



CESTODES

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DATE: 26/8/2016



CESTODES

- Species
- Characteristics
- Life cycle
- Clinical features
- Diagnosis
- Treatment
- Prevention
- Hydatid disease



CESTODES

- *T. Saginata*
- *T. Solium*
- *D. Latum*
- *H. Nana*
- Hydatid
- Sparganosis
- Tapeworms of dogs and cats



CESTODES

- Dorso-ventrally flattened
- Habitat – intestinal tract of vertebrates
- All require intermediate host except *H. Nana*
- Have **head or scolex** for attachment
- Each mature segment has male and female organs, nerve trunks and excretory canal

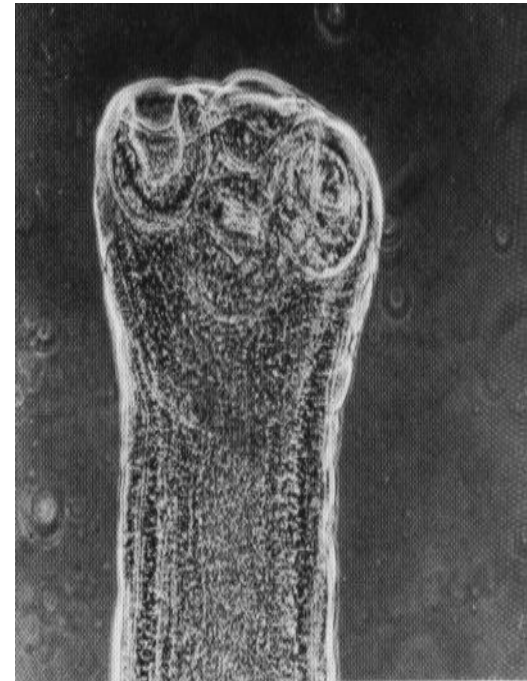


CESTODES

- Nutrition – direct absorption from cuticle
- Eggs – operculated in some for adaptation to water
e.g. *D. Latum*
- Humans are the only **definitive host** for *T. Solium*
and *T. Saginata*

T. SAGINATA – BEEF TAPE WORM

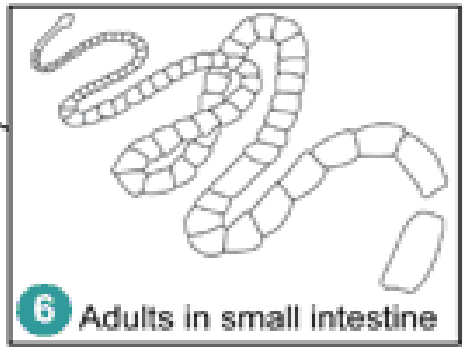
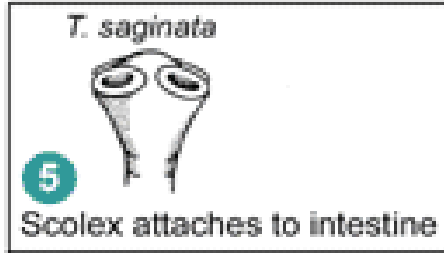
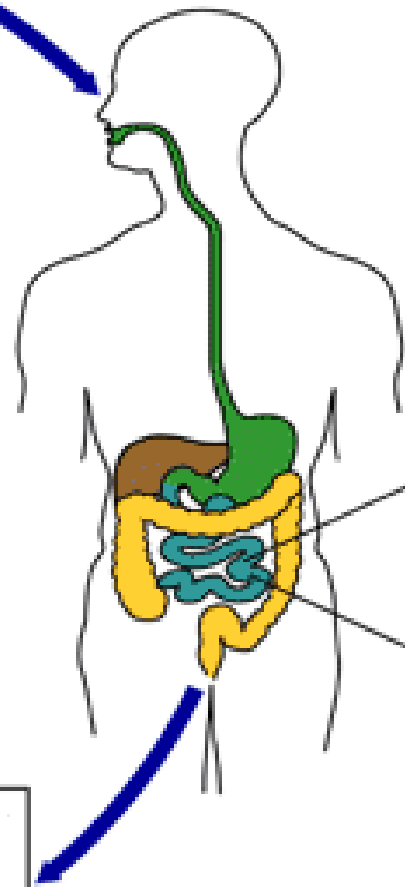
- Head has **no hooks** but **suckers**
- Adult 4-10 meters
- Adult worms are found in the small intestine



1 Oncospheres develop into cysticerci in muscle



4 Humans infected by ingesting raw or undercooked infected meat



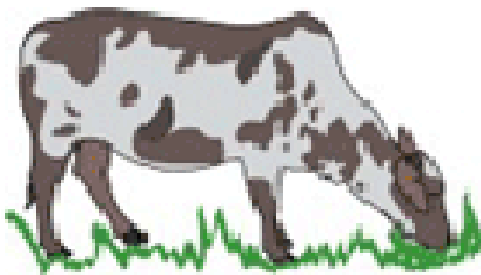
Oncospheres hatch, penetrate intestinal wall, and circulate to musculature

3



2

Cattle become infected by ingesting vegetation contaminated by eggs or gravid proglottids



T. saginata

Eggs or gravid proglottids in feces and passed into environment

i = Infective Stage
d = Diagnostic Stage





CLINICAL FEATURES

- Asymptomatic
- Abdominal pain, diarrhea, nausea, vomiting, proglottids crawling out

DIAGNOSIS

- Worm segments in the stools (Proglottids have **15-20 uterine branches**)
- Scolex has suckers
- Eggs – indistinguishable from *T. Solium*



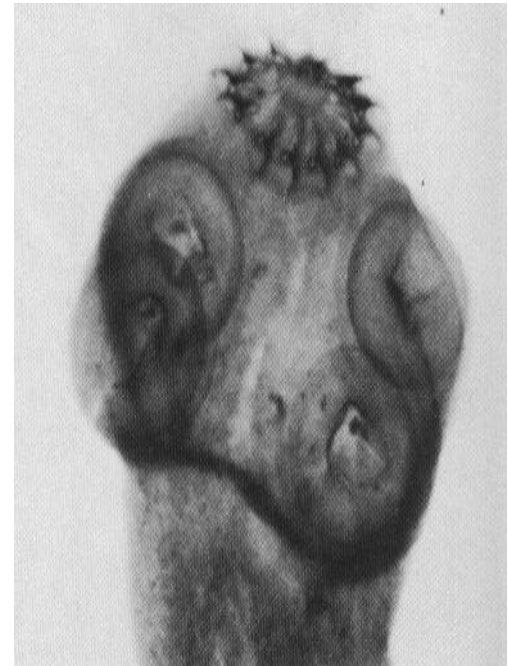


TREATMENT

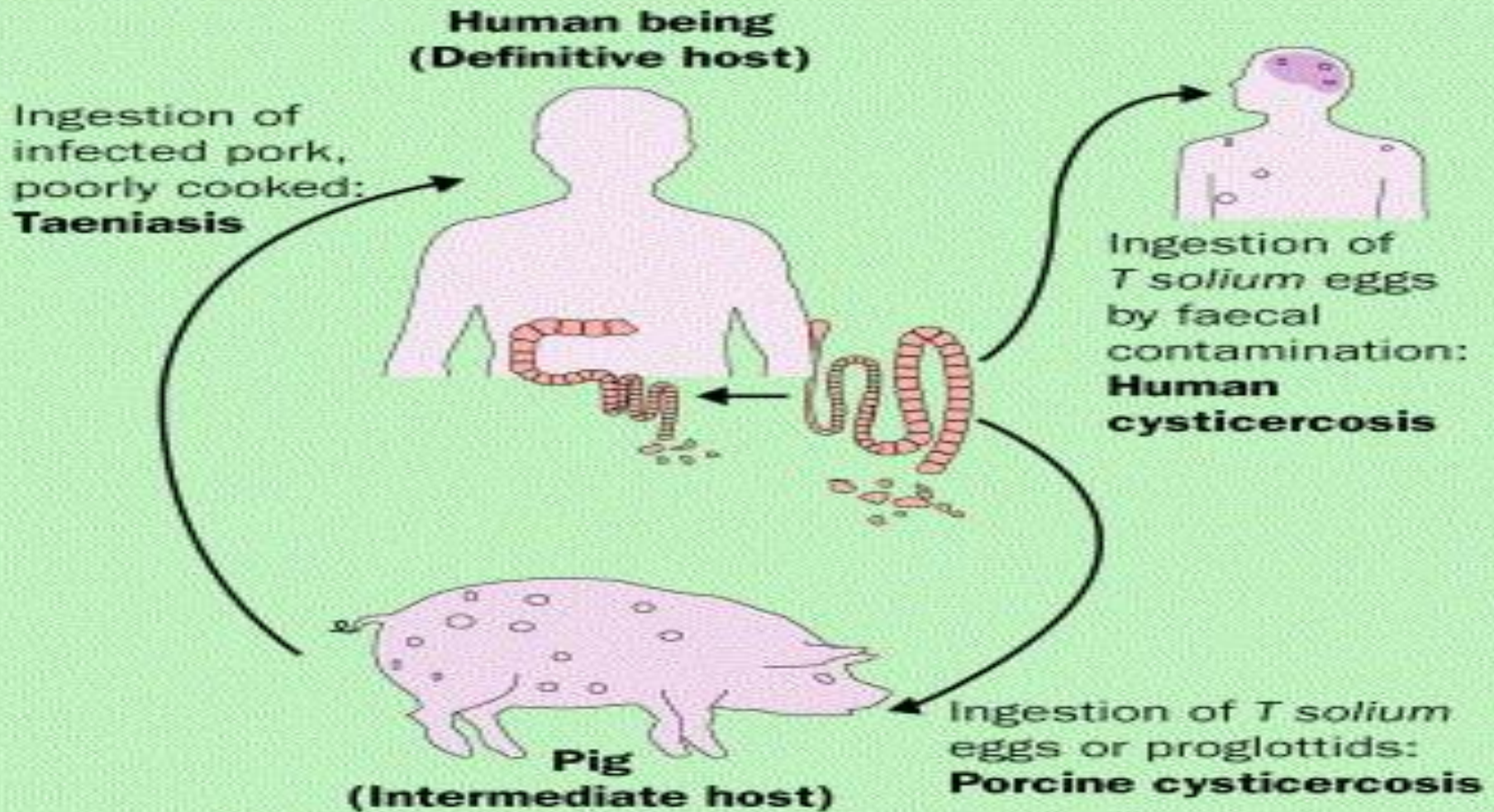
- **Praziquantel** 5-10 mg/kg single dose for all *Taenia* spp.
- **Niclosamide**

T. SOLIUM

- Not a problem in Kenya. Some MRI evidence recently
- Head has hooks
- 2-7 meters
- May live up to 25 years



LIFE CYCLE





CLINICAL FEATURES

- GIT
 - Abdominal pain, loose motions, passing of the proglottids
- Cysticerci – intermediate forms
 - Subcutaneous nodules - painless
 - Epilepsy
 - Hydrocephalus
 - Mental changes
 - Ocular (Retinitis, uveitis, conjunctivitis)
 - CVS – heart block



DIAGNOSIS

- Adult worm
- Head rostellum plus hooks
- Proglottids (8-12 lateral branches)
- Eggs
- X-rays
 - Cigar-shaped calcifications in muscular cysticerci
 - Multiple calcifications in the brain
- MRI
 - Acute cystic lesions with multiple cysticerci



TREATMENT

- **Praziquantel**
- **Niclosamide** with purge
3-4 hours (give dalcolex
that has a laxative effect)

For cysticercosis

- **Albendazole** 15mg/kg
for 8-30 days
 - Safer drug and a little
bit better than

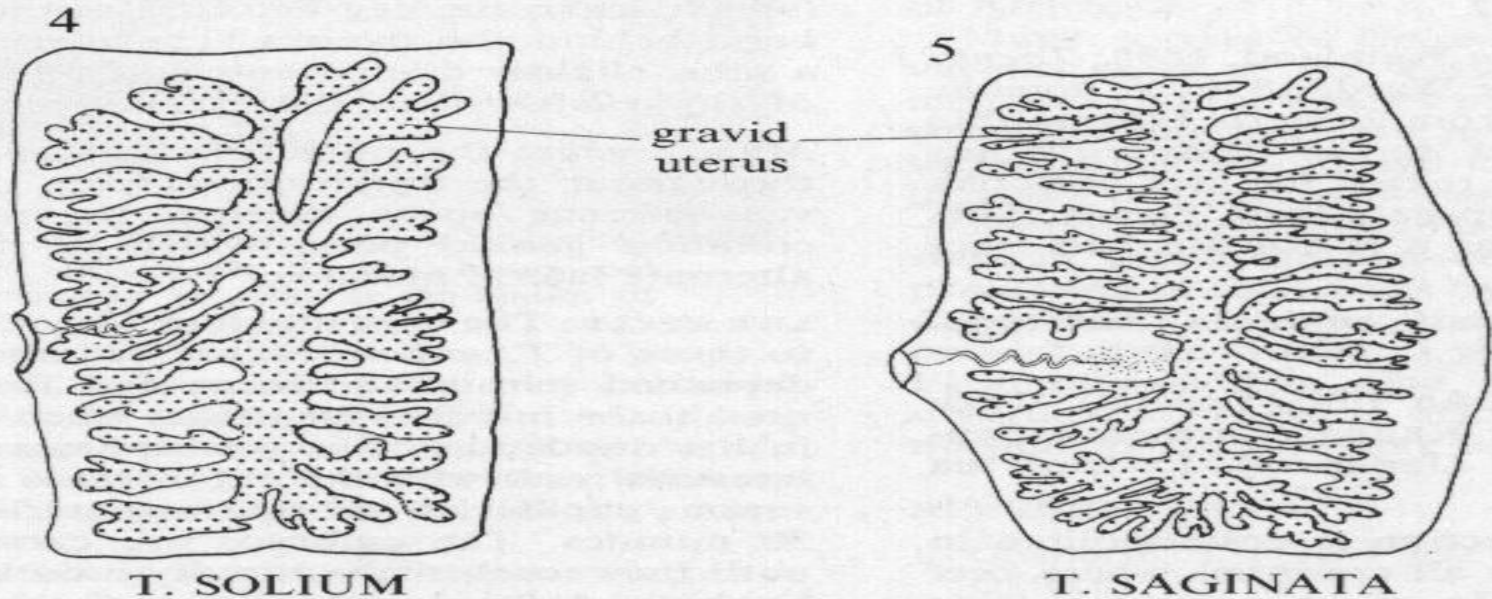
praziquantel

- No interaction with
steroids like
praziquantel

- **Praziquantel** 50-100
mg/kg in 3 divided doses

- **Steroids**

PROGLOTTIDS OF *T. SOLIUM* AND *T. SAGINATA*

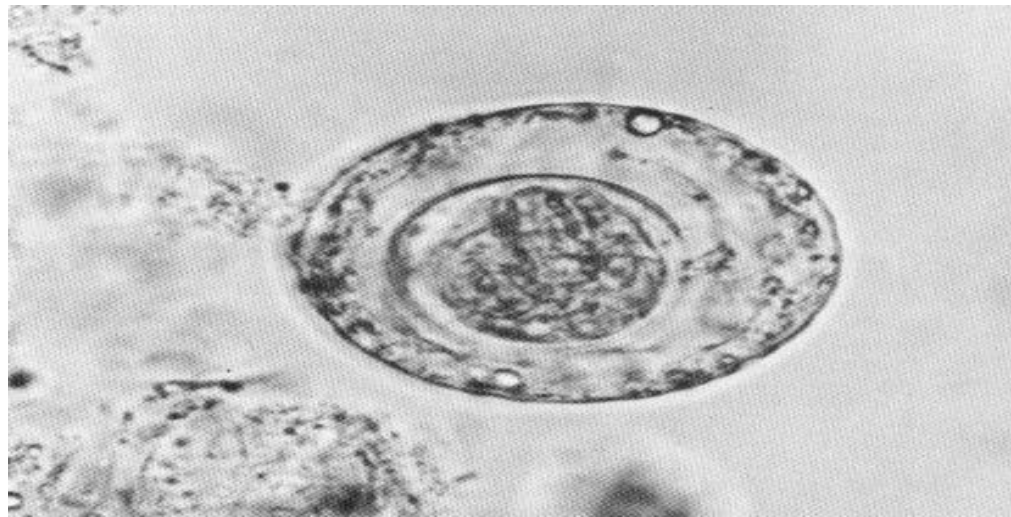


8-12 uterine branches

15-20 uterine branches

H. NANA – DWARF TAPE WORM

- No intermediate host required
- Measures 25-40mm by 1mm
- The cycle from ingested egg to adult worm is 10-12 days





CLINICAL MANIFESTATION

- Asymptomatic
- Heavy infection – headache, dizziness, weakness, allergic symptoms, pruritus and urticaria
- A worm load that exceeds 1000 predisposes one to symptomatology.

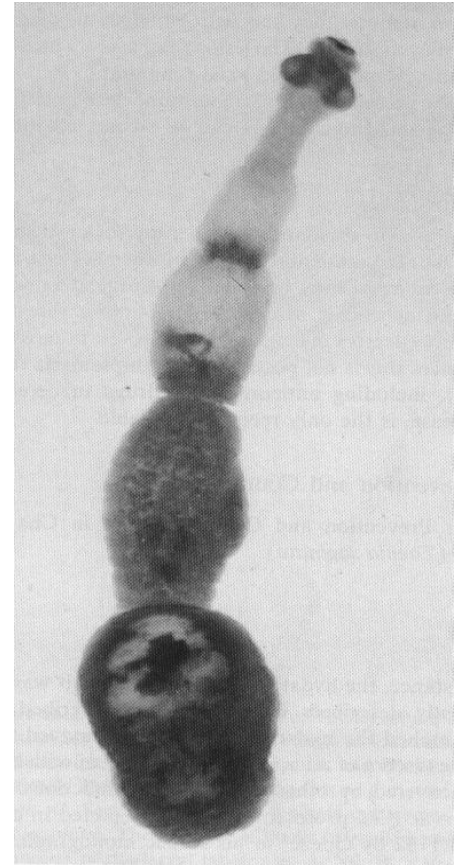


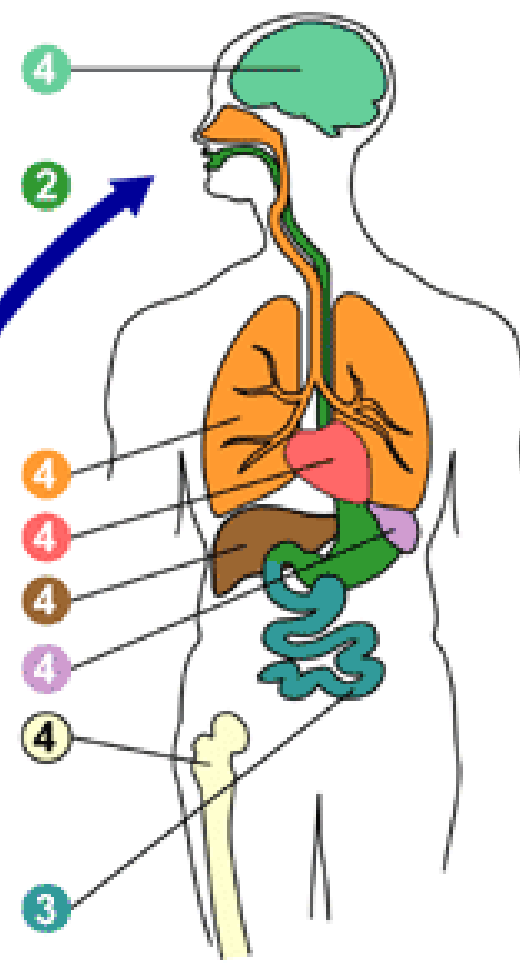
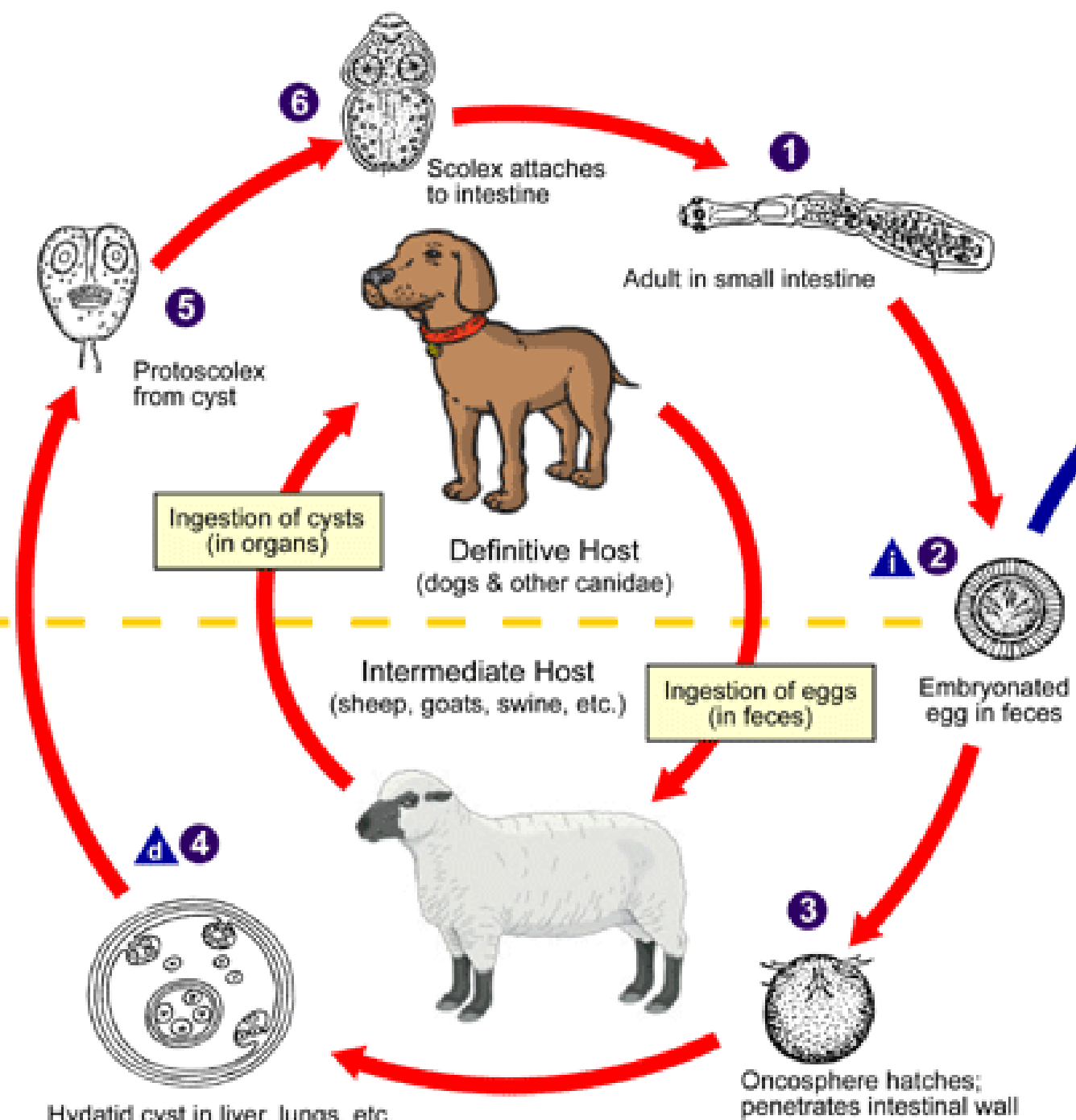
DIAGNOSIS AND TREATMENT

- Characteristic eggs in the stools
- Treatment – **praziquantel**
- **Nitazoxanide** - 500 mg twice daily for adults, 4-11 years 200 mg BD, 1-3 years 100 mg BD

HYDATID DISEASE (ECHINOCOCCUS GRANULOSUS)

- Zoonotic disease caused by larva stage of *E. Granulosus*
- Smallest cestode (2-5 segments)
- *E. multilocularis* is more of a problem in S. america

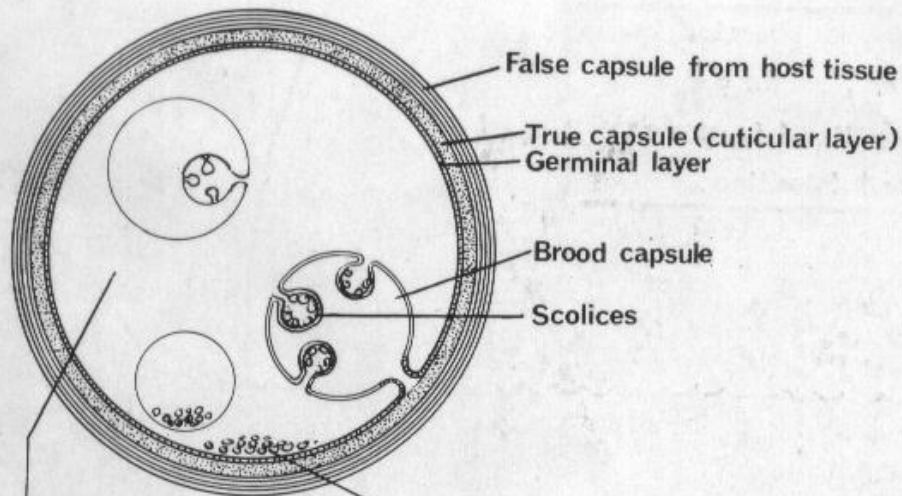




i = Infective Stage
d = Diagnostic Stage

HYDATID CYST

30-3

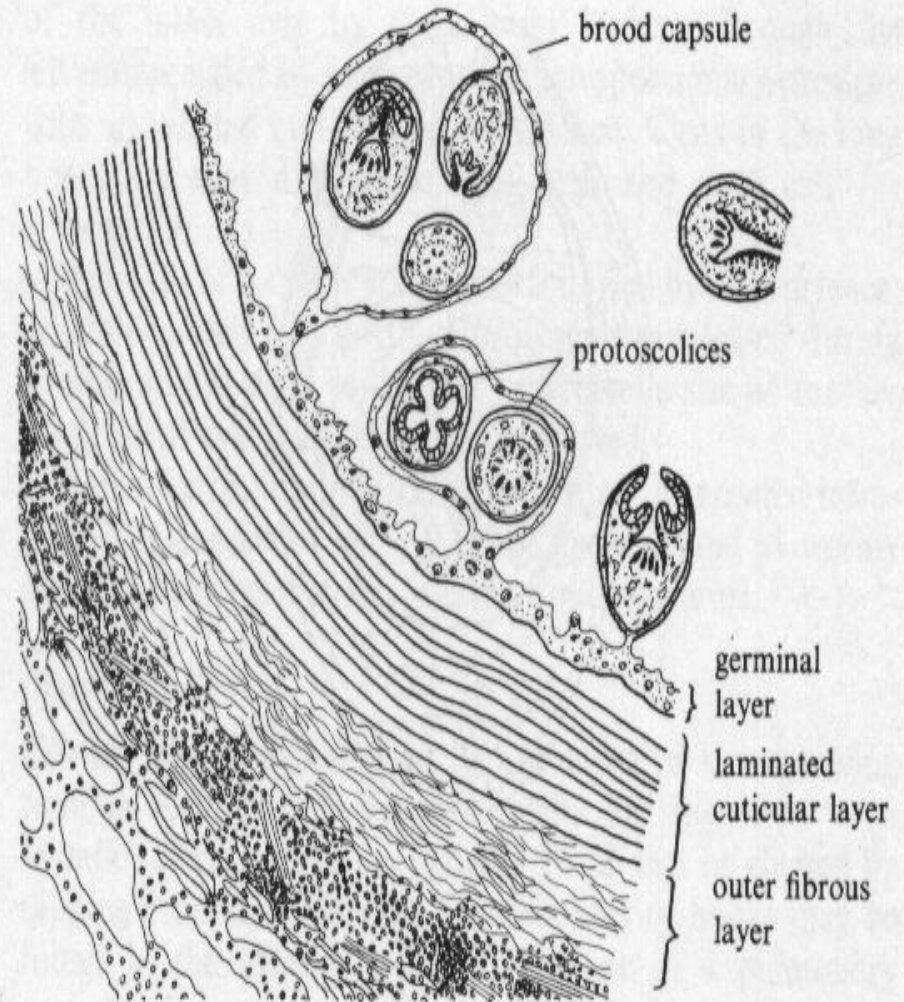
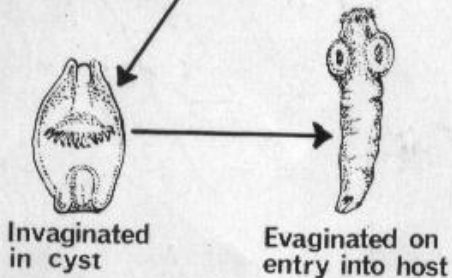


CYST FLUID

Salts
Enzymes
Toxins

HYDATID SAND

Remains of germinal epithelium
Brood capsules
Scolices



CLINICAL MANIFESTATION

- Rate of growth 1-5cm/year
- Signs and symptoms
 - **Abdominal pain** if secondary infection
 - **Abdominal distention**
 - **Hepatomegaly** (the liver is the commonest site)
 - Lungs – **cough, hemoptysis**
 - Bones – cysts within long bones; **pathological fractures**
 - Brain – increased ICP, seizures, blindness, orbital hydatid(huge proptosis, blindness)
 - Rupture – allergic manifestations (if the hydatid cyst ruptures), peritonitis (due to seeding of the cysts all over the peritoneum)



DIAGNOSIS

- Plain X-ray
 - Particularly if there is a cyst in the lung
 - Pleural effusion on the right lung may indicate a cyst in the liver (reactional effusion)
- Ultra sound
 - Liver involvement
- CT scan
 - Brain and orbital cysts
- Serology
 - ARC 5 (counter immuno electrophoresis)
 - Indirect haemagglutination and latex



TREATMENT

- Medical
 - Albendazole
 - Praziquantel
- Surgical

- Control