

# Atrial Fibrillation

## *Rate and Rhythm Control*

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# The big picture of AF

? ACEI, Statin  
• Omega-3  
• Ablation

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Sinus

Paroxysmal  
AF

Persistent  
AF

Permanent  
AF

Symptoms

Stroke

Heart Failure

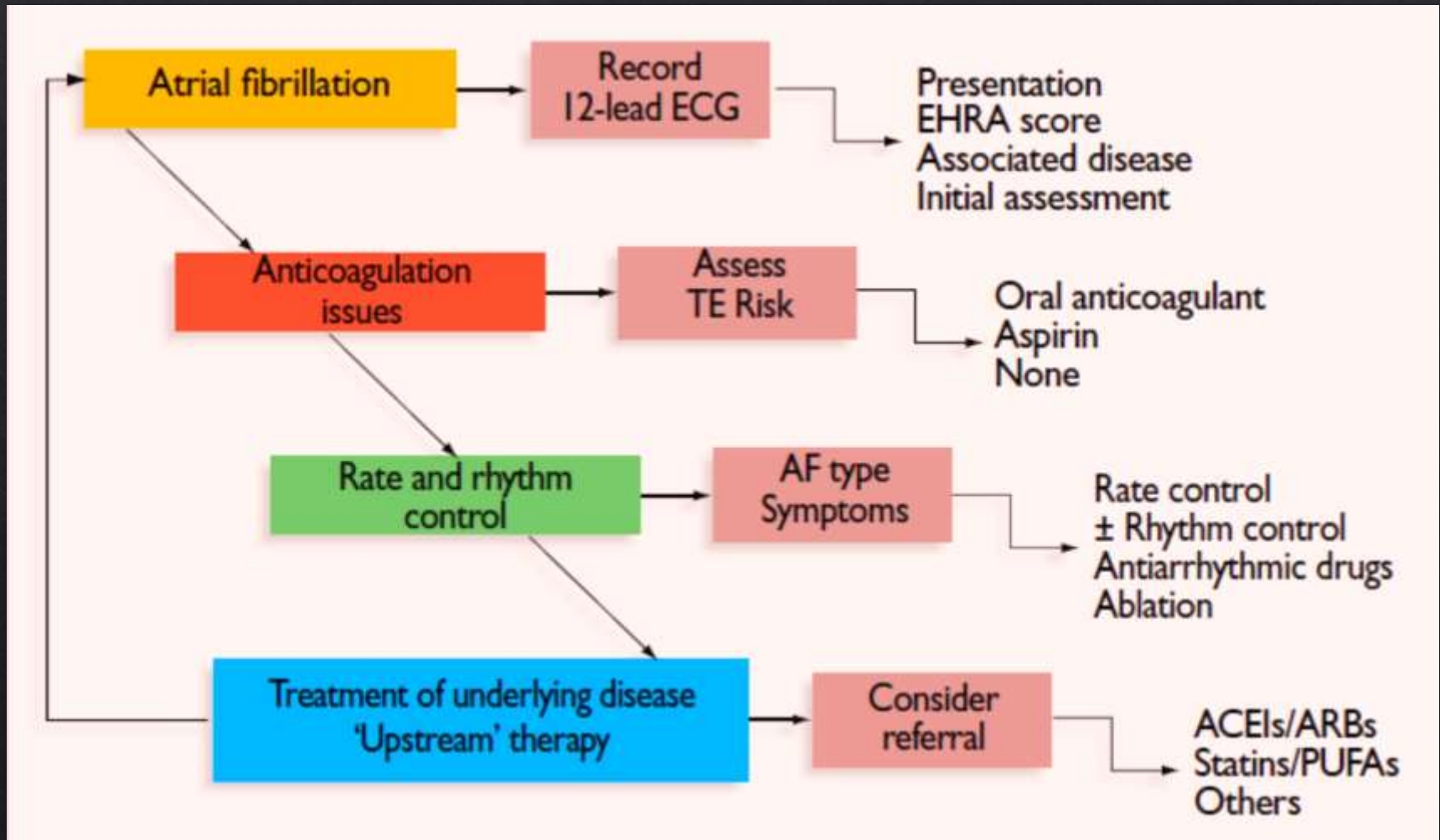
Death

↓  
Rate and rhythm  
control

↓  
Anticoagulation  
? AF ablation

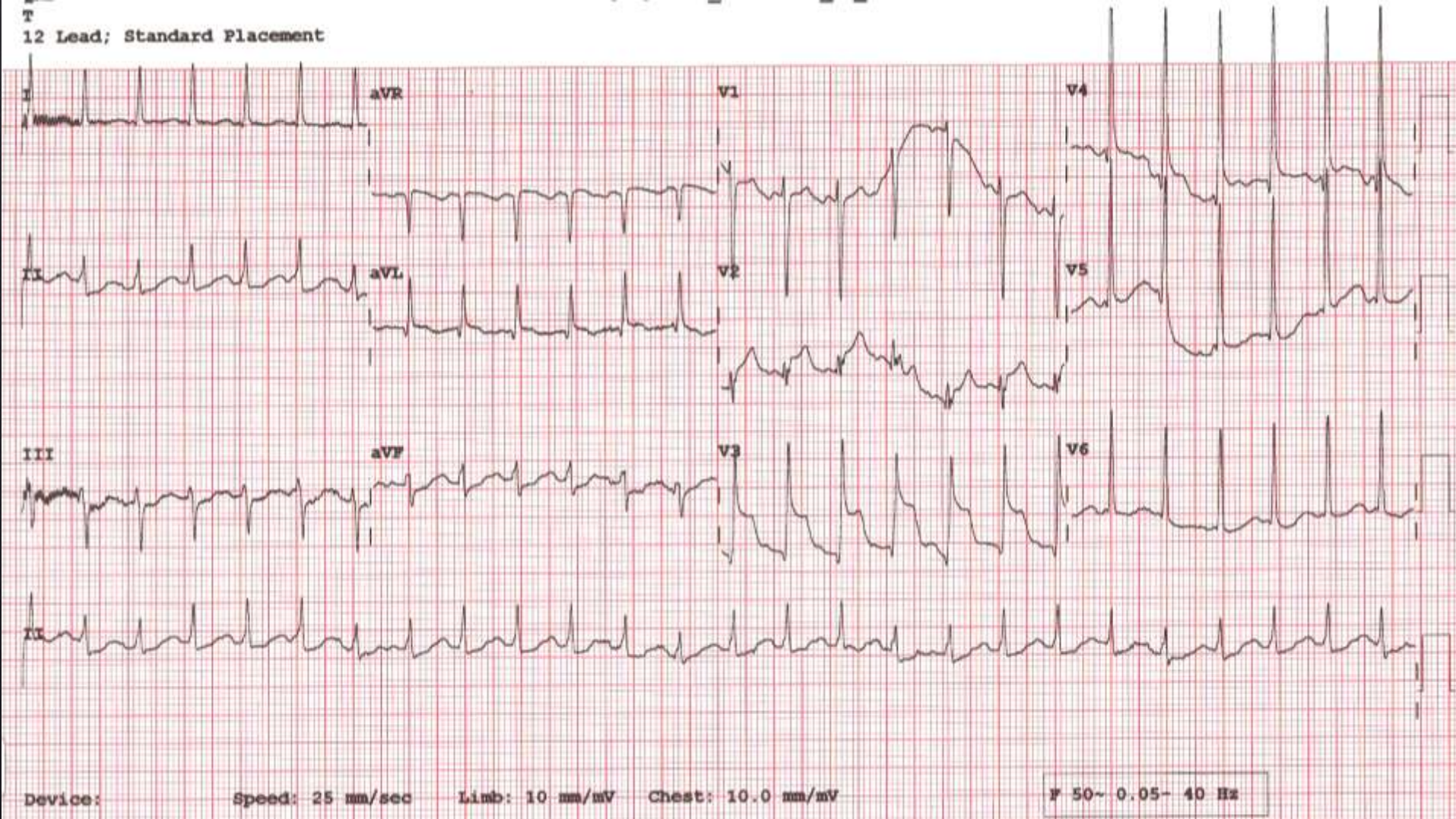
↘    ↙  
None available to date

# Management Cascade



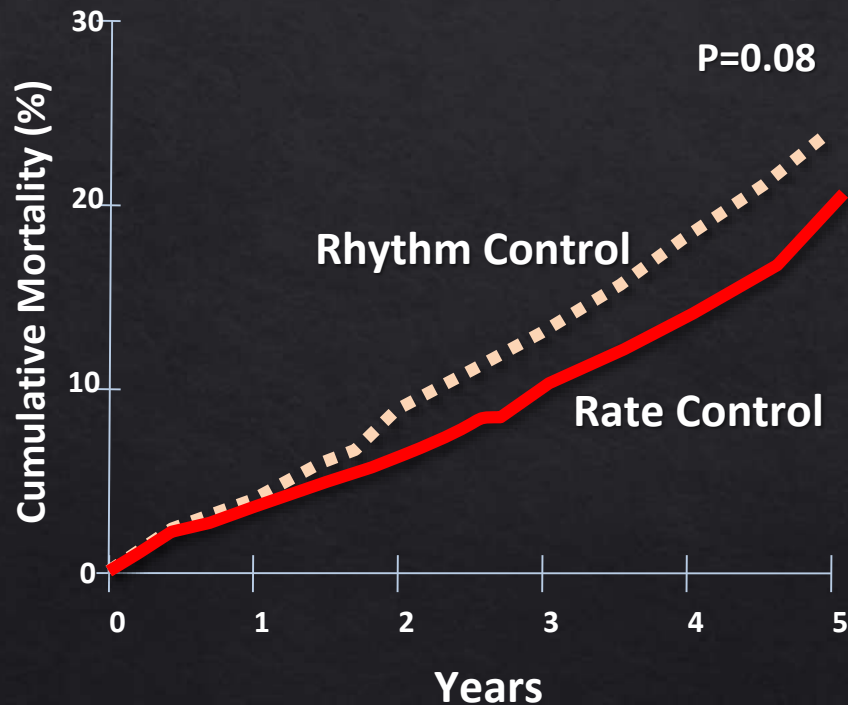


# Rate vs. Rhythm Control



# Rate vs. Rhythm Control

## AFFIRM: Death from Any Cause



AFFIRM. NEJM. 2002;347:1825-1833.

## Methods

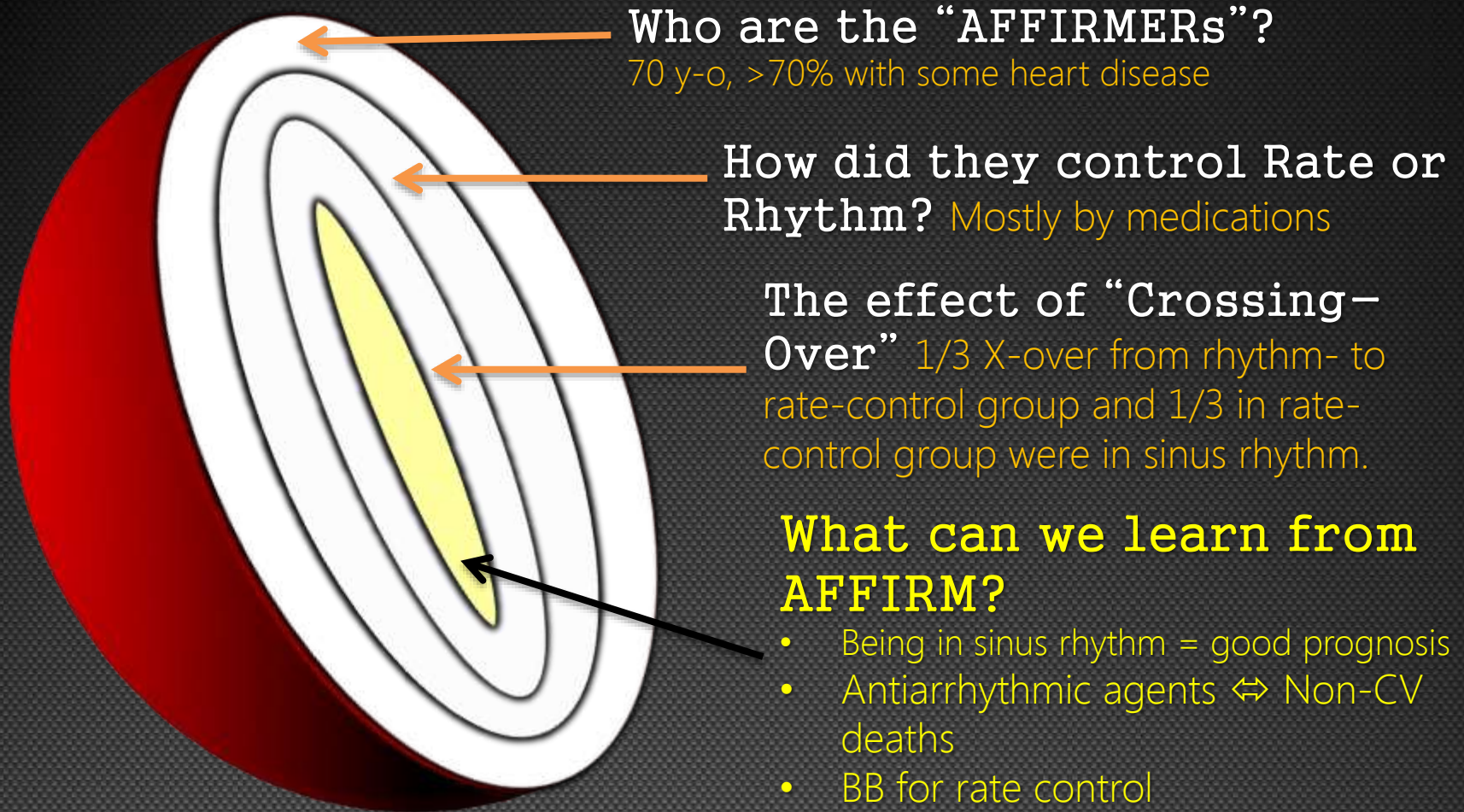
- Randomized, multicenter
- Compared 2 Tx strategies.
- Endpoint = overall mortality
- N=4060
- Mean f/u time = 3.5 years

## CONCLUSIONS

- Rhythm control has no survival benefits.



# Inside the AFFIRM



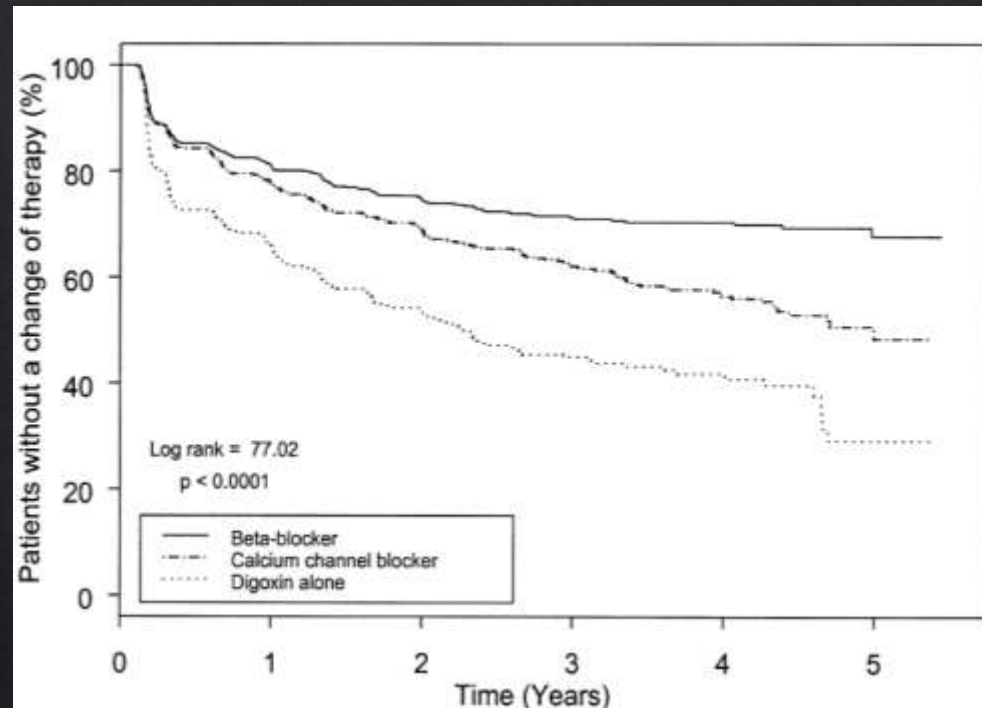
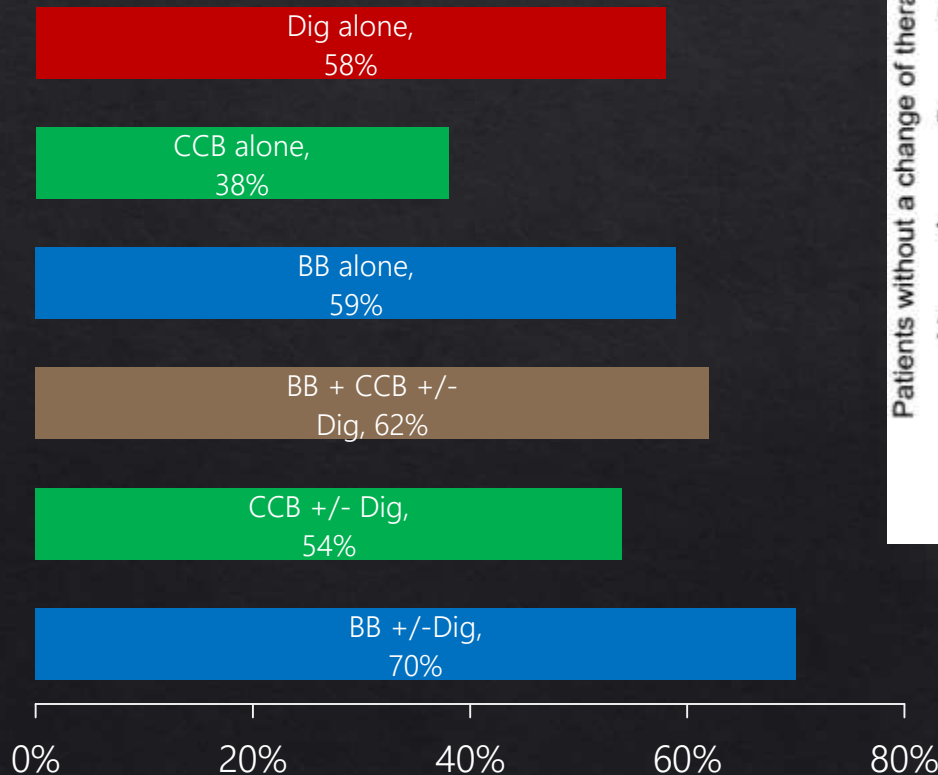
# *Rate* Control

- Being in sinus rhythm is always the best choice.
- Does the patient have “no symptoms” or “don’t know if he/she has symptoms”?
- Does the patient deserve a chance to be in sinus rhythm?

# Rate control using medications

Data from AFFIRM » Goal HR  $\leq 80$  bpm at rest & HR  $\leq 110$  bpm during the 6-min walk test

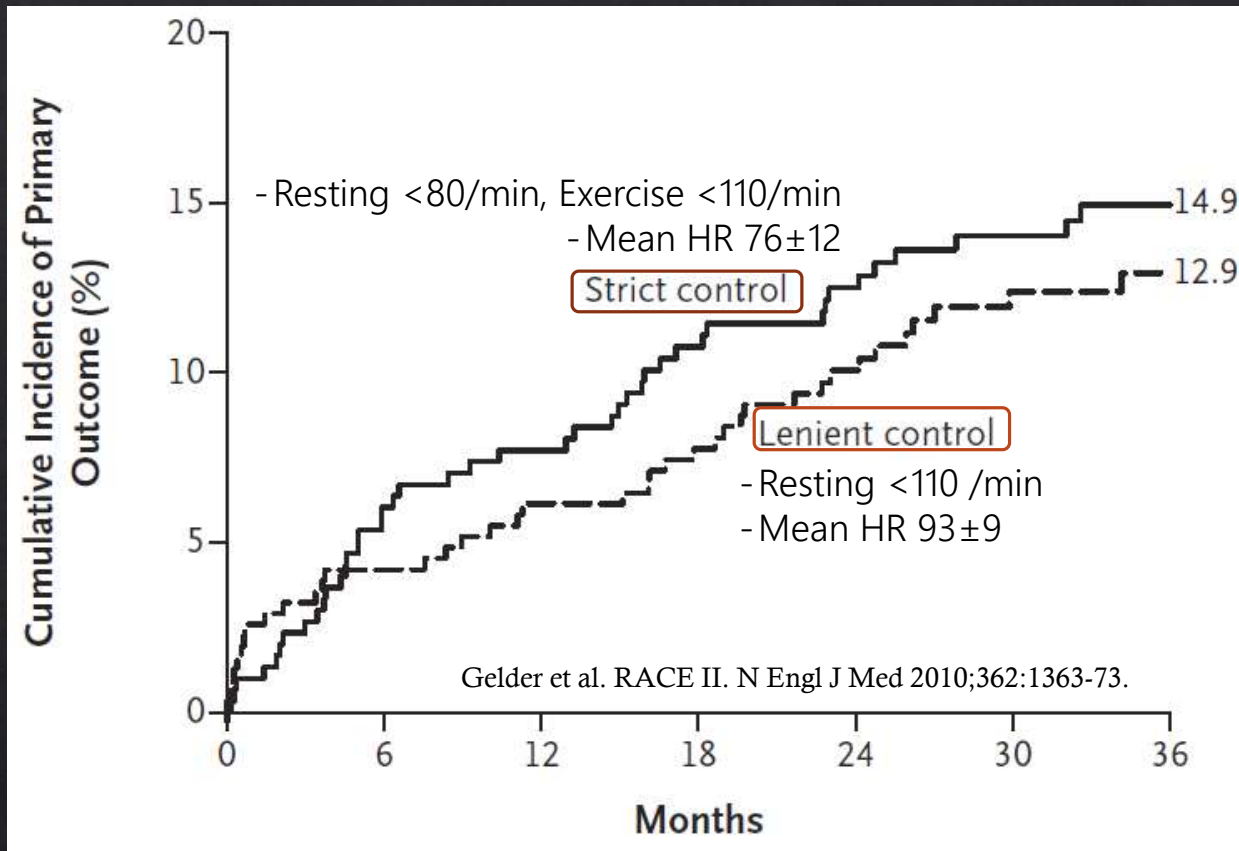
## Initial overall rate control achievement by drug (%)



Olshansky et al. J Am Coll Cardiol 2004;43:1201-8



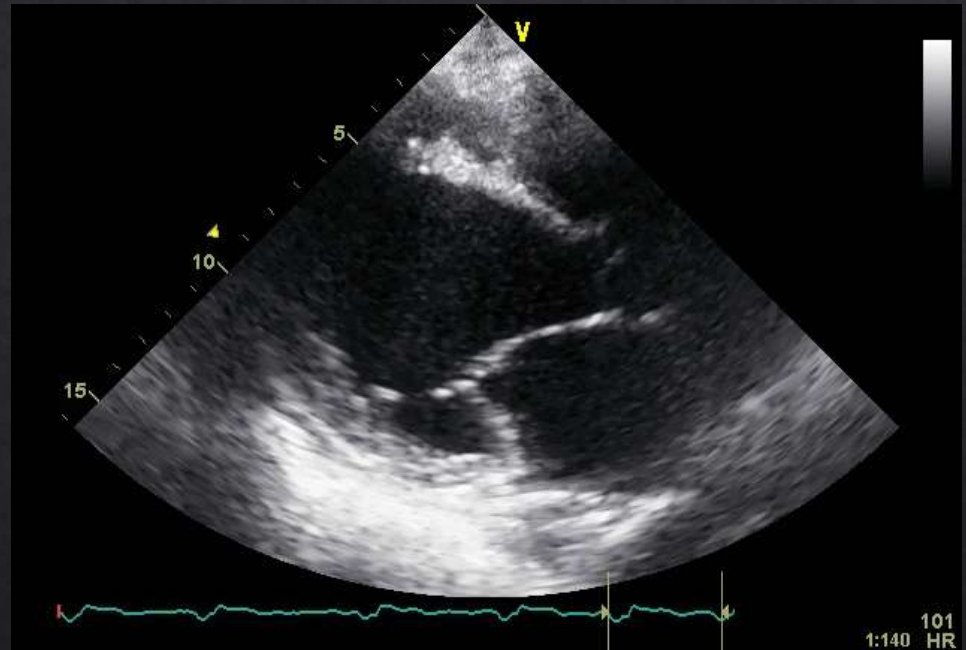
# Randomized Trial on how to control the rate

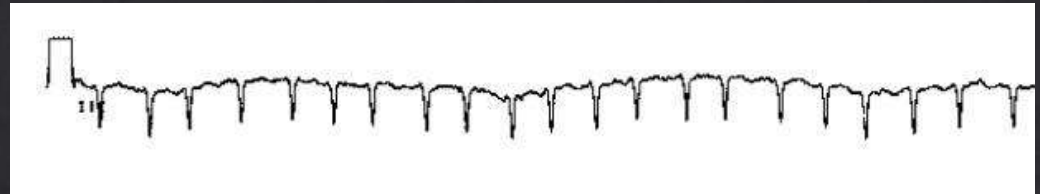


- Persistent AF, Age <80, mean resting HR <80, RCT, non-inferiority design
- Patients: mean age 68, LVEF 52%, <10% w/ Hx of CHF
- The primary outcome was a composite of CV death, HF hospitalization, systemic embolism, bleeding, and life-threatening arrhythmic events.

# Is lenient control for everybody?

- Is RACE II population similar to your patients?
- Strict rate control is reasonable in...
  - Persistent symptoms
  - Tachycardia induced cardiomyopathy
  - Poor LV function





## Rapid AF in Acute HF

Rhythm control by Electrical Cardioversion if UNSTABLE

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Rhythm control by Amiodarone. Beware of BP↓.

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Rate control by Digoxin or Amiodarone

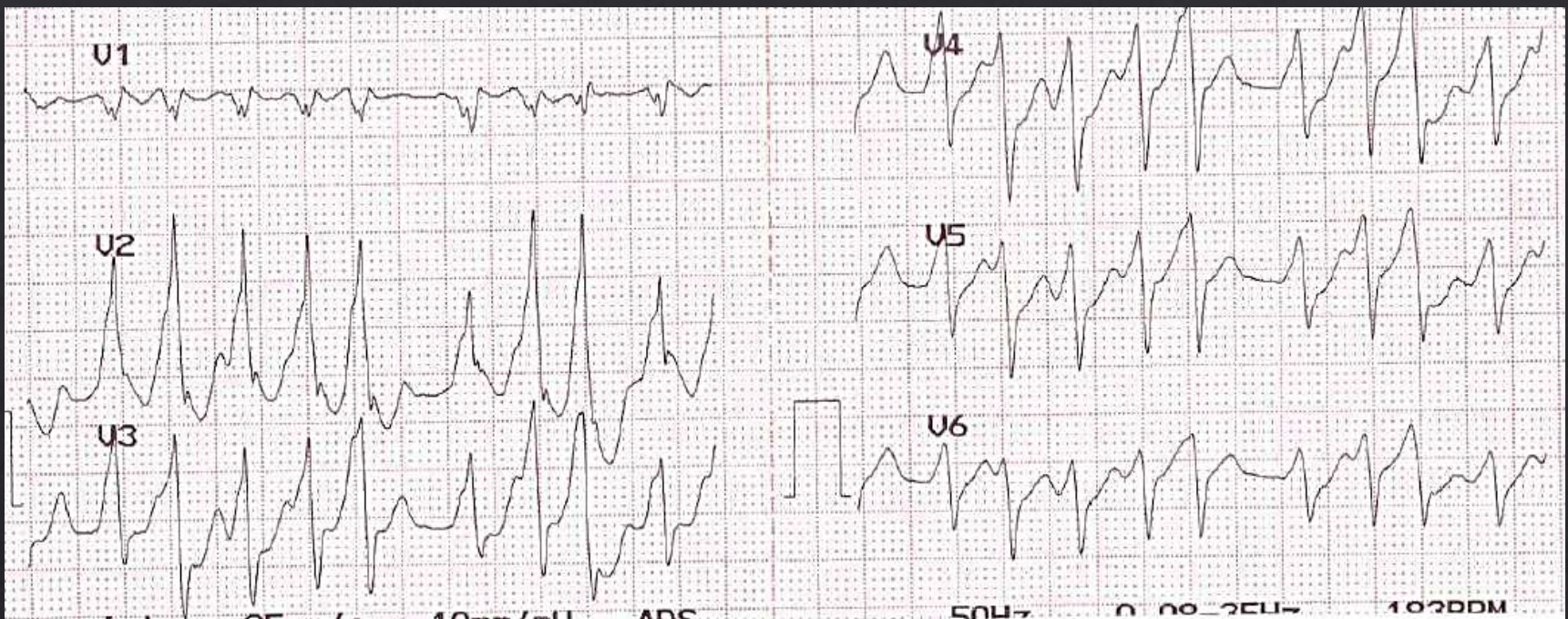
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Rate control by Calcium Channel Blocker is contraindicated  
due to negative inotropic effect

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Beta blocker: keep it as it is





## AF with WPW (Pre-excitation)

Rhythm control by Electrical Cardioversion

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Rhythm control by Chemical Cardioversion, ie. Amiodarone

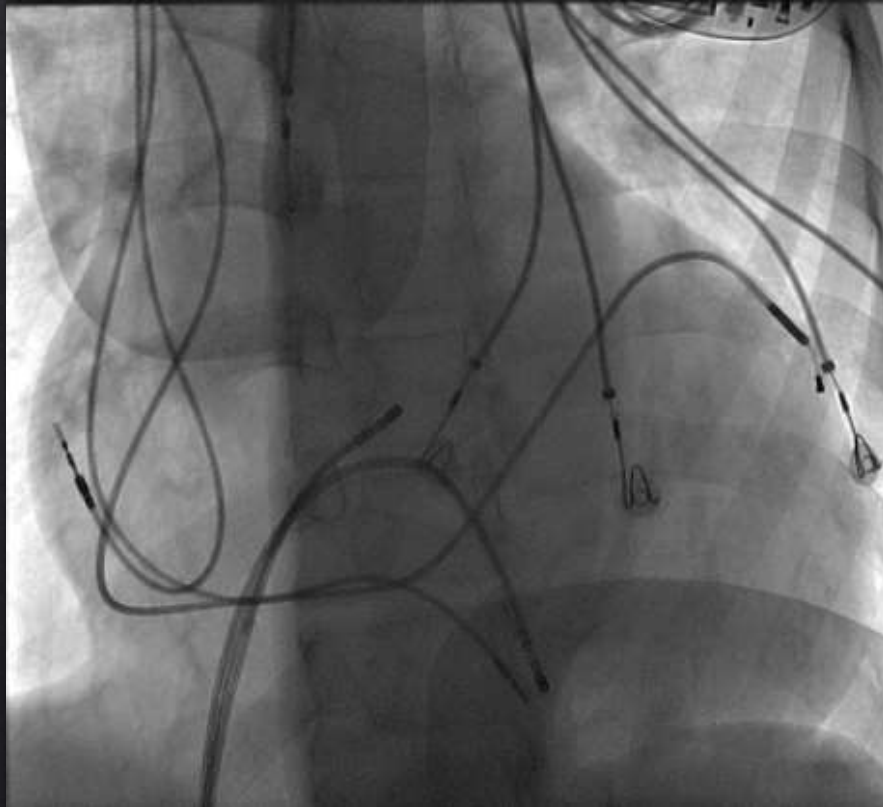
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Rate control by AV node blocking agents, ie. Beta-blockers, Digoxin, or Calcium channel blockers is **CONTRA-Indicated**

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Refer for **Ablation**

# AV node Ablation for rate control



## Advantage

- Extremely effective for rate control
- Very safe and simple procedure

## Disadvantage

- Total dependency on pacemaker

## Recommendations

- Reserve for the last choice after failed (many) medications
- Implant CRT, rather than PPM, in patients with depressed LVEF
  - $\leq 50\%$  (BLOCK-HF\*)
  - $\leq 35\%$  (ESC guidelines)

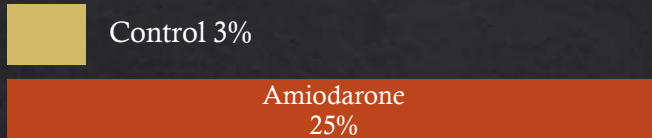
# Rhythm Control

- Goal: symptomatic relief
- Choices
  - Cardioversion
  - Antiarrhythmic agents
    - Flecainide, Propafenone
    - Amiodarone
    - Dronedarone
  - Ablation
- Rate control should be continued throughout a rhythm control approach.

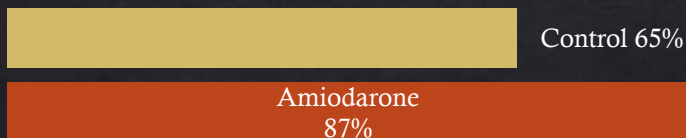


# Efficacy of Electrical Cardioversion

## Spontaneous Conversion before DCCV (%)



## DCCV Success rate (%)



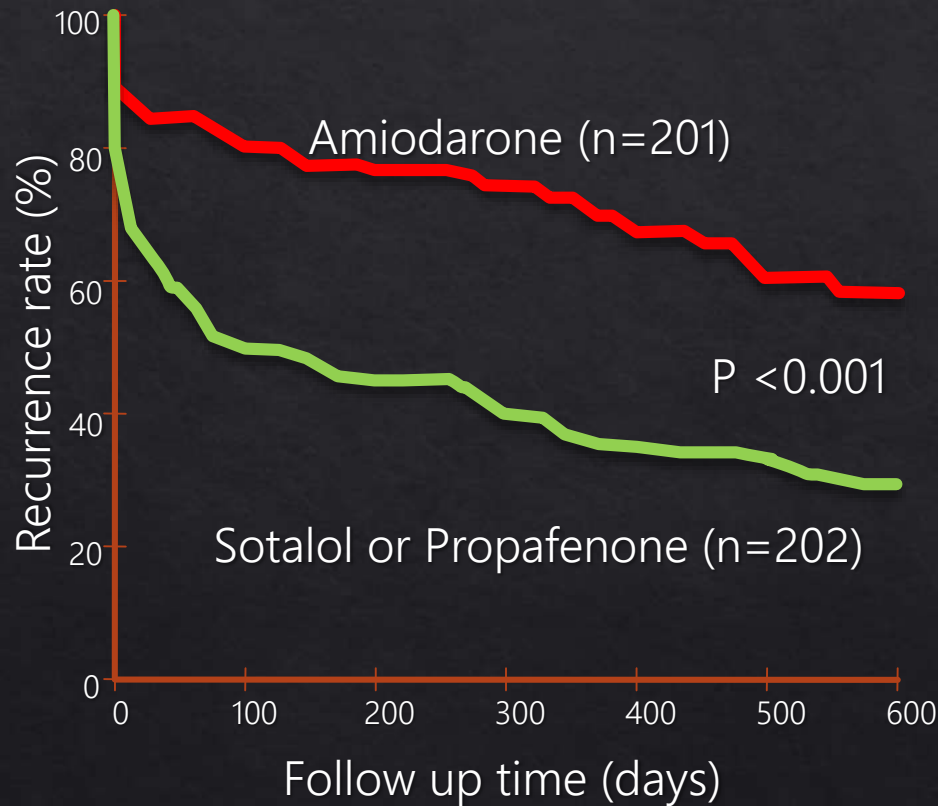
## Recurrence at 2 months (%)



P<0.05 for all comparisons

- 92 patients, age 60
- Persistent AF, average 16 wks
- Randomized
- Amiodarone group
  - 400 mg/d x 1mo before DCCV
  - 400 mg/d x 2mo after DCCV
- No side effects reported

# Efficacy of AAD and Ablation



CTAF. NEJM 2000;342:913-20.

## Efficacy of AF Ablation off drugs (mean follow up time = 14 months)

Single Procedure	57%
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Multiple Procedure	71%
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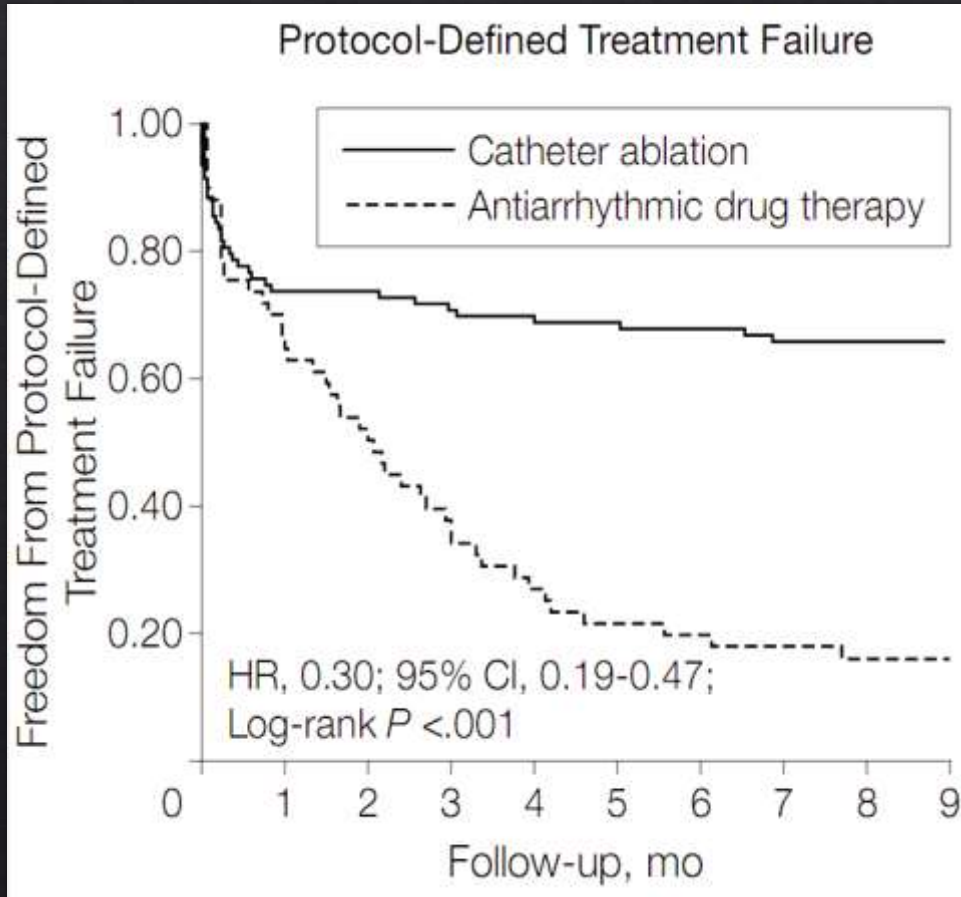
## Efficacy of Antiarrhythmic agents including Flecainide, Propafenone, Sotalol, Dofetilide, and Amiodarone (mean f/u 12 months)

All agents	52%
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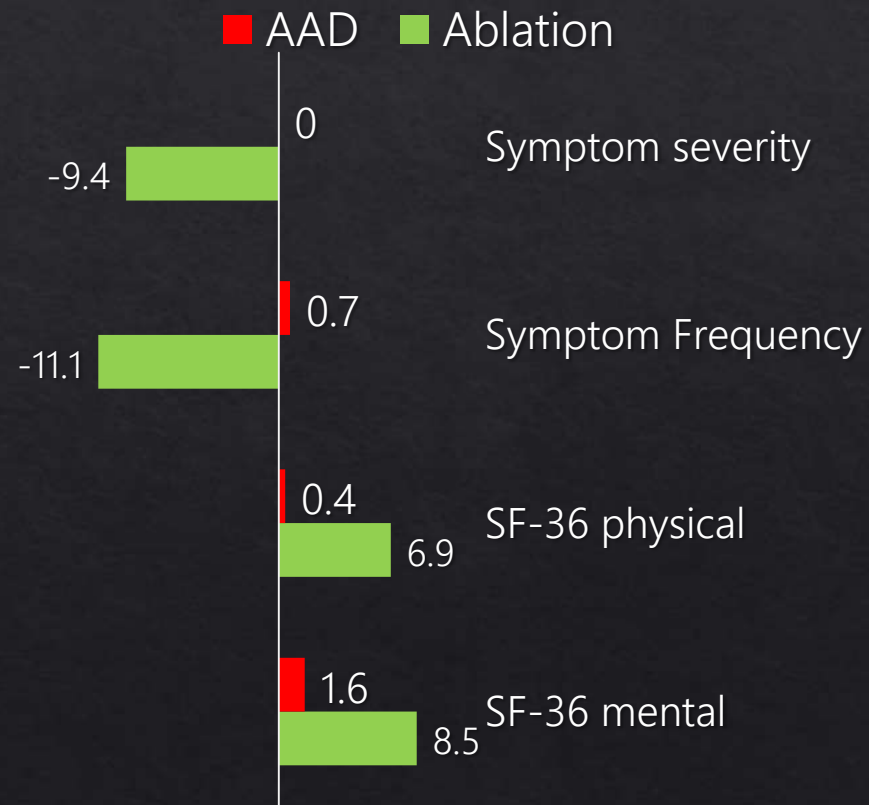
Calkins et al. Circ Arrhythm Electrophysiol 2009;2;349-361.

# Ablation vs. AAD

167 pts, Paroxysmal AF, failed at least 1 AAD  
Prospective, multicenter, RCT

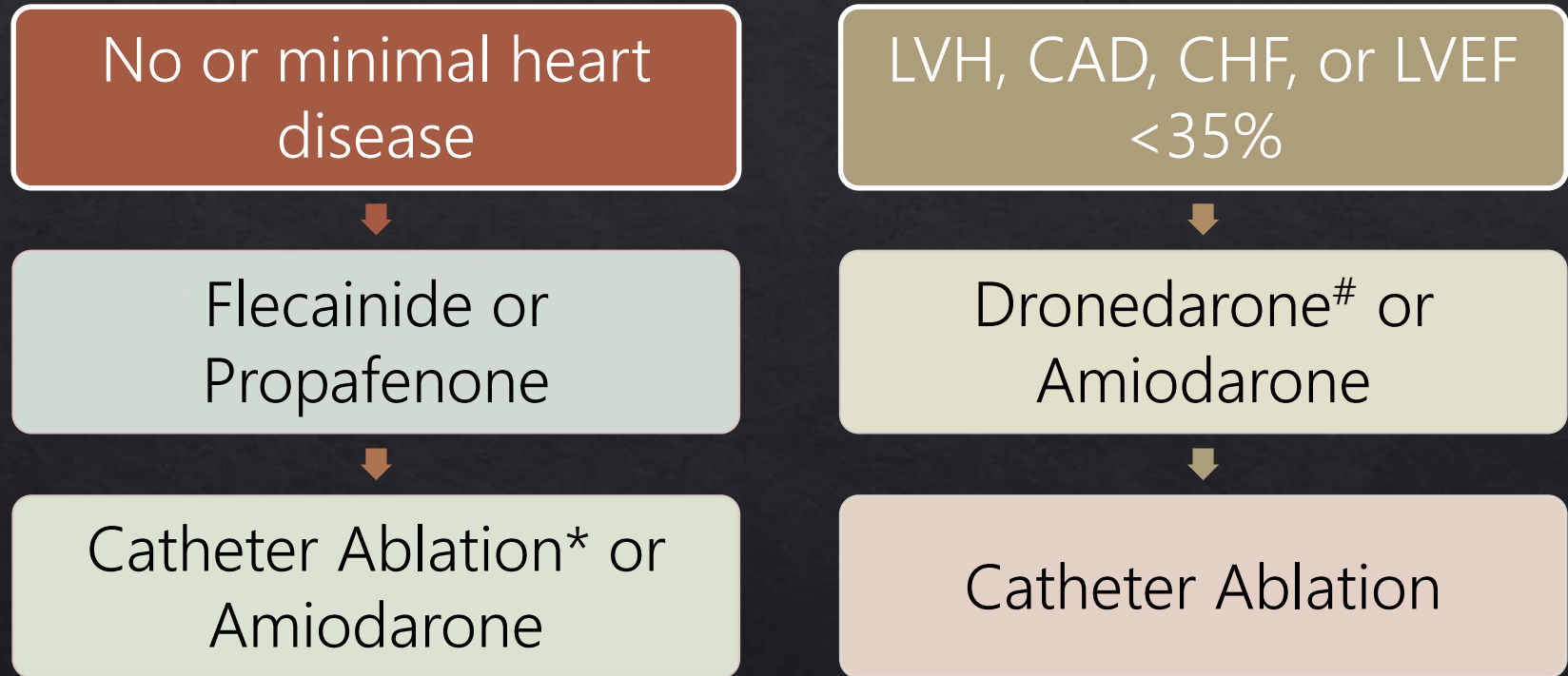


## Absolute Change from Baseline





# Guidelines for Rhythm Control



\*Significantly symptomatic patients in experienced center

#not recommended in NYHA III and IV, unstable NYHA II, and persistent AF

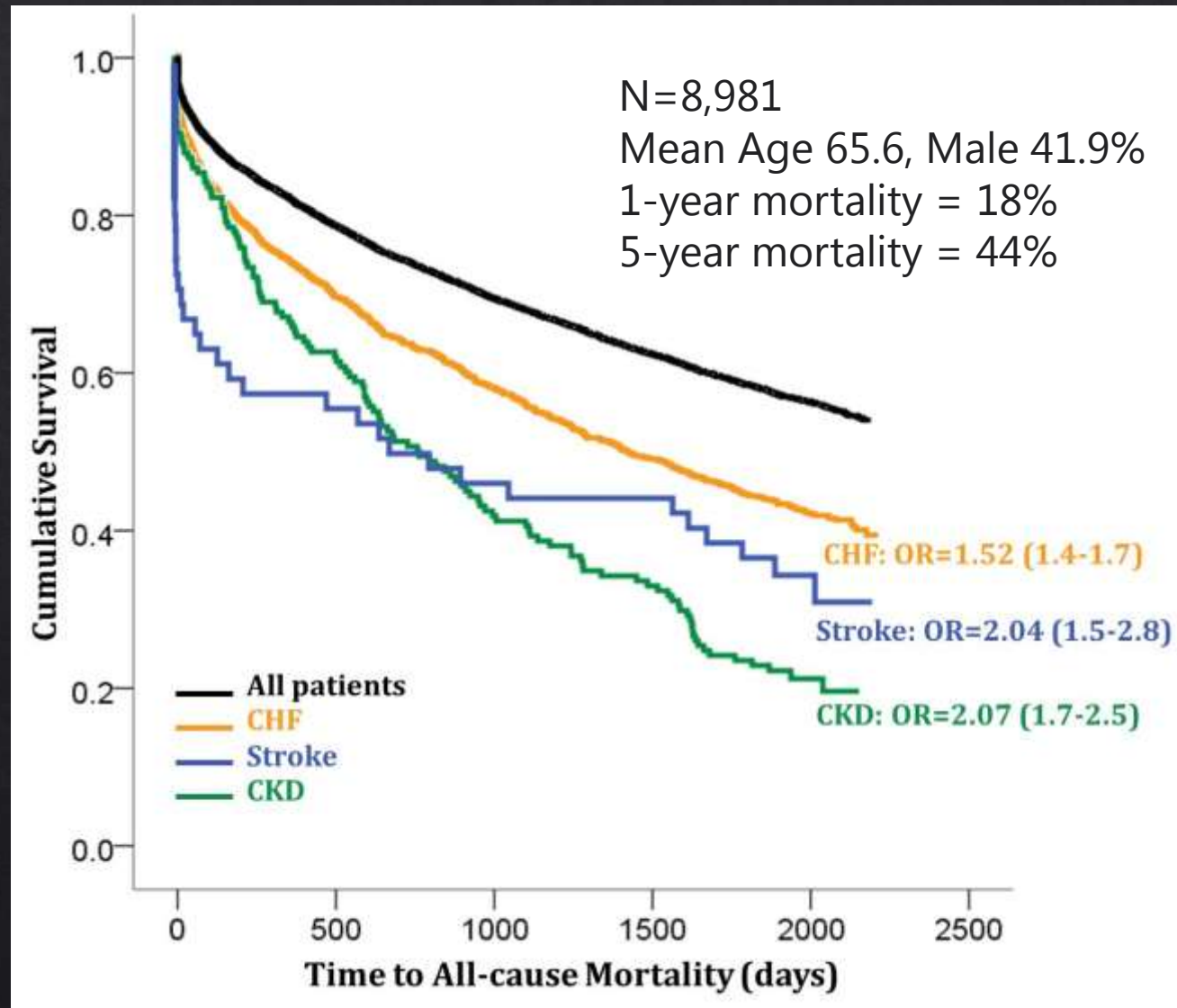
# Medications Consideration

	Acute conversion (<7d)	Late conversion (>7d)	LVH	CAD	CHF	AV node blocking property	ECG features prompting lower dose or D/C
Flecainide	Y	N	N	N	N	None	QRS>25% wider
Propafenone	Y	N	N	N	N	Minimal	QRS>25% wider
Sotalol	N	N	N	Y	N	A lot	QT>500
Dofetilide	Y	Y	Y	Y	Y	None	QT>500
Amiodarone	Y	Y	Y	Y	Y	Moderate	QT>500
Dronedarone	N	N	N	Y	N	Moderate	QT>500
Ibutilide	Y	Y	careful			None	
Vernakalant	Y	N	?	?	?	Moderate	

2006 ACC Guidelines  
2010 ESC Guidelines

# Mortality after AF Hospitalization

ข้อมูลจากคนไข้สิทธิ์ 30 บาทและข้าราชการ

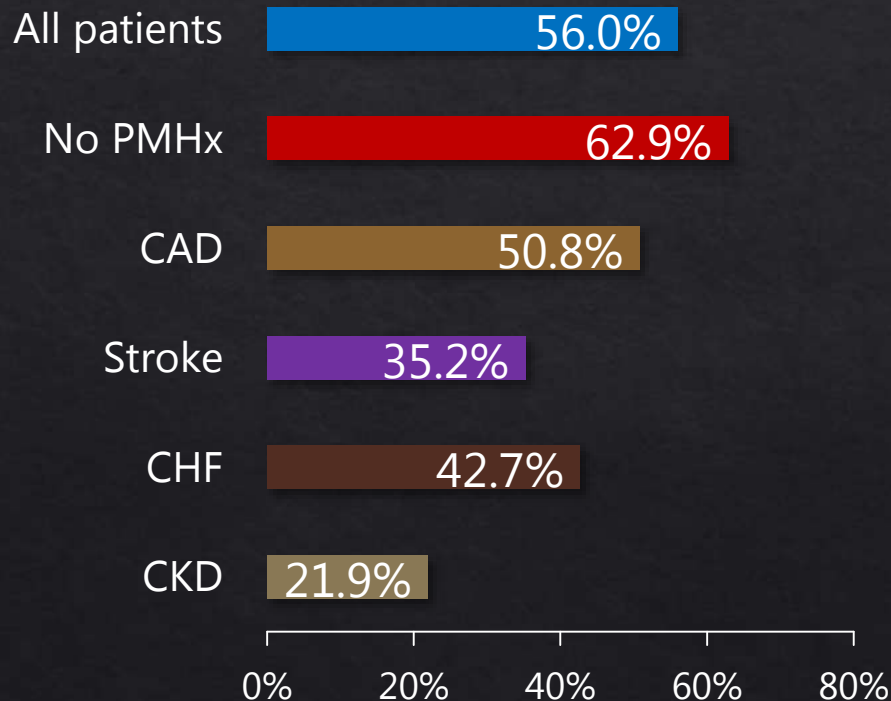




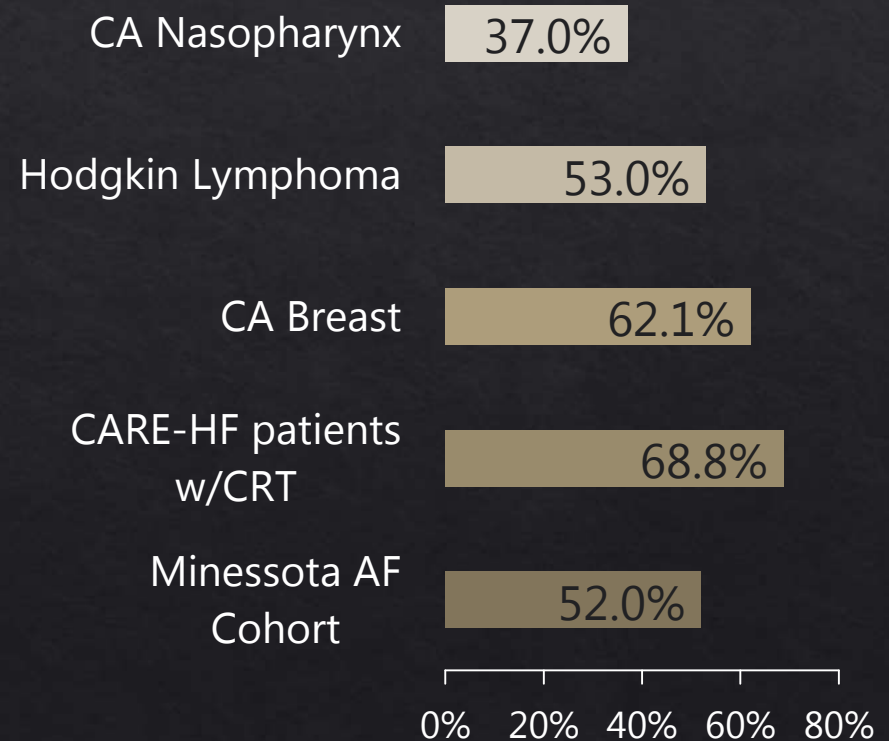
# Mortality after AF Hospitalization

ข้อมูลจากคนไข้สิทธิ์ 30 บาทและข้าราชการ

5-yr Survival (%) by PMHx  
Data from the Cohort



5-yr Survival (%)

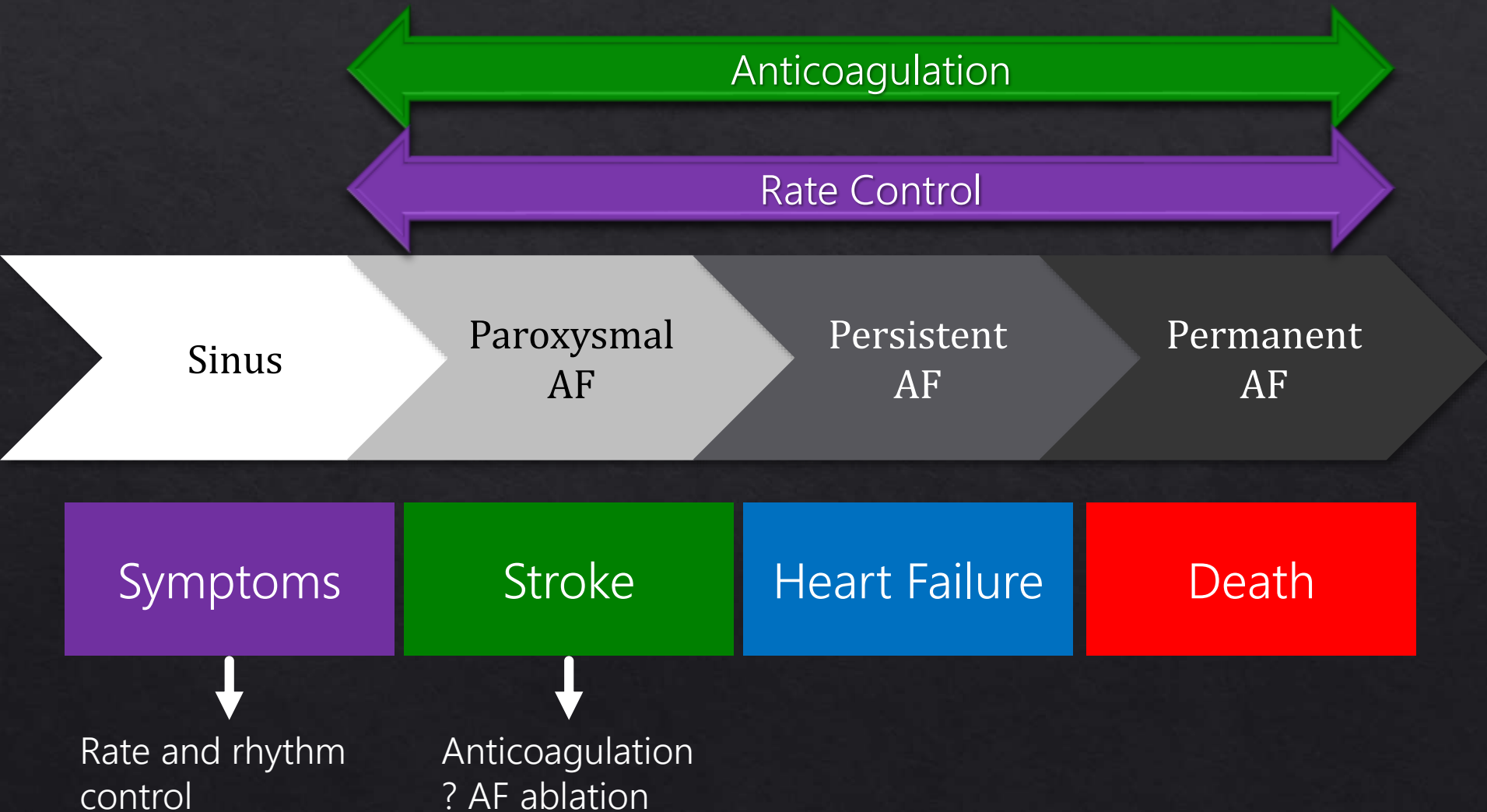


1. Chiang Mai Tumor Registry 1993-1997.

2. J.G.F. Cleland et al. CARE-HF Long-Term Follow Up. Eur J Heart Failure (2012)14, 628-634.

3. Miyasaka et al. J Am Coll Cardiol 2007;49:986-92

# The big picture of AF



**R**ate control  
should be continued  
throughout  
regardless of the  
strategy.

**A**void CCB in  
patients with  
impaired LV  
systolic function.

**T**arget HR depends  
on symptoms and  
underlying heart  
disease. Resting HR < 110  
is acceptable in most  
patients.

**E**mergent  
situations when  
rhythm control is  
needed include acute  
unstable HF and AF  
w/WPW.

## Rhythm Control

- Aim to reduce symptoms
- Beware of structural heart diseases when using AAD.
- Catheter ablation is indicated for symptomatic patients who failed AAD.