



MASSACHUSETTS GENERAL HOSPITAL

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SAMPLE CV NARRATIVE ASSOCIATE PROFESSOR AoE CEI + SSA Inv, SSA AIS

Overview

I am an adult cardiologist at Massachusetts General Hospital (MGH), with specific expertise in the mechanisms of valvular heart disease. My major achievements are in defining the fundamental mechanistic derangements underlying valvular heart disease and examining impact of valvular heart disease in patient oriented clinical trials and studies. My contributions have led to improved diagnosis of valvular heart disease, the exploration of novel therapies for treatment of secondary mitral regurgitation and to changes in clinical practice for treating valvular heart disease.

Area of Excellence: Clinical Expertise and Innovation

My research has demonstrated that the temporal pattern of mitral regurgitation is dynamic and impacts on the interplay between tethering and closing forces during mitral valve function. I showed the importance of mitral leaflet tethering as a fundamental mechanism for secondary mitral regurgitation and linked the persistence of tethering as the main mechanism for the significant rate (up to 50%) of recurrent mitral regurgitation following mitral valve ring annuloplasty which is the standard surgical therapy for this condition. This understanding led me to explore alternate therapies for secondary mitral regurgitation, resulting in the development of novel approaches including the use of a patch-balloon device and a polymer-based injection therapy. Experimental work has demonstrated acute and chronic efficacy of these therapies, which were presented as finalists in the Young Investigator Competition of the American Society of Echocardiography and the Vivien Thomas Young Investigator Award of the American Heart Association Scientific Session and subsequently published in the journals *Circulation* and *Journal of the American College of Cardiology Cardiovascular Interventions*.

To define a unique and independent career path, I focused on patient based clinical research on valvular heart disease. Based on the national recognition of my expertise on the mechanisms and evaluation of mitral regurgitation, I was asked to be a member of the Steering Committee of the Cardiothoracic Investigations Surgical Network (CTSN) and was selected in a competitive process to be the Director of the CTSN Echocardiography Core Laboratory. The CTSN is an NIH/NHLBI sponsored network of clinical centers. The mission of the CTSN is to perform randomized clinical trials addressing questions in the field of cardiothoracic surgery. The two initial trials from this network compared surgical therapies for treating secondary mitral regurgitation. I was a member of the Protocol Development Committee for the design and development of the echocardiographic protocol for these trials in which the primary endpoint (end-systolic volume) was an echocardiographic measure and adjudicated the echocardiographic data for these trials. The results from these two trials have been published in a series of four articles published in the *New England Journal of Medicine* both at the one year follow up and two year follow up periods. The results from these trials significantly impacted the surgical management of secondary mitral regurgitation and these trials resulted in modification of ACC/AHA Valvular Guidelines on intervention of secondary mitral regurgitation and echocardiographic criteria for severe mitral regurgitation. Prior to the publication of the clinical trial data, there had been a bias favoring mitral valve repair with ring annuloplasty over mitral valve replacement. The results of the CTSN trials demonstrated no difference in the primary endpoint between the two therapies. Importantly, patients in the mitral valve repair group

had a higher rate recurrent mitral regurgitation and this subgroup was associated with a higher rate of heart failure events.

Based on the results of CTSN secondary mitral regurgitation clinical trial data, I examined the factors associated with recurrence of mitral regurgitation following mitral valve ring repair and demonstrated the importance of a mismatch between left ventricular size to mitral valve ring size (left ventricular-mitral valve ring mismatch) as a major determinant of recurrence of mitral regurgitation following mitral valve ring repair. This concept challenges the prior bias that a restrictive mitral valve annuloplasty by itself was the main objective in mitral valve repair for secondary mitral regurgitation; rather, I demonstrated that it is not the absolute mitral valve ring size but its relation to the patient's left ventricular size that is important. This work was presented at the AHA Scientific Sessions and published in *Circulation*.

My current research aims to define the patient characteristics that benefit from mitral repair versus replacement using advanced imaging techniques including 3D echocardiography to evaluate mitral valve geometry. This research proposal aims to develop treatment algorithms to better select patients for treating secondary mitral regurgitation and has the potential to greatly improve the care of patients with secondary mitral regurgitation. This research proposal has been awarded a multi-PI RO1 grant from the NIH/NHLBI.

In recognition of my clinical expertise and innovation, I am active in international and national scientific societies. I was Chair of the Scientific Sessions for the American Society of Echocardiography (ASE) in 2013, and current Chair of the Education Committee of the ASE. I aim to continue to develop leadership responsibilities in the field of echocardiography through national and international administrative, educational and research roles. I was asked to direct the echocardiographic core laboratory for the clinical trials involving Harpoon Medical, Inc which is testing a novel transcatheter based therapy for degenerative mitral regurgitation and currently developing a major randomized clinical trial in US.

Significant Supporting Activity: Investigation

My investigation contribution has been in valvular mechanisms of disease and developing advanced noninvasive imaging tools to better understand cardiovascular physiology. As examples of my contributions to investigation, I have shown the changes in tricuspid valve and annular geometry in functional tricuspid regurgitation, described left ventricular remodeling features associated with aortic stenosis and developed a predictive algorithm based on echocardiographic features for percutaneous mitral valvuloplasty for rheumatic mitral stenosis. I have advanced the use of 3D echocardiography in quantifying valve disease including mitral regurgitation, mitral stenosis and aortic stenosis. I have received competitive grant funding from National Institute of Health, American Society of Echocardiography, Consortia for Improving Medicine with Innovation and Technology (CIMIT), Foundations (Clafin, Deane) and Industry to support my investigation.

Significant Supporting Activity: Administration and Institutional Service

I was recently named the Director of the Trial Innovation Unit within the Division of Clinical Research at MGH, a unit whose mission is to promote and conduct innovation in clinical trial research. I have had an administrative role since 2005 as Associate Director of the Echocardiography Laboratory at MGH. My responsibilities in this role include supervision of sonographer, administrative nursing and physician staff, day to day operational management and budgetary decisions. I participate in the strategic direction of the academic, teaching and clinical care missions of the echocardiography laboratory.

Teaching

My teaching role involves training medical students to junior faculty. I provide supervision and didactic talks to medical students, interns, medical residents and cardiology fellows and I supervise and teach first- and second-year cardiology fellows and senior echocardiography fellows in the performance and interpretation of transthoracic, transesophageal and stress echocardiograms. I mentor cardiology fellows and junior faculty, resulting in abstract presentations at the American College of Cardiology, American Heart Association, American Society of Echocardiography, European Cardiology Society, European Association of CV imaging and Heart Valve Society Scientific Sessions as well as publications in numerous journals.

Summary

I am a cardiologist with a special interest in valvular heart disease, coronary artery disease and optimizing noninvasive cardiac imaging techniques to improve diagnosis and treatment of heart disease. My research involves understanding mechanisms of valvular heart disease and development of novel therapies to treat valve disease. I aim

to continue to develop leadership responsibilities in the field of echocardiography through national and international administrative, educational, and research roles.