

Chagas Disease

WHAT IS CHAGAS DISEASE?

Chagas disease (aka American trypanosomiasis) is a tropical parasitic disease caused by the protozoan parasite *Trypanosoma cruzi* that is found mostly in triatomine insects (aka “kissing bugs”) and in the Americas. Infection is life-long, with symptoms ranging from fever and headaches to enlarged internal organs.

SYMPTOMS, COMPLICATIONS AND FATALITY RATES

Similar to other parasites of mammals/insects, the lifecycle of *T. cruzi* is complex, including 3 main developmental forms.¹ For this reason, the symptoms of Chagas disease change over time. In the early stages, symptoms are typically not present or mild and may include fever, swollen lymph nodes, headaches or local swelling at the bite site. After 8-12 weeks, individuals enter the chronic disease phase. Further symptoms do not develop in 60-70% of individuals. However, the other 30-40% develop additional symptoms 10-30 years after the initial infection. These symptoms include enlargement of the heart ventricles (20-30%), leading to heart failure and death in <5-10% of symptomatic cases.² Gastrointestinal complications and enlarged esophagus or colon might be experienced by ~10% of people.

TRANSMISSION

Triatomine insects are found in houses made from materials such as mud, adobe, straw and palm thatch. If a triatomine insect is a host for *T. cruzi*, the parasite is transmitted through the insect’s fecal matter. When a triatomine insect bites a human and ingests blood, it defecates on the person. If the feces enters the body through a mucous membrane (e.g., eyes or mouth) or break in the skin, the person can become infected. Individuals can also be infected through congenital transmission, blood transfusions, organ transplantation, consumption of food contaminated with *T. cruzi*-laden feces and accidental laboratory exposure.³



Trypanosomiasis is a group of diseases caused by *Trypanosoma* parasites.

There are two types that affect humans:

1. American trypanosomiasis, or Chagas disease, caused by *T. cruzi* parasites in the Americas and transmitted by the triatomine, or kissing bug.
2. African trypanosomiasis, or sleeping sickness, caused by *T. brucei* parasites in sub-Saharan Africa and transmitted by the tsetse fly.

Data current as of February 12, 2020

DIAGNOSIS AND TREATMENT

During the acute phase of infection, *T. cruzi* parasites may be seen circulating in the blood via microscopic observation. During the chronic phase, diagnosis is based on clinical findings, the likelihood of infection (e.g., residing in an endemic country) and laboratory tests using immunoassay or PCR detection of *T. cruzi* DNA. Treatment usually involves administration of benznidazole (first-line treatment) or nifurtimox (second-line treatment). However, these treatments have known safety issues, resistance and an inverse relationship between efficacy and infection time.⁴

CURRENT SITUATION, EPIDEMIOLOGY AND WHAT'S NEXT

Worldwide, Chagas affects 6-8 million people and kills more than 50,000 people each year. In addition, 65-100 million people are currently at risk of Chagas disease globally. Chagas is endemic to 21 Latin American countries. While the prevalence of *T. cruzi*-infected persons outside of Latin America was once rare, the epidemiology has changed markedly in the last few decades due to increased migration of individuals from endemic areas. According to recent estimates, 23 million persons from endemic countries now live in the US, 238,000–300,000 of whom have chronic *T. cruzi* infection.⁶

According to ClinicalTrials.gov, there are nine clinical trials currently planned or underway at sites across Latin America. While five of these trials are investigating the standard-of-care treatments benznidazole and nifurtimox, fexinidazole and colchicine are being assessed in chronic Chagas, and selenium and amiodarone are being investigated for Chagas-related cardiomyopathy. Prevention and control measures in Latin America will continue to include improved housing conditions and indoor insecticide spraying, while global measures include preventing transmission from blood transfusions, organ transplantation and mother-to-child.



Global expertise, responsive approaches and proven solutions to manage complex clinical research in resource-limited settings around the world. To learn more, visit fhiclinical.com or email info@fhiclinical.com.

1 "Chagas Disease (American Trypanosomiasis)," Louis Kirchoff, et al, April 26, 2019, Medscape website.

2 Rassi Jr, A. et al. Chagas Disease. Lancet 2010; 375:1388-1402.

3 "Chagas Disease (American trypanosomiasis)," April 17, 2019, WHO website.

4 Buckner, F. et al. Induction of Resistance to Azole Drugs in *Trypanosoma cruzi*. *Antimicrobial Agents & Chemotherapy* 1998, 42(12): 3245-3250.

5 Lidani, K. et al. *Frontiers in Public Health* 2019, 7(166): 1-13.

6 Manne-Goehler, J. et al. Estimating the Burden of Chagas Disease in the United States. *PLoS Neglected Tropical Diseases* 2016, 10(11): e0005033.

Prevalence in Latin America⁵



Total: 5,742,167



6-8M

people affected by
Chagas globally

Data current as of February 12, 2020