Lecture 8

Trematodes

- Additional Notes
- Important
- Explanation
- Examples

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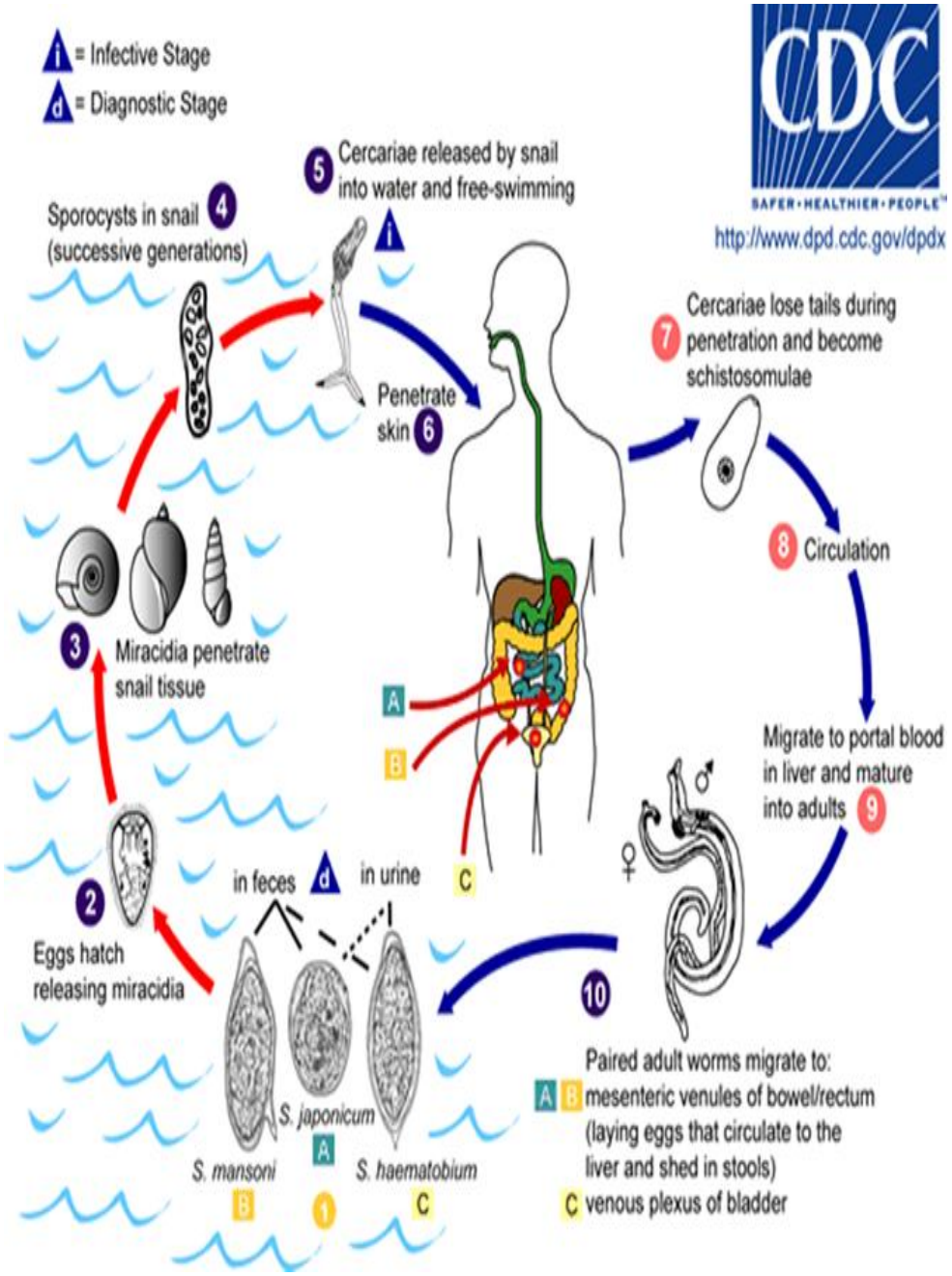
Life cycle of schistostomaisis

Eggs are eliminated with feces or urine . Under optimal conditions the eggs hatch and release miracidia , which swim and penetrate specific snail intermediate hosts . The stages in the snail include 2 generations of sporocysts and the production of cercariae . Upon release from the snail, the infective cercariae swim, penetrate the skin of the human host , and shed their forked tail, becoming schistosomulae . The schistosomulae migrate through several tissues and stages to their residence in the veins (,). Adult worms in humans reside in the mesenteric venules in various locations, which at times seem to be specific for each species . For instance, *S. japonicum*is more frequently found in the superior mesenteric veins draining the small intestine , and *S. mansoni* occurs more often in the superior mesenteric veins draining the large intestine . However, both species can occupy either location, and they are capable of moving between sites, so it is not possible to state unequivocally that one species only occurs in one location. *S. haematobium* most often occurs in the venous plexus of bladder , but it can also be found in the rectal venules. The females (size 7 to 20 mm; males slightly smaller) deposit eggs in the small venules of the portal and perivesical systems. The eggs are moved progressively toward the lumen of the intestine (*S. mansoni*and *S. japonicum*) and of the bladder and ureters (*S. haematobium*), and are eliminated with feces or urine, respectively . Pathology of *S. mansoni* and *S. japonicum* schistosomiasis includes: Katayama fever, hepatic perisinusoidal egg granulomas, Symmers' pipe stem periportal fibrosis, portal hypertension, and occasional embolic egg granulomas in brain or spinal cord. Pathology of *S. haematobium* schistosomiasis includes: hematuria, scarring, calcification, squamous cell carcinoma, and occasional embolic egg granulomas in brain or spinal cord.



Schistosomiasis

- Two species of schistosome:
  - ✓Schistosoma haematobium
  - ✓Schistostoma mansoni
- Pathogenesis:
  - ✓Adult schistosomes in blood vessels → Eggs laid by female are carried in blood and trapped in liver/bladder → Hypersensitivity to antigen of larva inside egg → granuloma → Fibrosis of the liver (↑ portal pressure, hepatosplenomegaly & formation of the varices)
  - ✓During swimming in the blood it can penetrate the skin and cause schistomsome dermatitis (swimmers itch)
- Drug of choice for schistomsomiasis is Pariquantel

Pathogenesis:

- ***S. haematobium:*** causes urinary bladder schistosomiasis
  - ✓ Prepatent period (10-12 weeks)
  - ✓ Eggs disposition and extrusion:
    - Painless haematuria
    - Inflammation of the bladder & burning micturition.
    - CNS involvement
  - ✓ Tissue proliferation & repair:
    - Fibrosis, papillomata in the bladder & lower ureter leading to obstructive uropathy
    - Periportal fibrosis
    - Lung & CNS involvement
- ***S. Mansoni:*** causes intestinal schistosomiasis
  - ✓ Prepatent period (5-7 weeks)
  - ✓ Eggs disposition and extrusion:
    - Dysentery
    - Hepatomegaly & splenomegaly
    - CNS involvement
  - ✓ Tissue proliferation & repair:
    - papillomata in the Intestine
    - Periportal fibrosis, hematoemesis
    - Lung & CNS involvement

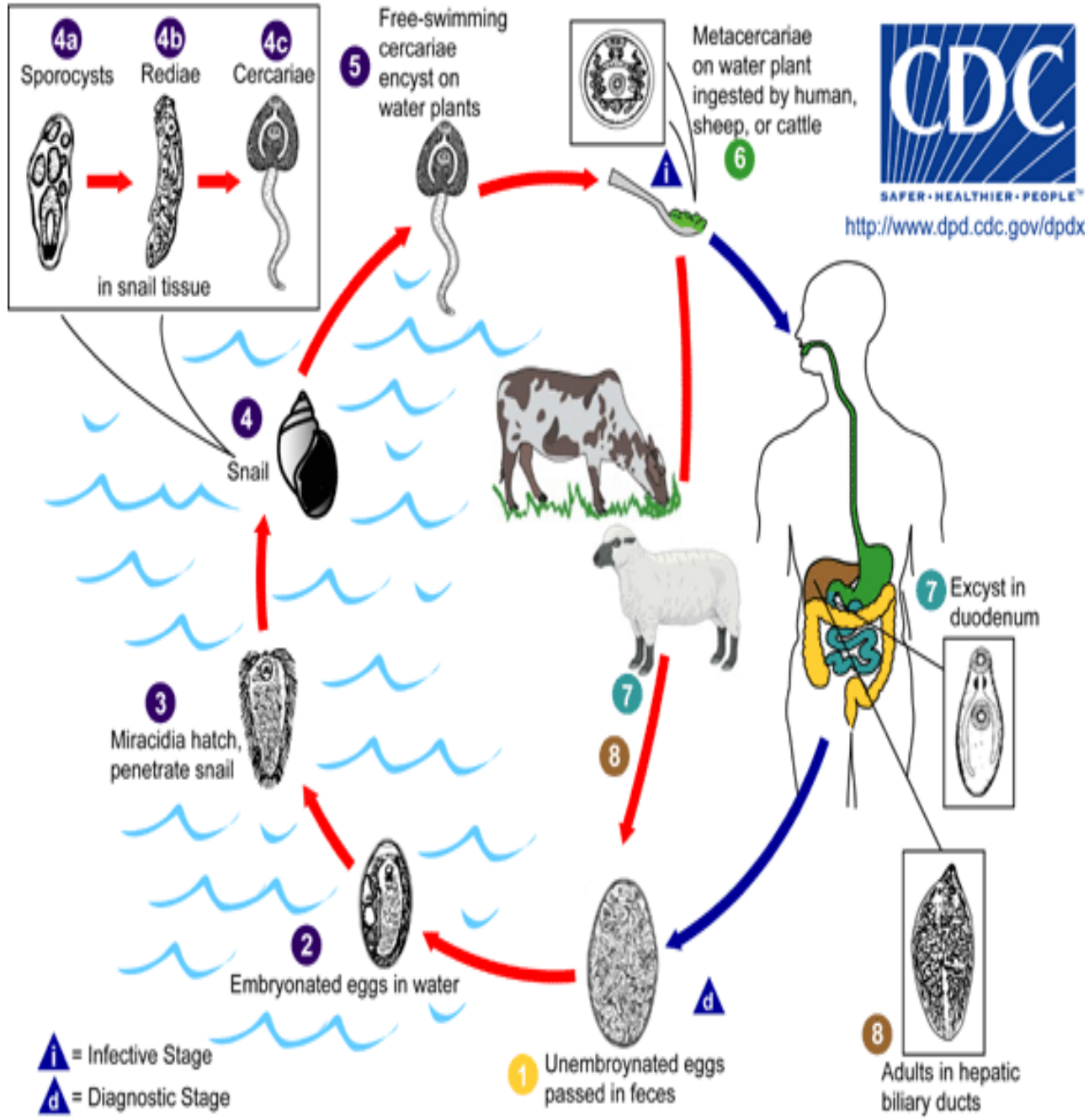
Diagnosis of Schistosomiasis

- ***S. haematobium:***
  - ✓Parasitological: Examination of urine
  - ✓Immunological: Serological tests
  - ✓Indirect: Radiological & Cystoscopy

- ***S. Mansoni:***
  - ✓Parasitological: Examination of stools
  - ✓Immunological: Serological tests
  - ✓Indirect: Radiological & endoscopy

Life cycle of fasciola hepatica

Immature *Fasciola* **eggs** are discharged in the biliary ducts and in the stool . Eggs become embryonated in water , eggs release **miracidia** , which invade a suitable snail intermediate host, including the genera *Galba,*
Fossaria and *Pseudosuccinea*. In the snail the parasites undergo several developmental stages (sporocysts , rediae , and cercariae). The **cercariae** are released from the snail and encyst as **metacercariae** on aquatic vegetation or other surfaces. Mammals acquire the infection by eating vegetation containing metacercariae. Humans can become infected by ingesting metacercariae-containing freshwater plants, especially watercress . After ingestion, the metacercariae excyst in the duodenum and migrate through the intestinal wall, the peritoneal cavity, and the liver parenchyma into the biliary ducts, where they develop into adult **flukes** .



Fasciola Hepatica

- Fasciola Hepatica is common seen in infected sheep's liver.
- Watercress is one means of transmission of fasciola
- Snail could be an intermediate host.
- Pathogenesis:
  - ✓**True infection** causes biliary obstruction and liver damage.
  - ✓**False infection** is when eggs are eaten in infected animal liver and passed in stool (the stool test is +ve but there is no infection)
- Diagnosis: eggs in stools or duodenal aspirate.
- Treatment: Triclabendazole (depends on the weight of the patient)