Recommended Therapies for Heart Rate and Rhythm Control in Patients with Atrial Fibrillation

Whether a rate control or rhythm control strategy is chosen is very specific to each individual patient. Factors to consider are: ability to tolerate medications, degree of symptoms, degree of functional limitation, occupation, age, and other co-morbidities. While many practitioners may have preferences for a particular strategy, the ACC recommends following the guidelines referenced below and considering referral to a cardiologist with experience managing heart rhythm disorders.

Table 1: Recommended Drug Doses for Heart Rate Control in Patients with Atrial Fibrillation

<table>
<thead>
<tr>
<th>Drug*</th>
<th>Dose Form</th>
<th>Loading or Starting Dose†</th>
<th>Maintenance Dose‡</th>
<th>Potential Adverse Effects**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone</td>
<td>IV</td>
<td>150 mg over 10 min</td>
<td>0.5-1 mg/min</td>
<td>hypotension, heart block, sinus bradycardia, bronchospasm, HF, pulmonary toxicity, skin discoloration, hypothyroidism, hyperthyroidism, corneal deposits, optic neuropathy, warfarin interaction</td>
</tr>
<tr>
<td>Oral</td>
<td>800 mg PO daily x 1 week, then 600 mg PO daily x 1 week, then 400 mg PO daily x 4 to 6 weeks, then 200 mg daily</td>
<td>Individual to patient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atenolol</td>
<td>Oral</td>
<td>25-100 mg daily</td>
<td>Same as starting dose</td>
<td>hypotension, heart block, bradycardia, bronchospasm, HF</td>
</tr>
<tr>
<td>Carvedilol</td>
<td>Oral</td>
<td>3.125-25 mg every 12 hrs (up to 50mg every 12 hrs for patients &gt;85 kg). May use carvedilol sustained release 10-80 mg daily</td>
<td>Same as starting dose</td>
<td>hypotension, heart block, bradycardia, bronchospasm, HF</td>
</tr>
<tr>
<td>Digoxin</td>
<td>IV</td>
<td>0.25 mg every 4-6 hrs up to 1 mg</td>
<td>0.125-0.25 mg daily (or orally)</td>
<td>life threatening arrhythmia, perceived color change, heart block, bronchospasm</td>
</tr>
<tr>
<td>Diltiazem</td>
<td>IV</td>
<td>0.25 mg/kg over 2 min. 2nd bolus can be given if HR &gt; 100 bpm.</td>
<td>5-15 mg/hr</td>
<td>hypotension, heart block, HF</td>
</tr>
<tr>
<td>Oral</td>
<td>Start with a non-sustained release dose 120-480 mg daily. Can switch to a slow-release/extended release dose, which is available and preferred</td>
<td>Same as starting dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Esmolol</td>
<td>IV</td>
<td>500 mcg/kg over 1 min</td>
<td>50-200 mcg/kg/min</td>
<td>hypotension, heart block, bradycardia, bronchospasm, HF</td>
</tr>
<tr>
<td>Metoprolol</td>
<td>IV</td>
<td>2.5-5 mg bolus over 2 min, up to 3 doses</td>
<td>N/A</td>
<td>hypotension, heart block, bradycardia, bronchospasm, HF</td>
</tr>
<tr>
<td>Oral</td>
<td>25-100 mg twice daily. May use metoprolol succinate ER 25-200 mg daily</td>
<td>Same as starting dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verapamil</td>
<td>IV</td>
<td>0.075-0.15 mg/kg over 2 mins. 2nd bolus can be given in 15-30 mins if needed</td>
<td>N/A</td>
<td>hypotension, heart block, HF</td>
</tr>
<tr>
<td>Oral</td>
<td>Start with a non-sustained release dose 120-480 mg daily. Can switch to a slow-release/extended release dose, which is available and preferred</td>
<td>Same as starting dose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Drugs are listed alphabetically.
†Dosages given in the table may differ from those recommended by the manufacturers. **Refer to prescribing information for more complete information.
§Amiodarone can be useful to control heart rate in patients with atrial fibrillation when other measures are unsuccessful or contraindicated.

Notes: AF = atrial fibrillation; BID = twice a day; GI = gastrointestinal; IV = intravenous; HR = heart rate; HF = heart failure; N/A = not applicable.
Click on drug names in table for more detailed usage information for each drug.

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## Table 2: Recommended Drug Doses for Heart Rhythm Control in Patients with Atrial Fibrillation

<table>
<thead>
<tr>
<th>Drug*</th>
<th>Dose Form</th>
<th>Loading or Starting Dose†</th>
<th>Maintenance Dose‡</th>
<th>Potential Adverse Effects**</th>
</tr>
</thead>
</table>
| Amiodarone*¹ | Oral | **Inpatient**: 1.2 to 1.8 g per day in divided dose until 10 g total or 30 mg/kg as single dose  
**Outpatient**: 600 to 800 mg per day divided dose until 10 g total | 200-400 mg per day | hypotension, bradycardia, QT prolongation, torsades de pointes (rare), GI upset, constipation, phlebitis (IV), photosensitivity, pulmonary toxicity, polyneuropathy, hepatic toxicity, thyroid dysfunction, eye complications  
See [black box warnings](#) for this drug |
| Dofetilide¹ | Oral | Creatinine Clearance  
> 60 mL/min = 500 mcg BID  
40-60 mL/min = 250 mcg BID  
20 to 40 mL/min = 125 mcg BID  
< 20 mL/min = Contraindicated | 125-500 mcg every 12 hrs, based on renal function.  
Must be initiated in hospital and patient must be registered to receive this drug. Adjust dose for renal function, body size and age. | QT prolongation, torsades de pointes  
See [black box warnings](#) for this drug |
| Dronedarone² | Oral | 400 mg twice daily, with meals | Same as starting dose | bradycardia, heart block, HF, hepatic toxicity, pulmonary toxicity, diarrhea, nausea, abdominal pain, vomiting, asthenia, stroke, death  
See [black box warnings](#) for this drug |
| Flecaïnide¹,² | Oral | 200-300 mg‡†  
When starting a patient on flecaïnide, it is prudent to do a treadmill stress test after the patient is fully loaded.³ | 50 to 150 mg every 12 hrs² | hypotension, atrial flutter with high ventricular rate, ventricular tachycardia, HF  
Close monitoring of this drug is required.  
See [black box warnings](#) for this drug |
| Ibutilide¹,² | IV | 1 mg over 10 min; repeat 1 mg when necessary (but risk of proarrhythmia increases) | N/A | QT prolongation, torsades de pointes  
See [black box warnings](#) for this drug |
| Propafenone¹,² | Oral | 600 mg | 150-300 mg every 8 hrs, or sustained release 225-425 mg every 12 hrs | hypotension, atrial flutter with high ventricular rate  
See [black box warnings](#) for this drug |
| Sotalol¹,² | Oral | 80-160 mg, to a max of 320 mg every 12 hrs, based on renal function | Same as starting dose | torsades de pointes, HF, bradycardia, exacerbation of chronic obstructive or bronchospastic lung disease  
See [black box warnings](#) for this drug |

*Drugs are listed alphabetically.  
**Refer to prescribing information for more complete information.  
†Dosages given in the table may differ from those recommended by the manufacturers.  
‡Insufficient data are available on which to base specific recommendations for the use of one loading regimen over another for patients with ischemic heart disease or impaired left ventricular function.  

Notes: AF = atrial fibrillation; BID = twice a day; GI = gastrointestinal; IV = intravenous; HR = heart rate; HF = heart failure; N/A = not applicable.  
Click on drug names in table for more detailed usage information for each drug.
Sources:


4. Professional clinical guidance provided by ACC members of the Best Practices & Quality Improvement Subcommittee.