5 Parasites affecting the heart and their manifestations

Parasitic diseases can affect nearly every organ system, including the cardiovascular system. Cardiac involvement is often underrecognized but can lead to severe complications such as **myocarditis** , **pericarditis** , **cardiomyopathy** , **arrhythmias** , and even **sudden cardiac death** . Below is a comprehensive overview of key parasitic organisms known to affect the heart, their mechanisms of pathology, clinical manifestations, and relevant transmission modes.

1. *Toxoplasma gondii*

Disease : Toxoplasmosis
Transmission : Ingestion of oocysts (from cat feces), consumption of undercooked meat, vertical (congenital) transmission
Reservoir : Cats (definitive hosts); humans and other warm-blooded animals (intermediate hosts)

Cardiac Involvement :

- *T. gondii* infects myocardial cells, surviving intracellularly by avoiding lysosomal degradation.
- Forms tissue cysts in cardiac muscle, especially in immunocompromised individuals.
- Chronic infections may result in **myocarditis** , **pericarditis** , **cardiac dilatation** , and **hypertrophy** .

Clinical Features :

- Fever
- Lymphadenopathy
- Retinochoroiditis
- Myocarditis and heart failure symptoms
- Pericarditis (less common)

2. *Entamoeba histolytica*

Disease : Amoebiasis
Transmission : Fecal-oral route
Reservoir : Humans
Geography : Common in tropical and subtropical regions

Cardiac Involvement :

- Rare but serious complication: **Amoebic pericarditis**
- Often secondary to direct extension of a liver abscess (especially left lobe) into the pericardium

Clinical Syndromes :

- **Acute** : Cardiac tamponade (chest pain, hypotension, shock)
- **Chronic** : Progressive pericardial effusion with fever, dyspnea, and chest discomfort
- ECG may reveal diffuse ST-elevations or low voltage

3. *Trichinella spiralis*

Disease : Trichinosis
Transmission : Ingestion of undercooked meat (usually pork or wild game)
Reservoir : Carnivores and omnivores (e.g., pigs, bears)

Cardiac Involvement :

- Larvae encyst in striated muscles, but **cardiac pathology** is usually due to an **eosinophilic myocarditis** —an immune-mediated reaction rather than direct invasion.
- Resembles **tropical endomyocardial fibrosis** in pathogenesis

Clinical Manifestations :

- Myocarditis with arrhythmias
- Chest pain, palpitations
- ECG abnormalities
- Can progress to heart failure or sudden death in severe cases

4. *Echinococcus granulosus*

Disease : Cystic echinococcosis (hydatid disease)
Transmission : Ingestion of tapeworm eggs from dog feces
Reservoir : Dogs (definitive host), sheep and humans (intermediate hosts)

Cardiac Involvement :

- Rare but life-threatening
- Cysts may form in myocardium, pericardium, or endocardium

Complications :

- Arrhythmias
- Myocardial infarction (due to compression)
- **Cardiac tamponade** , **purulent pericarditis** , **sudden death**

5. *Trypanosoma cruzi*

Disease : Chagas disease (American trypanosomiasis)
Transmission : Fecal contamination by triatomine bugs (kissing bugs); also congenital, blood transfusion, and organ transplant
Geography : Endemic in Latin America

Cardiac Involvement :

- *T. cruzi* invades cardiac myocytes and autonomic neurons
- Causes chronic myocarditis, leading to **dilated cardiomyopathy**

Phases :

- **Acute phase** (first 2 months): Fever, lymphadenopathy, hepatosplenomegaly, sometimes myocarditis
- **Chronic phase** (may be asymptomatic for years):
  - ~30–40% develop **chronic Chagas cardiomyopathy**
  - Features include:
    - Conduction abnormalities (RBBB, LAFB)
    - Ventricular arrhythmias
    - Apical aneurysm (classic finding)
    - Thromboembolism
    - Heart failure

Summary Table: Parasitic Infections Affecting the Heart

Parasite	Disease	Cardiac Complications	Key Clinical Features
Toxoplasma gondii	Toxoplasmosis	Myocarditis, pericarditis	Fever, lymphadenopathy, myocarditis, ocular disease
Entamoeba histolytica	Amoebiasis	Amoebic pericarditis	Cardiac tamponade, pericardial effusion, hepatic abscess
Trichinella spiralis	Trichinosis	Eosinophilic myocarditis	Myalgia, fever, chest pain, arrhythmias
Echinococcus granulosus	Hydatid disease	Cardiac hydatid cysts	Arrhythmias, tamponade, sudden death
Trypanosoma cruzi	Chagas disease	Chronic cardiomyopathy, arrhythmias	Conduction defects, apical aneurysm, CHF

High-Yield Clinical Pearls

- **Myocarditis** from parasitic infections can mimic viral etiologies; always consider parasitic causes in endemic regions.
- **ECG and echocardiography** are crucial for assessing complications like arrhythmias, pericardial effusion, and ventricular dysfunction.
- **Serological tests** (e.g., ELISA, IFA) and PCR are often required for definitive diagnosis.
- Early recognition and **antiparasitic therapy** (e.g., benznidazole for Chagas, albendazole for echinococcosis) can reduce morbidity.