Atrial Fibrillation: Guideline Directed Treatment

Melissa Wendell, FNP-C, MSN
Heart Failure - Lead Nurse Practitioner, Aspirus Wausau Hospital and Aspirus Cardiology

Cost and Prevalence of A fib
- 33.5 million people around the world have A Fib
- 2.7 – 6.1 million people in the U.S have A Fib
- 750,000 hospitalizations per year
- Estimated cost $6 Billion per year
- Individuals with A fib pay $8,705 more per year in medical costs

Prevalence of A Fib
- 70% of people with A Fib are between 65-85 years of age
- 2% of the population with A fib are <65
- Those with A Fib are 5 times more likely to have a stroke
- Women are at greater risk of stroke and dying then men with A Fib

Risk Factors for A Fib
- Hypertension
- Obesity
- Diabetes
- Sleep Apnea
- Ischemic Heart Disease
- Hypothyroidism

Conditions with A Fib

<table>
<thead>
<tr>
<th>Beneficiaries ≥65 y of Age (N=2,426,865)</th>
<th>Beneficiaries &lt;65 y of Age (N=105,378)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Mean Number of Conditions=5.8; Median=6)</td>
<td>(Mean Number of Conditions=5.8; Median=6)</td>
</tr>
<tr>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Hypertension</td>
<td>2,015,235</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>1,549,125</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>1,507,395</td>
</tr>
<tr>
<td>HF</td>
<td>1,247,748</td>
</tr>
<tr>
<td>Anemia</td>
<td>1,027,135</td>
</tr>
<tr>
<td>Arthritis</td>
<td>965,472</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>885,443</td>
</tr>
<tr>
<td>CKD</td>
<td>784,631</td>
</tr>
<tr>
<td>COPD</td>
<td>561,826</td>
</tr>
<tr>
<td>Cataracts</td>
<td>546,421</td>
</tr>
</tbody>
</table>
Defining A Fib

- **Paroxysmal AF**
  - Terminates spontaneously or with intervention with in 7 days of onset
  - Can recur

- **Persistent AF**
  - Continuous AF for > 7 days

- **Long – Standing Persistent AF**
  - Continuous AF > 12 months duration

- **Permanent AF**
  - Patient and clinician make joint decision to stop further attempts to restore/maintain sinus rhythm

- **Nonvalvular AF**
  - AF in absence of rheumatic Mitral stenosis, mechanical or bioprosthetic valve or mitral valve repair

**Mechanisms of AF**

- **Extracardiac Factors:**
  - Hypertension
  - Obesily
  - Sleep apnea
  - Hyperthyroidism
  - Alcohol/drugs

- **Atrial Structural Abnormalities:**
  - Fibrosis
  - Dilation
  - Ischemia
  - Infiltration
  - Hypertrophy

- **Atrial tachycardia remodeling**

- **Genetic Variants:**
  - Channelopathy
  - Cardiomyopathy

- **Atrial Electrical Abnormalities:**
  - ↑Heterogeneity
  - ↓Conduction
  - ↓Action potential duration/refractoriness
  - ↑Automaticity
  - Abnormal intracellular Ca** handling

- **Inflammation**
- **Oxidative stress**

- **RAAS activation**

- **Autonomic nervous system activation**
Evaluating A Fib

- EKG
- Echo
- Chest X Ray
- CBC
- BMP
- Magnesium

Evaluating A Fib

- Magnesium
- TSH
- INR (if using Warfarin)
- LFTs
- Consider holter (HR <70 with no rate control meds or for evaluation of rate control)
- Sleep Study

Suspected AFib/Flutter (for Primary Care Providers)

Confirm with 12-lead ECG

- Admit
  - Severe symptoms or HR >140 or <40 or pauses > 3 sec
- No

Work-Up
- BMP, TSH, Hemogram, INR, LFTs,
- Holter if pauses, or HR <70
- Echocardiogram, unless done in the last 3 months, and HR controlled <110
- Consider sleep study if at risk for sleep apnea

If Anticoagulation is not contraindicated, assess risk of thromboembolism (CHA2DS2-VASc)
- 0 - Consider Aspirin
- 1 - Consider Aspirin vs Anticoagulation
- 2 or higher – Anticoagulation (see guide)

Rate Control
- Metoprolol
- Diltiazem (ER)
  (Depending on comorbidities)

If patient agreeable to cardioversion, do EPIC referral to AFib Resource Center

Periodic re-evaluation, as clinically indicated. Consider EPIC referral for:
- Patients that remain with significant symptoms
- HR < 60 on no meds (possible pacemaker)
- Tachy-brady syndrome (possible pacemaker)
Preventing Thromboembolism

• Based on individual and risk of stroke and bleeding and patients values and preferences
• Therapy should be based risk despite if paroxysmal, persistent or permanent
• Utilize CHA2DS2-VASC in those with non valvular AF
• Mechanical heart valves Coumadin is recommended with INR 2-3.5 based on position and type of prosthesis

<table>
<thead>
<tr>
<th>Anticoagulants</th>
<th>Apixaban</th>
</tr>
</thead>
</table>
| • Treatment
  – Nonvalvular AF with prior stroke
  – TIA
  – CHA2DS2 – Vasc of 2 or greater
  – BMI > 40 be cautious with DOACs (not studied)
| • 5 mg orally twice daily
  – If patient has at least 2 of the following dose should be 2.5 mg BID
  • Age > or equal to 80
  • Weight < or equal to 60Kg
  • Creatinine > or equal to 1.5 |
| • Warfarin (2-3 INR)
 • Apixaban
 • Rivaroxaban
 • Dabigatran |

<table>
<thead>
<tr>
<th>Dabigatran</th>
<th>Rivaroxaban</th>
</tr>
</thead>
</table>
| • 150 mg twice daily if CrCl>30 ml/min
 • 75 mg twice daily if CrCl<30 |
| • 20mg daily if CrCl>50
 • 15 mg daily if CrCl 15-50 ml/min |
 Interruption of Anticoagulation

- Mechanical heart valve with AF undergoing procedure level 1 recommendation to bridge with UFH or LMWH
- Without Mechanical heart valve balance risk of stroke and bleeding
  - Current CHA2DS2 – Vasc 6 or greater
  - Recurrent stroke

 Coronary Revascularization

- IF CHA2DS2 – VASC of 2 or > may use Plavix with anticoagulant, no ASA
- DOAC and Clopidogrel/Ticagrelor or ASA until INR therapeutic (DC ASA when INR greater than or 2)

Anticoagulation

- Nonvalvular AF and CHA2DS2 – Vasc of 0 is reasonable to omit
- Nonvalvular AF and CHA2DS2 – Vasc of 1 no therapy or oral anticoagulation or ASA
- Nonvalvular AF and CHA2DS2 – Vasc of 2 or > with CrCL < 15 warfarin, if moderate to severe CKD consider reduced doses of direct thrombin or factor Xa inhibitors

Dose Selection of Oral Anticoagulant Options for Patients With Nonvalvular AF and CKD
(Based on Prescribing Information for the United States)*

<table>
<thead>
<tr>
<th>Renal Function</th>
<th>Warfarin</th>
<th>Dabigatran†</th>
<th>Rivaroxaban†</th>
<th>Apixaban†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal/mild impairment</td>
<td>Dose adjusted for INR 2.0–3.0</td>
<td>150 mg BID (CrCl &gt;30 mL/min)</td>
<td>20 mg QD with the evening meal (CrCl &gt;50 mL/min)</td>
<td>5.0 or 2.5 mg BID‡</td>
</tr>
<tr>
<td>Moderate impairment</td>
<td>Dose adjusted for INR 2.0–3.0</td>
<td>150 mg BID (CrCl &gt;30 mL/min)</td>
<td>15 mg QD with the evening meal (CrCl 30–50 mL/min)</td>
<td>5.0 or 2.5 mg BID‡</td>
</tr>
<tr>
<td>Severe impairment</td>
<td>Dose adjusted for INR 2.0–3.0 §</td>
<td>75 mg BID (CrCl 15–30 mL/min)</td>
<td>15 mg QD with the evening meal (CrCl 15–30 mL/min)</td>
<td>No recommendation¶</td>
</tr>
<tr>
<td>End-stage CKD not on dialysis</td>
<td>Dose adjusted for INR 2.0–3.0 §</td>
<td>Not recommended (CrCl &lt;15 mL/min)</td>
<td>Not recommended (CrCl &lt;15 mL/min)</td>
<td>No recommendation¶</td>
</tr>
<tr>
<td>End-stage CKD on dialysis</td>
<td>Dose adjusted for INR 2.0–3.0 §</td>
<td>Not recommended (CrCl &lt;15 mL/min)</td>
<td>Not recommended (CrCl &lt;15 mL/min)</td>
<td>No recommendation¶#</td>
</tr>
</tbody>
</table>
Approach to Selecting Drug Therapy for Ventricular Rate Control*

**Atrial Fibrillation**

- **No Other CV Disease**
  - Beta blocker
  - Diltiazem
  - Verapamil

- **Hypertension or HFrEF**
  - Beta blocker
  - Diltiazem
  - Verapamil

- **LV Dysfunction or HF**
  - Beta blocker†
  - Digoxin‡

- **COPD**
  - Beta blocker
  - Diltiazem
  - Verapamil

- **Amiodarone§**

**Rate Control**

- Beta Blockers
- Diltiazem
- Verapamil

**Rate Control**

- Goal HR < 80 for symptomatic AF
- GOAL <110 if patient asymptomatic and LV function stable
- Amiodarone oral if unable to control with other measures
- AV nodal ablation if unable to control
Rate Control

- Avoid calcium channel antagonists if decompensated HF
- Avoid Dronedarone if patients with recent decompensated CHF

Cardioversion

- AF for > 48 hour duration must be anticoagulated for at least 3 weeks prior to cardioversion
  - Continue anticoagulation for at least 4 weeks post CV
  - Does not matter method of conversion or CHA2DS2-Vasc

Cardioversion

- AF < 48 hours duration but high risk of stroke
  - IV heparin or LMWH or factor Xa or direct thrombin inhibitor is recommended as soon as possible before or after with long term anticoagulation
- AF < 48 hours but low risk for thromboembolism may consider CV

Cardioversion

- If unsuccessful CV consider antiarrhythmic medication
  - Consider length of time maintaining SR
  - Consider symptoms of patient

Antiarrhythmic

- Pharmacologic CV
  - Flecanide
  - Dofetilide
  - Propafenone
  - Amiodarone
- Pill in Pocket
  - Flecanide
  - Propafenone
Antiarrhythmic

Flecainide
- Dose: 50, 75, 100, 150 mg BID
- Paroxysmal AF, Persistent AF/flutter, A tach
- V Tach
- Caution
  - Renal and hepatic impairment
- Avoid in structural heart disease (LVH > 1.3cm)

Flecainide
- Watch QRS duration
- Beta Blocker or Calcium channel blocker to avoid 1:1 flutter
- Method of Action
  - Slows conduction in cardiac tissue by altering transport of ions across cell membranes, slight prolongation of refractor periods, decreases rate of rise of action potential

Dofetilide
- Not to be initiated out of hospital
- Dose: 125 mcg, 250 mcg, 500 mcg
  - Adjust for Renal and hepatic impairment
  - Avoid in patients with prolonged QT
    • Caution in QTC >440
  - Avoid if patient bradycardic
  - Avoid CrCl < 20

Propafenone
- Dose: 150, 225, 300 mg BID or TID
- Paroxysmal AF, persistent AF/flutter, A Tach
- V Tac
- Caution: renal impairment
- Avoid: Structural heart disease LVH > 1.3 cm

Propafenone
- Watch QRS duration
- Check hemogram (agranulocytosis)
- Method of Action
  - Blocks the fast inward sodium current and slows the rate of increase of action potential. Prolongs conduction and refractoriness. Has some beta blockade activity

Amiodarone
- Dose: 100 – 400 mg daily
- Paroxysmal AF, persistent AF/flutter, A tach, V tach
- Caution: COPD, hepatic impairment, lung disease,
- Avoid: iodine allergy, sinus node or AV node dysfunction
- Check: TSH, CXR, ALT, AST, PFTS
Amiodarone

- Needs f/u testing TSH, ALT, AST, CXR, EKG
- Eye exam yearly
- Method of Action
  - Blocks alpha and beta receptors. Affects sodium and calcium and potassium channels
  - Prolongs action potential

Dronedarone

- Dose: 400 mg BID
- Paroxysmal AF, persistent AF/flutter
- Avoid: LV < 35 %, CHF, liver failure, breast feeding
- Monitor EKG and LFTS every 3 months
- Method of action
  - Inhibits sodium and potassium channels prolonging action potential. Has beta receptor blocking activity

Sotalol

- Dose: 80mg, 120mg, 160 mg BID
- Paroxysmal AF, persistent AF/flutter, A Tach
- Avoid: Bronchial asthma, uncontrolled CHF, Long QT syndromes, cardiogenic shock
- Caution: Renal impairment, bradycardia, Severe COPD

Antiarrhythmic to maintain SR

- First make sure cause and precipitating events have been identified
  - Amiodarone
  - Dofetilide
  - Dronedarone
  - Flecanide
  - Propafenone
  - Sotalol

Sotalol

- Method of Action:
  - Blocks beta (1 and 2) and alpha receptors and prolongs cardiac action potential. Prolongs atrial and ventricular monophasic action potentials and prolongs refractory period of atrial and ventricular muscle and AV accessory pathways

Antiarrhythmic to maintain SR

- Make sure drug matches patient
- Amiodarone only after other agents considered
- Dronedarone not to be used with NYHA class III and IV
- May continue if spells of AF are infrequent
- If permanent AF discontinue Antiarrhythmic agent
Atrial Fibrillation: Guideline Directed Treatment

Strategies for Rhythm Control in Patients with Paroxysmal* and persistent AF†

Ablation

- Symptomatic AF with failure of at least 1 antiarrhythmic medication
- Consider procedural risks for individual patient
- Can be considered if AF > 12 months with failure of at least one antiarrhythmic medication
- Must be able to tolerate anticoagulation

Surgical Ablation

- Reasonable for AF in patients undergoing cardiac surgery for other reasons
- Stand alone procedure may be considered if highly symptomatic AF not well managed with other treatment

Thank You

- American College of Cardiology
- American Heart Association
- CDC.Gov
- Healthline.com