

الكلية: الطب

القسم او الفرع: الاحياء المجهرية

المرحلة: الثالثة

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اسم المادة باللغة العربية: الطفيليات الطبية

اسم المادة باللغة الإنكليزية: Medical Parasitology

اسم المحاضرة السابعة باللغة العربية: الدودة الدبوسية ، الدودة الخيطية القزما

اسم المحاضرة السابعة باللغة الإنكليزية: Dwarf Thread Worm·Pin Worm

محتوى المحاضرة السابعة

Dr. Sara Ayad
Practical parasitology

Enterobius vermicularis

Main features of Nematodes :

	Intestinal Nematodes	Tissue Nematodes
Shape	Large size, Cylindrical	Elongated, Slim
Habitat	Most adult worms live in the intestinal tract	Inhabit either lymph vessels; or skin and subcutaneous tissues

Diseases	Diseases are diagnosed by identifying their characteristic eggs in stool	Diseases are diagnosed by demonstrating microfilariae in blood, in tissue or tissue fluids

Terminology In Nematode

- **Rhabditiform larvae** - characterized by the presence of a muscular esophagus and bulbular pharynx. The worms leaving the egg are termed “rhabditiform” larvae.

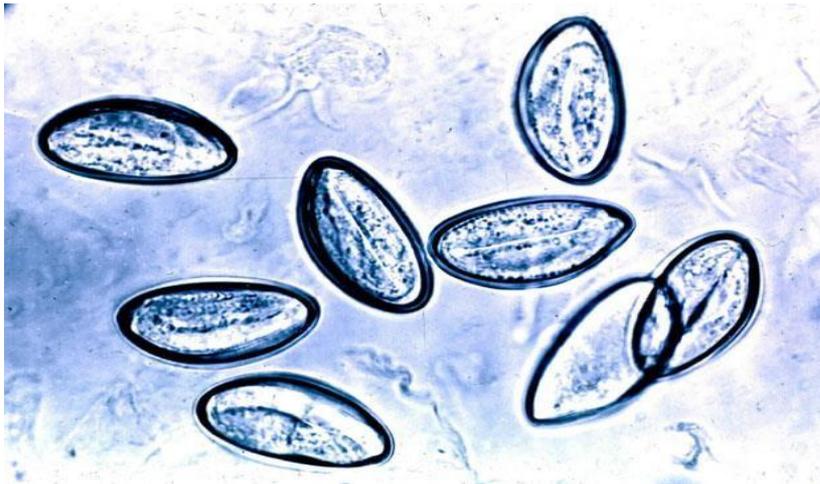
- **Filariform larvae** - the 3rd or infective stage; Long, thread-like; Designed for penetration.
- **Larvae** - undergo several molts (third stage usually the infective stage).
- **Adult** - varies in size from genus to genus; Range from less than 1 mm to over one meter.

Enterobius vermicularis - the pinworm

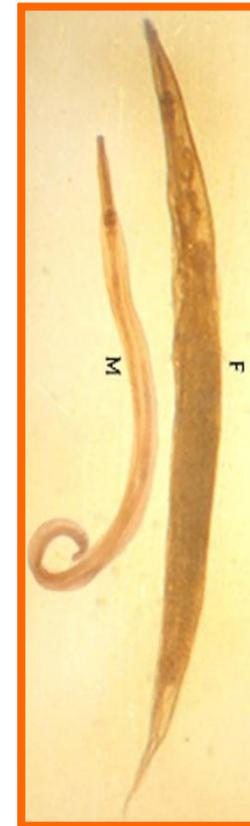
- **Transmission is direct, person-to-person.**
- **Egg is infective immediately or within hours of being shed by the female.**
- **Common worldwide but more prevalent in temperate climates.**

- It is a group infection especially common among children. Very often associated with poor hygiene.
- Humans are the only known host.
- *E. vermicularis* is Adults inhabit in cecum and the adjacent parts
- **Mode of infection :**
 - a- Autoinfection- hand to mouth
 - b- Contaminated food or drink
 - c- Inhalation of eggs in dust

- **Adults** - female: 8-13 mm long, with sharply pointed tails; Wing-like flaps (cervical alae) at head end;
- Male: small (2-5 mm) with strongly curved posterior.
- **Eggs** - 50 x 20 to microns, elongated to oval in shape, transparent, thick shell and flattened on one side. Compressed laterally; Normally are



embryonated (contain a larva).



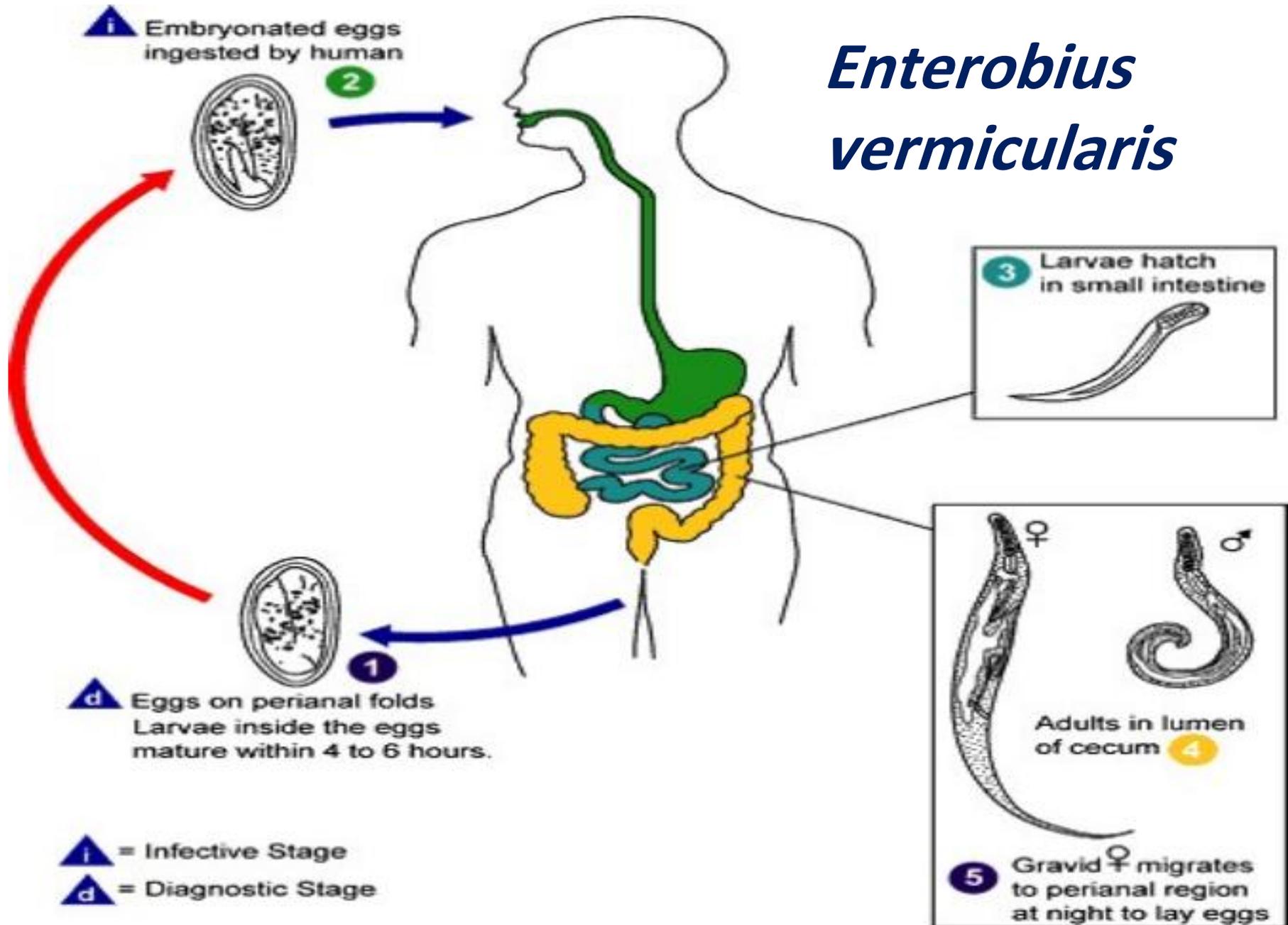
Diagnostic stage : Eggs and adult female

Infective stage :Eggs(embryonated- third stage larva)

Life cycle:

- Eggs are ingested, hatch in intestine, larvae mature to adults.
- Gravid females migrate to the perianal area at night to lay eggs.
- Eggs develop to infective stage within 4-6 hours. Eggs can survive for extended periods in moist environment.

Enterobius vermicularis



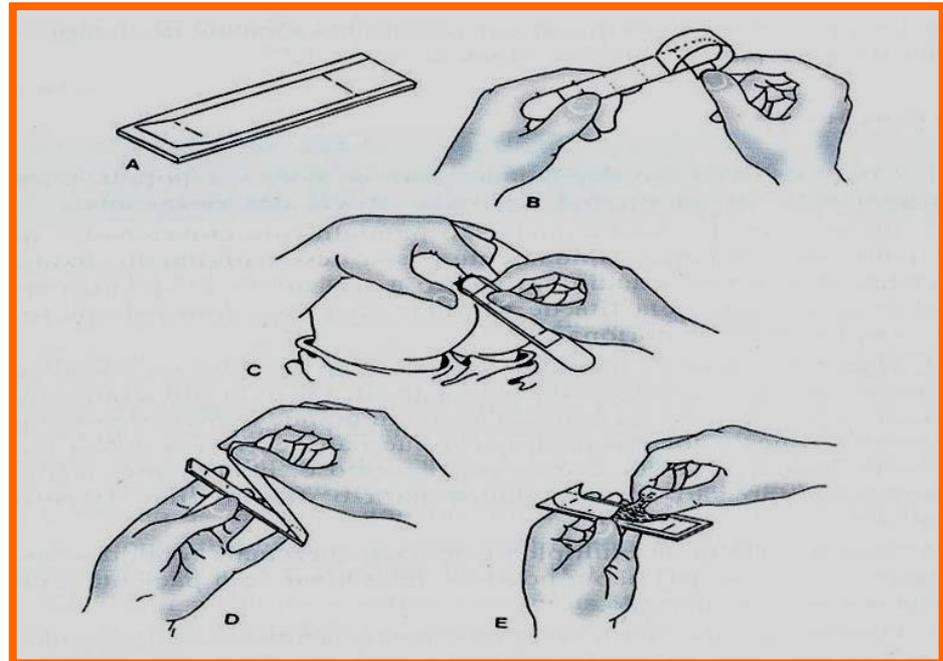
Pathogenesis

- Enterobiasis is usually asymptomatic .
- **The most typical symptom is perianal pruritus (itching and irritation)**, which associates with the migration of the gravid females from the anus and deposition of eggs in the perianal folds of the skin, may lead to vulvitis and bacterial superinfection
- Heavy infection in children may result in restlessness, sleeplessness, loss of appetite, weight loss, grinding of teeth, nervousness, abdominal pain and vomiting .

Laboratory Diagnosis

- Microscopic identification of eggs collected in the perianal area by **cellophane tape method** or **anal swabs**. This must be done in the morning, before defecation and washing

- Detection of adult on anal skin



Strongyloides stercoralis-**Dwarf** **thread worm**

- **Habitat:** females live in the tissues of the small intestine (duodenum and jejunum) in submucosa while male remain free in the lumen.
- **Definitive host:** Human, dogs and cats .

- **Route of infection:** Filariform larvae penetrate the skin of human(Direct contact).
- **Infective stage:** Third stage larvae (filariform).
- **Diagnostic stage:** First stage larvae(Rhabditiform) in feces.
- **Geographical distribution:** - cosmopolitan parasite, mainly in moist and warm areas of low hygiene .
- **Facultative and opportunistic parasite .**

Morphology

Egg:

Size : 55 x 30 um.

Shape: oval , translucent, very thin shell Similar to hookworm but are smaller.

Eggs are laid in the mucosa, hatch into rhabditiform larvae and pass into the lumen of the intestine and out the feces

(Eggs are rarely seen in stool).



Morphology

Parasitic female:

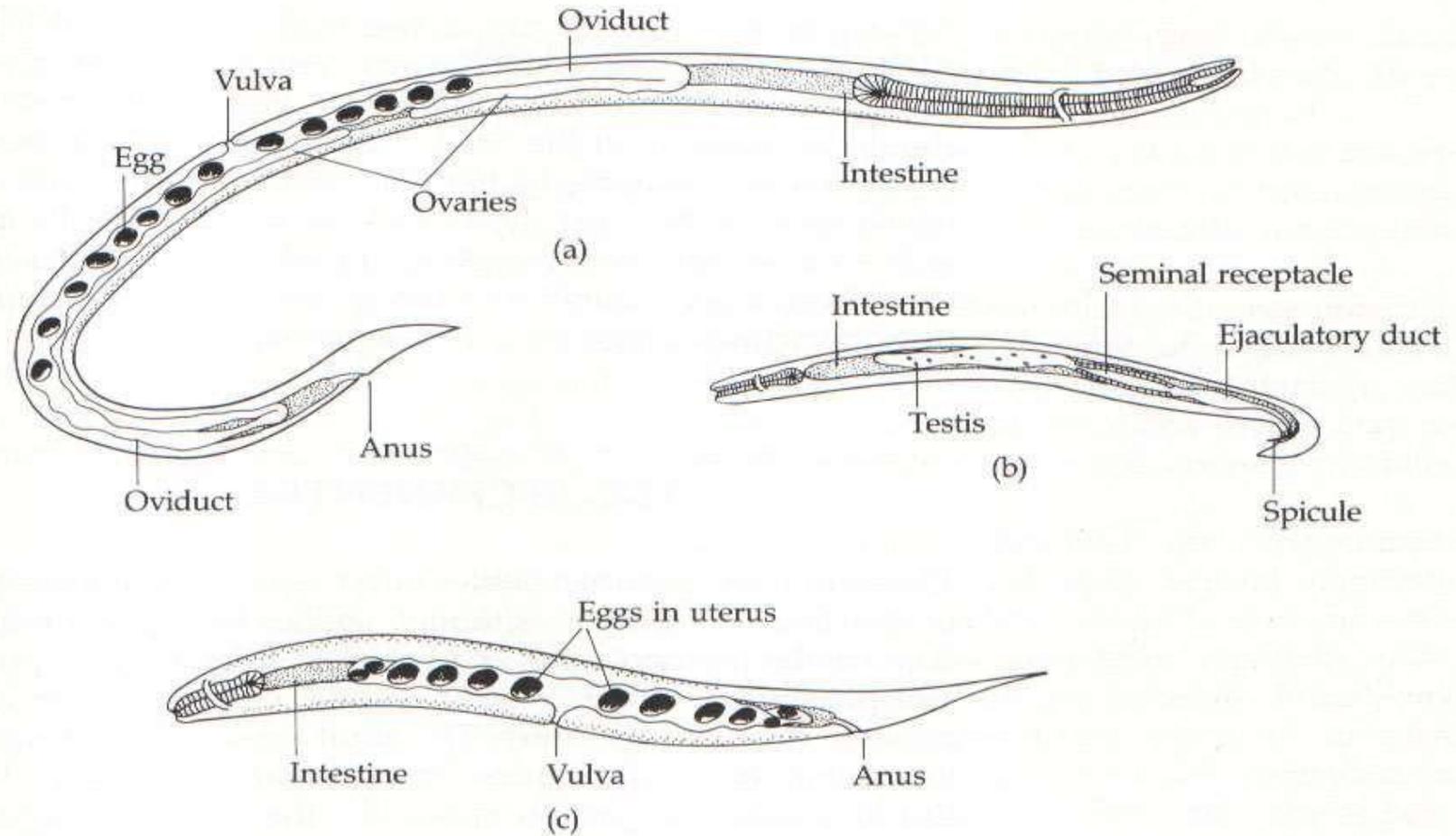
- 2.2 mm in length
- Cylindrical oesophagus (1/3 body length) - Posterior end straight

- Free living female:
- 1 mm in length
- rhabditiform oesophagus
- posterior end straight

Adult: Male (parasitic or free-living):

- 0.7 mm in length
- Rhabditiform oesophagus
- Posterior end curved ventrally with Spicules

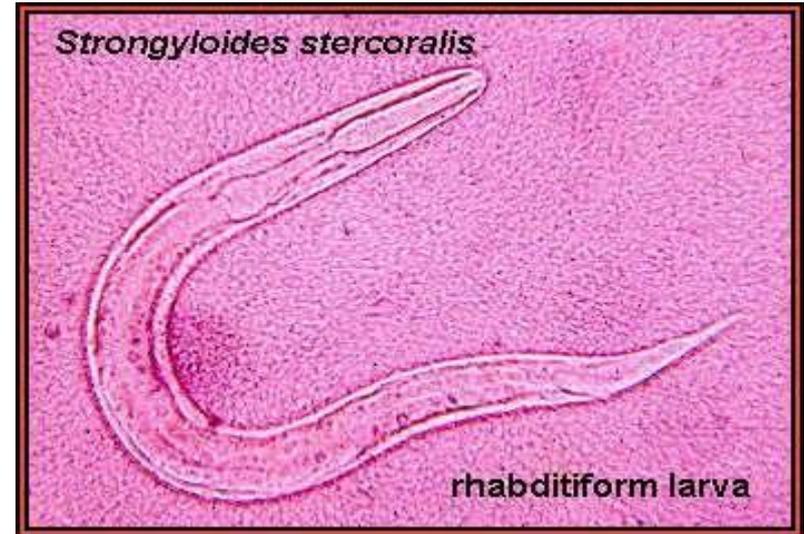
Morphology of *Strongyloides stercoralis*



a) parasitic female b) free-living male c) free-living female

Rhabditiform larvae

- 220 x 15 μm .
- Short buccal cavity.
- **Diagnostic stage** •
appear in stools within
- 4 weeks of infection.



Filariform larvae

posterior part Filariform larva with notched tail.
Infective stage





Size 600 x 20 μm .

Life Cycle

1. Free-living Phase

Free living *S. stercoralis* live in moist soil

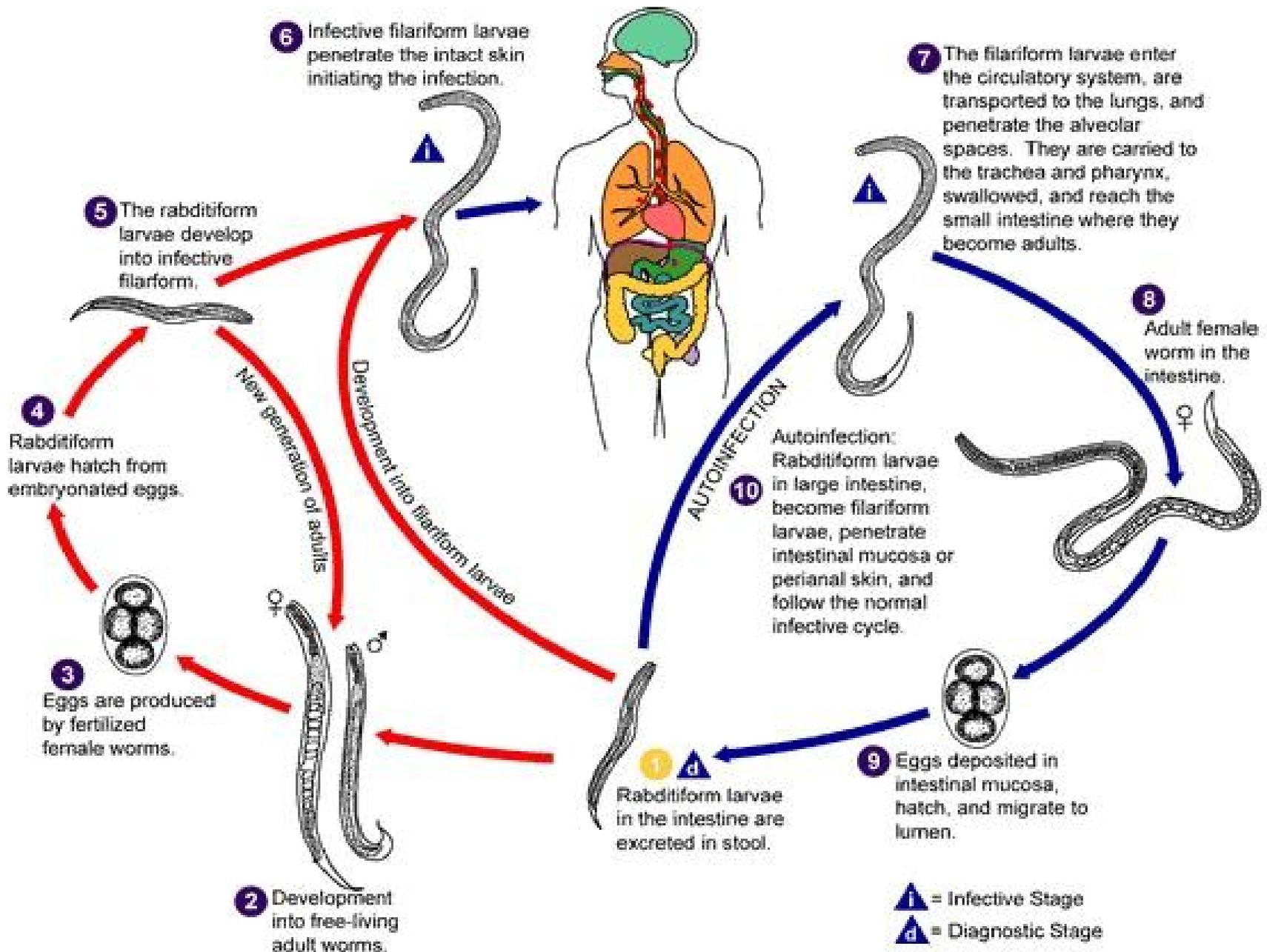
- Copulation occurs in soil
- Following oviposition, eggs hatch in the soil and give rise to 1st stage rhabditiform larvae
- These feed on organic debris, go through several molts and become sexually mature adults

- If the environment becomes inhospitable, the rhabditiform larvae molts to become a nonfeeding filariform larva - the form infective to humans

2. Parasitic Phase

- When filariform larvae encounter a human or another suitable host (e.g. cats and dogs), they penetrate the skin
- They enter the right side of the heart and are carried to the lungs via the pulmonary artery
- In the lungs, following a 3rd molt, the larvae rupture from the pulmonary capillaries and enter the alveoli
- From the alveoli, the larvae move up the respiratory tree to the epiglottis
- by coughing and subsequent swallowing by the host, they migrate over the epiglottis to the esophagus and down into the small

intestine, where they undergo a final molt and become sexually mature females



3. Autoinfection

- During passage through the host digestive system, rhabditiform larvae may undergo 2 molts to filariform larvae and by penetrating the intestinal mucosa, enter the circulatory system and continue their parasitic lives without leaving the host
- Autoinfection can also occur when larvae remain on and penetrate the perianal skin.
- Autoinfection often leads to very high worm burdens in humans

Clinical picture:

- Cutaneous reaction due to skin penetration- ground itch ,
Erythematous rash

- Pulmonary symptoms (including Loeffler's syndrome) can occur during pulmonary migration of the filariform larvae.
- Gastrointestinal symptoms include abdominal pain, vomiting, watery mucous diarrhea, weight loss, malabsorption.
- Dermatologic manifestations include urticarial rashes in the buttocks and waist areas (larva migrans or currens).
- **Autoinfection** within the human host can lead to **the (Hyperinfection Syndrome)** or disseminated strongyloidiasis occurs in immunosuppressed patients, neurologic (CNS), heart, lung, liver complications and septicemia. This syndrome is potentially fatal.

Laboratory Diagnosis

Direct **stool smears** (larvae)

Cultivation of stool. (Harada-Mori mediums).

Histological examination of duodenal or jejunal biopsy specimens obtained by endoscopy can demonstrate adult worms embedded in the mucosa.

Duodenal aspiration

Sputum (filariform larva)

an ELISA for IgG *anti-Strongyloides antibodies* is effective.

Prevention and control

Wearing shoes , gloves

Sanitary disposal of human excreta

Disinfection of human feces before used as fertilizers

Treatment

Albendazole , Thiabendazole

