Cestodes
Taenia Saginata

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Geographic Distribution

► T.saginata is prevalent in regions where cattle are raised: Africa, Middle-East, Central and South America, Europe and Asia

► T.saginata is the most highly endemic Taenia in the USA
General Recognition Features

- Can be 10 meters long though usually 2-5 meters
- 1000-2000 proglottids (1 cm long) with 1/3 – 1/2 being gravid
- Proglottids have 15-20 lateral branches from the uterus and a lateral genital pore
- Scolex has 4 suckers with a slight apical depression and no hooklets
General Recognition Features

Eggs

- 31-43 um
- Outer embryonal membrane
- Brown shell
- Hexacanth embryo with 3 pair of lancet shaped hooklets
General Recognition Features

- **Cysticercus**
  - 4-6 mm X 7-10 mm
  - In muscle of beef
  - Invaginated scolex
  - Scolex exvaginates and breaks off when digested out of the muscle
Life Cycle

- Definitive host - man
- Adults found - attached to the middle third of the small intestine
- Stage leaving the body – gravid proglottid that actively migrate and pass embryonated eggs
- Intermediate host – cattle
- Infectious stage for the definitive host – cysticercus infected meat
Life Cycle

Cysticercus stage develops in muscle (infectious for 1 year)

Embryo passes to tissue via mesenteric venules or lymphatics

Eggs hatch in duodenum

Eggs or proglottids eaten by cattle

Eggs extruded  Infectious for 2-6 months

Cysticercus digested out of infected tissue

Scolex exvaginates and attaches to small intestine

Gravid proglottid segments found in feces

Eggs or proglottids eaten by cattle

10-12 weeks

2-4 months

10-12 weeks
Life Cycle

► Prepatent period – 10-12 weeks
► Patent period - decades
Transmission

- Eating of inadequately cooked beef
- Inadequate meat regulation
- Use of raw human sewage for fertilizer
- Inadequate human fecal sanitation
Disease Characteristics

- Generally asymptomatic
- Diarrhea and abdominal cramps toward the end of the prepatent period (10-12 weeks)
- Rare – intestinal obstruction with a mass of entangled worms
Diagnosis

► Proglottids in the stool
► Eggs in the stool
► Scotch tape test for eggs on the perineum
► Fecal concentration techniques (Kato thick smear, Formyl ether)
► Taenia antigens in the stool
## Treatment

<table>
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<tr>
<th>Medication</th>
<th>Adult</th>
<th>Pediatric</th>
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<tbody>
<tr>
<td>Praziquantel</td>
<td>5-10 mg/kg once</td>
<td>5-10 mg/kg once</td>
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<tr>
<td>Niclosamide</td>
<td>2 gm once</td>
<td>50 mg/kg once</td>
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Adverse Medication Reactions

Praziquantel (Biltricide – Bayer)
- Frequent: abdominal pain, diarrhea, malaise, headache, dizziness
- Occasional: neutropenia, GI disturbance, methemoglobinemia
- Rare: CNS symptoms, hypertension, arrhythmias
Adverse Medication Reactions

- **Niclosamide**
  - Occasional – abdominal pain, anorexia, diarrhea, emesis
  - Rare – dizziness, skin rash, drowsiness, perianal itching, unpleasant taste
Control Measures

- Sanitary disposal of human feces
- Adequate meat inspection
- Cooking beef to >65°C or freezing at -20°C for 24 hours
- Stool examination of food handlers from endemic countries
- Avoid eating uncooked vegetables and fruits that cannot be peeled while traveling in developing countries