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[1] 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

Drug*	Dose Form	Loading or Starting Dose†	Maintenance Dose†	Potential Adverse Effects**
Amiodarone[§,1]	IV	150 mg over 10 min	0.5-1 mg/min	hypotension, heart block, sinus bradycardia, bronchospasm, HF, pulmonary toxicity, skin discoloration, hypothyroidism, hyperthyroidism, corneal deposits, optic neuropathy, warfarin interaction See black box warnings for this drug
	Oral	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	Individual to patient	
Atenolol[2]	Oral	25-100 mg daily	Same as starting dose	hypotension, heart block, bradycardia, bronchospasm, HF
Carvedilol[2]	Oral	3.125-25 mg every 12 hrs (up to 50mg every 12 hrs for patients >85 kg). May use carvedilol sustained release 10-80 mg daily	Same as starting dose	hypotension, heart block, bradycardia, bronchospasm, HF See black box warnings for this drug
Digoxin[1,4]	IV	0.25 mg every 4-6 hrs up to 1 mg	0.125-0.25 mg daily (or orally)	life threatening arrhythmia, perceived color change, heart block, bronchospasm
Diltiazem[1, 2]	IV	0.25 mg/kg over 2 min. 2nd bolus can be given if HR > 100 bpm.	5-15 mg/hr	hypotension, heart block, HF
	Oral	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	Same as starting dose	
Esmolol[1]	IV	500 mcg/kg over 1 min	50-200 mcg/kg/min	hypotension, heart block, bradycardia, bronchospasm, HF See black box warnings for this drug
Metoprolol[1,2]	IV	2.5-5 mg bolus over 2 min, up to 3 doses	N/A	hypotension, heart block, bradycardia, bronchospasm, HF See black box warnings for this drug
	Oral	25-100 mg twice daily. May use metoprolol succinate ER 25-200 mg daily	Same as starting dose	
Verapamil[1,2,4]	IV	0.075-0.15 mg/kg over 2 mins. 2nd bolus can be given in 15-30 mins if needed	N/A	hypotension, heart block, HF
	Oral	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	Same as starting dose	

*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.

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

Drug*	Dose Form	Loading or Starting Dose†	Maintenance Dose†	Potential Adverse Effects**
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 While 10 g desired to see max efficacy, does not have to be completed as an inpatient before fully loaded.[4]	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
Dofetilide[1]	Oral	Creatinine Clearance / Dose > 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
Dronedarone[2]	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
Flecainide[1,2]	Oral	200-300 mg[1,‡] When starting a patient on flecainide, it is prudent to do a treadmill stress test after the patient is fully loaded.[3]	50 to 150 mg every 12 hrs[2]	hypotension, atrial flutter with high ventricular rate, ventricular tachycardia, HF Close monitoring of this drug is required. See black box warnings for this drug
Ibutilide[1,2]	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
Propafenone[1,2]	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
Sotalol[1,2]	Oral	80-160 mg, to a max of 320 mg every 12 hrs, based on renal function Creatinine clearance should be calculated prior to dosing.	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:

1. American College of Cardiology Foundation (ACCF), American Heart Association (AHA), and Heart Rhythm Society (HRS). *2011 ACCF/AHA/HRS Focused Updates Incorporated Into the ACC/AHA/ESC 2006 Guidelines for the Management of Patients With Atrial Fibrillation*. Washington, DC: American College of Cardiology Foundation. Available at http://content.onlinejacc.org/cgi/content/full/57/11/e101.

2. Heart Rhythm Society. *AF360 Pocket Guide: Practical Rate and Rhythm Management of Atrial Fibrillation*. 2010, Washington, DC: Heart Rhythm Society.

3. Razavi, M. 2005. *Safe and Effective Pharmacologic Management of Arrhythmias*. Texas Heart Institute Journal, 2005; 32(2): 209–211. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1163475/

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