



Kingdom: Anamalia
Phylum: Platyhelminthes
Class : Cestoda

2

1- *Taenia saginata* (Beef tapeworm)

Mode of human Infection: Eating beef containing larval stage (*Cysticercus bovis*)

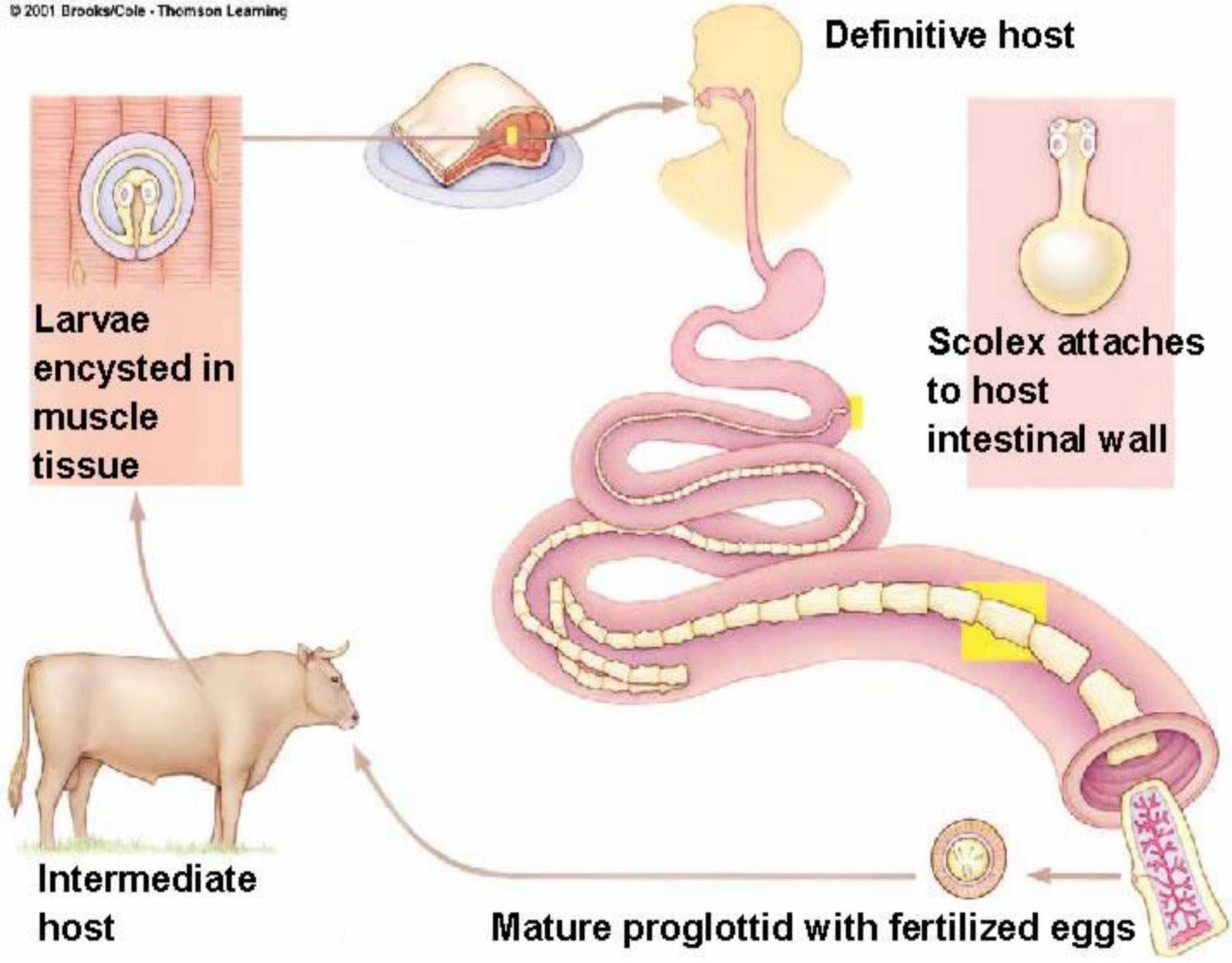
Transmission: Consumption of infected raw meat.

Biology: Adult lives in human intestine lumen.

Clinical: diarrhea, abdominal cramping, nervousness, nausea, and loss of appetite.

Diagnosis: Stool examination for eggs or segments. Segments differentiated from pork tapeworm by having large number of uterine branches when viewed with a trans-illuminating light source.

Prevention: Sewage treatment; cook or freeze beef



Definitive host

Larvae encysted in muscle tissue

Scolex attaches to host intestinal wall

Intermediate host

Mature proglottid with fertilized eggs

2- *Taenia solium* (Cysticercosis)

Mode of human infection: Eating mealy pork containing larval stage (*Cysticercus cellulosae*)

Epidemiology: The larval form of *T. solium* infects humans who ingest the eggs of this tapeworm passed in human stool. This occurs most frequently, where human stool is used as fertilizer. This occurs most frequently in developing countries where pigs are bred.

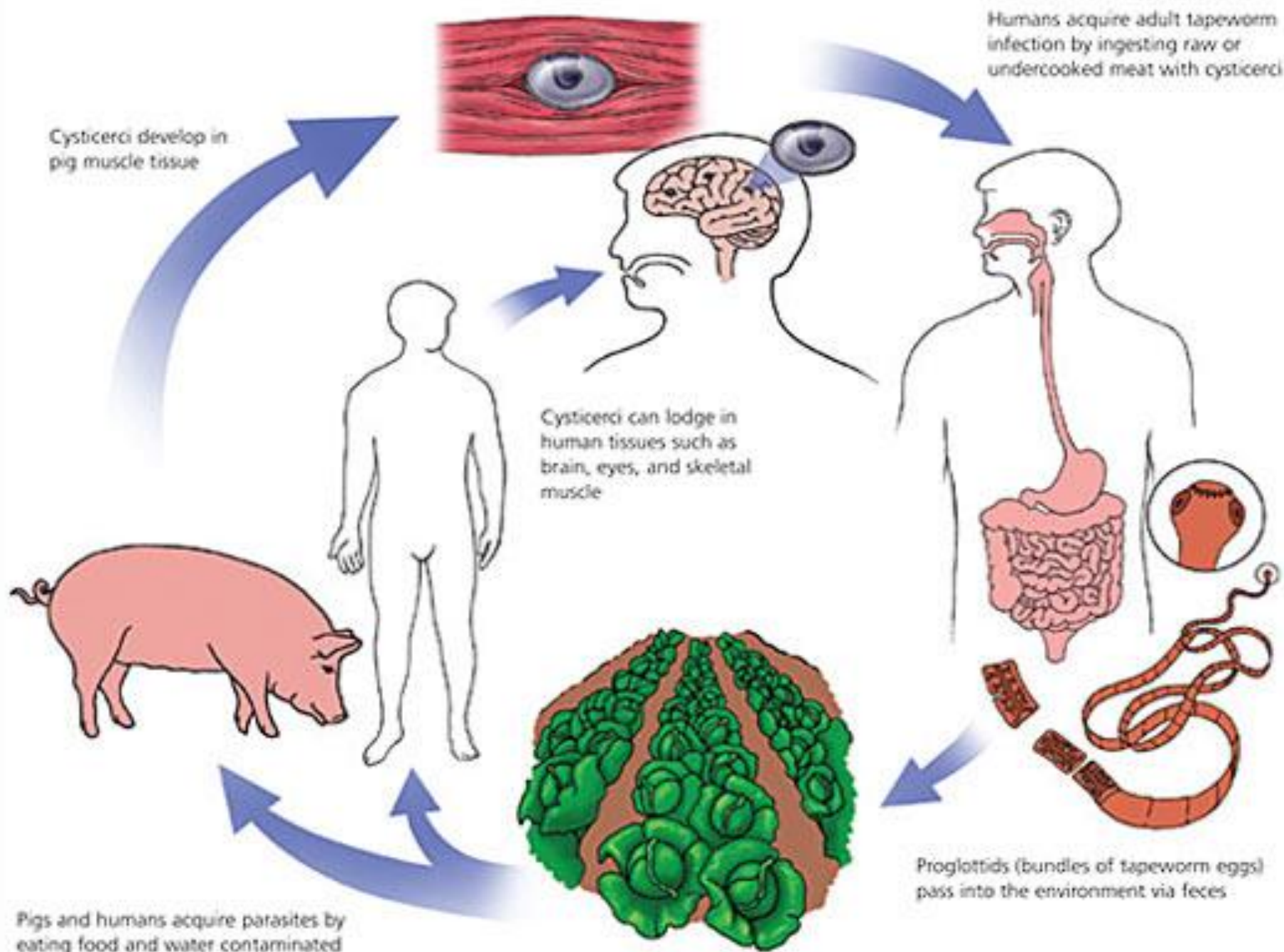
Biology: *T. solium* larvae, which penetrate small intestine mucosa and are carried throughout the body where they are deposited and grow in many different tissues (muscle, subcutaneous, brain, eye, heart).

Clinical: Pathology is produced by the cysts as space occupying lesions (especially brain) and as foci of host inflammatory response when the cyst eventually dies or is killed with anti-helminthics.

It is shorter than beef tapeworm, having fewer than 1,000 proglottids. Twenty to thirty thousand eggs every day can be shed into the feces of a carrier. Over time, the tapeworm can riddle the brain with its grape-sized bladders, causing progressive brain deterioration to the point of death, heart, and eyes.

This worm can remain in a human host for twenty-five to thirty years, reaching lengths of two and one-half to three meters (eight to ten feet).

Humans become infected after eating undercooked pork or smoked ham or sausage where cysts are imbedded in the tissue.



Cysticerci develop in pig muscle tissue

Humans acquire adult tapeworm infection by ingesting raw or undercooked meat with cysticerci

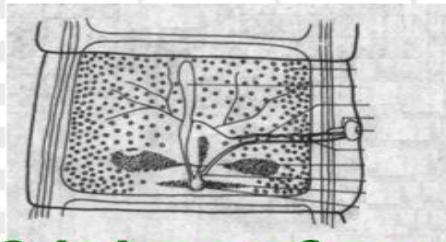
Cysticerci can lodge in human tissues such as brain, eyes, and skeletal muscle

Proglottids (bundles of tapeworm eggs) pass into the environment via feces

Pigs and humans acquire parasites by eating food and water contaminated by eggs or by autoinfection

Differences between *T. saginata* and *T. solium*:

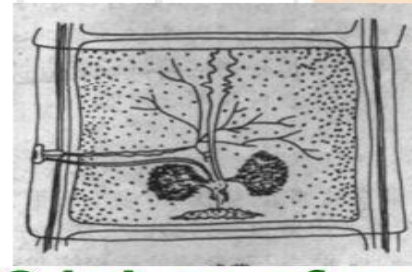
<i>Taenia solium</i>	<i>Taenia saginata</i>	Characteristic
Pig, wild boar	Cattle, reindeer	Intermediate Host
Brain, skin, muscle	Muscle, viscera	Site of Development
Hooks	No hooks	Scolex: adult worm
Rostellum& hooks	No rostellum	Scolex: cysticercus
8 (7 -11)	23 (14 - 32)	Proglottids: uterine branches
In groups, passively	Single, spontaneous	Passing of proglottids
Three lobes	Two lobes	Ovary
Absent	Present	Vagina: sphincter muscle



3 lobes of ovary



**Mature proglottid
of *T. solium***



2 lobes of ovary



**Mature proglottid
of *T. saginata***

4. Gravid proglottid



T. solium

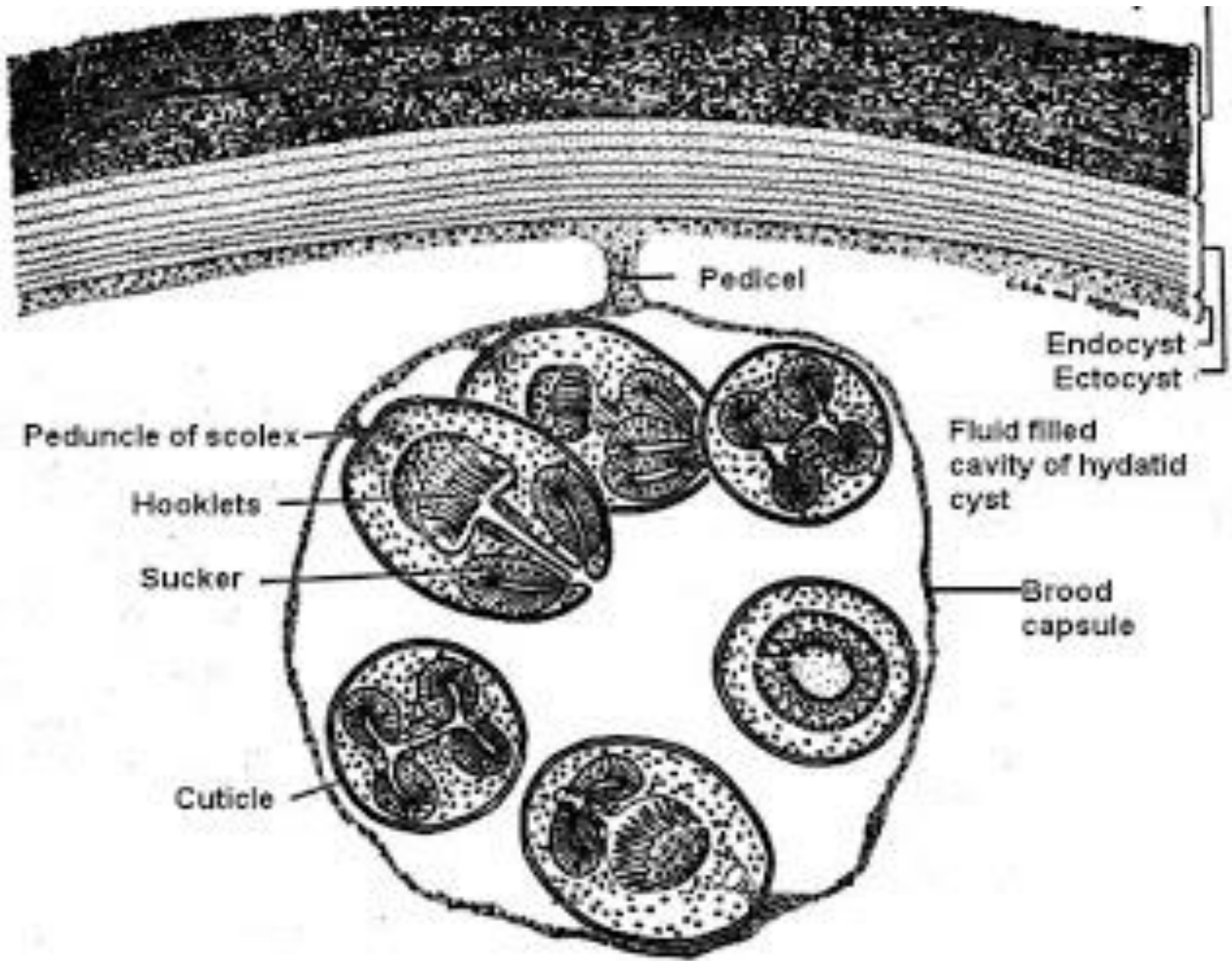


T. saginata



3- *Echinococcus granulosus*: (Hydatid disease)

- Adult worms are small (3-6 mm in length).
- Composed from a :Scolex -Neck - Strobila - segments (Immature , Mature ,Gravid)
- Hydatid cyst features : Round & cystic
- Cyst wall: laminated layer and germinal layer, its contents from: cystic fluid, brood capsules, protoscolex, daughter & granddaughter cyst, (hydatic sand).
- Hydatid sand :The protoscoleces generally settle down at the bottom of the cyst .



Hydated cyst

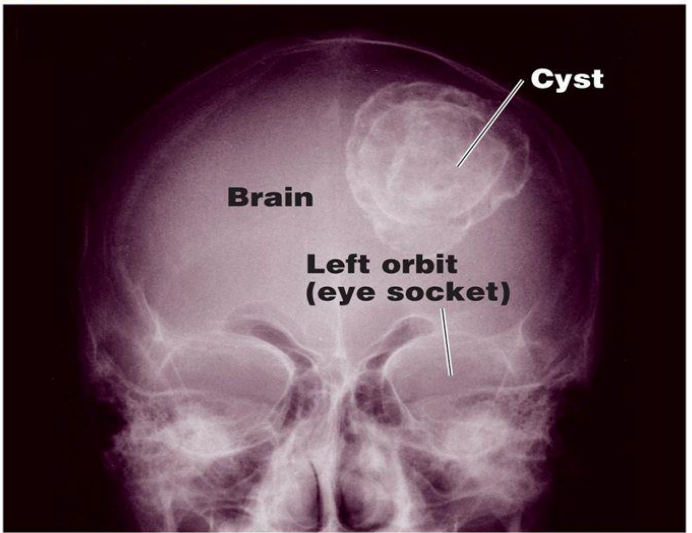
The adult *Echinococcus granulosus* resides in the small bowel of the definitive hosts(dogs or other canids). Gravid proglottids release eggs that are passed in the feces.

After ingestion by a suitable intermediate host (sheep, goat, swine, cattle, horses, camel), the egg hatches in the small bowel and releases an oncosphere that penetrates the intestinal wall and migrates through the circulatory system into various organs, especially the liver and lungs. In these organs, the oncosphere develops into a cyst that enlarges gradually, producing protoscolices and daughter cysts that fill the cyst interior.

The definitive host becomes infected by ingesting the cyst-containing organs of the infected intermediate host. After ingestion, the protoscolices evaginate, attach to the intestinal mucosa, and develop into adult stages in 32 to 80 days.

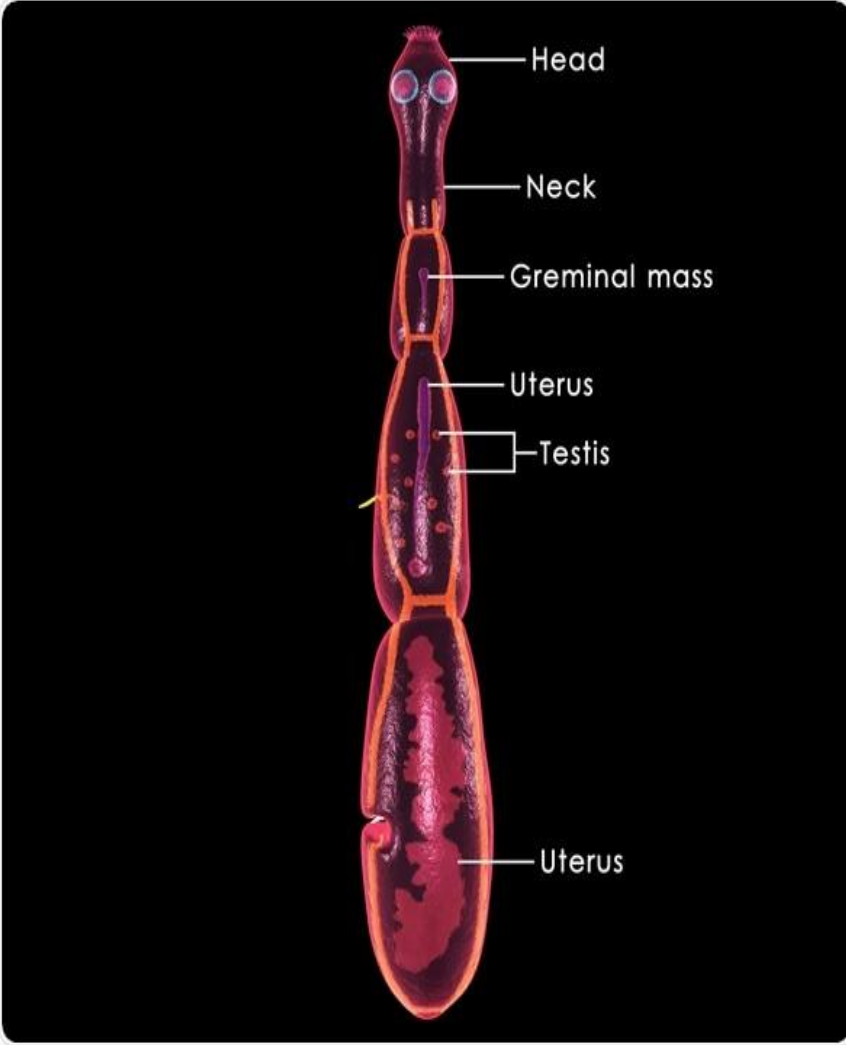
Human become infected by ingesting eggs, with resulting release of oncospheres in the intestine and developing the cysts in various organs.

Hydatid Disease



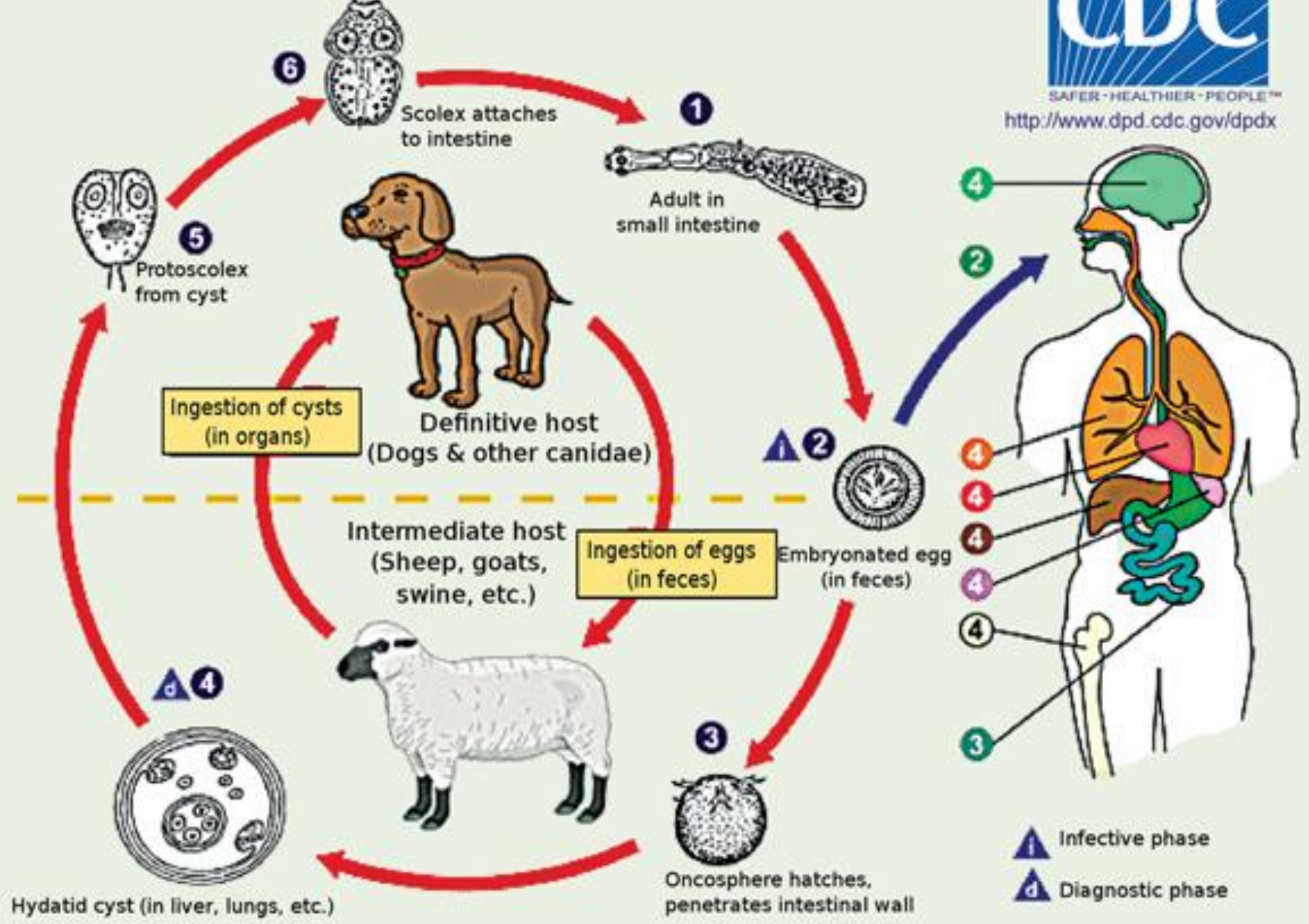
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Figure 25.22



Adult worm





Thank you

