



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

**PARASITOLOGY II:
 select GI parasites**



Mark K. Huntington MD PhD FAAFP
 Sioux Falls Family Medicine Residency Program
 University of South Dakota Sanford School of Medicine



Activity Disclaimer

ACTIVITY DISCLAIMER

It is the policy of the AAFP that all individuals in a position to control content disclose any relationships with commercial interests upon nomination/invitation of participation. Disclosure documents are reviewed for potential conflicts of interest (COI), and if identified, conflicts are resolved prior to confirmation of participation. Only those participants who had no conflict of interest or who agreed to an identified resolution process prior to their participation were involved in this CME activity.

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

2

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

Although incorporation of all images used in the presentation fall under the Fair-use clause of the US Copyright laws, they have been pixelated for the handout version to avoid any potential concerns.

(should have been there in person!)

4

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

- | | |
|--|--|
| <ul style="list-style-type: none"> •Viral causes
 Rotavirus, enterovirus •Bacterial causes
 Cholera
 Travelers' diarrhea
 Tropical sprue (?) | <ul style="list-style-type: none"> •Parasitic causes
 Giardiasis
 Coccidian infections
 (really, any GI parasites...) |
|--|--|

AMERICAN ACADEMY OF FAMILY PHYSICIANS

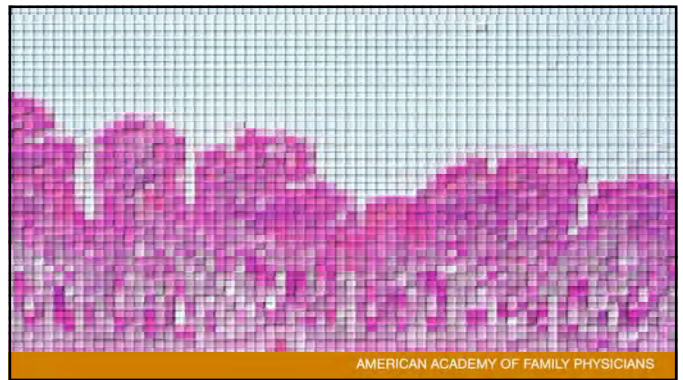
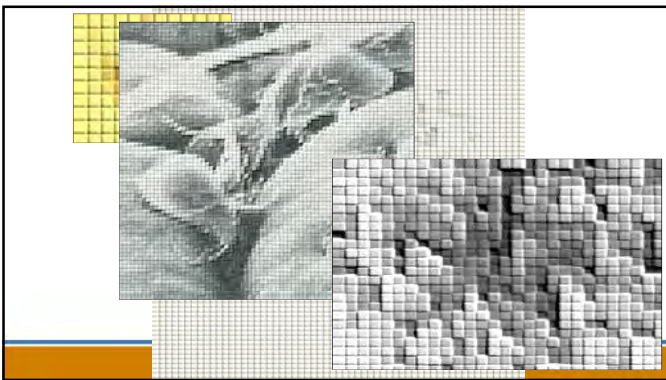
Cases

- 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)

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Giardiasis

AMERICAN ACADEMY OF FAMILY PHYSICIANS



AMERICAN ACADEMY OF FAMILY PHYSICIANS

Giardiasis

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Coccidian infections

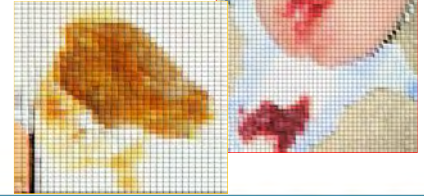
Cryptosporidium
Cyclospora
Isospora
Microspora

AMERICAN ACADEMY OF FAMILY PHYSICIANS



Dysentery

- Significant blood and mucous in diarrhea



AMERICAN ACADEMY OF FAMILY PHYSICIANS

Case

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Dysentery

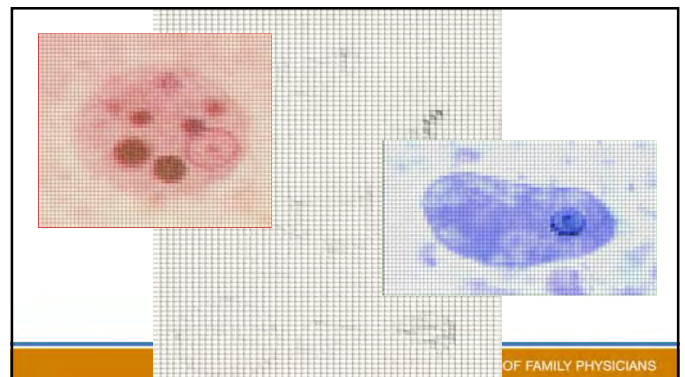
- Bacterial causes
 - *Shigella*
 - *E. coli* O157:H7
- Parasitic causes
 - Amoebae
 - *Trichuris*
 - others...

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Amoebae

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS



OF FAMILY PHYSICIANS



Key points

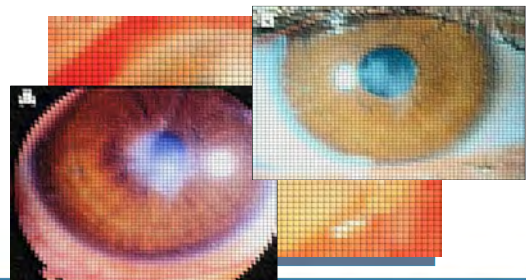
- Normally, a free-living amoeba
- Warm freshwater contact
- Encephalitis, meningitis
- Contains *Legionella*

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Acanthamoebae

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Acanthamoebiasis



AMERICAN ACADEMY OF FAMILY PHYSICIANS

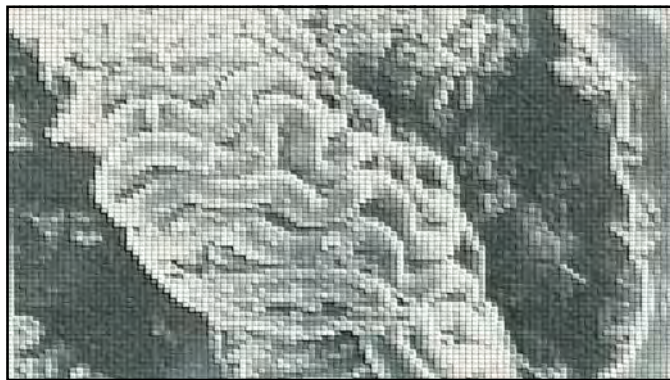
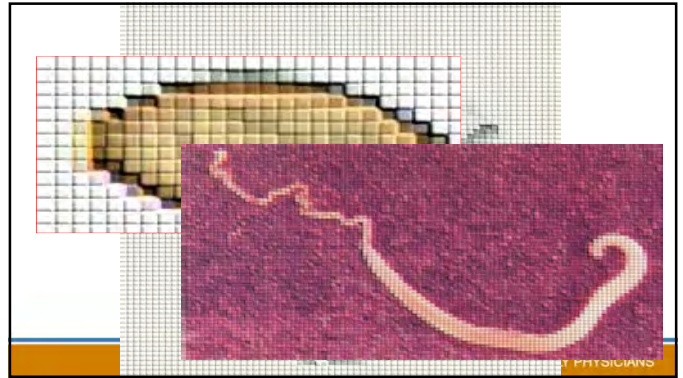
Key points

- 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*

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Trichuriasis (whipworm)

AMERICAN ACADEMY OF FAMILY PHYSICIANS



Trichuriasis

•Main symptoms:

- diarrhea, may be blood
- tenesmus
- weight loss
- Rarely, rectal prolapse



AMERICAN ACADEMY OF FAMILY PHYSICIANS

Assorted bowel trouble

Diarrhea Constipation
Abdominal mass
PAIN BLOATING

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Cases

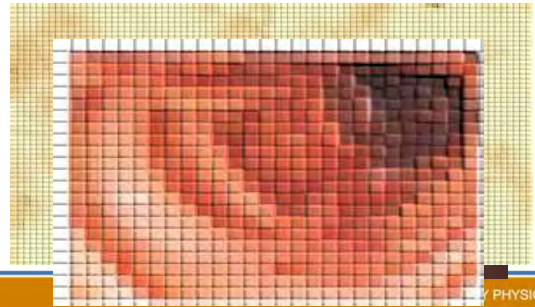
- 6 year old female with right-sided pelvic mass.
 - Afebrile, cough
 - cachexia, poor appetite, nontender
- 48 year old female with abdominal pain
 - Chronic
 - Nausea, fatigue

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Ascariasis

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Prototype geohelminth

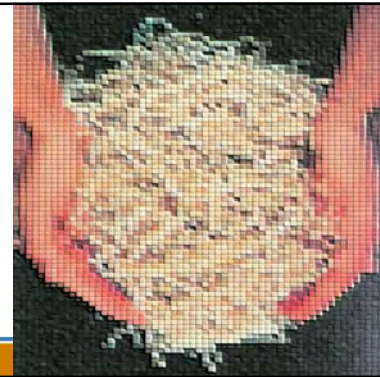


FAMILY PHYSICIANS

Ascaris

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS

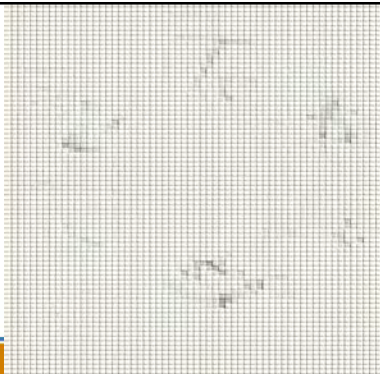


FAMILY PHYSICIANS

Hookworms

(*Ancylostoma*, *Necator*)

AMERICAN ACADEMY OF FAMILY PHYSICIANS



FAMILY PHYSICIANS



Hookworms

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



AMERICAN ACADEMY OF FAMILY PHYSICIANS

Strongyloidiasis

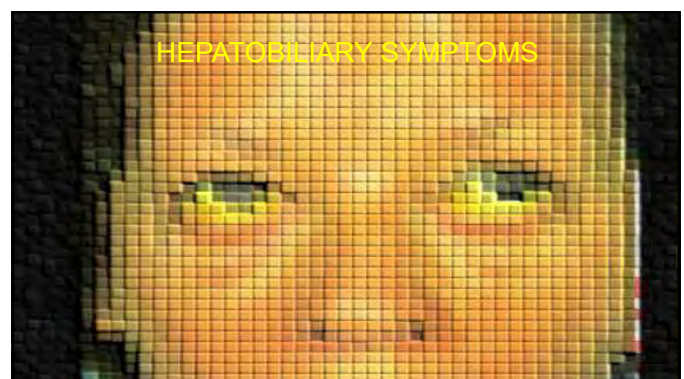
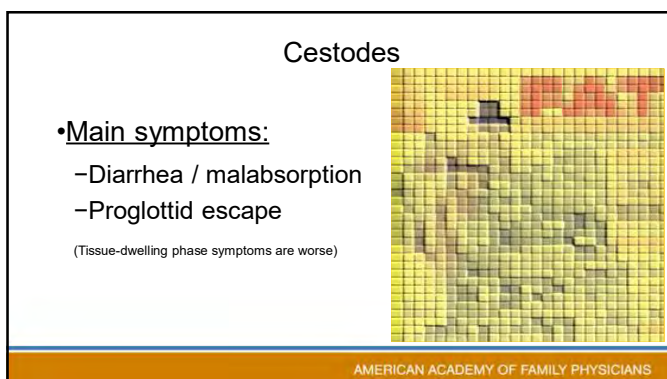
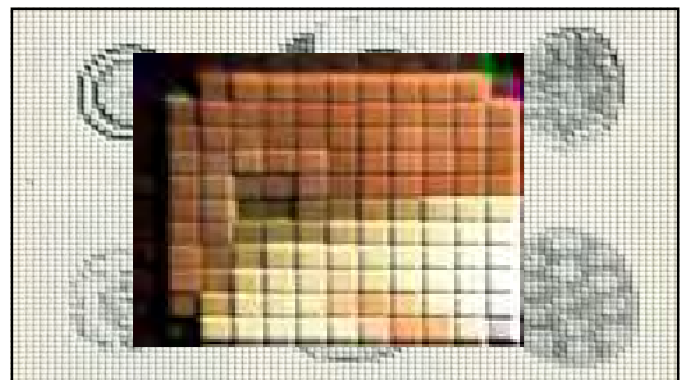
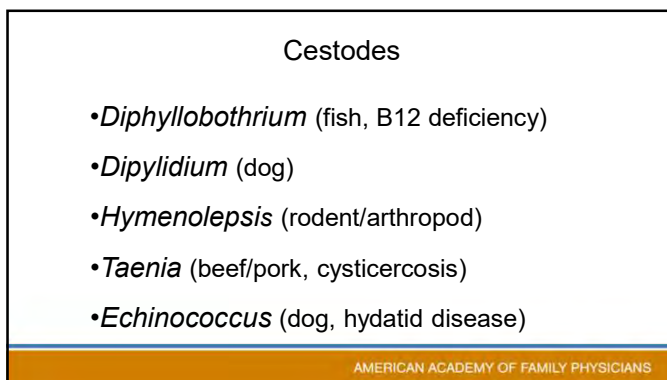
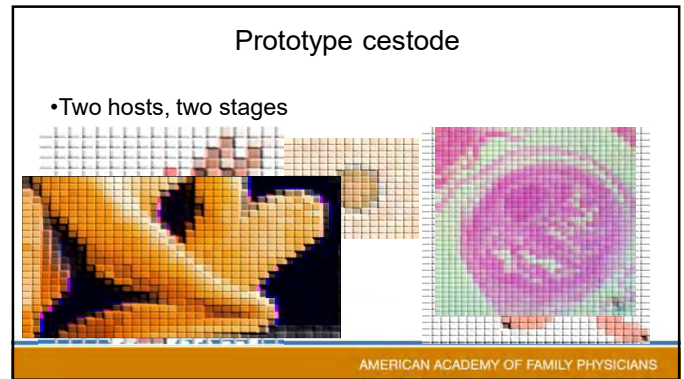
AMERICAN ACADEMY OF FAMILY PHYSICIANS



Strongyloidiasis

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS



Cases

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS

HEPATOBIILIARY SYMPTOMS

- | | |
|---|--|
| <ul style="list-style-type: none"> • Non-microbial causes <ul style="list-style-type: none"> Medication/herbs Alcohol Neoplasm • Viral causes <ul style="list-style-type: none"> Hepatitis A, B, C... EBV, CMV Yellow fever | <ul style="list-style-type: none"> • Parasitic causes <ul style="list-style-type: none"> Ascariasis Amoebiasis Hydatid disease Larval migrans Toxoplasmosis Flukes Leishmaniasis Malaria |
|---|--|

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Tissue-dwelling, GI acquired parasites

Protozoa

- Amoebae
- Toxoplasmosis

Helminths

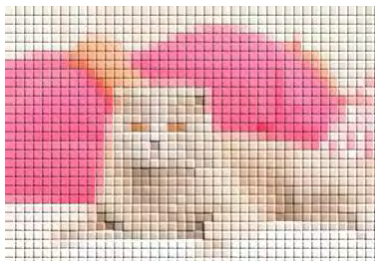
- Extra-luminal tapeworms
- Larval migrans
- Trichinosis
- Guinea worm

AMERICAN ACADEMY OF FAMILY PHYSICIANS

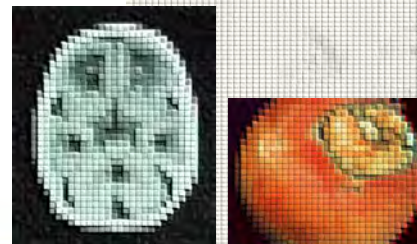
Toxoplasmosis

AMERICAN ACADEMY OF FAMILY PHYSICIANS

What's wrong with this picture?!



AMERICAN ACADEMY OF FAMILY PHYSICIANS



FAMILY PHYSICIANS

Key points

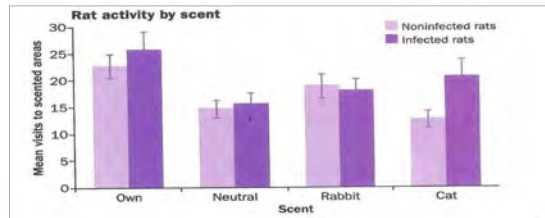
- Common, generally asymptomatic
- Prenatal: part of TORCH syndrome
- Immunocompromise: HIV, etc.

But wait...there's more!

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Psychoparasitism

Parasite changed host's behavior



AMERICAN ACADEMY OF FAMILY PHYSICIANS

Extra-luminal tapeworms

Cysticercosis
Hydatid disease

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Cysticercosis

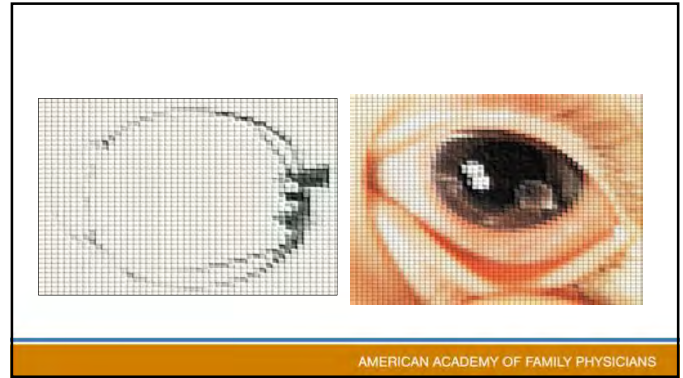
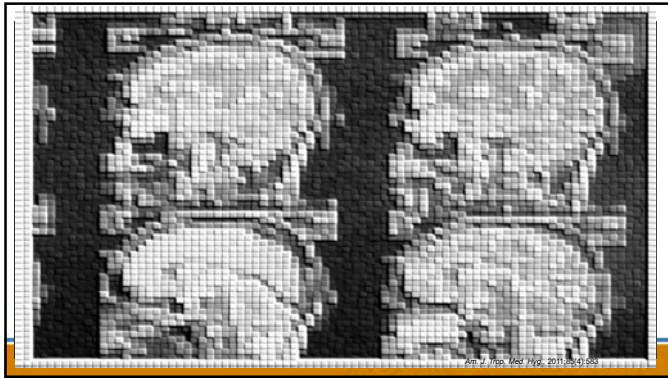
AMERICAN ACADEMY OF FAMILY PHYSICIANS



PHYSICIANS



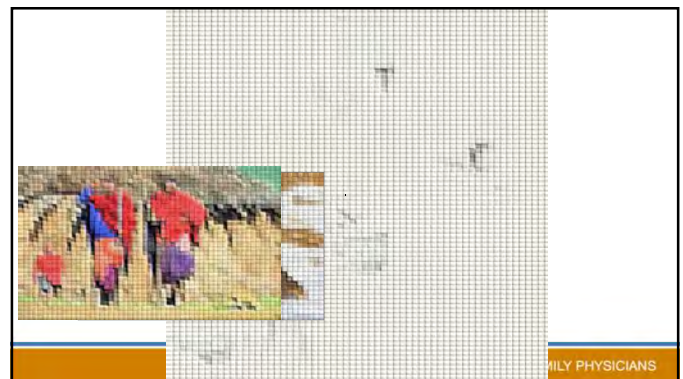
AMERICAN ACADEMY OF FAMILY PHYSICIANS

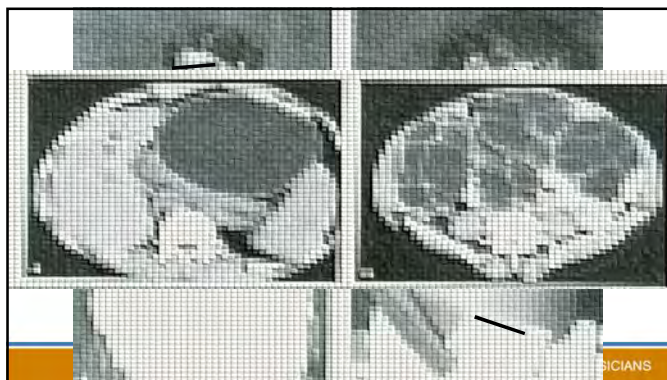
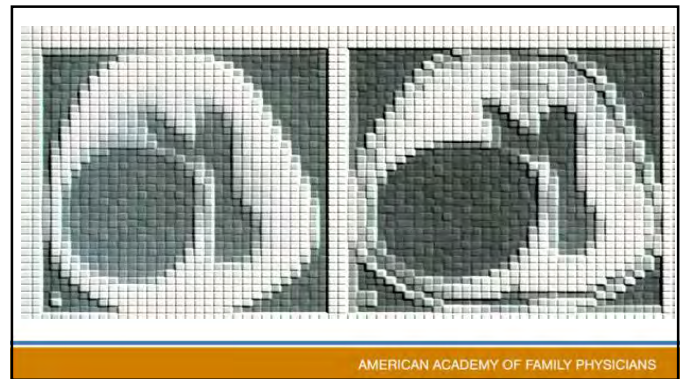
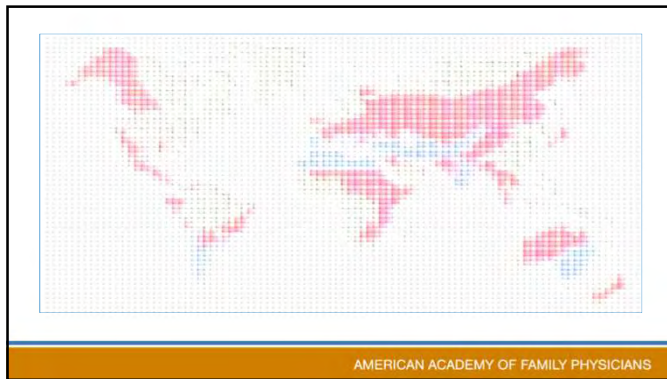


Key points

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

Hydatid disease





Key points

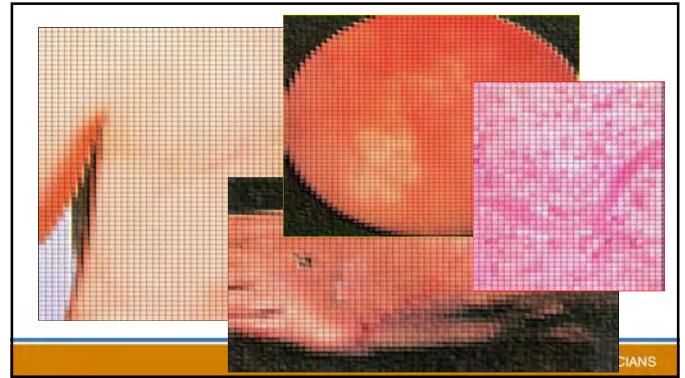
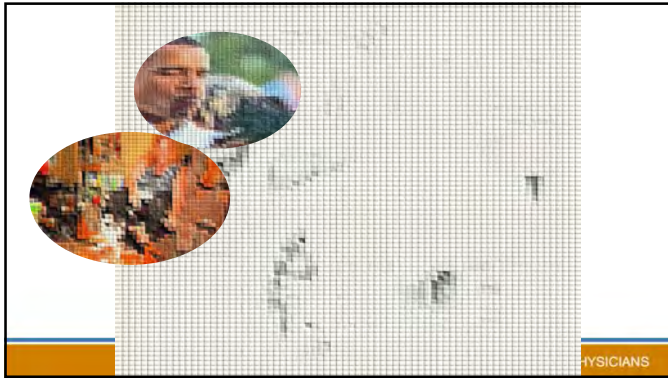
- Most hydatid cysts are symptomatic
- Highly allergenic
- Prevention: hygiene and sanitation

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Larval migrans

(*Toxocara*)

AMERICAN ACADEMY OF FAMILY PHYSICIANS



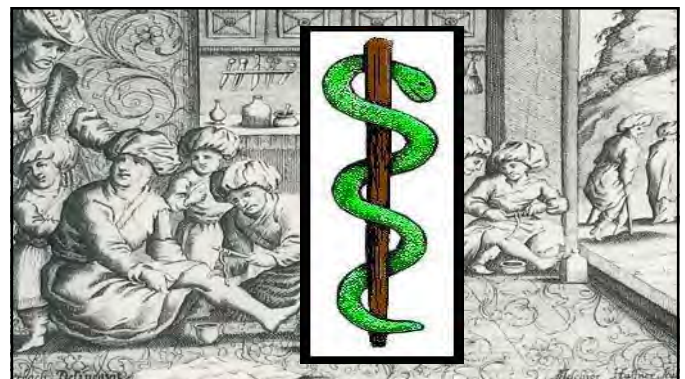
Key points

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Dracontiasis

AMERICAN ACADEMY OF FAMILY 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)

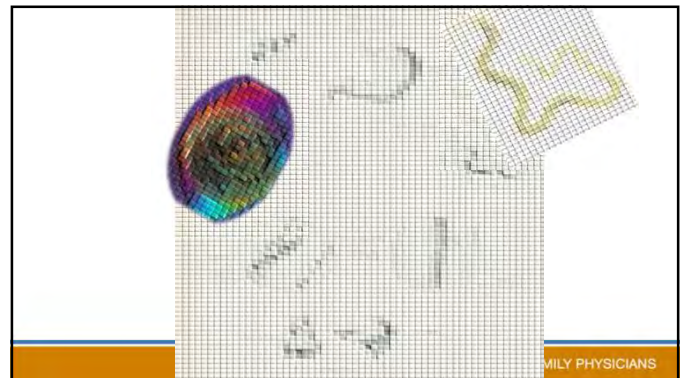
Deadlines for the eradication of Guinea worm disease have come and gone without success. The first deadline was set in 1991 when the World Health Assembly adopted a resolution calling for the eradication of the disease, which is caused by the nematode *Dracunculus medinensis*, within 4 years. This target 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.

87

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Trichinosis

AMERICAN ACADEMY OF FAMILY PHYSICIANS



FAMILY PHYSICIANS

Key points

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

AMERICAN ACADEMY OF FAMILY PHYSICIANS



FAMILY PHYSICIANS

Where we have been

Symptom-based:*

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

*with occasional detours to related parasites

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Simplistic GI Antiparasitic Primer

•Roundworms:

Mebendazole
Pyratel pamoate
Thiabendazole
Ivermectin

•Tapeworms:

Niclosamine
Quinacrine
Praziquantel

•Amoebae:

Metronidazole
Paromomycin

•Cryptosporidium:

Nitazoxanide

•Toxoplasmosis

Pyrimethamine

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Questions or discussion

94

AMERICAN ACADEMY OF FAMILY PHYSICIANS

Credits

Images utilized in this lecture were wantonly plagiarized from the following sources:

- 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
- JF Williams, personal collection
- Google image search

Reference to commercial trademarks in this lecture is not an endorsement, and more likely causes their respective holders to cringe.

AMERICAN ACADEMY OF FAMILY PHYSICIANS

© 2019 American Academy of Family Physicians. All rights reserved.

All materials/content herein are protected by copyright and are for the sole, personal use of the user.

No part of the materials/content may be copied, duplicated, distributed or retransmitted in any form or medium without the prior permission of the applicable copyright owner.

95

AMERICAN ACADEMY OF FAMILY PHYSICIANS

