


# Drug therapy of Filariasis

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# Signs and symptoms

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## *Lymphatic filariasis*

- ❖ Fever
  - ❖ Inguinal or axillary lymphadenopathy
  - ❖ Testicular and/or inguinal pain
  - ❖ Skin exfoliation
  - ❖ Limb or genital swelling - Repeated episodes of inflammation and lymphedema lead to lymphatic damage, chronic swelling, and elephantiasis of the legs, arms, scrotum, vulva, and breasts.
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# Filariasis

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The following acute syndromes have been described in filariasis:

- ❖ Acute adenolymphangitis (ADL)
- ❖ Filarial fever - Characterized by fever without associated adenitis
- ❖ Tropical pulmonary eosinophilia (TPE)

# Drugs used in treatment of filariasis

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- ❖ Diethylcarbamazine
- ❖ Ivermectin
- ❖ Albendazole
- ❖ Doxycycline



# Diethylcarbamazine

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## Therapeutic action

- Antihelmintic
- Drug of choice for lymphatic filariasis



# Diethyl Carbamazine

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## Indications

- Filariasis
  - *W. bancrofti*
  - *B. malayi*
- Tropical pulmonary eosinophilia
- Loa loa

# Diethyl Carbamazine

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## Mechanism of action

- ❖ Alteration of organelle membranes of microfilariae promoting cell death
  - ❖ Also muscular activity is affected
  - ❖ Prolonged treatment may kill adult worms
  - ❖ Also enhances Cell mediated immunity
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# Diethyl Carbamazine

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## Presentation

- 50,100mg tablets
- 120mg, 50mg syrups

## Dosage

- Adult: 2mg/kg three times a day






# Diethyl Carbamazazine - Efficacy

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## FILARIASIS

- ❖ 2mg/kg TDS produces rapid symptomatic relief and
  - ❖ Microfilariae disappear from blood in 7 days
  - ❖ Patient becomes non-infective
  - ❖ Adult worms survives in lymphatics
  - ❖ More than one course may be needed with a gap of 3-4 weeks
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# Tropical pulmonary eosinophilia (TPE)

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- ❖ symptoms result from allergic and inflammatory reactions elicited by the microfilariae and parasite antigens that the lungs clear from the bloodstream
- ❖ Typical mottling in the lungs, fever, anorexia, attacks of dyspnea resembling bronchial asthma
- ❖ Leukocytosis and marked eosinophilia more than 3000/cmm
- ❖ DEC in doses of 6mg/kg daily for 7-10 days is highly effective



# Diethyl Carbamazazine - Efficacy

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## ELEPHENTIASIS

- ❖ Is due to chronic lymphatic obstruction and not affected by DEC
  - ❖ Single dose treatment with a combination of DEC 6mg/kg and Albendazole 400mg once a year on mass scale
  - ❖ Brings down transmission
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# Diethyl Carbamazine

## Adverse effects

- Gastric discomfort
- Loss of appetite
- Headache
- Dizziness
- Weakness



# Diethyl Carbamazine

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## Adverse effects

### ❖ Febrile reaction

- ❖ Due to mass destruction of microfilariae and adult worms
- ❖ Rash, pruritus, enlargement of lymph nodes, bronchospasm
- ❖ Can be minimized by starting with a low dose of 0.5mg/kg
- ❖ Stop DEC temporarily, treat with antihistaminic and steroids
- ❖ Can restart once again



# Ivermectin

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## Therapeutic actions

- ❖ Antinematodal drug obtained from *Streptomyces avermitilis*
- ❖ Comparable to DEC for bancroftian and brugian filaria
- ❖ Microfilaricidal but not macrofilaricidal

# Ivermectin

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## Indications

- ❖ Single dose treatment of onchocerciasis and Hook worm infection
- ❖ Cutaneous larva migrans
- ❖ Oral drug effective for Scabies and pediculosis

# Ivermectin

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## Mechanism of Action

- ❖ Nematodes develop tonic paralysis
- ❖ Act through special type of glutamate gated Chloride channel found only in invertebrates
- ❖ Also potentiate GABA ergic transmission
- ❖ Ivermectin doesnot cross blood brain barrier in humans



# Ivermectin

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- ❖ Well absorbed orally with peak serum time of 4 hours
- ❖ Does not cross blood brain barrier
- ❖ Metabolized by liver and excreted in faeces
- ❖ it has GABA agonistic activity – do not combine with CNS depressants



# Ivermectin

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## Presentation


❖ Tablets of 3 and 6mg



# Ivermectin

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## Dosage in filariasis

- ❖ Single dose of 100-200mcg/kg is highly effective against microfilariae
  - ❖ Ivermectin 10- 15 mg with albendazole 400mg given annually for 5-6 years in endemic areas of filariasis
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# Ivermectin

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## Dosage in onchocerciasis

- ❖ Single dose of 150mcg/kg in treatment of onchocerciasis
- ❖ Repeat the dose after 6-12 months for 10-14 years
- ❖ Single dose of 400mcg/kg if onchocerciasis and loasis coexist

# Ivermectin

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## Adverse effects

- ❖ Reaction to degenerative products of microfilariae
- ❖ Pruritus and Dizziness,
- ❖ Transient ECG changes may occur

# Ivermectin

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## Adverse effects

- ❖ Mazotti Reaction to degenerative products of microfilariae
  - ❖ ocular inflammation occurs and may lead to blindness
  - ❖ Severe reaction can be controlled by 5% hydrocortisone drops
  - ❖ Prior antihistaminic and steroids to be given to minimize systemic allergies
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## Doxycycline

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- ❖ 200mg/day for 6 weeks causes long term sterilising effect in bancroftian filariasis
- ❖ Inhibits wolbachia bacteria which live in symbiosis with microfilariae
- ❖ Growth, reproduction and survival of adult worms depends on wolbachia

## Doxycycline

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- ❖ Nor a drug of choice for filariasis nor for mass treatment
- ❖ Used to treat individual cases
- ❖ Contraindicated in children and pregnant women



## Mansonelliasis infection

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- ❖ Usually asymptomatic and considered as minor filariasis
- ❖ Diethylcarbamazine is ineffective
- ❖ Long term doxycycline 200 mg daily for 6 weeks is reported to be effective

## Summary

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- ❖ Diethylcarbamazine – DOC for lymphatic filariasis
- ❖ Ivermectin- DOC for onchocerciasis
- ❖ Albendazole – used for mass treatment along with DEC and ivermectin
- ❖ Doxycycline – long term sterilizing effect in bancroftian filaria

**Thank You**

