Atrial Fibrillation Update:
Canadian Cardiovascular Society
2010 Atrial Fibrillation Guidelines

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A New Approach to Guideline Development & Evaluation

GRADE Approach
(Grading of Recommendations, Assessment, Development and Evaluation)

Clear separation of 2 issues:

1. Quality of Evidence: Four Categories
   - High, Moderate, Low or Very Low

2. Strength of Recommendations: 2 Grades
   - Strong or Conditional (weak)
     - Quality of evidence
     - Difference between desirable and undesirable effects
     - Values and preferences
     - Cost

Modified with permission from: Guyatt GH, et al. BMJ 2008;336:926
Establish Pattern of Atrial Fibrillation

Newly Diagnosed AF

Paroxysmal self terminating < 7 days

Persistent ≥ 7 days or require cardioversion

Permanent

Modified with permission from Fuster et al Circulation 2006;114:e257-354.
Goals of AF Arrhythmia Management

- Identify and treat underlying structural heart disease and other predisposing conditions
- Relieve symptoms
- Improve functional capacity/quality of life
- Reduce morbidity/mortality associated with AF/AFL
  - Prevent tachycardia-induced cardiomyopathy
  - Reduce/prevent emergency room visits or hospitalizations secondary to AF/AFL
  - Prevent stroke or systemic thromboembolism
# Establish AF Severity

Use to Guide Therapeutic Approach

<table>
<thead>
<tr>
<th>CCS SAF Score</th>
<th>Impact on QOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Asymptomatic</td>
</tr>
<tr>
<td>1</td>
<td>Minimal effect on QOL</td>
</tr>
<tr>
<td>2</td>
<td>Minor effect of QOL</td>
</tr>
<tr>
<td>3</td>
<td>Moderate effect on QOL</td>
</tr>
<tr>
<td>4</td>
<td>Severe effect on QOL</td>
</tr>
</tbody>
</table>

Dorian et al Can J Cardiol 2006;22:383-386
Overview of AF Management

AF Detected

- Detection and Treatment of Precipitating Causes

Assessment of Thromboembolic Risk (CHADS₂)

- ASA OAC

Management of Arrhythmia

- Rate Control
- Rhythm Control

No antithrombotic therapy may be appropriate in selected young patients with no stroke risk factors
# Ventricular Rate Control

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Evidence Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>We recommend that ventricular rate be assessed at rest in all patients with persistent and permanent AF/AFL.</td>
<td>Strong Recommendation Moderate Quality Evidence</td>
</tr>
<tr>
<td>We recommend that heart rate during exercise be assessed in patients with persistent or permanent AF/AFL and associated exertional symptoms.</td>
<td>Strong Recommendation Moderate Quality Evidence</td>
</tr>
<tr>
<td>We recommend that treatment for rate control of persistent/permanent AF/AFL should aim for a resting heart rate of less than 100 beats per minute.</td>
<td>Strong Recommendation High Quality Evidence</td>
</tr>
</tbody>
</table>

**Values and Preferences**

These recommendations place a high value on the randomized clinical trials and other clinical studies demonstrating that ventricular rate control of AF is an effective treatment approach for many patients with AF.
Atrial Fibrillation Guidelines

Rate Control Drug Choices

No Heart Disease Hypertension
- β-blocker
- Diltiazem
- Verapamil
- Combination Rx
- Digitalis†
- Dronedarone

CAD
- β-blocker
- Diltiazem
- Verapamil

Heart Failure
- β-blocker ± digitalis

*β-blockers preferred in CAD
†Digitalis may be considered as monotherapy in sedentary individuals
# Ventricular Rate Control

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>We suggest that dronedarone may be added for additional rate control in patients with uncontrolled ventricular rates despite therapy with β-blockers, calcium channel blockers and/or digoxin.</td>
<td>Conditional Recommendation Moderate Quality Evidence</td>
</tr>
<tr>
<td>We suggest that amiodarone for rate control should be reserved for exceptional cases in which other means are not feasible or are insufficient.</td>
<td>Conditional Recommendation Low Quality Evidence</td>
</tr>
</tbody>
</table>

**Values and Preferences**

These recommendations recognize that selection of rate control therapy needs to be individualized based on the presence or absence of underlying structural heart disease, the activity level of the patient and other individual considerations.
**Rhythm Control Recommendations**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Strength of Recommendation</th>
<th>Quality of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>We recommend use of maintenance oral antiarrhythmic therapy as first-line therapy for patients with recurrent AF in whom long-term rhythm control is desired (see flow charts).</td>
<td>Strong Recommendation</td>
<td>Moderate Quality Evidence</td>
</tr>
<tr>
<td>We recommend that oral antiarrhythmic drug therapy should be avoided in patients with AF/AFL and advanced sinus or AV nodal disease unless the patient has a pacemaker/implantable defibrillator</td>
<td>Strong Recommendation</td>
<td>Low Quality Evidence</td>
</tr>
<tr>
<td>We recommend that an AV blocking agent should be used in patients with AF/AFL being treated with a class I antiarrhythmic drug (e.g. propafenone or flecainide) in the absence of advanced AV node disease.</td>
<td>Strong Recommendation</td>
<td>Low Quality Evidence</td>
</tr>
</tbody>
</table>

**Values and preferences**

These recommendations place a high value on the decision of individual patients to balance relief of symptoms and improvement in QOL and other clinical outcomes with the potential greater adverse effects of Class I/III antiarrhythmic drugs compared to rate control therapy.
## Rhythm Control Strategy

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Strength of Recommendation</th>
<th>Quality of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>We recommend the optimal treatment of precipitating or reversible predisposing</td>
<td>Strong</td>
<td>Low</td>
</tr>
<tr>
<td>conditions of AF prior to attempts to restore/maintain sinus rhythm.</td>
<td></td>
<td>Evidence</td>
</tr>
<tr>
<td>We recommend a rhythm control strategy for patients with AF/AFL who remain</td>
<td>Strong</td>
<td>Moderate Quality</td>
</tr>
<tr>
<td>symptomatic with rate control therapy or in whom rate control therapy is</td>
<td></td>
<td>Evidence</td>
</tr>
<tr>
<td>unlikely to control symptoms.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We recommend that the goal of rhythm control therapy should be improvement</td>
<td>Strong</td>
<td>Moderate Quality</td>
</tr>
<tr>
<td>in patient symptoms and clinical outcomes, and not necessarily the elimination</td>
<td></td>
<td>Evidence</td>
</tr>
<tr>
<td>of all AF.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Values and Preferences**

These recommendations place a high value on the decision of individual patients to balance relief of symptoms and improvement in QOL and other clinical outcomes with the potential greater adverse effects of the addition of Class I/III antiarrhythmic drugs to rate control therapy.
Atrial Fibrillation Guidelines

Antiarrhythmic Drug Choices
Normal Ventricular Function

Dronedarone
Flecainide*
Propafenone*
Sotalol

Catheter Ablation

Amiodarone

* Class I agents should be AVOIDED in CAD
They should be combined with AV-nodal blocking agents
Sotalol contraindicated in women >65 yrs taking diuretics
Drugs listed in alphabetical order
Antiarrhythmic Drug Choices
Abnormal Left Ventricular Function

EF > 35%
Amiodarone
Dronedarone
Sotalol*

EF ≤ 35%
Amiodarone

Catheter Ablation

*Sotalol should be used with caution with EF 35-40%
Contraindicated in women >65 yrs taking diuretics
We recommend intermittent antiarrhythmic drug therapy ("pill in pocket") in symptomatic patients with infrequent, longer-lasting episodes of AF/AFL as an alternative to daily antiarrhythmic therapy.

- Single dose flecainide (200-300 mg) or propafenone (450-600 mg) as an oral dose
- Often prescribed with a short-acting beta-blocker at the same time (metoprolol 50-100 mg)

Values and preferences
This recommendation places a high value on the results of clinical studies demonstrating the efficacy and safety of intermittent antiarrhythmic drug therapy in selected patients.
<table>
<thead>
<tr>
<th></th>
<th>CCS Guidelines</th>
<th>ESC Guidelines</th>
<th>ACCF/AHA/HRS</th>
<th>Level of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength</td>
<td>Class</td>
<td>Level of Evidence</td>
<td>Class</td>
</tr>
<tr>
<td>Paroxysmal*</td>
<td>Conditional</td>
<td>IIa (Conditional)</td>
<td>A (High)</td>
<td>I (Strong)¶</td>
</tr>
<tr>
<td>Persistent*</td>
<td>Conditional</td>
<td>IIa (Conditional)</td>
<td>B (Moderate)</td>
<td>IIa (Conditional)</td>
</tr>
<tr>
<td>Failed 1 drug</td>
<td>Conditional</td>
<td>Moderate</td>
<td>--</td>
<td>I (Strong)¶</td>
</tr>
<tr>
<td>Failed ≥ 2 drugs</td>
<td>Strong</td>
<td>Moderate</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>1st Line</td>
<td>Conditional</td>
<td>Low</td>
<td>IIb (Conditional)</td>
<td>B (Moderate)</td>
</tr>
<tr>
<td>PAF / sign. structural heart disease</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

* Applies to patients with symptomatic AF and failed at least one anti-arrhythmic drug.
¶ Dictates ablation performed in experienced centre in patient with minimal heart disease
-- Not directly addressed. Often this group is incorporated into other recommendations
Rhythm Control Does Not Replace Anticoagulation

- No evidence that AF reduction via antiarrhythmic therapy reduces the risk of stroke/thromboembolism
- Patients must continue on appropriate anticoagulation according to their individual embolic risk (CHADS$_2$ score)
We recommend that all patients with AF or AFL (paroxysmal, persistent or permanent), should be stratified using a predictive index for stroke (e.g. CHADS$_2$) and for the risk of bleeding (e.g. HAS-BLED), and that most patients should receive antithrombotic therapy.
### Predictive Index for Stroke

#### CHADS<sub>2</sub>

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive Heart Failure</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>Age ≥ 75</td>
<td>1</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>1</td>
</tr>
<tr>
<td>Stroke/TIA/Thromboembolism</td>
<td>2</td>
</tr>
<tr>
<td><strong>Maximum Score</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

#### Patients (n = 1733) Adjusted Stroke Rate (%/yr) 95% CI CHADS<sub>2</sub> Score

<table>
<thead>
<tr>
<th>Patients</th>
<th>Adjusted Stroke Rate (%/yr) 95% CI</th>
<th>CHADS&lt;sub&gt;2&lt;/sub&gt; Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>1.9 (1.2 to 3.0)</td>
<td>0</td>
</tr>
<tr>
<td>463</td>
<td>2.8 (2.0 to 3.8)</td>
<td>1</td>
</tr>
<tr>
<td>523</td>
<td>4.0 (3.1 to 5.1)</td>
<td>2</td>
</tr>
<tr>
<td>337</td>
<td>5.9 (4.6 to 7.3)</td>
<td>3</td>
</tr>
<tr>
<td>220</td>
<td>8.5 (6.3 to 11.1)</td>
<td>4</td>
</tr>
<tr>
<td>65</td>
<td>12.5 (8.2 to 17.5)</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>18.2 (10.5 to 27.4)</td>
<td>6</td>
</tr>
</tbody>
</table>
### Bleeding Risk – HAS-BLED Score

<table>
<thead>
<tr>
<th>Letter</th>
<th>Clinical Characteristic</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>Abnormal Liver or Renal Function 1 point each</td>
<td>1 or 2</td>
</tr>
<tr>
<td>S</td>
<td>Stroke</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Bleeding</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>Labile INRs</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Elderly (age &gt; 65 yr)</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Drugs or Alcohol 1 point each</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>

**Maximum 9 points**

*Pisters R et al. Chest. 2010 Nov;138:1093-100*
Overview of Thromboembolic Management

Assess Thromboembolic Risk (CHADS₂) and Bleeding Risk (HAS-BLED)

- **CHADS₂ = 0**
  - aspirin
  - No antithrombotic may be appropriate in selected young patients with no stroke risk factors

- **CHADS₂ = 1**
  - OAC*
  - *Aspirin is a reasonable alternative in some as indicated by risk/benefit

- **CHADS₂ ≥ 2**
  - OAC
  - Dabigatran is preferred OAC over warfarin in most patients.
Dabigatran vs Warfarin

We suggest, that when OAC therapy is indicated, most patients should receive dabigatran in preference to warfarin. In general, the dose of dabigatran 150 mg po bid is preferable to a dose of 110 mg po bid.

Conditional Recommendation High Quality Evidence

Values and preferences: This recommendation places a relatively high value on the greater efficacy of dabigatran over a relatively short time of follow-up, particularly among patients who have not previously received an oral anticoagulant, the lower incidence of intracranial hemorrhage and its ease of use, and less value on the long safety experience with warfarin.
Antithrombotic Management of AF/AFL in CAD

Stable CAD

Choose antithrombotic based on stroke risk

- CHADS$_2$ = 0
  - Aspirin
- CHADS$_2$ ≥ 1
  - OAC* monotherapy

Recent ACS

Choose antithrombotic based on balance of risks and benefits

- CHADS$_2$ ≤ 1
  - aspirin + clopidogrel
- CHADS$_2$ ≥ 2
  - Triple antithrombotic Rx

PCI

Choose antithrombotic based on balance of risks and benefits

- CHADS$_2$ ≤ 1
  - aspirin + clopidogrel
- CHADS$_2$ ≥ 2
  - Triple antithrombotic Rx

* Warfarin is preferred over dabigatran for patients at high risk of coronary events
Since 2010 Guidelines:

• Stroke prevention:
  – ROCKET - rivaroxaban vs. warfarin
  – AVERROES – apixaban vs. ASA
  – ARISTOTLE – apixaban vs. warfarin

• Rate and Rhythm Management:
  – PALLAS – dronedarone trial stopped early secondary to increased CV events in permanent AF patients
Knowledge Translation Stroke Prevention in Atrial Fibrillation

Approximately 20% of all strokes are attributable to Atrial Fibrillation (AF). Of these, 20% will result in death and 60% will result in disability. Given this, it is important to ensure appropriate antithrombotic therapy for those at risk for cardioembolic stroke.

This pocket reference summarizes the therapeutic options for the prevention of stroke in patients with non-valvar AF. It does not address patients with rheumatic heart disease or patients with transient, self-limited AF associated with an acute illness or secondary cause. It is intended only as a general reference to supplement the existing knowledge of healthcare professionals and is NOT a substitute for the sound clinical judgement of the knowledgeable healthcare professional. The authors, editors, or CCPN cannot be held responsible for any harm, direct or indirect, caused as a result of the application of the information contained in this resource.