American Heart Association.

Top Ten Things to Know
Chagas Cardiomyopathy: An Update of Current Clinical Knowledge and Management

1. Chagas disease, caused by the protozoan *Trypanosoma cruzi*, is an important etiology of heart failure, stroke, arrhythmia, and sudden death. Traditionally regarded as a tropical disease found only in Central and South America, Chagas disease is now effects at least 300,000 residents of the United States and is growing in prevalence in other traditionally non-endemic areas.

2. The AHA and the InterAmerican Cardiology Society commissioned this statement to increase global awareness among providers who may encounter patients with Chagas disease outside of traditionally endemic environments. This Statement summarizes the most updated information on diagnosis, screening, and treatment of *T. cruzi* infection, focusing primarily on its cardiovascular aspects.

3. This Scientific Statement provides a broad summary of current knowledge and practice in the diagnosis and management of Chagas cardiomyopathy, and also provides quick reference tables highlighting salient considerations when encountering a patient with suspected or confirmed Chagas disease. The intent is to increase the recognition of Chagas cardiomyopathy in low-prevalence areas and improve care for patients with Chagas heart disease around the world.

4. Chagas cardiomyopathy is the most important clinical manifestation of Chagas disease, resulting in the majority of Chagas morbidity and mortality. Though generally classified as having a hemodynamic pattern of dilated cardiomyopathy, the typical predominant distribution of fibrosis to the posterior and apical regions of the left ventricle and involvement of the sinus node and the electrical conduction system distinguishes Chagas disease from other cardiomyopathies.

5. Chagas cardiomyopathy carries a poor prognosis compared to other forms of cardiomyopathy, including hypertensive heart disease, idiopathic dilated cardiomyopathy, and ischemic cardiomyopathy. When controlling for severity of ventricular dysfunction and other co-variates, Chagas emerges as an independent predictor of mortality. Poor outcomes have been attributed to the aggressive ventricular remodeling observed in the Chagas patients, which puts them at higher risk for fatal arrhythmias and other adverse events.

6. The current recommendation for evaluation of a patient in the United States with suspected or newly diagnosed Chagas disease includes serological confirmation, based on two different assays for anti-*T. cruzi* IgG, a history, physical exam, ECG, and a 30-sec rhythm strip. Additional cardiac and gastrointestinal work-up are only recommended when this first evaluation raises clinical suspicion of more advanced disease forms.

7. Anti-trypanosomal treatments are complex and important uncertainties remain. Early biomarkers of therapeutic efficacy are needed in order to better evaluate and address antiparasitic treatment to develop more accurate treatment recommendations for patients around the globe.

8. Several key characteristics of Chagas disease make the development of early biomarkers critical. First, the majority of patients with Chagas disease are asymptomatic until presenting with severe, typically irreversible cardiac or gastrointestinal symptoms and complications. Second, parasites in the chronic form are typically rooted in deep tissues, with only transient low levels of circulating parasites, undetectable by classic parasitological methods. Finally, the gold standard tool of certificate cure is conventional serology, but negative sero-conversion can lag years behind cure. Progress has been shown in this area of research, and there has been an attempt to define the ideal characteristics of a biomarker of early treatment response, however most studies have been conducted in single, homogenous populations, making comparison and generalization challenging.

9. Though the etiology of Chagas disease was first described over 100 years ago, it remains a largely neglected disease, with insufficient diagnostic, therapeutic, and prognostic advances. Compounding the health-care inequality, these patients are often cared for by providers with little knowledge of Chagas disease. High-quality epidemiological research and investment in provider education is urgently needed to improve recognition of and care for Chagas disease outside of Latin America.

10. Due to the complexity of the disease, it is likely that future success will come through a panel of several biomarkers organized through an algorithm, and not by one single "gold-standard" marker of cure. In addition to direct patient benefit, reliable biomarkers would also strengthen and shorten clinical trials, facilitating the discovery of new therapeutics for Chagas disease.

Nunes MCP, Beaton A, Acquatella H, Bern C, Bolger AF, Echeverría LE, Dutra WO, Gascon J, Morillo CA, Oliveira-Filho J, Ribeiro ALP, Marin-Neto JA, on behalf of the American Heart Association Rheumatic Fever, Endocarditis and Kawasaki Disease Committee of the Council on Cardiovascular Disease in the Young, Council on Cardiovascular and Stroke Nursing, and Stroke Council. Chagas cardiomyopathy: an update of current clinical knowledge and management: a scientific statement from the American Heart Association [published online ahead of print August 20, 2018]. *Circulation*. DOI: 10.1161/CIR.0000000000000599.