

**Faisal M. Merchant, MD****Young Clinician Award 2008****Investigator Profile****Education**

- MD, Duke University School of Medicine, 2003
- BA, Emory University, Summa Cum Laude, 1999

**Clinical /Professional Appointment**

- Clinical and Research Fellow in Cardiology, Massachusetts General Hospital
- Clinical Fellow in Medicine, Harvard Medical School

**Recent Honors and Awards**

- Finalist, Laennec Young Clinician Award, American Heart Association 2007
- Senior Resident Teaching Award, Massachusetts General Hospital

**Impact on Care**

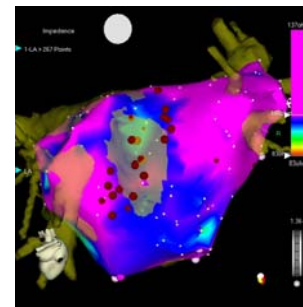
- Atrial fibrillation (AF) is the most commonly encountered cardiac arrhythmia, affecting approximately 1% of the general population and doubling in prevalence with each decade of age, reaching a prevalence of about 10% by age 80
- AF is associated with a two-fold increase in mortality and a four-five fold increase in stroke rate compared to age-matched controls in normal sinus rhythm
- Pharmacologic therapy to prevent AF is limited by major drug toxicities
- Catheter ablation has emerged as a promising tool to reduce the burden of AF and promote sinus rhythm. However, procedural outcomes are limited by high AF recurrence rates and safety concerns related to thermal injury
- Novel techniques to identify ablation targets and limit thermal injury may improve outcomes

**Abstract**

The aim of this proposal is to develop a novel method for guiding radiofrequency catheter ablation of atrial fibrillation (AF). Although catheter ablation is being increasingly utilized as a minimally invasive, non-pharmacologic method to treat AF, the safety and efficacy of this procedure has been limited by the inability to consistently identify specific anatomical targets for ablation. Therefore, novel methods to rapidly, safely and efficiently identify foci for ablation are likely to hold significant promise for improving outcomes.

We hypothesize that one potential means for guiding catheter ablation procedures is through measurement of atrial alternans, a subtle beat-to-beat variation in the morphology of the atrial electrocardiographic (ECG) waveform. According to this hypothesis, the presence of atrial alternans is associated with the same myocardial substrate that gives rise to AF and that elimination of atrial alternans could serve as a marker of successful AF ablation.

We aim to develop a system to measure atrial alternans in real-time with the goal of identifying atrial foci with heightened alternans magnitude and targeting them for ablation. We will also determine if post-ablation measurement of atrial alternans can be used as a marker to predict adequacy of catheter ablation and risk of AF recurrence. We will perform pilot testing of this system in patients undergoing AF ablation procedures in the MGH Cardiac Electrophysiology Lab.



Atrial Fibrillation Ablation Map