As per SPPU CBCS pattern

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Life cycle of *Ascaris lumbricoides*

Ascaris lumbricoides Structure and Life Cycle

Ascaris lumbricoides is a nematode roundworm that resides like parasites in a human being's small intestine. These worms fall under the family Ascarididae, the class Secernentea and the order Oxyurida. These worms are prominently found in pigs.

They are large roundworms that measure up to 40 cm long, surrounded by a mouth with three lips.

Ascaris roundworms cause an infection called Ascariasis found in the small intestine.

This infection has no symptoms but heavy infestation in children can lead to digestive issues, malnutrition and growth stunting.

Ascariasis is a disease that has affected around 807 million to 1.2 billion people worldwide.

Let us learn the structure and life cycle of *Ascaris lumbricoides* with the help of a neat labelled diagram.

Structure

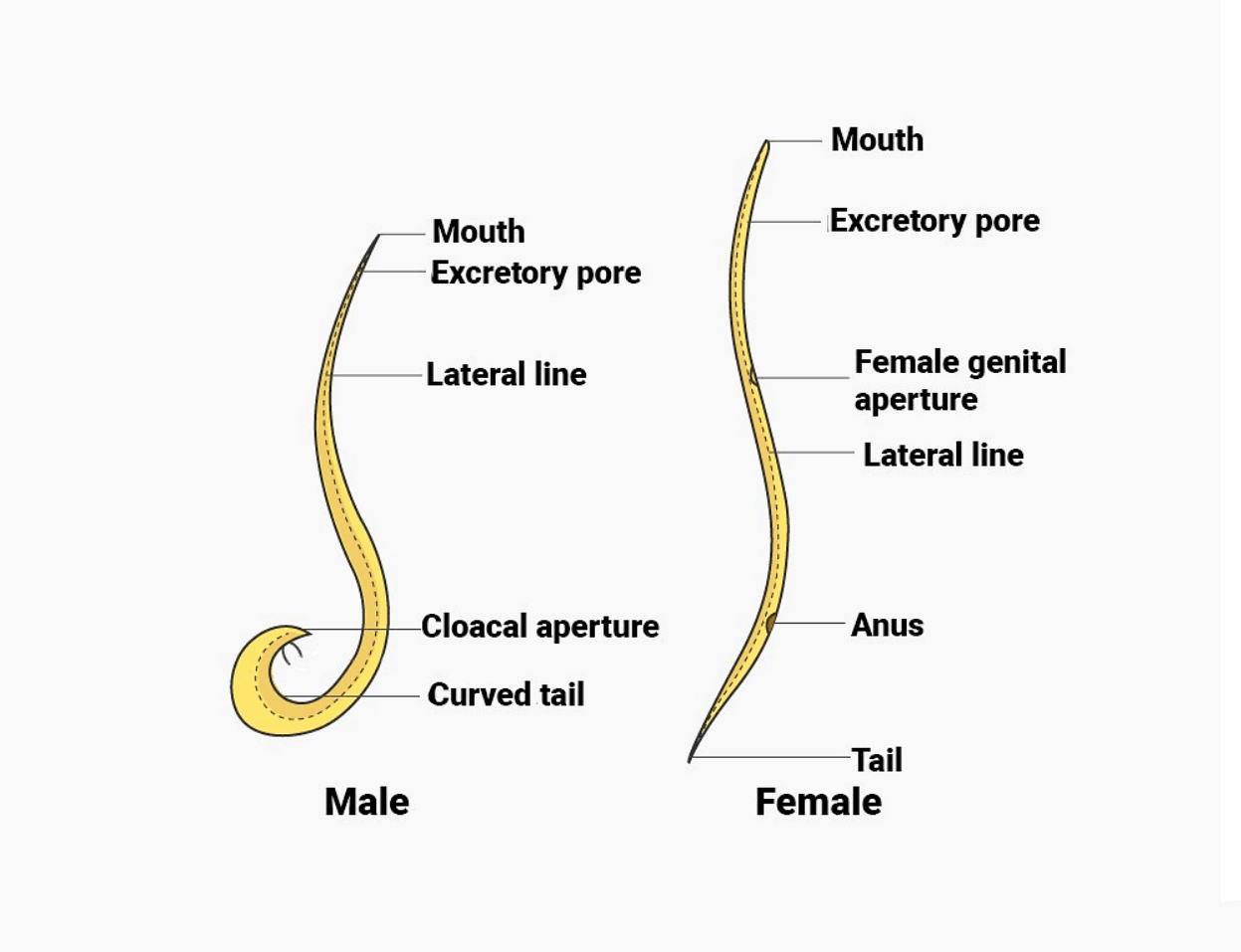
Ascaris comes under the phylum Aschelminthes. They are commonly called **roundworms**. They are bilaterally symmetrical and have a pseudocoelom.

Sexes are separate, females are longer than males. The alimentary canal is well developed with a muscular pharynx. Waste products are excreted out through an excretory pore.

Ascaris lumbricoidesis the largest and, globally, the most widespread of all **human intestinal roundworms (Nematode).**

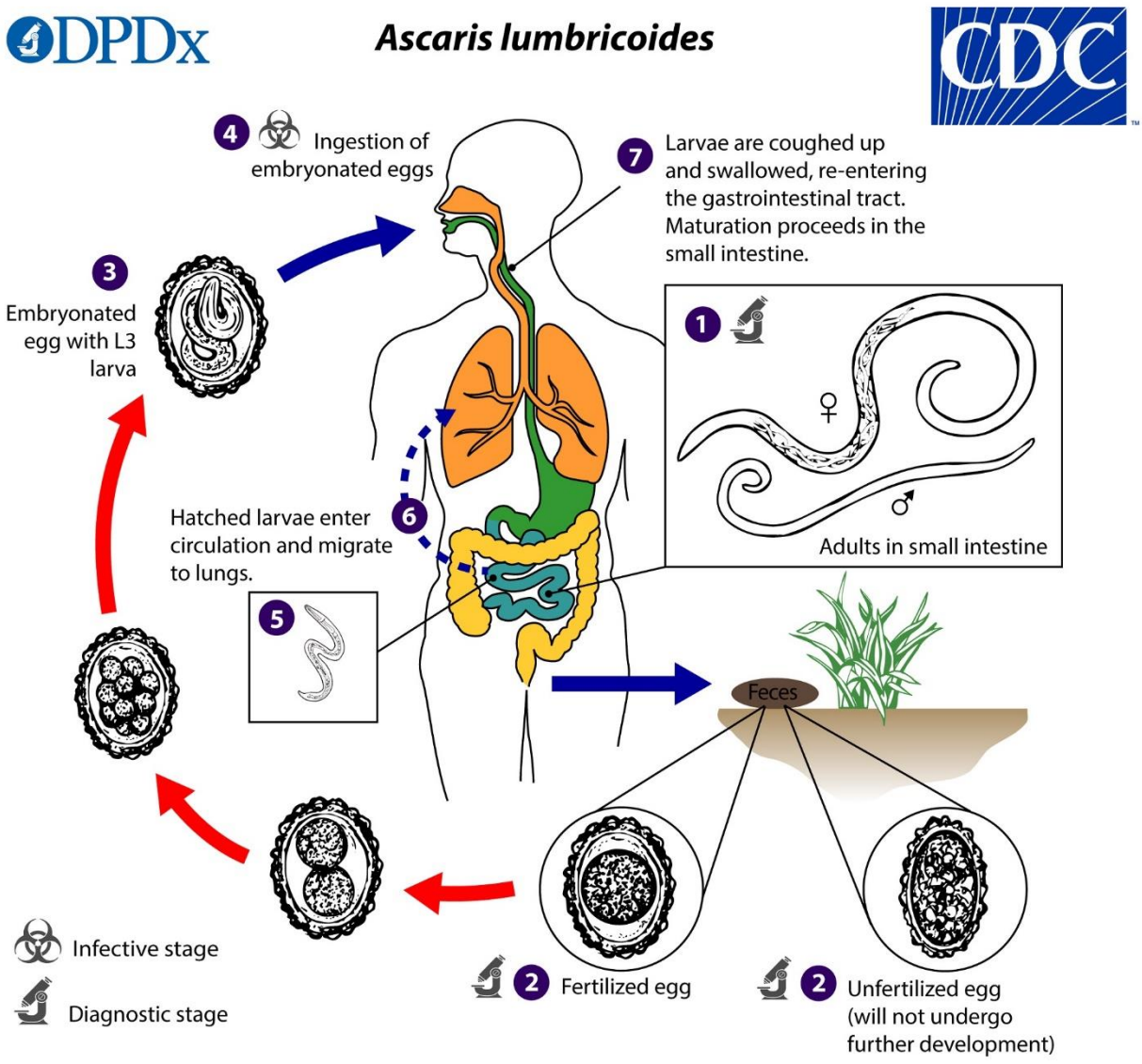
Difference between the male and female roundworms

Male worm	Female worm
1. Male worm is small in size	1. Female worm is larger in size than male worm.
2. The posterior end of male worm is pointed and bend.	2. The end behind the tail of femaleworm is strait and blunt.
3. Its cloacal and genital apertures are not separate.	3. It has separate cloacal and genital apertures.
4. Excretory materials and reproductive cells are discharged through the cloacal aperture of the male worm.	4. In the female worm the excretory products are discharged through the cloacal aperture and the productive cells through the genital aperture.
5. There are spines like penial setae behind the cloacal aperture.	5. There is no penial setae in female worm.


Mouth
Excretory pore
Lateral line
Cloacal aperture
Curved tail
Male
Mouth
Excretory pore
Female genital aperture
Lateral line
Anus
Tail
Female

Life cycle:

- Human is the definitive host. There is no intermediate host
- Transmission is human - feces - human
- Adult ascaris live in the small intestines.
- Females produce 200 000 **eggs** per day. Eggs are deposited in the lumen, passed in feces, and must embryonate for 3 weeks in the soil before becoming infectious.
- **Ingestion of infective eggs** by another human from contaminated soil results in infection.
- After ingestion, the hatched larvae penetrate intestinal mucosa and invade portal venules.
- They are carried to the liver, and travel via the hepatic vein to the right heart and into the lungs.
- Larvae enlarge and rupture into alveoli, are coughed up and subsequently swallowed.
- Upon reaching the small bowel, they mature, mate and deposit eggs.
- If the infection is untreated, adult worms can live for 12 to 18 months, resulting in daily excretion of large numbers of ova.
- The incubation period is prolonged. The interval between ingestion of the egg and the development of egg-laying adults is approximately 8 weeks.


DPDx
Ascaris lumbricoides
CDC
4 Ingestion of embryonated eggs
7 Larvae are coughed up and swallowed, re-entering the gastrointestinal tract. Maturation proceeds in the small intestine.
3 Embryonated egg with L3 larva
1
Adults in small intestine
Hatched larvae enter circulation and migrate to lungs.
6
5
Feces
Infective stage
Diagnostic stage
2 Fertilized egg
2 Unfertilized egg (will not undergo further development)

Clinical Manifestations:

- **Most infections are asymptomatic**, although nonspecific gastrointestinal tract symptoms may occur in some patients.
- **Pulmonary involvement.** During the larval migratory phase, an acute transient pneumonitis **(Loffler syndrome)** associated with fever, cough and wheezing (hypersensitivity) and marked eosinophilia may occur.
- The adult worms can be stimulated to **migrate by stressful conditions** (eg, fever, illness, or anesthesia) and by some antihelmintic drugs.
    - Worm migration can cause **peritonitis,** secondary to intestinal wall penetration
    - **Common bile duct obstruction** resulting in acute obstructive jaundice.

Diagnostic Tests:

- The diagnosis is established by finding characteristic eggs in the feces.
    - Eggs are elliptical in shape, measure 30 by 50 pm, and have a rough, wavy, albuminous coat over their shell.
    - They are highly resistant and may remain viable up to 6 years.
- The pulmonary phase may be diagnosed by finding larvae and eosinophils in sputum.
- Occasionally, patients pass **adult worms** from
    - the rectum
    - the nose following migration through the nares in febrile patients
    - The mouth in vomitus.
    - Can be recognized with barium studies

Control Measures:

- Isolation of the Hospitalized Patient: Standard precautions are recommended.
- Sanitary disposal of human feces stops transmission.
- Children's play areas should be given special attention.
- Vegetables cultivated in areas where human feces are used as fertilizer must be thoroughly cooked or soaked in a dilute iodine solution before eating.
- Household bleach is ineffective.