Atrial Fibrillation (AF): Rate vs. Rhythm
April 30, 2012

Jay Simonson, MD, FACC, FHRS
Medical Director, Cardiac Electrophysiology
Park Nicollet Heart and Vascular Center

A-Fib FEELS LIKE...
...DRUMS POUNDING IN MY CHEST.
AND IT INCREASES STROKE RISK BY 500%

AF: Facts and Fiction
- **Facts**
  - Yes, you may be able to blame your parents
  - It is more of a nuisance than a life-threatening problem
  - Alcohol can provoke
  - Onset of AF is not activity dependent
  - It is usually managed rather than cured
  - Sleep Apnea is important to treat

- **Fiction**
  - "All I need is a pacemaker"
  - "My AF is brought on by stress."
  - "All I need to do is cut out caffeine, exercise or change my diet and my AF will go away."
  - "I always know when I have AF."

AF Treatment Strategies

**RATE CONTROL**
- Means to accept AF
- Does not eliminate AF
- Aim to keep resting heart rate < 100/min
- Best for those with minimal or no symptoms

**RHYTHM CONTROL**
- Restore and maintain a normal rhythm (sinus)
- Requires either drugs or ablation
- May require cardioversion (shock)
- Best if symptomatic

NO DIFFERENCE IN SURVIVAL
Difference of Rate vs. Rhythm Control

AF Rate Control:
AV Node Ablation + Permanent Pacemaker
- Low risk procedure (2 hours)
- Controls the heart rate very effectively without need for drugs
- But AF persists; it just eliminates symptoms due to irregularity and rapidity
- AV node is ablated with one catheter and typically can be done via the pacemaker incision
- A good choice for:
  - AF with persistent rapid rate &/or drug side effects
  - AF ablation failure
  - Patients seeking easier, quick control

Drugs for AF Rate Control
Target the AV node to slow the ventricle rate
- Beta Blockers
  - atenolol, metoprolol, carvelelodil
- Calcium Channel Blockers
  - verapamil, diltiazem

Drugs for AF Rhythm Control
- If normal heart function (EF):
  - Flecaainide (Tambocor), Propafenone (Rythmol)
- If abnormal heart function or if normal heart function and above drugs fail:
  - Amiodarone, dofetilide (Tikosyn), sotalol (Betapace), dronedarone (Multaq)

Advantages and Disadvantages of Drugs for AF Rhythm Control

<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-invasive</td>
<td>Significant side effects</td>
</tr>
<tr>
<td>Side effects tend to be minor / reversible</td>
<td>Cost - $$$</td>
</tr>
<tr>
<td>Most meds have a long track record</td>
<td>Compliance (Must take as prescribed)</td>
</tr>
<tr>
<td>Effect usually within a few days</td>
<td>Chronic daily dosing</td>
</tr>
<tr>
<td>40-60% effective</td>
<td>Possible interactions with other drugs</td>
</tr>
<tr>
<td></td>
<td>Limited effectiveness</td>
</tr>
<tr>
<td></td>
<td>Drugs don't cure</td>
</tr>
</tbody>
</table>
AF Ablation

“What do I do when drugs don’t work?”
or
“What do I do if I don’t want drugs?”

Atrial Fibrillation Ablation

Antirhythmic Drug Therapy vs. Catheter Ablation for Paroxysmal AF:

- General anesthesia
- Both groins used for venous access
- Trans-septal catheterization
- Intracardiac Echocardiography
- Miniature local GPS system guidance
- Irrigated (cooled tip) RF catheter for ablations
- Duration 2 - 3 hours
- Overnight stay in the hospital

Electrical System of the Heart

Dr. Simpson doing an AF ablation procedure; Sonya Helven, RN assembling
Who is the Optimal Patient for AF Catheter Ablation?

- Substantial symptoms with AF
- Failure to control AF with drugs
- Failure to tolerate AF drugs

AF Ablation: Park Nicollet Success in 2010

Success= Sinus rhythm & off antiarrhythmic drugs
  - Paroxysmal:
    - 88% success with a single procedure
  - Persistent:
    - 75% success with a single procedure
    - 52% success with two procedures
    - Up to 25% will require a second procedure to achieve success

AF Treatment: What is right for me?

- AF has many complexities
- Simpler options usually control symptoms
- Advanced procedures are available when simpler options don’t work
- No one treatment is appropriate for everyone

Atrial Fibrillation Ablation: Risks*

- Major:
  - Stroke (4%)
  - Heart attack (0.07%)
  - Atrial myocardial infarction (0.01%)
  - Death (0.01%)
- Intermediate:
  - Pulmonary vein narrowing or stenosis (0.01%)
  - Bleeding around the heart or temporary pacemaker (0.001%)
  - Diaphragm paralysis (0.01%), higher with cryoballoon
  - Need for a pacemaker (rare, < 0.05%)
- Minor:
  - Gastrointestinal bleeding or hematoma (0.03%)
  - Infection (0.02%)

*CABANA: Comparison of Ablation and Medical Therapy to Assess Risk Reduction and Endpoints in Atrial Fibrillation.
Catheter Ablation versus Antiarrhythmic Drug Therapy in Atrial Fibrillation Trial (CABANA)

Sponsored by:
National Heart, Lung, and Blood Institute (NHLBI)

CABANA Trial
Primary Objective and Hypothesis

Hypothesis: The treatment strategy of catheter ablation is superior to current state-of-the-art medical therapy in patients with AF warranting therapy.

Primary endpoint:
Total mortality

Major secondary endpoint:
- Composite of total mortality, disabling stroke, serious bleeding, or cardiac arrest

CABANA Trial Inclusion Criteria

- Documented AF episodes ≥1 hour in duration, with ≥2 episodes over 4 months with ECG documentation of 1 episode
- ≥1 or at least 1 episode of AF lasting ≥1 week
- Warrant active therapy beyond simple ongoing observation
- Be ≤65 yr of age, or >65 yr with ≥1 of the following risk factors for stroke
  - Hypertension
  - Diabetes
  - Congestive heart failure (excluding systemic or diastolic heart failure)
  - Prior stroke or TIA
  - LA size ≥5 cm (or volume index ≥40 cm³)
  - EF ≤35