

Chagas Disease-Awareness Program for CHWs

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A Brief Review

- Chagas disease is caused by a parasite called *T.cruzi* that lives in the gut of a triatomine bug (also called a “kissing bug”)
- Chagas disease is primarily spread through contact with the contaminated feces of the Kissing Bug
 - Congenital transmission (mother-to-child) is also of concern
- Chagas is endemic in Latin America and the vector is also found in the Southern U.S.
- Humans and animals can both be infected with the parasite
- A single bite from a Kissing Bug does not mean the person is infected
 - The kissing bug must be positive for *T. cruzi* and the feces must enter the wound
- Local transmission (in the U.S.) is a possibility, but not common
- TxDSHS can test kissing bugs for *T.cruzi* if associated with a human exposure
 - If the kissing bug is positive for *T.cruzi*, a blood meal analysis will be completed to test for human blood
- Testing the exposed person for Chagas may be recommended, but waiting to be tested may be necessary



Photo from: <https://web.diarioelunodetehuacan.com/nacional/la-enfermedad-de-chagas/>

Session 2:

Chagas disease and its symptoms/treatment

T. cruzi infection



**Acute phase
of Chagas disease**

~8 weeks



Chronic phase

Indeterminate form
No signs or symptoms of Chagas disease

Life long
infection
if untreated



20 - 40% progress
over years - decades

60-80% remain
indeterminate
throughout life



Determinate forms
Chagas cardiomyopathy &/or
Gastrointestinal disease

*Can reactivate if
immunosuppressed*

Acute Stage of Chagas Disease

Symptoms (if any)

- Fever
- Body Aches
- Rash or Swelling At the Bite Site
- Nausea, diarrhea, vomiting
- Headache



- Symptoms (if any) last for a few weeks after infection and are so generalized that many individuals assume they have a cold and not a parasitic disease
- Often there are no noticeable symptoms

Chronic Stages of Chagas Disease

Stage One- ASYMPTOMATIC: The disease may be dormant and without any symptoms in humans for decades or longer for 60-70% of the population

Stage Two - SYMPTOMATIC: approximately 30% of those infected may go on to develop symptoms

- Heart rhythm abnormalities that can cause sudden death;
- A dilated heart that doesn't pump blood well; and
- A dilated esophagus or colon, leading to difficulties with eating or passing stool.



Chronic Chagas disease: STAGE 1

Indeterminate form

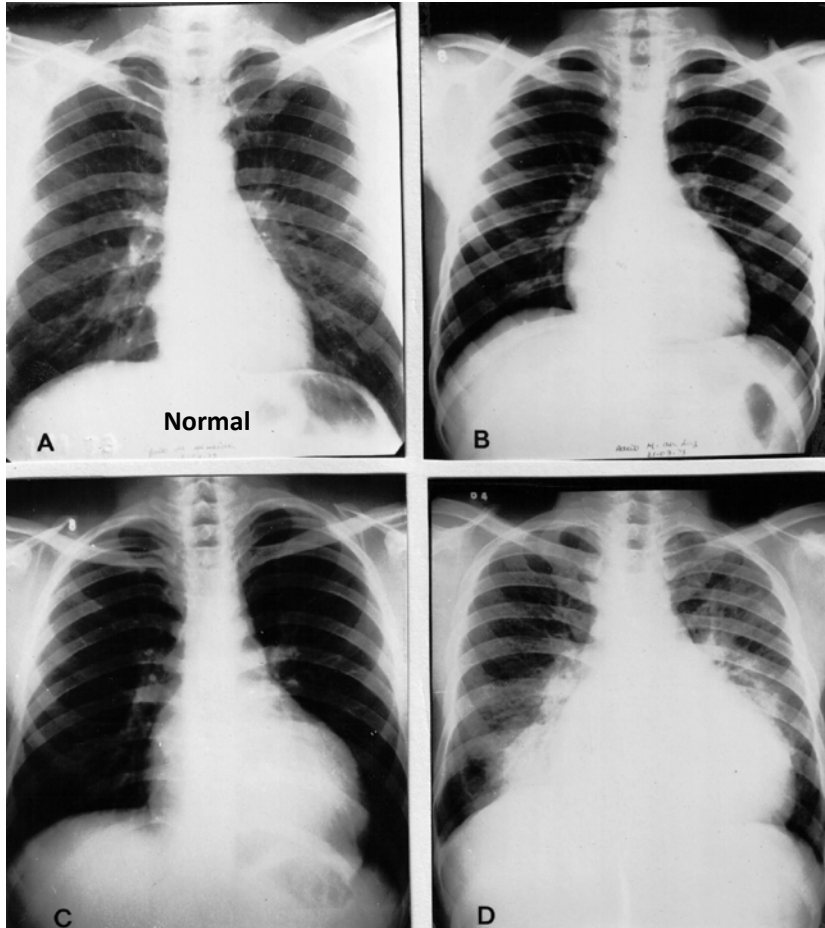
- Parasitemia below level of detection, diagnosis based on antibody detection
 - Infectious by transfusion, organ transplantation, and congenital transmission
- No symptoms, normal ECG and CXR
- May have subtle changes on autonomic testing or echocardiogram, unclear if these have prognostic value
- > 70% remain asymptomatic life-long
- Most infected blood donors are in this form

Chronic Chagas disease:

STAGE 2 Clinical disease / determinate form

- < 30% of infected people develop disease over lifetime
- Parasitemia below level of detection, diagnosis based on antibody detection
- Onset 10 to 40 years after initial infection
- Unclear why some develop disease and others remain asymptomatic life-long
 - Possible factors include: males > females, parasite strains, severity of original acute infection, host genetics and immune response, repeated parasite exposure?

Stage 2 Chronic Chagas disease symptoms



About 30% of people will develop cardiac damage:

Cardiomyopathy

Heart rhythm abnormalities

Apical aneurysm.

Sudden death or heart failure caused by progressive destruction of the heart muscle.



Less than 10% of patients will experience enlargement of the gastrointestinal tract and organs, and gastrointestinal motor disorders

Enlargement of the esophagus

Enlargement of the colon.

Disturbances of gastric emptying

Colon and gallbladder motor disorders.



Chagas cardiomyopathy

- Conduction system abnormalities often first sign
- RBBB, LAHB, complete AVB, bradycardia, ventricular extrasystoles, sudden death
- Apical aneurysm
- Congestive heart failure especially right sided

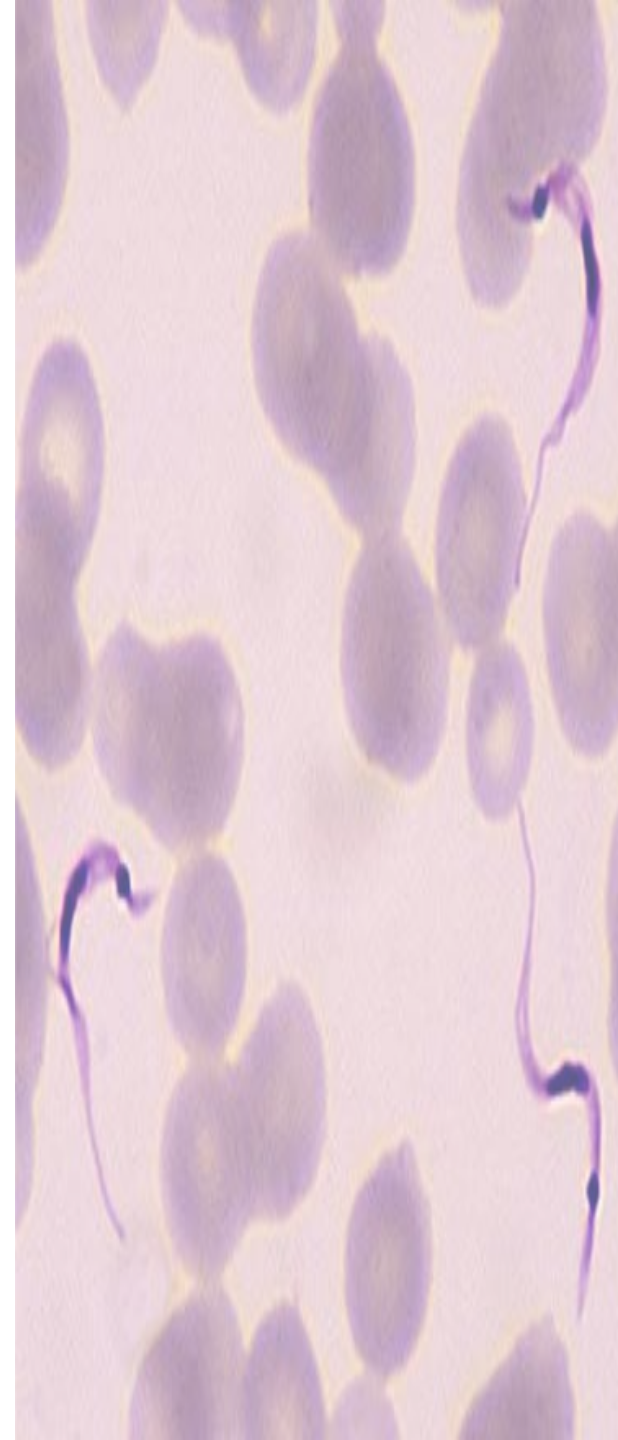
Images courtesy Dr. Anis Rassi Jr

Diagnosis and Treatment

- **Acute Phase:** *T. Cruzi* may be diagnosed by blood smear examination for the parasite, then also confirmed with serology tests.
 - Not reliable and few places in the US are trained in looking for *T. cruzi*

Since 2006 the FDA has required FIRST-TIME blood donations to be screened for the Chagas parasite.

- **Diagnosis of chronic Chagas disease is made by serologic tests for antibody to the parasite.**
 - **A single test is not sufficiently sensitive and specific to make the diagnosis.**
 - Standard approach is to apply two or more tests that use different techniques and that detect antibodies to different antigens
 - Commonly used techniques include enzyme-linked immunosorbent assay (ELISA) and immunofluorescent antibody test (IFA).
 - Careful consideration of the patient's history to identify possible risks for infection may be helpful.



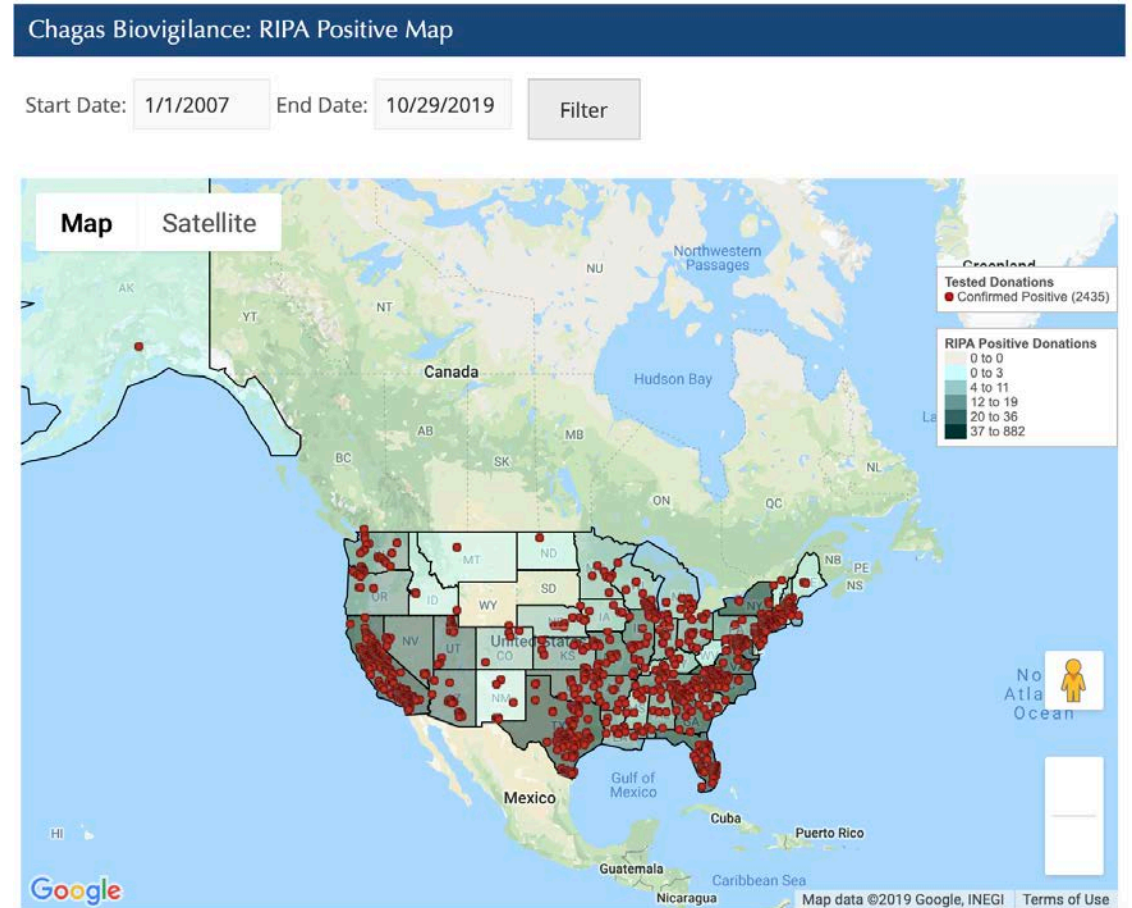
Blood Donor Screening in the US



- FDA approved first screening test in Dec 2006 (ORTHO[®] T. cruzi ELISA Test System)
- Second test approved April 2010 (ABBOTT PRISM Chagas assay)
- Many but not all blood centers started screening early 2007
- FDA guidance issued Dec 2010; all centers expected to screen by end of 2011 (U.S. military blood banks started in 2012)
- Defer donor based on positive screening test (repeatedly positive)
- **Screen all donors initially, if negative no need to test future donations**

How to interpret blood donor testing results

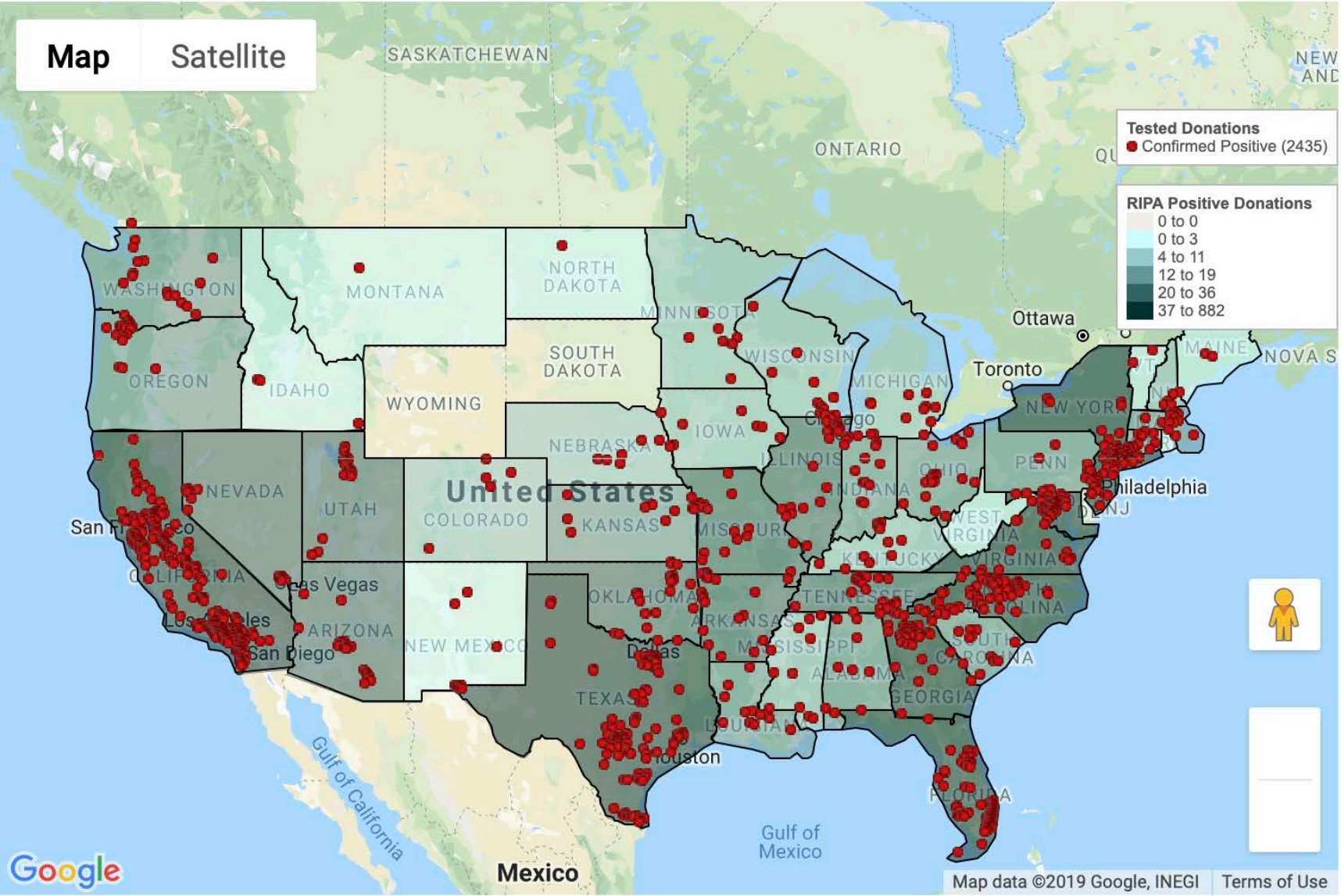
- > 2,430 cases of chronic Chagas disease among blood donors since introduction of screening in 2007*
- FDA approved blood donor screening \neq diagnostic testing
- False positives happen, risk history of donor/patient is important
- **Blood donor testing not sufficient for diagnosis**



[AABB Chagas Biovigilance program](#)

Chagas Biovigilance: RIPA Positive Map

Start Date: 1/1/2007 End Date: 10/29/2019 Filter



Chagas Positive Blood Donations since 2007
N= 2,435

[AABB Chagas Biovigilance program](#)

Patient with new diagnosis of Chagas disease

- Confirm diagnosis with laboratory testing
- Obtain complete medical history
- Perform physical examination, complete review of systems
- 12-lead EKG with 30 sec rhythm strip
- If cardiac or gastrointestinal signs/ symptoms are present, further work-up as indicated
 - Barium studies, etc.
 - Echocardiogram, Holter, etc.
- Evaluation feasible at primary care level

Antitrypanosomal Drug Therapy

- **Drug therapies are most effective during the acute stage or Chronic asymptomatic stage** of the disease after serology confirmation.
- This would include all vertical/congenital cases and reactivation of a chronic Chagas condition to acute stage when the individual's immune system is suppressed due to organ transplantation or human immunodeficiency virus (HIV).

Benznidazole
TABLETS 12.5 mg
100 mg

Benznidazole is now available in the U.S. Nifurtimox does not have FDA approval and the clinicians must request the drug from the CDC.

Indications for antitrypanosomal drug treatment

- Should always be offered
 - Acute *T. cruzi* infection
 - Early congenital *T. cruzi* infection
 - Children < 12 years old, chronic *T. cruzi* infection
 - Children 13 – 18 years old, chronic *T. cruzi* infection
 - Reactivated *T. cruzi* infection in patient with HIV/AIDS or other immunosuppression
- Should generally be offered
 - Reproductive-age women
 - Adults 19 – 50 years old with indeterminate form, or mild to moderate cardiomyopathy
 - Impending immunosuppression

Indications for antitrypanosomal drug treatment, cont'd.

- Optional
 - Adults > 50 years old without advanced cardiomyopathy
 - Chagas gastrointestinal disease patients without advanced cardiomyopathy
- Should generally not be offered
 - Advanced chagasic cardiomyopathy with congestive heart failure
 - Megaesophagus with significant impairment of swallowing
- Should never be offered
 - During pregnancy
 - Severe renal or hepatic insufficiency

Follow-up

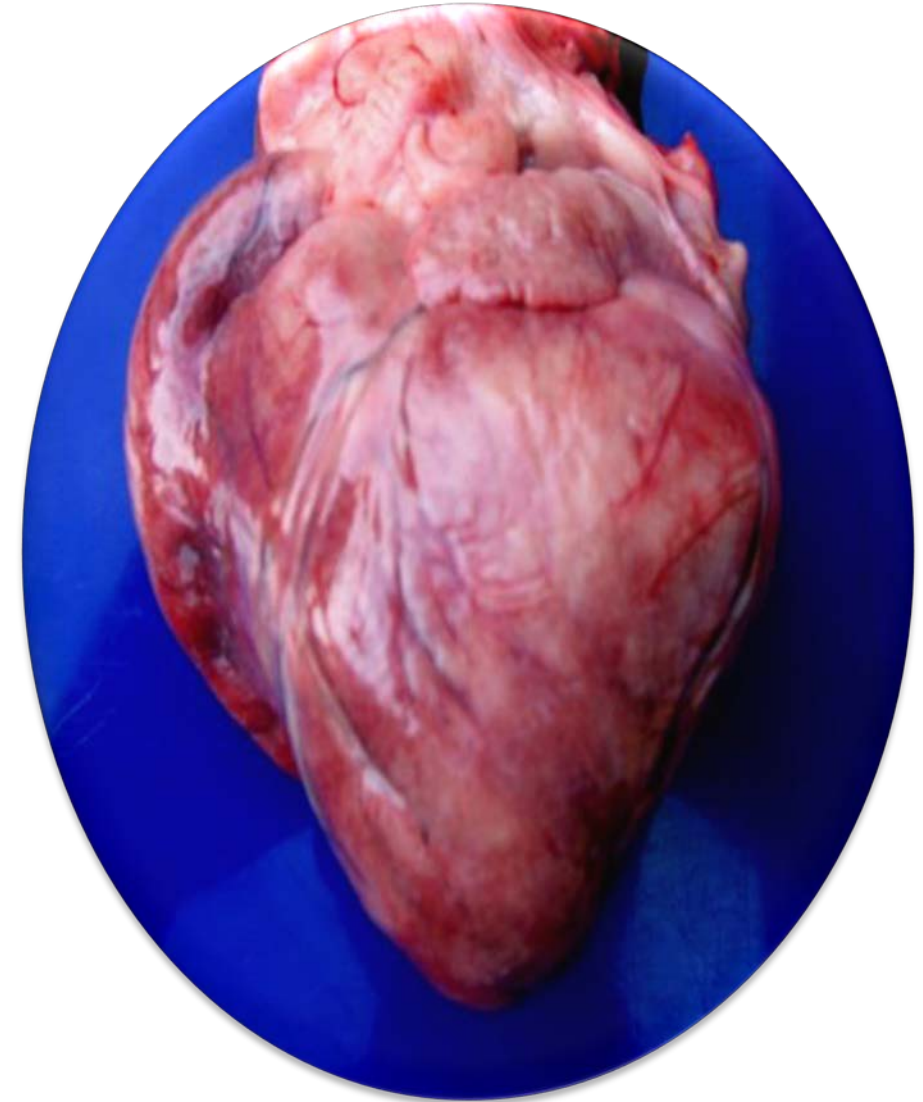
- Documenting response to treatment
 - Acute, congenital, reactivation disease monitored by blood smear / buffy coat / PCR
 - Chronic infection by serological methods but may take years to see negative seroconversion
- Indeterminate patients with normal initial exam should be evaluated annually whether or not treated
 - History, PE
 - EKG

Case Study 2:

Patient receives a letter after donating
blood that they tested positive

Summary

- Acute phase of Chagas disease lasts for approx. 8 weeks after *T.cruzi* infection
 - Symptoms (if any) are similar to cold or flu
- *T. cruzi* infection may be lifelong if untreated and develops into either of 2 chronic stages of Chagas disease
 - Stage 1 is ASYMPTOMATIC because disease stays dormant without any symptoms & occurs in 60-70% of population
 - Stage 2 is SYMPTOMATIC because symptoms develop & occur in 30% of population
 - Symptoms: dilated heart, esophagus or colon; heart rhythm abnormalities
- Chagas is treatable if caught before advanced symptoms occur



Summary

- FDA has required first-time blood donations to be screened for Chagas parasite since 2006
- FDA blood donor screenings ARE NOT diagnostic testing – only a screening test
- Patients must confirm their Chagas disease diagnosis with laboratory testing
 - Must also receive complete physicals to check for Chronic Chagas Stage 2 symptoms
 - If those symptoms are present, patient must undergo further examinations
- Drug therapies are most effective during the Acute Stage or Chronic asymptomatic
 - Benznidazole is now available in the U.S. & Nifurtimox is available through the CDC
- Individuals who are pregnant, have severe renal/hepatic insufficiency, or advanced chagasic cardiomyopathy/megaesophagus **should not** undergo drug therapy



Thank you!

Next sessions –

- Session 3: Chagas disease health threat to pregnant and reproductive age women
 - November 6th 11am
- Session 4: Talking about Chagas disease and prevention
 - November 13th 11am