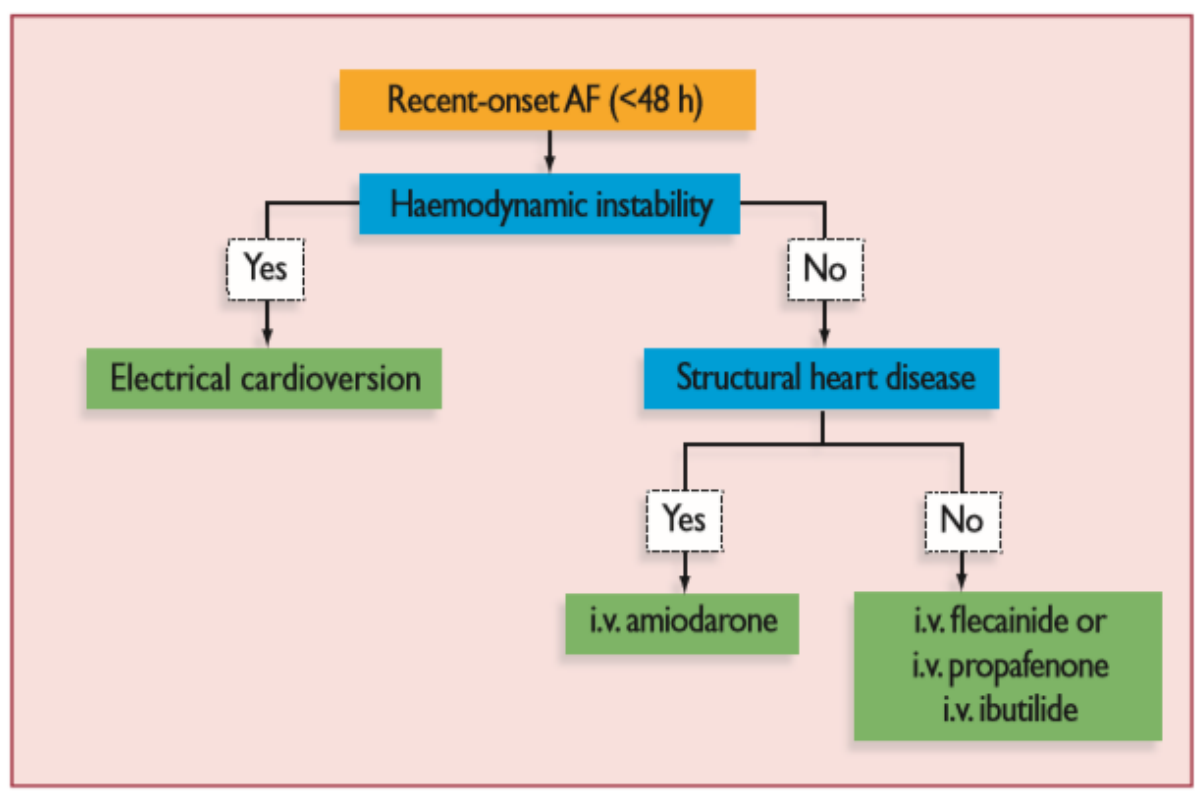
Acute Rhythm Control or Rate Control ?



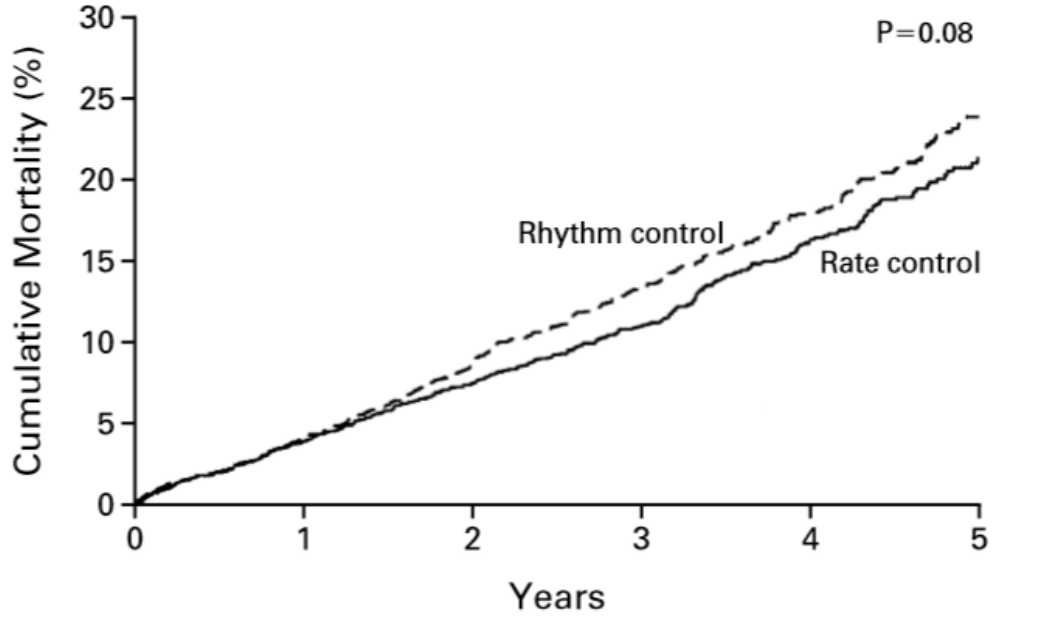
Camm AJ, et al. Guidelines for management of atrial fibrillation. EHJ 2010;31:2369-2429

Acute Rhythm Control or Rate Control ?

Drug	Class/LOE Recommendation	Loading Dose	Onset	Maintenance Dose	Major Side Effects
ACUTE SETTING					
Heart rate control in patients without accessory pathway					
Esmolol*†	Class I, LOE C	500 mcg/kg IV over 1 min	5 min	60 to 200 mcg/kg/min IV	↓ BP, HB, ↓ HR, asthma, HF
Metoprolol†	Class I, LOE C	2.5 to 5 mg IV bolus over 2 min; up to 3 doses	5 min	NA	↓ BP, HB, ↓ HR, asthma, HF
Propranolol†	Class I, LOE C	0.15 mg/kg IV	5 min	NA	↓ BP, HB, ↓ HR, asthma, HF
Diltiazem	Class I, LOE B	0.25 mg/kg IV over 2 min	2 to 7 min	5 to 15 mg/h IV	↓ BP, HB, HF
Verapamil	Class I, LOE B	0.075 to 0.15 mg/kg IV over 2 min	3 to 5 min	NA	↓ BP, HB, HF
Heart rate control in patients with accessory pathway§					
Amiodarone‡‖	Class IIa, LOE C	150 mg over 10 min	Days	0.5 to 1 mg/min IV	↓ BP, HB, pulmonary toxicity, skin discoloration, hypothyroidism, hyperthyroidism, corneal deposits, optic neuropathy, warfarin interaction, sinus bradycardia
Heart rate control in patients with heart failure and without accessory pathway					
Digoxin	Class I, LOE B	0.25 mg IV each 2 h, up to 1.5 mg	60 min or more§	0.125 to 0.375 mg daily IV or orally	Digitalis toxicity, HB, ↓ HR
Amiodarone‡	Class IIa, LOE C	150 mg over 10 min	Days	0.5 to 1 mg/min IV	↓ BP, HB, pulmonary toxicity, skin discoloration, hypothyroidism, hyperthyroidism, corneal deposits, optic neuropathy, warfarin interaction, sinus bradycardia

Fuster V, et al. ACC/AHA/ESC guidelines for the management with AF. JACC 2006;48(4):854-906.

Rhythm Control or Rate Control ?



No. of Deaths		number (percent)				
Rhythm control	0	80 (4)	175 (9)	257 (13)	314 (18)	352 (24)
Rate control	0	78 (4)	148 (7)	210 (11)	275 (16)	306 (21)

Wyse DG, et al. A comparison of rate control and rhythm control in patients with AF. NEJM 2002;347:1825-33.

Rhythm Control or Rate Control ?

Trial	Reference	Patients (n)	Mean Age (y)	Mean Length of Follow-Up (y)	Inclusion Criteria	Primary Endpoint	Patients Reaching Primary Endpoint (n)		
							Rate Control	Rhythm Control	*p*
PIAF (2000)	130	252	61.0	1.0	Persistent AF (7 to 360 d)	Symptomatic improvement	76/125 (60.8%)	70/127 (55.1%)	0.317
RACE (2002)	124	522	68.0	2.3	Persistent AF or flutter for less than 1 y and 1 to 2 cardioversions over 2 y and oral anticoagulation	Composite: cardiovascular death, CHF, severe bleeding, PM implantation, thromboembolic events, severe adverse effects of antiarrhythmic drugs	44/256 (17.2%)	60/266 (22.6%)	0.11
STAF (2002)	126	200	66.0	1.6	Persistent AF (longer than 4 wk and less than 2 y), left atrial size greater than 45 mm, CHF NYHA II–IV, LVEF less than 45%	Composite: overall mortality, cerebrovascular complications, CPR, embolic events	10/100 (10.0%)	9/100 (9.0%)	0.99
AFFIRM (2002)	128	4060	69.7	3.5	Paroxysmal AF or persistent AF, age 65 y or older, or risk of stroke or death	All-cause mortality	310/2027 (25.9%)	356/2033 (26.7%)	0.08
HOT CAFÉ (2004)	127	205	60.8	1.7	First clinically overt episode of persistent AF (7 d or more and less than 2 y), 50 to 75 y old	Composite; death, thromboembolic complications; intracranial or other major hemorrhage	1/101 (1.0%)	4/104 (3.9%)	Greater than 0.71

Fuster V, et al. ACC/AHA/ESC guidelines for the management with AF. JACC 2006;48(4):854-906.

Rhythm Control or Rate Control ?

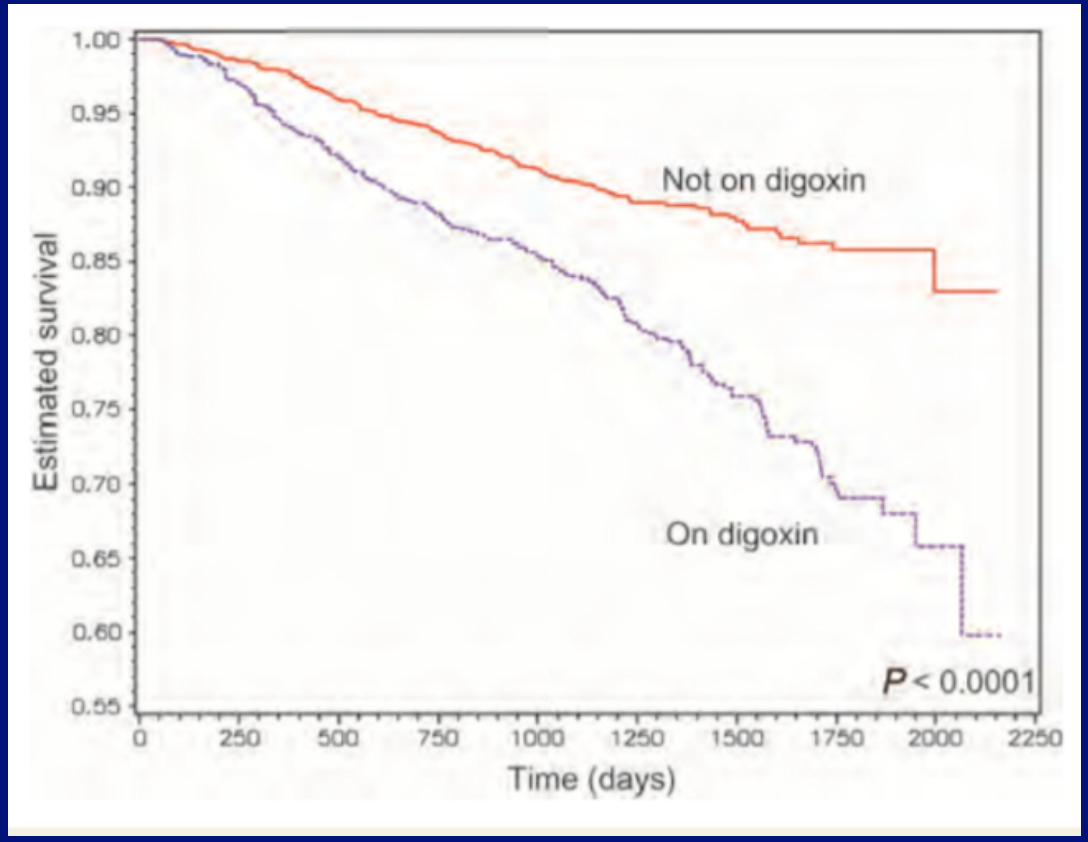
- Aetiology of AF
- Severity of symptoms
- Echocardiographic findings
- Age
- Duration of AF
- Tachycardia-induced cardiomyopathy
- Patient preference

Chronic Rate Control

Drug	Class/LOE Recommendation	Loading Dose	Onset	Maintenance Dose	Major Side Effects
NON-ACUTE SETTING and CHRONIC MAINTENANCE THERAPY¶					
Heart rate control					
Metoprolol†	Class I, LOE C	Same as maintenance dose	4 to 6 h	25 to 100 mg twice a day, orally	↓ BP, HB, ↓ HR, asthma, HF
Propranolol†	Class I, LOE C	Same as maintenance dose	60 to 90 min	80 to 240 mg daily in divided doses, orally	↓ BP, HB, ↓ HR, asthma, HF
Diltiazem	Class I, LOE B	Same as maintenance dose	2 to 4 h	120 to 360 mg daily in divided doses; slow release available, orally	↓ BP, HB, HF
Verapamil	Class I, LOE B	Same as maintenance dose	1 to 2 h	120 to 360 mg daily in divided doses; slow release available, orally	↓ BP, HB, HF, digoxin interaction
Heart rate control in patients with heart failure and without accessory pathway					
Digoxin	Class I, LOE C	0.5 mg by mouth daily	2 days	0.125 to 0.375 mg daily, orally	Digitalis toxicity, HB, ↓ HR
Amiodarone‡	Class IIb, LOE C	800 mg daily for 1 wk, orally 600 mg daily for 1 wk, orally 400 mg daily for 4 to 6 wk, orally	1 to 3 wk	200 mg daily, orally	↓ BP, HB, pulmonary toxicity, skin discoloration, hypothyroidism, hyperthyroidism, corneal deposits, optic neuropathy, warfarin interaction, sinus bradycardia

Fuster V, et al. ACC/AHA/ESC guidelines for the management with AF. JACC 2006;48(4):854-906.

Digoxin



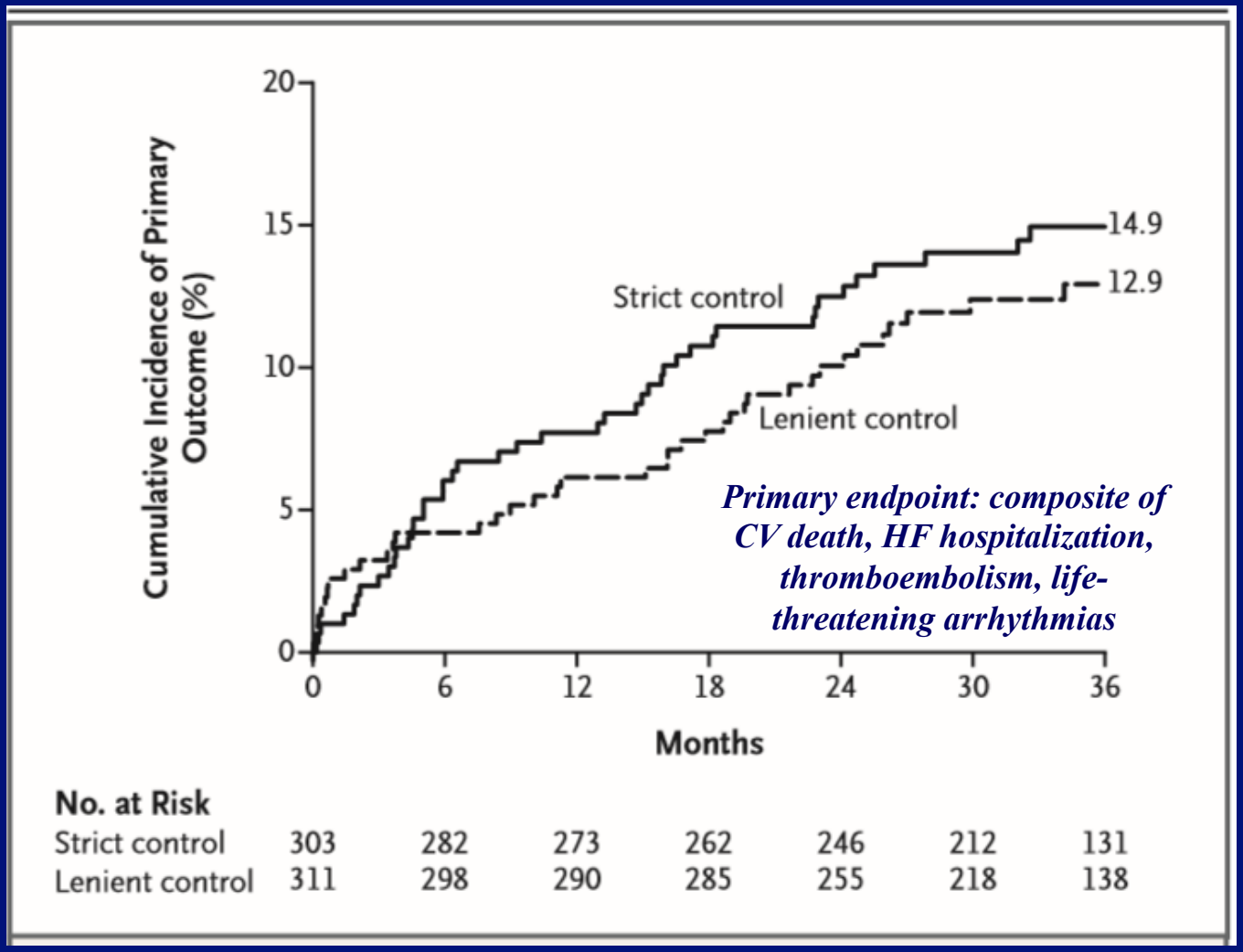
Whitbeck MG, et al. Increased mortality among patients taking digoxin -analysis from the AFFIRM study. EHJ 2013;34:1481-8.

AV-nodal Ablation + Pacemaker Support

Measure	Effect Size, mean±SD	95% CI	*P*
Exercise duration			
Treadmill	107± 8 s	94 to 120 s	<0.001
Bicycle	61± 37 s	0.3 to 122 s	0.049
Cardiac function			
Fractional shortening	1.7± 1.3%	−0.33 to 3.8%	0.08
Ejection fraction	4.4± 0.01%	2.9 to 5.8%	<0.001
Heart rate	−38± 2 bpm	−34 to −42 bpm	<0.001
Quality of life			
Well-being scale	0.20± 0.03	0.15 to 0.25	<0.001
Activity scale	−0.46± 0.18	−0.17 to −0.76	0.005
General quality of life	0.25± 0.02	0.21 to 0.28	<0.001
Improved patients	87± 5%	78% to 95%	<0.001
Symptoms			
Palpitations	−0.64± 0.03	−0.58 to −0.69	<0.001
Rest dyspnea	−0.20± 0.03	−0.16 to −0.25	<0.001
Effort dyspnea	−0.31± 0.03	−0.26 to −0.36	<0.001
Exercise intolerance	−0.32± 0.04	−0.26 to −0.37	<0.001
Frequency of symptoms	−0.39± 0.03	−0.35 to −0.43	<0.001
Severity of symptoms	−0.16± 0.02	−0.13 to −0.19	<0.001
NYHA classification	−0.83± 0.07	−0.72 to −0.95	<0.001
Healthcare use			
Outpatient visits	−3.1± 0.4 visits	−2.6 to −3.6 visits	<0.001
Hospital admissions	−2.3± 0.4 admissions	−1.7 to −3.0 admissions	<0.001
No. of cardiac drugs	−2.0± 1.0 drugs	−1.8 to −2.2 drugs	<0.001

Wood MA, et al. Clinical outcomes after ablation and pacing therapy for AF: a meta-analysis. Circulation 2000;101:1138-44.

Lenient vs Strict Rate Control



Van Gelder IC, et al. Lenient versus strict rate control in patients With AF. NEJM 2010;362:1363-73.

Rhythm Control

- Antiarrhythmic drugs
- Catheter ablation

Recommendations	Class[a]	Level[b]	Ref.[c]
The following antiarrhythmic drugs are recommended for rhythm control in patients with AF, depending on underlying heart disease:			
• amiodarone	I	A	46, 111, 125
• dronedarone	I	A	95, 99
• flecainide	I	A	111, 127
• propafenone	I	A	111, 125
• d,l-sotalol	I	A	46, 83, 111
Amiodarone is more effective in maintaining sinus rhythm than sotalol, propafenone, flecainide (by analogy), or dronedarone (LoE A), but because of its toxicity profile should generally be used when other agents have failed or are contraindicated (LoE C).	I	A C	46, 111, 121, 125
In patients with severe heart failure, NYHA class III and IV or recently unstable (decompensation within the prior month) NYHA class II, amiodarone should be the drug of choice.	I	B	126
In patients without significant structural heart disease, initial antiarrhythmic therapy should be chosen from dronedarone, flecainide, propafenone, and sotalol.	I	A	95, 99, 111, 125–127
β-Blockers are recommended for prevention of adrenergic AF.	I	C	

Antiarrhythmic Drugs