

Chagas ECHO: Chronic Chagas: Insights from Cardiology

February 26 2020

Project ECHO/UT Health San Antonio



Agenda for today's session

- Introductions
- Presentation by Dr. Rachel Marcus
 - Brief overview of Chagas Disease
 - Chagas Cardiomyopathy diagnostics and treatment
- Case Presentation and Discussion
- Conclusion

“Chronic Chagas: Insights from Cardiology” Online Webinar Via Zoom February 26, 2020

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Paula Stigler Granados, PhD, Rachel Marcus, MD **Susan Montgomery**, DVM Planning Committee Members

Thank you Sheba Meymandi!!!

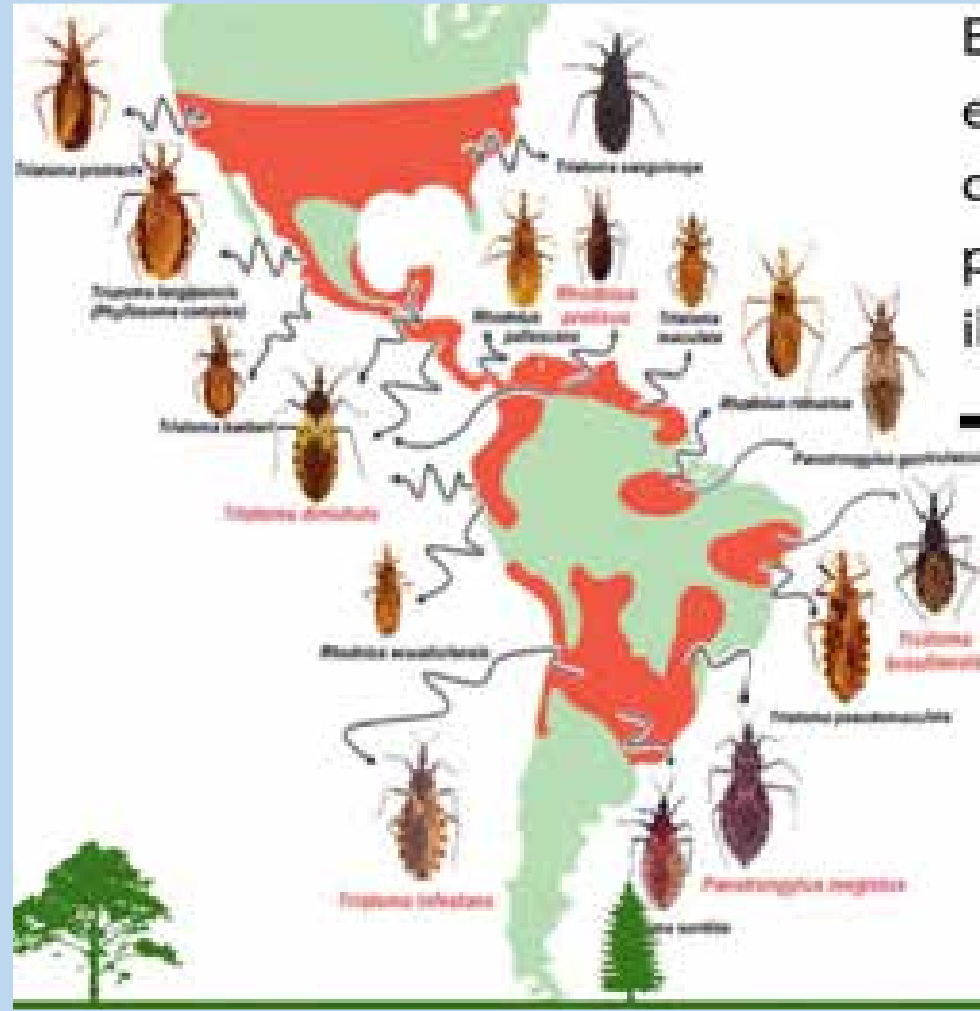
Chagas Disease: Old School

- A parasitic infection causing heart and gastrointestinal damage, chiefly transmitted by reduviid bugs to a mammalian host
- Zoonosis: over 100 reservoirs known.
- Disease of rural poverty in non-island nations of Latin America:
 - domiciled nocturnal bug feeds on sleeping victims,
 - lives in cracks/crevices of poorly built houses/chicken coops.



AKA: Kissing Bug, Insecto asesino, Vinchuca, Chinche, Barbeiro, Chipo, Pito

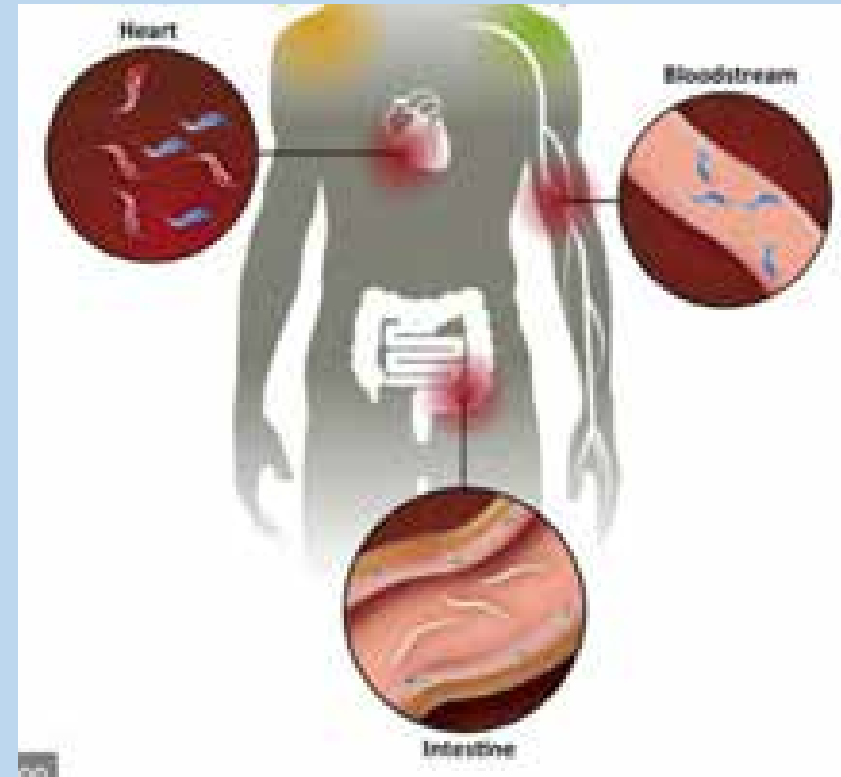
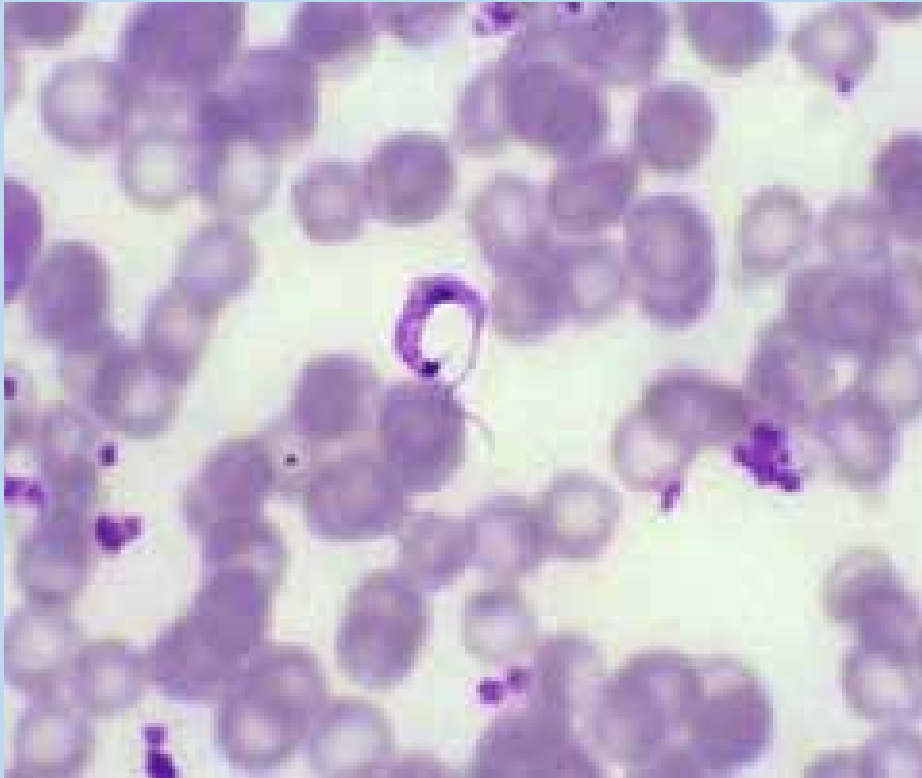
- Triatomines: *Triatoma Infestans*, *Rhodnius Prolixus* in Lat. Am., *T. Sanguisuga*, *Gerstaeckeri*, *Protracta* in US
- Intestine of triatomine is obligate part of parasite lifecycle.



Its gross, but this is how it gets the job done...



The parasite, *Trypanosoma Cruzi*, infects smooth muscle cells, autonomic nerve terminii



Transmission 2.0

- Vector control has been very effective, though not complete, but with rural to urban migration:

Vertical transmission: 1-10% of infected moms pass to infant

Blood transfusion: 10% transmission rate if infected product, highest risk with platelets

Reactivation: chemical or disease-induced immunosuppression, especially HIV

Oral: consumption of unpasteurized juice with bug/fecal material.

Local transmission: Uncommon (?) but does occur

- Regardless, remains a “neglected” disease of the poor.

Clinical Course: Acute Phase

- Non-specific symptoms in many, fever, malaise, adenopathy. Frequently not remembered as an adult. Lasts 6-8 wks.
- Romana's sign(10%)
- 5%< clinically important presentation with myocarditis/meningoencephalitis which in 10% can be fatal.
- Parasitemia is present/treatment with antiparasitic medications effective for “cure” in 70-90%



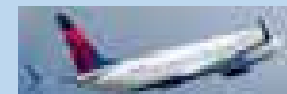
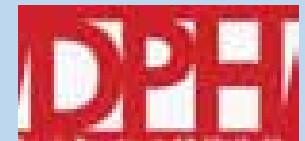
Clinical Course: Indeterminate Phase

- Most untreated patients pass into this phase, no end organ manifestations
- Positive serology(2 forms) ELISAs/TESA
- End of significant manifestations of illness for 70-80% of patients, 2-5%/year progress.

Testing: Serologic diagnosis*

(*special exceptions: congenital/reactivation)

- Commercial lab testing is ELISA, and diagnosis should be made with positive IgG, not IgM
- Recent exposure: wait 8-10 weeks for IgG development
- Indeterminate/Chronic: IgG
- Confirm Confirm Confirm....did I mention Confirm???



Clinical Course: Chronic Phase

- Presents 15-30 years after time of likely infection
- 20-30% of patients progress, not clear who, although more men have significant cardiac impairment. Degree of parasitemia? Reinfection? Manual labor? Strain type? Genetic factors in immune response.
- GI manifestations in 10%, more common in South America

Chagas Cardiomyopathy: Heart Failure



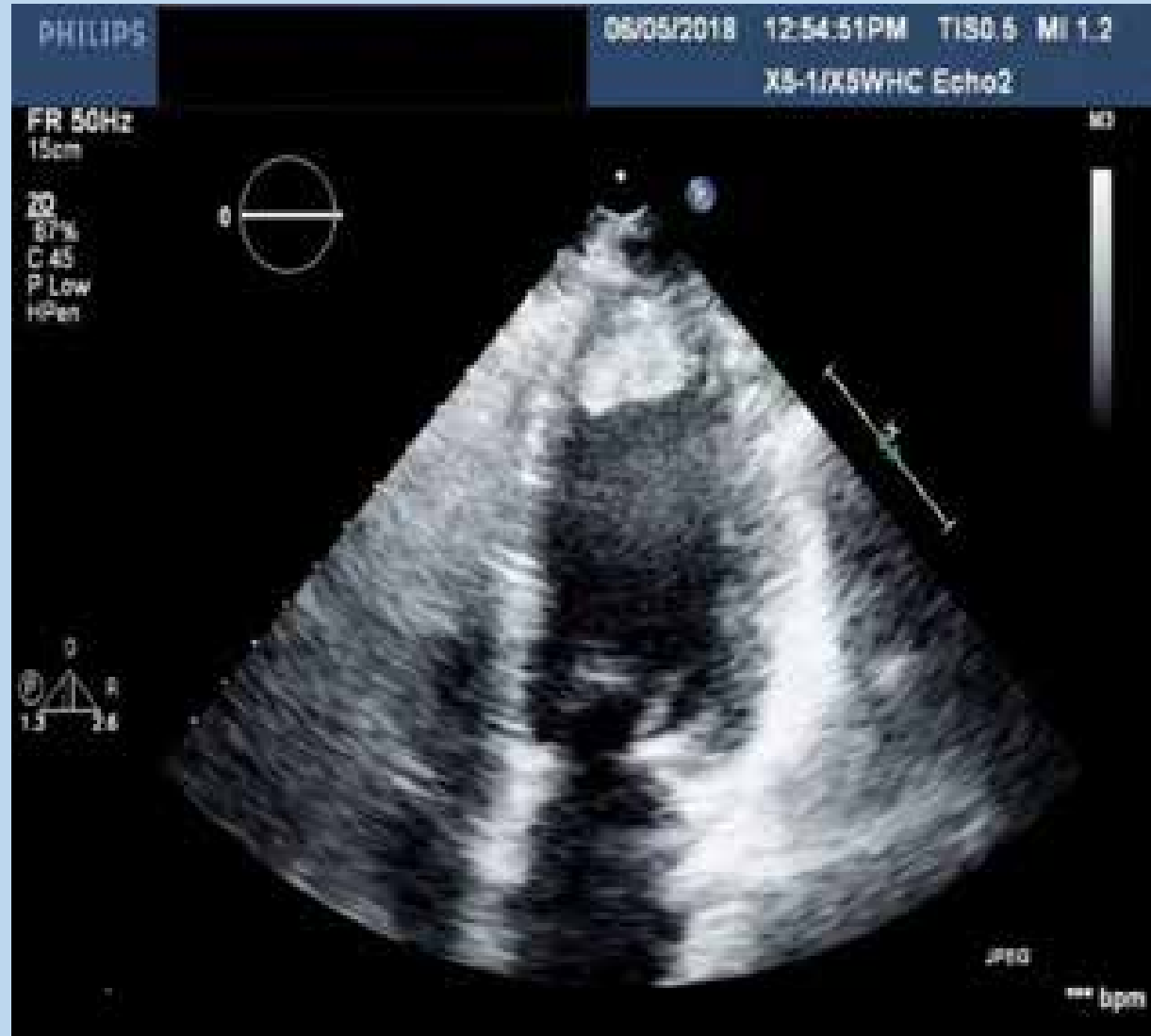
CCC: Arrhythmia

- Bradyarrhythmias
- Tachyarrhythmias



CCC: Thromboembolism

- Strokes,
systemic
embolism



My patient is confirmed positive... What do I do now?

- 12 lead ECG and echocardiogram: if normal, consider antiparasitic treatment
- If abnormal, refer to cardiology, infectious disease, preferably someone who knows about Chagas!

ECG in Chagas Disease

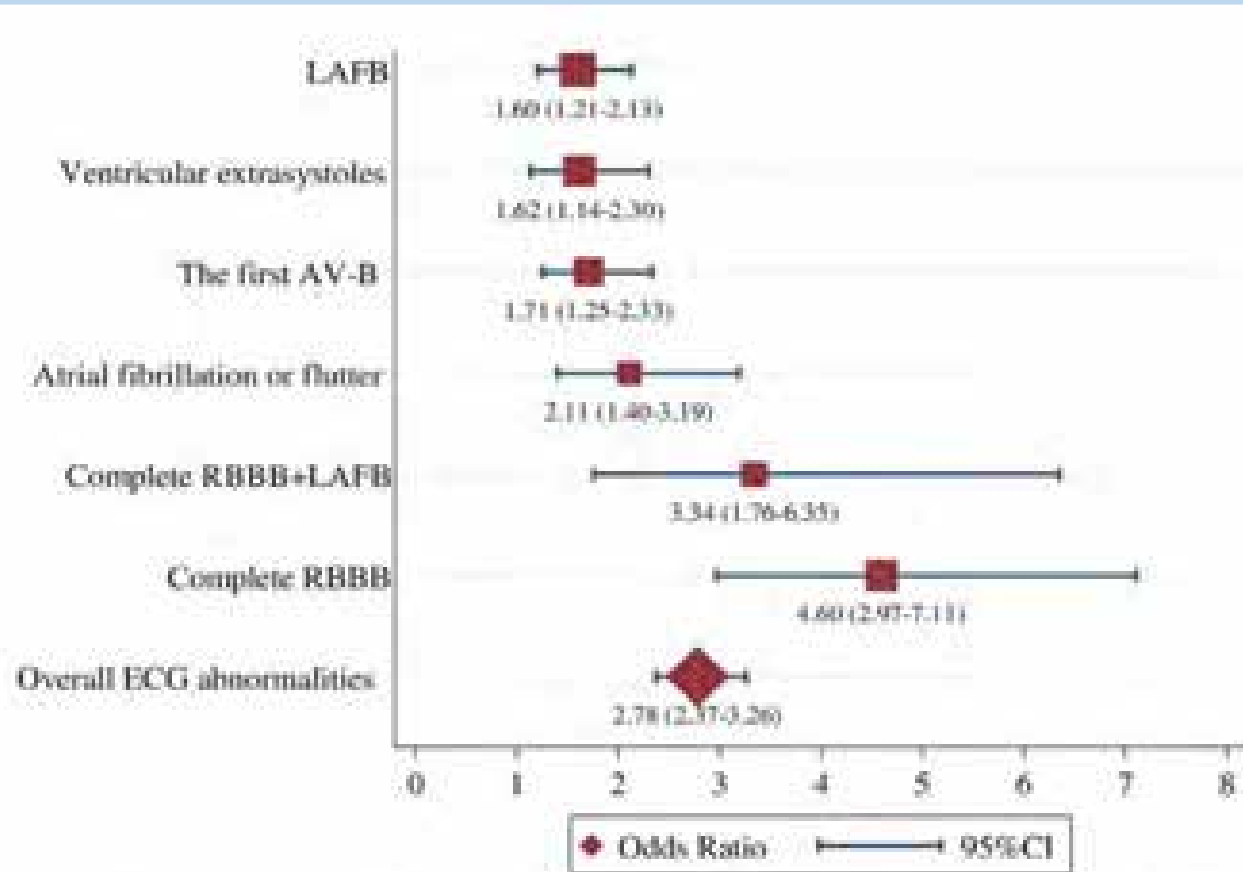


Fig 3. Prevalence of overall and specified ECG abnormalities in CD to compared non-CD participants. Forest plot showed the association between overall and specified ECG abnormalities with CD to compared Non-CD participants. Abbreviations: CD=Chagas disease; RBBB=Right Bundle Branch Block; LAFB=Left Atrial Fibrillation or Flutter.

| Electrocardiographic parameters | CD (n/N) | Non-CD (n/N) | P-value |
|---------------------------------|--------------|--------------|---------|
| RBBB plus LAFB | 11 (50) | 3 (5) | <.001 |
| LBBB | 23 (10) | 32 (51) | <.001 |
| QRS duration, ms | 125 (27) | 134 (39) | .459 |
| Atrial fibrillation | 11 (5) | 2 (3) | .599 |
| PVC ^a | 104 (46) | 13 (21) | .002 |
| Pacemaker | 29 (13) | 1 (2) | .013 |
| QTc | 455.4 (66.1) | 473.9 (55.1) | .487 |

CARDIOLOGY EVALUATION

- Echocardiogram: EF, WMA. Strain? Focus on apex!
- Holter: NSVT, brady
- Stress Test: chronotropic incompetence, ex. induced VT
- MRI: gadolinium uptake, risk stratification

Antiparasitic therapy

• Benznidazole: 2 nitro-imidazole

- FDA approved
- 5-7mg/kg po in divided doses 60 days.
(max dose @300mg/day)
- Rash/wt loss/HA/late
polyneuropathy/LFTs/neutropenia
- 85% finish Rx
- Cannot use in pregnancy

• Nifurtimox: 5-nitrofurans

- Not FDA approved
- 8-10mg/kg divided TID-QID po x 90
days
- Only 50% complete course
- Skin, GI, psychiatric

What's the data for treatment?

- Seronegativization associated strongly with rx in children
- Observational data suggests significant decrease in risk of transplacental passage in women of childbearing age
- Prospective trial suggested decrease in risk of progression associated with rx, and medication does decrease PCR positivity with modest impact on seronegativization.
- **BENEFIT** trial...

Does Antiparasitic Therapy Help in CCC? BENEFIT Trial

2854 pts randomized to Benz vs placebo

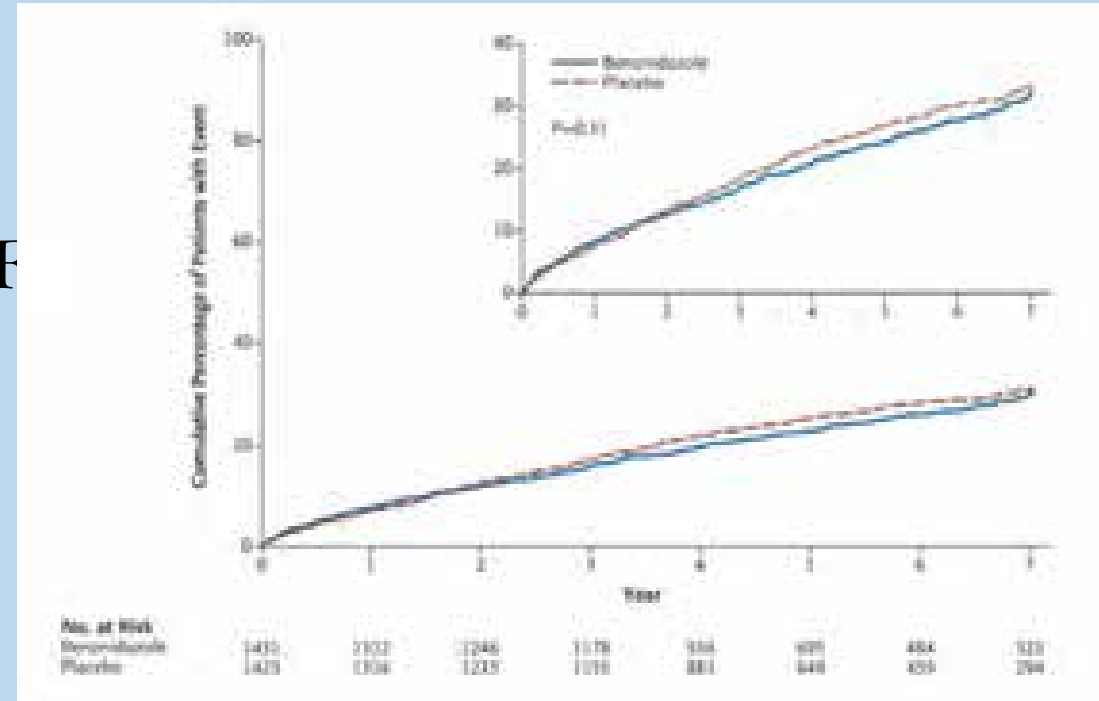
Mean age 55, 74% NYHA I, 70% normal EF

5 year f/u (99.5%)

7 year f/u (75%)

Primary endpoint: CV

Secondary endpoint: PCR



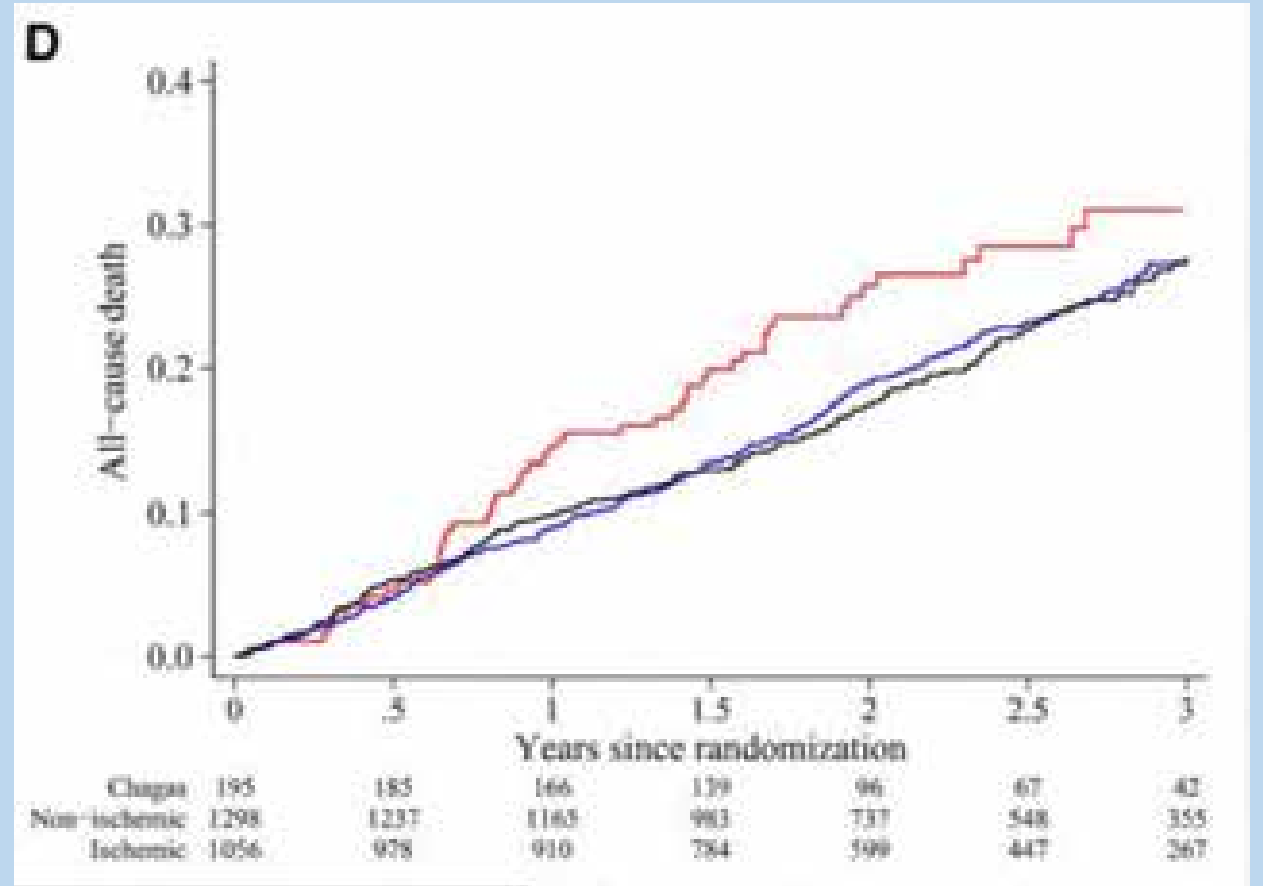
So what can we do for a patient with CCC?

- GDMT
- Risk assessment: VT
- Risk assessment: thromboembolism
- Advanced heart failure therapies

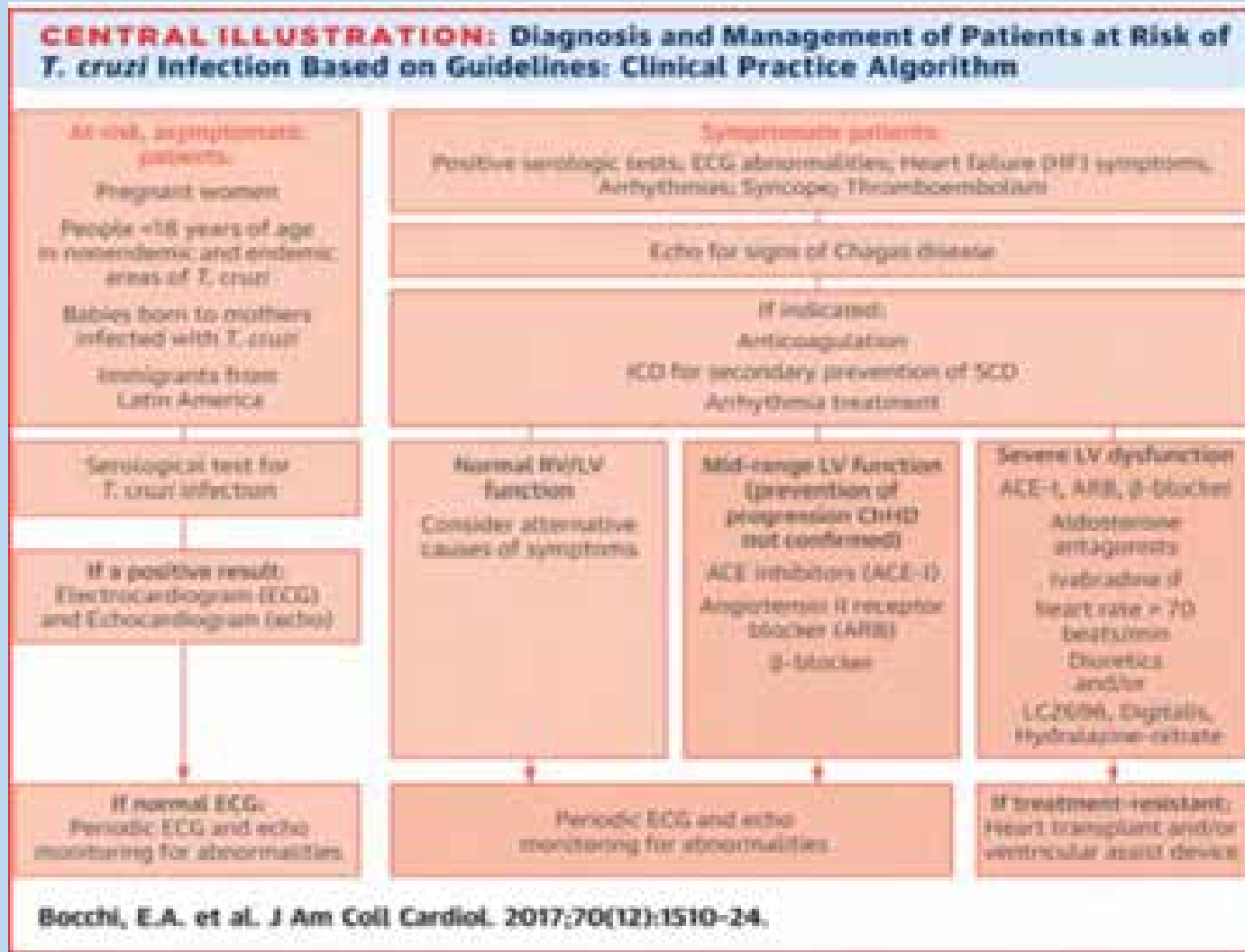
Prognosis of CCC

Circ Heart Failure 2017;10 and Circ Heart Fail 2015;8:938-943

- Data suggest it is worse than other dilated/ischemic: 40% higher risk of death.
- In US study, death/tx in 36% vs. 10% at 36mo.



Algorithm for Diagnosis and Management



So who should we test in Cards Clinic?

(AKA: Shout out to Sheba Meymandi!)

- 13-19% of immigrants from endemic countries with nonischemic cardiomyopathy had Chagas as the cause of CHF.
- 5% of same with bundle branch blocks had Chagas, but 18% of patients with bifascicular block tested positive!
- 7.5% of immigrants with pacemakers had Chagas
- 7x higher risk of Chagas if a family member has disease!

And why should we test for Chagas in Cardiology Clinic?

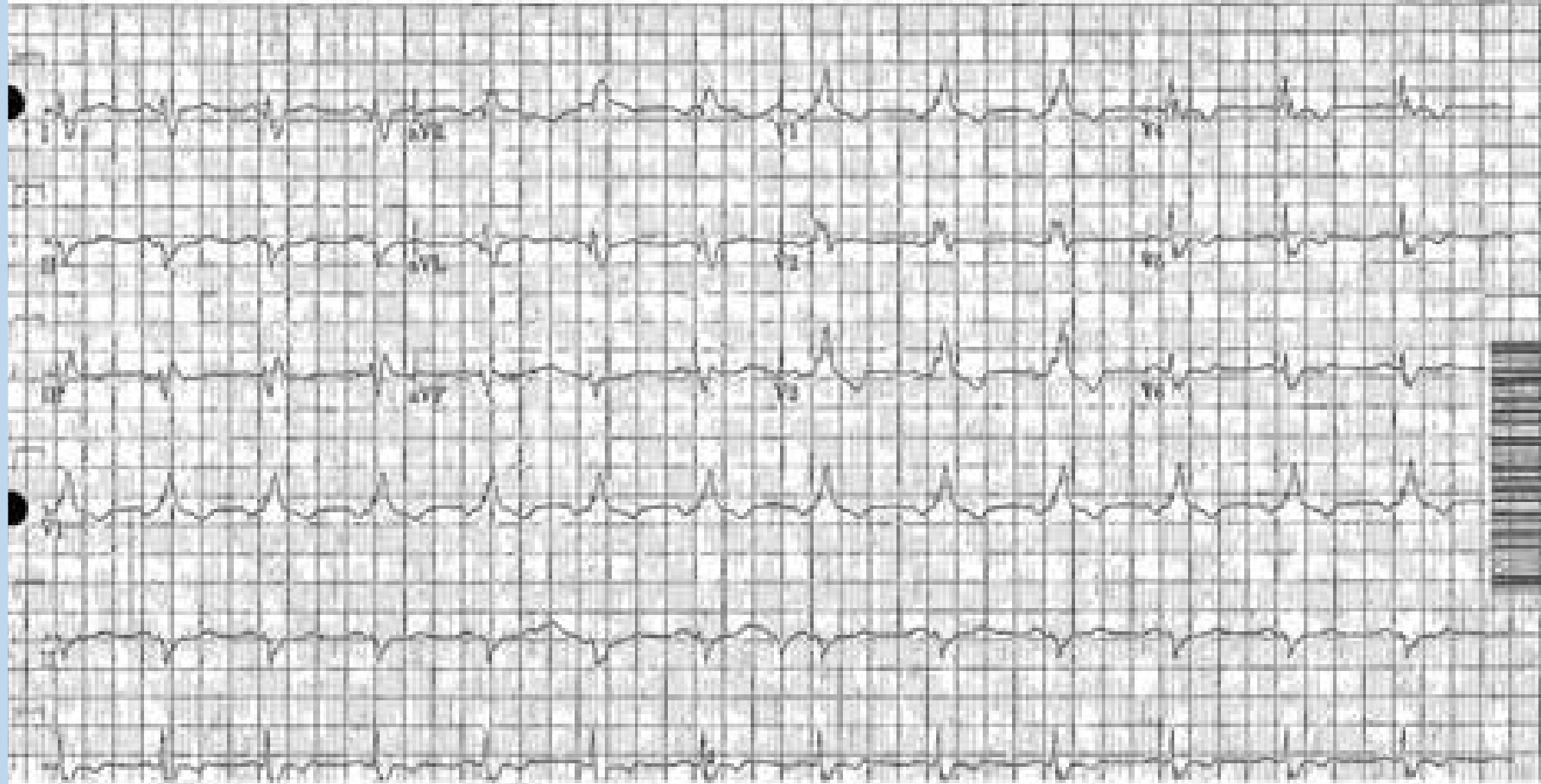
- Dx matter for how we care for patient: VT, thromboembolic risk, and reactivation if transplanted
- If the patient is a woman, **MUST** test children
- All family should be screened

Case Presentation

A 56 year old man with new onset left sided weakness, slurred speech

- Born in El Salvador
- No other PMH
- Had brief episode of similar symptoms one week prior
- Found to have acute R MCA stroke on CT and multiple old infarcts, given IV TPA with excellent response.

ECG



2D echo: “Low normal EF, no obvious source of embolus”



Which of the following tests should be performed next?

Which of the following tests should be performed next?

- T Cruzi IgG
- Echo with contrast
- Hypercoagulability workup
- Implantable loop recorder

T Cruzi IgG sent....

- Takes about one week to come back
- Then confirmation takes another 1-2 weeks....
- And in this patient population that means **LOST TO FOLLOW UP!**



Echo with
contrast:



Take home points:

- 1) NO ONE thinks of Chagas, even when you tell them to.
- 2) Be very thorough in looking for apical disease!
- 3) Chagas patients with normal to mildly reduced EFs can still have catastrophic strokes and/or lethal arrhythmias.

Where to turn for help?

- https://www.cdc.gov/parasites/chagas/health_professionals/index.html
- <https://www.mundosano.org/wp-content/uploads/2019/07/Guia-Medica-Ingles-v1.pdf>
- uschagasnetwk@listsrv.ucsf.edu US Chagas Disease Providers Network

Next Chagas Disease ECHO sessions

March 25 @ 12noon CST

Chagas for OB/GYN and Pediatrics: screening/diagnostics in pregnant women and newborns

April 29 @ 12 noon CST

Diagnosis and Treatment of Chagas from the Infectious Disease Specialists perspective