunosuppressed

- *Use of prednisolone 20mg or more for > 2 weeks. (For other corticosteroids, see eTG for dose equivalent table)*
- *Patients on long term immunosuppressive therapy*
- *Patients on chemotherapy*
- *Patients with hematological cancer such as leukemia*
- *Patients with HTLV1 or HIV infection*

NOTE: Immunosuppressed patients from endemic

Response to Treatment

- Successful therapy is indicated by absence of symptoms + negative stool MCS and OCP + strongyloides serology a negative result, 6 months after treatment.
- Positive or equivocal but declining serology may not be indicative of treatment failure. Discuss with a specialist.

Prevention

Most worms are ingested into the gut from dirty hands, food or water. As such, hygiene to avoid faecal-oral contamination is important in preventing transmission of worms.

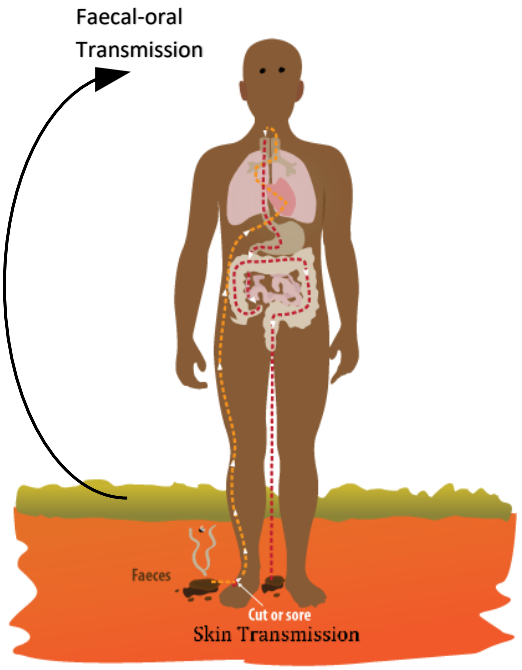
Other worms like strongyloides and hookworm infect the body through the skin, in particular through the soles of the when walking without footwear. (See Diagram 1)

General hygiene and **appropriate footwear** are the best ways to prevent worm infection.

Please use "No Germs On Me" patient handout. Available at link - NT.GOV.AU: No Germs On Me

If patient is worried about their environmental conditions, gain consent and refer to local Environmental Health and Services who will visit their home for assessment. Available at link- KAHPF: Resources

Diagram 1 – Routes of Transmission



Follow Up

- **Asymptomatic parasitic worm infection**: No follow-up required unless strongyloides is suspected or confirmed.
- **Strongyloides infection**: Follow-up in 6 months with strongyloides serology.
- **Symptomatic parasitic worm infection**: Non-urgent follow-up to assess for resolution of symptoms.
  - Increase the monitoring of children with symptoms of diarrhea or nausea & vomiting, until symptom free and any weight loss has been regained.
  - Consider differential diagnoses if symptoms persist despite treatment for parasitic worm.
- **Recurrence of infection** is common if there is ongoing

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environmental exposure to worms.

Women of Child Bearing Age

Albendazole is contraindicated in the first trimester, and is not routinely recommended in pregnancy.
Use mebendazole instead if pregnant or suspected to be pregnant.

- Mebendazole 100mg orally, 12 hourly for 3 days

Threadworm/Pinworms require single dose only
Ivermectin is not recommended in pregnancy.
Discuss with doctor or seek specialist advice for strongyloides infection in pregnancy.
See "Iron deficiency and iron in pregnancy" protocol for more information on treating possible parasitic infections in pregnancy.
Refer/Discuss

Refer Discuss

Discuss with microbiologist or refer to specialist;

- Any persistent cases not responding to treatment
- All cases where patient is immunosupressed
- When strongyloides hyperinfection is suspected
- If first line treatment is ineffective

Resources

1. *CARPA Standard Treatment Manual 7th Edition. Chapter – Worms. Available at URL:* https://www.crh.org.au/the-manuals/carpa-standard-treatment-manual-7th-edition
2. eTG complete [Internet]. Therapeutic Guidelines Ltd; 2019. "Gastrointestinal helminths (worms)", "Strongyloides setercoralis prophylaxis in immunocompromised adults without HIV infection" & "Assessing the need for antimicrobial prophylaxis in immunocompromised adults without HIV infection"
3. Practice Guideline - Management of Strongyloidiasis. World Gastroenterology. Available at URL: http://www.worldgastroenterology.org/guidelines/global-guidelines/management-of-strongyloidiasis/management-of-strongyloidiasis-english