Treatment of Tropical Diseases

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ABSTRACT

Tropical diseases found in tropics are mostly contagious and vector borne. Here in the tropics as there is moisture in the air and hot climate sustained for a long time in the year the spread of the pathogens causing the diseases is very much congenial. This hand book written on the treatment of tropical diseases will help the practicing Physicians to choose the most appropriate drug for the treatment. Here therapeutic drugs are highlighted according to their uses. The dominant symptoms, pathogens, area of endemic and epidemic diseases are focussed in coloured world map along with pathogenecity. The generic and brand names of the drugs along with the names of the manufacturing company are mentioned. The adverse effects of the drugs are also discussed.

Keywords: Tropical diseases; antiparasitic; drugs; genera names; brand names; adverse effects; proton pump inhibitors
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INTRODUCTION

The tropical diseases mean the diseases those are commonly found in tropics i.e. the space in between the tropic of Cancer and tropic of Capricorn. The climate is peculiar here. The countries included in the tropics are mainly wet, more moisture in the weather, summer continues for a long time in a year. Dry and winter season stay here only for a very short period. This type of climate is very much congenial to the spread of the diseases caused by different pathogens. The metabolic diseases are also present here as the people are generally illiterate and economically backward. Undernourishment is the very word in these places. Proper care for the children never met with the standard specification specified by the WHO. Most of the people are poor their living place is not provided with proper sanitation. So any contagious disease plays havoc here. Several syndromes and pathological conditions which the people of the tropics suffer prevail most of the time in a year. Population density is high, natality and mortality rate are also high. Emigration is higher than immigration The people here is struggling for a square meal each and every day. Metabolism cannot run unhindered.

This hand book written on the treatment of tropical diseases with an aim to suggest and help the physicians to choose the most appropriate drug for the treatment. We have highlighted the drugs according to their uses which have themselves been focused according to their dominant symptoms like fever, diarrhoea etc. with a brief summary of the relevant pathogenicity. We hope that this ready reckoner will achieve its aim and any suggestion from practicing physicians and readers regarding improvements will be incorporated in the future edition. Tropical diseases include a group of diseases encountered exclusively and frequently, in the tropical regions of the globe. Such diseases are widespread in these areas only because of conditions of climate and economic under-development. A physician practicing in these areas will be confronted with these pathological conditions every day and therefore requires medicines especially designed to meet the particular needs of tropical pathology. The doctors working in tropical medicine have some drugs in their hand which are suitable for direct use in the treatment of tropical diseases.

TROPICAL DISEASES

The main symptom encountered in the tropical diseases is fever. Fever is often the only sign of an infection which sometimes are overlooked. But the fever itself is the cause for concern, especially in children, where it may be the cause of dehydration and/or hyperpyretic convulsions. Before attempting diagnosis, symptomatic treatment should be undertaken: antipyretics like Catalgine, Doliprane and for children preventive treatment to forestall hyperpyretic convulsions and dehydration with Gardenal. In the absence of a laboratory diagnosis, the patient is initially treated for malaria with Nivaquine 25 mg/kg of bodyweight for 3 days as malaria is the most frequent and most serious cause of fever occurring in these areas. If treatment with Nivaquine proves ineffective, further diagnosis must be considered according to the characteristics of the fever and accompanying symptoms. Now serological test for malaria is available in the market.
Tropical Fevers

CATALGINE (Sodium acetylsalicytate)
Buffered Aspirin
Sodium acetylsalicytate – Monosodic carbonate
Sachets – 0.10 g (pink), 0.25 g (violet), 0.50 g (blue), 1.00 g (green)

Uses: analgesic, anti-inflammatory, antipyretic.

Contra-indications: Gastro-duodenal ulcers, allergy to aspirin, haemorrhagic conditions.

Precautions: In cases of previous gastro-duodenal ulcers, digestive tract haemorrhage, renal insufficiency, asthma and gout.
To be used with caution in children under one year old and with pregnant women.

Adverse effects: Buzzing in the ears, headache (cephalalgia) in case of overdosage, abdominal pains, gastric ulceration and haemorrhagic syndromes.

Dosage:
Catalgine 0.10 g:
0 to 1 year: 1 to 5 sachets/day
1 to 2 years: 2 to 6 sachets/day
2 to 4 years: 2 to 8 sachets/day

Catalgine 0.25 g:
4 to 10 years: 1 to 4 sachets/day

Catalgine 0.50 g:
10 to 15 years: 1 to 3 sachets/day
adults : 1 to 8 sachets/day
Catalgine 1.00 g : adults : 1 to 4 sachets/day

DOLIPRANE (Paracetamol)

Tablets containing 0.50 g of paracetamol.
Sachets of powder containing 0.50 g of paracetamol; 0.125 g; 0.050 g of sachets.
Suppositories containing : 0.35 g of paracetamol and 0.17 g; 0.08 g.

Uses : symptomatic treatment of feverish or painful conditions.

Contra-indications : allergy to paracetamol, hepatocellular insufficiency.

Adverse effects : infrequent allergic reactions (erythema, urticaria) very rarely thrombopenia. Can affect dosages of uric acid and of glycaemia.

Overdosage : Hepatic cytolysis.

Dosage:
Adults : 0.50 to 1 g per intake, 1 to 3 times per day at 4 hourly intervals.
Children : 20 to 30 mg per kilo per day of bodyweight in 3 to 4 intakes.

GARDENAL (Phenobarbital)

Tablets containing 100 mg, 50 mg, 10 mg of Phenobarbital
40 mg of injectable solution in kit (bottle + solvent).
200 mg injectable ampoules.
Anti-convulsive, sedative, hypnotic.

Uses : Epilepsy.

Prevention of hyperpyretic convulsions in young children.

Contra-indications: porphyria, severe respiratory insufficiency, hypersensitivity to barbiturates.

Adverse effects : Daytime drowsiness.
Occasional cutaneous reactions, megaloblastic anaemia, rickets, psychic or neurological disorders in cases of extended treatment.

Warning:
The dose is to be reduced in cases of hepatic or renal insufficiency. In cases of prolonged treatment, vitamin D should be prescribed for children. To be administered with care to pregnant women and to newborn babies up to 24 hours old.
Phenobarbital is an enzyme inductor, reducing the activity of vitamin D, antivitamin K and it potentializes the sedative of phenothiazines, antihistamins, benzodiazepine. Overdosage: obnubilation, possibly coma.

**Dosage:**

- 2 to 3 mg/kilo of bodyweight per day for adults
- 3 to 4 mg/kilo of bodyweight per day for children

By injection (SC or IM):

- Adult: one to two 200 mg ampoules to be administered by glass syringe.
- Children: 12 to 30 months: 10 to 20 mg per day
- 30 months to 15 years old: 20 to 40 mg per day according to age

**MALARIA**

Malaria is generally manifested as a fever accompanied by G.I. tract disorders. The disease is caused by a parasite which lives in the red blood cells (Plasmodium) and is transmitted between human beings by the female Anopheles mosquito.
Malaria is the most common and the most deadly disease in the tropics. The clinical signs of malaria vary according to the degree of the patient’s immunity to Plasmodium.

![Anophales stephensi](image)

Malaria is generally manifested as a fever accompanied by G.I. tract disorders. The disease is caused by a parasite which lives in the red blood cells (Plasmodium) and is transmitted between human beings by the female Anopheles mosquito.

- When the level of immunity is low or nil (patients considered to be at risk: young children, pregnant women, sick people and foreign travelers), the disease may be cerebral malaria (*P. falciparum*):
  - high fever accompanied by neurological disorders (coma), without intervention will lead to death.

![Plasmodium vivax](image) ![Plasmodium falciparum](image)

- When the immunity level is satisfactory (immune patients), malaria often appears as a non-specific fever which may or may not be accompanied by digestive disorders.
- Where treatment is insufficient, chronic malaria, characterized by a slight fever, severe anaemia and splenomegaly can develop, especially in children.
Prevention

Nivaquine: 5 mg per kilo of bodyweight once a week. This prophylaxis only applies to high risk groups (pregnant women, sick people, travelers, and possibly children under 5 years of age).

Treatment

Attack without complications; 25 mg per kilo of bodyweight of Nivaquine is used as a first line of treatment over 3 days:
1\textsuperscript{st} day: 10 mg per kilo of bodyweight followed by 5 mg per kilo of bodyweight 6 hours later.
2\textsuperscript{nd} and 3\textsuperscript{rd} days: 5 mg per kilo of bodyweight per day orally.

Chronic Malaria: Nivaquine orally:
5 mg per kilo of bodyweight per day for 2 to 3 weeks.

Cerebral Malaria: Paluject, 25 mg per kilo of bodyweight per day by IV infusion 3 times a day followed by Nivaquine orally.

NIVAQUINE (Chloroquine sulphate)

Tablets containing 100 mg, 150 mg and 300 mg of chloroquine base.
Syrup, bottle of 150 ml – each 5 ml measured spoonful containing 25 mg or 50 mg of chloroquine base.
Injectable 100 mg ampoules.

Pharmacokinetics: rapid absorption with slow urinary elimination (half-life 7 to 14 days).
- Marked tissue bonding.
- High concentration in infected erythrocytes.

Uses: Malaria.

Contra-indications: retinopathy (except for treatment of malaria).

Precautions:
- Ophthalmological monitoring if treatment is prolonged.
- 300 mg tablets for adults only.

Adverse effects: benign pruritus, digestive disorders correctable on cessation of treatment. In cases of prolonged treatment at high doses, opacification of the cornea. At high doses, possibility of (transient) impairment of accommodation causing impressions of dizziness.
PALUJECT (Quinine)

1.2 and 4 ml injectable ampoules containing respectively 61.6 mg, 123.2 mg and 246.4 mg quinine base.

**Pharmacokinetics:** rapid absorption and elimination (8 hour half-life).

**Uses:** serious forms of malaria (especially cerebral malaria).

**Contra-indications:** conduction disorders – serious haemolytic anaemia.

**Secondary effects:**
- In cases of overdosage: conduction disorders, amaurosis.
- Cinchonism: buzzing in the ears, dizziness.
- Digestive disorders: vomiting, diarrhoea.
- Hypoglycaemia.
- Local reactions: necrosis in case of IM injection endophlebitis.

**Dosage:** It is recommended that Paluject should be used in D5W or D10W IV infusions.

Dosage, 25 mg of quinine base per kilo of bodyweight per day divided between 3 injections at 8 hourly intervals.

Treat orally as soon as possible.

**Some more advanced treatments:**

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AFRICAN TRYPANOSOMIASIS

African trypanosomiasis (sleeping sickness) is a disease of the central nervous system caused by an extracellular parasite living in the blood (Trypanosoma) transmitted to mankind by a fly of the genus Glossina (tsetse fly).

The condition normally develops through two stages: the first is linked with the dissemination of the parasite through the lymphatic and blood systems and is characterized by fever and swollen ganglia. The second stage occurs when the trypanosome enters the central nervous system giving rise to neurological symptoms with neurosensory and motor disorders followed by mental disorders. Without treatment the outcome of the disease is cachexia and death.

PENTACARINAT (Pentamidine)

Powder for IM or IV injection vials of 200 and 300 mg (respectively 114 and 171 mg of pentamidine base).
Uses: Trypanosomiasis during the lymph-blood system phase. Second line of treatment of leishmaniasis.

Adverse effects: The injections can be painful and may be associated with pallor, hypertension and lipothemia.
- Sometimes proteinuria develops during treatment, with regression when treatment is stopped.
- Occasionally diabetes mellitus appears which may sometimes be irreversible.

Dosage: Treatment during the lymphatico-blood phase – IM injection (or IV infusion) of 4 mg per kilo of bodyweight every other day. Series of 5 injections to be renewed one month later.

Prophylaxis: One IM injection of 4 mg per kilo of bodyweight every six months.

ARSOBAL (Melarsoprol)

Uses: Neurological (2nd stage) trypanosomiasis.

Contra-indications: Because of the gravity of the disease there are no formal contra-indications. Nevertheless the drug should be used only in the treatment of neurological trypanosomiasis.

Precautions: Measures should be taken to ensure that the patient is well capable of taking the treatment.
Injections must always be given strictly IV under medical supervision.
Renal function must be monitored.
Treatment must be interrupted at the appearance of any neurological symptom.

Adverse effects: Risk of delayed arsenical poisoning :- peripheral neuritis.
- Encephalopathy : loss of consciousness, convulsions.
  Risk of death is under 3% of cases.
Treatment suggested : corticosteroids, adrenalin, diazepam, BAL.
Early signs of intolerance (usually benign) :
- Fever, allergy.
- Hepatic or renal signs.

Dosage: Various regimes are suggested : in general : strictly IV injections of 3.6 mg per kilo of bodyweight, i.e. 1 ml per 10 kilo of bodyweight.

Some more advanced treatments:
Detection of trypanosomes is prerequisite for treatment of African trypanosomiasis.
The examination of CSF is required.
### Disease Stages and Treatments

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#### Visceral Leishmaniasis

*Trypanosoma gambiense*

*Trypanosoma rhodesiense*

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**Visceral Leishmaniasis**

- 12 million people infected
- 350 million people at risk

- **Visceral**
- **Cutaneous / Mucocutaneous**
- **Visceral + Cutaneous / Mucocutaneous**
Leishmaniasis covers a group of pathological conditions caused by a parasite of the reticuloendothelial system which is transmitted to man by the bite of the Phlebotomus, sand-fly.

The visceral form or Kala Azar is clinically characterized by intermittent fever, polyadenopathy and progressive enlargement of the spleen and liver (hepatosplenomegaly), accompanied by pancytopenia.

The disease develops rapidly and if remain without treatment death occurs.

A cutaneous form of leishmaniasis also exists.

GLUCANTIME (Meglumine antimoniate)

Ampoules containing 1.5 g, i.e. 425 mg of antimony.

Uses: Leishmaniasis.

Contra-indications:

- Serious renal or hepatic insufficiency.
- Heart disorders.

Adverse effects:

- Adverse reaction to antimony: fever, severe cough, myalgia, vomiting.
- Antimony poisoning (due to overdosage): same signs as above, occurring at the end of the treatment.

Precautions:

- Treatment should begin with progressively increasing doses.
- Dosage should be reduced on appearance of adverse reactions.
• Renal and cardiac functions to be monitored.

**Dosage:**
1 injection of 60 mg per kilo of bodyweight per day (20 mg per kilo of bodyweight per day of antimony) for eight to ten days. Treatment should begin gradually. If a second course of treatment is necessary, wait until 4 to 6 weeks have passed.

**Some more advanced treatments:**

The treatment for visceral leishmaniasis is liposomal amphotericine B which is effective and well tolerated by the patient but much expensive.

**MEASLES**

Measles is a viral disease very commonly infects children, benign in nature in the north where mortality being only 0.17% in northern Europe, but one of the major causes of death in children in the developing countries like 15% in Africa.

Measles is characterized by an oculonasal catarrh followed by a rash which spreads downwards in one single swipe.

Ocular, respiratory and neurological complications are particularly frequent in the tropics and for this reason the disease is so serious. One of the reasons that measles is so virulent in the tropical region is probably because of the wide spread vitamin A deficiency in the tropics.

**Symptomatic treatment:**

**Rehydration**

Catalgine 0.10: 1 to 5 sachets, from 0 to 1 year old
2 to 6 sachets, from 1 to 2 years old

Doliprane: 20 to 30 mg per kilo bodyweight in 3 intakes

Gardénal: 3 to 4 mg per kilo bodyweight in one intake

Avibon: 200,000 IU (100,000 IU under 1 year old).

**Treatment of superinfections:**

• Auréomycine (ointments)
• Rovamycine 0.75 M IU per 4 kg – Josacine 30 to 50 mg/kg per day.
ROVAMYCINE spiramycin

Tablets containing 1.5 M IU of spiramycin (box of 16)

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Syrup in 150 ml bottle – 1 measured spoonful (5 ml) containing 0.375 M IU of spiramycin.

An antibiotic of the macrolide group characterized by high tissue concentration in the broncho-pulmonary and ENT spheres, and acting on gram + cocci germs (Streptococci, pneumococci…), on intracellular germs (chlamydiae, mycoplasma), and on certain gram – germs.

Antiparasite action: toxoplasma, cryptosporidium, plasmodium.

**Uses**: mainly ENT and bronchopulmonary infections. Cutaneous infections.

**Contra-indications**: allergy to spiramycin.

**Adverse effects**: occasional digestive disturbances.

**Dosage**:

Adults: 2 tablets at 1.5 M IU twice per day.
Children: 2 tablets at 0.75 M IU per 10 kg bodyweight per day.
Infants: 2 measured spoonfuls per 5 per day.

JOSACINE josamycin

Tablets containing 500 mg of josamycin, box of 20 or 100.

Granules for drinkable suspension 500 mg per measured spoonful.

| 250 mg | 125 mg |

Bottle containing 60 ml.

An antibiotic of the macrolide group characterized by high tissue concentration in the broncho-pulmonary and ENT spheres, acting on gram + cocci germs (streptococci, pneumococci…), and on certain gram-germs.

**Uses**: mainly ENT and bronchopulmonary infections.

**Contra-indications**: allergy to josamycin.

**Adverse effects**: occasional digestive disturbances. Do not associate with derivatives of rye ergot.
**Dosage:**

- **Infants**: 125 mg syrup : 2 measured spoonfuls per 5 kg per day.
- **Young children**: 250 mg syrup : 2 measured spoonfuls per 10 kg per day.
- **Older children**: 500 mg syrup : 2 measured spoonfuls per 20 kg per day.
  or 500 mg tablets : 1 tablet per 10 kg per day.

**RHEUMATIC FEVER AND POST-STREPTOCOCCAL SYNDROMES**

The clinical manifestations occurring after β-haemolytic, A-streptococcal tonsillitis is rheumatic fever and post streptococcal syndromes. The condition is very common in the tropics and is manifested by an inflammatory syndrome characterized by an immunological disturbance associated with streptococcal infection.

Rheumatic fever itself is characterized by polyarthritis, asymmetrical in larger joints and disappears after few weeks. The condition is serious because it is associated with carditis. The carditis may affect the endocardium causing a valvopathy which has a very serious prognosis.

Other post-streptococcal syndromes include:

- **Acute glomerulonephritis**: oedema, high blood pressure, oliguria, proteinuria, hyperazotemia.
- **Cutaneous lesions**: formation of nodules, marginal erythemia, rheumatoid purpura, scarlet fever, an acute, rare infectious disease of children with an incubation period of 2-4 days. It is caused by a group of A beta haemolytic streptococcus. There is sore in the throat, high fever and rash of *frei*’s fine spots. It is readily treated by antibiotics and the complications of nephrites and middle ear infection are less common.
- **Acute chorea**, a symptom of disease of the basal ganglia when the individual suffers from sporadic, involuntary rapid movements of the face, shoulders and hips.

**Treatment**

Systematic treatment of all cases of suspicious tonsillitis.

- **Oracilline**:
  - children: 50,000 to 100,000 IU per kg per day
  - adult: 2 to 4 M IU per day

**Prevention of relapse**

- **Extencilline**: 1.2 M IU every 3 weeks for children
  2.4 M IU every 2 weeks for adults

- **Oracilline**: 200,000 to 500,000 IU per day

Rovamycine, Josacine : in cases of allergy.
ORACILLINE phenoxymethylpenicillin

Oblong tablets containing 1 M IU, box of 12 tablets.

Oral powder in sachets containing 500,000 IU, box of 12.

Drinkable suspension : 250,000 IU/5 ml – bottle of 120 ml.

Drinkable suspension : 500,000 IU/5 ml – bottle of 120 ml.

Antibiotic of the penicillin V group administered orally, acting on: *Corynebacterium diphtheria*, streptococci (including pneumococcus), meningococcus, gonococcus, treponema.

**Uses**: streptococcal tonsillitis and treatment of rheumatic fever, impetigo.

**Contra-indications**: Allergy to β-lactams (patient to be questioned). Allergy to cowsmilk proteins for the powder form.

**Adverse effects**: allergic manifestations requiring interruption of treatment: fever, Quinke’s oedema, anaphylactic shock. These are cross-reactions with all drugs of the β-lactam group (penicillins and cephalosporines). Digestive disorders, reversible haematological reactions.

**Dosage**:

- **Adults**: 2 to 4 M IU per day
- **Children**: 50,000 to 100,000 IU per day
- **Under 30 months**: 1 sachet at 500,000 IU per 5 kg
  - 2 spoonfuls of suspension at 250,000 IU per 5 kg
- **30 months to 8 years**: 1 to 2 tablets at 1 M IU
  - 2 to 4 sachets of 500,000 IU
  - 2 to 4 spoonfuls of suspension at 500,000 IU
- **8 to 15 years**: 2 to 3 tablets at 1 M IU
  - 4 to 6 sachets at 500,000 IU
  - 4 to 6 spoonfuls suspension at 500,000 IU.

TROPICAL DIARRHOEA

Amongst the tropical diseases still a major cause of mortality is diarrhoea. It is estimated by the World Health Organization that as many as 4 to 5 million deaths occur each year.

Whatever may be the origin of the diarrhoea, the loss of water and electrolytes bring about dehydration which, in the case of children, may quickly lead to death.

A child becomes dehydrated from the stage of 4 liquid stools per day and even less if he/she is vomiting. The child becomes weak with dry, sunken eyes and dry mouth, breathing becomes rapid and the pulse, urine becomes scarce, the skin loses its elasticity and in case of...
infants the soft area between the bones of the skull in a baby (fontanelle) sinks. Finally there is loss of weight.

The patient should be rehydrated before etiological treatment is undertaken. If the treatment begins early enough, simple rehydration, administered orally will suffice. The mother can herself prepare the rehydrating solution (ORS) which contains 3.5 gm of salt and 40 gm of sugar in 1 litre of water. Necessary potassium may be provided in the form of orange juice or mashed banana.

Numerous physicians recommended a supplement of vitamin A as it seems that vitamin A deficiency considerably make the prognosis worse and vice versa.

AVIBON 200,000 IU is administered following day if necessary, every 4 to 6 months.

**TYPHOID FEVER**

This is an ailment of the digestive tract due to the infection by *Salmonella typhi*, bacteria, which is common in tropical countries. Typhoid fever is characterized by high temperature, dissociated pulse, neurological disorders (tuphos) and more or less marked digestive symptoms like diarrhoea and vomiting.

Severe complications can happen afterwards as a result of the disease like digestive disturbance, cardiovascular complications and internal haemorrhage etc.

Suggested treatment UKAPEN.

**UKAPEN** ampicilline

Capsules containing 500 mg of ampicilline, box of 20.

Antibiotic of the β-lactam division of the penicillin A group.

Wide spectrum, acting on streptococci, pneumococci, gonococci, meningococci, leptospira, clostridium, E. coli, staphylococci…

**Uses** : Pulmonary, ENT, renal, gyno-urinary and digestive infections caused by germs sensitive to this antibiotic.

**Contra-indications** : Allergy to penicillin (patient to be questioned).
Adverse effects: Allergic reactions: urticaria, Quincke’s oedema, anaphylactic shock. Digestive disorders: nausea, diarrhoea...

Dosage: Adults: 2 g per day (2 capsules twice a day)  
Children: 50 mg per kilo bodyweight per day.

SALMONELLOSIS-SHIGELLOSIS

The symptom of the disease is infectious type of diarrhoea very common in tropical areas and is manifested by more or less severe diarrhoea sometimes stool containing blood and mucus.

Treatment is based on oral rehydration. Most commonly use of intestinal antiseptics has been recommended like COLIMYCINE.

In certain susceptible cases, generalized treatment is required: UKAPEN, ANTRIMA.

ANTRIMA: sulphadiazine and trimethoprim

Tablets containing 400 mg of sulphadiazine  
80 mg of trimethoprim, box of 10 tablets

Drinkable suspension, bottle of 50 ml.

Bactericidal antibiotic combining a sulphonamide with a diaminopyrimidine, acting mainly on E. coli, klebsiella, enterobacter, proteus, shigella and salmonella, haemophilus, Vibrio cholerae, listeria, Pneumocystis carinii.

Uses: Urogenital, bronchopulmonary, digestive and other infections caused by sensitive germs.

Contra-indications: Allergy to sulphonamides, G6PD deficiency.

Premature and new-born babies, end of pregnancy, lactation.

Adverse effects: Digestive disorders. Haematological manifestations.

**Precautions:**
- Haematological, hepatic and renal functions should be monitored in cases where treatment is prolonged.
- Not advised during pregnancy.
- Close monitoring where associated with anticoagulants and antidiabetic treatment.

**Dosage:**
- Adults: 2 tablets per day in two intakes.
- Children: 1 spoonful per 5 kg per day in two intakes.

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**AMOEBIASIS**

Amoebiasis is caused by the protozoan parasite *Entamoeba histolytica* which lives in the small and large intestine. The parasites are encysted in the colon before being expelled outside the body and are able to survive in external environment for a considerable time.

Human contamination occurs when the cysts are taken through water and food. The infection is communicated through unhygienic living conditions and is therefore common in regions where standards of hygiene are inadequate.

During development within the organism, the amoeba (which normally causes no disorder) can become histolytic and haematophagus and attack the colic mucus, brings about an amoebic dysentery syndrome characterized by stools containing blood staining mucus, violent colic and tenesmus with absence of fever.

The amoebae can also spread to other organs in particular to the liver where they give rise to the symptoms of hepatic abscess characterized by fever and painful hepatomegaly. Amoeba can enter into brain causing abscess leading to death.

**Advanced treatments:**

**Clinical symptoms**

Asymptomatic intestinal infection

**Drugs – adult dosage**

Diloxamide furate, 500 mg orally 3 times daily for 10 days, Iodoquinol, 650 mg orally three times daily for 21 days. Or Paromcin, 10 mg/kg of body weight orally three times daily for 7 days.
Mild to moderate intestinal infection

Metranidazole, 750 mg orally three times daily for 10 days. Or
Tinidazole, 2 g orally daily for 3 days plus Luminal agent – Diloxamide furate.

Severe intestinal infection

Metronidazole, 750 mg orally three times daily for 10 days. Or
Tinidazole, 2 g orally daily for 3 days plus Luminal agent.

Hepatic abscess and extra-intestinal infection

Metronidazole, 750 mg orally three times daily for 10 days. Or
Tinidazole, 2 g orally daily for 3 days plus Luminal agent.

GIARDIASIS

Common, generally benign condition which can sometimes be the cause of serious symptoms of malabsorption in children. The parasite, *Giardia intestinalis*, lives in the duodenum and is transmitted orally.

**FLAGENTYL** (Secnidazole)

500 mg tablets.
Slow elimination imidazole derivative (1/2 life 20 hours, amoebicide plasmatic level of 72 hours duration) enabling amoebiasis to be treated in one single intake.

**Adverse effects – Contra-indications – Precautions**: see Flagyl.

**Dosage**: 30 mg per kilo of bodyweight in one intake
   Adults: 4 tablets in one single intake.

**FLAGYL** (Metronidazole)

200 mg, 250 mg, 400 mg or 500 mg tablets.
- Drinkable suspension at 125 mg, 200 mg or 250 mg per spoonful.
- Injectable solution: bottle of 500 mg.
- Pessaries at 500 mg.
- Suppositories containing 500 mg and 1 g of metronidazole.

**Uses**: Treatment of conditions due to *Trichomonas vaginalis, Entamoeba histolytica* and *Giardia intestinalis*.  

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Adverse effects: Moderate digestive disorders, alteration of taste. Occasionally: dizziness, incoordination, ataxia, polyneuritis.

Contra-indications: Hyper-sensitivity to imidazoles.

Precautions: During first 3 months of pregnancy: not to be associated with alcohol or with disulphirame, patients being treated with warfarine to be closely monitored.

Dosage: Amoebiasis: 30 to 40 mg per kilo of bodyweight per day for 7 days.
Adults: 2 g a day for 7 days.

More advanced treatments:

The safest drug is Paronomycin, 500 mg orally three times a day for 7 days though appears to have lower efficacy.

ASCARIASIS

Ascariasis is a very common disease caused by a parasite (the roundworm) with a complex life-cycle. Human contamination occurs when the eggs of the parasite are taken through food and drink (the disease is prevalent in conditions of inadequate hygiene). The hatched larvae make their way to the lungs where their presence give rise to a more or less marked allergy syndrome (fever, arthralgia, and associated pulmonary symptom sometimes leading to Loeffler’s syndrome). They then return to the digestive tract.
tract where, as adults, they lay eggs which are excreted into the external environment. Adult roundworm causes digestive disorders which may be more or less serious: diarrhoea, vomiting, abdominal pains, and intestinal obstruction due to the presence of Ascaris in large numbers.

Advanced treatments:

The best treatment is albendazole, single dose of 400 mg orally, mabendazole, single dose of 500 mg orally or 100 mg twice daily for 3 days. OR Pyrantol pamoate single dose of 11 mg/kg of body weight orally.

These drugs are well tolerated by the patients but may cause mild gastrointestinal toxicity. They are now considered safe for children above 1 year of age and in pregnancy. Surgery may be needed for if the worm causes appendicitis or other serious gastrointestinal complications.

ANKYLOSTOMIASIS

Ankylostomiasis is caused by a parasite (the hookworm) which differs from the roundworm in two fundamental ways:

- Contamination occurs through the penetration of the skin of the legs: eggs excreted into the external environment produce larvae which penetrate the cutaneous barrier.
- The adult hookworm is haematophagous and in addition to the digestive disorders described above, can cause very serious anaemic condition.

SOLASKIL (Levamisole)

Tablets containing 300 mg and 150 mg levamisole base.

Indications: Ascariasis, ankylostomiasis.

Adverse effects: Used in high doses over a long period (as an immunoregulator) it can cause agranulocytosis.

Dosage: 3 to 6 mg per kilo of bodyweight (150 to 300 mg for adult) in one intake. In case of heavy parasitemia, the treatment may be renewed the following day.
TAENIASIS

The common tapeworm infestation due to the ingestion of beef (*Taenia saginata*) or pork (*Taenia solium*) and which causes only minor digestive disorders, there exists a condition, mainly affecting children which is more specific to the tropics and which is caused by the small taenia, *Hymenolepis nana*. These worms cause various digestive disorders because of auto-infestation, require sustained treatment over a long period. They may develop accidentally within rat, grain beetle or flea.

**TREDEMINE** (Niclosamide)

Tablets containing 0.50 g of niclosamide.
Dose not cross the intestinal barrier.

**Indications**: Taeniae (tapeworm)

**Dosage**: *Taenia saginata* – *Taenia solium*.

Adult and children over 7 years of age:
2 tablets in the morning in an empty stomach, 2 tablets 1 hour later.
It is important that nothing should be eaten or drunk for 12 hours before the treatment and for 3 hours afterwards: the tablets must be chewed before they are swallowed.
Children between 2 and 7 years of age: half the adult dose.

**Hymenolopis nana**

Adults and children over 7 years of age: 4 tablets on the 1st day, then 2 tablets per day for 6 days (to be chewed after meals).
Children under 7: half the adult dose.
In the tropical countries, climatic factors like heat and humidity, inadequate hygiene and undernourished condition give rise to a large number of dermatological diseases. In addition, many parasite caused ailments affect the skin elasticity and finally ectoparasitic infection also occur more commonly in tropical regions.

**CUTANEOUS MYCOSIS**

Skin infections caused by microscopic fungi is called cutaneous mycosis. The infection caused by dermatophytes is biologically different from that caused by yeasts.

The infections, however, do not need to classify clinically as the treatment is the same whatever may be the etiological origin of the mycosis.

Mycosis of the skin includes –

- Herpes circinata : round erythematous lesions surrounded by a corona of pearly vesicles.
- Pityriasis versicolor : discolouration of small patches of the skin in the thorax.
- Skin fold lesions : eczema in the inguinal skin wrinkles appear in the male. Lesions in the skin in the form of wrinkles below the breasts of obese females.
- Athellet’s foot : puriginous fissure between the toes.
- Lessions of the exoskeleton, tinea : scalp infection causing smaller or larger areas of alopecia (baldness) in children.
- Favus in the adult : Ringworm infection with formation of scale. It usually affects the scalp and is due to fungus infection, Trichophyton schoenleinii.
- Onyxis-perionyxis : infection commonly affecting the toe nails.
FAZOL isoconazole

Cream containing 2% micronized isoconazole. 30 g tube.
Powder containing 2%. 30 g jar.
Gynecological pessary containing 300 mg of micronized isoconazole, box of 3 (Fazol G).
Wide spectrum imidazole derivative acting locally on filamentous fungi (dermatophytes,
asparagillus…), yeasts (candida, pityrosporum…) and certain gram + germs.

Uses: cutaneous or mucous mycosis of any origin:
– Herpes circinata, pityriasis versicolor.
– Hebra’s marginate eczema, athlete’s foot, skin fold lesions.
– Onychomycosis. – Tinia.
– Vaginitis.

Contra-indications: hypersensitivity to one of the ingredients.

Adverse effects: pruritus in rare cases.

Dosage:
– Cutaneous mycosis: normally applied twice daily well beyond the edge of the lesion, for
  at least 2 to 3 weeks.
– Onychis: treatment lasts several months. A generalized treatment may be necessary.
– Vaginitis: 1 pessary each evening at bedtime for 3 to 6 days.

TROPICAL PHADEGEDENA

Extensive and destructive chronic ulcer aggravated by malnutrition is called tropical
phagedena. It begins within a wound or insect bite. It is a type of skin disease or dermatitis.
The edges of the ulcer are clearly marked, raised, indurated, detached. The centre is exuberant
and sanious. There is no fever, pain or adenopathy.

Treatment: Penicillin G in large dosage like Oracillina, Extencilline; Hexomédine together
with localized treatment of the skin.

HEXOMEDINE solution (hexamidine)

Clear non-foaming hydroalcoholized solution containing 1%. 45 ml and 250 ml bottles.
• There is also a transcutaneous form of Hexomédine, acting on deep skin infections (acne,
  boils).

Uses: antibacterial antiseptic of the diamidine family.
• Auxiliary treatment for dermatological infections and superinfections.
Contra-indications: know hypersensitivity to diamidines.

Dosage: 2 to 3 daily applications locally. Rinsing after application is not necessary.

**FILARIASIS**

Filariasis is a group of diseases mainly causing important cutaneous manifestations.

**ONCHOCERCIASIS**

Transmitted by midges (Simulium) this causes a widespread pruritus (filarial scabies) on the buttocks, legs, thighs and thorax. The skin thickens, becomes dry and brittle and lichenified (reptile-like). Discolouration is also observed.

The adult parasite may roll itself into the subcutaneous tissue and cause non-inflammatory fibrous nodules visible against underlying bony surfaces. The risk of ocular lesions makes the disease a serious one.

Onchocerciasis or river blindness is caused by *Onchocerca volvulus*. An estimated 18 million person are infected. Among them 3-4 million have skin disease, 5 laks have severe visual problems and 3 laks are blinded.
In some area of West Africa especially in Nigeria and Congo 10% of the population are blind due to this infection.

The treatment is ivermectin. This medicine destroys microfilariae but not adult worms, so disease control requires repeat administration. One regimen is to treat every 3 months for 1 year followed by treatment every 6-12 months for the suspected lifespan of adult worms which is about 15 years.

Treatment kills quite a number of microfilariae in the skin and eyes. Ivermectin should be used with caution in patients also at risk of loiasis. This is the only drug known to destroy adult worms but it is very toxic.

Doxycycline acts against *O. volvulus* by destroying intracellular bacteria. A course of 100 mg/day for 6 weeks kills the bacteria and prevents parasitic embryogenesis for at least 18 months.

**Lymphatic filariasis**

The disease is caused by filarial worm, *Wucheria bancrofti, Brugia malayi* and *Brugia timori*. The disease is among the most important parasitic diseases of human beings. Nearly 120 million people are infected in tropical and sub-tropical countries.

The parasite is transmitted by mosquitoes, the adult parasite living in the lymph channels, the embryo within the bloodstream. It causes bouts of acute lymphangitis, mainly in the area of the lower limbs and scrotum, accompanied by fever. The lymphangitis is normally retrograde and is often accompanied by adenitis.
Asthma-like paroxystic bronchitis (tropical eosinophilia) may be observed during or between the bouts of lymphangitis.

At a later stage, elephantiasis-type complications appear: sclerofibrous hypertrophy of the skin and the hypodermis affecting mainly the lower limbs and the scrotum.

**HETRAZAN** (Diethylcarbamazine)

Tablets containing 100 mg of DEC base.

**Uses**: Filariasis.

**Adverse effects**: Nausea, vomiting, cephalae, drowsiness.

**Precautions**: Hetrazan brings about a lysis of the parasites which can cause serious allergic reactions where parasitemia is high, particularly in cases of onchocercosis or loasis. These reactions are characterized by increase in pruritus, fever and cephalalgia. Onchocercosis lesions of the eye can be aggravated.

In cases of very high *Loa loa* parasitemia, anaphylactic shock may occur. Treatment should therefore begin with small doses, under antihistaminic cover (Primalan).

**Dosage**: Adult – 4 tablets per day in two intakes for a period of ten days to be renewed after further ten days.

Children – 6 mg per kilo of bodyweight per day.

In cases of Onchocercosis, treatment should begin with one quarter of a tablet, the dose being doubled every day. Antihistaminic cover should be provided:

**Primalan** : 2 tablets per day beginning some days before the treatment.

In cases of loasis with parasitemia, treatment should begin with the equivalent of 1/32 of a tablet (dilute one tablet in 32 ml of water and extract 1 ml of the solution. Use a graduated syringe). The patient should receive 2 tablets per day of Primalan before the treatment.

In cases of high parasitemia, hospitalization is required.

**Prophylaxis**: High risk populations (i.e. foresters) can be protected by a preventive dose of one tablet per week.

Mass treatment with the aim of eradicating the disease has also been proposed as follows: 5 mg per kilo of bodyweight per day (i.e. 3 tablets per day for the adult) for 3 days every 6 months or 2 mg per kilo of bodyweight per day (i.e. 1 tablet per week for the adult) over a period of 18 months.

**Some more advanced treatment**:

According to Lange (2009) treatment is controversial because no drugs can fully control or cure the disease. On the other hand treatment may cause serious acute inflammation.
Diethylcarbamazine is used frequently but it cannot cure infection as it does not act against adult worm.

Asymptomatic infection and acute lymphangitis are treated with Diethylcarbamazine 2 mg/kg of bodyweight orally three times daily for 10-14 days which helps to control the number of microfilariae at low level.

The treatment sometimes produce allergic symptoms like fever, headache, malaise, hypotention and bronchospasm, this is due to release with lower dose with escalation over the first 4 days of treatment. Single annual dosage of Diethylcarbamazine 6 mg/kg of bodyweight orally alone or with ivermectin 400 mg/kg of bodyweight orally or abendazole 400 mg orally may be effective as longer courses of diethylcarbamazine.

**ECTOPARASITES**

Name given to a group of arthropods which by their presence on the outer skin, cause generally benign local irritation mainly in the form of more or less intense pruritus.

Certain arthropods cause only local irritation (*Thrombicula autumnalis*, *Sarcoptes scabiei*).

Scabies is characterized by intense itching and burrowings beneath the skin between the fingers at the wrists and in the armpits.

*Sarcoptes scabiei*

**ASCABIOL** (Benzyl benzoate)

125ml bottle containing 12.5 g of benzyl benzoate and 2.5 g of sulphiram. Active on acarids, sarcoptes, *Thrombicula autumnalis* and lice.

**Adverse effects**:

- Immediate burning sensation, risk of eczematization in case of repeated applications.
- Convulsions in case of accidental ingestion or in case of application to injured skin, particularly in young children.

**Dosage**:

Ascabiol should be applied by a flat brush in one or two coats over the entire body, taking care to avoid the face and the scalp. To be kept on for 24 hours.

For children under 2 and for pregnant women one coat only should be applied. To be kept on for 12 hours.

Disinfect clothing.
Infestation by lice, fleas or ticks can be dangerous; these arthropods can infect human beings with serious bacterial or viral conditions (plague, typhus).

**PLAGUE – TYPHUS**

![World map showing plague and typhus endemic areas]

Plague is a bacterial infection caused by *Pasteurella pestis* transmitted by the flea, and it is still endemic in certain areas. The reservoir of infection is usually the rat.

Three clinically different patterns can be marked:

- **Bubonic plague**:
  Sudden onset with high fever, shivering, trembling. A malignant inflammation of the lymphatic glands of the axilla or groin appears from the second day.
  Nervous, cutaneous or pulmonary complications may result and the mortality rate is 25 to 90%.

- **Septicemic plague**:
  This occurs when the ganglionic barrier is overwhelmed and results in the immediate establishment of a fatal septicemia.

- **Pulmonary plague**:
  This is an extremely serious and directly contagious acute pneumopathy. Death results in 48 hours.
Treatment: Streptomycine, Antrima.

Among the different types of rickettsiosis transmitted by lice, exanthematus typhus, *Rickettsia prowazekii*, is the most deadly.

This condition is often observed in the aftermath of severe disasters such as wars or earthquakes and is characterized by a distinctly recognizable infections syndrome associated with a typhoid state and skin rash.

Treatment: Ukapen, Rovamycine.

Lice

**STREPTOMYCINE** streptomycin

1 bottle containing 1 g of streptomycin base, in the form of sulphate. Antibiotic bactericidal on gram- germs and on Koch’s bacillus.

**Contra-indications**: allergy to streptomycine. Disorders affecting the auditory nerve and the cochleovestibular system. Renal insufficiency – Myasthenia.

**Adverse effects**:
Risk of damage to the auditory nerve (audiogram monitoring)
– Allergies – neuromuscular blockage.

**Dosage**: Adults: 1 to 2 injections per day (reduced dose for elderly patients). Children: 20 to 40 mg per kilo per day in 2 injections. Infants: 10 to 20 mg per kilo per day in 2 injections.
LEPROSY

Leprosy is a type of infection of the skin and of the nervous system caused by Hansen’s bacillus, *Mycobacterium leprae*. Dr. Gerhard Henrik Armauer Hensen, a physician from Norway, discovered the bacteria in 1873.

Leprosy spreads through coughing and sneezing by untreated infections patients but is relatively noncontagious.

Two types of leprosy can be distinguished according to the level of the patient cellular immunity.

- Positive reaction: tuberculoid form
- Negative reaction: lepromatous form

Tuberculoid form:
The first appearance of symptoms are skin lesions or patches on body surface. Skin colour becomes lighter than normal or reddish. Loss of sensation, presence of hair or sweat on the patches, muscular weakness, pain under elbow joint, numbness or lack of sensation in the hands and feet.

Very early sign of infection is smooth, oily, shiny appearance of face and body surface, thickening and swelling of earlobes and ear borders, loss of eye brow and five or more patches on the body surface. Infection of the upper respiratory tract characterized by perfuse discharge from nasal mucous membrane, sneezing and watering of the eyes occur.

Lepromatous form:
Lepromatous leprosy is characterized by cutaneous lesions, but the gravity of the disease is due mainly to the spread of the bacillus to all organs. The initial lesions develop into leproma, dermal swelling, more or less well delimited and located on the face and limbs.

At second stage, the facial infiltration, followed by collapse of the nose known as lepromatous minitis. It is an osseous deformity of the face which produces a lion like appearance.

Leprosy spreads through the ganglia, the spleen, the kidneys, the lungs etc.
DISULONE dapsone

Tablets containing 100 mg of dapson (DDS), plus 200 mg of ferrous protoxalate. 100 tablets per box.

Uses: leprosy – herpetiform dermatitis – malaria (taken with pyrimethamin or proguanil).

Adverse effects: haemolytic anaemia (compensated by addition of iron), methemoglobinemia, digestive disorders.

Rare complications of neurological (cephalea, insomnia, paresthesia…) and allergic (fever, pruritus, phototoxicity…) type.

To be prescribed with caution in cases of renal insufficiency and hepatitis. May be administered to pregnant woman.

Treatment should begin with progressively increasing doses.

Dosage: Adult: 1 tablet per day (100 mg)

Children: 25 mg per day up to 12 kg bodyweight

50 mg per day between 12 and 25 kg bodyweight

75 mg per day up to 50 kg bodyweight

Duration of treatment: Tuberculoid leprosy: 2 years minimum

Lepromatous leprosy: 10 years minimum.

CUTANEOUS LEISHMANIASIS

Single or multiple ulcerations develop at the site of the bite of Phlebotomus (sandfly).

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Dry Old-World (Afro-Asian) form (*L. tropica*) : ulceration centered on an inflammatory nodule surrounded by a peripheral dropsical swelling, sometimes pruriginous but never painful. Clears up spontaneously leaving a disfiguring scar.

Humid form (*L. major*) : develops faster, with greater ulceration.

Cutanomucous American form (*L. braziliensis*) : mucous ulcerations may reach in the cartilage resulting in extended mutilation and/or affecting the deeper organs.

**Treatment** : The dry forms require no treatment. Perilesional Glucantime injections have been suggested to accelerate cure.

**Other forms** : Glucantime or Pentacarinat.
Cases of superinfection, should be treated with Pyostacine.

**Some more advanced treatments** :
Treatment is very difficult as most drugs are toxic and require long treatment. The drug is pentavalent antimonials. Newer therapies are amphotericin B, millefosine and paramomycin.

**PRIMARY AMOEBIC MENINGOENCEPHALITIS**

The disease is caused by free living amoeba, *Nagleria fowleri*. The disease is fulminating, haemorrhagic, necrotizing meningoencephalitis which is found in healthy children and young adults. The disease if untreated becomes fatal.

The best drug is Amphotericin B. Sometimes if needed intravenous miconazole and oral rifampin may be administered.
VAGINITIS

The main causes of vaginitis are infection with Trichomonas, Candida, Gonococcus, and anaerobic germs.

<table>
<thead>
<tr>
<th>Anaerobic germs</th>
<th>Trichomonas</th>
<th>Candida</th>
<th>Gonococcus</th>
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<tbody>
<tr>
<td>White-grey vaginal discharge</td>
<td>Yellowish malodorous discharge;</td>
<td>Whitish discharge, thick &amp; pruritus, heavy</td>
<td>Greenish discharge; bartholinitis moderate</td>
</tr>
<tr>
<td>homogenous malodorous, isolated</td>
<td>malodorous discharge; pruritus &amp;</td>
<td>inflammation</td>
<td>inflammation</td>
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<td>inflammatory reaction</td>
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</table>
Flagyl 1 g per day for 7 days or 2 g in one intake

Flagyl 1 g per day for 7 days or 2 g in one intake

Fazol 1 pessary per day for 3 to 6 days

Peflacine 2 tablets in one intake
Pyostacine (for pregnant women) 2 g per day for 7 days

| Treatment of sexual partners is also suggested. |

Some more advanced treatments:

The chief cause of vaginitis is the presence of the parasite *Trichomonas vaginalis* in the vagina.

Treatment of both partners simultaneously is recommended. Metronidazole 2 g orally as a single dose or 500 mg orally twice a day for 7 days is of much use. In the case of treatment failure, the patient may be treated with metronidazole 500 mg orally twice a day for 7 days. If treatment failure occurs again metronidazole 2 g orally once daily for 3-5 days.

ONCHOCERCIASIS

Parasite-caused lesions of the subcutaneous tissue caused by filarial worm (*Onchocerca volvulus*) transmitted by a biting midge, the *simulium*. Adult parasites and larvae live in the subcutaneous tissue and produce three types of lesion:

- **Cutaneous lesions** characterized by intense pruritus and complications linked to pruritus (thickening and discolouration of the skin).
  - Cystic lesions: subcutaneous cysts form close to the bones, containing the adult worm.
  - Ocular lesions lead to blindness: punctuated keratitis spreading gradually, chorioretinitis producing the characteristic cracked mud appearance of the fundus oculi.

*Simulium indicum*

*Onchocerca volvulus*
Treatment: Hetrazan (already discussed).

PRIMALAN (Mequitazine)

5 mg tablets.
60 ml bottle on sirup containing 1.25 mg per measured spoonful.
Antihistamin H1 (phenothiazinic derivative) cause no increase in drowsiness.

Uses: Treatment of symptoms of allergic conditions: rhinitis, conjunctivitis, urticaria, Quincke’s oedema. Adjuvant treatment of pruriginous dermatological conditions (eczema, parasitis, ectoparasitis).

Contra-indications: Association with MAO inhibitors.
- Angle closure glaucoma.
- Prostatic adenoma.

Adverse effects: Immediate and temporary: dryness of the mouth, accommodation disorders, confusion in elderly patients.

Dosage: Adult: 2 tablets per day in one or two intake.
Children: ½ a tablet per 10 kg of bodyweight per day.
1 spoonful per 5 kg of bodyweight per day.

TRICHRUIASIS

The disease is caused by *Trichuris trichura*, the whip worm infects about a billion persons throughout the globe. Infection is most frequent in children.

The patient is treated with albendazole (400 mg/daily orally or mebendazole (200 mg/ daily orally) for 1-3 days for light infection and 3-7 days for heavy infection.

*Trichuris trichura*
STRONGYLOIDIASIS

The disease is caused by infection with *Strongyloides stercoralis*.

Full eradication of *S. stercoralis* is very important because it replicates in human beings. The routine treatment is ivermectin 200 mcg orally daily for 1-2 days. For heavy infection ivermectin is administered daily until the clinical syndrome has resolved and larvae have not been seen in stool for at least 2 weeks.

![Strongyloides stercoralis](image)

**ENTEROBIASIS**

*Enterobius vermicularis*, the pinworm, is a common cause of intestinal infections worldwide with prevalence in school going children.

Treatment is done with single oral dose of albendazole 400 mg, mebendazole 100 mg or pyrantal pamoate 11 mg/kg of bodyweight to a maximum of 1 g. The dose is repeated in 2 weeks due to frequent reinfection.

![Enterobius vermicularis](image)

**DRACUNCULIASIS**

![Dracunculus medinensis](image)

![Cyclops sp.](image)
The disease is caused by the nematode *Dracunculus medinensis* or guinea worm. It causes chronic cutaneous ulcers. It is transmitted by a crustacean larva Cyclops by ingesting the infected larvae.

No drug cures the infection, but metronidazole and mebendazole are used to restrict inflammation and facilitate removal of worm from the body. Simple surgical method may be used to remove worms. Corticosteroid ointments are used to heal the injured part of the body. Topical antibiotics are used to cure bacterial secondary infections.

**TRICHINOSIS**

This disease is caused by *Trichinella spiralis*. Pigs and other animals become infected by eating infected uncooked food scraps or other animals such as rats.

Human infections occur sporadically or in outbreaks.

No effective treatment is still possible for full blown trichinosis. However, if infection is suspected early treatment with mebendazole 2.5 mg/kg of bodyweight orally twice daily will destroy intestinal worms and may restrict tissue invasion. Supportive therapy with analgesics, antipyretics, bed rest and in severe illness, corticosteroids will be fruitful.

**LOIASIS**

*Loa loa* 

Eye worm
The disease is caused by a worm called *Loa loa*.

The treatment is done with diethylcarbamazine which destroys microfilariae and has also same action against adult worms. Treatment starts with diethylcarbamazine 8-10 mg/kg of bodyweight per day orally for 21 days which destroys 50% of microfilariae repeat courses increase efficacy. The treatment is similar as in the case of Onchocerciasis.

**BILHARZIASIS or URINARY SCHISTOSOMIASIS**

Bilharziasis is a pathological condition caused by a trematode parasite, blood fluke, *Schistosoma haematobium* which is transmitted to man by snails of Bulinus group, *Bulinus truncates*.

Bilharziasis is characterized by intense irritation of skin rash called cercarial dermatitis – swimmer’s itch which disappears in 2 to 3 days.

Toxin liberated by the worm produces vague symptoms like anorexia, headache, generalized pain in the back and extremities, rise of temperature accompanied by rigor and night sweat.

Urticarial rash along with oedema in the subcutaneous tissue occur resulting eosinophilia due to the cercarial migrans.

Fever, cough, lymphadenopathy, liver and spleen enlargement are seen which is called katayama fever in fourth and fifth week after infection. Haematuria and dysuria are found 8 to 12 weeks after infection.

The granulomatous response to the eggs leads to the formation of fibrosis and calcification of the egg masses. Hydronephrosis occurs and may cause renal failure.

Sodium antimony tartrate (tartar emetic) is administered intravenously in a freshly prepared 1 percent solution in distilled water or in 5 percent glucose solution on alternate days in graduated doses.

Fouadin (Stibophen B.P.; neoantimosan, Bayer) is administered in all three types of schistosomiasis. It is obtained in 6.3 percent solution and 1 ml of this solution contains 8.5 mg of trident antimony.
Anthiomaline (Lithium antimony thiomalote) is administered in daily doses of 2 ml containing 10 mg of Stibophen up to a total of 66 ml. A maximum individual dose of 4 ml may be administered.

T.W. Sb (Antimony dimercaptosuccinate) – The dose is 2 gm (containing 500 mg of Sb.) which is divided into equal doses for 4 or 5 days, preferably intramuscularly. It is effective in both urinary and intestinal schistosomiasis (S. mansoni).

Miracil D (Nilodon) – is a thioxinate derivative and proved to be of appreciable therapeutic effect in mice and rats experimentally infected with S. mansoni. It is obtained in 0.5 gm tablets. When administered orally in patients, in doses of 10-20 mg per kg body weight per day for one week or a total dose of 60 mg per kg of body weight in 3 to 6 days. It is effective against S. haematobium and S. mansoni. The daily dose may be administered in two times.

SEXUALLY TRANSMITTED DISEASES

Although sexually transmitted diseases or STD present all over the globe, sexually transmitted diseases are particularly virulent in the tropics.

SYPHILIS

Sexually transmitted diseases caused by Treponem pallidum, which develops through several phases is the syphilis. The phases are –

- Chancre : typical ulceration, nonsensitive with clearly delimited edges centered on a hard area, accompanied by adenopathy.
- Dermatological lesions : a rose cloured rash on the skin and eruption of rose coloured spots in early secondary syphilis.
- Tertiary effects : cardiovascular complications, neurological disorders and bony deformity.

**Treatment** : In case of recent infection, one single injection of 2.4 million IU of Extencelline should be administered. Then to be repeated once every seven days for 3 months in cases of earlier infection. Treatment of sexual partner is also suggested.
EXTENCILLINE Benzathin-benzylpenicillin

Bottles containing 600,000 IU – 1.2 M IU – 2.4 M IU.
Bactericidal antibiotic of the β-lactam family.
Delayed-action penicillin G ensuring prolonged penicillinaemia.
Acting principally on streptococcus and treponema.

Uses: treatment of rheumatic fever, and prevention of relapse.
Treatment of syphilis and yaws.

Contra-indications: Allergy to penicillins to be revealed by questioning.

Adverse effects: Allergic conditions: fever, urticaria, Quincke’s oedema and occasionally, anaphylactic shock.
Reversible haematological reactions: anaemia, thrombopenia, leucopenia, coagulatary disorders.

Dosage: - Syphilis: 2.4 M IU a single injection, or repeated at seven day intervals for a minimum of three treatments.
- Yaws: 1.2 or 2.4 M IU in a single injection. Half this dose for children.
- Rheumatic fever: 1 injection of 600,000 IU to 2.4 M IU every two weeks.

BEJEL

Endemic non venereal syphilis is widespread in dry or desert zones is called Bejel, whereas in forest areas yaws is more prevalent. Chancre is rare and easily passes unnoticed, conversely buccal or anogenital mucous patches are formed which are very distinct.

The effect on the skin and muscle tissue and on the longer bones can result in mutilation, however, in this case there is no neurosensory effect.

Treatment: It is done based on penicillin G.

YAWS

Yaws is a skin infection in tropical countries but is not sexually transmitted caused by Treponema pertanue. It is like the infection caused by Trepanoma pallidum and developed in three phases:

- Primary lesion: clearly delimited ulcer on a hard base, pruriginous and found on the exposed parts of the body surface.
- Secondary phase: fever and pain in the bones, formation of cutaneous lesions in the form of rosetta, ulcer and scably lesions.
- Tertiary phase: cutaneous lesions and bony deformity which may result in mutilation.
Treatment: Injection of 1.2 M IU or 2.4 M IU of Extencilline.

EXTENCILLINE Benzathin-benzylpenicillin
Bottles containing 600,000 IU – 1.2 M IU – 2.4 M IU.
Bactericidal antibiotic of the β-lactam family.
Delayed-action penicillin G ensuring prolonged penicillinaemia.
Acting principally on streptococcus and treponema.
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- Yaws: 1.2 or 2.4 M IU in a single injection. Half this dose for children.
- Rheumatic fever: 1 injection of 600,000 IU to 2.4 M IU every two weeks.

SOFT CHANCRE
Soft chancre is a type of STD caused by the infection of *Haemophilus ducreyi* amongst males in Africa and Asia. The chancre is painful, sometimes multiple with raised edges and uneven
and festering bottom. Often associated with adenopathy. It is actually the initial lesions of syphilis developing at the site of inoculation.

**Treatment**: Antrima – Peflacine.

**PEFLACINE** pefloxacin

400 mg tablets.

Bactericidal antibiotic of the quinolone group. Wide spectrum. Half-life approximately 12 hours.

Slow renal and digestive elimination of non-metabolized product. Because of its antibacterial activity and its pharmacokinetic properties, Péflacine has the following uses in tropical environments:
- Typhoid fever
- Gonococcal infection
- Soft chancre.

**Contra-indications**: allergy to quinolone

Children under 15 – G6PD deficiency – Pregnant women – nursing mothers.

**Adverse effects**: Risk of photosensitization, digestive disorders, cutaneous symptoms, muscular pains, neurological disorders.

**Dosage**: 2 tablets in one intake.
- Gonococcal infection – Soft chancre: treatment for one day only.
- Typhoid fever: treatment over seven days.

**GONOCOCCAL INFECTION**

Gonococcal infection caused by *Neisseria gonorrhoeae* is a type of STD.

In the male: acute urethritis is manifested as a burning sensation during urination. Urine is clouded because of the presence of pus in the urine.

Local complication: prostatitis, vesiculitis, epididymitis cause sterility in male.

Long term complication: conjunctivitis, arthritis, septicaemia etc.
In the female: urethra-skenitis, bartholinitis, cervicitis. Often diagnosed from after effects like tubal obstruction.

In the infant: conjunctivitis which may lead to the formation of pus resulting melting of the eye.

**Treatment**: Peflacine, Pyostacine.

**PEFLACINE** pefloxacin

400 mg tablets.
Bactericidal antibiotic of the quinolone group. Wide spectrum. Half-life approximately 12 hours.
Slow renal and digestive elimination of non-metabolized product. Because of its antibacterial activity and its pharmacokinetic properties, Péflacine has the following uses in tropical environments:

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- Typhoid fever: treatment over seven days.

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**TROPICAL BLINDNESS**

Infectious blindness is extremely common in the tropics. It is so widespread that some two-thirds of the total cases of blindness worldwide are found in tropical regions. The causes of the tropical blindness due to infection or nutrition deficiency are specific to these areas. In particular the ocular complications like blindness are due to general illness like measles, chickenpox, gonococcal infection and by parasitic infections like onchocercosis and loasis.

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**TRACHOMA**

Trachoma is a type of disease in which increased vascularity of the cornea occurs leading to granulation tissue formation and impaired vision. This is because of the infection of *Chlamydia trachomatis*. The disease associated with underdevelopment and is encountered in the more economically deprived regions of the world. It develops through four phases,
beginning with an ordinary bilateral conjunctivitis and progressing towards the inflammation of the cornea and thickening of the eyelids. Complications: A fibrous retraction of the band of ligaments which stretches from the junction of the upper and lower eyelid to the orbital bones both medially and laterally causing the eyelashes to turn inward occurs. This phenomenon results in the ulceration of the cornea. The lachrymal glands are also affected and the cornea dries out the condition is called Xerosis. This is a type of bacterial super infection.

Treatment: Antrima, Rovamycin or Josacine as generalized treatment. Aureomycin ointment to be applied locally.

AUREOMYCINE SPECIA chlortetracycline

Ophtalmological ointment containing 50 mg of chlortetracycline (5 g tube). Bacteriostatic antibiotic of the wide spectrum tetracycline group. Ensures a high local concentration of tetracycline.

Uses: blepharitis, conjunctivitis, keratitis, trachoma, measles…

Contra-indications: allergy or intolerance to tetracyclins.

Dosage: 1 application in the evening at bedtime.

XEROPHTHALMIA
Xeropthalmia is a disease of the eye which is the result of Vitamin A deficiency. In this disease ability to see clearly in dim light is impaired with the alteration of the rhodopsin containing retinal rod cells.

Stable phase: abnormal dryness of the conjunctiva and of the cornea the condition known as xerosis conjunctivae. Accumulation of keratinized metaphasic cells (Bitot’s spots) occurs followed by keratomalacia and ulcerations of the cornea. It is an important tropical complication.

**Treatment**: Vitamin A, Avibon 10 to 50,000 IU per day for 10-14 days followed by 200,000 IU every 6 months to be administered.

**AVIBON** retinol vitamin A

Capsules containing 50,000 IU of vitamin A – box of 20 capsules.

Exists also as 2 ml injectable ampoules, containing respectively 100,000 IU and 500,000 IU of vitamin A.

**Uses**: treatment of:
- Vitamin A deficiency, particularly in the case of signs evolving xerophthalmia.
- Prevention or treatment of deficiencies in undernourished children, particularly to forestall the complications of diarrhoea, or measles…

**Contra-indications**: Avibon is not to be used in the case of lipid absorption disorders.

**Adverse effects**: none, except in the event of overdosage. Treatment must therefore be stopped on the appearance of the following symptoms:
- Digestive disorders (nausea, vomiting, diarrhoea).
- Intracranial hypertension, psychiatric disorders.

**Dosage**: Treatment: 10,000 IU to 50,000 IU for a period of 10 to 15 days.
Prevention: 200,000 IU once every 6 months.
## DRUGS FOR PARASITIC INFECTIONS

### List of Generic with Brand Names

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Brand Name (Company)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albendazole</td>
<td>Albenza (Glaxo Smith Kline)</td>
</tr>
<tr>
<td>Artemether</td>
<td>Artenam (Arneco, Belgium)</td>
</tr>
<tr>
<td>Artesunate</td>
<td>Guilin (Peoples Republic of China)</td>
</tr>
<tr>
<td>Atovaquone</td>
<td>Mepron (Glaxo Smith Kline)</td>
</tr>
<tr>
<td>Proguinol</td>
<td>Malarona (Do)</td>
</tr>
<tr>
<td>Bacitracin</td>
<td>A number of manufacturers</td>
</tr>
<tr>
<td>Bacitracin-zinc</td>
<td>Apothekernes Laboratorium A.S., Oslo, Norway</td>
</tr>
<tr>
<td>Benznidazole</td>
<td>Rochagan (Roche, Brazil)</td>
</tr>
<tr>
<td>Bittional</td>
<td>Bitin (Tanabe, Japan)</td>
</tr>
<tr>
<td>Chloroquine HCl and Chloroquine phosphate</td>
<td>Aralen (Sanofi and others)</td>
</tr>
<tr>
<td>Crotamiton</td>
<td>Eurax (West Wood – Squibla)</td>
</tr>
<tr>
<td>Dapsone</td>
<td>(Jacobus)</td>
</tr>
<tr>
<td>Diethylcarbamazine citrate USP</td>
<td>(University of Iowa School of Pharmacy)</td>
</tr>
<tr>
<td>Diloxanide furoate</td>
<td>Furamide (Boots, UK)</td>
</tr>
<tr>
<td>Eflornithine</td>
<td>Ornidyl (Aventis, France)</td>
</tr>
<tr>
<td>Furazolidone</td>
<td>Furoxane (Roberts)</td>
</tr>
<tr>
<td>Halofantrine</td>
<td>Halfan (Glaxo Smith Kline)</td>
</tr>
<tr>
<td>Iodoquinol</td>
<td>Yodoxin (Glenwood and a number of company)</td>
</tr>
<tr>
<td>Ivermectin</td>
<td>Stromectol (Merck)</td>
</tr>
<tr>
<td>Malathione</td>
<td>Ovide (Medics)</td>
</tr>
<tr>
<td>Mebandazole</td>
<td>Vermox (McNeil)</td>
</tr>
<tr>
<td>Mefloquine</td>
<td>Lariam (Roche)</td>
</tr>
<tr>
<td>Meglumine antimononate</td>
<td>Glucantine (Aventis, France)</td>
</tr>
<tr>
<td>Melarsoprol</td>
<td>Mel-B (Specia)</td>
</tr>
</tbody>
</table>
Metronidazole (Flagyl (Searle and others))
Miltetofosine (Zentaris)

## CURRENT CHEMOTHERAPY

<table>
<thead>
<tr>
<th>Infection</th>
<th>Drug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoebiasis (<em>Entamoeba histolytica</em>)</td>
<td>Iodoquinol or Paramomycin sulfate or Diloxanide furoate (Alternative)</td>
</tr>
<tr>
<td>Mild to moderate Intestinal disease</td>
<td>Metronidazole or Tinidazole</td>
</tr>
<tr>
<td>Severe Intestinal disease</td>
<td>Metronidazole or Tinidiazole</td>
</tr>
<tr>
<td>Primary amoebic meningoencephalitis</td>
<td>Amphotericin B</td>
</tr>
<tr>
<td>(<em>Nagleria</em> sp.)</td>
<td></td>
</tr>
<tr>
<td>Ascariasis (<em>Ascaris lumbricoides</em>)</td>
<td>Albendazole or Mebendazole or Pyrantel pamoate</td>
</tr>
<tr>
<td>Babesiosis (<em>Babesia</em> sp.)</td>
<td>Clindamycin plus Quinine or Atovaquone plus Azithromycin</td>
</tr>
<tr>
<td>Balantidiasis</td>
<td>Tetracycline or Metronidazole or Iodoquinol</td>
</tr>
<tr>
<td>Chagas disease (<em>Trypanosoma cruzi</em>)</td>
<td>Nitzoxanide</td>
</tr>
<tr>
<td>Cutaneous larval migrans (<em>Ancylostoma</em> sp.)</td>
<td>Albendazole or Ivermectin</td>
</tr>
<tr>
<td>Cyclospora infection</td>
<td>Trimethoprim-sulfamethoxazole</td>
</tr>
<tr>
<td>Dientamoebiasis (<em>Dientamoeba fragilis</em>)</td>
<td>Iodoquinol or Paramomycin or Tetracycline or Metronidazole</td>
</tr>
<tr>
<td>Dracunculiasis (<em>Dracnula medinensis</em>)</td>
<td>Metronidazole</td>
</tr>
<tr>
<td>Enterobiasis (<em>Enterobius vermacularis</em>)</td>
<td>Pyrantel pamoate or Mebendazole or Albendazole</td>
</tr>
<tr>
<td>Filariasis (<em>Wuchereria bancrofti</em> or <em>Brugia malayi</em> or <em>Brugia timori</em>)</td>
<td>Diethylcarbamazine</td>
</tr>
<tr>
<td>Loa loa</td>
<td>Do</td>
</tr>
<tr>
<td>Condition</td>
<td>Treatment Options</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Giardiasis (Giardia lamblia or Giardia intestinalis)</td>
<td>Metronidazole or Quinacrine or Tinidazole or Furazolidone or Paromomycin</td>
</tr>
<tr>
<td>Hookworm infection (Ancylostoma duodenale, Nector americanus)</td>
<td>Albendazole or Mebendazole or Pyrantal pamoate</td>
</tr>
<tr>
<td>Leishmaniasis (Leishmania donovani)</td>
<td>Sodium stibogluconate or Meglumine antimonite or Amphotericin B or Liposomal or Pentamidine or Paromomycin</td>
</tr>
<tr>
<td>Lice infestation (Pediculus humanus, Pthirus pubis)</td>
<td>1% Permethrine or 0.5% Malathione or Pyrethrins with Piperonyl butoxid or Ivermectin</td>
</tr>
<tr>
<td>Malaria (Plasmodium vivax, P. falciparum, P. ovale, P. malariae)</td>
<td>Quinine sulphate plus Doxycycline or plus Tetracycline or plus Pyrimethamine Sulphadoxine or plus Clindamycin or Atovaquone proguanil</td>
</tr>
<tr>
<td>Alternative</td>
<td>Mefloquine Halofantrine or Artesunate plus Mefloquine</td>
</tr>
<tr>
<td>Chloroquine resistant P. vivax</td>
<td>Quinine sulfate plus Doxycycline or Mefloquine</td>
</tr>
<tr>
<td>Alternative</td>
<td>Halofrantine chloroquine plus Pimaquine</td>
</tr>
<tr>
<td>All Plasmodium except chloroquine – resistant forms</td>
<td>Chloroquine phosphate</td>
</tr>
<tr>
<td>All Plasmodium (Perenteral)</td>
<td>Quindine gluconate or Quinine dihydrochloride</td>
</tr>
<tr>
<td>Alternative</td>
<td>Artemether</td>
</tr>
<tr>
<td>Prevention of Relapses; P. vivax and P. ovale only</td>
<td>Primaquine phosphate</td>
</tr>
<tr>
<td>Prevention of chloroquine – sensitive areas</td>
<td>Chloroquine phosphate</td>
</tr>
<tr>
<td>Chloroquine – resistant areas</td>
<td>Mefloquine or Doxycycline or Atovaquone proguanil</td>
</tr>
<tr>
<td>Alternative</td>
<td>Primaquine Chloroquine phosphate plus Proguanil</td>
</tr>
<tr>
<td>Presumptive treatment</td>
<td>Atovaquone or Pyrimethamine sulfadoxine</td>
</tr>
<tr>
<td>Onchocerciasis (Onchocerca volvulus)</td>
<td>Ivermectin</td>
</tr>
<tr>
<td>Schistosomiasis (Schistosome humatobium, S. mansoni, S. japonicum)</td>
<td>Praziquantel</td>
</tr>
<tr>
<td>Alternative</td>
<td>Oxamniquine</td>
</tr>
</tbody>
</table>
Strongyloidiasis (*Strongyloides stercoralis*)  
Ivermectin or Thiabendazole

**Tapeworms (Adults or Intestinal stage):**

*Diphyllobothrium latum, Taenia saginata, T. solium*  
Praziquantel or Niclosamide

*Hymeno lepis nana*  
Praziquantel

**Tapeworms (Larval or tissue stage):**

*Cysticercosis (Taenia solium cysticercus, Cysticercus cellulosae)*  
Albendazole or Praziquantel

*Echinococcus granulosus (Hydatid cyst)*  
Albendazole

*Toxoplasmosis (Toxoplasma gondii)*  
Pyrimethamine plus Sulfadiazine or Spiramycin

**Trematodes**

*Clonorchis sinensis*  
Praziquantel or Albendazole

*Fasciola hepatica*  
Triclabendazole or Bithionol

*Fasciolopsis buski*  
Praziquantel

*Paragonimus westermani*  
Praziquantel or Bithionol

*Trichinellosis (Trichinella spiralis)*  
Mebendazole plus Steroids or Albendazole

*Vaginitis (Trichomonas vaginalis)*  
Metronidazole or Tinidazole

*Trichuriasis (Trichuris trichiura)*  
Mebendazole or Albendazole

*Trypanosomiasis (T. cruzi)*  
Benznidazole or Nifurtimox

*T. brucei gambiense (Haemolymphatic stage)*  
Pentamidine isothionate or Suramin

*T. brucei rhodeniense (Haemolymphatic stage)*  
Suramin

*Toxicariosis (Visceral larva migrans)*  
Albendazole or Mebendazole

[Dosage are not mentioned here which may be misleading]
ADVERSE EFFECTS OF ANTIPARASITIC DRUGS

**Albendazole** (Albenza):

Sometimes: diarrhoea, abdominal discomfort, coming out of adult Ascaris through nose and mouth.

Rare: Leucopenia, alopecia, increased level of SGOT & SGPT.

**Bithionol** (Bitin):

Common: photosensitivity of skin reactions, diarrhoea, vomiting, abdominal distress, rash on the skin.

**Chloroquine** (Aralen):

Sometimes: great irritation of the skin, headache, vomiting, confusion, whitening of hair, eruption on the skin, opacity of cornea, retinal ulcer, loss of weight, eczema, exfoliative dermatoses.

Rare: Deafness due to nerve disorder, discolouration of nails and mucus membrane of mouth, photophobia.

**Diethylcarbamazine citrate USP** (Hetrazan):

Common: severe allergy, intestinal disturbances.

Rare: loss of vision, encephalopathy.

**Diiodohydroxyguin** (Iodoquinol):

Sometimes: acne, rash on the skin, slight enlargement of Thyroid gland, nausea, vomiting, cramps, diarrhoea, irritation of the anal skin.

Rare: loss of vision, iodine sensitivity.

**Diloxanide Furoate** (Furamide):

Common: flatulence.

Sometimes: nausea, vomiting, diarrhoea, great irritation on the skin.
**Furazolidone** (Furoxon):

- **Common:** nausea, vomiting.
- **Sometimes:** allergic reactions, headache, hypotension, hypoglycemia, polyneuritis.
- **Rare:** haemolytic anaemia.

**Halofantrine** (Halfan):

- **Sometimes:** diarrhoea, abdominal discomfort.

**Ivermectin** (Stromectol):

- **Sometimes:** fever, rash on the skin, tender lymph nodes, headache, joint and bone pain.
- **Rare:** hypotension.

**Mebendazole** (Vermox):

- **Sometimes:** diarrhoea, abdominal pain.
- **Rare:** leukopenia.

**Mefloquine** (Lariam):

- **Common:** vertigo, nausea, intestinal disturbances, nightmares, visual disturbances, headache.
- **Sometimes:** confusion.
- **Rare:** hypotension, convulsion, paraesthesia, coma.

**Melarsoprol** (Mel-B):

- **Common:** myocardial damage, albuminuria, hypertension, colic vomiting, encephalopathy, peripheral neural disorder.
- **Rare:** shock.
Metronidazole (Flagyl):

Common: nausea, headache, dry mouth, metallic taste.

Sometimes: vomiting, diarrhoea, insomnia, weakness, vertigo, parenthesis, rash, during sensation during maturation.

Rare: ataxia, encephalopathy, colitis, neutropenia.

Nifurtimox (Lampit):

Common: anorexia, vomiting, weight loss, loss of memory, sleep disorder, tremors, weakness, polyneuritis.

Ornidazole (Tiberal):

Common: dizziness, headache, intestinal disturbances.

Rare: reversible peripheral neuropathy.

Oxamnique (Vansil):

Sometimes: headache, fever, dizziness, nausea, diarrhoea, rash, insomnia, hepatic enzyme changes, ECG changes.

Rare: convulsions.

Paromycin (Humatin):

Common: Intestinal disturbances.

Rare: auditory nerve damage, renal changes.

Pentamidine Isethionate (Pentam zoo; Nebu Pent):

Common: hypotension, hypoglycemia, vomiting, renal damage, pain at injection site.

Sometimes: may aggravate diabetes, shock, liver damage.

Rare: acute pancreatitis.
Primaquine phosphate USP:

- Common: haemolytic anaemia.
- Sometimes: neutropenia, intestinal disturbances.
- Rare: CNS symptoms, hypertension, arrhythmia.

Pyrenal Pamoate (Antiminth):

- Sometimes: Intestinal disturbances, headache, dizziness, rash, fever.

Pyrimethamine USP (Daraprim):

- Sometimes: folic acid deficiency, blood dyscrasias.
- Rare: rash, vomiting, convulsions, shock.

Quinine dihydrochloride and Quinine sulfate:

- Common: cinchonism (headache, nausea, abdominal pain, visual disturbance).
- Sometimes: haemolytic anaemia, photosensitivity reactions.
- Rare: blindness, sudden death if injected too rapidly.

Sodium stibogluconate (Pentostam):

- Common: muscle pain and joint stiffness, bradycardia.
- Sometimes: colic, diarrhoea, rash, myocardial damage.
- Rare: liver damage, hemolytic anaemia, renal damage, shock, sudden death.

Spiramycin (Rovamycine):

- Sometimes: Intestinal disturbances.
- Rare: allergic reaction.

Suramin sodium (Germanin):
Common: vomiting, urticaria, paresthesia, hyperesthesia hands and feet, photophobia, peripheral neuropathy.

Sometimes: kidney damage, shock, optic atrophy.

**Thibendazole** (Mintezol):

Common: nausea, vomiting, vertigo.

Sometimes: leucopenia, crystalluria, rash, hallucinations, olfactory disturbances.

Rare: shock, tinnitus.

**Tinidazole** (Fasigyn):

Sometimes: metallic taste, nausea, vomiting, rash.

**ADVERSE EFFECTS OF PROTON – PUMP INHIBITORS (PPIS) EDITED BY G. S. MATHUR**

A set of drugs commonly prescribed to counter stomach acidity and heartburn should be used at the lowest effective dose possible and the shortest length of time, a research review has said raising concerns about potentially serious side-effects. Drugs called proton-pump inhibitors (PPIs) reduce gastric acid secretion and are effective in allying gastric distress – sensations of pain or burning in the stomach or the oesophagus – caused by the secretions of acids in the stomach.

These drugs are prescribed worldwide, including India, where spicy cuisine can stimulate more gastric acid secretion. “Proton-pump inhibitors are associated with a number of rare but potentially serious adverse effects. These uncommon effects become highly relevant when considering tens of millions of people who take (these drugs) worldwide,” said the research review published today in the Canadian Medical Association Journal (27.11.15).

The review, led by Todd Lee, an internal medicine specialist at McGill University in Montreal, has said proton-pump inhibitors are the most widely prescribed gastrointestinal drugs. About 15 million patients were prescribed these drugs in the US alone during 2013.

The researchers have outlined the potential risks of proton-pump inhibitors, including rebound heartburn after discontinuing the drugs, malabsorption of essential nutrients such as vitamin B12 iron and magnesium and an increased risk of intestinal infections with certain bacteria, including *Clostridium difficile*, which can cause intractable diarrhoea. The review has also cautioned about an increased risk of fracture in patients prescribed long-term therapy with proton-pump inhibitors. “The concerns about the overuse of proton-pump inhibitors isn’t new to India,” said Chandra Gulhati, a pharmacologist and editor of the Monthly Index of
Medical Specialities, India, a journal of drugs, who was not associated with the review by the Canadian researchers.

Among the proton-pump inhibitors sold in India are omeprazole, Pantoprazole, esomeprazole and rabeprazole. Some of the common brand names of these drugs in India are Omez (omeprazole), Pan and Pantocid (pantoprazole), Esoz and Naxium (esomeprazole) and Prorab and Rablet (rebeprazole). “Studies suggest that two in three people consuming proton-pump inhibitors do not suffer the disorders for which these drugs are indicated,” Gulhati said.

He said these drugs are often used for prolong periods. “Using them for a month or longer can lead to rebound acid hyper secretion with the result that patients start taking the drugs again, creating long-term dependence.” Some doctors in Calcutta said they were recommending antacids such as Rantac (ranitidine) and Famtach (famotidine) to their patients.

“Rantac or Famtac close one of the avenues of production of acids from the cells, but they do not stop acid production completely as proton-pump inhibitors do. So the proton-pump inhibitors often work better, but they are harmful in the long run.” surgical gastro-entrologist Sanjay De Bakshi said. The review has recommended lifestyle modifications such as limiting the consumption of caffeine and alcohol, which can exacerbate gastric-distress.

CONCLUSION

We have tried our best to cater relevant information regarding the treatment of tropical diseases. The Physicians practising in the tropical region regularly facing with newer problems and complications regarding treatment of these diseases due to continuous mutations of the pathogens as the pathogens are continuously subjected to the drugs. The result is the formation of resistant variety. Practising Physicians are confronted with such pathological conditions, that they are sometimes confused and puzzled to find required medicines especially designed to meet the particular needs of the tropical pathology. Very recent treatments are also discussed here. In the ongoing chapters Physicians will find a number of medicines particularly antiparasitic therapeutic drugs designed for particular disease.

The current chemotherapy is very much important as such diseases are widespread in the tropics only because of prevailing conditions of the climate and economic underdevelopment. The practising Physicians of tropics will also be benefited from the information regarding generic names of the drugs with brand names along with the manufacturing company. The adverse effects of the antiparasitic drugs are discussed in detail to avoid complications and confusions.

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References


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