

GIARDIASIS (*Giardia duodenalis*)

	Drug	Adult dosage	Pediatric dosage
Drug of choice:	Metronidazole ¹	250 mg PO tid x 5-7d	15 mg/kg/d PO in 3 doses x 5-7d
	OR Tinidazole ²	2 g PO once	50 mg/kg PO once (max. 2 g)
	OR Nitazoxanide ³	500 mg PO bid x 3d	1-3yrs: 100 mg PO q12h x 3d 4-11yrs: 200 mg PO q12h x 3d >12yrs: 500 mg PO q12h x 3d
Alternative: ⁴	Paromomycin ^{1,5,6}	25-35 mg/kg/d PO in 3 doses x 5-10d	25-35 mg/kg/d PO in 3 doses x 5-10d
	OR Furazolidone*	100 mg PO qid x 7-10d	6 mg/kg/d PO in 4 doses x 7-10d
	OR Quinacrine ^{7,8*}	100 mg PO tid x 5d	6 mg/kg/d PO in 3 doses x 5d (max 300 mg/d)

* Availability problems. See table below.

- Not FDA-approved for this indication.
- A nitroimidazole similar to metronidazole, tinidazole appears to be as effective as metronidazole and better tolerated (Med Lett Drugs Ther 2004; 46:70). It should be taken with food to minimize GI adverse effects. For children and patients unable to take tablets, a pharmacist can crush the tablets and mix them with cherry syrup (*Humco*, and others). The syrup suspension is good for 7 days at room temperature and must be shaken before use (HB Fung and TL Doan et al, Clin Ther 2005; 27:1859). Ornidazole, a similar drug, is also used outside the US.
- Nitazoxanide may be effective against a variety of protozoan and helminth infections (DA Bobak, Curr Infect Dis Rep 2006; 8:91; E Diaz et al, Am J Trop Med Hyg 2003; 68:384). It was effective against mild to moderate amebiasis, 500 mg bid x 3d, in a recent study (JF Rossignol et al, Trans R Soc Trop Med Hyg 2007 Oct; 101:1025 E pub 2007 July 20). It is FDA-approved only for treatment of diarrhea caused by *Giardia* or *Cryptosporidium* (Med Lett Drugs Ther 2003; 45:29). Nitazoxanide is available in 500-mg tablets and an oral suspension; it should be taken with food.
- Another alternative is albendazole 400 mg/d PO x 5d in adults and 10 mg/kg/d PO x 5d in children (KYereli et al, Clin Microbiol Infect 2004; 10:527; O Karabay et al, World J Gastroenterol 2004; 10:1215). Combination treatment with standard doses of metronidazole and quinacrine x 3wks has been effective for a small number of refractory infections (TE Nash et al, Clin Infect Dis 2001; 33:22). In one study, nitazoxanide was used successfully in high doses to treat a case of *Giardia* resistant to metronidazole and albendazole (P Abboud et al, Clin Infect Dis 2001; 32:1792).
- Paromomycin should be taken with a meal.
- Poorly absorbed; may be useful for treatment of giardiasis in pregnancy.
- Not available commercially. It may be obtained through compounding pharmacies such as Panorama Compounding Pharmacy, 6744 Balboa Blvd, Van Nuys, CA 91406 (800-247-9767) or Medical Center Pharmacy, New Haven, CT (203-688-6816). Other compounding pharmacies may be found through the National Association of Compounding Pharmacies (800-687-7850) or the Professional Compounding Centers of America (800-331-2498, www.pccarx.com).
- Quinacrine should be taken with liquids after a meal.

Information provided by The Medical Letter. For a copy of the entire **Drugs for Parasitic Infections** article, go to: www.medicalletter.org/parasitic_cdc

MANUFACTURERS OF DRUGS USED TO TREAT PARASITIC INFECTIONS

- albendazole – *Albenza* (GlaxoSmithKline)
- Albenza* (GlaxoSmithKline) – albendazole
- Alinia* (Romark) – nitazoxanide
- AmBisome* (Gilead) – amphotericin B, liposomal
- amphotericin B – *Fungizone* (Apothecon), others
- amphotericin B, liposomal – *AmBisome* (Gilead)
- Ancobon* (Valeant) – flucytosine
- § *Antiminth* (Pfizer) – pyrantel pamoate
- *Aralen* (Sanofi) – chloroquine HCl and chloroquine phosphate
- § artemether – *Artenam* (Arenco, Belgium)
- § artemether/lumefantrine – *Coartem*, *Riamet* (Novartis)
- § *Artenam* (Arenco, Belgium) – artemether
- § artesunate – (Guilin No. 1 Factory, People's Republic of China)
- atovaquone – *Mepron* (GlaxoSmithKline)
- atovaquone/proguanil – *Malarone* (GlaxoSmithKline)
- azithromycin – *Zithromax* (Pfizer), others
- *Bactrim* (Roche) – TMP/Sulfa
- § benznidazole – *Rochagan* (Brazil)
- *Biaxin* (Abbott) – clarithromycin
- § *Bitricide* (Bayer) – praziquantel
- † bithionol – *Bitin* (Tanabe, Japan)
- † *Bitin* (Tanabe, Japan) – bithionol
- § *Brolene* (Aventis, Canada) – propamidine isethionate
- chloroquine HCl and chloroquine phosphate – *Aralen* (Sanofi), others
- clarithromycin – *Biaxin* (Abbott), others
- *Cleocin* (Pfizer) – clindamycin
- clindamycin – *Cleocin* (Pfizer), others
- Coartem* (Novartis) – artemether/lumefantrine
- crotamiton – *Eurax* (Westwood-Squibb)
- dapsone – (Jacobus)
- § *Daraprim* (GlaxoSmithKline) – pyrimethamine USP
- † diethylcarbamazine citrate (DEC) – *Hetrazan*
- *Diflucan* (Pfizer) – fluconazole
- § diloxanide furoate – *Furamide* (Boots, United Kingdom)
- doxycycline – *Vibramycin* (Pfizer), others
- eflornithine (Difluoromethylornithine, DFMO) – *Ornidyl* (Aventis)
- § *Egaten* (Novartis) – triclabendazole
- Elimite* (Allergan) – permethrin
- Ergamisol* (Janssen) – levamisole
- Eurax* (Westwood-Squibb) – crotamiton
- *Flagyl* (Pfizer) – metronidazole
- § *Flisint* (Sanofi-Aventis, France) – fumagillin
- fluconazole – *Diflucan* (Pfizer), others
- flucytosine – *Ancobon* (Valeant)
- § fumagillin – *Flisint* (Sanofi-Aventis, France)
- *Fungizone* (Apothecon) – amphotericin
- § *Furamide* (Boots, United Kingdom) – diloxanide furoate
- § furazolidone – *Furozone* (Roberts)
- § *Furozone* (Roberts) – furazolidone
- † *Germanin* (Bayer, Germany) – suramin sodium
- § *Glucantime* (Aventis, France) – meglumine antimonate
- † *Hetrazan* – diethylcarbamazine citrate (DEC)
- Humatin* (Monarch) – paromomycin
- § *Impavido* (Zentaris, Germany) – miltefosine
- iodoquinol – *Yodoxin* (Glenwood), others
- itraconazole – *Sporanox* (Janssen-Ortho), others
- ivermectin – *Stromectol* (Merck)
- ketoconazole – *Nizoral* (Janssen), others
- † *Lampit* (Bayer, Germany) – nifurtimox
- Lariam* (Roche) – mefloquine
- § *Leshcutan* (Teva, Israel) – topical paromomycin
- levamisole – *Ergamisol* (Janssen)
- lumefantrine/artemether – *Coartem*, *Riamet* (Novartis)
- Malarone* (GlaxoSmithKline) – atovaquone/proguanil
- malathion – *Ovide* (Medicis)
- mebendazole – *Vermox* (McNeil), others
- mefloquine – *Lariam* (Roche)
- § meglumine antimonate – *Glucantime* (Aventis, France)
- † melarsoprol – *Mel-B*
- † *Mel-B* – melarsoprol
- Mepron* (GlaxoSmithKline) – atovaquone
- metronidazole – *Flagyl* (Pfizer), others
- § miconazole – *Monistat i.v.*
- § miltefosine – *Impavido* (Zentaris, Germany)
- § *Monistat i.v.* – miconazole
- NebuPent* (Fujisawa) – pentamidine isethionate
- § niclosamide – *Yomesan* (Bayer, Germany)
- † nifurtimox – *Lampit* (Bayer, Germany)
- nitazoxanide – *Alinia* (Romark)
- Nix* (GlaxoSmithKline) – permethrin
- *Nizoral* (Janssen) – ketoconazole
- § ornidazole – *Tiberal* (Roche, France)
- Ornidyl* (Aventis) – eflornithine (Difluoromethylornithine, DFMO)
- Ovide* (Medicis) – malathion

(continued)

- § oxamniquine – *Vansil* (Pfizer)
- § *Paludrine* (AstraZeneca, United Kingdom) – proguanil
paromomycin – *Humatin* (Monarch); *Leshcutan*
(Teva, Israel; topical formulation not available
in US)
Pentam 300 (FujiSawa) – pentamidine isethionate
pentamidine isethionate – *Pentam 300* (FujiSawa),
NebuPent (FujiSawa)
- † *Pentostam* (GlaxoSmithKline, United Kingdom) –
sodium stibogluconate
permethrin – *Nix* (GlaxoSmithKline), *Elimite*
(Allergan)
- § praziquantel – *Biltricide* (Bayer)
- § primaquine phosphate USP
- § proguanil – *Paludrine* (AstraZeneca, United Kingdom)
proguanil/atovaquone – *Malarone*
(GlaxoSmithKline)
- § propamidine isethionate – *Brolene* (Aventis,
Canada)
- § pyrantel pamoate – *Antiminth* (Pfizer)
- § pyrethrins and piperonyl butoxide – *RID* (Pfizer),
others
- § pyrimethamine USP – *Daraprim* (GlaxoSmithKline)
- § *Qualaquin* – quinine sulfate (Mutual Pharmaceutical
Co/AR Scientific)
- quinacrine
- * quinidine gluconate (Eli Lilly)
- § quinine dihydrochloride
quinine sulfate – *Qualaquin* (Mutual Pharmaceutical
Co/AR Scientific)
Riamet (Novartis) – artemether/lumefantrine
- *RID* (Pfizer) – pyrethrins and piperonyl butoxide
 - *Rifadin* (Aventis) – rifampin
rifampin – *Rifadin* (Aventis), others
- § *Rochagan* (Brazil) – benznidazole
- * *Rovamycine* (Aventis) – spiramycin
- † sodium stibogluconate – *Pentostam*
(GlaxoSmithKline, United Kingdom)
- * spiramycin – *Rovamycine* (Aventis)
- *Sporanox* (Janssen-Ortho) – itraconazole
 - *Stromectol* (Merck) – ivermectin
- sulfadiazine – (Eon)
- † suramin sodium – *Germanin* (Bayer, Germany)
- § *Tiberal* (Roche, France) – ornidazole
Tindamax (Mission) – tinidazole
tinidazole – *Tindamax* (Mission)
TMP/Sulfa – *Bactrim* (Roche), others
- § triclabendazole – *Egaten* (Novartis)
- § *Vansil* (Pfizer) – oxamniquine
- *Vermox* (McNeil) – mebendazole
 - *Vibramycin* (Pfizer) – doxycycline
 - *Yodoxin* (Glenwood) – iodoquinol
- § *Yomesan* (Bayer, Germany) – niclosamide
- *Zithromax* (Pfizer) – azithromycin

* Available in the US only from the manufacturer.

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† Available from the CDC Drug Service, Centers for Disease Control and Prevention, Atlanta, Georgia 30333; 404-639-3670 (evenings, weekends, or holidays: 770-488-7100).

• Also available generically.