



# **TREMATODES (FLUKES)**

**&**

# **NEMATODES (ROUND WORM)**



# Trematodes (Flukes)

- *Fasciola hepatica*
- Also known as the **common liver fluke** or **sheep liver fluke**. It's zoonotic trematodes worm, worldwide distribution parasite. Hermaphrodite fluke.
- Intermediate hosts: freshwater snails from the family Lymnaeidae.
- Definitive hosts: human and ruminates.
- Normal habitat in human liver and bile duct
- Mode of infection: Generally infected as a result of eating contaminated freshwater plants which contains the infective larvae, called Metacercaria.

## Life cycle

### Infective stage:

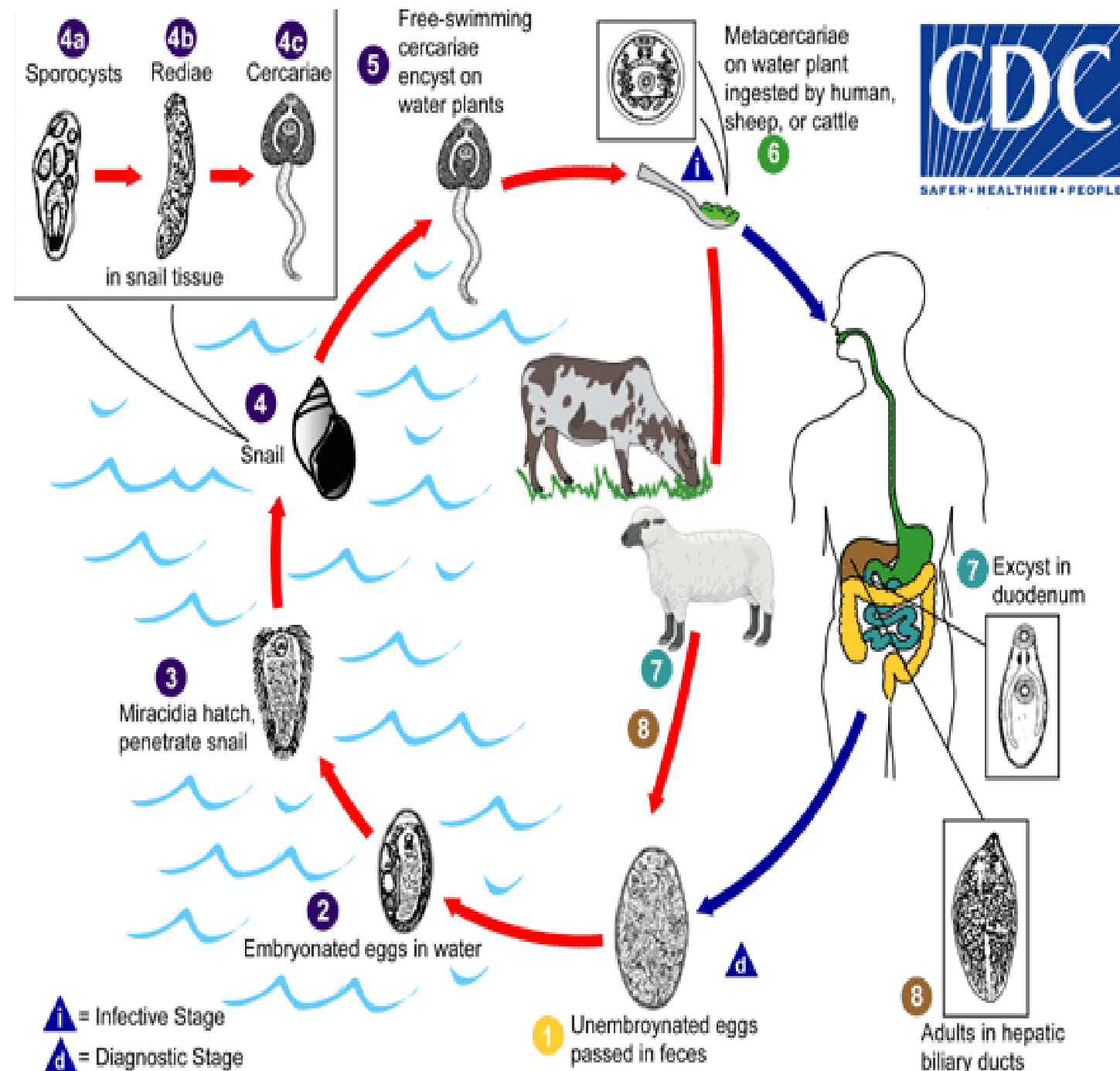
Metacercaria

### Pathogenic stage:

Adult worm in liver

### Diagnostic stage:

Unembryonated Egg



# Clinical sings

- In the early (acute) phase, symptoms can occur as a result of the parasite's migration from the intestines to and through the liver. Symptoms can include gastrointestinal problems such as nausea, vomiting, and abdominal pain/tenderness. Fever, rash, and difficulty breathing may occur.
- During the chronic phase (after the parasite settles in the bile ducts), the clinical manifestations may be similar or more discrete, reflecting inflammation and blockage of bile ducts, which can be intermittent. Inflammation of the gallbladder and pancreas also can occur.

- Diagnosis:

GSE find egg in stool, or examine duodenal or bile content

- Treatment:

The drug of choice is triclabendazole

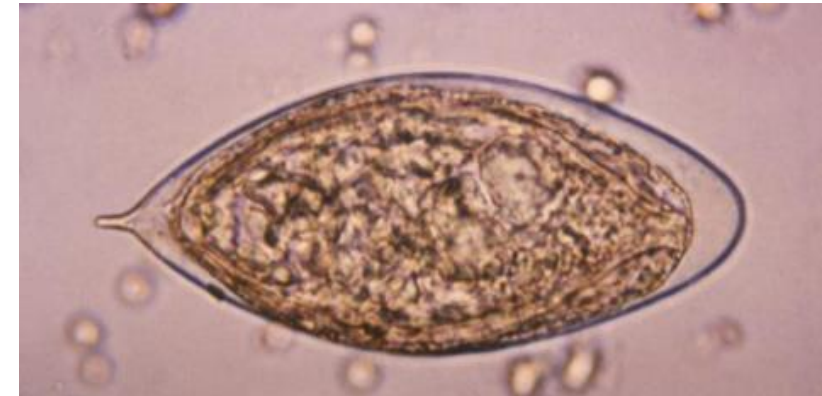
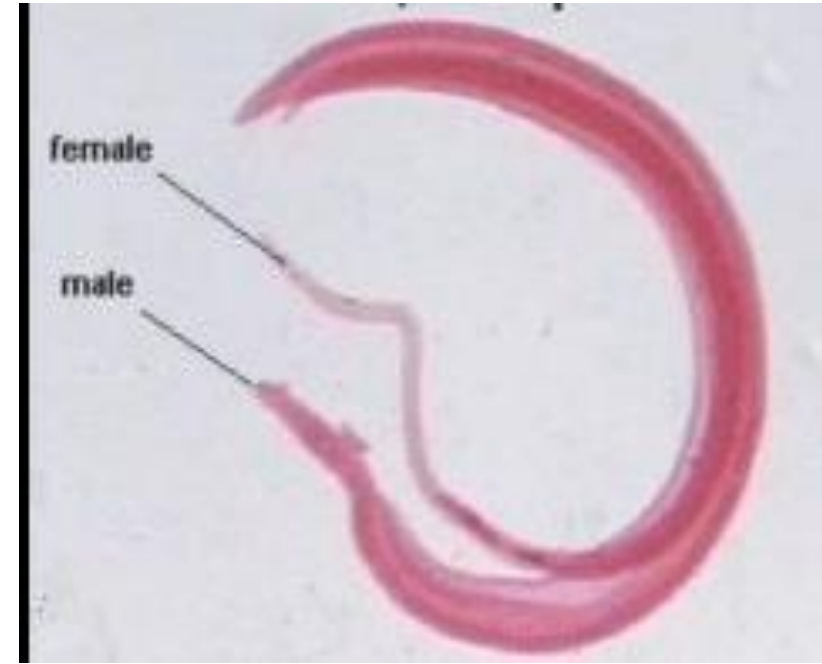
- Prevention:

Ovoid contaminated food or water in endemic area.

Eradication of snails.

# Schistosoma

- The three main species infecting humans are *Schistosoma haematobium*, *S. japonicum*, and *S. mansoni*.
- *Schistosoma haematobium* is a type of blood flukes that infected the urinary bladder and causes Schistosomiasis (Bilharziasis).
- Adult worms have separated sexes male and female. The female body becomes enveloped within the rolled-up canal of the male.
- The pathogenic effect occurs because of eggs.
- Intermediate hosts: freshwater snails.
- Definitive hosts: human.
- Normal habitat in human: venous plexus of urinary bladder.
- Mode of infection: Generally infected as a result of penetrating of skin by infected larva cercaria.



- Life cycle

- Infective stage

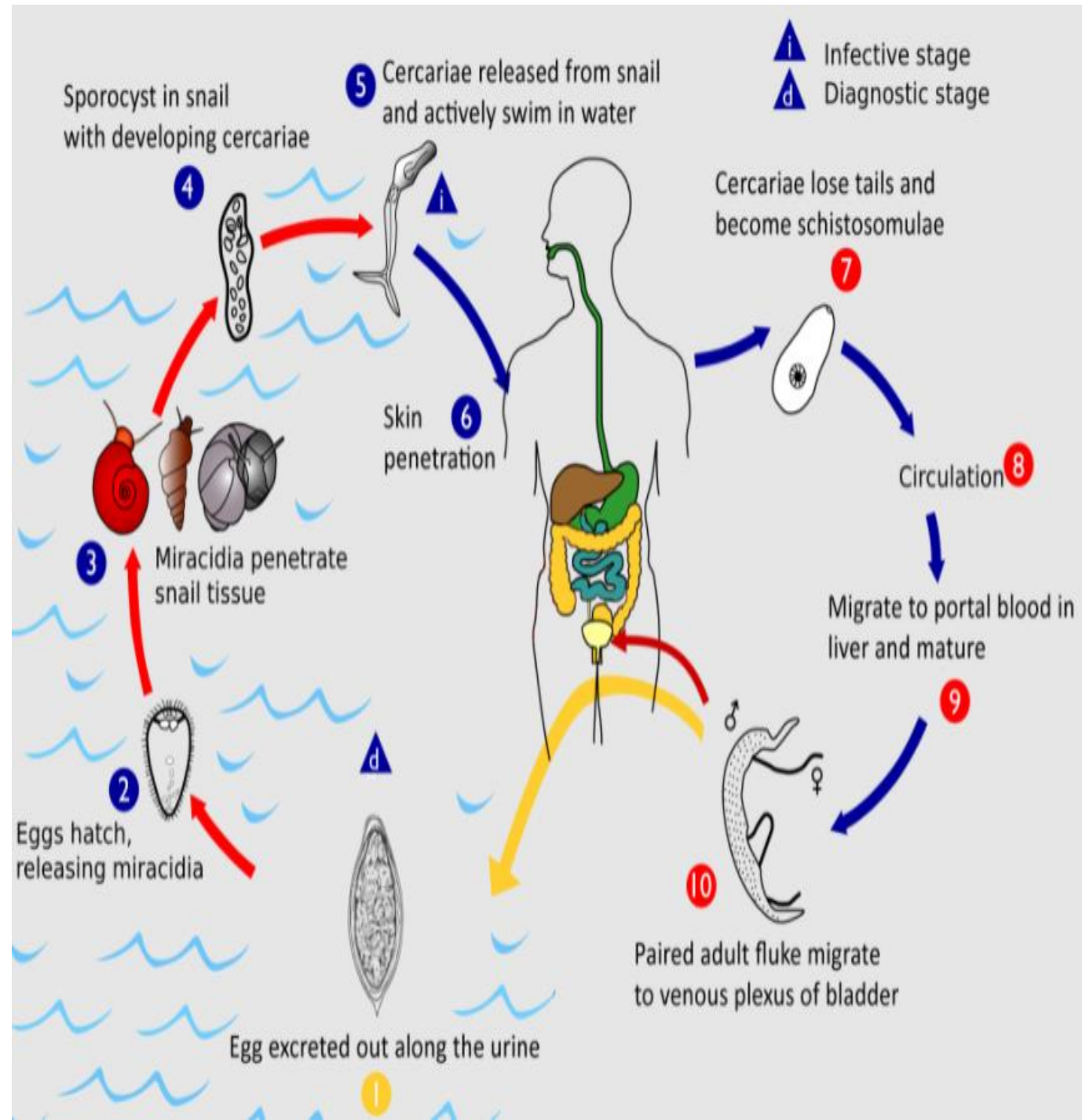
Larva cercaria

- Pathogenic stage

Egg

- Diagnostic stage

Egg in urine



- **Clinical signs:**
- Most people have no symptoms when they are first infected.
- However, within days after becoming infected, they may develop a rash or itchy skin in site of penetration. Within 1-2 months of infection, symptoms may develop including fever, chills, cough, and muscle aches.
- Without treatment, schistosomiasis can persist for years. Signs and symptoms of chronic schistosomiasis include
  - abdominal pain, enlarged liver, blood in the urine, and problems passing urine. Chronic infection can also lead to increased risk of liver fibrosis or bladder cancer.
  - Rarely, eggs are found in the brain or spinal cord and can cause seizures, paralysis, or spinal cord inflammation.



- Diagnosis:

- traditionally observation of egg in urine.
- Serological test ELISA.

- Treatment : The drug of choice is praziquantel

- Prevention:

- Hygienic disposal of waste would be sufficient to eliminate the disease
- Water for drinking and bathing should be boiled in endemic regions
- Wearing long shoes in agricultural activities such as fishing and rice cultivation
- Systematic eradication of snails is an effective method

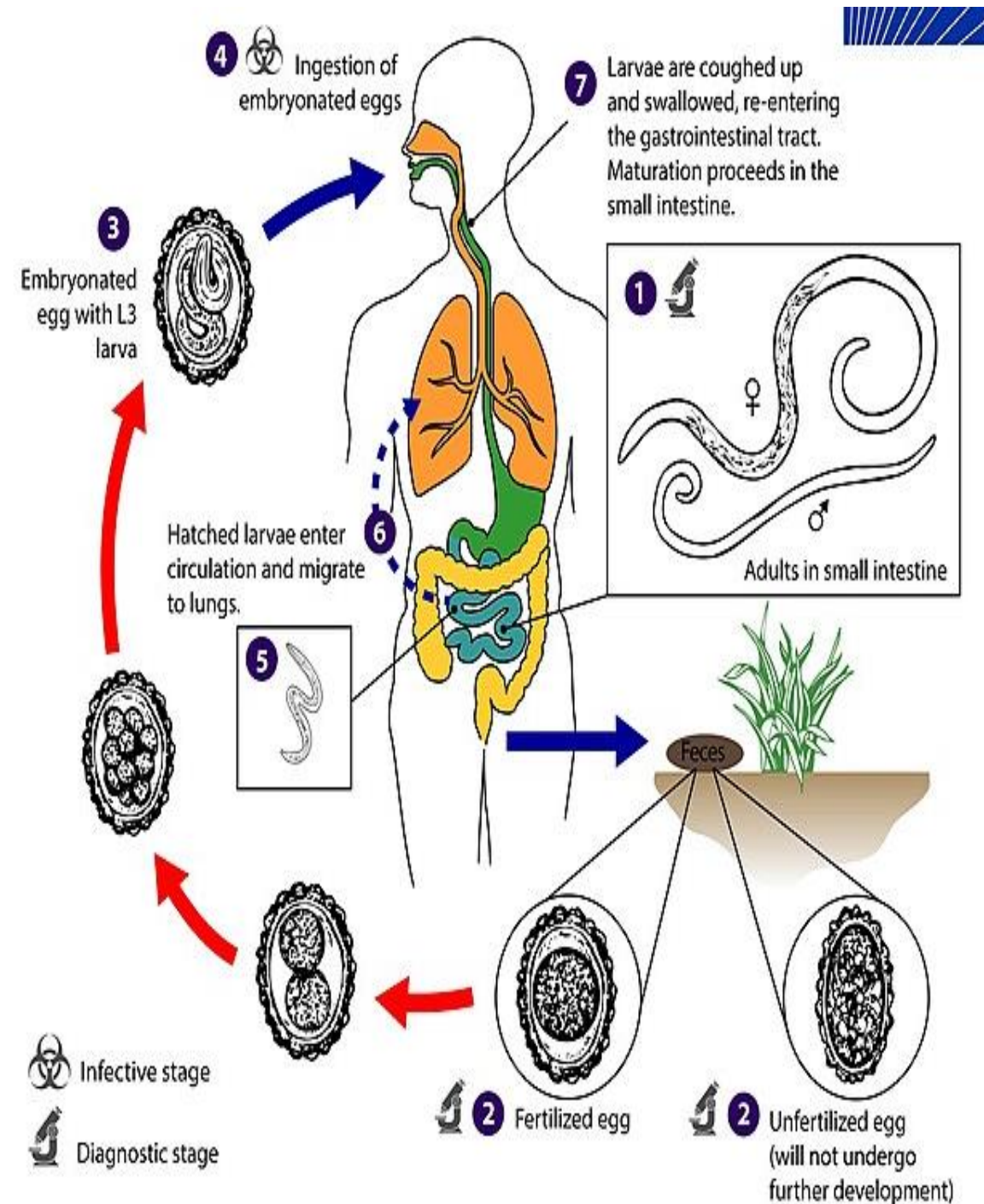
# Nematode

- Cylindrical shape, elongate, have body cavity separated sex (male, female), tapered at both ends.
- Has complete digestive system.
- Separated male and female reproductive system ( two worm)
- Excretory system and nervous system.
- Different method of transmittion or infection
  - Ingestion egg, larvae
  - Penetration via skin
  - Insect bite

# *Ascaris lumbricoides*

- Is the "large roundworm" of humans.
- Normal habitat small intestine
- No intermediate hosts
- Definitive hosts: human.
- Mode of infection:
  1. Eating contaminated food or water with embryonated egg.
  2. Autoinfection with migrated larva.

- Life cycle:
- Infective stage:  
Embryonated egg
- Pathogenic stage  
Adult worm and larva
- Diagnostic stage  
Adult worm and fertilized and unfertilized egg



- Clinical signs:

- People infected with *Ascaris* often show no symptoms.
- If symptoms do occur, they can be light and include abdominal discomfort. Heavy infections can cause intestinal blockage and impair growth in children.
- Other symptoms such as cough are due to migration of the worms through the body.

- Diagnosis:

- Identification of egg or adult worm in stool sample.

- Treatment:

- Albendazole and mebendazole, are the drugs of choice

- Prevention:

- Personal hygiene ( washing hand before food handling)
- Proper washing of raw vegetables

# *Ancylostoma duodenale*

- Intestinal hookworm in humans
- Definitive host: human
- Normal habitat: Small intestine
- Larvae can migrate to lung.
- Mod of infection:
  1. Larvae skin penetration.
  2. Autoinfection.

## Life cycle:

### Infective stage:

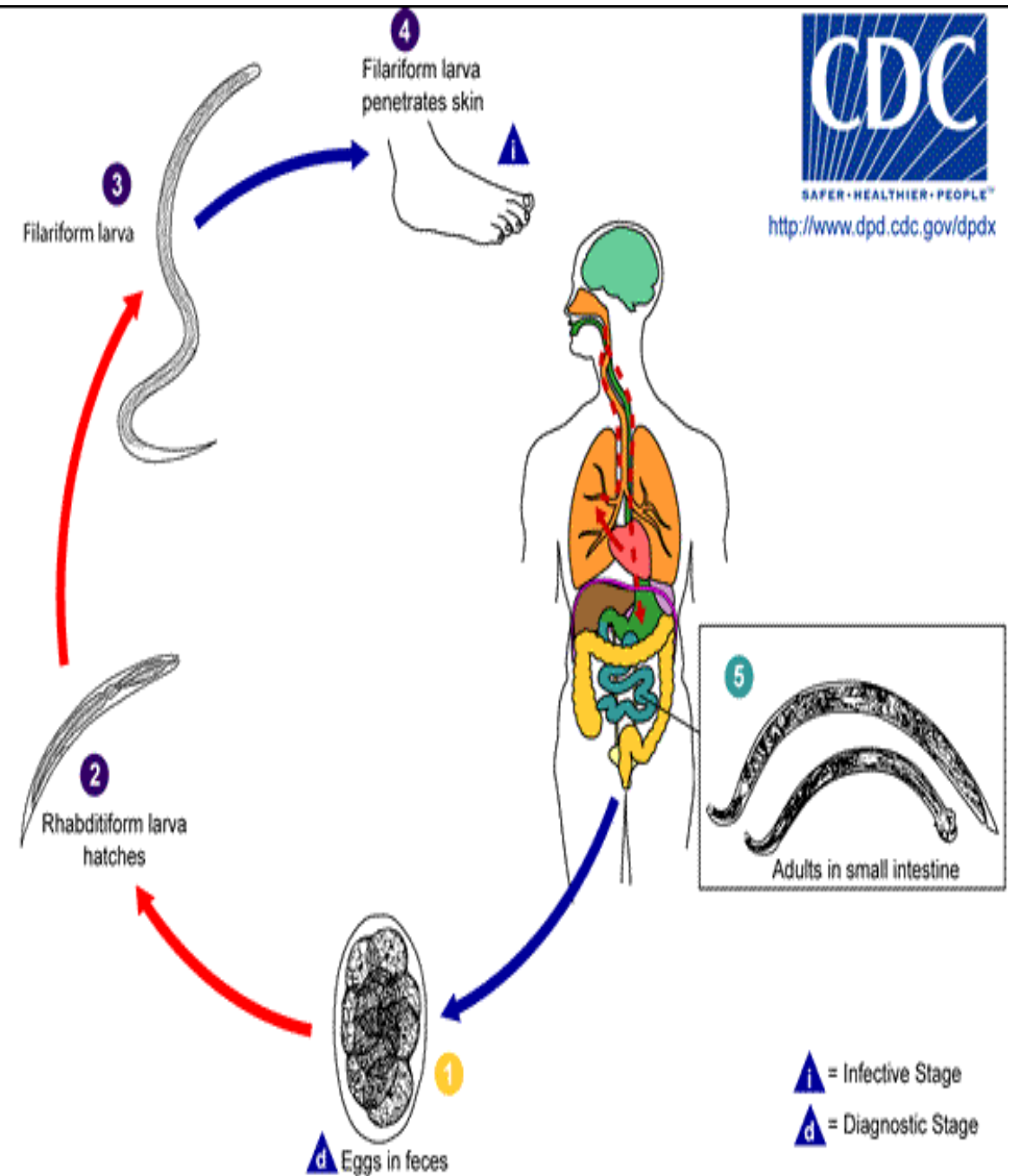
Filariform larva

### Pathogenic stage:

Adult worm in small intestine  
Larvae in lung

### Diagnostic stage:

Egg in feces.



## • Clinical signs

- Intestinal hookworm infections are commonly asymptomatic.
- Attachment of the hookworms to the intestinal wall may stimulate abdominal pain, nausea, and anorexia.
- Iron deficiency anemia caused by blood loss at the site of intestinal attachment of adult worms may occur especially in heavy infections.
- Occult blood in the stool may also be seen in heavy infections.
- Other clinical manifestations of hookworm infection include an urticarial dermal reaction (“ground itch”) associated with filariform (L3) larvae penetration.
- Respiratory involvement including eosinophilic pneumonia may be observed may occur during larval pulmonary migration.





- Diagnosis:

- Egg identification in faces
- Larvae in sputum

- Treatment:

- Mebendazole, albendazole

- Prevention:

- Proper sanitation practices.
- Appropriate fecal disposal.
- Do not walk barefoot or contact with bare hands in areas where hookworms is common or there are likely to be feces in the soil or sand.

# *Enterobius vermicularis*

- Widely known as the human pinworm due to the female's long, pointed tail.
- Definitive host: human
- Normal habitat: small intestine
- Mode of infection:
  1. Ingestion of egg via contaminated food or water.
  2. Autoinfection, especially in children.

Life cycle:

Infective stage:

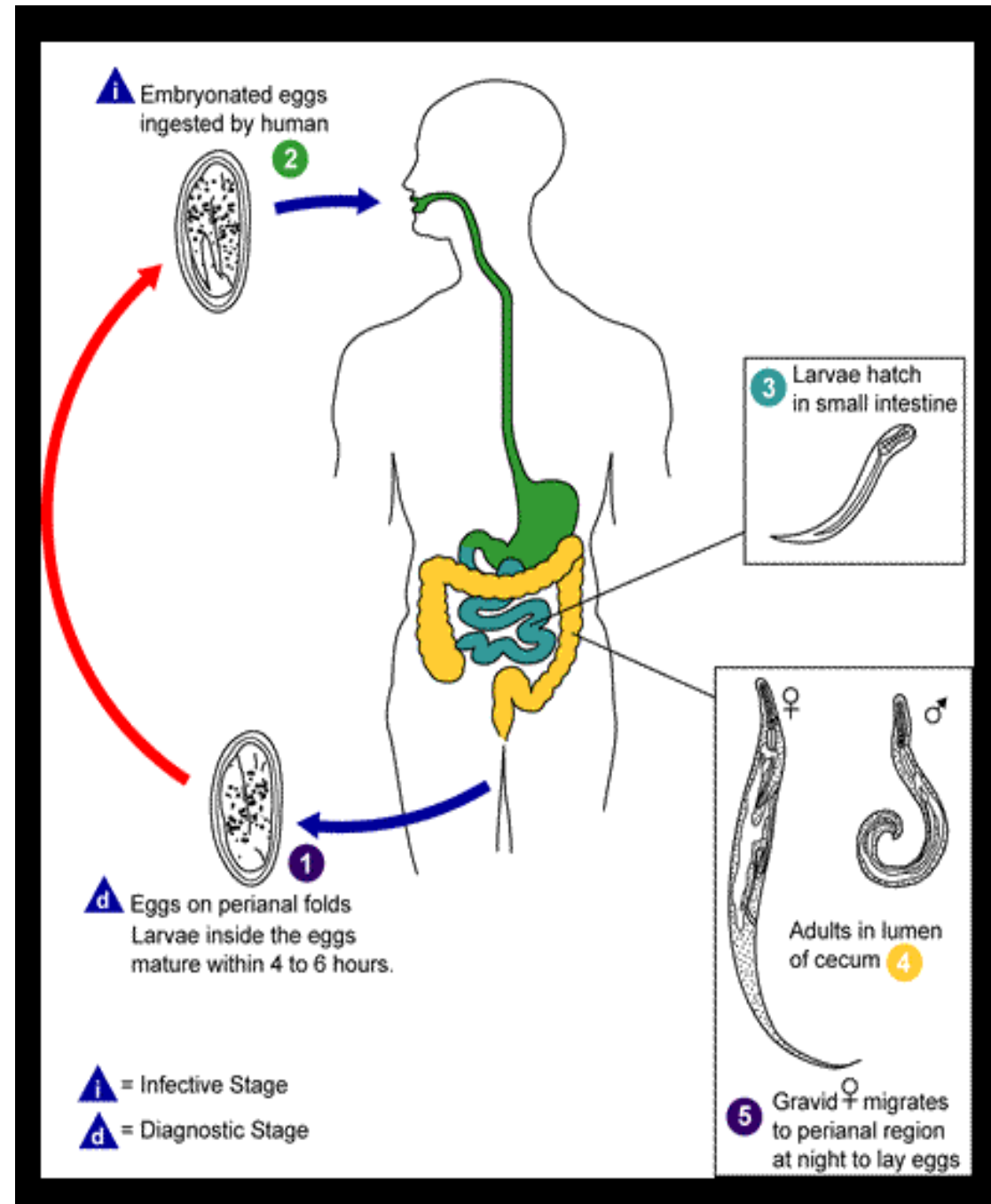
Embryonated egg

Pathogenic stage

Adult worm

Diagnostic stage:

Egg



- **Clinical sings:**

- Enterobiasis is frequently asymptomatic.
- The most common clinical manifestation of a pinworm infection is an itchy anal region., especially at night, which may lead to secondary bacterial superinfection, due to the irritation and scratching of the anal area.
- Occasionally, invasion of the female genital tract with vulvovaginitis and pelvic or peritoneal granulomas can occur.
- Often the patient will complain of teeth grinding, and insomnia due to disturbed sleep, or even abdominal pain or appendicitis.

- Diagnosis:

- Identification of egg or adult worm in feces or by adhesive tape under the microscope.

- Treatment:

- Albendazole or mebendazole.

- Prevention:

- Infected people should comply with good hygiene practices such as washing their hands with soap and warm water after using the toilet, changing diapers, and before handling food.
- They should also cut fingernails regularly and avoid biting the nails and scratching around the anus.
- Frequent changing of underclothes and bed linens first thing in the morning is a great way to prevent possible transmission of eggs in the environment and risk of reinfection.



THANK YOU  
QUESTIONS?