The Health Department of Western provides a screening service for refugees and migrants arriving in Australia under some humanitarian resettlement schemes.

All screening procedures and tests will first be initiated by a Medical Officer at the Migrant Health Centre. In most instances, all results of tests undertaken will be interpreted by the Medical Officer of the Migrant Health Centre, who will then prescribe and document treatment if necessary in the client’s record. In some situations, ie. where repeat tests are undertaken at a later date, the general practitioner may be the Medical Officer responsible for interpreting results and prescribing treatment if necessary.

Community nurses working throughout the State of Western Australia will in most instances be involved in the follow-up care of migrant people, particularly where further treatment or tests need to be conducted.

This document provides community nurses with the Health Department’s recommended treatment protocols for the various parasitic diseases.

The Medical Officer at the Migrant Health Centre will authorise the treatment for parasitic infections. Community nurses should follow the authorised instructions of the Medical Officer as documented in the clients record. If treatment is recommended by a general practitioner at a later date, with no directions for medications provided, community nurses should refer to the attached recommended protocol.

Any concerns should be discussed with the Medical Officer at the Migrant Health Centre, telephone (08) 9221 4445 or the Medical Coordinator at the Communicable Diseases Control Program, telephone (08) 9388 4999.

ENTERIC LABORATORY RESULTS - When laboratory results are received, community nurses should proceed as follows:

A. TREATMENT NOT GIVEN UNLESS CAUSING SYMPTOMS
   (Check with enteric laboratory or doctor if in doubt)

Note that some of these organisms, such as cryptosporidia can cause gastroenteritis which may be severe and prolonged in immunodeficient individuals.
Blastocystis hominis
Entamoeba coli
Entamoeba hartmanni
Endolimax nana
Iodamoeba butschlii
Cryptosporidia
Sarcocystis
Plesiomonas shigelloides
Dientamoeba fragilis
Chilomastix mesnili
Trichomonas hominis

Any other organism which the laboratory report states is “rarely, if ever, pathogenic” - no further action.

B. NOTIFIABLE - but not treated unless causing serious symptoms - discuss with doctor.

Campylobacter - all varieties
Salmonella - all varieties
Shigella - all varieties

Repeat specimen in two weeks to see if cleared. Refer to general practitioner if necessary.

C. NOTIFY AND TREAT - see treatment protocols

Giardia lamblia (intestinalis)
Schistosoma
Entamoeba histolytica

D. TREAT- as shown in protocols

Ancylostomiasis (Hookworm)
Trichuris trichiura (whipworm)
Hymenolepis nana (dwarf tapeworm)
Strongyloides stercoralis (threadworm)
Ascaris lumbricoides (roundworm)
Taenia species (beef or pork tapeworm)
Enterobius vermicularis (pinworm/threadworm)
Clonorchis sinensis (liver fluke)

Any treatment requires one to ascertain proof of cure with a stool specimen taken two to three weeks after treatment. However, if community-wide treatment is applied as a public health measure such follow-up is not required.

In mixed helminth infections use a broad spectrum drug such as albendazole or mebendazole. The former is preferred if Strongyloides is present. If not cleared after two treatments, refer patient to doctor.
In mixed parasitic infections treat for the parasite considered to be causing symptoms first. For example, if a child is anaemic due to Hookworm infection, but also has giardia, treat for Hookworm first. However, if such a child also has diarrhoea considered to be due to giardia, then treat for both conditions at the same time. Most antiparasitic drugs can be given at the same time, but as there is inadequate data available, praziquantel should be given after the other antiparasitic drugs. An interval of one day between cessation of one drug and the commencement of the next is reasonable.

Thiabendazole (Mintezol) should only be used after Ascariasis has been treated.

In pregnancy, forward laboratory reports to antenatal clinic for obstetrician to follow-up as appropriate.

Note: Diseases marked * are notifiable.

ASCARIASIS

Treatment: Drug of choice is Pyrantel Embonate (Combantrin, Anthel, Early Bird) to be taken as a stat dose. Syrup 50 mg/ml is available, and tablets 125 mg or 250 mg.

Dosage: 10 mg/kg body weight up to maximum of 750 mg given as a stat dose.

Contraindications: Acute liver disease.

Infrequent side-effects: Anorexia, headache, fatigue, etc.

Alternative (1): Mebendazole (Vermox, Sqworm, Banworm)

Age 2 years and over: 100 mg bd x 3 days
• Not recommended for children under 2 years or whilst breast feeding.

Possible side-effects: Mebendazole is generally well tolerated but patients with high parasitic burdens may have diarrhoea, vomiting or abdominal pain.

Alternative (2): Albendazole (Zentel, Eskazole)

400 mg as a single dose on an empty stomach - tablets may be crushed, chewed or swallowed whole.
• Mothers should not breast feed during or for 5 days after treatment.
• Women should avoid pregnancy for 1 month after treatment.

Possible side-effects: Albendazole is well tolerated although abdominal pain, nausea, diarrhoea, vomiting, headache, dizziness and itching or skin rashes have been reported.
CLONORCHIASIS

**Treatment:** Praziquantel (Biltricide)

**Dosage:** Three doses of 25 mg/kg body weight given at not less than four hourly or more than six hourly intervals on the same day. To be taken with liquid after meals. Tablets taste slightly bitter and should **NOT** be chewed.

- Mothers should not breast feed on day of treatment or for the next 72 hours.
- Safety in children not established.
- Patients should not drive or operate machinery.

**Possible side-effects:** Abdominal pain, nausea, headache.

ENTAMOEBA HISTOLYTICA

Treatment only required if *E. histolytica* infection is confirmed. *E. dispar* does not require treatment. An adhesion test to distinguish the two species is available at PathCentre. Amoeba serology should be requested to establish whether tissue invasion is present. If tissue invasion is present, treatment is urgent and follow-up to confirm cure is required. Therefore, refer to hospital.

Fresh stool specimens are required for amoeba speciation and need to reach the laboratory within one hour of collection. If *E histolytica* is confirmed, trophozites detected, and there is no tissue invasion, treat as follows:

**Treatment:** Metronidazole (Flagyl, Metrogyl, Metrozine)
Available as tablets or suspension (200 mg/5 mL).

**Dosage:**
- 1 - 2 years: 100 mg tds x 7 days
- 3 - 6 years: 100 mg qds x 7 days
- 7 - 12 years: 200 mg tds x 7 days
- 12 years and older: 600 mg tds x 7 days **together with**
  Tetracycline 500 mg 6 hourly x 5 days.

- Suspension should be taken with water one hour before food, tablets swallowed whole, without chewing, with water, with or after food.
- Mothers should not breast feed during treatment.
- Avoid alcohol during treatment - causes severe vomiting.
- Contraindicated in patients with history of blood dyscrasias.
- Enhances activity of Warfarin.
- Metronidazole is usually well tolerated.

**Possible side-effects:** Metallic taste, nausea, vomiting, headache, diarrhoea.

TREATMENT OF CARRIERS OF ENTAMOEBA HISTOLYTICA

If only cysts are detected and there is no tissue invasion, i.e. carrier status, treatment is with diloxanide furoate (Furamide).
Furamide is not a registered drug in Australia and is only available under the Special Access Scheme (SAS).

**Action/Pharmacology:**

Amoebicide - specific against Entamoeba histolytica: absorbed from the gut after an oral dose - low toxicity.

**Contraindications:**

None known. No special precautions necessary and no interactions stated.

**Use in lactation:**

No information available on the excretion of Furamide in breast milk.

**Dosage:**

- **Children** under 12 years: 20 mg/kg body weight daily in divided doses, (in three doses daily for 10 days).
- **Adults:** 500 mg (1 tablet) three times daily for 10 days.

For clients diagnosed through the Migrant Health Unit the appropriate treatment will be authorised and supplied by the Director, Disease Control.

Clients diagnosed from other sources should be referred to their general practitioner.

**ENTEROBIUS VERMICALARIS**

**Treatment:** Drug of choice is mebendazole (Vermox, Sqworm, Banworm).

**Dosage:** 2 years and above: 100 mg as a single dose and repeat two to three weeks later.

- Not recommended for children under 2 years old.
- Mothers should not breast feed babies during treatment.

**Possible side-effects:** Mebendazole is generally well tolerated but patients with high parasitic burdens may have diarrhoea, vomiting or abdominal pain.

**Alternative:** Albendazole (Zentel, Eskazole) 400 mg as a single dose on an empty stomach - tablets may be crushed, chewed or swallowed whole.

- Mothers should not breast feed during or for 5 days after treatment.
- Women should avoid pregnancy for 1 month after treatment.

**Possible side-effects:** Albendazole is well tolerated although abdominal pain, nausea, diarrhoea, vomiting, headache, dizziness and itching or skin rashes have been reported.
**GIARDIA LAMBLIA (Intestinalis)**

**Treatment:** Drug of choice is tinidazole (Fasigyn, Simplotan)

**Dosage:** To be taken orally as a stat dose after a meal.

**Children:** 50 mg/kg up to a maximum of 2 g.

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 4 years</td>
<td>About 10 kg</td>
<td>500 mg</td>
</tr>
<tr>
<td>5 - 9 years</td>
<td>About 20 kg</td>
<td>1,000 mg</td>
</tr>
<tr>
<td>10 - 14 years</td>
<td>About 30 kg</td>
<td>1,500 mg</td>
</tr>
<tr>
<td>Over 15 years</td>
<td></td>
<td>2,000 mg</td>
</tr>
</tbody>
</table>

**Adults:** 2 gm (4 x 500 mg tablets)

**Alternative:** Metronidazole (Flagyl, Metrogyl, Metrozine)

Available as tablets or suspension (200 mg/5 mL)

<table>
<thead>
<tr>
<th>Age</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 2 years</td>
<td>400 mg once daily x 3 days</td>
</tr>
<tr>
<td>3 - 6 years</td>
<td>600 mg once daily x 3 days</td>
</tr>
<tr>
<td>7 - 12 years</td>
<td>1 gm once daily x 3 days</td>
</tr>
</tbody>
</table>

**Adults:** 2 gms once daily x 3 days

- Suspension should be taken with water one hour before food, tablets swallowed whole, without chewing, with water, with or after food.
- Mothers should not breastfeed during treatment.
- Avoid alcohol during treatment - causes severe vomiting.
- Contraindicated in patients with history of blood dyscrasias.
- Enhances activity of Warfarin.
- Metronidazole is usually well tolerated.

**Possible side-effects:** General malaise, metallic taste, nausea, vomiting, headache, diarrhoea.
HOOKWORM (Ancylostomiasis, Necatoriasis)

**Treatment:** Drug of choice is Pyrantel Embonate (Combantrin, Anthel, Early Bird) to be taken as a stat dose.
Available as syrup 50 mg/ml.
Tablets of 125 mg or 250 mg strength.

**Dosage:** Based on bodyweight - 10 mg/kg.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Weight</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2 years</td>
<td>10 kg or less</td>
<td>2.5 ml syrup</td>
</tr>
<tr>
<td>Age 2 - 4 years</td>
<td>20 kg</td>
<td>2 x 125 mg or 5.0 ml syrup</td>
</tr>
<tr>
<td>Age 5 - 9 years</td>
<td>35 kg</td>
<td>3 x 125 mg or 7.5 ml syrup</td>
</tr>
<tr>
<td>Age 10 - 14 years</td>
<td>45 kg</td>
<td>4 x 125 mg or 2 x 250 mg or 10 mL syrup</td>
</tr>
</tbody>
</table>

**Adult:** 3 x 250 mg

**Contraindications:** Acute liver disease.

**Infrequent side-effects:** Anorexia, headache, fatigue, etc.

**Note:** Pyrantel has generally been given as a stat dose at Migrant Health Unit three days prior to collection of stool specimen. This dosage can be repeated so long as there has been one week between doses.

**Alternative (1):** Mebendazole (Vermox, Sqworm, Banworm)
Age 2 years and over: 100 mg bd x 3 days

- Not recommended for children under 2 or whilst breast feeding.

**Possible side-effects:** Mebendazole is generally well tolerated but patients with high parasitic burdens may have diarrhoea, vomiting or abdominal pain.

**Alternative (2):** Albendazole (Zentel, Eskazole)
400 mg as a single dose on an empty stomach - tablets may be crushed, chewed or swallowed whole.

- Mothers should not breast feed during or for 5 days after treatment.
- Women should avoid pregnancy for 1 month after treatment.

**Possible side-effects:** Albendazole is well tolerated although abdominal pain, nausea, diarrhoea, vomiting, headache, dizziness and itching or skin rashes have been reported.
HYMENOLEPIS NANA

Treatment: Praziquantel (Biltricide)

Dosage: Based on bodyweight - 25 mg/kg as a single dose.

To be taken after food and swallowed rapidly with liquid and not chewed. Tablets have a slightly bitter taste.

- Mothers should not breast feed on day of treatment or for the next 72 hours.
- Patients should not drive or operate machinery.
- Safety in children not established. Overseas studies indicate reasonable safety. When treating children please observe for any side-effects and report to the Director, Disease Control, Health Department of Western Australia.

Possible side-effects: Side-effects are usually mild and transitory. Can cause abdominal pain, nausea and headache.

*SCHISTOSOMIASIS

Treatment: Praziquantel (Biltricide)

Dosage: Three doses of 20 mg/kg body weight given not less than four hours or more than six hours apart on the same day. Tablets taste slightly bitter and should be swallowed rapidly with liquid after meals and NOT chewed.

- Mothers should not breast feed on day of treatment or for the next 72 hours.
- Safety in children not established.
- Patients should not drive or operate machinery.

Possible side-effects: Generally well tolerated although can cause abdominal pain, nausea, headache.

Professor Tim Davies at Fremantle Hospital has requested that patients treated for Schistosomiasis with Praziquantel be referred to him for follow-up.
STRONGYLOIDES

**Treatment:** Thiabendazole (Mintezol) - tablets to be taken with or after meals and chewed before swallowing.

**Dosage:**
- Patients less than 60 kg: 25 mg/kg/dose bd x 2 days.
- Patients 60 kg and over: 1.5 gm/dose bd x 2 days.

**Note:** Maximum dose is 1.5 gms per dose.

**Precautions:** Do not use in mixed infections with ascaris (may cause worms to migrate).

Avoid tasks requiring mental alertness.

**Refer to Medical Officer:**
- If hypersensitivity reactions occur (cease treatment).
- If other medical conditions are present.
- During lactation and for children less than 15 kg.

**Possible side-effects:** Anorexia, nausea, vomiting, dizziness.

**Alternative:** Albendazole (Zentel, Eskazole)

400 mg once daily on an empty stomach x 3 days - tablets may be crushed, chewed or swallowed whole.

- Mothers should not breast feed during or for 5 days after treatment.
- Women should avoid pregnancy for 1 month after treatment.

**Possible side-effects:** Albendazole is well tolerated although abdominal pain, nausea, diarrhoea, vomiting, headache, dizziness and itching or skin rashes have been reported.
TAENIA SPECIES

Treatment: Praziquantel (Biltricide)

Dosage: 5 - 10 mg/kg body weight taken as a single dose.

To be taken after food and swallowed rapidly with liquid and not chewed. Tablets have a slightly bitter taste.

- Mothers should not breast feed on day of treatment or for the next 72 hours.
- Patients should not drive or operate machinery.
- Safety in children not established. Overseas studies indicate reasonable safety. When treating children please observe for any side-effects and report to the Director, Disease Control, Health Department of Western Australia.

Possible side-effects: Side-effects are usually mild and transitory. Can cause abdominal pain, nausea and headache.

TRICHURIASIS

Treatment: Mebendazole (Vermox, Sqworm, Banworm)

Dosage: Age 2 years and above: 100 mg bd x 3 days.

- Not recommended for children under 2 years old.
- Mothers should not breast feed babies during treatment.

Possible side-effects: Mebendazole is generally well tolerated but patients with many parasites may have diarrhoea, vomiting or abdominal pain.

Alternative: Albendazole (Zentel, Eskazole)

400 mg as a single dose on an empty stomach - tablets may be crushed, chewed or swallowed whole.

Dr J S Gill
DIRECTOR
DISEASE CONTROL
# DRUGS FOR THE TREATMENT OF PARASITIC INFECTIONS

## (Summary Table)

<table>
<thead>
<tr>
<th>PARASITE</th>
<th>DRUG</th>
<th>ADULT DOSAGE</th>
<th>PAEDIATRIC DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASCARIASIS:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drug of choice</td>
<td>Pyrantel Embonate</td>
<td>750 mg stat</td>
<td>10 mg/kg stat</td>
</tr>
<tr>
<td>• Alternative (1)</td>
<td>Mebendazole</td>
<td>100 mg bd x 3 days</td>
<td>100 mg bd x 3 days</td>
</tr>
<tr>
<td>• Alternative (2)</td>
<td>Albendazole</td>
<td>400 mg stat</td>
<td>400 mg stat</td>
</tr>
<tr>
<td><strong>CHLONORCHIASIS:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drug of choice</td>
<td>Praziquantel</td>
<td>25 mg/kg tds x 1 day</td>
<td>25 mg/kg tds x 1 day</td>
</tr>
<tr>
<td><strong>ENTAMOeba HISTOLYTICA:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drug of choice (trophozoites)</td>
<td>Metronidazole</td>
<td>600 mg tds x 7 days plus tetracycline 500 mg qds x 5 days</td>
<td>1-2 years: 100 mg tds x 7 days</td>
</tr>
<tr>
<td></td>
<td>Diloxanide Furoate</td>
<td>500 mg tds x 10 days</td>
<td>3-6 years: 100 mg qds x 7 days</td>
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<td></td>
<td></td>
<td></td>
<td>7-12 years: 200 mg tds x 7 days</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>20 mg/kg divided tds x 10 days (SAS)</td>
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<tr>
<td><strong>ENTEROBIUS VERMICULARIS:</strong></td>
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<td></td>
</tr>
<tr>
<td>• Drug of choice</td>
<td>Mebendazole</td>
<td>100 mg stat - Repeat in 2-3 weeks</td>
<td>100 mg stat - Repeat in 2-3 weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400 mg stat</td>
<td>400 mg stat</td>
</tr>
<tr>
<td>• Alternative</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>GIARDIA LAMBLIA:</strong></td>
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<tr>
<td>• Drug of choice</td>
<td>Tinidazole</td>
<td>2 gm stat</td>
<td>1-4 years: 500 mg stat</td>
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<td>5-9 years: 1 gm stat</td>
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<td>10-14 years: 1.5 gm stat</td>
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<td>• Alternative</td>
<td>Metronidazole</td>
<td>2 gm once daily x 3 days</td>
<td>1-2 years: 400 mg daily x 3</td>
</tr>
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<td></td>
<td></td>
<td>3-6 years: 600 mg daily x 3</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>7-12 years: 1 gm daily x 3</td>
</tr>
<tr>
<td><strong>HOOlkWORM</strong></td>
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<tr>
<td>• Drug of choice</td>
<td>Pyrantel Embonate</td>
<td>750 mg stat</td>
<td>10 mg/kg stat</td>
</tr>
<tr>
<td></td>
<td>Mebendazole</td>
<td>100 mg bd x 3 days</td>
<td>100 mg bd x 3 days</td>
</tr>
<tr>
<td></td>
<td>Albendazole</td>
<td>400 mg stat</td>
<td>400 mg stat</td>
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<tr>
<td><strong>HYMENOLEPIS NANA:</strong></td>
<td></td>
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</tr>
<tr>
<td>• Drug of choice</td>
<td>Praziquantel</td>
<td>25 mg/kg once</td>
<td>25 mg/kg once</td>
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<tr>
<td><strong>SCHISTOSOMIASIS:</strong></td>
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</tr>
<tr>
<td>• Drug of choice</td>
<td>Praziquantel</td>
<td>20 mg/kg tds x 1 day</td>
<td>20 mg/kg tds x 1 day</td>
</tr>
<tr>
<td><strong>STRONGYLOIDES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drug of choice</td>
<td>Thiabendazole</td>
<td>60 kg 1.5 gm bd x 2 days</td>
<td>&lt; 60 kg: 25 mg/kg bd x 2 days</td>
</tr>
<tr>
<td>• Alternative</td>
<td>Albendazole</td>
<td>400 mg daily x 3 days</td>
<td>400 mg daily x 3 days</td>
</tr>
<tr>
<td><strong>TAENIASIS:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drug of choice</td>
<td>Praziquantel</td>
<td>5-10 mg/kg body weight - once</td>
<td>5-10 mg/kg body weight - once</td>
</tr>
<tr>
<td>• Alternative</td>
<td>Mebendazole</td>
<td>100 mg bd x 3 days</td>
<td>100 mg bd x 3 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>400 mg stat</td>
<td>400 mg stat</td>
</tr>
<tr>
<td><strong>TRICHURIASIS:</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Drug of choice</td>
<td>Mebendazole</td>
<td>100 mg bd x 3 days</td>
<td>100 mg bd x 3 days</td>
</tr>
<tr>
<td>• Alternative</td>
<td></td>
<td>400 mg stat</td>
<td>400 mg stat</td>
</tr>
</tbody>
</table>