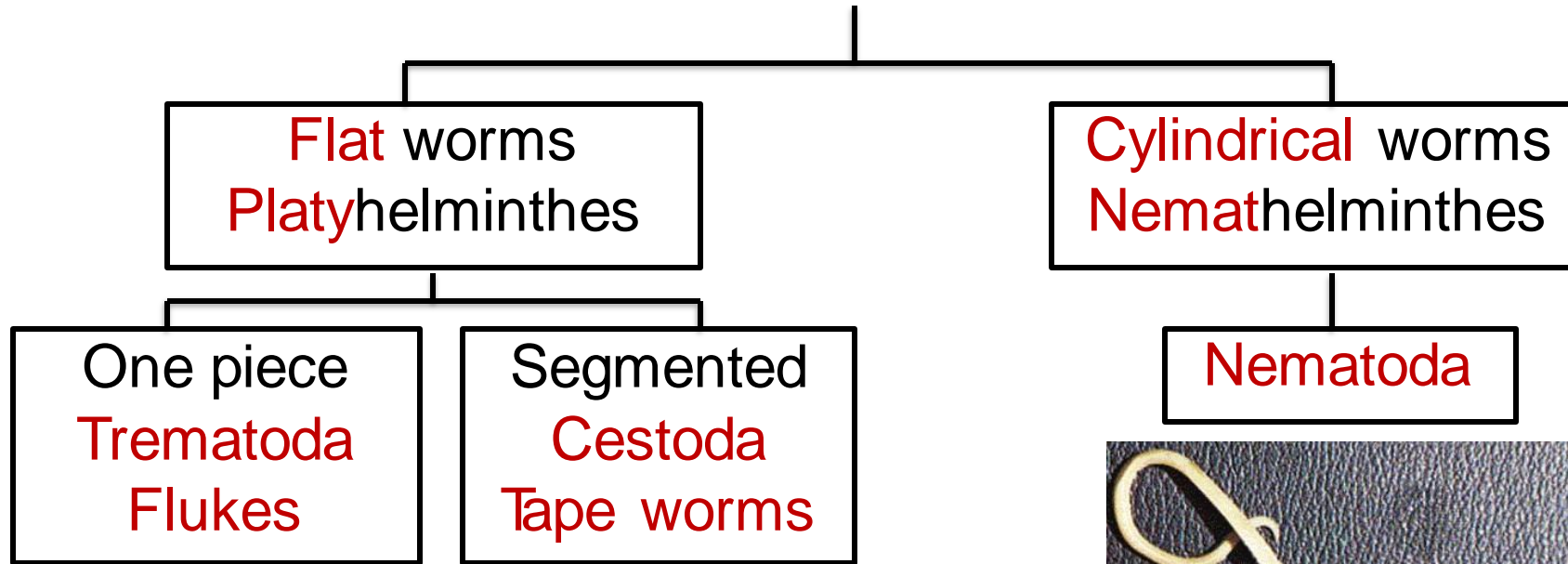
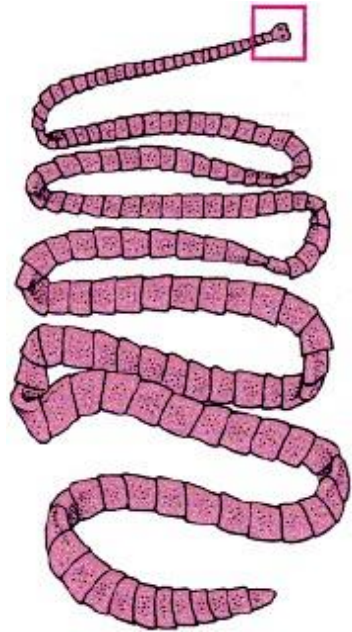


Helminths (worms)



in different
areas



intestine & Tissue



Intestinal, Blood & tissue

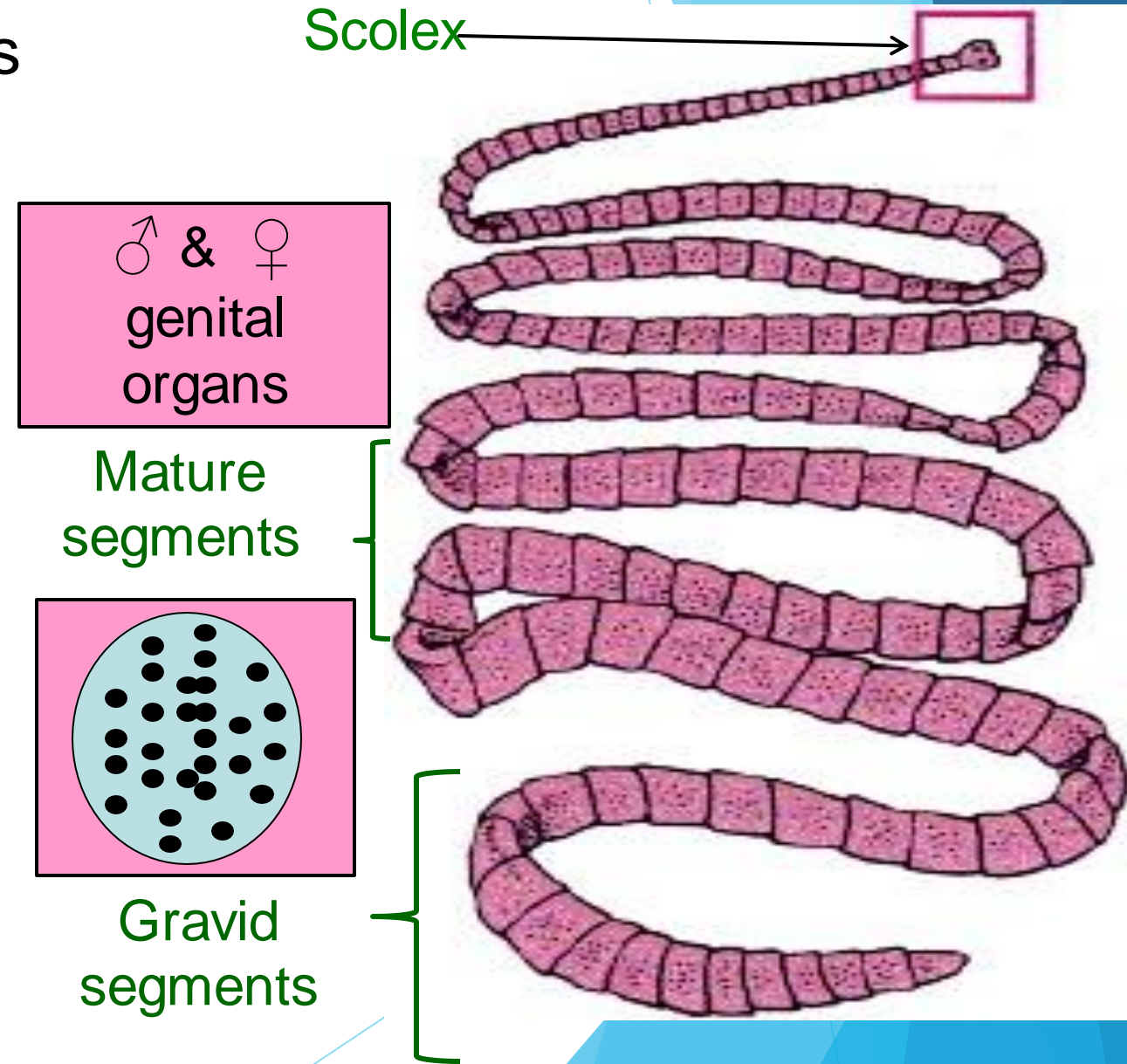
General Characters of Cestodes

Flat and segmented. Tape worms

Hermaphrodite.

6 adult cestodes live in the small intestines of man: **intestinal cestodes**.

3 adult cestodes live in the small intestines of animals and their larvae are found in tissues of man: **extraintestinal cestodes**



General Characters of Cestodes

- 1-The adults are parasites of the small intestine.**
- 2-Flattened, ribbon-shaped and segmented (Tape worm).**
- 3- Covered with a protective cuticle.**
- 4- Flattened dorso-ventrally with no body cavity.**
- 5- Its body (strobila) is provided with a head (scolex) and is segmented into (proglottids).**
- 6-Proglottids proximal to the scolex are immature, they get mature as they grow away from the scolex.**
- 7- Distal segments are gravid (except in pseudophyllidae)**
- 8- The scolex or head fixes to the wall of the intestine.**



General Characters of Cestodes

- 9- The scolex may be armed with hooks or spines.**
- 10- Scolex has either suckers or bothria (grooves) for fixation.**
- 11- Segments (proglottids) are hermaphrodites.**
- 12- The neck region is responsible for the formation of new segments.**

General Characters of Cestodes

- ▶ **2 subclasses:**
- ▶ ***Pseudophyllidae***
- ▶ ***Cyclophyllidae***
- ▶ **In members of *Pseudophyllidae*:**
- ▶ **Organs of fixation are grooves (bothria)**
- ▶ **Eggs are operculated.**
- ▶ **Water is necessary for its life cycle.**
- ▶ **There are 2 larval stages in 2 intermediate hosts.**
- ▶ **Laval stages are solid (not cystic)**
- ▶ **Members are:**
- ▶ ***D. latum***
- ▶ ***D. mansoni***

General Characters of Cestodes

In members of *cyclophyllidae*:

Eggs (not operculated) are laid mature (the embryo has 6 hooks)

One larval stage in one IH.

Larval stages are cystic.

Members are:

T. saginata.

T. solium.

H. nana.

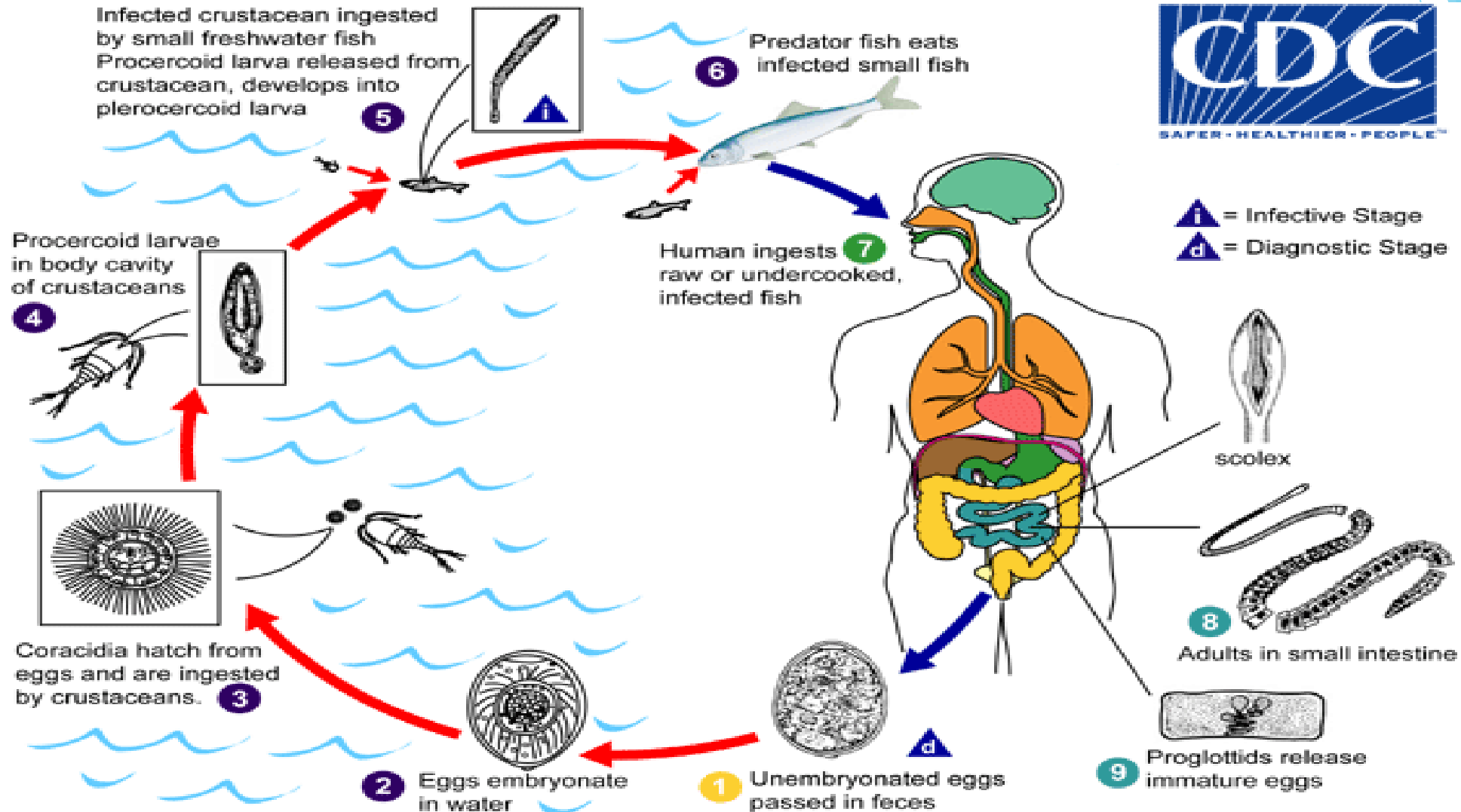
H. Diminuta.

D. caninum.

E. granulosus* & *E. multilocularis.

Multiceps multiceps.

Diphyllobothrium latum causes Diphyllorhynchiasis



Sparganosis

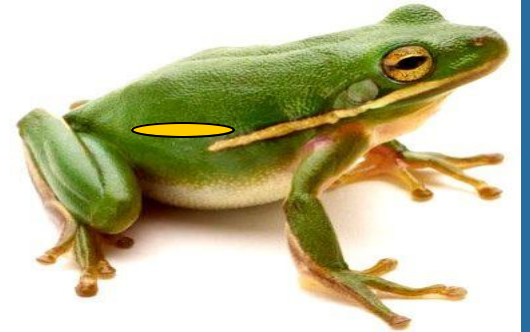
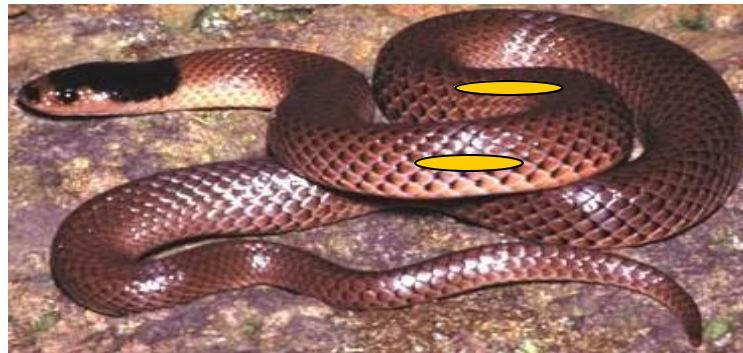
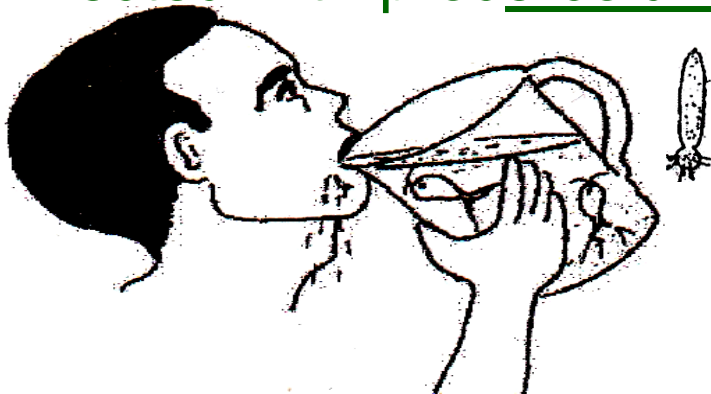
Infection of human tissues by the plerocercoid larva of *D.mansoni* or *D.proliferum*.

Mode of Infection in man:

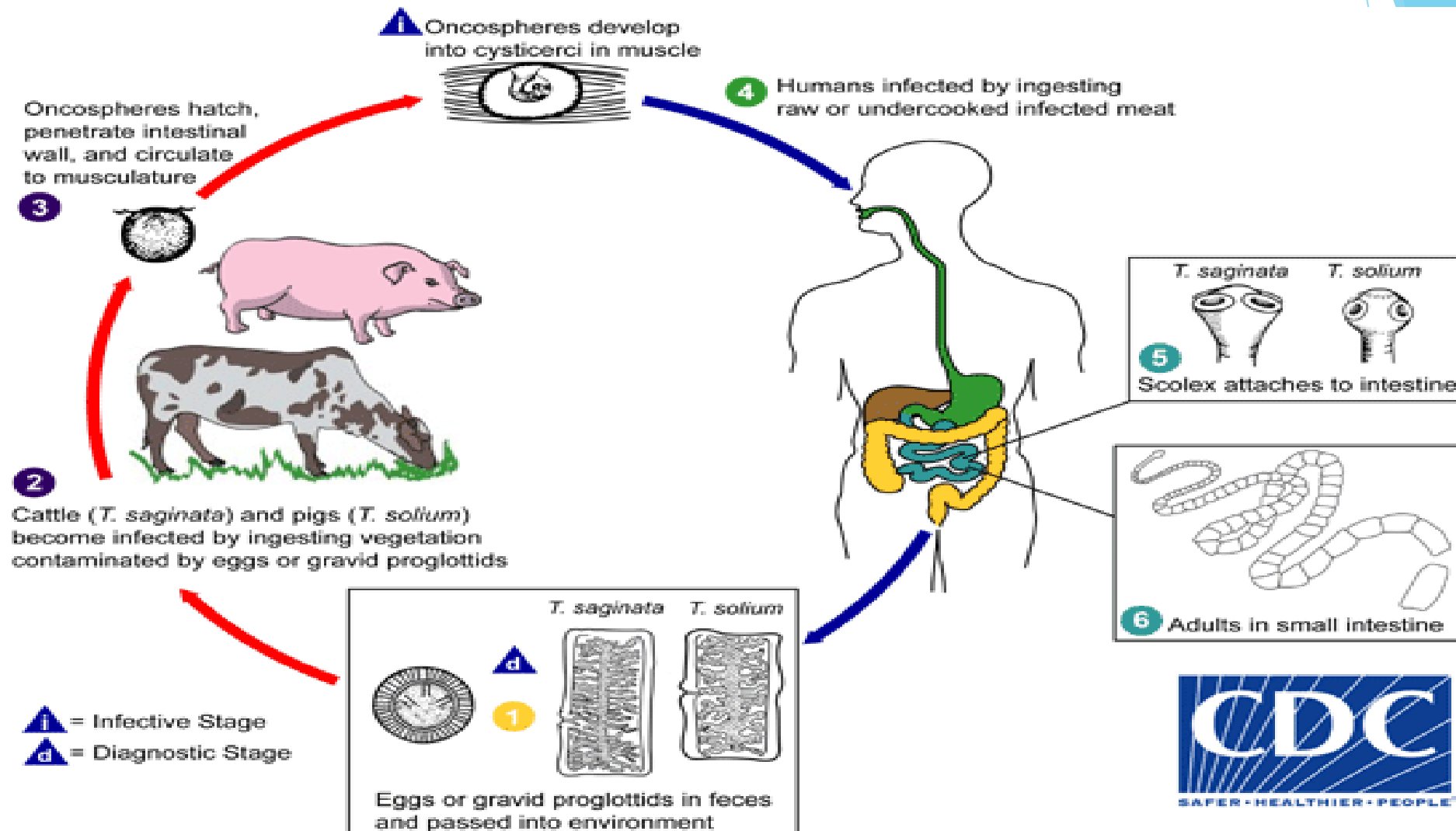
Eating raw or undercooked flesh of frogs, snakes and birds infected with plerocercoid larva.

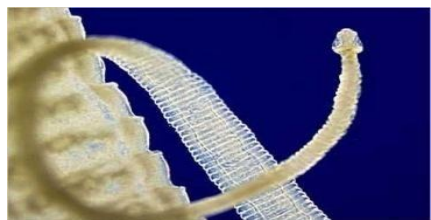
Applying infected flesh of frogs and snakes as foment or poultice to inflamed tissues as skin or eye.

Drinking water containing Cyclops infected with procercoid larva.



Taenia





Adult worm
in intestine of
man



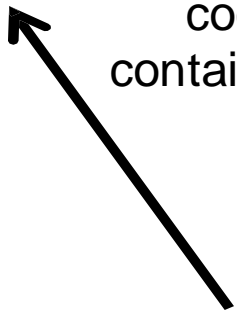
Eggs or segments
gravid in
stools



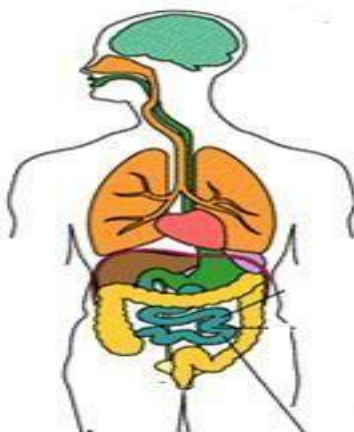
Eggs swallowed by cow

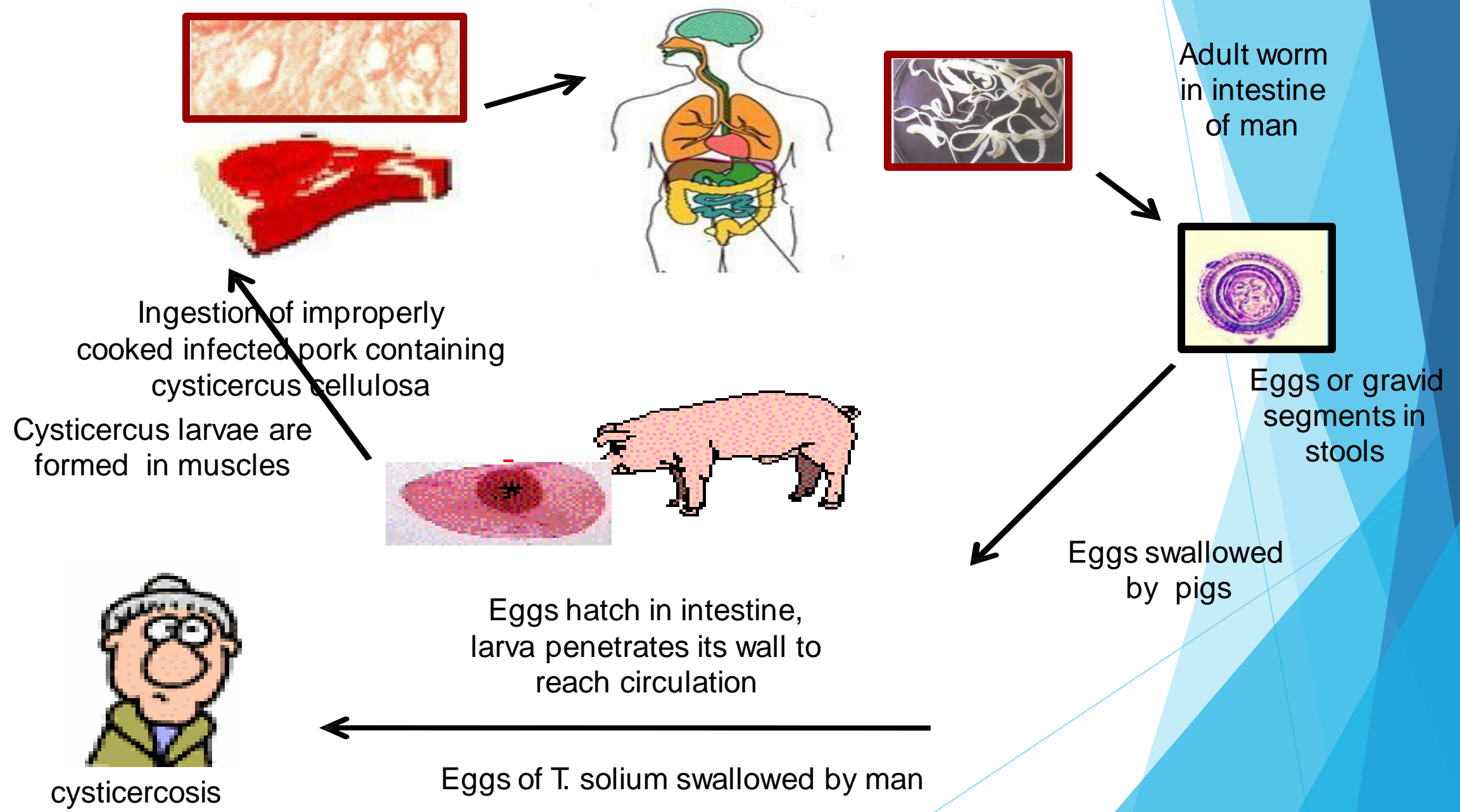


Cysticercus larvae
are formed in
muscles



Ingestion of improperly
cooked infected meat
containing cysticercus larvae





Cysticercosis

Means: Invasion of human tissues by *cysticercus cellulosa*, the larval stage of *T.solium*.

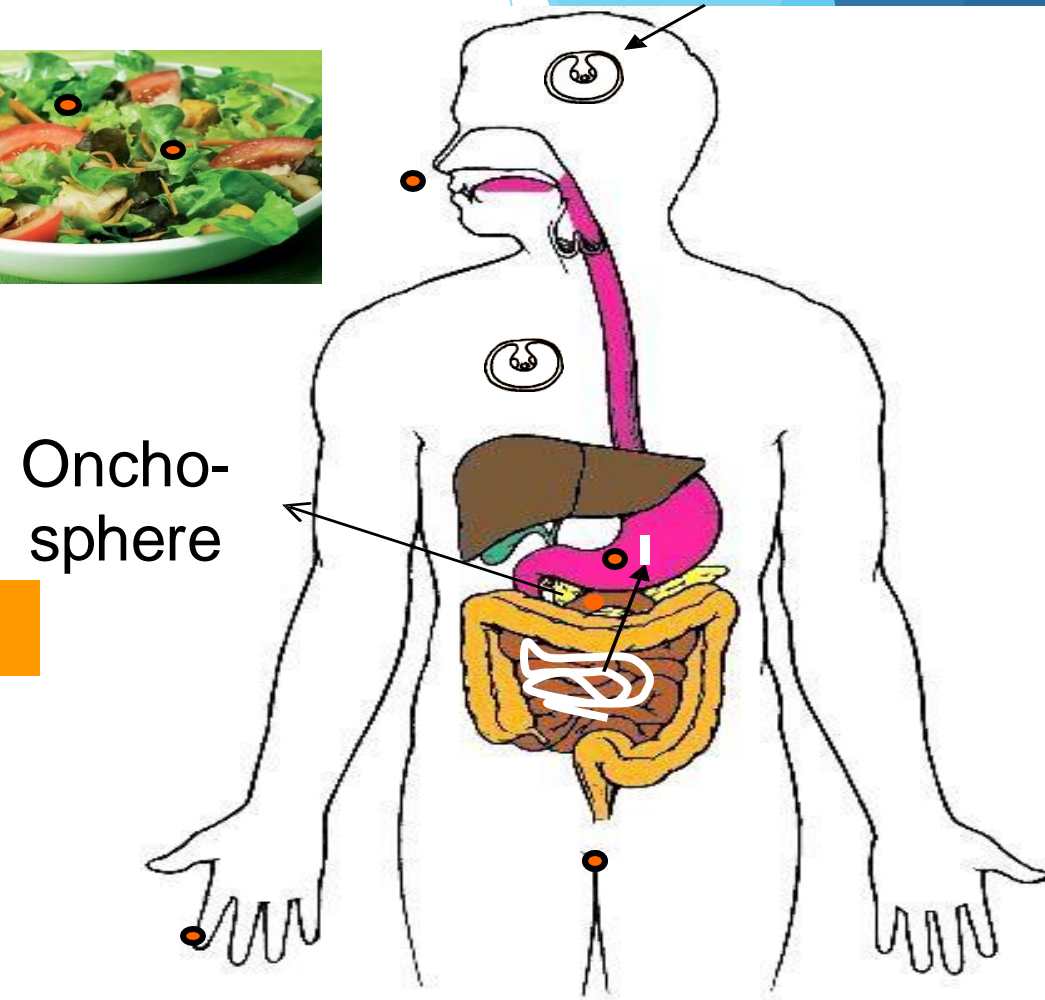
Mode of Infection:

- Ingestion of *T.solium* eggs in contaminated food or drink.

Heteroinfection
- Hand to mouth infection in a patient having adult worms in his intestine.

External autoinfection
- In a patient having adult worms in his intestine, some detached segments ascend by anti-peristaltic movements to the stomach then descend again to the intestine where eggs hatch and cause cysticercosis.

Internal autoinfection



How is man infected with

H.nana ?

Final host:
infected human

Mode of infection:

1-Ingestion of *H.nana*

- In contaminated food or drink
- Hand to mouth (autoinfection)

egg

2-Ingestion of infected rat flea

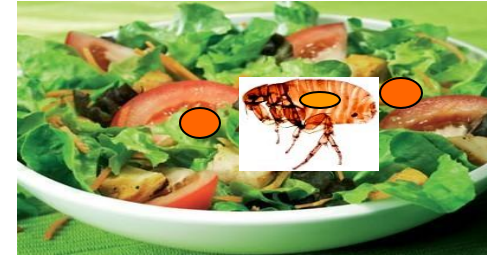
Cysticercoid
nana
in submucosa

Adult in small
intestine (habitat)

Two Infective Stages:

I

Egg of
H.nana



II

Cysticercoid
nana in Rat
flea

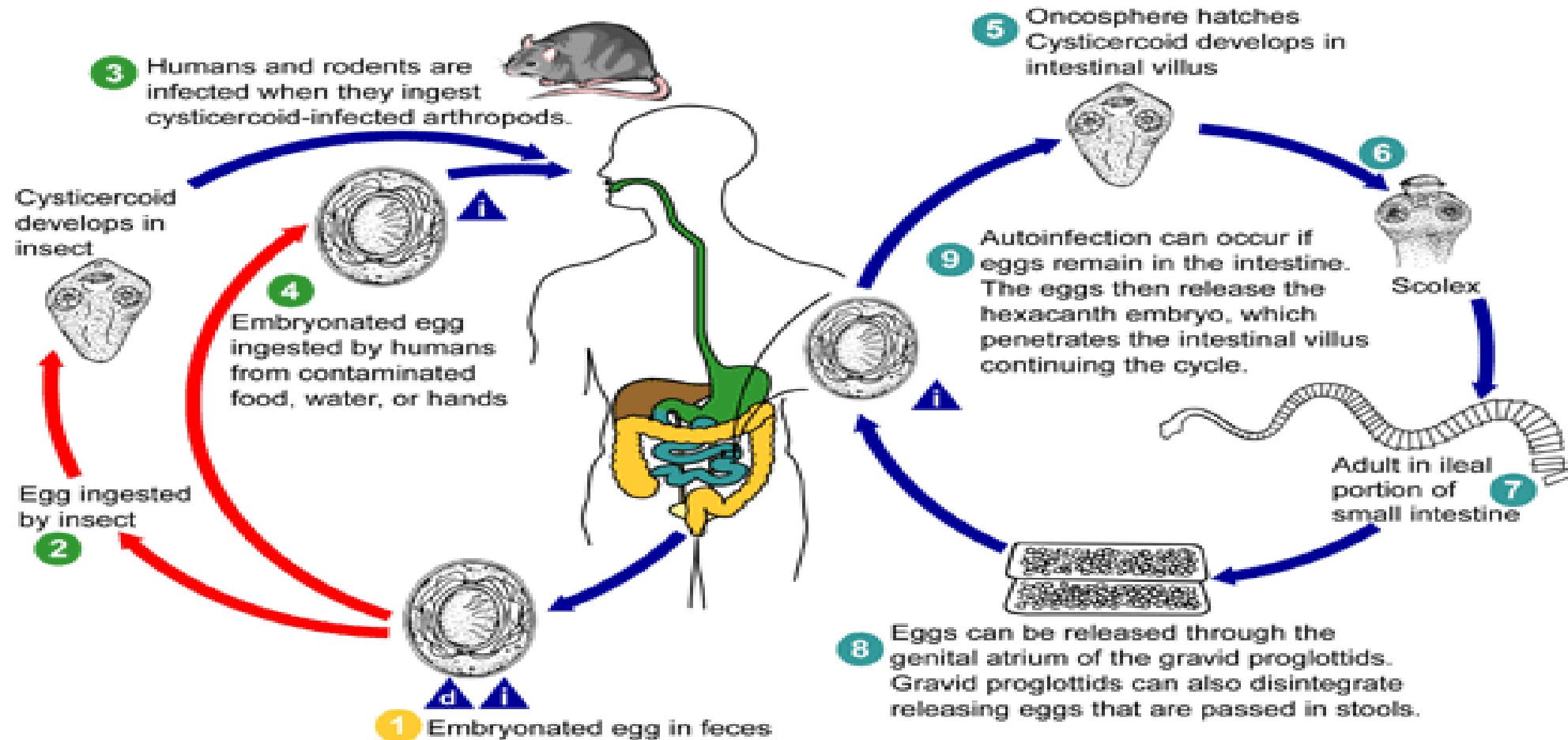


Rat

Diagnostic stage
H.nana egg in stool



i = Infective Stage
d = Diagnostic Stage



How is man infected with *H. diminuta* ?

Final host:
infected human

Mode of infection:

Ingestion of infected
rat flea



One Infective Stage:

Cysticercoid
diminuta in
Rat flea



Cysticercoid
diminuta



Adult in small
intestine (**habitat**)



Diagnostic stage
H. diminuta egg in stool



How is man infected with *D.caninum* ?

Final host:
infected human

Mode of infection:

Ingestion of infected
dog flea



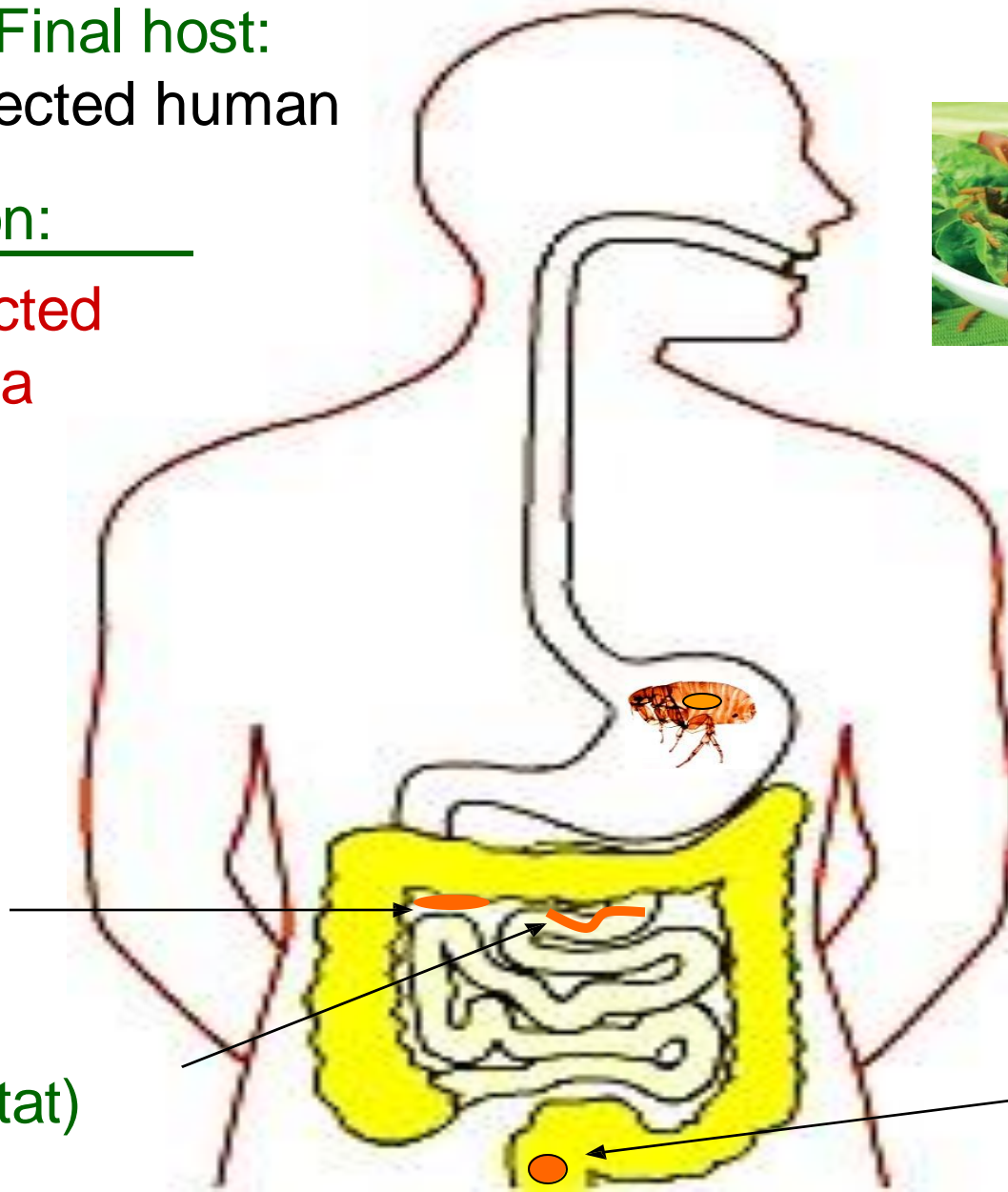
One Infective Stage:

Cysticercoid
caninum in
DOG flea



Diagnostic stage
Egg capsules in stool

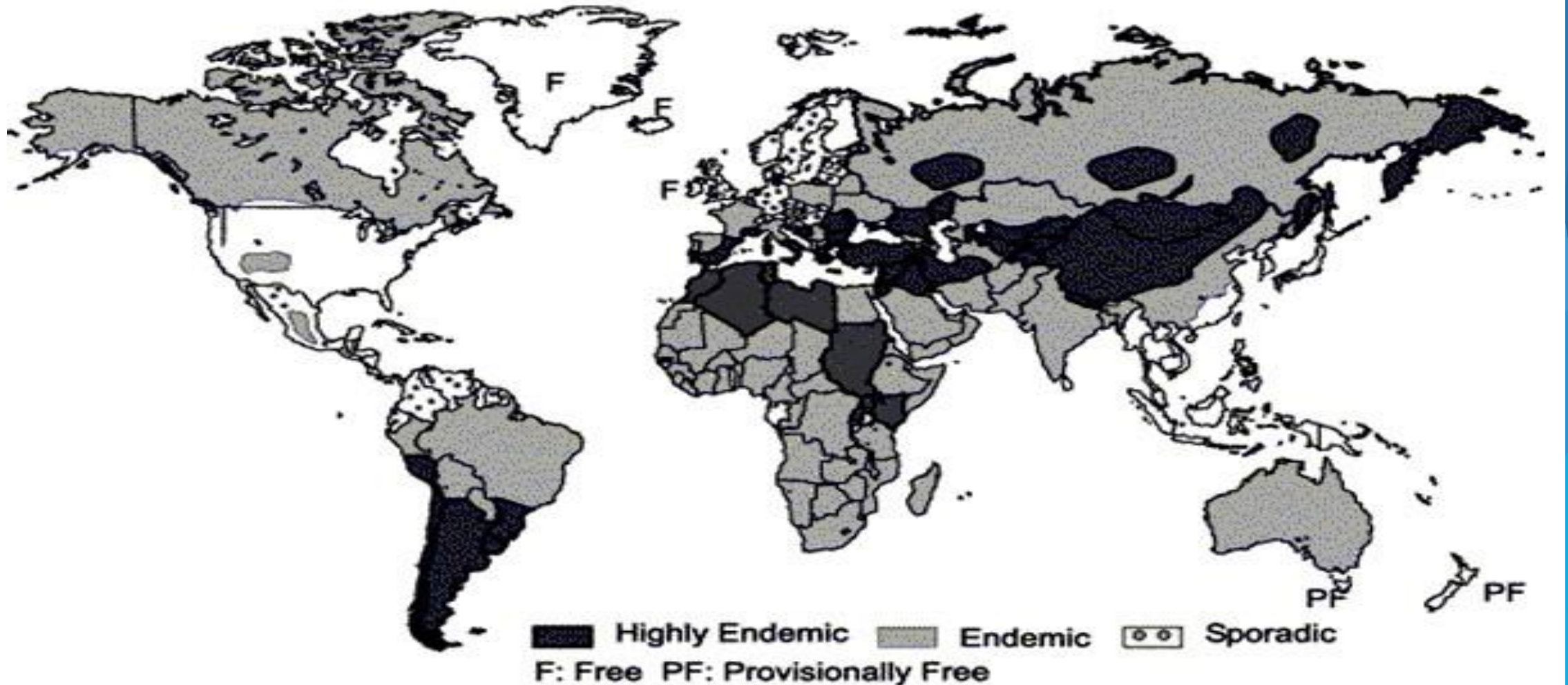
Cysticercoid
caninum

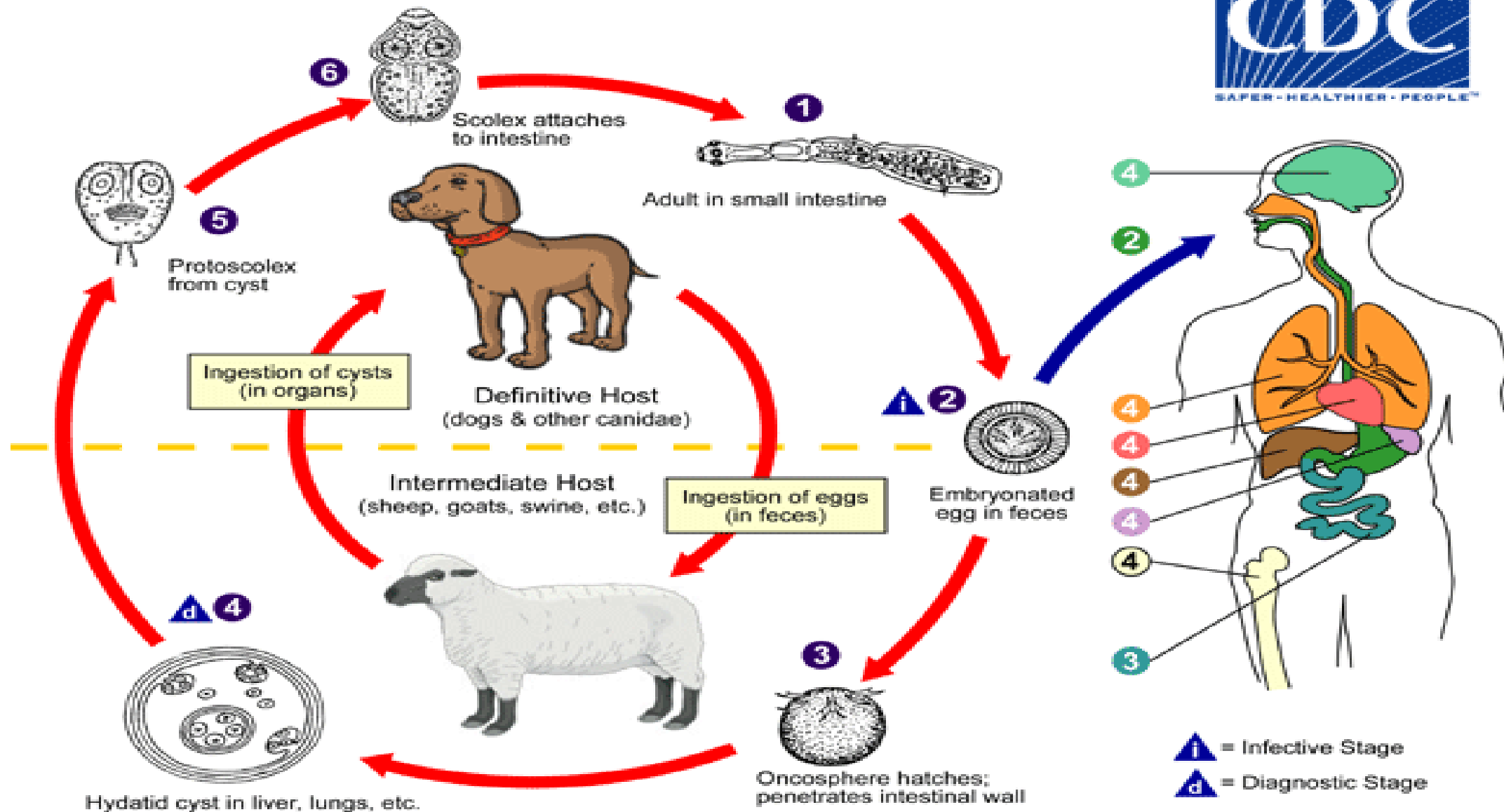


Adult in small
intestine (habitat)

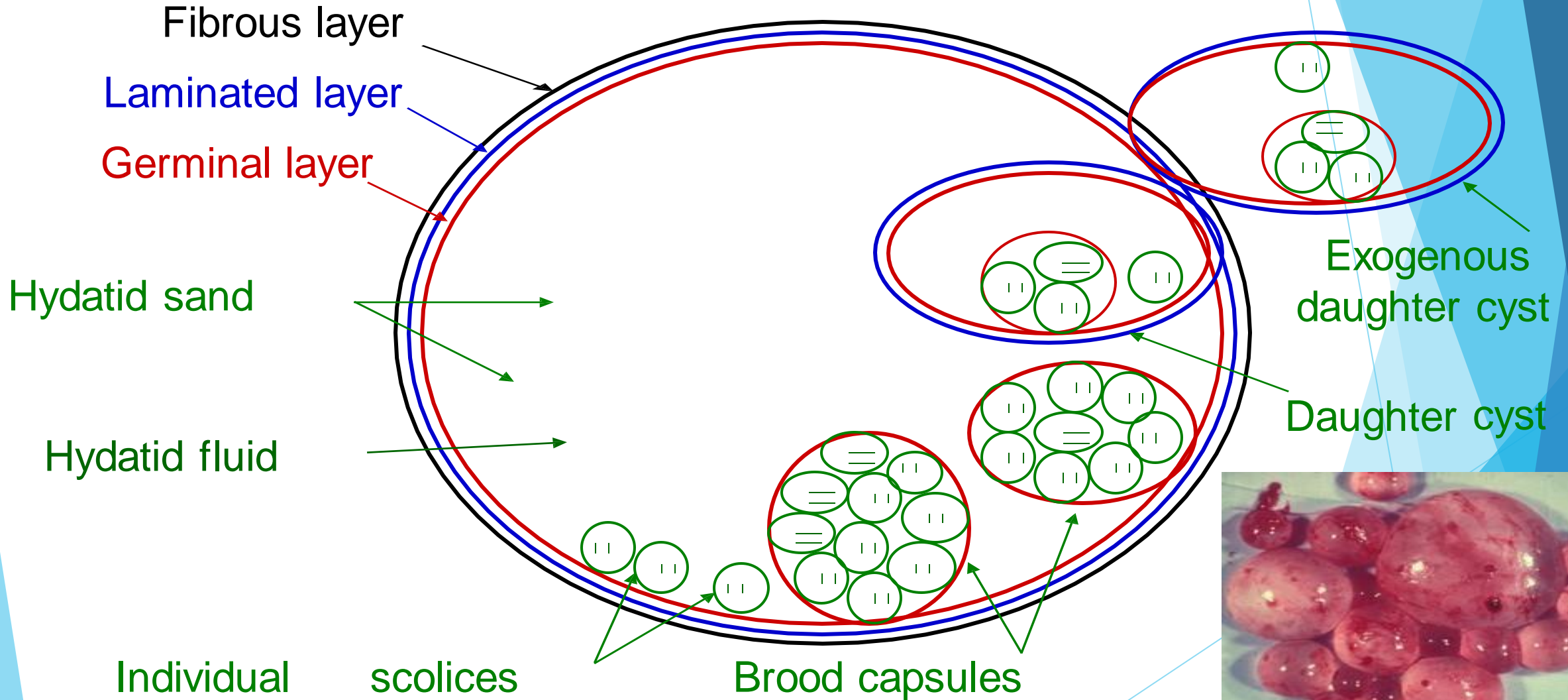
Echinococcus granulosus causes Hydatid disease

Geographical Distribution: cosmopolitan especially in sheep raising countries.





Hydatid Cyst



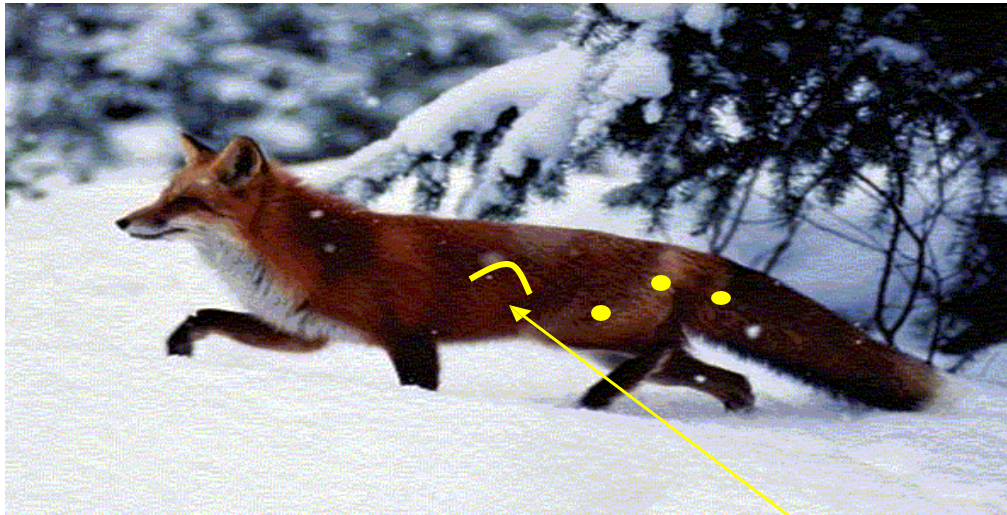
Echinococcus multilocularis and Alveolar Hydatid Disease

Geog. Distribution:

North America,

Siberia & Eskimos

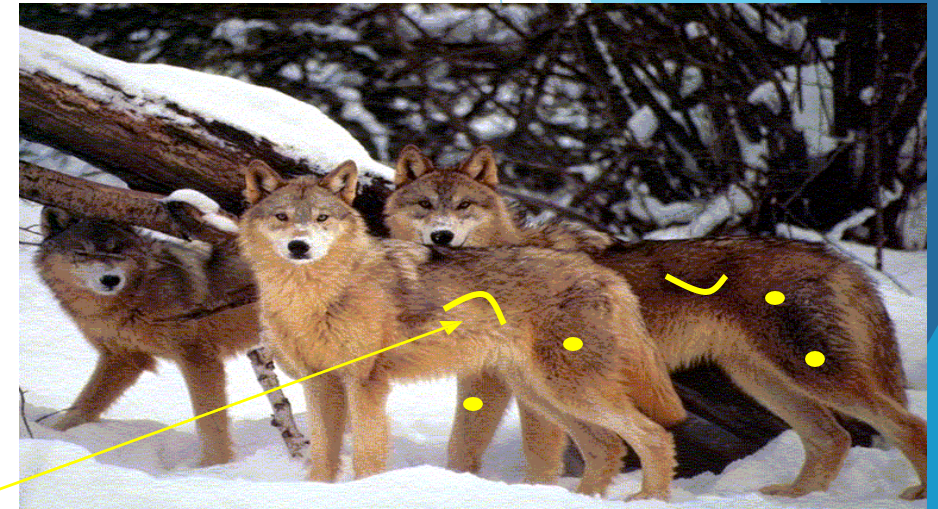
Foxes



Cats



Wolves



Adult *E. multilocularis* in

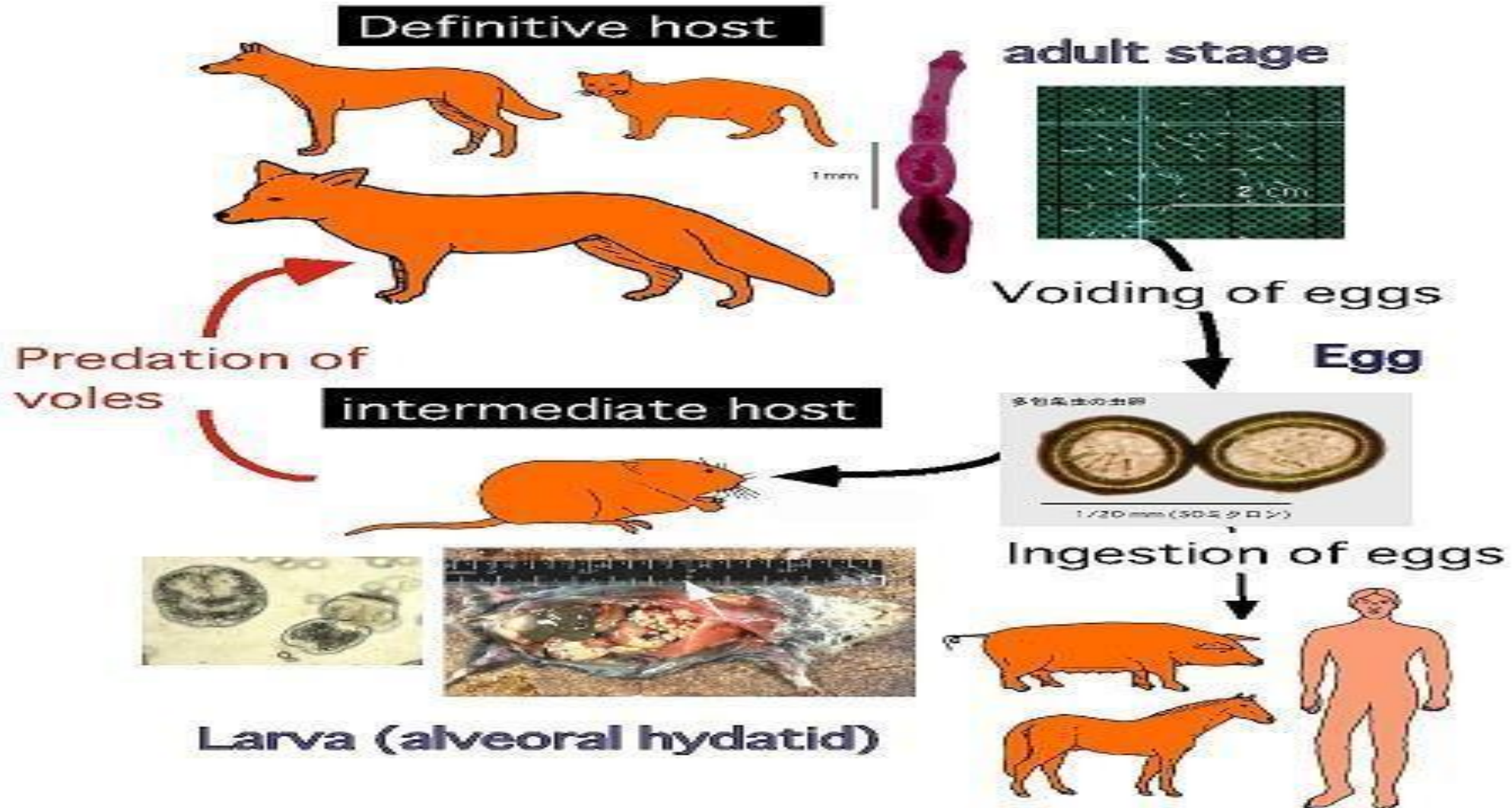
small intestine

E. multilocularis eggs are infective stage to man

Eggs form Alveolar cyst in human body (>90% in liver)

Life cycle

Life-cycle of *Echinococcus multilocularis*

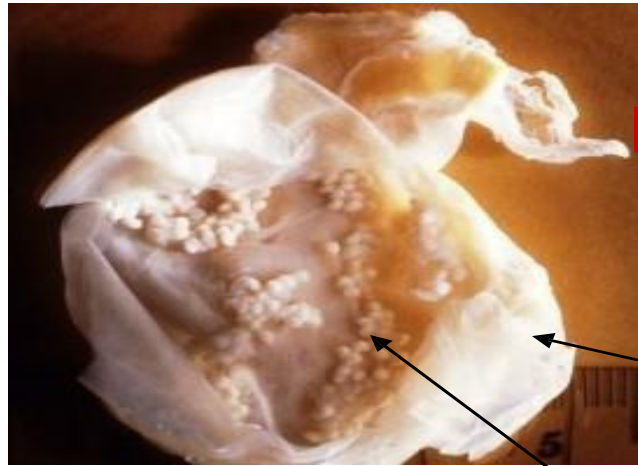


Multiceps multiceps cause Coenurosis

Geog. Distribution: worldwide



Adult in small intestine



Few macroscopic

Coenurus cyst
develops in
human brain
Germinal
layer



scolices



How man gets
infected with
M.multiceps



E. granulosus

In Small intestine
of dogs



Mode of infection

Ingestion of egg
similar to **Taenia** egg

Forms Hydatid cyst

Favorite site in
man is the **LIVER**
(66%)

E. multilocularis

In Small intestine of
foxes, wolves



Mode of infection

Ingestion of egg
similar to **Taenia** egg

Forms Alveolar
Hydatid cyst

Favorite site in man is
the **LIVER** (90%)

M. multiceps

In Small intestine
of dogs



Mode of infection

Ingestion of egg
similar to **Taenia** egg

Forms Coenurus cyst

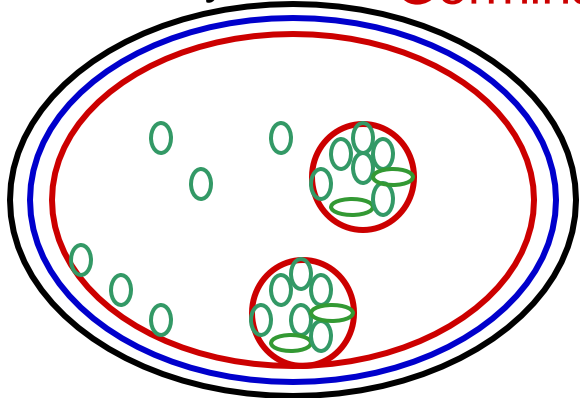
Favorite site in
man is the **BRAIN**

Hydatid cyst



Unilocular cyst

Fibrous, **laminated** & **germinal** layers

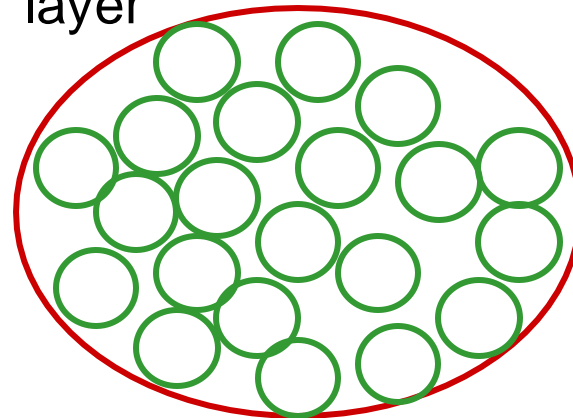


Many microscopic scolices (100-1000)

Coenurus cyst

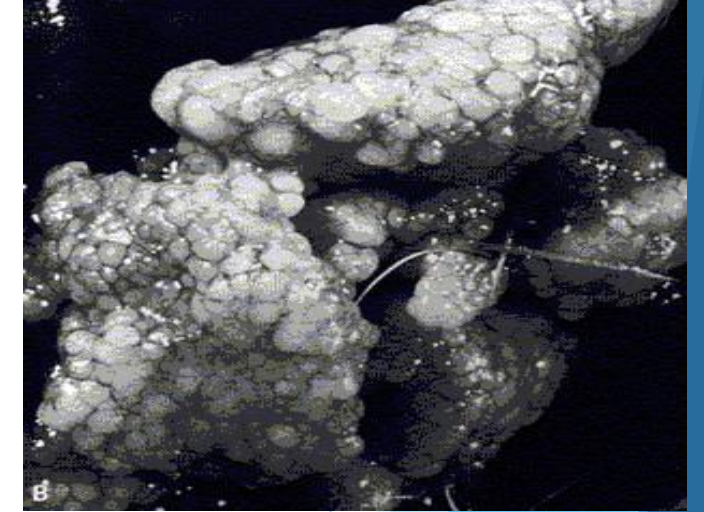


Unilocular cyst layer



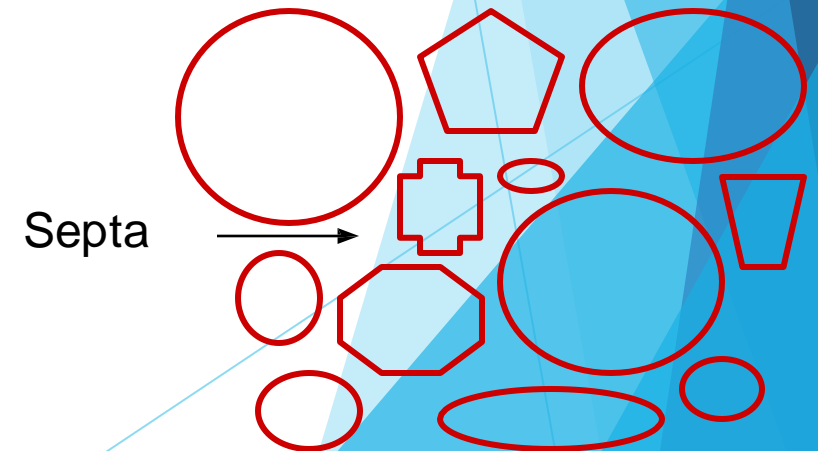
Few macroscopic scolices (30-60)

Alveolar cyst



Multilocular cyst

Germinal layer



Septa

No scolices

(Sterile)