Chagas Disease ECHO Series

Extension for Community Healthcare Outcomes

Congenital and Pediatric Chagas Disease in the USA

Session 2 of 4 Part Series

January 10th, 2024 | 12:00 PM ET / 9:00 AM PT

Agenda

- Welcome
- Introductions and Announcements
  - ECHO Hub Team
  - CDN Team
- Presentations
  - Dr. Morven Edwards, MD
  - Nancy Jenks, FNP
- Q&A
- Closing Remarks

WHO WE ARE – THE ECHO HUB TEAM

Rockefeller University
- Jonathan Tobin, PhD

Clinical Directors Network
- Jonathan Tobin, PhD
- Marija Zeremski, PhD
- Melissa Samanoglu
- Monisa Nayim

Texas State University
- Zo Ramamanjiarvielo, PhD

San Diego State University
- Paula Stigler Granados, PhD
- Michael Vingiello, MPH

University of Texas Health Science Center (UTHealth), San Antonio
- Shreya Prasanna, BPTh., MSc.
- Keito Kawasaki, MPH

CHAGAS DISEASE 4-PART SERIES

Today's Session: Congenital and Pediatric Chagas Disease in the USA

Upcoming Sessions:
- **February 7, 2024** - Chagas Disease as a Migrant Health Issue
- **March 6, 2024** - Interprofessional Team Approaches to Chagas Disease Management

Past Session:
- **December 6, 2023** - Chagas Disease in the USA: Screening, Diagnosis, and Treatment for Primary Care Clinicians

1.5 CME/CNE credit available for each session for total **6.0** credits for entire series provided by The American Academy of Family Physicians (AAFP)

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WITH EXTENSION FOR COMMUNITY HEALTHCARE OUTCOMES (ECHO) SESSIONS

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THE ROCKEFELLER UNIVERSITY CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE
Stavros Niarchos Foundation (SNF) Institute for Global Infectious Disease Research

RU-SNF Pilot Project:
Chagas Disease as an Emerging Infectious Disease in the USA

Funded by: the SNF Institute for Global Infectious Disease Research,
NCATS NIH CTSA #UL1-TR-001866 and AHRQ grant #1P30-HS-021667

Sun River Health · CDIPD Research Education Awareness, Center for Discovery and Innovation in Parasitic Diseases · Texas State University, The rising STAR of Texas · Project ECHO · UT Health San Antonio · Migrant Clinicians Network MCN · UC San Diego · SDSU San Diego State University · USCCN · BCM Baylor College of Medicine · National School of Tropical Medicine

Clinical Directors Network, Inc. (CDN)

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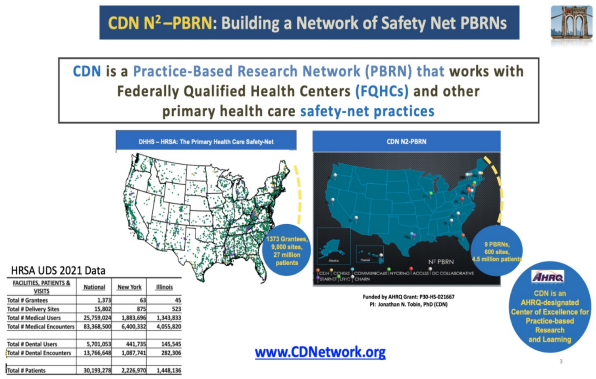


FACILITIES, PATIENTS & VISITS	National	New York	Illinois
Total # Grantees	1,373	63	45
Total # Delivery Sites	15,802	875	523
Total # Medical Users	25,759,024	1,883,696	1,343,833
Total # Medical Encounters	83,368,500	6,400,332	4,053,820
Total # Dental Users	5,701,053	441,735	145,545
Total # Dental Encounters	13,766,648	1,087,741	282,306
Total # Patients	30,193,278	2,226,970	1,448,136

PRESENTER

Dr. Morven S. Edwards, MD

- Dr. Edwards is an Attending Physician in the Division of Infectious Diseases at Texas Children's Hospital and Professor of Pediatrics at Baylor College of Medicine. Her research interests include group B streptococcal infections in infants, children and adults, and congenital Chagas disease.

PRESENTER

Nancy Piper Jenks, FNP

- Nancy Piper Jenks, MS, CFNP,MFTM RCPS (Glas), FAANP is a primary care practitioner in internal medicine at Sun River Health. She is a specialist in travel medicine, with a particular interest in tropical diseases and immigrant health.
- She has been the GeoSentinel site director at SRH for over 20 years, tracking infectious diseases in migrant populations. She has published in the peer-reviewed medical literature on topics that include Hepatitis E in travelers, enteric fever, strongyloidiasis in migrants, MRSA and Lyme disease in immigrant populations.

DISCUSSION FACILITATOR

Dr. Paula Stigler Granados, PhD

- Dr. Paula Stigler Granados is an Associate Professor in the School of Public Health and Division Head of the Environmental Health Division.
- She is a subject matter expert in Chagas disease and has been the PI for the last 8 years on a Center for Disease Control funded cooperative agreement award to raise awareness among healthcare providers in the U.S. about Chagas disease. She also works with the U.S. military on Chagas disease surveillance activities and helped launch the Texas Chagas Taskforce in 2015.

REMINDERS

Click "Live Transcript" button to enable Closed captioning

Complete evaluation survey upon exit

Use Zoom Q & A to ask a question

Session is being recorded

- Will be posted to our website within 1 week
- Available with our previous recordings https://wp.uthscsa.edu/echo/echo-programs/chagas-disease/

Use Zoom chat feature for comments/reactions/intros

CME/CNE Evaluation

- To obtain CME/CNE credit, you must complete the evaluation form
- This session has been approved for 1.5 CME/CNE prescribed credits by the American Academy of Family Physicians (AAFP)
- **CME/CNE Evaluation Link:** https://www.proprofs.com/quiz-school/ugc/story.php?title=chagas-disease-echo-educational-series-session-2-11024d8

Thank You!

- CME certificates will be issued within 3 weeks following this session
- Recordings of the sessions will be made available for CME/CNE
- If you have any questions, please reach out to **chagasus@gmail.com**

This work is supported by the Cooperative Agreement Number, 6 NU2GGH002323-01-01, funded by the Centers for Disease Control and Prevention. The contents of this webinar are solely the responsibility of the presenters and do not necessarily represent the official views of the Centers for Disease Control and Prevention or the Department of Health and Human Services.

Congenital and Pediatric Chagas Disease in the USA

Chagas Disease ECHO Educational Series
January 10, 2024

Texas Children's Hospital

Morven S. Edwards, M.D.
Professor of Pediatrics
Division of Infectious Diseases
Baylor College of Medicine
Houston, Texas

Baylor College of Medicine
GIVING LIFE TO POSSIBLE

Objectives

- Cite the population at risk for congenital Chagas disease in the United States
- Describe the clinical features of congenital Chagas disease
- Understand how to establish the diagnosis of congenital Chagas disease
- Know which US children are at risk for Chagas disease

Medical News & Perspectives

Putting Chagas Disease on the US Radar Screen

Bridget M. Kuehn, MSJ

- "In the Los Angeles clinic of Sheba Meymandi, MD, about 20% of Latin American patients with heart failure can trace their illness to a cause many US physicians would never suspect: Chagas disease."
- "Chagas disease is joining an increasing list of infectious diseases such as dengue and chikungunya that are a concern in the United States."
- "It's not an exotic disease any more".

***JAMA* March 24/31, 2015; 313:1195.**

What is Chagas Disease?

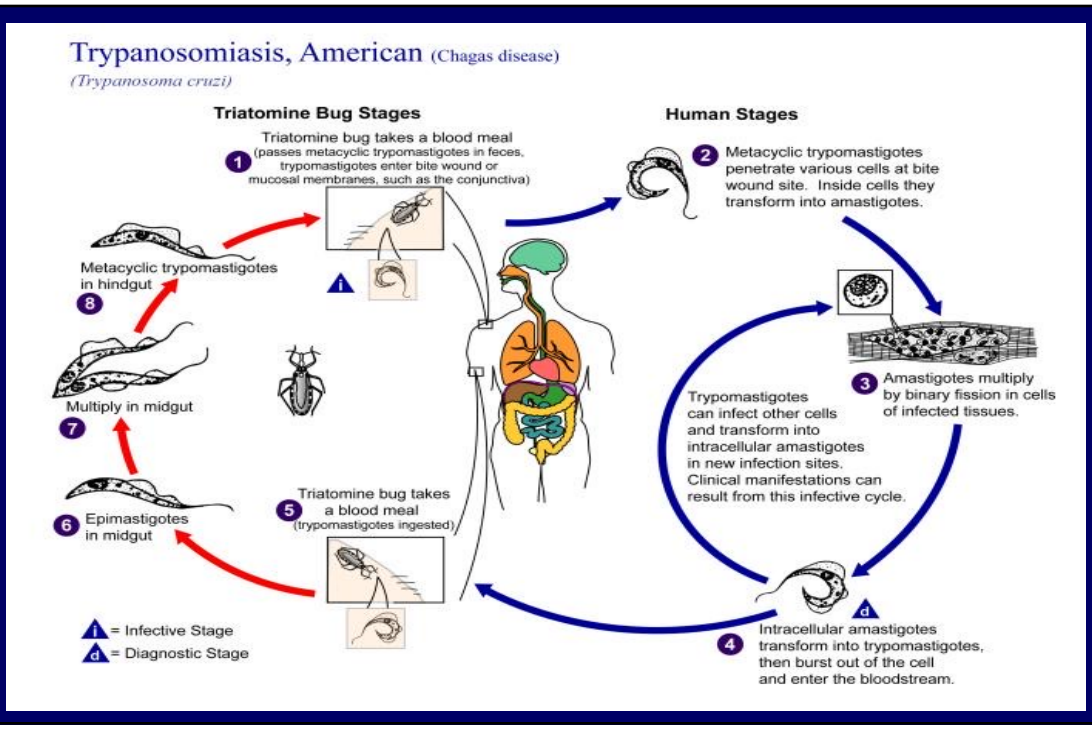
- Chagas disease is a vector-borne zoonosis with many animal reservoirs that is caused by the parasite, *Trypanosoma cruzi.* The parasite can be transmitted from mother to infant during pregnancy
- Most people who have Chagas disease live, or have lived in, Mexico, Central America or South America
- The parasite is only found in the Americas. An estimated 6 million people have Chagas disease
- Without treatment, Chagas disease is a lifelong infection. Approximately 1.2 million people have Chagas cardiomyopathy

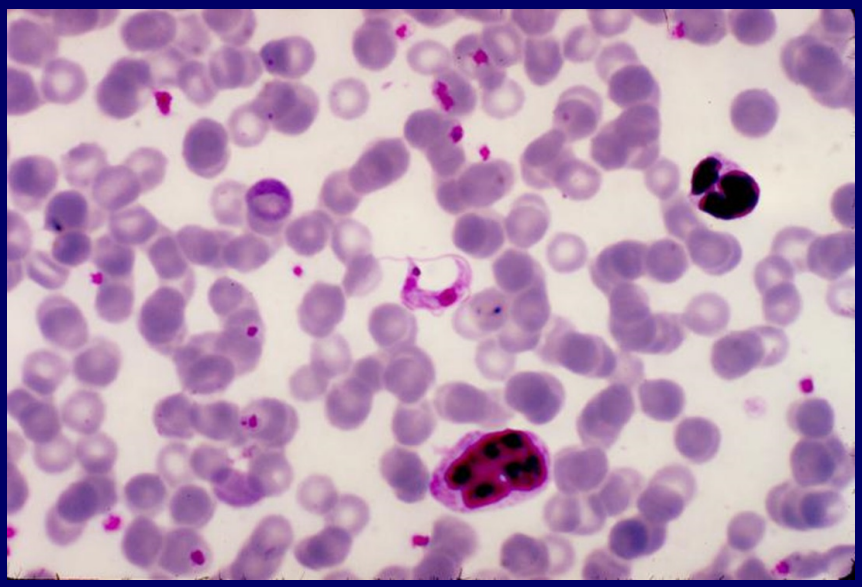
Photo: Carlos Chagas in 1909 in his laboratory at the Instituto Oswaldo Cruz
Bern C et al. *Clin Microbiol Rev* 2019;33(1):e00023-19

The triatomine bug, sometimes known as the kissing bug, is the vector for Chagas disease. The bug becomes infected after biting an animal or a person who is already infected with *T. cruzi*.

Triatomines defecate during or after taking a blood meal. A person bitten is inoculated by rubbing insect feces into the bite or on mucous membrane.

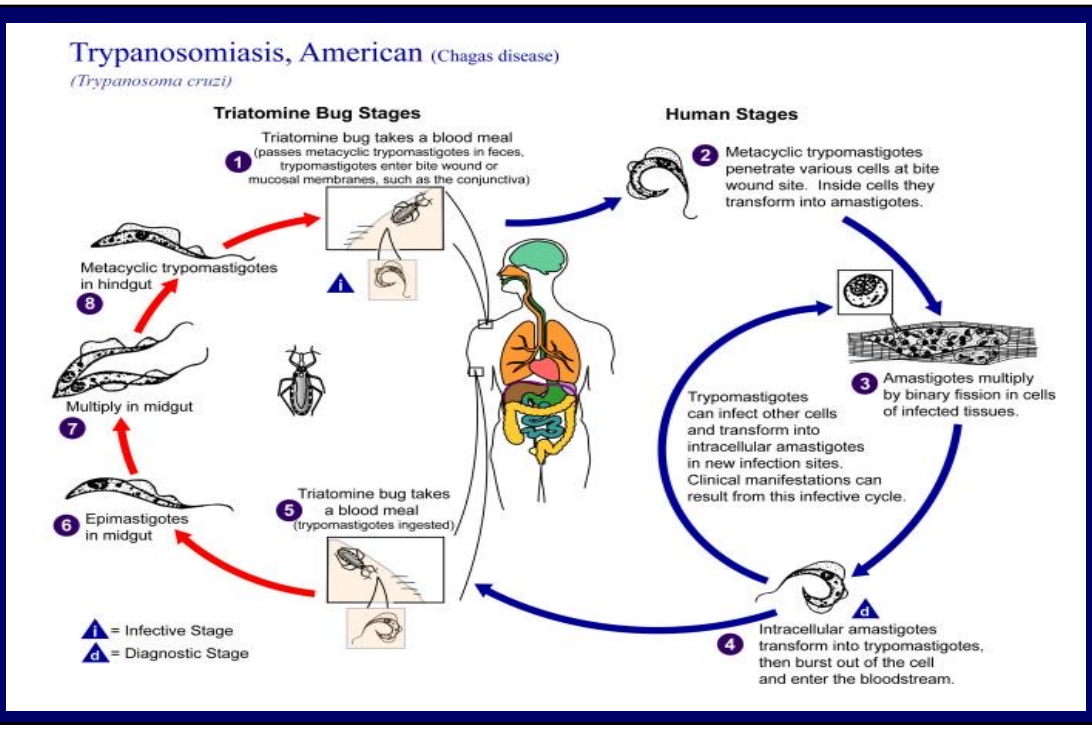
CDC Public Health Image Library

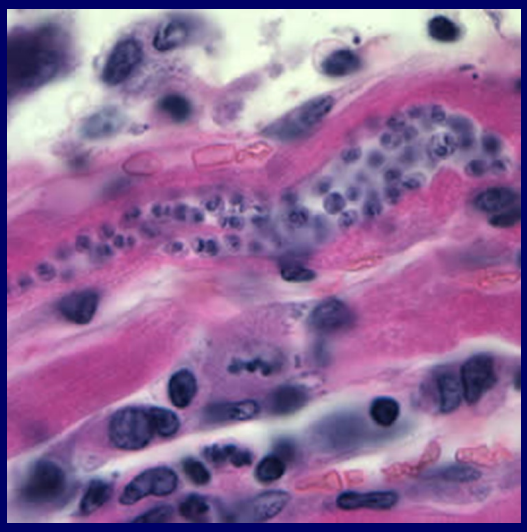




Blood smear with a *T. cruzi* trypomastigote, the extracellular form of the parasite

CDC Public Health Image Library

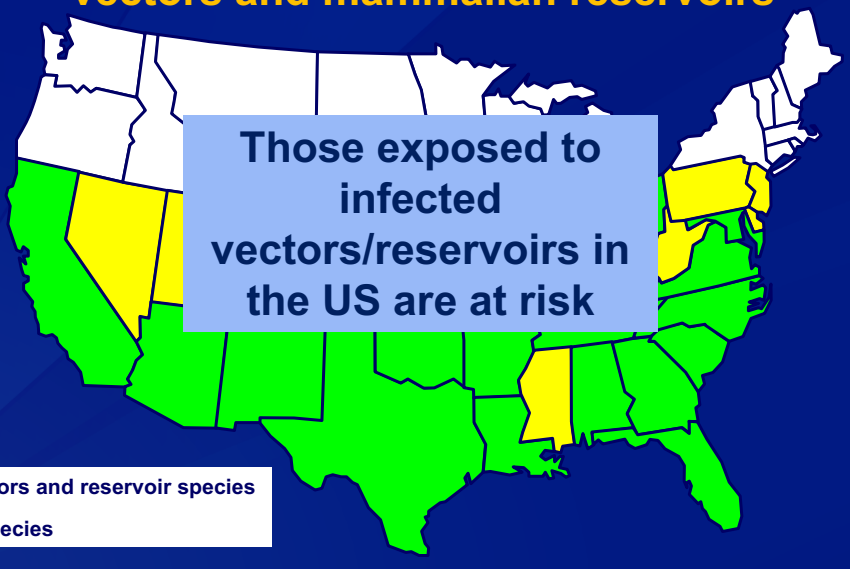




Trypanosoma cruzi amastigotes in infected heart muscle tissue

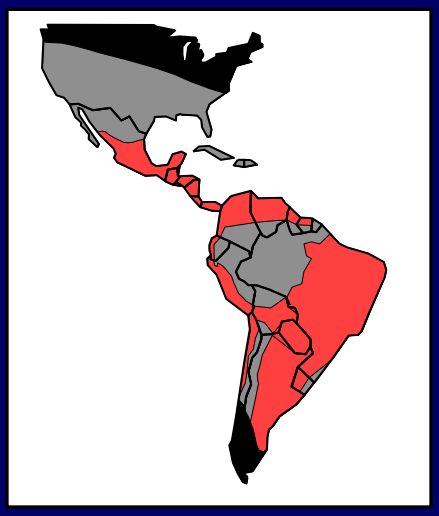
CDC DPDx-Laboratory Identification of Parasites of Public Health Concern. Available at: https://www.cdc.gov/dpdx/trypanosomiasisamerican/index.html

States with documented vectors and mammalian reservoirs



> 18 infected reservoir species identified

Distribution of Vectors and Disease



- Endemic for human Chagas disease
- Infected vectors, nonhuman mammals*

Panstrongylus megistus

***Including opossums, raccoons, foxes, armadillos, skunks, squirrels, dogs.**

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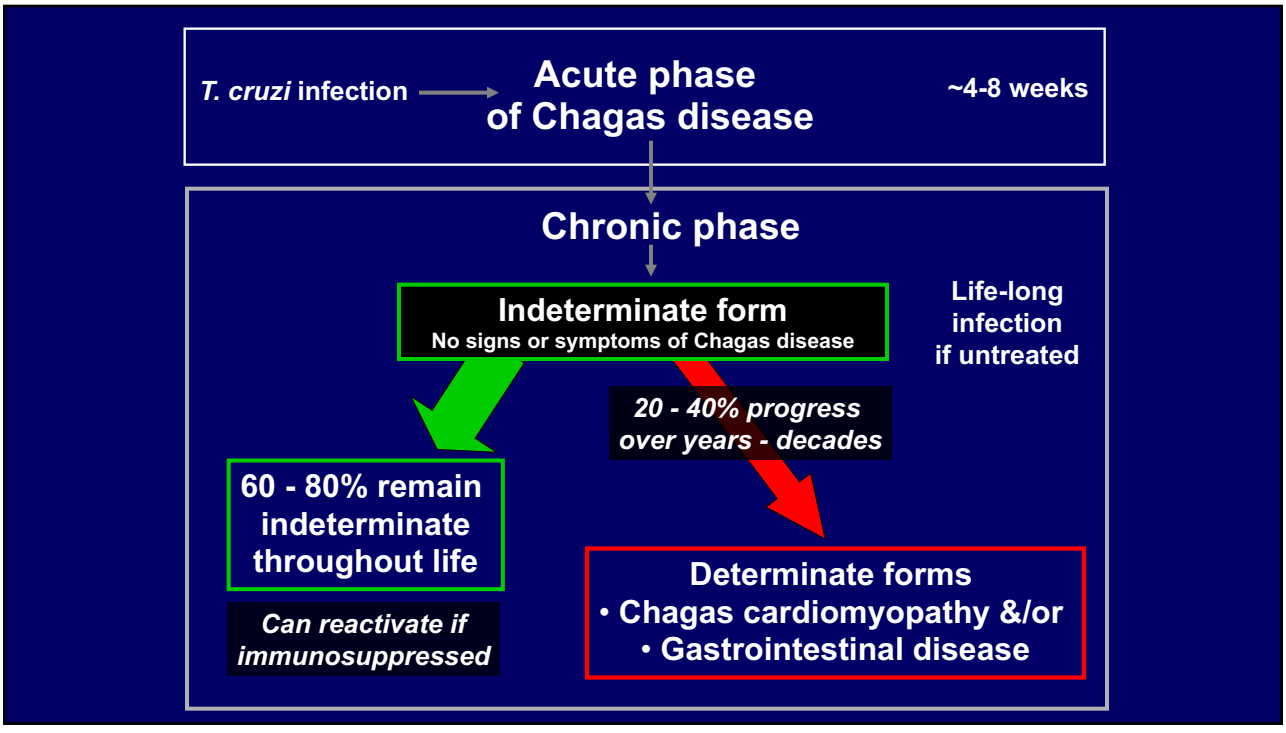
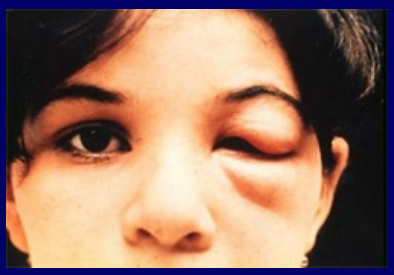
Chagas Disease in the United States

- The largest group of women with Chagas disease living in the United States are immigrants from Mexico, El Salvador, Guatemala or Honduras
- An estimated 288,000 to 300,000 *T. cruzi-infected* persons live in the United States
- An estimated 43,000 women of childbearing age who have chronic Chagas disease live in the United States. Infants of these women are at risk for congenital Chagas disease
- Between 22 and 315 infants with congenital Chagas disease are born yearly in the United States

Bern C, Montgomery SP. *Clin Infect Dis* 2009; 49:e52.
Irish A et al. *Emerg Infect Dis* 2022; 28:1313.

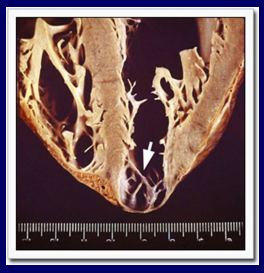




Chagoma or Romaña sign is thought to be from parasite penetration of the conjunctiva. The swelling is firm and lasts weeks

Photos from CDC

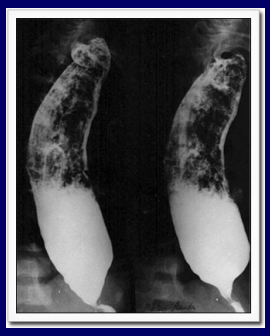
Chagas Cardiomyopathy



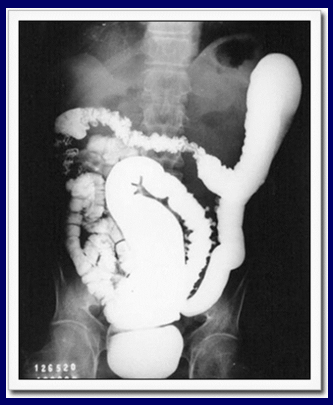
- Chagas heart disease results from chronic inflammation of the heart chambers and damage to the conduction system
- The pathogenesis is thought to involve parasite persistence in cardiac tissue and immune-mediated myocardial injury
- Early manifestations include conduction system abnormalities and segmental left ventricular wall motion abnormalities
- Later findings can include ventricular tachycardia, atrioventricular block or apical aneurysm with risk of sudden death

Photo by Dr. Anis Rassi, Jr.

Chagas Gastrointestinal Disease



Digestive Chagas disease is thought to be caused by parasitic damage to intramural neurons. The effects on the esophagus range from motility disorders to severe megaesophagus.

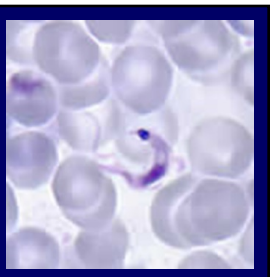


Involvement of the colon can cause constipation, abdominal pain and fecaloma.

Gastrointestinal Chagas disease occurs predominantly in patients infected in Argentina, Bolivia, Chile, Paraguay, Uruguay, and southern Brazil. This pattern is likely linked to differences in predominant *T. cruzi* genotypes.

Photos by Dr. Anis Rassi Jr.

Modes of Transmission



- Vector-borne: Contact with an infected triatomine bug is the most common mode of transmission
- Bloodborne: Contaminated blood products, organs or tissue
- Food or waterborne: In endemic regions, drinking water contaminated with triatomine bug feces or eating contaminated foods
- Laboratory accidents: Rare mode of transmission
- Congenital: Mothers with Chagas disease can transmit infection to their infants. An estimated 23% of infections occur through congenital transmission

Bern C et al. *Clin Microbiol Rev* 2019; 33:e00023-19.
Photo: *Trypanosoma cruzi* parasite in a thin blood smear. CDC photo.

Mother-to-Child Transmission of *T. cruzi*

- Transmission occurs transplacentally in the 2nd or 3rd trimester of gestation. There is little evidence to suggest intrapartum or postpartum transmission
- Mothers usually asymptomatic
- Mother-to-infant transmission rates are 1% to 5%
- Transmission rates are higher (5%) in countries where *T. cruzi* is endemic than in those where it is not (3%)*

*Howard et al. *BJOG* 2014; 121:22.

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Congenital Chagas Disease

- An estimated 43,000 infected women of childbearing age live in the United States; an estimated 22-315 infected infants are born each year*
- Most congenitally infected infants appear at healthy at birth; untreated, they are at risk for developing life-threatening cardiac or GI disease decades later
- 10% to 40% of infants have clinical signs at birth with findings that can include prematurity, hepatosplenomegaly, jaundice, anemia and thrombocytopenia; none is specific for Chagas disease

Bern & Montgomery. *Clin Infect Dis* 2009; 49:e52.
Beukens et al. *Mat Child Health* 2008; 12:283.

Congenital Chagas Disease: Initial U.S. Report

- Congenital Chagas disease in the United States was first reported in a boy born in Virginia in 2010. His mother had moved recently to the United States from Bolivia.*
- The infant was born at 29 weeks' gestation by C-section for fetal hydrops. His birth weight was 1,840 g. APGAR scores were 6 at 1 and 9 at 5 minutes. He had ascites and pleural and pericardial effusions
- Blood smear in week 2 of life revealed *T. cruzi* trypomastigotes and *T. cruzi* PCR was strongly positive; serologic tests for *T. cruzi* antibodies were positive
- He received benznidazole for 60 days and was cured

***CDC. Congenital transmission of Chagas disease- Virginia, 2010. *MMWR* 2012; 61:477.**

Signs of Congenital Chagas Disease in 91 Infants

Feature	Frequency of Finding[b]
Low birth weight (<2500 g)	++++
Prematurity	++
Respiratory distress	+++
Hepatomegaly	++++
Splenomegaly	+++
Sepsis	++
Cardiomegaly/heart failure	++
Myocarditis	++
Cardiac arrhythmia	++
Meningoencephalitis	++
Neurologic signs	++
Edema/anasarca	++
Petechiae	++
Anemia	+

[a]Adapted from references 33, 43, 45, and 46. Not all infants had each feature assessed. The remaining 110 infants infected with *T cruzi* had no clinical signs of Chagas disease.
[b]++++, noted in >50% of infants assessed; +++, 25% to 50%; ++, 10% to 24%; +, <10%.

Edwards MS et al. *J Pediatr Infect Dis Soc* 2019; 8:461.

Congenital Chagas Disease Differential Diagnosis

- Congenital Chagas disease can mimic congenital infections such as syphilis, cytomegalovirus (CMV) and toxoplasmosis or fetal hydrops from intrauterine parvovirus B19 infection
- Prematurity or low birth weight, hepatosplenomegaly and petechiae are common in infants with congenital syphilis or CMV
- Congenital Chagas disease can mimic noninfectious conditions including congestive heart failure or respiratory distress syndrome

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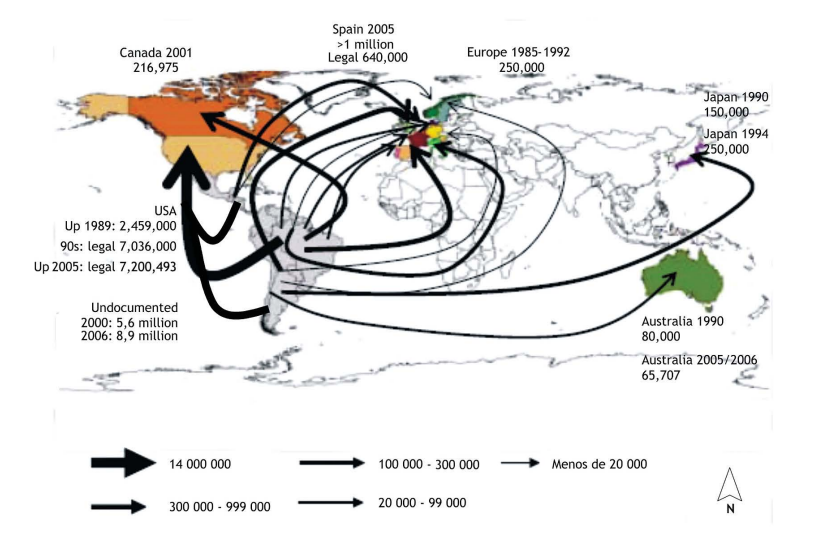
Pregnancy-Based Screening for Chagas Disease Benefits Mother and Infant

- Pregnancy is the optimal access point for identifying Chagas disease at risk family units because delivery is the most likely time for contact with the healthcare system
- Women at risk have migrated from an endemic region
  - ➔ Risk is enhanced by having lived in a rural region
  - ➔ Having lived in a mud or thatched-roof home also increases risk
- Women who have visited and lived in an endemic region for 6 months or longer are also at risk
- Women at risk for Chagas disease should have pregnancy-based screening for *T. cruzi* IgG

18 Million People in the US were Born in Mexico, Central or South America



Schmunis et al. *Mem Inst Osw Cruz* 2007.

Triatomine Bug Infestation of a House in Mexico

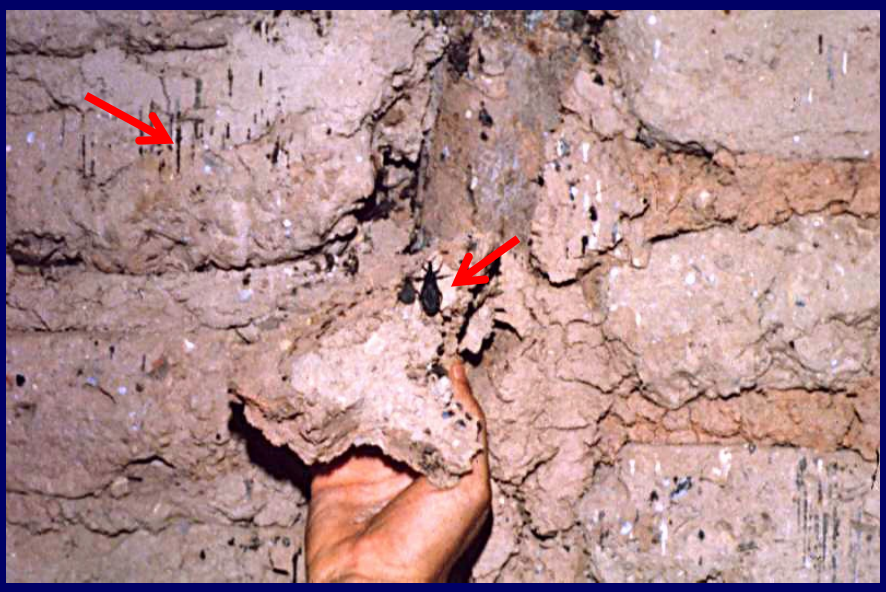
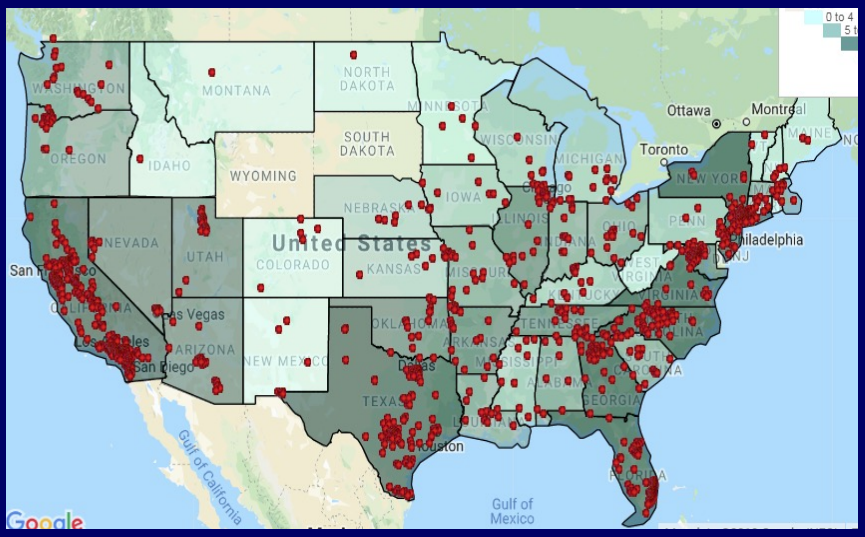


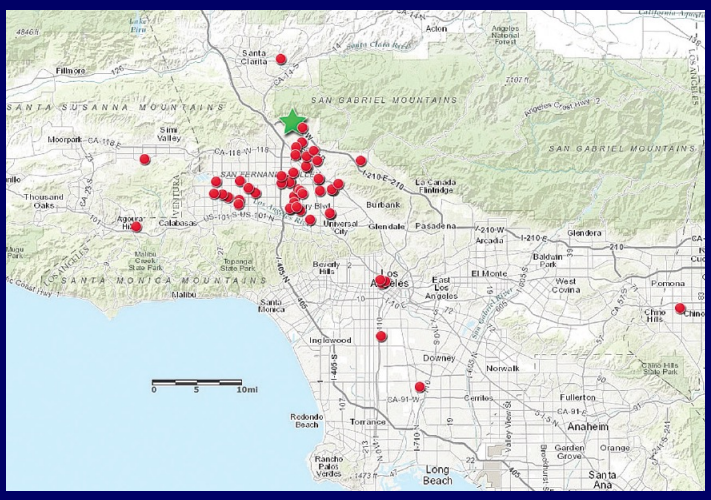
Photo from WHO at http://www.who.int/chagas/resources/photo_gallery/en/

American Association of Blood Banks (AABB): 2,437 Confirmed Positive Blood Donors 2007-2020*



*AABB Chagas Biovigilance Program

Chagas Disease Positive Persons in Los Angeles County, 2008-2014



Among 4,755 Latin American-born residents of Los Angeles County, 59 had Chagas disease for an overall prevalence of 1.24%.

Prevalence was highest among Salvadorans (3.45%) and, among those born in Mexico, from the states of Oaxaca (4.65%) and Zacatecas (2.2%).

>30,000 people living in Los Angeles county may have Chagas disease.

Meymandi SK et al. *Clin Infect Dis* 2017; 64:1182.

Challenges to Identifying Mothers and Infants with Chagas Disease

- Identifying maternal infection is key but mothers have no symptoms
- None of the findings in infant infection are specific for Chagas disease
- The diagnosis must be considered
- Screening during pregnancy or at delivery is key to identifying women and infants at risk but maternal screening is not standard of care
- The prevalence of infection among women of child-bearing age in the US is not known

Screening for Chagas Disease during Pregnancy

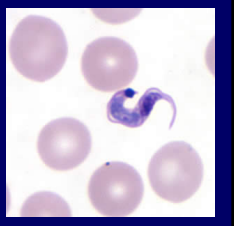
- Screening for Chagas disease can be performed during any trimester
- A commercially-available ELISA should be ordered to test for *Trypanosoma cruzi* IgG
- Chagas disease screening is a send-out test from most hospital laboratories. Results are available within days
- Chagas screening can be included with routine maternal screening
- It is not necessary or appropriate to screen for *T. cruzi* IgM

Pregnancy-Based Screening for Chagas Disease is Cost-Saving

- Pregnancy-based screening has the advantage that results are known at delivery. Screening at admission for delivery or screening of neonates are alternative approaches
- At current costs, targeted screening, including the cost of treatment, would result in savings of $1,314 per birth and $670 million in lifetime savings per birth-year cohort
- Universal screening and treatment would also be cost-saving

Perez-Zetune V et al. *Am J Trop Med Hyg* 2020; 102;1086

Evaluation for Suspected Congenital Chagas Disease



- Direct detection: Diagnostic if positive; less sensitive than PCR
- PCR: The most sensitive test for early diagnosis
  - → PCR for *T. cruzi* is available at the CDC; testing is under CLIA
  - → Initial negative should be repeated at 1 month of age as parasites multiply in the first weeks of life
- Maternal Serology: Order *T. cruzi* IgG if not performed during pregnancy
- Infant Serology: If PCR is negative and maternal serology is positive, follow infant's *T. cruzi* IgG. Negative serology at 9-12 months of age excludes congenital infection

Treatment of Chagas Disease

- Treatment is always indicated for congenital Chagas disease. Treatment early in life kills the parasite and prevents long-term complications from heart and intestinal disease; cure rates exceed 90%*
- Treatment is always indicated for women in the childbearing years**, both for the health of the woman and for the sake of her children
- Infection can be transmitted congenitally in sequential pregnancies among women chronically infected with *T. cruzi*

*** *MMWR* 2012; 61:477-9.**
****Bern C. Antitrypanosomal therapy for chronic Chagas' disease. *N Engl J Med* 2011; 364:2527.**

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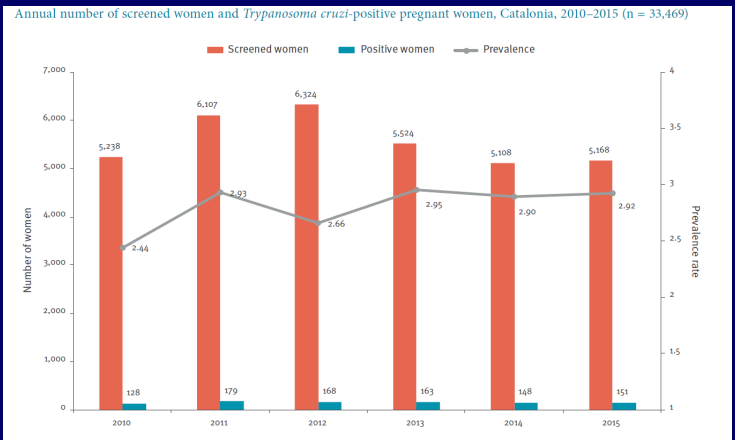
Epidemiology of congenital Chagas disease 6 years after implementation of a public health surveillance system, Catalonia, 2010 to 2015



33,469 pregnant women from endemic countries and those who had lived in a rural area of an endemic country were screened

The overall prevalence of maternal Chagas disease was 2.8%. Rates were highest in women from Bolivia (15.8%), El Salvador (1.4%) and Paraguay (1.2%)

28 infants were diagnosed with congenital Chagas disease (transmission rate 4.2%)

Basile L et al. *Euro Surveill.* 2019;24(26):pii=1900011. https://doi.org/10.2807/1560-7917.ES.2019.24.26.19-00011

Epidemiology of congenital Chagas disease 6 years after implementation of a public health surveillance system, Catalonia, 2010 to 2015

- Children born to *T. cruzi*-positive women before the current pregnancy were screened
- Among 178 children, 14 (7.9%) were diagnosed with Chagas disease. The children ranged in age from 3-18 (median 10) years of age
- Siblings of an index case of Chagas disease should also undergo screening

Basile L et al. *Euro Surveill.* 2019;24(26):pii=1900011. https://doi.org/10.2807/1560-7917.ES.2019.24.26.19-00011

Evaluation of Family Members

- If a mother is diagnosed with Chagas disease, her other children should undergo serologic testing; treatment is always indicated for children <18 years of age
- Serologic testing of family members of an infant with congenital Chagas disease should also include:
  - ➔The maternal grandmother
  - ➔The mothers siblings

Chagas Disease Prevention

Chagas disease fact sheets for the public are available on-line in English and Spanish through CDC

Other printable resources include, “What happens to blood donors who test positive for Chagas disease?” and, “Chagas disease fact sheet for the public”

www.cdc.gov/parasites/chagas/printresources.html

Protect Your Baby from Chagas Disease

Chagas disease is an illness that can lead to serious heart and stomach problems, and even death. Chagas disease can be life threatening even though you may not feel sick now. In fact, people usually don't feel sick until many years after they have been infected.

Who can get Chagas disease?

Anyone. However, people have a much greater chance if at some point in their lives they have:

- Lived in rural areas of Mexico, Central America, or South America
- Stayed in a house in Mexico, Central America, or South America with walls that have cracks or crevices
- Seen this bug

How can someone get Chagas disease?

People usually get Chagas disease from contact with a triatomine bug (also called "kissing bug"). However, there are other ways the disease can be spread, including from an infected mother to her unborn baby.

What should I do if I think I might have Chagas disease?

If you think you might have Chagas disease, you should see your OB/GYN or other health care provider, who will examine you. He or she may take a sample of your blood for testing.

If I have Chagas disease, does it mean my baby is infected?

No, not necessarily. The risk of an infected mother spreading Chagas disease to her unborn baby is less than 1 in 10.

If I have Chagas disease, should my baby be tested?

Yes. If you have been told you have Chagas disease, all of your children should be tested, regardless of their ages.

Is there treatment for Chagas disease?

Yes, there is treatment for the disease. Your baby can be treated any time after birth, and treatment is very effective for newborns and children. You can be treated after your baby is born and you have finished breastfeeding.

Many people who have tested positive are leading healthy lives with the help of their health care providers.

For more information on Chagas disease, please visit www.cdc.gov/parasites/chagas or call **404.718.4745.**

Center for Global Health
Division of Parasitic Diseases and Malaria

CDC

Chagas Disease Prevention

Chagas disease printable resources are available through CDC

This poster is available without charge at this website, laminated with English on one side, Spanish on the other:

https://www.cdc.gov/parasites/chagas/printresources.html

Acknowledgements

I am grateful to Susan P. Montgomery, DVM, MPH, epidemiology team lead in the CDC's parasitic disease branch for providing some of the slides in this presentation and for her example as a mentor and teacher.

Selected References

Bern C et al. Chagas disease in the United States: a public health approach. *Clin Microbiol Rev* 2019; 33(1):e00023-19. Comprehensive and current review.

Centers for Disease Control and Prevention. Access at: http://www.cdc.gov/parasites/chagas/index.html Excellent source for general information and diagnosis and treatment information.

Edwards MS et al. Evaluation and management of congenital Chagas disease in the United States. Provides algorithms for evaluation of mothers and infants. *J Pediatr Infect Dis Soc* 2019; 8:461.

Stillwaggon E et al. Congenital Chagas disease in the United States: Cost savings through maternal screening. *Am J Trop Med Hyg* 2018; 98:1733.
Maternal screening is cost saving, whether targeted to at-risk pregnant women of performed universally.

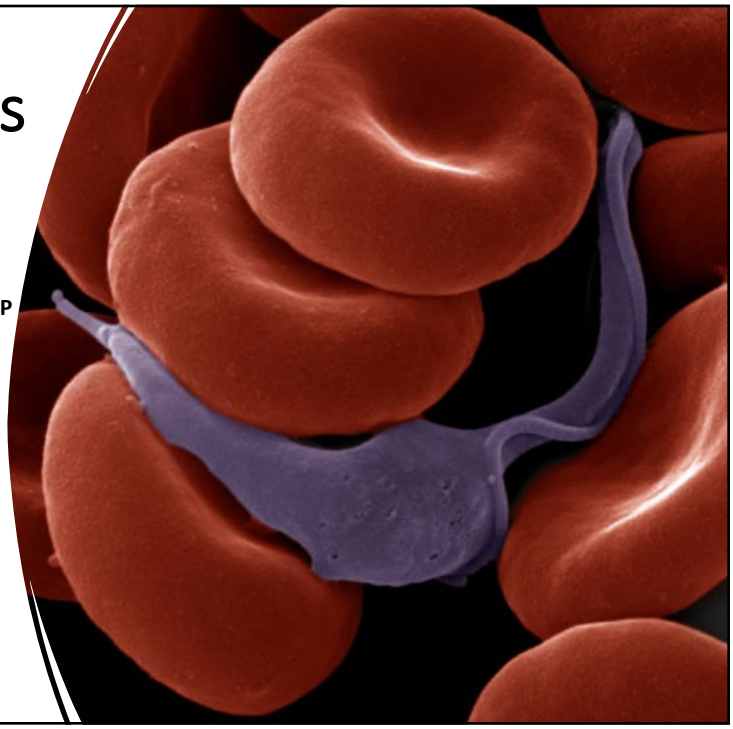
Looking for Chagas

Nancy Piper Jenks MS,CFNP,MFTM RCPS (Glasg),FAANP

Sun River Health, Peekskill, NY

January 10, 2024

“



Overview

- Introduce Sun River Health
- How did screening for Chagas come to us
- Describe our quality improvement project to screen OB patients at one SRH site
- Two recent cases

Sun River Health

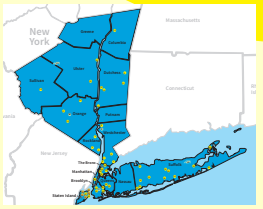
From Left to Right: Willie Mae Jackson, Pearl Woods, Rev. Jeannette Phillips, Anne K. Nolon, Mary Woods.

In the early 1970's a group of residents and religious leaders addressed the lack of appropriate health services in their community. In particular, a group of four women, fondly referred to as our founding mothers, spearheaded the efforts and have remained committed to the organization since its inception.

50

Health Center Locations

Across 3 diverse regions of New York, the Hudson Valley, New York City, and Long Island, providing comprehensive primary, behavioral and women's health among other services.



Patient Population

60% of our patient population is on Medicaid, 49% have a primary language other than English and special populations include agricultural workers, homeless individuals, veterans, public housing individuals and others.

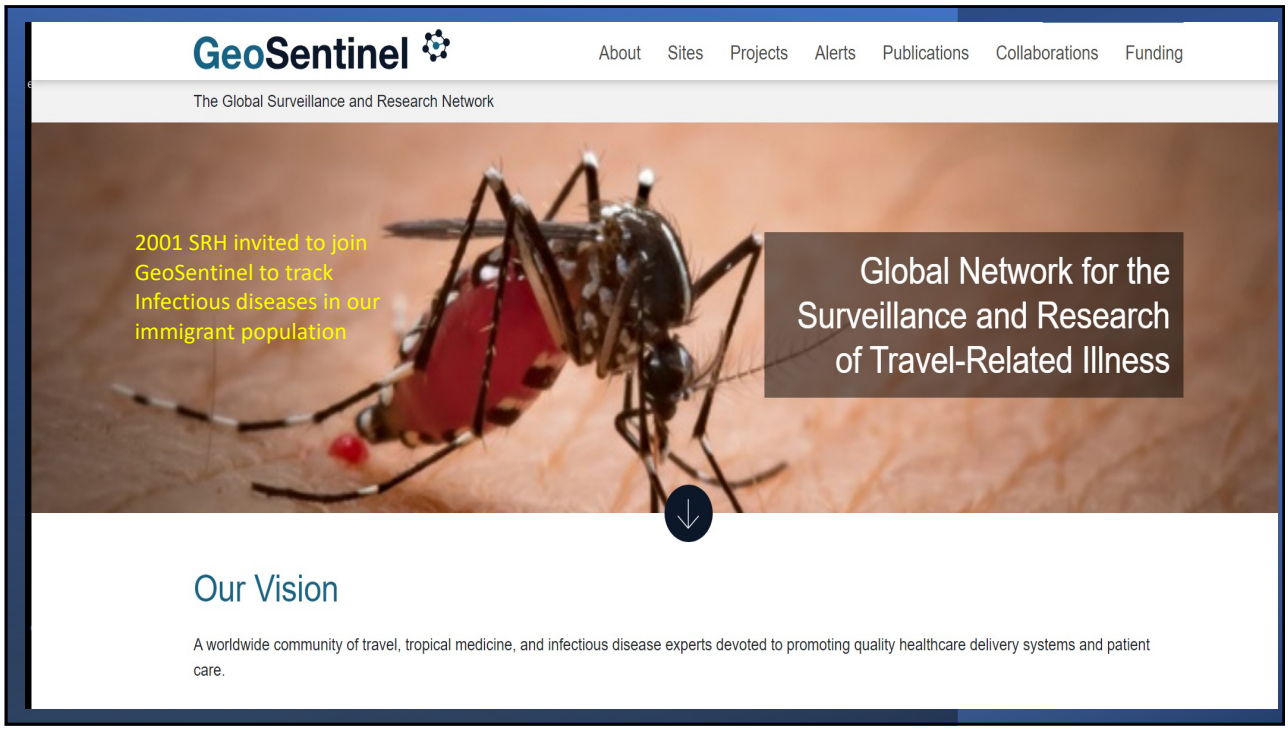
250,000

2,000

Staffing

Providers, Nurses, and Health Professionals are key in making Sun River Health a leader in providing comprehensive care to our patient population.

Sun River Health



> Travel Med Infect Dis. 2023 Nov-Dec:56:102653. doi: 10.1016/j.tmaid.2023.102653. Epub 2023 Oct 17.

Infections with long latency in international refugees, immigrants, and migrants seen at GeoSentinel sites, 2016–2018

Elizabeth D Barnett [1], Alyse B Wheelock [2], William B MacLeod [3], Anne E McCarthy [4], Patricia F Walker [5], Christina M Coyle [6], Christina A Greenaway [7], Francesco Castelli [8], Rogelio López-Vélez [9], Federico G Gobbi [10], Elena Trigo [11], Martin P Grobusch [12], Philippe Gautret [13], Davidson H Hamer [14], Susan Kuhn [15], William M Stauffer [16]

Affiliations + expand

PMID: 37852594 PMCID: PMC10760402 (available on 2024-11-01)
DOI: 10.1016/j.tmaid.2023.102653

Abstract

Background: The continued increase in global migration compels clinicians to be aware of specific health problems faced by refugees, immigrants, and migrants (RIM). This analysis aimed to characterize RIM evaluated at GeoSentinel sites, their migration history, and infectious diseases detected through screening and diagnostic workups.

Methods: A case report form was used to collect data on demographics, migration route, infectious diseases screened, test results, and primary infectious disease diagnosis for RIM patients seen at GeoSentinel sites. Descriptive statistics were performed.

Results: Between October 2016 and November 2018, 5,319 RIM patients were evaluated at GeoSentinel sites in 19 countries. Africa was the region of birth for 2,436 patients (46 %), followed by the Americas (1,644, 31 %), and Asia (1,098, 21 %). Tuberculosis (TB) was the most common infection screened and reported as positive (853/2,273, 38 % positive by any method). TB, strongyloidiasis, and hepatitis B surface antigen positivity were observed across all migration administrative categories and regions of birth. Chagas disease was reported only among RIM patients from the Americas (393/394, 100 %) and schistosomiasis predominantly in those from Africa (480/510, 94 %). TB infection (694/5,319, 13 %) and Chagas disease (524/5,319, 10 %) were the leading primary infectious disease diagnoses.

GeoSentinel Data from Sun River Health 2001-2022

Chagas Disease – one case in Mexican immigrant who donated blood and was then informed of infection, came to us for treatment, significant heart disease

Quality Improvement Project

Presented to our QI council and approved January 2023

- Importance of identifying and treating Chagas in our at-risk patients
- Framing initiative as quality improvement, not research

Organizing our pilot

Choosing a site and cohort

Putting together a team

Training and educating team members and staff

Working with IT to create templates for EMR

Choosing a site and cohort

Small in number

- Starting small as we design process

Right population

- Patients from Chagas endemic areas
- Obstetric patients: captured audience who come in regularly, patients who have health insurance, greater ease in tracking

Mission focus

- Impact on lives: treating young mothers, treating babies, treating other family members, LOOKING FOR CHAGAS

Countries of Origin OB Patients SRH Brentwood Site, Long Island, NY

Informatic system review 1/9/2023

• El Salvador	63	(59%)
• Honduras	17	(16%)
• Ecuador	9	(8.4%)
• Colombia	6	(5.6%)
• DR	3	(2.8%)
• Peru	2	(1.8%)
• Mexico	2	(1.8%)
• Chile	2	(1.8%)
• USA	3	(2.8%)

Sun River Health

Our Team

Sun River Health

Nancy Piper Jenks, MS, CFNP, MFTM RCPS (Glasg), FAANP
Quratulain Zeeshan, MD, Quality Medical Director WH
Aarathi Nagaraja, MD, CPH, Medical Director HIV/Hep C
Vasanthi Arumugam, MD, Infectious Diseases
Marianne Boyce, RN, VP Infection Prevention, Lab Services
Roberta Kelly, FNP-BC, CIC, Chief Nursing Officer, SVP
Carlos Ortiz, Deputy Chief Operating Officer
Amanda Ascher, MD, CMO
Rachel Barnett, Program Director

Organization of pilot (January 2023)

- Guidance from experts
- Training/educating staff
- Creating protocols for screening and tracking
- Working with IT to create EMR templates for Chagas screening
- Organizing system to bring in family members and spouses of patients for screening

Screening

Pregnant women at our Brentwood site beginning July 2023

Case presentations

Case 1

March 2016

23-year-old woman from Honduras presents to our health center for prenatal care

P2011 Has an 8-year-old child

Has been in USA for 10 months

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1

▾ Family History

- Father: alive
- Mother: alive 46 yrs
- Siblings: alive
- Spouse: alive
- Children: alive
- Paternal Grand Father: deceased
- Paternal Grand Mother: deceased
- Maternal Grand Father: deceased, heart attack
- Maternal Grand Mother: deceased, heart attack
- 1 brother(s) , 4 sister(s) - healthy. 2 son(s) , 1 daughter(s) - healthy.

▾ Social History

Were you born in this country?

[redacted] Were you born in this country? No, Where were you born? Honduras, What was the date of your most recent entry in the U.S.? 06/2016, What was the date of your first entry in U.S.? 06/2016

Household: [redacted] Marital Status: Single, Number of Adults in Household: 2, Number of Children in Household: 3, Religion Catholic, Level of Education: Not finished High School

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1

April 2016

Assessment:

Assessment:

1. Encounter for supervision of other normal pregnancy, first trimester - Z34.81 (Primary)

Plan:

1. Encounter for supervision of other normal pregnancy, first trimester

Start Prenatal Tablet, 28-0.8 MG, as directed, Orally, once a day, 90 days, 1 bottle, Refills 0 .

LAB: CYSTIC FIBROSIS SCREEN MUTATION (DNA)
LAB: PRENATAL PANEL 1 (P283-5)
LAB: QUANTIFERON-GOLD TB ASSAY
LAB: HIV AB/AG 4th Gen
Imaging: US (OB) FIRST TRIMESTER TA/TV

[redacted]

Labs:

Lab: CYSTIC FIBROSIS PANEL EXPANDED

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Case 1

Normal delivery October 2016

7.3 pound baby; apgars 8/9

March 2020 – COVID-19 infection

March 2022 – ER visit for numbness in face and extremities, chest pain and palpitations. Negative work up at ER
Referred to cardiology, normal ECG, ECHO.
Neuro symptoms resolved

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Case 1

February 2023

Pt returns to health center for prenatal care

P3012

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Case 1

- July 2023 Patient is screened for T Cruzi AB, sent to commercial lab

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1

July 2023

Reason for Appointment

1. EOB 28.6 WKS- Tdap Accepted
2. Pre-Visit Planning done for visit
3. *Attained By: RSantana CA
4. Nursing-Urinalysis (SCREEN)
5. Interpreter

Assessments

1. Encounter for screening, unspecified - Z13.9
2. 28 weeks gestation of pregnancy - Z3A.28 (Primary)
3. Encounter for immunization - Z23

Treatment

1. 28 weeks gestation of pregnancy

LAB: URINE CULTURE, ROUTINE
LAB: GLUCOSE,1HR.PP(PREG.)w/glucola
LAB: CBC W/DIFF, PLATELET CT. (0053-9)
LAB: Syphilis Reverse Algorithm (J275-9)
LAB: TRYPANOSOMA CRUZI,AB TOTAL 6199-4

2. Encounter for screening, unspecified

LAB: Urinalysis W/O Microscopy, In House

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1

Case 1

Commercial serology positive 7/2023
2 tubes of whole blood and serum sent to NYS DOH Wadsworth 10/2023

Test	Interpretation
T. cruzi AB EIA*	Reactive
Comments and Disclaimers	
• Reference value: Non-reactive/negative	
Test	**Result**
T. cruzi AB IB (TESA)*	Weak Positive
Comments and Disclaimers	
• Reference value: Non-reactive/negative	
Test	**Result**
T. cruzi Interpretation	Positive*

Comments and Disclaimers

• The test results are considered **Positive** and are consistent with T. cruzi infection. Diagnosis of chronic Chagas disease is established after concordant positive results are obtained with at least two different types of T. cruzi serologic assays. Clinical consultation is available at CDC (phone: 404-718-4745; parasites@cdc.gov) for interpretation of these serologic results and other diagnostic indicators, in the context of additional information.

T. cruzi AB EIA Test Comments: This test detects antibodies against T. cruzi recombinant antigens.

T. cruzi AB IB (TESA) Test Comments: This test is an immunoblot assay which detects antibody reactivity to the 150-160kDa transialidase antigens of T. cruzi.

The performance characteristics of the T. cruzi AB IB (TESA) and T. cruzi AB IFA tests were determined by validations performed at the Division of Parasitic Diseases and Malaria (DPDM) at the Centers for Disease Control and Prevention. They have not been cleared or approved by the U.S. Food and Drug Administration.

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1

October 2023

4 weeks (Reason: for follow up)

History of Present Illness

General:

spanish translator# 1101036

This is 30 yr old female with no significant PMhx ,1 month postpartum, she is refered for positive T.cruzi antibody

She born in Hunduras Us for last 8yrs[redacted]

She lives in Hunduras vilaage

As per patient her house with thatched roof, she also says lots of holes and crackes in the house

She denies any blood transfusion or surgery

She denies any family h/o heart/Gi problem

She denies any complaints now, not taking any medication

She has 3 heqalthy children.

T. Cruzi/Chagas Disease:

Screening

Screening : *Adult* ..

Counseling information *The patient is from an endemic region of North, South, or Central America and is requesting screening for T.cruzi., The patient/ parent or care giver verbalized understanding that screening positive will require further evaluations, including diagnostic testing and possible treatment.*

Country of origin/birth: *Honduras, undefined* ...

Region: ...

Prior treatment or testing in the past? *No* ...

Do other family members want to be screened? *Yes* ...

Sun River Health

1

Case 1

T. Cruzi/Chagas Disease:
Screening
Screening : *Adult* ..
Counseling information *The patient is from an endemic region of North, South, or Central America and is requesting screening for T.cruzi., The patient/ parent or care giver verbalized understanding that screening positive will require further evaluations, including diagnostic testing and possible treatment.*
Country of origin/birth: *Honduras, undefined* ...
Region: ...
Prior treatment or testing in the past? *No* ...
Do other family members want to be screened? *Yes* ...
Diagnostic Evaluation and Treatment
Diagnostic evaluation and treatment for: *Adult*
Why was the patient referred for testing: ...
Did other family members test positive on screening or diagnostic labs: ...
Country of origin/birth: *Honduras, undefined* ...
Housing: *Mud, Thatch, Palm leaves, undefined* ...
Location of bathroom: *Outside of the home, suggest strongyloides* ...
Does the patient or parent/care giver recognize a kissing bug? *No* ...
Does the patient or parent/care giver recall family with Chagas disease or heart disease in their country of origin? *No* ...
Is the patient currently pregnant or recently delivered ? *Recently Delivered* ...
Date of delivery: [redacted]
Mode of delivery: *Vaginal*
The patient was counseled that the recently delivered child needs to be tested. *Yes*
Lab Results:
Bio-Reference: T. Cruzi Screening Date: [redacted]
Bio-Reference: T. Cruzi Screening Results: *Reactive* ...
NYS Wadsworth: T. Cruzi Total Antibody ELISA Wiener Date: [redacted]
NYS Wadsworth: T. Cruzi Total Antibody ELISA Wiener Results: *Reactive* ...
NYS Wadsworth: T. Cruzi IgG ELISA (Hemagen) Date: 10/00/0000

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Case 1

delivered healthy baby girl

September 2023

January 2024

follow up with cardiologist from previous visits

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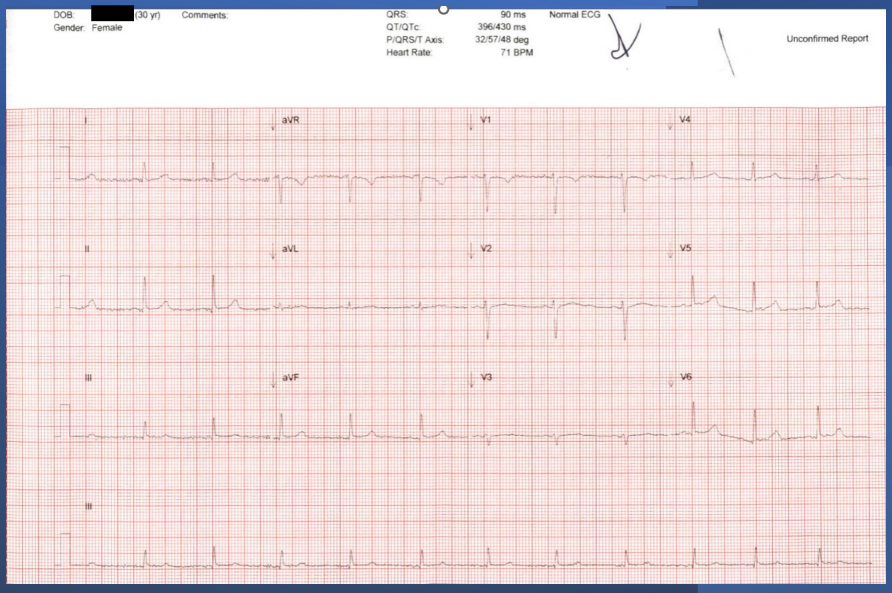
1

November 2023



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CHIEF COMPLAINT: History of palpitations.

Subjective:

The patient is a 29-year-old female, now mother of a 3-month-old healthy child, baby girl. She previously was seen for palpitations. Her HeartSmart monitor performed in January of this year did not reveal any sustained arrhythmias. In the past, there was question of patent foramen ovale and she underwent a transesophageal echo on May [redacted] 2022 with no evidence of PFO. She feels well without any chest discomfort or respiratory difficulty. There has been no palpitations, PND, orthopnea, dizziness or syncope.

Past Medical History:
Diagnosis Date

- Hyperlipidemia
- Pregnancy
  6 weeks

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Assessment:

is now a mother of a 3-month-old health baby girl. Her palpitations have resolve
are no active symptoms to suggest acute coronary syndrome or hemodynamic compromise.

Plan:

1. There was no evidence of PFO by Bubble study or contrast with transesophageal echo.
2. Palpitations have resolved.
3. She has history of preserved left ventricular function.
4. Hyperlipidemia. Atorvastatin 40 mg daily will be maintained without change of dosage.
5. We will repeat an echocardiogram.

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Case 2

33 year old patient from El Salvador

2015 Arrived USA

2015: CPE at center, family history: father died age 50 cardiac disease, cardiomegaly, uncle with same illness

2/2017: +pregnancy test, delivered healthy baby 9/2017 C-sec

2/2020: + pregnancy;

4/2020 COVID-19 infection,

8/2020 delivered a healthy baby

C-section

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Case 2

- 11/2022: + pregnancy test
- 2023: Tested as part of our screening for T Cruzi

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2

TRYPANOSOMA CRUZI,AB TOTAL 6199-4

NAME	VALUE
F TRYPANOSOMA CRUZI,TOT (24)	REACTIVE A

REFERENCE RANGE: NONREACTIVE

The enzyme immunoassay for T. cruzi (Chagas disease)

antibodies is sensitive and specific for acute or

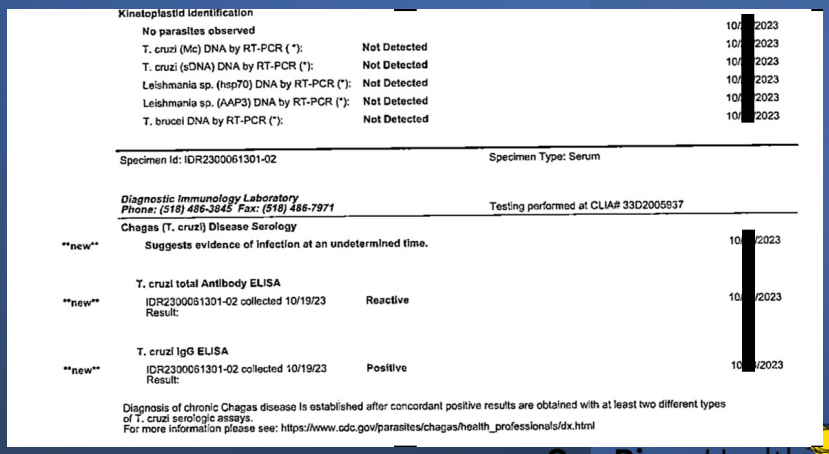
chronic American trypanosomiasis. However,

crossreactivity may be observed in patients with

Sun River Health

2

Whole blood and serum sent to Wadsworth



Kinetoplastid identification

No parasites observed

T. cruzi (Mc) DNA by RT-PCR (*):	Not Detected	10/[redacted]/2023
T. cruzi (sDNA) DNA by RT-PCR (*):	Not Detected	10/[redacted]/2023
Leishmania sp. (hsp70) DNA by RT-PCR (*):	Not Detected	10/[redacted]/2023
Leishmania sp. (AAP3) DNA by RT-PCR (*):	Not Detected	10/[redacted]/2023
T. brucei DNA by RT-PCR (*):	Not Detected	10/[redacted]/2023

Specimen Id: IDR2300061301-02 Specimen Type: Serum

Diagnostic Immunology Laboratory
Phone: (518) 486-3845 Fax: (518) 486-7971
Testing performed at CLIA# 33D2005937

Chagas (T. cruzi) Disease Serology

new	Suggests evidence of infection at an undetermined time.		10/[redacted]/2023
new	T. cruzi total Antibody ELISA IDR2300061301-02 collected 10/19/23 Result:	Reactive	10/[redacted]/2023
new	T. cruzi IgG ELISA IDR2300061301-02 collected 10/19/23 Result:	Positive	10/[redacted]/2023

Diagnosis of chronic Chagas disease is established after concordant positive results are obtained with at least two different types of T. cruzi serologic assays.
For more information please see: https://www.cdc.gov/parasites/chagas/health_professionals/dx.html

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2

Assessments

1. Diabetes mellitus without complication - E11.9
2. Chagas disease - B57.2 (Primary)
3. Urinary tract infection without hematuria, site unspecified - N39.0

Treatment

1. Chagas disease

Start Benznidazole Tablet, 100 MG, 2 tab, Orally, Twice a day, 30 days, 120 Tablet, Refills 1

IMAGING: ECHOCARDIOGRAM

Notes: She is here for treatment
Start benzinidazole 200mg po q12 x 60 days
Side effects (rash, metalic taste, stomach upset, pins and needle in the hands and feeet, muscle and joint pain, headache extensively explain to the pain)
Advise her to reach us if she develop any side effects
She says she underwent tubal ligation during third delevery and she isays she is not breast feeding
She is going bring her husband and 2 children for chagas t

2. Diabetes mellitus without complication

LAB: STRONGYLOIDES IgG, AB.

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2

Assessments

1. Diabetes mellitus without complication - E11.9
2. Chagas disease - B57.2 (Primary)
3. Urinary tract infection without hematuria, site unspecified - N39.0

Treatment

1. Chagas disease

Start Benznidazole Tablet, 100 MG, 2 tab, Orally, Twice a day, 30 days, 120 Tablet, Refills 1

IMAGING: ECHOCARDIOGRAM

Notes: She is here for treatment

Start benzinidazole 200mg po q12 x 60 days

Sun River Health

2

T. Cruzi/Chagas Disease:

Screening

Screening : *Adult* ..

Counseling information *The patient is from an endemic region of North, South, or Central Am*
and is requesting screening for T.cruzi., The patient/ parent or care giver verbalized understanding
screening positive will require further evaluations, including diagnostic testing and possible treatm

Country of origin/birth: *El Salvador, undefined* ...

Region: ...

Prior treatment or testing in the past? *No* ...

Do other family members want to be screened? *Yes* ...

Diagnostic Evaluation and Treatment

Diagnostic evaluation and treatment for: *Adult*

Why was the patient referred for testing: *screening during pregnancy*

Did other family members test positive on screening or diagnostic labs: *Yes* ...

Details: *Father died of cardiomyopathy at age 50 (told T.cruzi infection)*

Country of origin/birth: *El Salvador, undefined* ...

Housing: *Mud, Adobe, Thatch, undefined* ...

Location of bathroom: *Outside of the home, suggest strongyloides* ...

Does the patient or parent/care giver recognize a kissing bug? *Yes* ...

How does the patient refer to the kissing bug ? *El bicho besador*

Does the patient or parent/care giver recall family with Chagas disease or heart disease in their country of origin? *Yes* ...

Details: *Father and uncle died of cardiomyopathy and told because of T.Cruzi infection*

Is the patient currently pregnant or recently delivered ? *Recently Delivered* ...

Date of delivery: *07/[redacted]2023*

Mode of delivery: *C-Section*

The patient was counseled that the recently delivered child needs to be tested. *Yes*

Lab Results:

Bio-Reference: T. Cruzi Screening Date: *10/[redacted]2023* ...

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Take home points

Start	Start small with screening initiatives in order to organize process
Consider	Consider costs associated with screening, prenatal and pediatric patients have benefit of insurance
Take	Take advantage of tremendous resource networks and individuals to support Chagas screening and treatment
LOOK	LOOK for Chagas

Questions??