Chagas in SOT

Lynne Strasfeld, MD

February 4, 2026

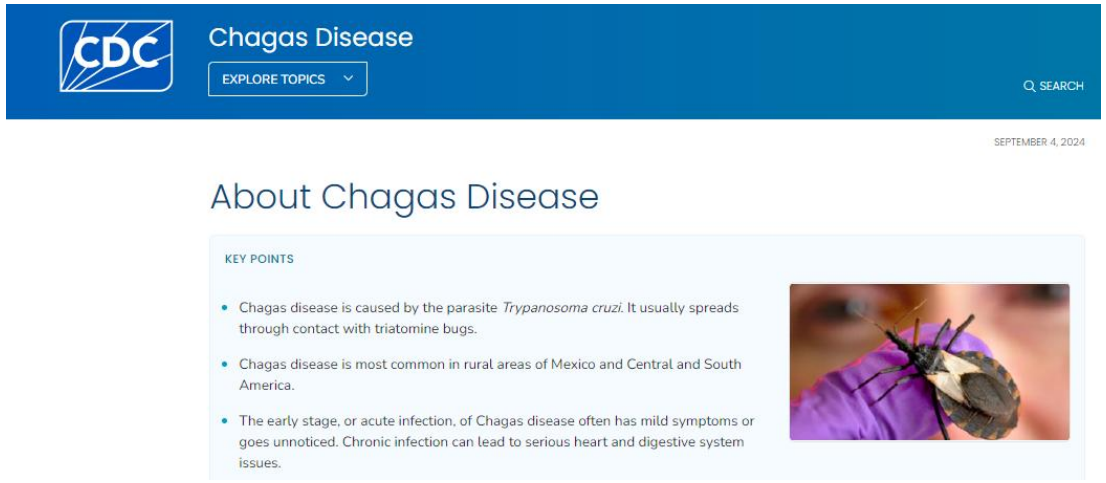
The case

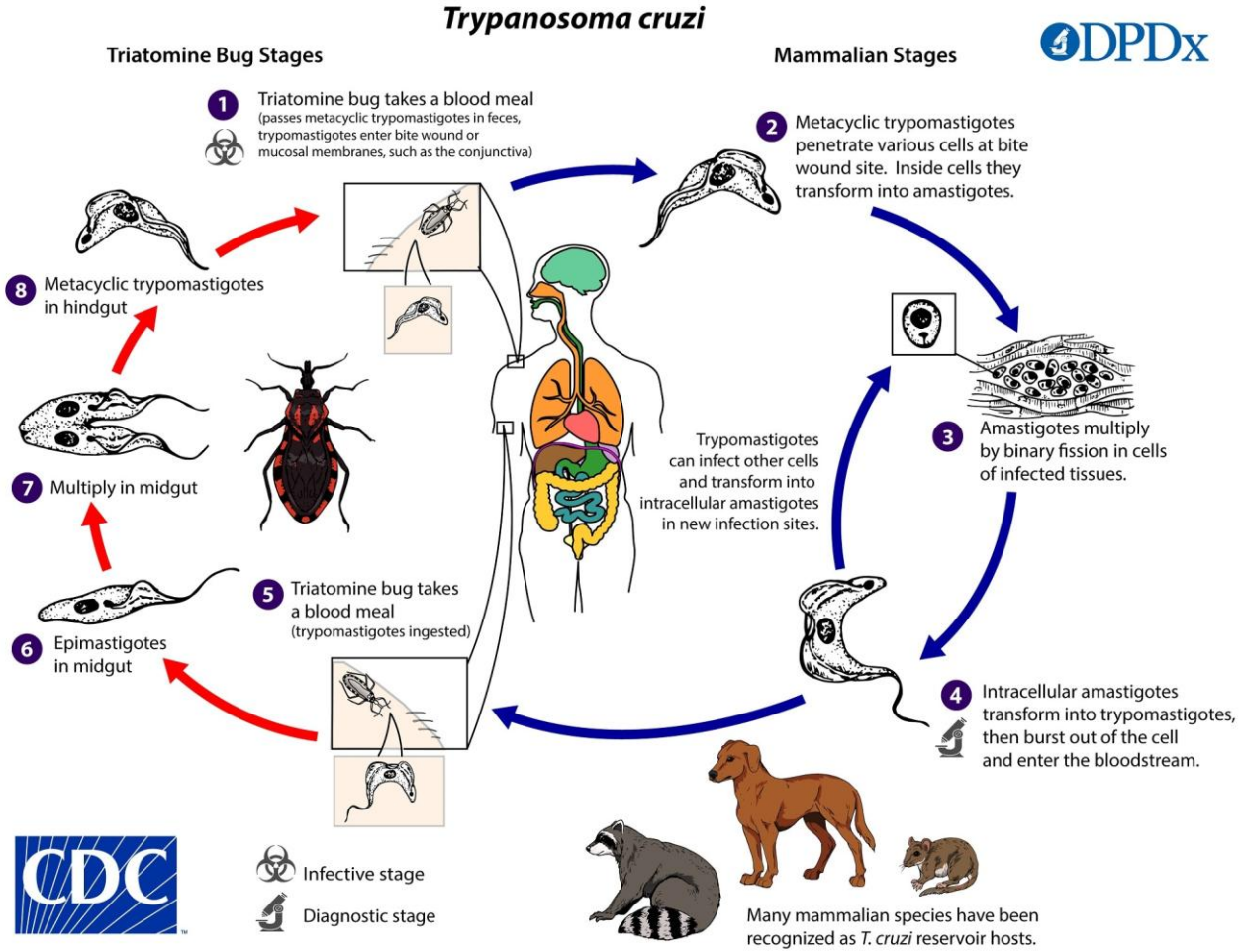
[redacted] with HFrEF and VT, s/p ICD (201[redacted]), s/p myomectomy for ventricular aneurysm (“Batista Repair”) in El Salvador in 200[redacted]

- Admitted [redacted] 2024 with syncope in the setting of VT, transferred to CVICU on hospital day 7 with pulseless VT → CPR/shock with ROSC
- Listed for heart transplant early June
- Impella placed 1 month into admission

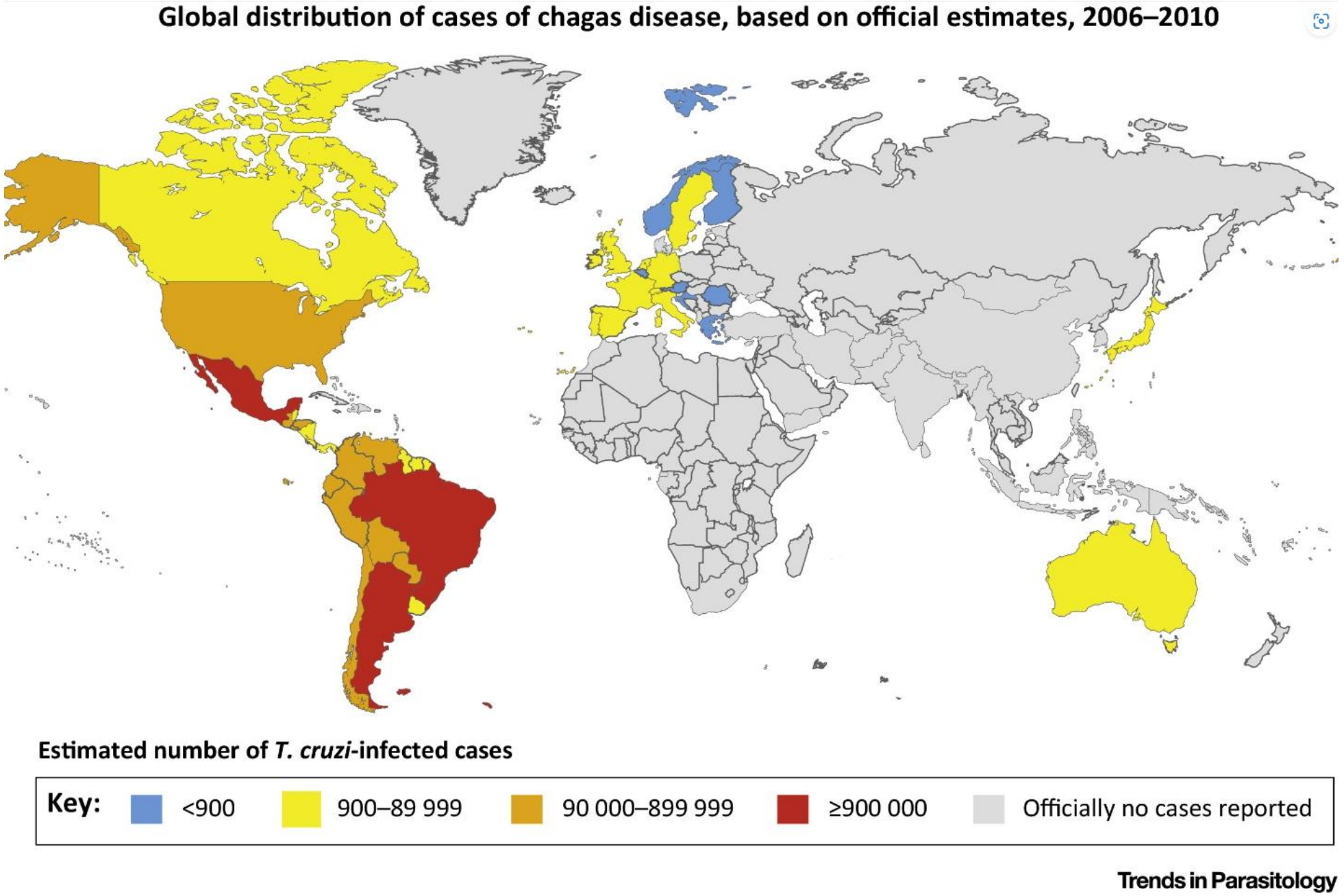
- Transplant ID consult day -1 for heart transplant: management for Chagas cardiomyopathy

- Patient confirms knowledge of Chagas diagnosis dating back to 2015
- Lived in concrete home with "paper roof" in El Salvador, recalls "chinch bugs"





- Epidemiology: approximately 8 million globally & >300,000 in US
- Other routes of transmission: blood transfusion, organ transplant, in utero vertical transmission (congenital), consumption of contaminated food or drink



Perez CJ et al. Reactivation of Chagas Disease: Implications for Global Health. 2015

The Journal of Infectious Diseases

MAJOR ARTICLE

Recommendations for Screening and Diagnosis of Chagas Disease in the United States

Colin J. Forsyth,[1] Jennifer Manne-Goehler,[2] Caryn Bern,[3] Jeffrey Whitman,[4] Natasha S. Hochberg,[5,6,7] Morven Edwards,[8] Rachel Marcus,[9,10] Norman L. Beatty,[11] Yagahira E. Castro-Sesquen,[12] Christina Coyle,[13] Paula Stigler Granados,[14] Davidson Hamer,[5,15] James H. Maguire,[2] Robert H. Gilman,[12] and Sheba Meymandi[16]; US Chagas Diagnostic Working Group

[1]Drugs for Neglected Diseases initiative, New York, New York, USA, [2]Division of Infectious Diseases, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA, [3]Department of Epidemiology and Biostatistics, University of California, San Francisco, San Francisco, California, USA, [4]Department of Laboratory Medicine, University of California, San Francisco, San Francisco, California, USA, [5]Department of Medicine, Section of Infectious Diseases, Boston University School of Medicine, Boston, Massachusetts, USA, [6]Department of Epidemiology, Boston University School of Public Health, Boston, Massachusetts, USA, [7]Boston Medical Center, Boston, Massachussetts, USA, [8]Department of Pediatrics, Baylor College of Medicine, Houston, Texas, USA, [9]Medstar Union Memorial Hospital, Washington, District of Columbia, USA, [10]Latin American Society of Chagas, Washington, District of Columbia, USA, [11]Division of Infectious Diseases and Global Medicine, University of Florida College of Medicine, Gainesville, Florida, USA, [12]Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA, [13]Division of Infectious Diseases, Albert Einstein College of Medicine and Jacobi Medical Center, Bronx, New York, USA, [14]School of Public Health, San Diego State University, San Diego, California, USA, [15]Department of Global Health, Boston University School of Public Health, Boston, Massachusetts, USA, and [16]Center of Excellence for Chagas Disease, Olive View-University of California, Los Angeles Medical Center, Sylmar, California, USA

Background. Chagas disease affects an estimated 326 000–347 000 people in the United States and is severely underdiagnosed. Lack of awareness and clarity regarding screening and diagnosis is a key barrier. This article provides straightforward recommendations, with the goal of simplifying identification and testing of people at risk for US healthcare providers.

Methods. A multidisciplinary working group of clinicians and researchers with expertise in Chagas disease agreed on 6 main questions, and developed recommendations based on the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology, after reviewing the relevant literature on Chagas disease in the United States.

Results. Individuals who were born or resided for prolonged time periods in endemic countries of Mexico and Central and South America should be tested for *Trypanosoma cruzi* infection, and family members of people who test positive should be screened. Women of childbearing age with risk factors and infants born to seropositive mothers deserve special consideration due to the risk of vertical transmission. Diagnostic testing for chronic *T. cruzi* infection should be conducted using 2 distinct assays.

Conclusions. Increasing provider-directed screening for *T. cruzi* infection is key to addressing this neglected public health challenge in the United States.

Keywords. Chagas disease; *Trypanosoma cruzi*; diagnosis; neglected diseases.

J Infect Dis 2022

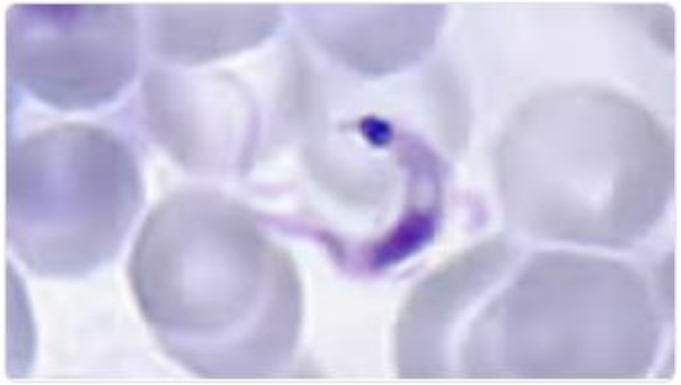
Diagnostics

CDC Chagas Disease

EXPLORE TOPICS

Acute infection:

- microscopy
- PCR
- xenodiagnosis



Trypanosoma cruzi parasite (trypomastigote) in a thin blood smear. Credit: DPDx

Chronic infection:

Diagnosing Chronic Chagas Disease:

- For chronic Chagas disease, healthcare providers detect antibodies against the parasite using serologic tests.
- Testing protocol:
  - No single test is sufficiently sensitive and specific for diagnosis.
  - Use two or more tests that detect antibodies to different antigens.
  - Common techniques include enzyme-linked immunosorbent assay (ELISA) and immunofluorescent antibody test (IFA).
- Assessing the patient's history for infection risks is also helpful.

Question #1
At your center, who do you screen for Chagas?

A. All heart transplant candidates
B. All SOT candidates
C. All heart transplant candidates with epidemiologic risk
D. All SOT candidates with epidemiologic risk

OHSU screening

Kidney, liver and heart candidates

- Screening for Chagas should be performed in all transplant candidates who were born or resided ≥ 6 months in Mexico, Central America or South America

Living donor (kidney) candidates

- Screening for Chagas should be performed in all transplant candidates who were born or resided ≥ 6 months in Mexico, Central America or South America

Screening serology: two tests based on different antigens or techniques (confirmatory serology)

From our case patient

(ABNORMAL) _Miscellaneous Referral Test 1 (11/09/2015 5:10 AM PST)

Component	Value	Ref Range	Test Method
Referral Test 1	SEE NOTE (A)		

Comment:

```
Test name                      Result Flag Units  RefIntvl
-------------------------------------------------------------
Trypanosoma cruzi Antibody, IgG
                                4.30 H         IV <=1.10
INTERPRETIVE INFORMATION: Trypanosoma cruzi Ab, IgG
 1.00 IV or less......Negative - No significant level of
                      Trypanosoma cruzi IgG antibody detected.
 1.01-1.10 IV.........Equivocal - Questionable presence of
                      Trypanosoma cruzi IgG antibody detected.
                      Repeat testing in 10-14 days may be helpful.
 1.11 IV or greater...Positive - IgG antibodies to Trypanosoma
                      cruzi detected, which may suggest current
                      or past infection.
This assay should not be used for blood donor screening or
associated re-entry protocols, or for screening Human Cell and
Cellular Tissue-Based Products (HCT/Ps).
Performed by ARUP Laboratories,
500 Chipeta Way, SLC,UT 84108 800-522-2787
www.aruplab.com, Jerry W. Hussong, MD - Lab. Director
```

MAYO CLINIC LABORATORIES

1-800-533-1710

CHAGS

Trypanosoma cruzi Total Antibody, Enzyme-Linked Immunosorbent Assay, Serum

Patient ID	Patient Name	Birth Date	Sex	Age
[redacted]	[redacted]	[redacted]	M	56

Order Number	Client Order Number	Ordering Physician	Report Notes
[redacted]	[redacted]	[redacted]	

Account Information	Collected
C7006531 Oregon Hlth Sci Univ L471	24 May 2024 15:28

T. cruzi Total Ab, EIA, S SDL

Reactive

Abn

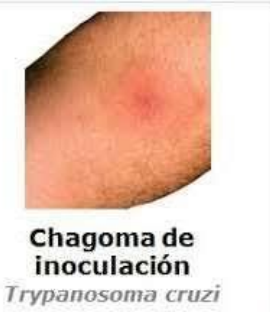
Reference Value
Negative

Antibodies to Trypanosoma cruzi (Chagas disease) detected. Result is not diagnostic. Supplemental testing by a second, different T. cruzi serologic assay is recommended.

Received: 30 May 2024 12:35 **Reported:** 03 Jun 2024 10:52

Trypanosoma cruzi – acute and chronic infection

- Acute phase (8-12 weeks, ~ 1-2 weeks after exposure):
  - Most are asymptomatic or have mild, nonspecific symptoms (malaise fever, hepatosplenomegaly)
  - May see Romaña sign or chagoma at site of inoculation



- Chronic phase (indefinite, in the absence of treatment):
  - Indeterminate form (70-80%)
    - No signs/symptoms of disease, diagnosis by serology, smear negative, PCR variably positive, normal EKG
  - Determinate forms (20-30%)
    - Cardiomyopathy (after 5-30 years of latency)
    - Gastrointestinal disease

roughly 1.9-7% annual progression

Chronic Chagas cardiomyopathy (CC) = serologic + clinical diagnosis:

Positive serology with confirmatory testing

Conduction abnormalities & arrythmias +/- LV dysfunction, ventricular aneurysm or intracavitary thrombus

Exclusion of ischemic heart disease

T cruzi – treatment

- Indeterminate phase
  - Age < 50, treatment advised (strong recommendation for those ≤ 18 years of age, weak recommendation in adults; ***weak quality of evidence***)
  - Women who wish to become pregnancy, treatment advised prior to conception

  - Monitor for development of cardiac or gastrointestinal dysfunction

*at risk for transmitting the parasite via any route, including SOT

T cruzi – treatment

- Acute/congenital infection → trypanocidal therapy (benznidazole or nifurtimox) = parasitologic cure in 60-85%*
  - AAP: Treatment for all cases of acute, congenital, or “early chronic” infection in children (< 18 yrs)

  *measured by negative seroconversion
- Chronic phase, established cardiomyopathy – no benefit to trypanocidal therapy
  - Morillo CA, et al. Randomized trial of benznidazole for chronic Chagas’ cardiomyopathy. *NEJM* 2015 (BENEFIT Trial)

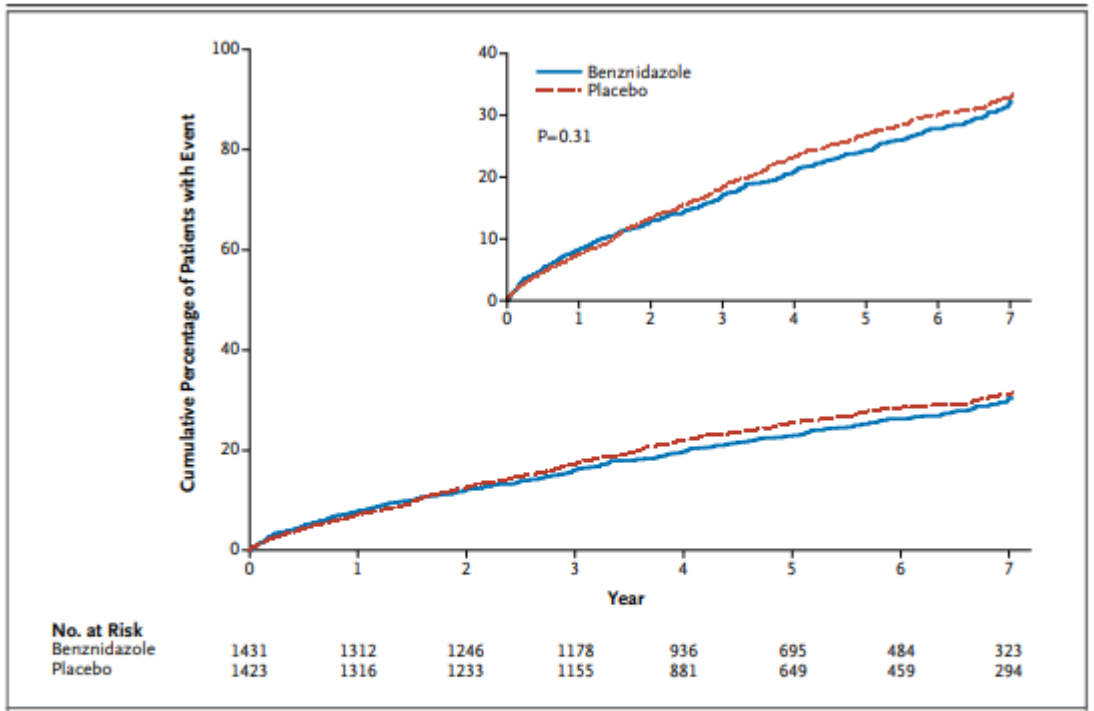


Figure 1. **Primary Composite Outcome during 7 Years of Follow-up.**
Shown is the rate of the primary composite outcome (death, resuscitated cardiac arrest, sustained ventricular tachycardia, insertion of a pacemaker or implantable cardioverter–defibrillator, cardiac transplantation, new heart failure, stroke or transient ischemic attack, or other thromboembolic event) among patients in the benznidazole group and the placebo group during a 7-year period (hazard ratio in the benznidazole group, 0.93; 95% CI, 0.81 to 1.07; P=0.31 by the log-rank test). The inset shows the same data on an enlarged y axis.

- Treatment of choice for refractory CCC = transplantation (3rd most common indication for cardiac transplantation in South America)

Outcomes of heart transplant for CCC

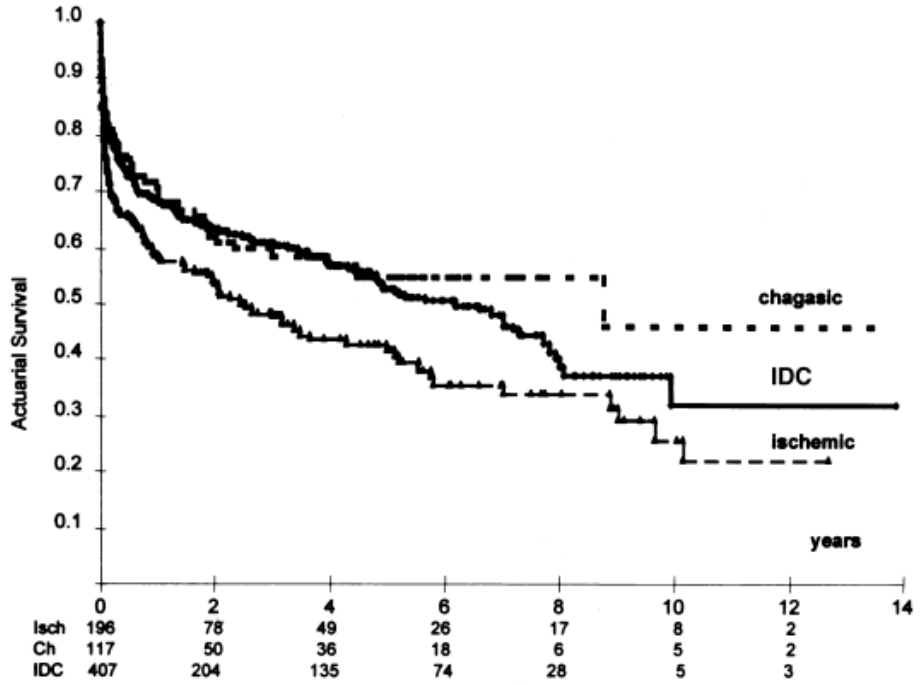
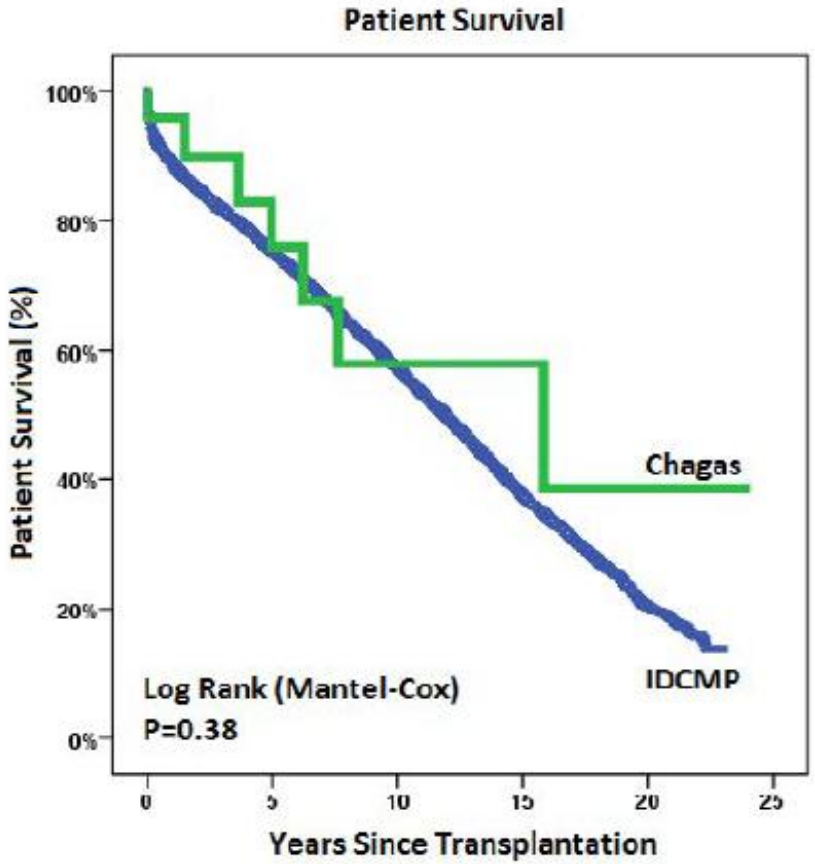


Fig 1. Comparison of estimated survival using the Kaplan-Meier method after primary heart transplantation for the treatment of ischemic (Ischemic)*, idiopathic dilated cardiomyopathy* (IDC)*, and chagasic etiology* (chagasic) ($p < 0.027$).

Bocchi EA and Fiorelli A. The paradox of survival results after heart transplantation for cardiomyopathy caused by *Trypanosoma cruzi*. *Ann Thorac Surg* 2001



Benatti RD, et al. The paradox of survival results after heart transplantation for cardiomyopathy caused by *Trypanosoma cruzi*. *Clin Transplant* 2018

Reactivation of Chagas disease among heart transplant recipients in the United States, 2012-2016

Elizabeth B. Gray[1], Ricardo M. La Hoz[2], Jaime S. Green[3], Holenarasipur R. Vikram[4], Theresa Benedict[1], Hilda Rivera[1], and Susan P. Montgomery[1]

31 patients with Chagas disease, transplanted in US 2012-2016

- 14/30 from El Salvador, 7 from Mexico, 4 from Honduras
- Transplants in CA (10), NY (4), DC (2), FL (2), NJ (2), TX (2), VA (2), AZ (1), MD (1), MA (1), MN (1), NC (1), UT (1), WI (1)
- Preemptive monitoring strategy with Chagas PCR

➢ 19 (61%) developed laboratory evidence of reactivation* at median 3 weeks (range <1-89 weeks) post-transplant, 18/19 with PCR detected before clinical reactivation

➢ 19 treated with benznidazole

➢ All 19 alive at follow-up (median 60 weeks, range 11-172 weeks)

*2 sequential PCRs with signal crossing threshold for MNC & TCZ genes, with decreasing Ct values

Transpl Infect Dis 2018

Chagas (indeterminate) in transplant

- Risk for recipient reactivation
  - Highest risk in Chagas+ heart transplant (20-90%)
  - Lower risk in Chagas+ non-heart transplant
  - Higher “net state of immunosuppression” is associated with higher risk for reactivation
- Chagas disease clinical presentation in transplant recipients: myocarditis, acute febrile illness, hepatosplenomegaly, painful skin nodules, inflammatory panniculitis, CNS infection

La Hoz RZ. Transplantation for Chagas’ disease: closing the knowledge gap. *Curr Opin Infect Dis* 2022

Heart Transplantation for Chagas Cardiomyopathy

Maria da Consolação Moreira, Fabio Morato Castilho, Renato Braulio, Guilherme Ferraz Messina de Pádua Andrade, José Renan da Cunha Melo

Universidade Federal de Minas Gerais (UFMG), Minas Gerais, MG – Brazil.

International Journal of Cardiovascular Sciences. 2020; 33(6):697-704

Table 1 – Clinical and laboratory monitoring of *T.cruzi* infection reactivation after heart transplanta disease and etiological treatment

Procedure
Before transplantation
- Serological tests for Chagas disease for the donor
- Serological tests for Chagas disease for the potential recipient with some possibility of Chagas cardiomyopathy
After transplantation
- Periodic clinic visits with attention to signs/symptoms of reactivation, including ECG and Echocardiogram
- Routine blood *T.cruzi* test (smear, blood culture) for diagnosis of infection reactivation
- Routine blood test for *T.cruzi* by PCR if available
- Routine periodic endomyocardial biopsies, with *T.cruzi* search (histology, immunohistochemistry, and PCR analysi
- Search of *T.cruzi* in tissues (skin, bone marrow, among others) in a suspicion of *T.cruzi* infection
Frequency of procedures after transplantation
- First month: weekly
- Second month: every two weeks
- Third to sixth month: monthly
- Seventh to 12th month: every 3 months
- After 12 months: every six months
Etiological treatment of reactivation
- Benznidazole 5mg/Kg/day for 60 days

Adapted from references [25], and [26].

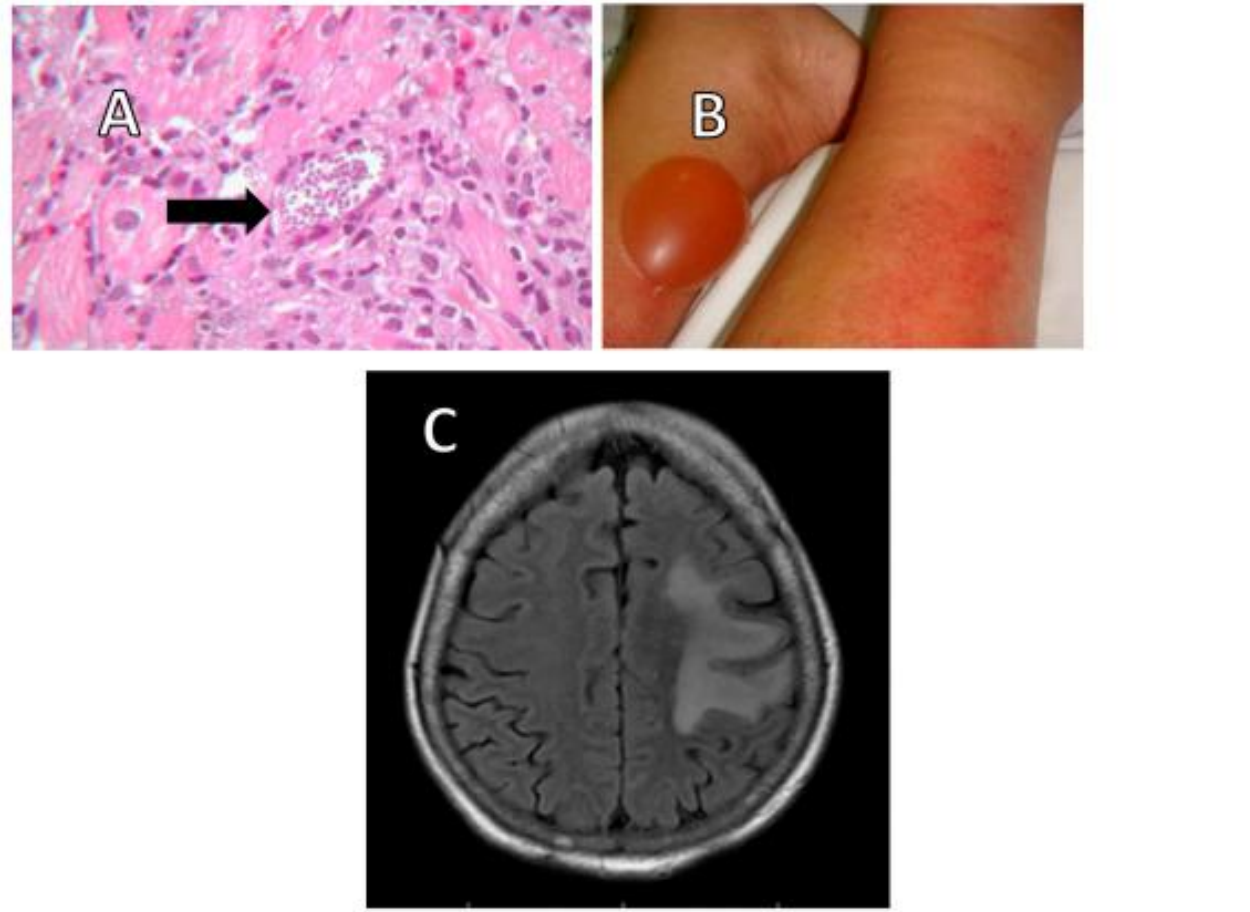


Figure 1 – Illustration of Chagas disease reactivation in the heart (A), skin (B), and brain (C) in chagasic patients submitted to HT.
A: Endomyocardial biopsy fragment showing myocarditis and a nest of amastigotes in the transplanted heart (hematoxylin-eosin staining). B: Bullous skin lesions and dermatitis in the legs. The bubble fluid analysis showed trypomastigote forms. C: Expansive lesion in the brain as shown by magnetic resonance imaging. A stereotaxic brain biopsy demonstrated nests of amastigotes upon hematoxylin-eosin staining and immunohistochemistry for T. cruzi and confirmed the diagnosis (not shown) (Authors file).

Interventions to reduce impact of *T cruzi* reactivation in SOT recipients

1. Screen candidates with epidemiological risk factors for *T cruzi* infection
2. Monitor chronically infected patients with PCR after transplant
3. Preemptive treatment for those with positive PCR results and decreasing Ct on serial testing

La Hoz RZ. Transplantation for Chagas' disease: closing the knowledge gap. *Curr Opin Infect Dis* 2022

Our protocol

CHAGAS

****Notifications that need to happen upon transplant (Send via email)**

Transplant ID Service Attending (cc Strassfeld)

Nicole Tate (Supervisor, Specimen Processing)

Dr. Xuan Qin (Microscopy/Pathology)

Dr. Luke Streich, Dr. Brinkerhoff, Dr. Kristina Wakeman (CV Pathology)

**HMW will send. If HMW on vacation, RN calling in patient to send notification

Immunosuppression

No induction at time of transplant

1500 MMF in OR

Start at 1000 BID MMF

Surveillance/Taper Schedule

PCRs should be drawn as early as possible in the week, as CDC will not accept specimens on weekends or holidays

Time	Surveillance	Prednisone Dose
Day 0-1		Solumedrol 500 mg iv pre- and intraop, then 125 mg q 8 hrs (3-5 doses)
Day 2		60/60
Day 3		50/50
Day 4		40/40
Day 5		70
Day 6		60
Week 1	Chagas PCR, Thick and thin blood smears	50
Day 8-13		40
Day 14 (Week 2)	EMB, Thick and thin blood smears and Chagas PCR	40
Day 15-20		35
Day 21 (Week 3)	EMB, Thick and thin blood smears and Chagas PCR	
Day 22-27		30
Day 28 Week 4	EMB, Thick and thin blood smears and Chagas PCR	Drop to 25 if bx ok

Week 5	Thick and thin blood smears and Chagas PCR	25
Week 6	EMB, Thick and thin blood smears and Chagas PCR	Drop to 20 if bx ok
Week 7	Thick and thin blood smears and Chagas PCR	20
Week 8	EMB, Thick and thin blood smears and Chagas PCR	Drop to 15 if bx ok
Week 9	Thick and thin blood smears and Chagas PCR	15
Week 10	EMB, Thick and thin blood smears and Chagas PCR	Drop to 10 if bx ok
Week 11	Thick and thin blood smears and Chagas PCR	10
Week 12	EMB, Thick and thin blood smears and Chagas PCR	Drop to 5 if bx ok
Week 14	EMB, Thick and thin blood smears and Chagas PCR	Drop to 2.5 if bx ok
Week 16 (Month 4)	EMB, Thick and thin blood smears and Chagas PCR	Stop Pred if bx ok
Week 18	Thick and thin blood smears and Chagas PCR	
Week 20 (Month 5)	EMB, Thick and thin blood smears and Chagas PCR	
Week 22	Thick and thin blood smears and Chagas PCR	
Week 24 (Month 6)	EMB, Thick and thin blood smears and Chagas PCR	Move to quarterly at month 6
Month 9	EMB, Thick and thin blood smears and Chagas PCR	
Month 12	EMB, Thick and thin blood smears and Chagas PCR	
Month 15	Thick and thin blood smears and Chagas PCR	
Month 18	EMB, Thick and thin blood smears and Chagas PCR	

****Orders**

Parasites, Blood (Malaria, Non-Mal) LAB00204

Under comments: Chagas patient thick and thin blood smears

Chagas PCR to CDC

Lab Other LAB00906- Use smartphrase CHAGASPCR to populate comments (nurses and APPs all are users)

Notify Dr. Strasfeld and HMW the day prior to Chagas PCR draw (to coordinate with CDC and OSPHL)

Notify Dr. Qin AND CV Pathology team to be aware of incoming specimens

**** See next section for details**

Patient update

- Transplant on [redacted]/24
  - Induction basiliximab
  - Required placement of RVAD, AKI (resolved) requiring RRT, ischemic colitis with Klebsiella & Citrobacter bacteremia
- Weekly Chagas PCR & smear ([redacted] →)

- Chagas PCR positive [redacted], [redacted] (Ct 28.43/27.98 -> 25.93/26.86) → benznidazole (150 mg BID) begun [redacted]

- [redacted] & subsequent: Chagas PCR negative

- Nausea/vomiting, headache, tingling sensation fingers, transient facial numbness → benznidazole held 8/29
- Headache and nausea management
- Benznidazole resumed [redacted] (completed 8 weeks of therapy)

- [redacted] visit: hand/foot tingling & heel pain (→ resolved)

- No rejection to date
- Prednisone discontinued [redacted]/24
- On tacrolimus & sirolimus (previously MMF)

- Subsequent Chagas PCR undetected

A case I’m working on

- [redacted] with positive T cruzi screening antibody, performed in context of evaluation for 2nd kidney transplant
  - Hemagen EIA POSITIVE (1.2, at cutoff), Labcorp
- First transplant in 2018, for glomerulonephritis → allograft rejection (high-dose steroids in 2022)
- New diagnosis heart failure in [redacted] 2025, TTE 9/11 with EFT 35% and severe left chamber involvement, etc. Angiogram without CAD.
  - ➢? Chagas cardiomyopathy
- 2nd confirmatory Chagas serology obtained
  - Roche cobas Elecsys NEGATIVE, Eurofins Viracor

Chagas testing options

Test name • Lab(s)	Methodology/target(s)	Diagnostic vs donor screening
Abbott Alinity s Chagas	• Chemiluminescent microparticle immunoassay (CMIA) • T cruzi recombinant antigens (FP10, FP6, FP3, TcF)	Donor screening
Roche cobas Elecsys Chagas • Eurofins Viracor, etc.	• Electrochemiluminescent assay (ECLIA) • T cruzi recombinant antigens derived from FCaBP, FRA and Cruzipain	Donor screening
Abbott ESA Chagas	• Nitrocellulose strip confirmatory assay • T cruzi recombinant antigens (FP10, FP6, FP3, TcF)	Supplemental test in donors who test positive with first-line assays, not approved for individual diagnosis
Hemagen Chagas' Kit • ARUP, LabCorp, UCSF, NYS PHL, etc.	• EIA • Purified antigens from cultured T cruzi	Diagnostic
Chagatest ELISA recombinant v 3.0, Wiener Laboratories • ARUP, Kephera, LabCorp, Mayo, Quest, UCSF, NYS PHL, etc.	• EIA • Recombinant epimastigote and trypomastigote proteins	Diagnostic
Chagas Detect Plus Rapid Test (RDT), InBios • Mayo, Quest, UCSF, NYS PHL	• Immunochromatographic strip assay • ITC8.2, recombinant multiepitope fusion antigen	Diagnostic
Chagas serology - TESA immunoblot • CDC, Kephera	• Western • T cruzi trypomastigote excretory secretory antigens	Diagnostic, confirmatory

Gratitude to Sue Montgomery, CDC parasitology branch, for collaboration on this table

A call from your transplant surgeon

- Local donor, kidney offer
- Donor *T cruzi* antibody positive

- Can we proceed??

32 organ transplant recipients from 14 seropositive donors in the United States, 2001-2011

- Transmission confirmed in 9 recipients from 6 donors
  - 3/4 (75%) heart recipients
  - 2/10 (20%) liver recipients
  - 2/15 (13%) kidney recipients
- 13 recipients had no or incomplete monitoring
  - transmission in 5/13
  - 4/5 had symptomatic Chagas disease
  - 4 died (1 death directly related to Chagas disease)
- 19 recipients had partial or complete monitoring
  - transmission in 4/19, no cases of symptomatic disease

➢Liver & kidney transplant from *T cruzi* seropositive donors may be feasible with recommended monitoring and prompt treatment (benznidazole).

Huprikar S, … Montgomery S. Donor-derived Trypanosoma cruzi infection in solid organ recipients in the United States, 2001-2011. *Am J Transplant* 2013.

Received: 21 January 2020 | Revised: 21 May 2020 | Accepted: 19 June 2020

DOI: 10.1111/ajt.16178

ORIGINAL ARTICLE

AJT

Ten years of donor-derived disease: A report of the disease transmission advisory committee

Daniel R. Kaul[1] | Gabe Vece[2] | Emily Blumberg[3] | Ricardo M. La Hoz[4] | Michael G. Ison[5] | Michael Green[6] | Timothy Pruett[7] | Michael A. Nalesnik[8] | Susan M. Tlusty[2] | Amber R. Wilk[2] | Cameron R. Wolfe[9] | Marian G. Michaels[6]

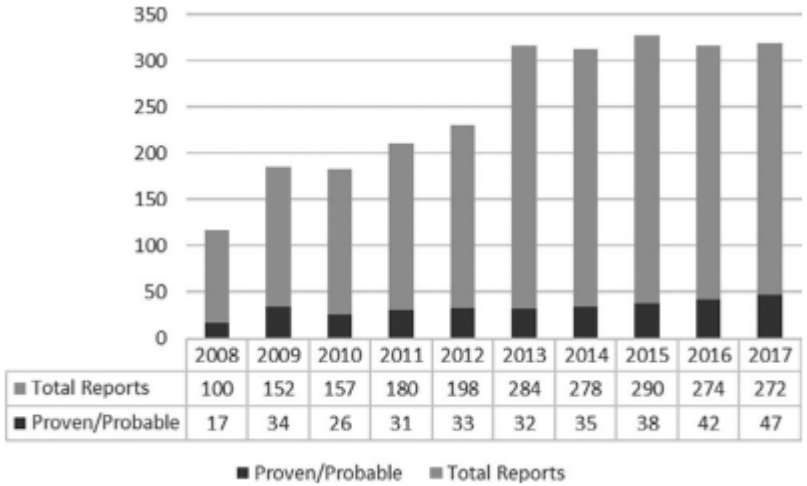


TABLE 5 (Continued)

Type	Total Reports	Total P/P Donors	Total Recipients from P/P Donors	Recipients with Transmission ÷ Exposed Recipients								Recipients with P/P Transmission ÷ Recipients from P/P Donors	Graft Loss	Total Transmission-Related Deaths ÷ Recipients with P/P Transmission	Recipients with P/P Transmission per 10,000 Transplanted Recipients During 2012-2017	Transmission-Related Deaths per 10,000 Transplanted Recipients During 2012-2017
				kidney	pancreas	kidney/panc	liver	heart	lung	heart/lung	intestine					
Total Fungal	**237**	**35**	**115**	**18/52**	**0/0**	**0/3**	**11/30**	**6/13**	**15/20**	**0/0**	**0/0**	**41.7%**	**9**	**14.6%**	**2.67**	**0.39**
Mycobacteria																
Tuberculosis	63	3	12	0/4	0/0	0/1	0/3	0/2	3/3	0/0	0/0	25.0%	0	0.0%	0.17	0.00
Parasite																
Strongyloides	52	10	29	3/12	0/0	3/3	5/9	1/3	3/3	0/1	1/1	44.8%	1	30.8%	0.72	0.22
Toxoplasmosis	18	8	30	2/12	0/1	0/1	2/7	4/6	1/3	0/0	0/0	30.0%	0	55.6%	0.50	0.28
Trypanosomiasis	7	1	5	0/2	0/1	0/0	1/1	0/0	0/1	0/0	0/0	20.0%	0	0.0%	0.06	0.00
Other	20	4	11	4/4	0/0	0/0	2/3	1/2	2/2	0/0	0/0	81.8%	2	22.2%	0.50	0.11
Total Parasite	**97**	**23**	**75**	**9/30**	**0/2**	**3/4**	**10/20**	**6/11**	**6/9**	**0/1**	**1/1**	**42.7%**	**3**	**34.4%**	**1.78**	**0.61**

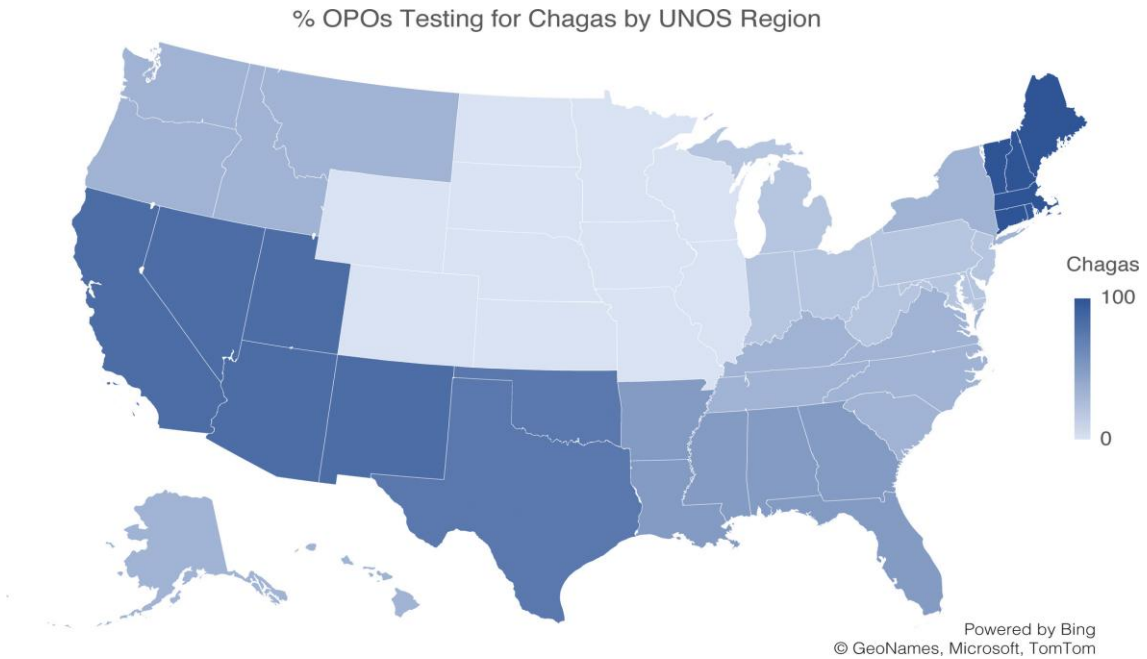
Received: 1 November 2020 | Revised: 18 January 2021 | Accepted: 15 February 2021
DOI: 10.1111/ajt.16552

BRIEF COMMUNICATION

AJT

Testing deceased organ donors for infections: An organ procurement organization survey

Nicole M. Theodoropoulos[1] | Melissa A. Greenwald[2] | Peter Chin-Hong[3] | Michael G. Ison[4,5,6]



Seventeen (37%) OPOs tested for Chagas disease (*Trypanosoma cruzi*); seven tested all donors, while 10 tested based on travel history or nation of birth

American J Transplantation, Volume: 21, Issue: 5, Pages: 1924-1930, First published: 23 February 2021, DOI: (10.1111/ajt.16552)

OPTN

Notice of OPTN Guidance Change

Recognizing Seasonal and Geographically Endemic Infections in Organ Donors: Considerations during Deceased and Living Donor Evaluation

Sponsoring Committee:	Ad Hoc Disease Transmission Advisory
Public Comment:	July 27, 2023- September 19, 2023
Board Approved:	December 4, 2023
Effective Date:	January 10, 2024

New screening policy approved in 2024, implemented as of October 1, 2025

Who Should Be Screened

Living and Deceased Donors

Deceased donors who were born in a country currently classified as endemic for Chagas disease by the CDC must be screened according to OPTN Policy 2.9 pending implementation of *Improve Deceased Donor Evaluation for Endemic Diseases*[220] and is recommended until then. Screening is recommended for living donors born in a country currently classified as endemic for Chagas CDC by the CDC as well.

Screening should also be considered for living and deceased donors in the following circumstances:

- Children of women born in endemic regions if their birth mother's serology is positive or unknown
- Donors who have resided in an endemic region for more than three months
- Donors who received a blood transfusion in endemic regions and those who have a previous diagnosis of Chagas disease
- Symptomatic donors who have chronic infection and may present with cardiomyopathy, cardiac conduction abnormalities, megaesophagus, megacolon

Countries currently classified as endemic for Chagas disease by the CDC:

Argentina
Belize
Bolivia
Brazil
Chile
Colombia
Costa Rica
Ecuador
El Salvador
French Guiana
Guatemala
Guyana
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
Suriname
Uruguay
Venezuela

https://www.hrsa.gov/sites/default/files/hrsa/optn/policy_notice_dtac_endemic_guidance.pdf

Chagas testing options (circa 2023)

Table 2: Serological Tests Available for *T. cruzi Infection*

Test name, Manufacturer	Target Antigen	Test Format	Sample Type	FDA-cleared/approved use
Abbott Prism Chagas (T. cruzi [E. coli, recombinant] antigen)[221], Abbott Laboratories, Abbott Park, IL	*T. cruzi* recombinant antigens (FP10, FP6, FP3, TcF)	ChLIA[222]	Serum/plasma	Donor screening
ORTHO T. cruzi ELISA Test System Ortho-Clinical Diagnostics, Inc. Raritan, NJ	Whole cell lysate	EIA[223]	Serum/plasma	Donor screening, individual diagnostics
Chagatest ELISA recombinant v.3.0 [224]Wiener Laboratories S.A.I.C., Rosario, Argentina	Recombinant epimastigote and trypomastigote Proteins	EIA	Serum/plasma	Diagnosis, NOT donor screening test
Hemagen Chagas' Kit, Hemagen Diagnostics, Inc., Columbia, MD	Purified antigens from cultured *T. cruzi*	EIA	Serum	Diagnosis, NOT donor screening test
Abbott ESA Chagas Assay, Abbott Laboratories, Abbott Park, IL	*T. cruzi* recombinant antigens (FP10, FP6, FP3, TcF)	Enzyme Strip Assay	Serum/plasma	Supplemental test in donors who test positive with first-line assays, not approved for individual diagnosis

*Serologic testing may also be available through the CDC

- "*For access to testing of transplant recipients at risk for reactivation of Chagas, contact the CDC Division of Parasitic Diseases and Malaria at 404-718-4745 (business hours) or 770-488-7100 (nights and weekends) or via e-mail at parasites@CDC.gov.*"

https://www.hrsa.gov/sites/default/files/hrsa/optn/policy_notice_dtac_endemic_guidance.pdf

Chagas testing options - updated

Test name • Lab(s)	Methodology/target(s)	Diagnostic vs donor screening
Abbott Alinity s Chagas	• Chemiluminescent microparticle immunoassay (CMIA) • T cruzi recombinant antigens (FP10, FP6, FP3, TcF)	Donor screening
Roche cobas Elecsys Chagas • Eurofins Viracor, etc.	• Electrochemiluminescent assay (ECLIA) • T cruzi recombinant antigens derived from FCaBP, FRA and Cruzipain	Donor screening
Abbott ESA Chagas	• Nitrocellulose strip confirmatory assay • T cruzi recombinant antigens (FP10, FP6, FP3, TcF)	Supplemental test in donors who test positive with first-line assays, not approved for individual diagnosis
Hemagen Chagas' Kit • ARUP, LabCorp, UCSF, NYS PHL, etc.	• EIA • Purified antigens from cultured T cruzi	Diagnostic
Chagatest ELISA recombinant v 3.0, Wiener Laboratories • ARUP, Kephera, LabCorp, Mayo, Quest, UCSF, NYS PHL, etc.	• EIA • Recombinant epimastigote and trypomastigote proteins	Diagnostic
Chagas Detect Plus Rapid Test (RDT), InBios • Mayo, Quest, UCSF, NYS PHL	• Immunochromatographic strip assay • ITC8.2, recombinant multiepitope fusion antigen	Diagnostic
Chagas serology - TESA immunoblot • CDC, Kephera	• Western • T cruzi trypomastigote excretory secretory antigens	Diagnostic, confirmatory

Gratitude to Sue Montgomery, CDC parasitology branch, for collaboration on this table

Donor-derived transmission: mitigation

- Screening of living donors & deceased donors with epidemiological risk
- Non-cardiac organs from *T cruzi* infected donors can be utilized after obtaining consent from the intended recipient
- PCR monitoring with preemptive treatment (after a single positive PCR) in the recipient

Summary points

- The evolving epidemiology of *T cruzi* infection has implications for screening, and specifically for management of patients with anticipated immune suppression.

- Heart transplant is a viable approach for management of heart failure in patients with chronic Chagas cardiomyopathy, provided care includes consultation with experts and access to preemptive monitoring by PCR.

- Donor-derived Chagas disease has been reported. Current screening guidelines are designed to mitigate risk for donor-derived disease.