

## Design of an Outpatient Atrial Fibrillation of Excellence: Current Experience with the Deliver of Pre and Post Procedure Care

Kevin Kreighbaum, RN, BSN; Loren Berenbom, MD

Center for Excellence in Atrial Fibrillation, The Bloch Heart Rhythm Center, Mid America Cardiology at the University of Kansas Hospital, Kansas City, KS 66221

### Introduction

The population of patients with atrial fibrillation (AF) continues to expand and emerges to be the most common arrhythmia we deal with. Referrals to centers performing catheter based ablation procedures for AF also continue to grow as catheter ablation becomes an increasingly accepted therapeutic approach. In this article we will describe the infrastructure we have developed to manage our atrial fibrillation ablation population at the Richard and Annette Bloch Heart Rhythm Center at the University of Kansas Hospital. Our goal is to provide a “nuts and bolts” overview from the allied health professional perspective. For concise reviews of AF management we recommend the ACC/AHA/EFC 2006 guidelines and the HRS/EHRA/ECAS expert consensus statement on catheter and surgical ablation of atrial fibrillation.<sup>1,2</sup>

The Bloch Heart Rhythm Center at the University of Kansas Hospital provides electrophysiology services, including patient medical management, implantable cardiac devices and complex ablation techniques, to 35 cardiologists at the University, as well as a regional referral area extending several hundred miles. Patients for complex ablation procedures come from even greater distances. We have five electrophysiologists, Loren Berenbom,

MD, Raghuvveer Dendi, MD, Martin Emert, MD, Dhanunjaya Lakkireddy, MD, and Rhea Pimentel, MD. Not all our electrophysiologists perform ablation procedures, although all are involved in patient selection, as well as post-procedure management. We feel it is important to maintain a high degree of proficiency in A-Fib ablation and believe that operators should perform a minimum of 50 cases per year, and ideally 100 cases per year to develop and maintain excellence in this technically demanding procedure. Again, we would like to highlight that there is no consensus on what the magic number is.

Our outpatient allied health staff consists of nurse practitioners, registered nurses, exercise specialists, medical technicians, ECG, Holter and event recorder staff at our main campus and at various outreach sites. The Bloch Heart Rhythm Center provides comprehensive care for electrophysiology patients including medical management, implant devices and complex ablation techniques.

Our facility initiated a catheter based AF ablation program in 2005. Volume increased substantially with the addition of Dr. Dhanunjaya Lakkireddy in July 2006 and has continued to increase. Currently we perform approximately 20 cases monthly. The logistics of evaluating these

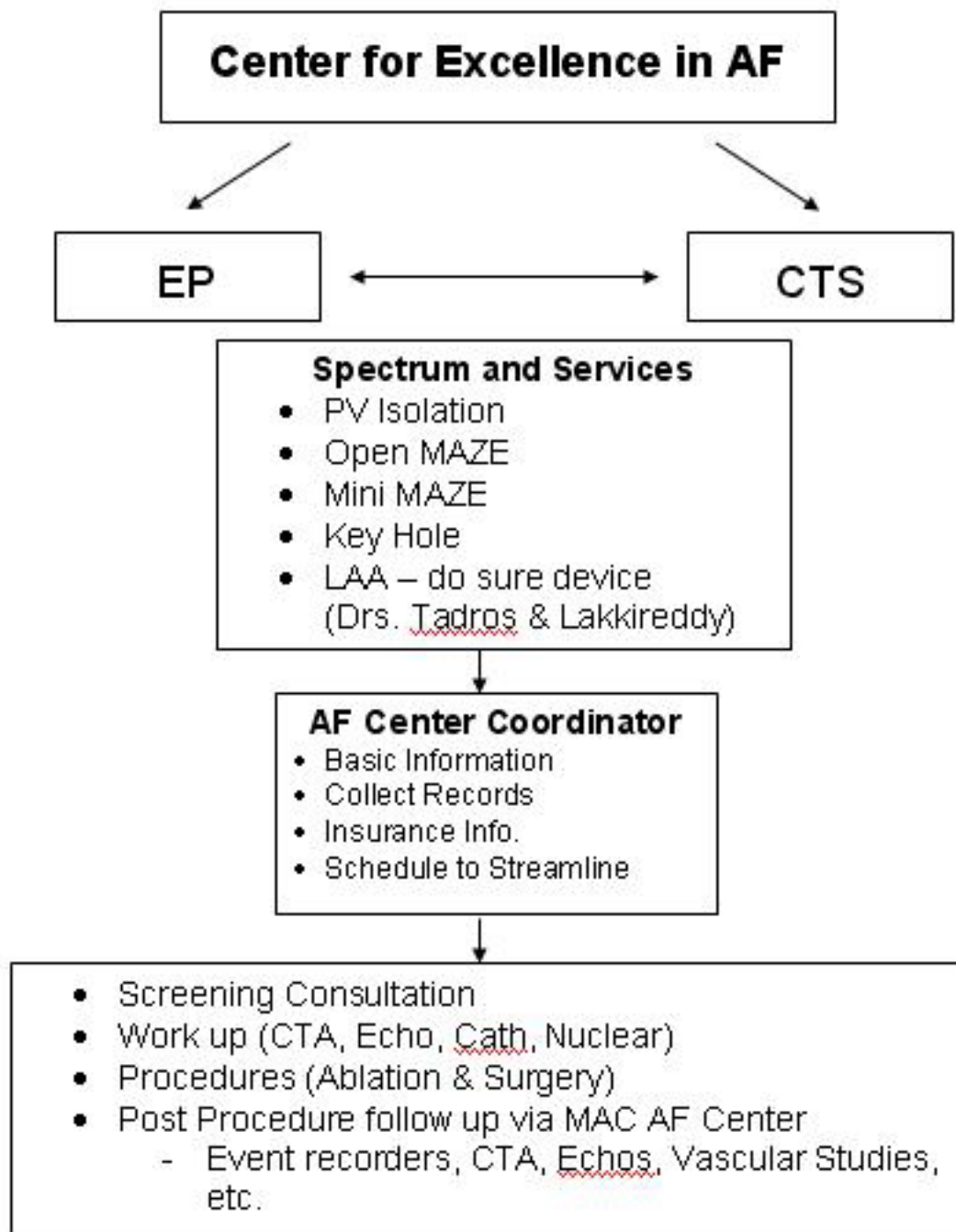
**Corresponding Address** :Director, Outpatient EP services, The Bloch Heart Rhythm Center, Mid America Cardiology at the University of Kansas Hospital, Kansas City, KS 66221.

patients, completing appropriate pre-procedure diagnostic testing, and orchestrating post-procedure follow-up is complex. As our population grows, the complexity of organization continues to grow as well. Although all of our staff is expected to be familiar with this patient population, we quickly learned identification of “AF Champions” was necessary to our ongoing success as a regional referral center. We also identified the need to partner with our surgical colleagues to of-

fer an integrated program which includes surgical as well as medical and catheter based options. Ultimately, the Center for Excellence in Atrial Fibrillation was developed.

(Figure-1) The outpatient portion of the Center needs a strong outpatient allied professional team consisting of RNs, EP technicians, EKG and holter technicians along with administrative staff. (Figure-2)

Figure 1: Flow chart of organization of Center for Excellence in Atrial Fibrillation



As part of ongoing training, our outpatient staff has the opportunity to observe in the EP lab to ensure familiarity with the procedure itself. The staff also has the opportunity to attend relevant meetings such as the Boston Atrial Fibrillation Symposium and the Heart Rhythm Society Scientific Sessions.

We have established basic pathways but remain flexible. No two AF patients are the same. It is important to customize our approach to accommodate patient needs. Our basic pathway continues to evolve over time.

### Pre-Procedure AF Management

Information management is facilitated by our electronic medical record. Outside records are scanned into this system so that all pertinent information is immediately available to anyone on our staff who requires access to it.

Prior to scheduling appointments, we attempt to obtain all relevant outside records, including office notes, echocardiograms, stress tests, and laboratory work. Previous catheterization data, results of electrophysiology studies and implanted device information are also obtained. Our business office reviews insurance information for

compatibility. Once pertinent records are obtained, patients are scheduled at our main campus or one of our outreach sites to see an electrophysiologist to discuss treatment options. All appropriate options are discussed with the patient and family in detail. Additional patient education is carried out by Allied Health staff and includes both print and web-based materials.

If catheter ablation is determined to be a viable option, a detailed discussion of procedures, possible outcomes and complications, is outlined in detail verbally and again reinforced with written and web-based materials. If patients have not had an Echo Doppler completed within the past twelve months, we will update the study or request one from the referring physician if they provide echo services.

We routinely obtain a 64-slice cardiac CT to assess the left atrium and pulmonary vein anatomy for proper planning of the procedure. Also these segmented images are used for integration into our EP lab three dimensional mapping systems. Insurance reimbursements for these critical tests continue to be an issue and we try to deal with these one on one. Ruling out prior PV stenosis is important especially for people who had prior attempts at AF ablation. More than a few times we caught

**Figure 2:** The outpatient wing of the Center. From Left to Right – Diane Parker (RN); Dustin Baker (Tech); Jamie Salmons (RN); Lori Garnett (Tech); Kevin Kreighbaum (RN); Justin Conley (Tech); Jean Ann Thompson (Tech), Marie Hauser (Tech), Carrie Uecker (RN); Katherine Lee (Tech). Absent from the picture – Debbie Mc Morris (RN), Jeanine Swope (RN); Shawn Beggs (RN); Andrea Behne (RN); Debbie Pelke (RN); Courtney Jeffery (PA).



structural anomalies like intracavitary (right atrial) coronary artery, tortuous and elongated left atrial appendageal clots usually not visualized by TEE with the help of these preablation CTs. The importance of post ablation CTs could not be stressed less.

Anticoagulation management is an area of particular concern. INR's are obtained weekly for at least one month prior to the procedure. Coumadin is typically held for two days before ablation. For patients in atrial fibrillation in the days prior to the procedure, a Lovenox bridge is utilized. (1 mg/kg subcutaneously every 12 hours with the last dose administered 12-18 hours prior to the procedure.) Although, in the recent months, we are slowly moving towards ablation while INRs are therapeutic between 2 and 3. There is increasing evidence that AF ablation can be safely performed on therapeutic INRs minimizing the risk of periprocedural stroke.

Transesophageal echocardiograms are obtained on the day prior to the procedure, or on the day of the procedure, if anticoagulation has been interrupted in the presence of atrial fibrillation. Most patients do not require a TEE. This is an area where particularly close communication between the physician performing the A-Fib ablation procedure and the nurse orchestrating pre-procedure care is important.

Routine pre-procedure labs, besides PT/INR include CBC, BMP and magnesium. These are typically obtained 7-14 days prior to procedure to allow adequate time to address any abnormalities. If a woman of childbearing potential is scheduled for ablation, a beta HCG is obtained within three days of the procedure. Membrane active antiarrhythmic medications are typically held for 48 hours before ablation. Amiodarone is typically held for at least six weeks prior to ablation. Patients are admitted on the morning of their procedure and most procedures are done on an outpatient basis, although all of our patients remain in the hospital overnight.

### Post-Procedure Care

Patients are discharged on Lovenox 0.5mg/kg q 12 hours until their INR is greater than or equal 2.0.

PT/INR is monitored every 2-3 days early post-procedure. Most patients are on membrane active antiarrhythmic drugs pre-procedure and most continue on these drugs for at least 8-12 weeks post-procedure.

Post-procedure rhythm monitoring requires a robust infrastructure. We do ambulatory recording on our patients for at least three months post-procedure. We typically use a "heart card" type device and request that patients make recordings whenever they are symptomatic, and at least twice a week on a random basis. Rhythm strips are reviewed by staff on a daily basis. Significant abnormalities are brought to the attention of one of our Electrophysiologists, or ARNP for further guidance and management. Otherwise, recordings are reviewed by a physician at the end of each month. We continue to evaluate new technologies to enhance post-procedure monitoring.

Patients are contacted by phone by the EP lab staff, 2-4 days post-procedure and by the office staff at 1 and 2 weeks post-procedure. The staff inquires about potential post-procedure complications, including palpitation, lightheadedness, catheterization site status, chest pain, shortness of breath, dysphagia and overall sense of well being.

Follow-up is recommended at one month with the patient's primary provider and at two months with the ablating electrophysiologist. Not infrequently patient concerns lead to additional APRN visits. At two months, if the patient is doing well, membrane active drugs are discontinued. In those patients who have had recurrence of arrhythmia in the first two months membrane active drugs are continued. Heart rhythm monitoring is continued for another 4 weeks off of the antiarrhythmic drug. In the absence of any recurrences we discontinue the heart rhythm monitoring but continue monthly EKGs either at the primary care physician or the cardiologists office. In the event of symptoms we tend to extend the heart rhythm monitoring.

A second follow-up visit with one of our electrophysiologists is scheduled at 3-4 months post-procedure. A follow-up CT is typically obtained at 4-6 months although we are considering eliminating this as a routine, given very low incidence



of significant pulmonary vein stenosis.

The six month follow-up visit is generally the first time that we will entertain the possibility of discontinuing Coumadin in appropriate patients (CHADS score 0-1 and no evidence of AF recurrence). In conjunction with this decision, an additional 30 days of heart rhythm monitoring is typically completed. We take a conservative approach to anticoagulation and favor maintaining it if there is any question as to possible recurrence of arrhythmia.

### Management of Post Ablation Atrial Tachy Arrhythmias

Management of post ablation left atrial tachycardia is complex. Majority of these are reentry tachycardias that subside by the end of 8 weeks post ablation. Certainly, a small percentage (5%) of these patients have persistent atrial tachycardias that need repeat intervention. We generally take an aggressive approach to terminating any sustained arrhythmias within 24-48 hours by moving quickly to DC cardioversion. If these patients have not been on a membrane active antiarrhythmic drug, one is initiated in the hospital in association with cardioversion. We try to delay repeat ablation until at least three months, preferring up to six months, after the initial procedure.

### Psychosocial Issues

Many of these patients are very knowledgeable about atrial fibrillation and have actively researched their condition. These patients often have many questions which we begin to address by phone even before they are seen for their initial evaluation. Much of what they have read and heard is accurate and helpful, but occasionally they have some misperceptions that we work hard to correct. Both pre and post-procedure patients often have significant anxiety. They require extensive counseling and reassurance. Prompt access to a well informed RN, APRN, or physician is the key to managing these patients in a constructive way.

### Conclusions

A well trained, well educated, focused staff supported by their physician partners, enhances our

ability to effectively manage patients pre and post-procedure. Excellent counseling skills as well as technical expertise, is necessary to maintain patients' confidence through what can be an emotional and physical roller coaster ride for these patients. The guiding bodies like HRS should proactively consider releasing some position statements in attempt to create uniform practice guidelines.

### Acknowledgements

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### References

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