



AAFP GLOBAL HEALTH SUMMIT
Primary Health Care and Family Medicine: Health Equity for All

**PARASITOLOGY II:
select GI parasites**



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Dr. Huntington has indicated he has no relevant financial relationships to disclose.

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AMERICAN ACADEMY OF FAMILY PHYSICIANS



PG **PRETTY GRUESOME**

These lectures are amply illustrated with pictures designed to make even calloused surgeons squirm.

AMERICAN ACADEMY OF FAMILY PHYSICIANS

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(should have been there in person!)

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AMERICAN ACADEMY OF FAMILY PHYSICIANS

Where we are heading

Symptom-based:*

- Diarrhea & Dysentery
- Assorted bowel trouble
- Hepatobiliary issues
- Tissue-dwelling, GI acquired

*with occasional detours to related parasites

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Diarrhea

- | | |
|------------------------|-------------------------------|
| •Viral causes | •Parasitic causes |
| Rotavirus, enterovirus | Giardiasis |
| •Bacterial causes | Coccidian infections |
| Cholera | (really, any GI parasites...) |
| Travelers' diarrhea | |
| Tropical sprue (?) | |

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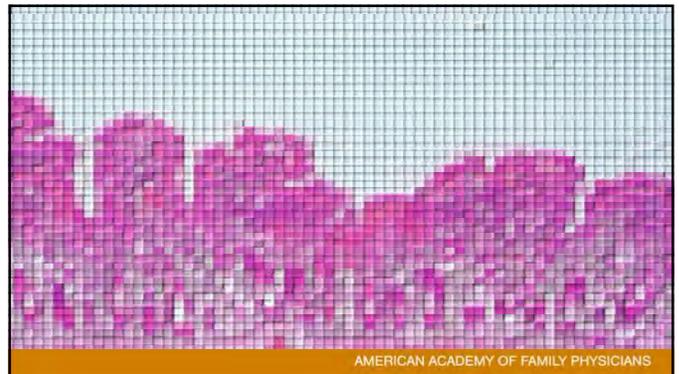
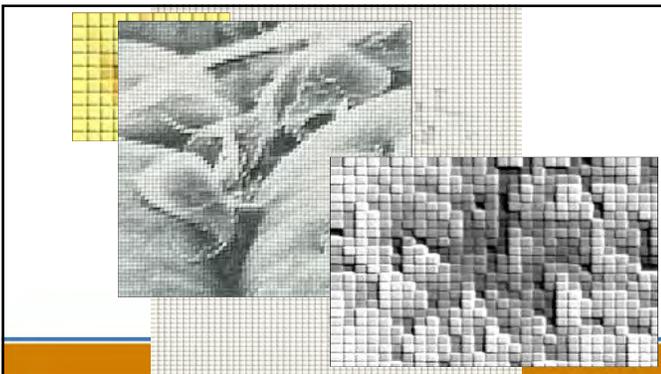
Cases

- 8 yr old female presents with diarrhea.
 - Afebrile
 - Several stools/day; watery, nonbloody
 - Mucous membranes tacky
- 48 year old female presents with diarrhea
 - Afebrile, tachycardia
 - Many stools/day; watery, nonbloody
 - Disaster setting (post-hurricane)

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Giardiasis

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Giardiasis

- Main symptom: malabsorptive diarrhea
- To treat, or not to treat...

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Coccidian infections

Cryptosporidium
Cyclospora
Isospora
Microspora

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Dysentery

- Significant blood and mucous in diarrhea

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Case

- 8 yr old female presents with diarrhea.
 - Afebrile
 - Several stools/day; watery, **bloody**
 - Mucous membranes tacky

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Dysentery

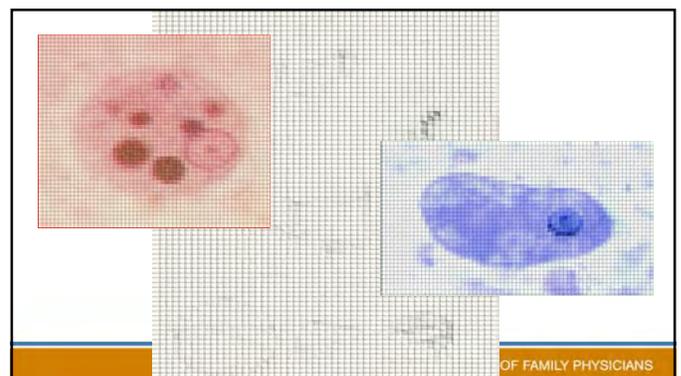
- Bacterial causes
 - Shigella*
 - E. coli* O157:H7
- Parasitic causes
 - Amoebae
 - Trichuris*
 - others...

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Amoebae

- *Entamoeba histolytica* – the main pathogenic amoebae
- Other GI dwellers
 - Iodamoeba butschlii*
 - Endolimax nana*
 - Entamoeba coli*
- Naegleria* and *Acanthamoebae*

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Key points

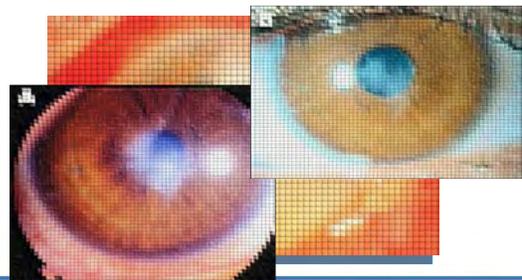
- Normally, a free-living amoeba
- Warm freshwater contact
- Encephalitis, meningitis
- Contains *Legionella*

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Acanthamoebae

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Acanthamoebiasis



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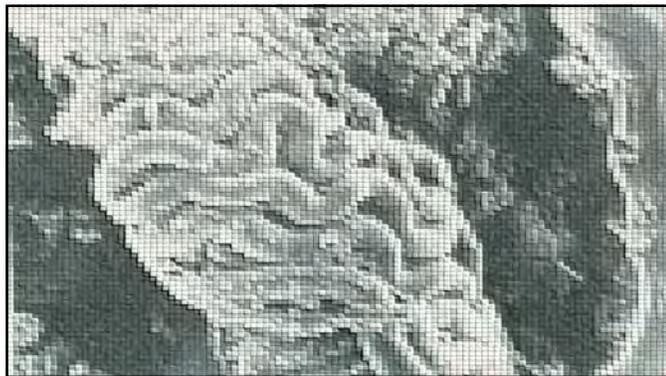
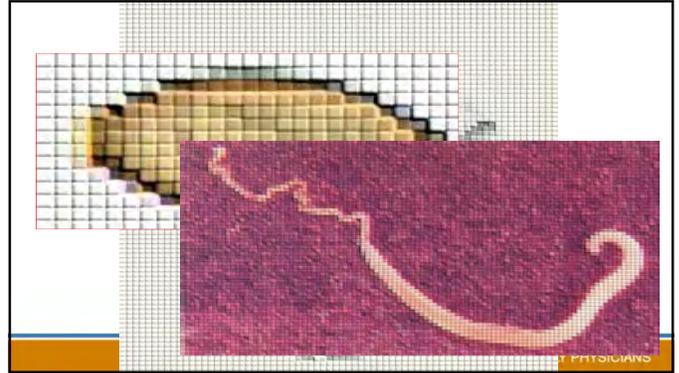
Key points

- Normally, a free-living amoeba
- Strongly associated with contact lenses
 - 85% of cases in contact lens users
 - 1-2 cases per million contact lens users
- Contains *Legionella*

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Trichuriasis (whipworm)

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Trichuriasis

- Main symptoms:
 - diarrhea, may be bloody
 - tenesmus
 - weight loss
 - Rarely, rectal prolapse



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Assorted bowel trouble

Diarrhea Constipation
Abdominal mass
PAIN BLOATING

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Cases

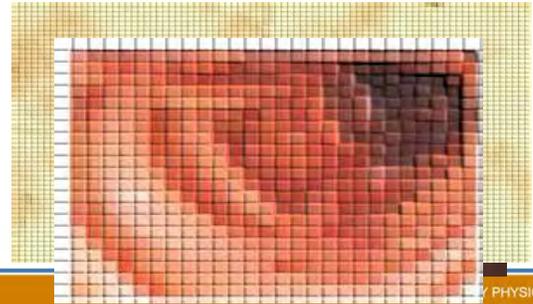
- 6 year old female with right-sided pelvic mass.
 - Afebrile, cough
 - cachexia, poor appetite, nontender
- 48 year old female with abdominal pain
 - Chronic
 - Nausea, fatigue

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Ascariasis

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Prototype geohelminth

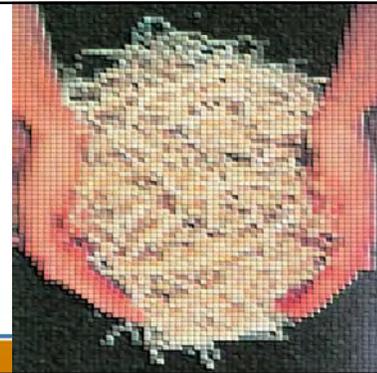


FAMILY PHYSICIANS

Ascaris

- Main Symptoms: asthma, biliary or colon obstruction
- Ingested, hatch and migrate to GI tract via the liver, heart, and lungs.

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Hookworms

(*Ancylostoma*, *Necator*)

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Hookworms

- Main symptoms:
 - Anemia - leading cause
 - Ground itch
- Prevention: shoes!

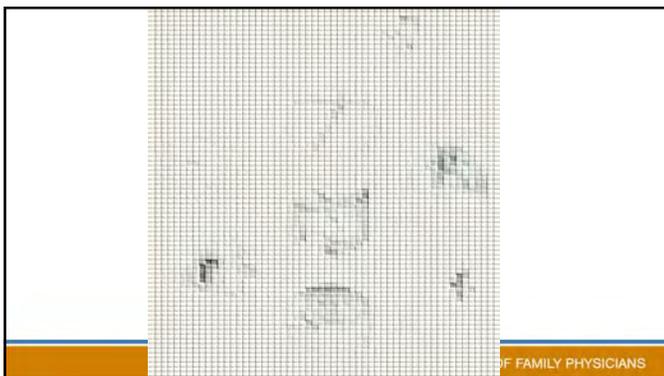


A close-up photograph of a person's foot showing ground itch, a common symptom of hookworm infection, characterized by small, red, itchy lesions on the skin.

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Strongyloidiasis

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Strongyloidiasis

- Main symptoms:
 - Diarrhea
 - Polymicrobial sepsis
- Found as larvae, not ova, in stool

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Prototype cestode

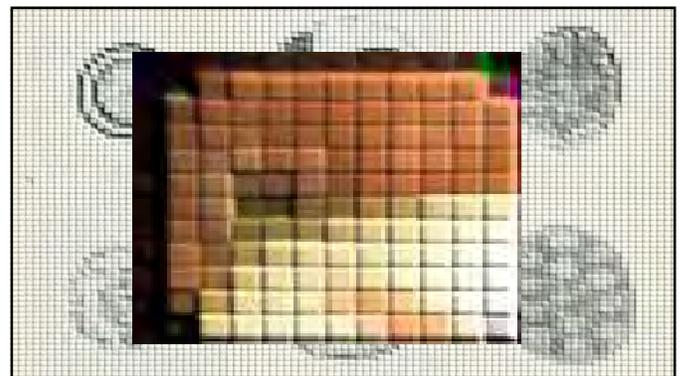
- Two hosts, two stages

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Cestodes

- Diphyllobothrium* (fish, B12 deficiency)
- Dipylidium* (dog)
- Hymenolepsis* (rodent/arthropod)
- Taenia* (beef/pork, cysticercosis)
- Echinococcus* (dog, hydatid disease)

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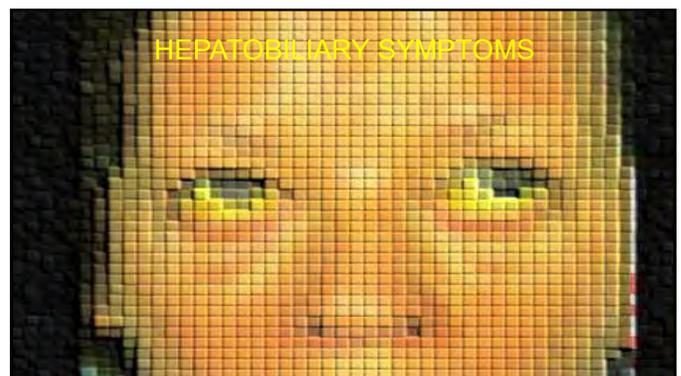


Cestodes

- Main symptoms:
 - Diarrhea / malabsorption
 - Proglottid escape

(Tissue-dwelling phase symptoms are worse)

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Cases

- 8 yr old male presents with ascites
 - Afebrile, nontender abdomen
 - No jaundice
- 48 year old female presents with jaundice
 - Afebrile, mild RUQ pain

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HEPATOBILIARY SYMPTOMS

- Non-microbial causes
 - Medication/herbs
 - Alcohol
 - Neoplasm
- Viral causes
 - Hepatitis A, B, C...
 - EBV, CMV
 - Yellow fever
- Parasitic causes
 - Ascariasis
 - Amoebiasis
 - Hydatid disease
 - Larval migrans
 - Toxoplasmosis
 - Flukes
 - Leishmaniasis
 - Malaria

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Tissue-dwelling, GI acquired parasites

Protozoa

- Amoebae
- Toxoplasmosis

Helminths

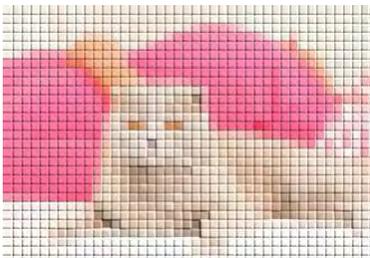
- Extra-luminal tapeworms
- Larval migrans
- Trichinosis
- Guinea worm

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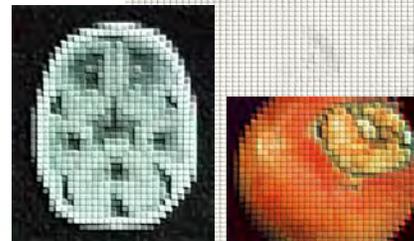
Toxoplasmosis

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What's wrong with this picture?!



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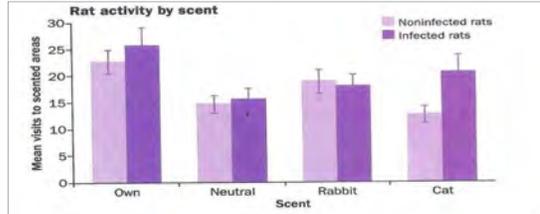
Key points

- Common, generally asymptomatic
- Prenatal: part of TORCH syndrome
- Immunocompromise: HIV, etc.

But wait...there's more!

Psychoparasitism

Parasite changed host's behavior

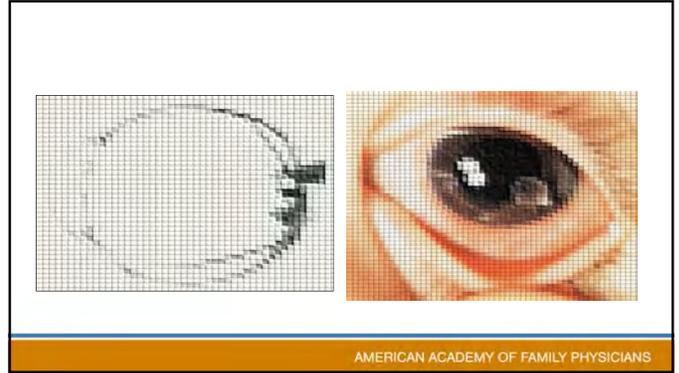


Extra-luminal tapeworms

- Cysticercosis
- Hydatid disease

Cysticercosis





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Key points

- Most cysticera are asytmomatic
- Neurocysticercosis is a leading cause of seizure disorder in endemic regions
- Prevention: hygiene and sanitation

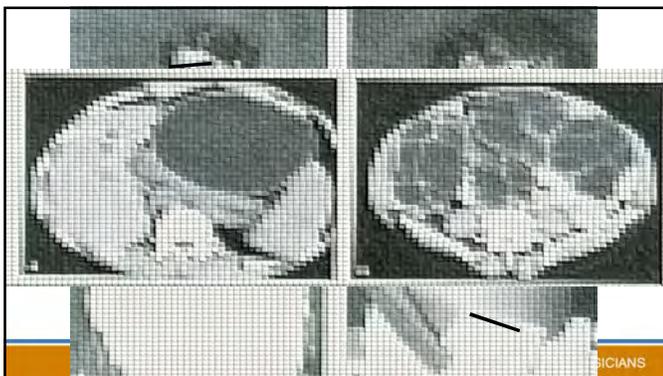
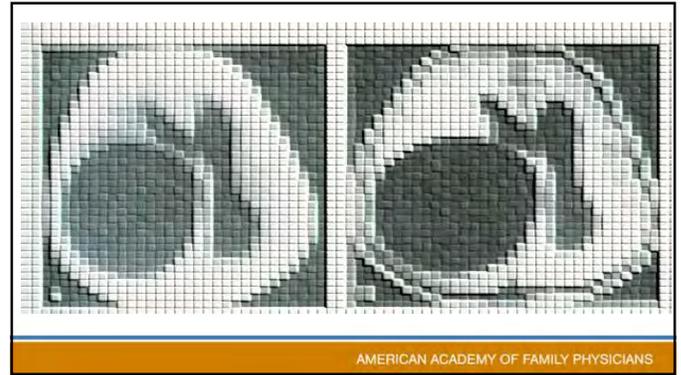
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Hydatid disease

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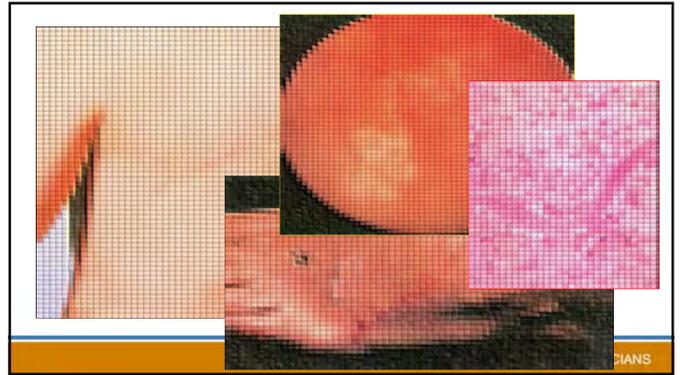
Key points

- Most hydatid cysts are symptomatic
- Highly allergenic
- Prevention: hygiene and sanitation

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Larval migrans
(*Toxocara*)

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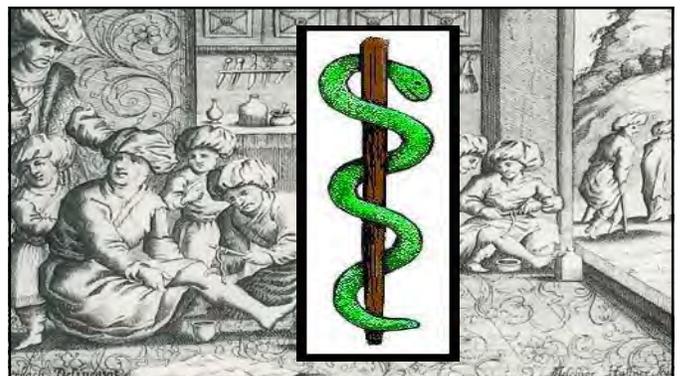
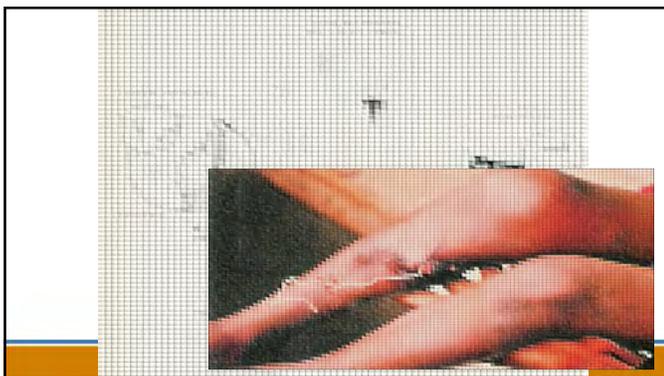
Key points

- *Toxocara canis* and *Toxocara cati*
- Fecal-oral route; lost in migration
- Cutaneous and visceral forms
- Related to our pet addiction in U.S.

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Dracontiasis

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ONLINE JOURNAL / MAY 15, 2019

HOW ONE NIGHTMARISH DISEASE WAS ERADICATED



Former U.S. President Jimmy Carter addresses Ghanaian children outside Savelugu Hospital in Ghana

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PHYSICIANS

EDITORIAL | VOLUME 393, ISSUE 10178, P1261, MARCH 30, 2019

Guinea worm disease eradication: a moving target

The Lancet DOI: [https://doi.org/10.1016/S0140-6736\(19\)30738-X](https://doi.org/10.1016/S0140-6736(19)30738-X)

Deadlines for the eradication of Guinea worm disease have come and gone without success. The first deadline was set in 1991 when the World Health Assembly adopted a resolution calling for the eradication of the disease, which is caused by the nematode *Dracunculus medinensis*, within 4 years. This target was not met, so a second 2009 deadline was set; this too was not met. After an additional failed deadline in 2015, a new date of eradication has been scheduled for 2020. However, data from the US Centers for Disease Control and Prevention (CDC) and the Carter Center, a US-based global health non-governmental organisation, puts even this new target in question.

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Trichinosis

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Key points

- From eating pink pork
- Parasite lives in “nurse cell”
- A public health success story

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Where we have been

Symptom-based:*

- Diarrhea & Dysentery
- Assorted bowel trouble
- Hepatobiliary issues
- Tissue-dwelling, GI acquired

*with occasional detours to related parasites

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Simplistic GI Antiparasitic Primer

•Roundworms:

Mebendazole
Pyratel pamoate
Thiabendazole
Ivermectin

•Tapeworms:

Niclosamine
Quinacrine
Praziquantel

•Amoebae:

Metronidazole
Paromomycin

•Cryptosporidium:

Nitazoxanide

•Toxoplasmosis

Pyrimethamine

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Questions or discussion

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- Ash et al, Parasites: A guide to laboratory procedures and identification, ASCP
- Halstead et al, Disease of Travelers and Immigrants, Scope Publications
- Katz et al, Parasitic Diseases, Springer-Verlag
- Markell et al, Medical Parasitology, Saunders
- Meyers et al, Pathology of Infectious Diseases, Vol. 1 Helminthiases, AFIP
- Peters et al, A Color Atlas of Tropical Medicine and Parasitology, Wolfe
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