Rate Control for AF: Deal or No Deal?

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Oklahoma Heart Institute

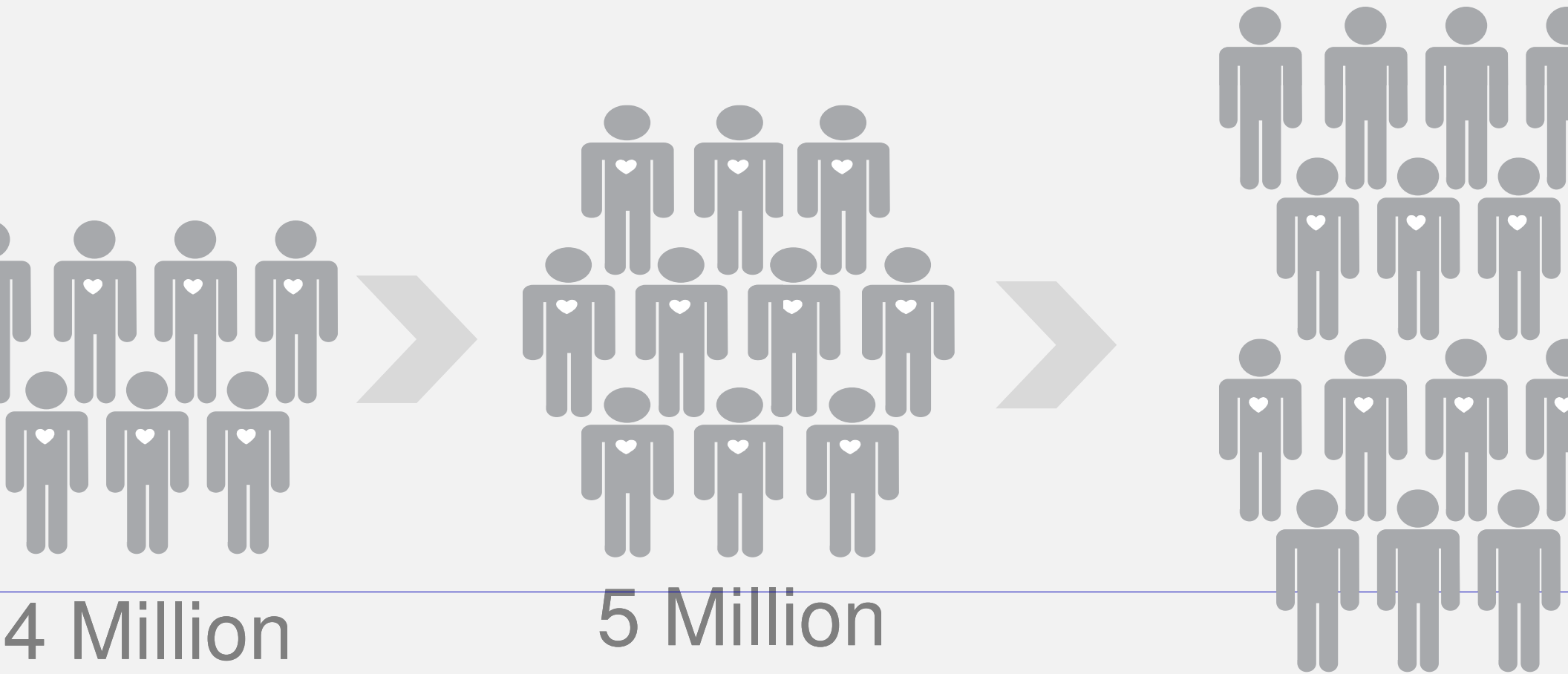
Case

- yo man with h/o typical atrial flutter –s/p RFA 200
  - oxysmal AF
- Previous rx w/ propafenone, now on amio 100 mg
  - y and beta-blocker
- CHA_2DS_2-VASc = 0 (never on anticoagulation)
- No palpitations, mild fatigue. Very active with Ta
  - Bo kickboxing.
- Paroxysmal AF on recent holter.
- Echo: normal LVEF, normal LA size.
- Presenting rhythm: AF with CVR (HR 75). Pt
  - eeling fine in office

you recommend?

. Increase amiodarone to 200 mg daily.
. Discontinue amiodarone and pursue rate-control strategy.
. Change amiodarone to sotalol or tikosyn.
. Recommend catheter ablation.
. Continue present care and follow.
. Screen for enrollment in CABANA.

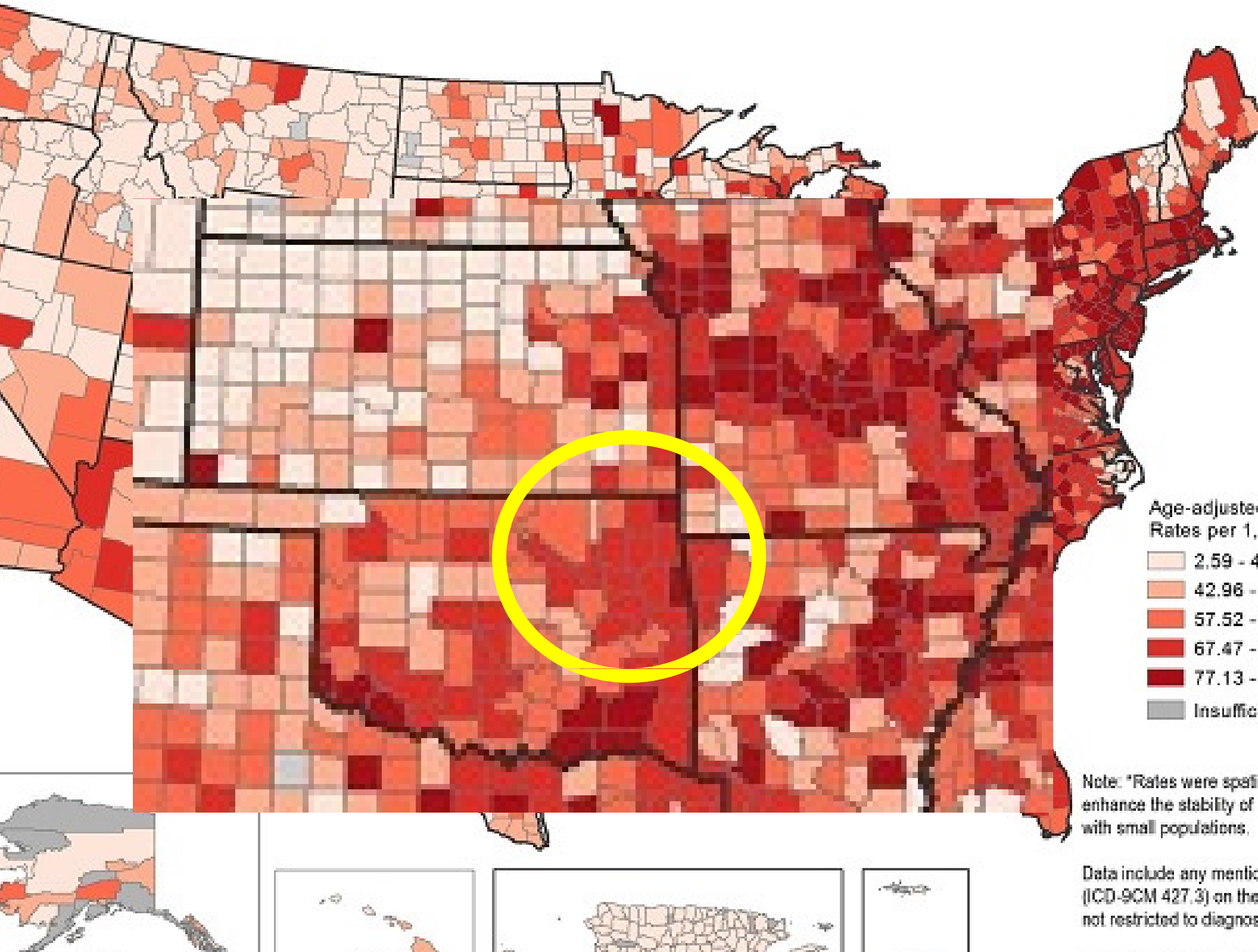
revalence of Atrial Fibrillatio



4 Million

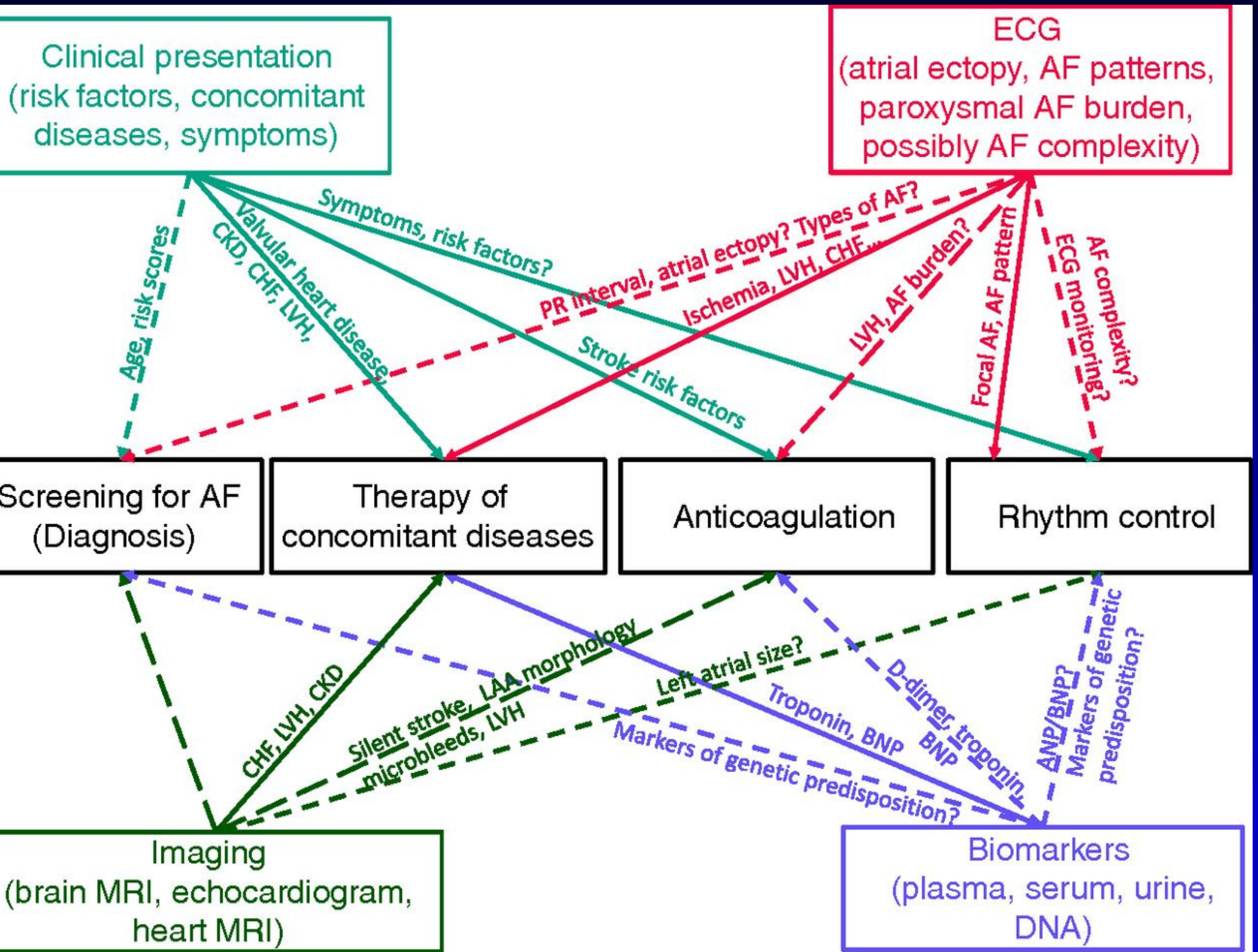
5 Million
by 2020

8 Million
by 2035

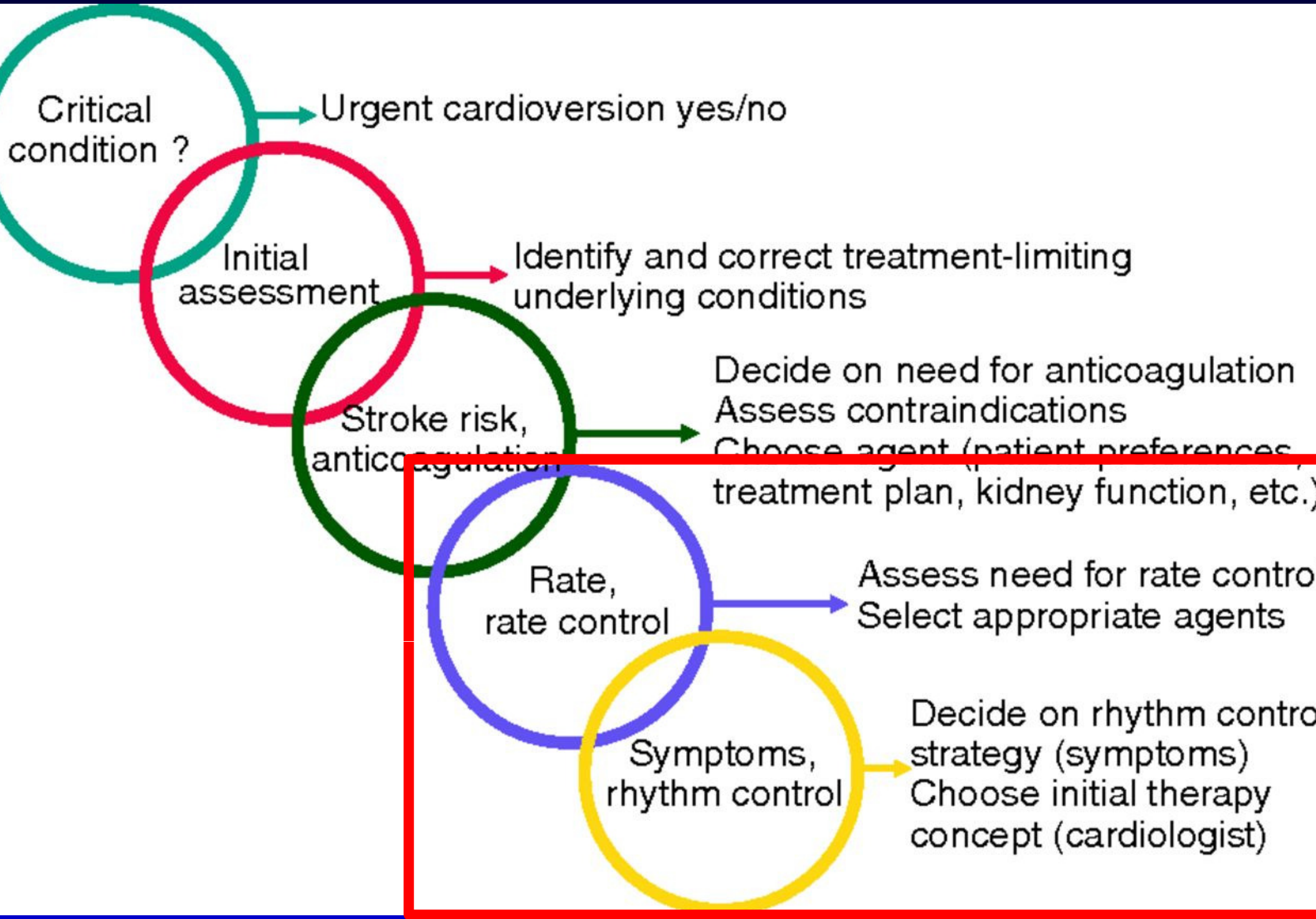


Note: "Rates were spec
enhance the stability of
with small populations.

Data include any mentio
(ICD-9CM 427.3) on the
not restricted to diagnos


Clinical presentation
(risk factors, concomitant diseases, symptoms)
ECG
(atrial ectopy, AF patterns, paroxysmal AF burden, possibly AF complexity)
Age, risk scores
CKD, CHF, LVH,
Valvular heart disease
Symptoms, risk factors?
PR interval, atrial ectopy? Types of AF?
Ischemia, LVH, CHF...
Stroke risk factors
LVH, AF burden?
Focal AF, AF pattern
AF complexity?
ECG monitoring?
Screening for AF
(Diagnosis)
Therapy of concomitant diseases
Anticoagulation
Rhythm control
CHF, LVH, CKD
Silent stroke, microbleeds, LVH
LAA morphology
Left atrial size?
Markers of genetic predisposition?
Troponin, BNP
D-dimer, troponin
BNP
ANP/BNP?
Markers of genetic predisposition?
Imaging
(brain MRI, echocardiogram, heart MRI)
Biomarkers
(plasma, serum, urine, DNA)

patients with AF



Classification of Atrial Fibrillation

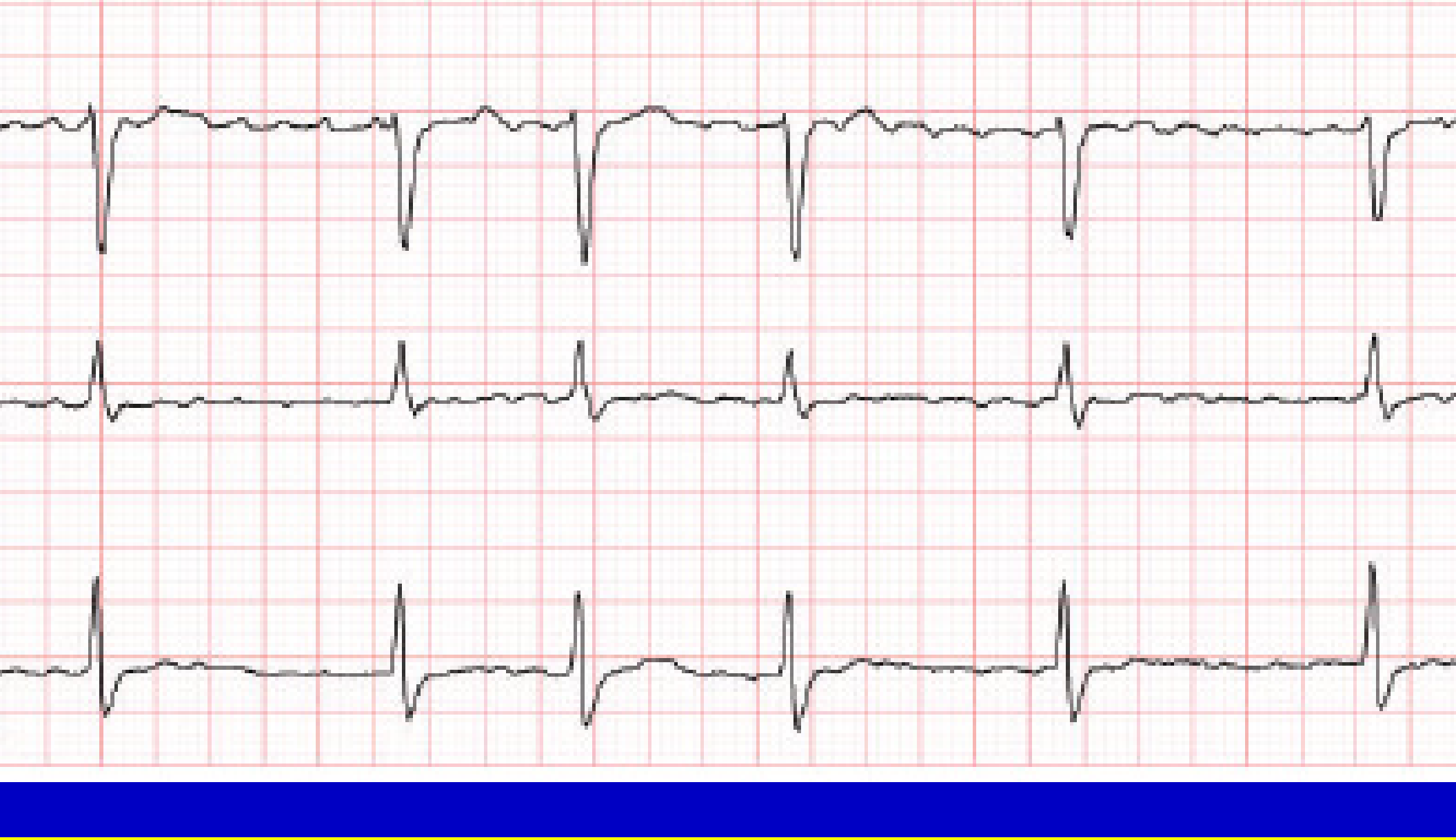
Paroxysmal AF - AF that terminates spontaneously or with intervention within 7 days of onset.

Persistent AF - Continuous AF that is sustained for more than 7 days.

Longstanding Persistent AF - Continuous AF of greater than 12 months duration.

Permanent AF - used when there has been a joint decision by the patient and clinician to cease further attempts to restore and/or maintain sinus rhythm.

Definition of Rate Control



efers to Heart Rate (Ventricular Response) During A

Definitions of Rate Control

AFFIRM TRIAL

Average heart rate at rest 80 beats/min, *and*

Either (A) or (B)

A. Heart rate maximum during a 6-min walk 110 beats/min, *or*

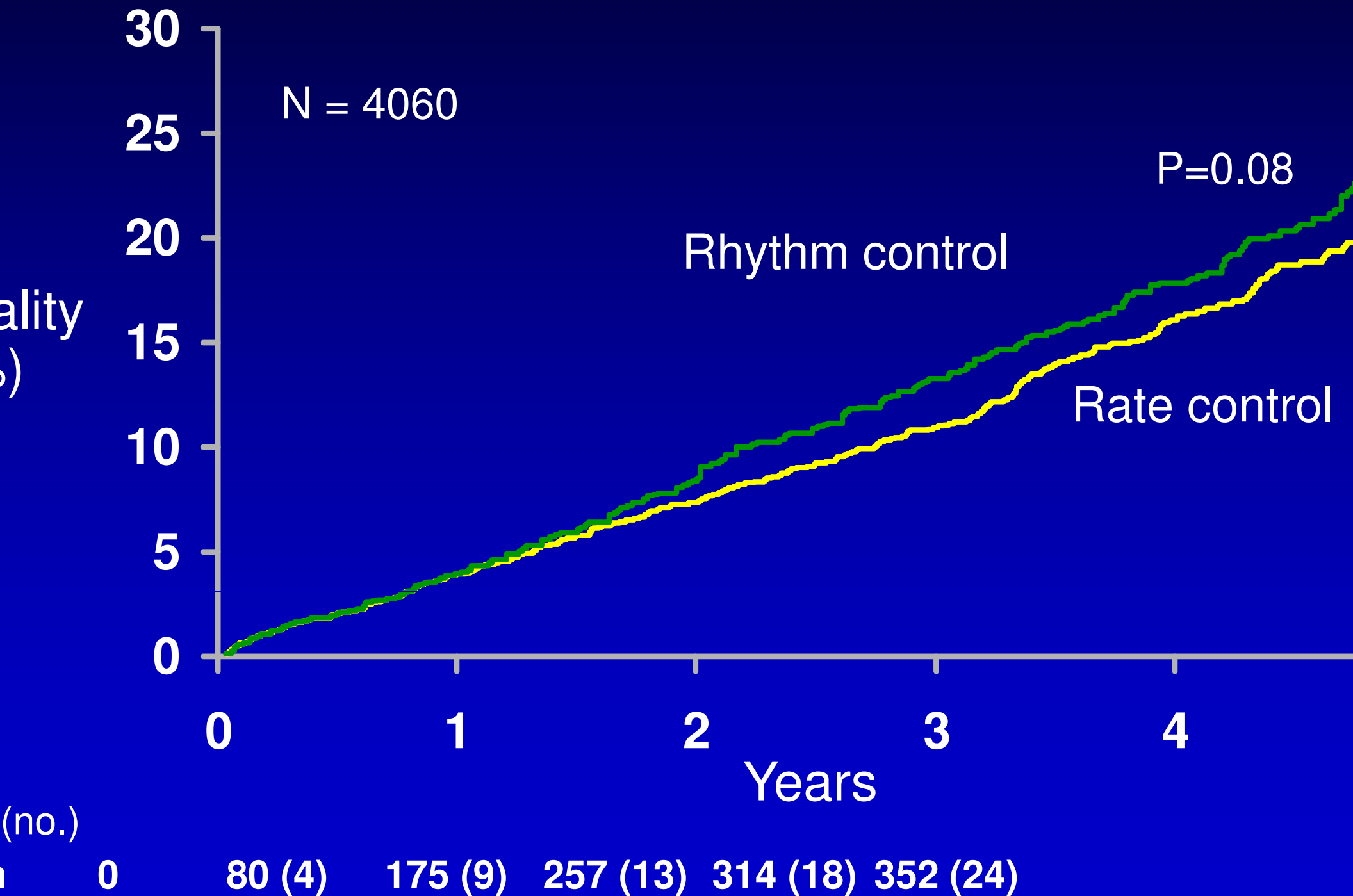
B. Average heart rate during 24-h ambulatory Holter monitoring (ECG) 100 beats/min (at least 18 h of interpretable monitoring)

and no heart rate 110% maximum predicted age-adjusted exercise heart rate

RACE II TRIAL

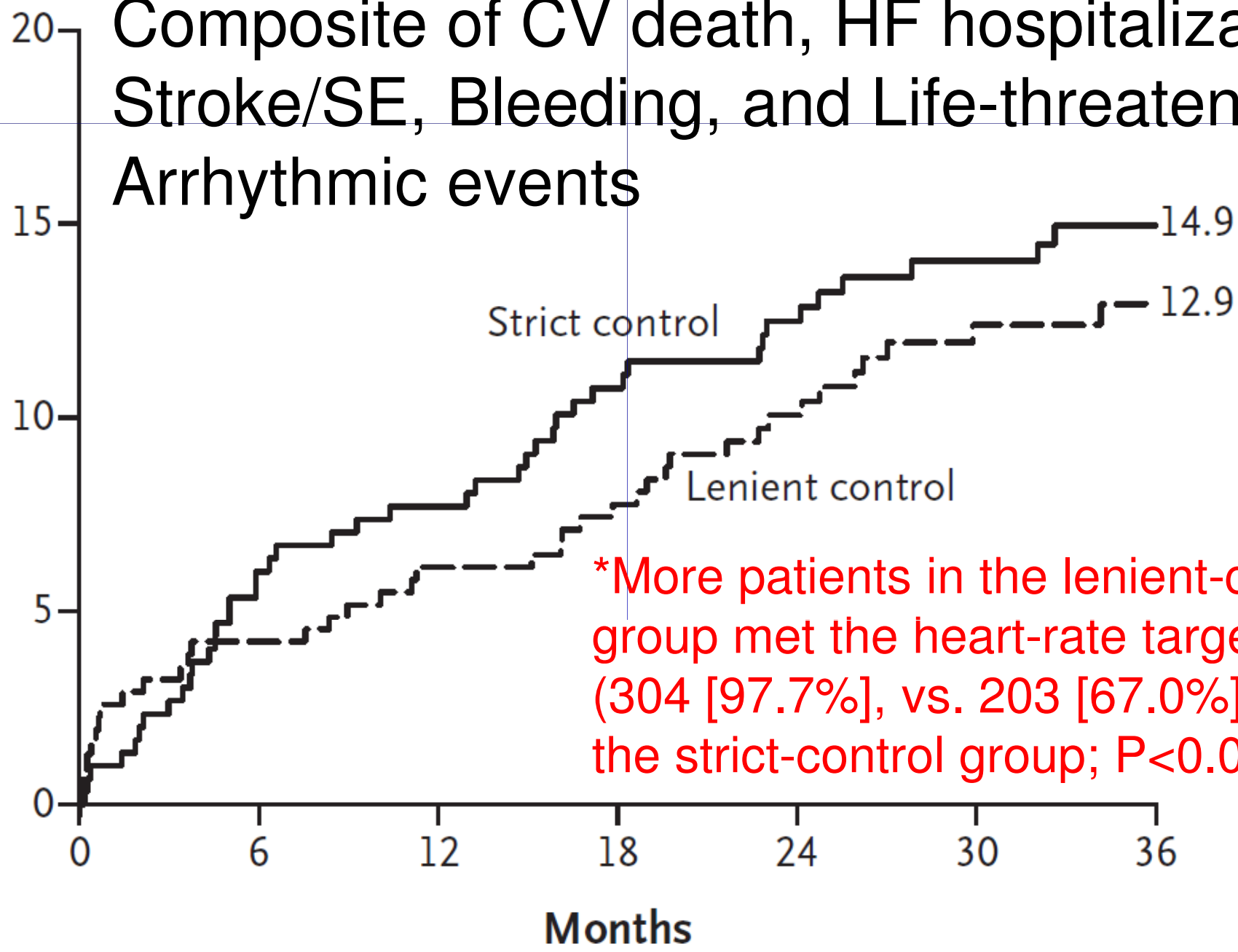
- Lenient
  - Target resting heart rate be 110 bpm.
- Strict
  - Target resting heart rate be 80 bpm
  - Target heart rate during exercise below 110 bpm during moderate exercise

Primary Endpoint: All-Cause Mortality



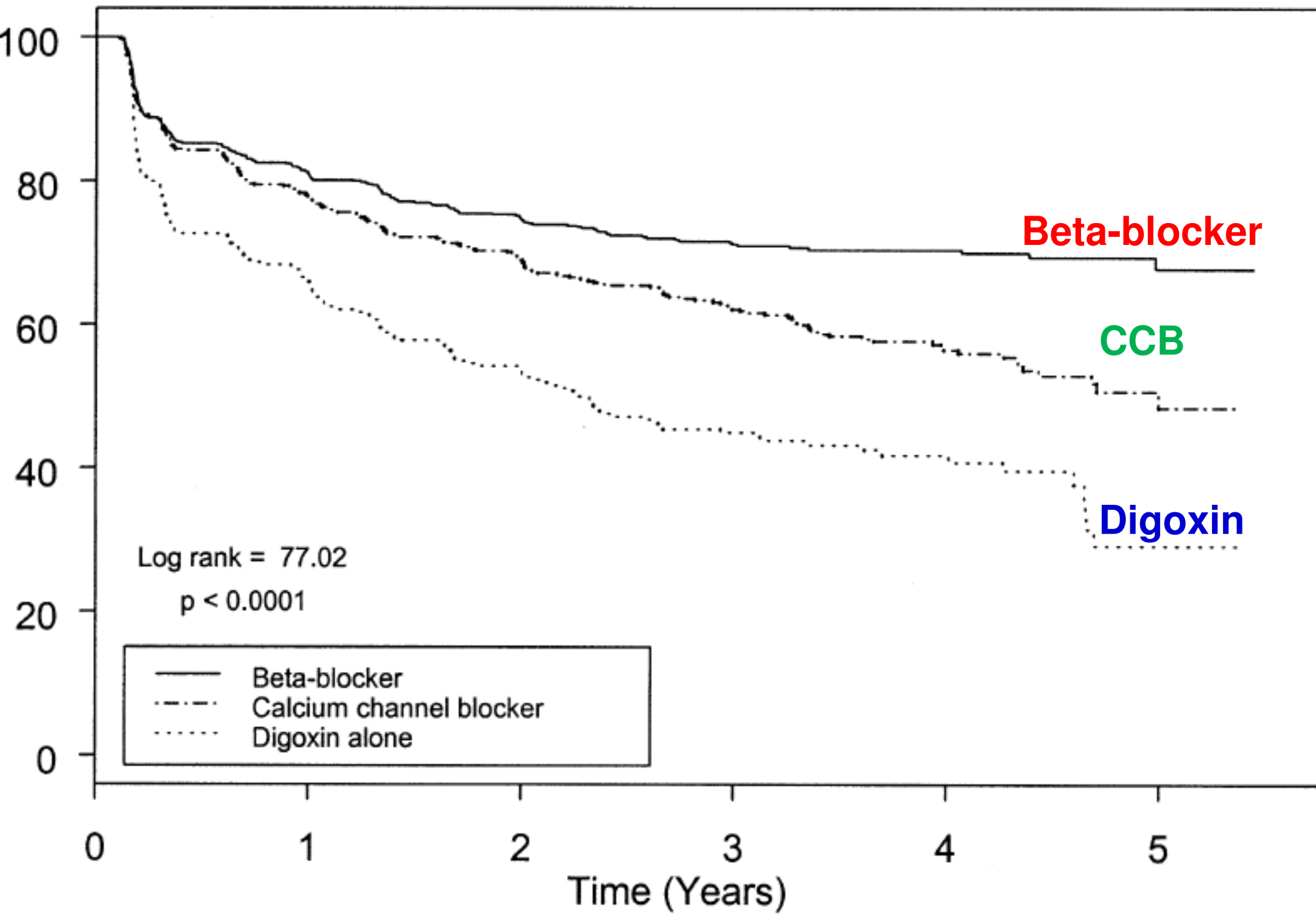
with Atrial Fibrillation

Composite of CV death, HF hospitalization, Stroke/SE, Bleeding, and Life-threatening Arrhythmic events



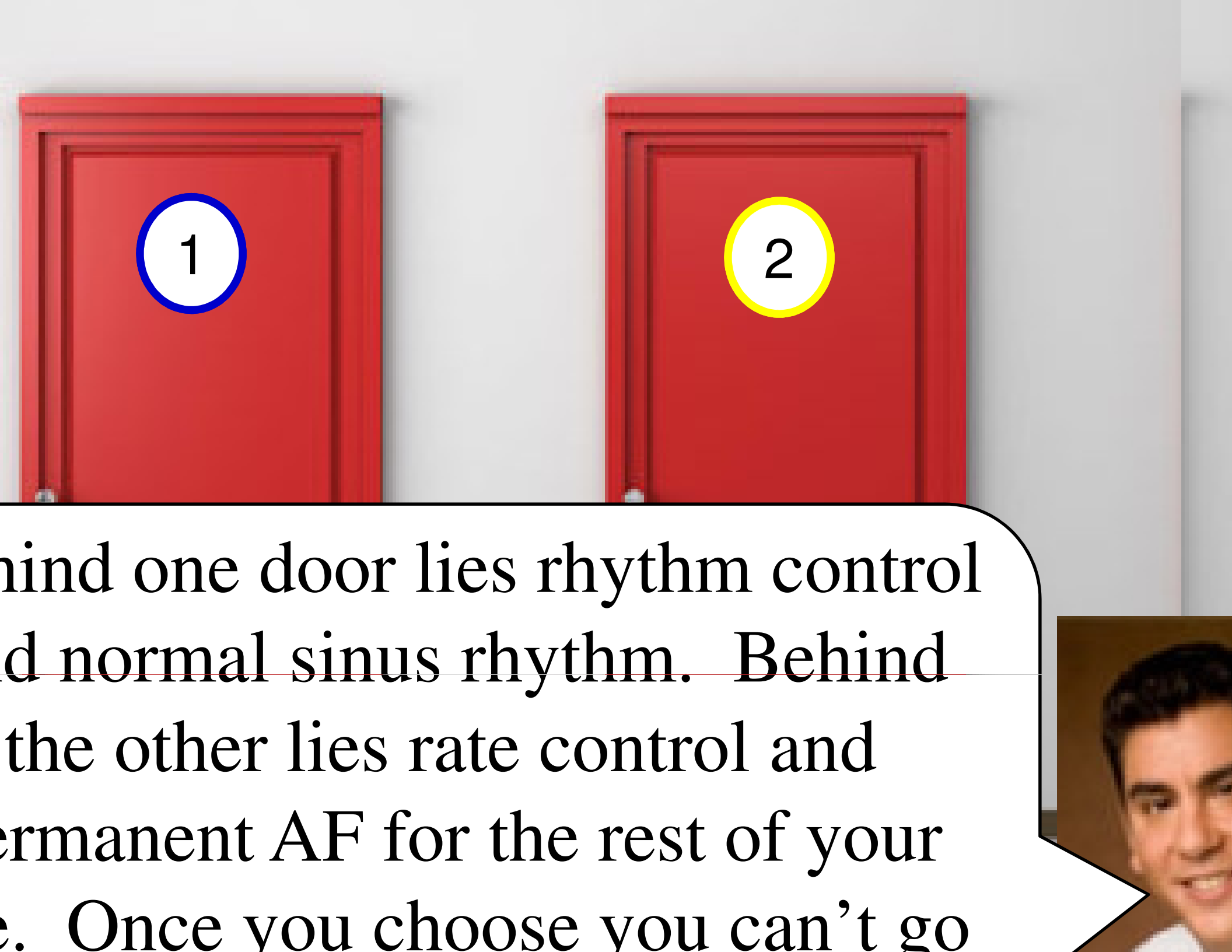
*More patients in the lenient-control group met the heart-rate targets (304 [97.7%], vs. 203 [67.0%] than in the strict-control group; P<0.001)

proaches to Rate Control in AFH

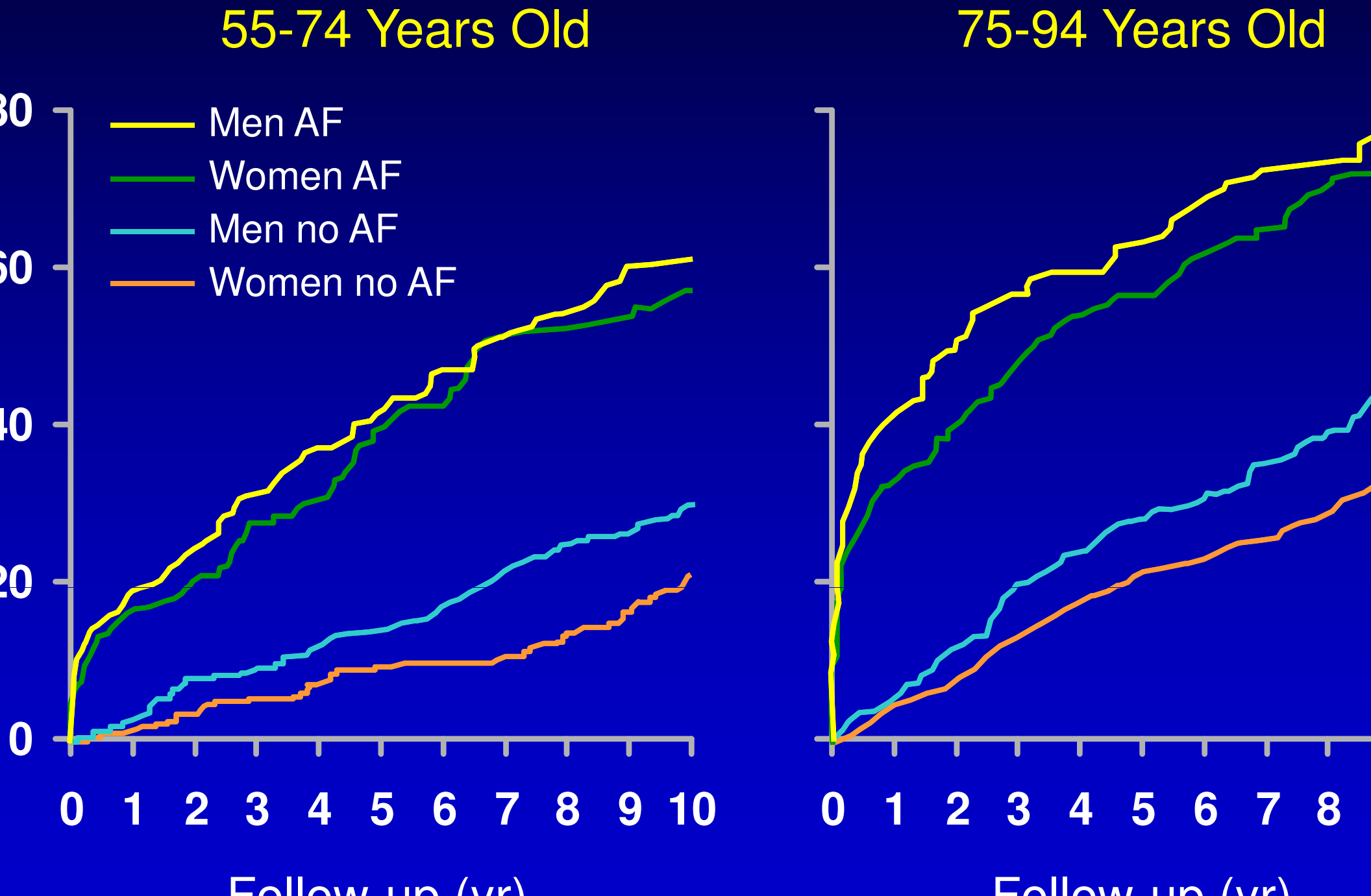


Patients With Atrial Fibrillation: Rate Cont

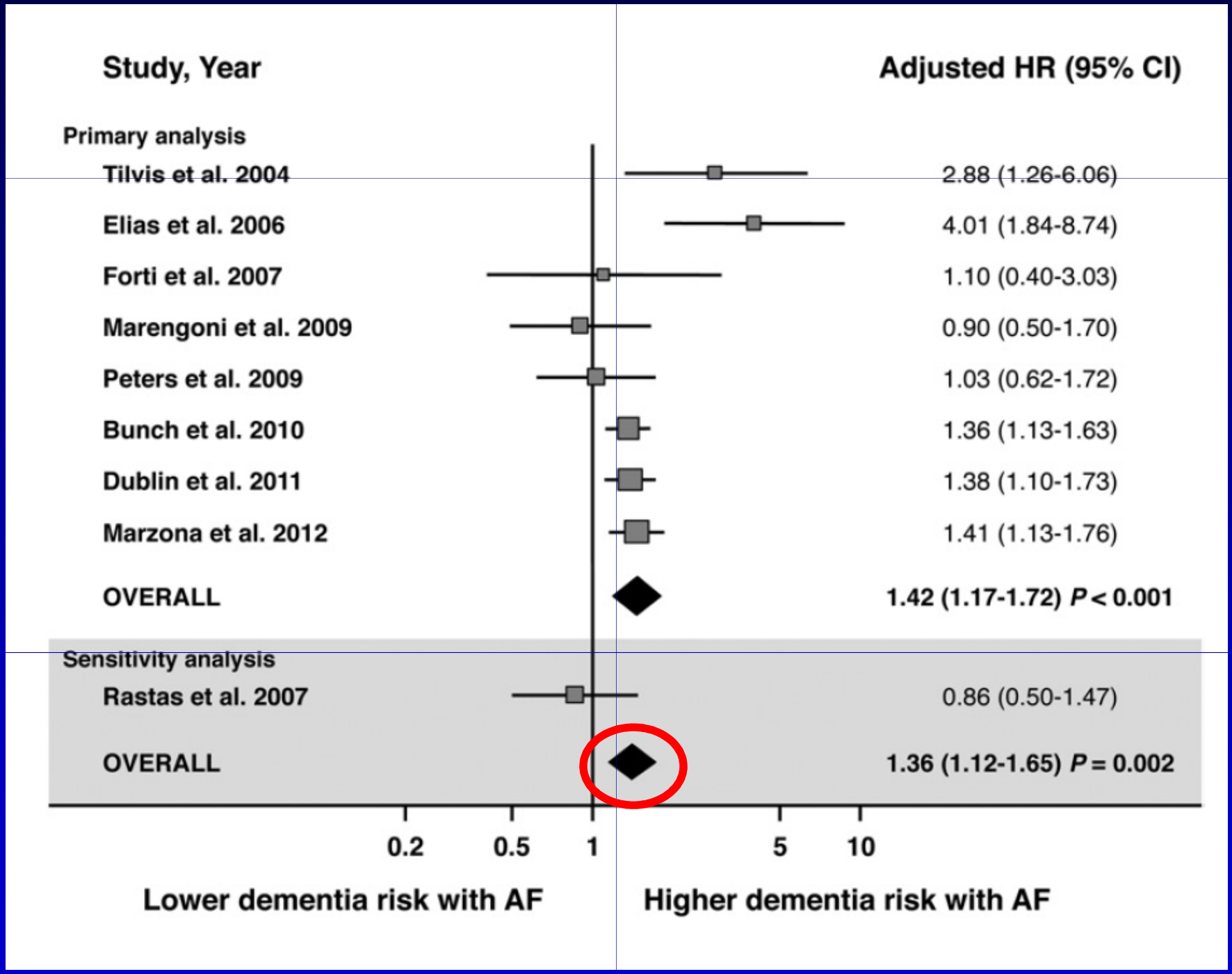
Recommendations	COR
ventricular rate using a beta blocker or nondihydropyridine calcium antagonist for paroxysmal, persistent, or permanent AF	I
blockers or nondihydropyridine calcium channel blocker ended to slow ventricular heart rate in the acute setting in patients...	I
assess heart rate control during exertion, adjusting pharmacological t as necessary	I
rate control (resting heart rate <80 bpm) strategy is reasonable for matic management of AF	IIa
darone can be useful for rate control in critically ill patients…	IIa
l ablation with permanent ventricular pacing is reasonable when ological management is inadequate and rhythm control is not ble	IIa
rate control strategy (resting heart rate <110 bpm) may be ble with asymptomatic patients and LV systolic function is	IIb


1
2
hind one door lies rhythm control
d normal sinus rhythm. Behind
the other lies rate control and
rmanent AF for the rest of your
e. Once you choose you can't go

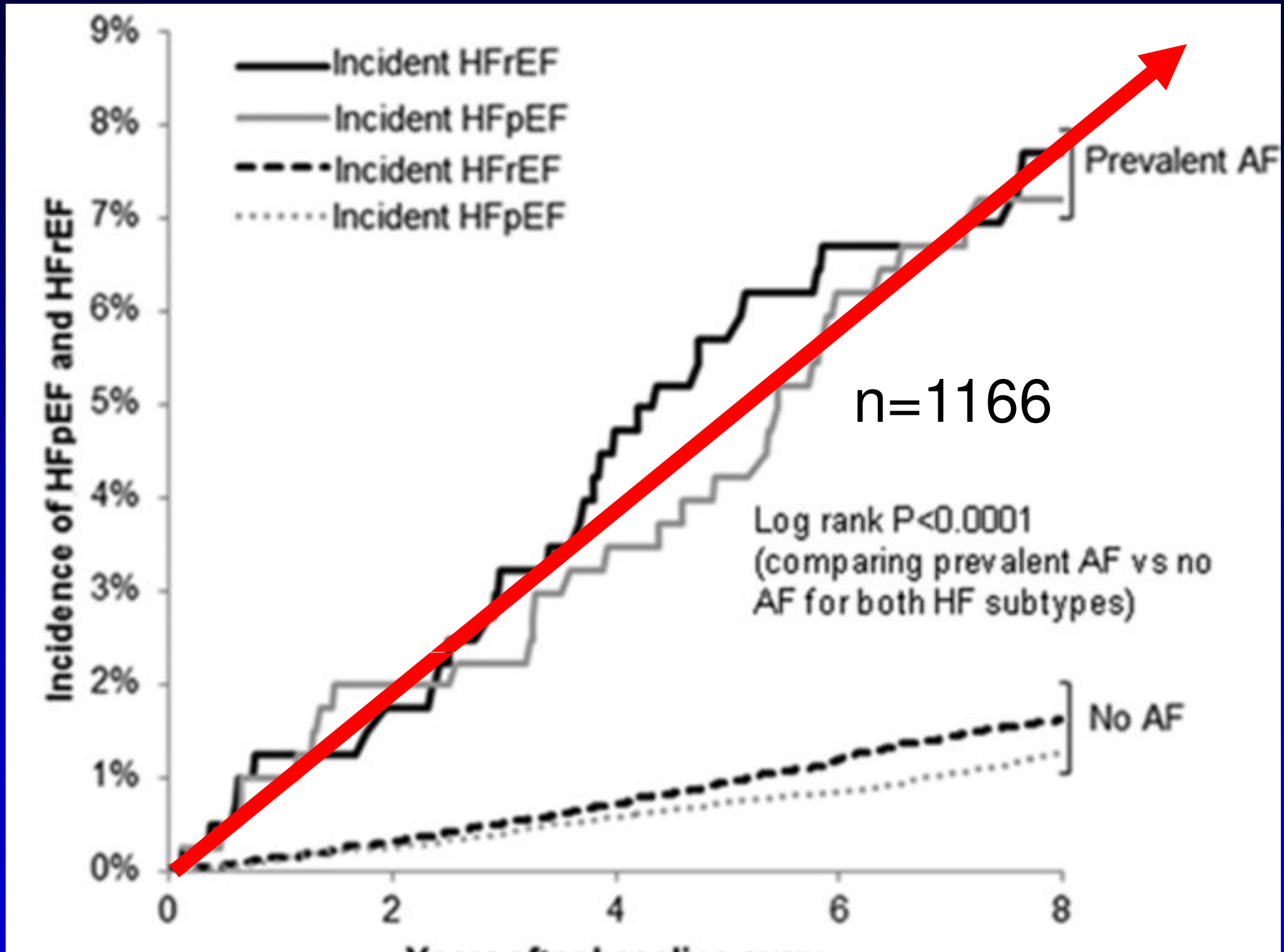
Framingham Study



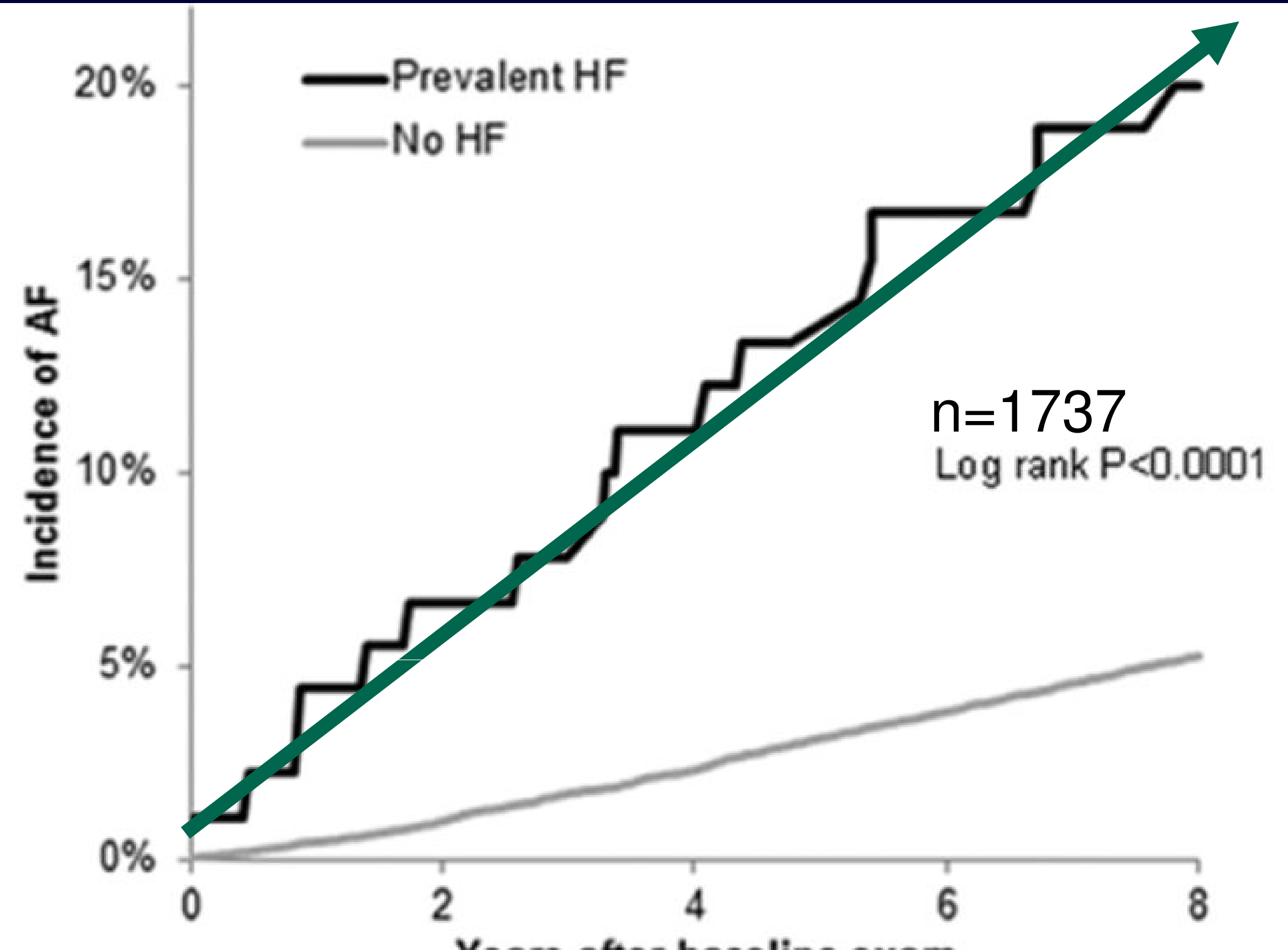
AF and Cognitive Decline



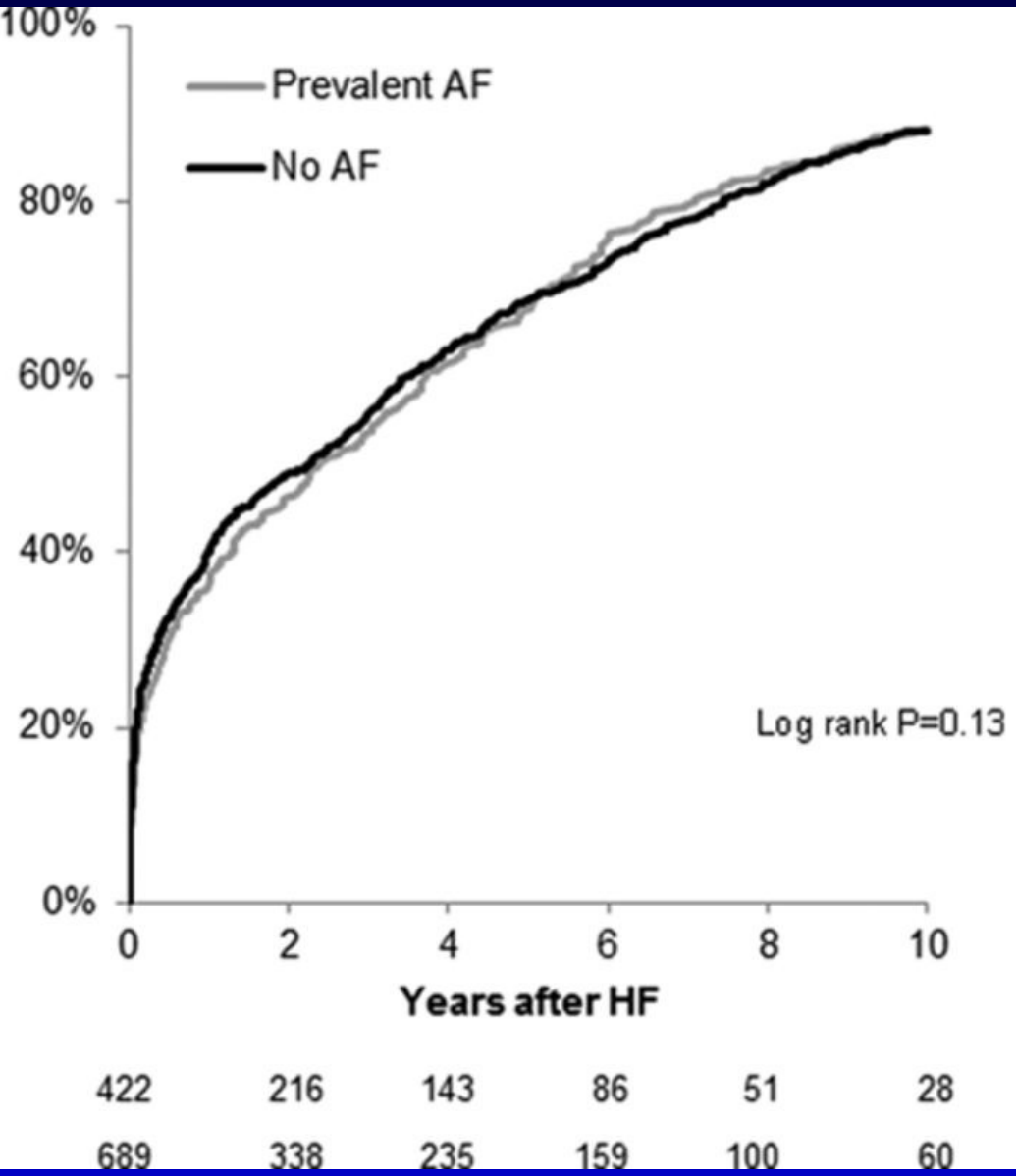
AF Begets Heart Failure



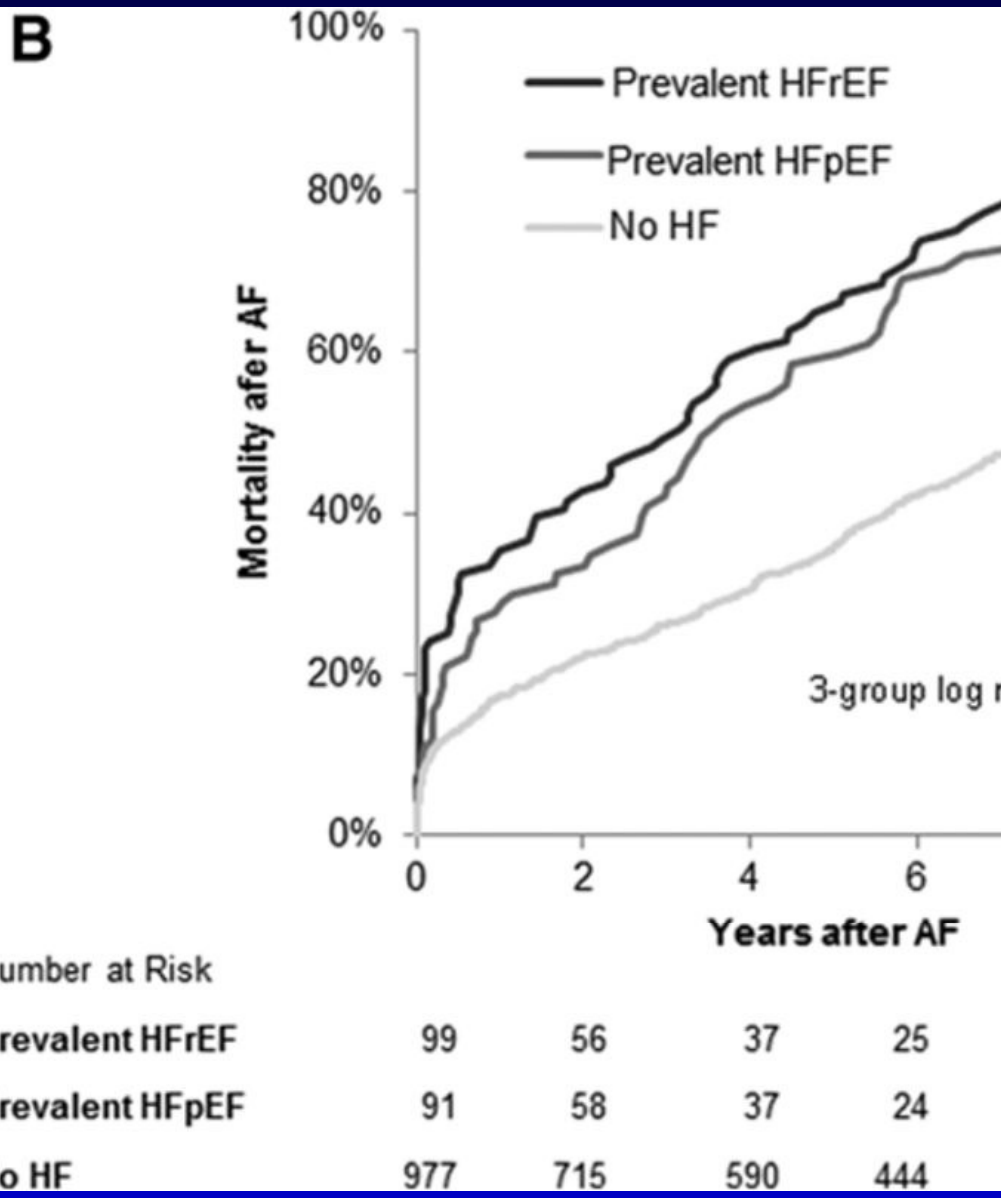
Heart Failure Begets AF



All-Cause Mortality

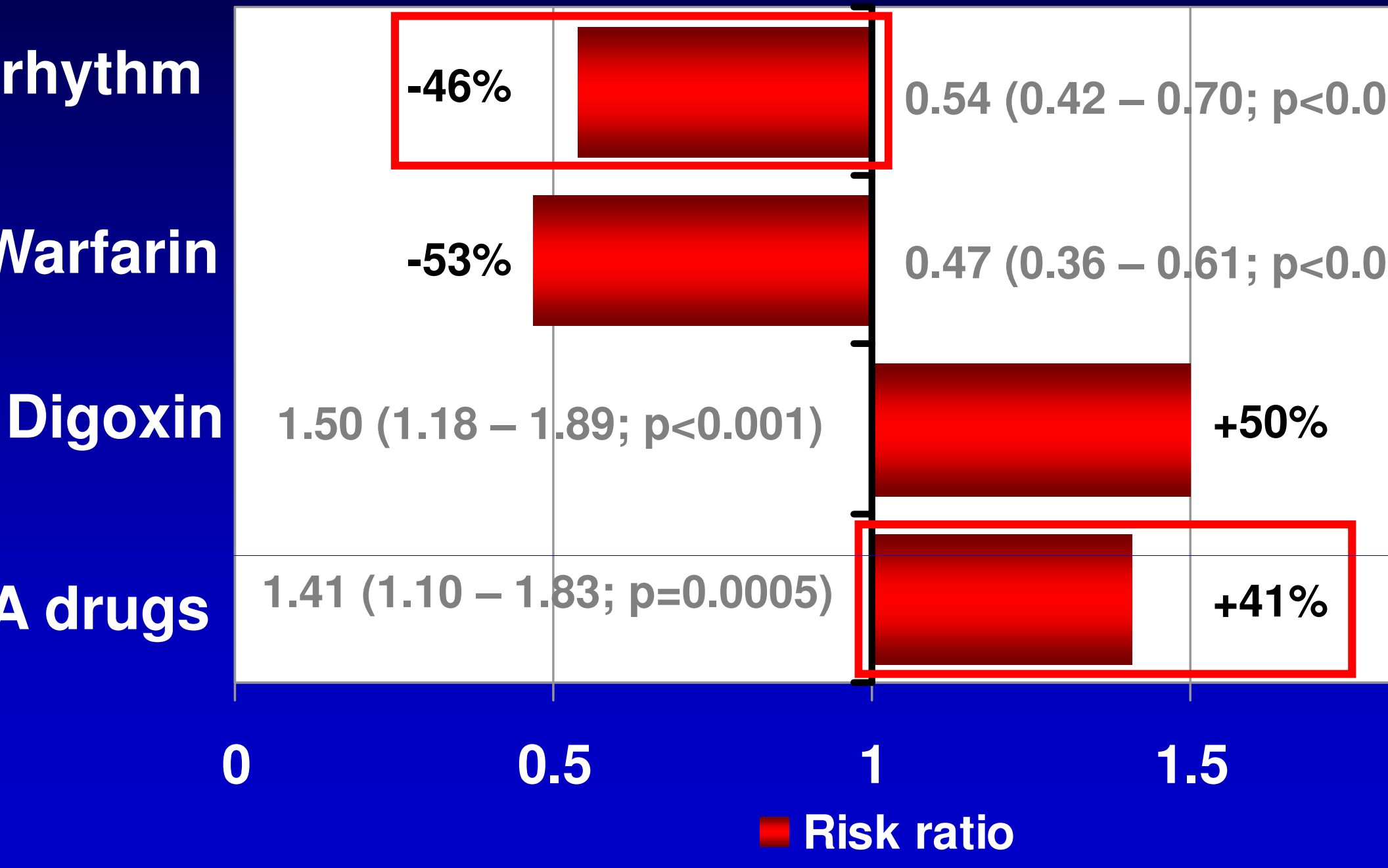


422	216	143	86	51	28
689	338	235	159	100	60

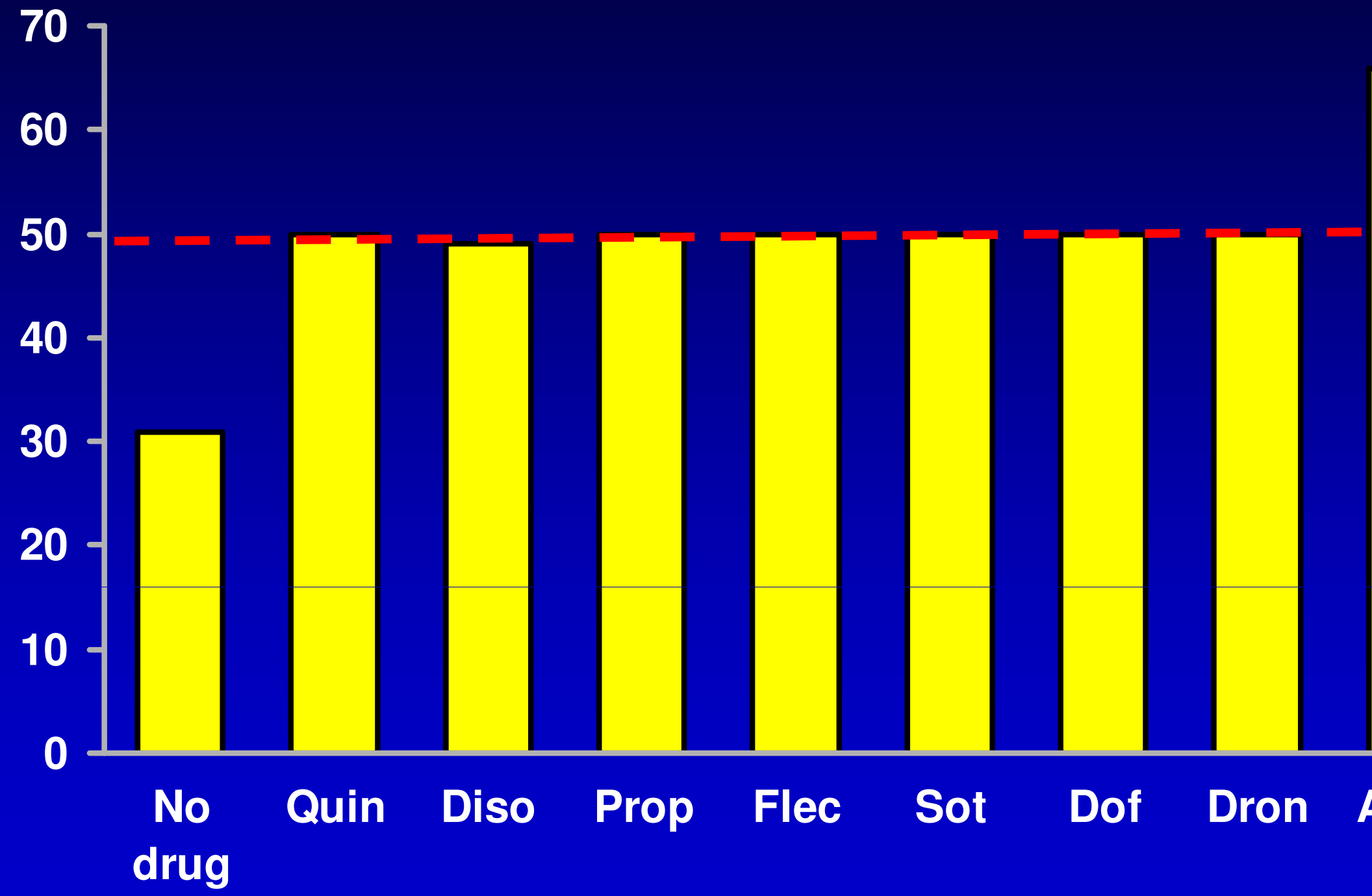


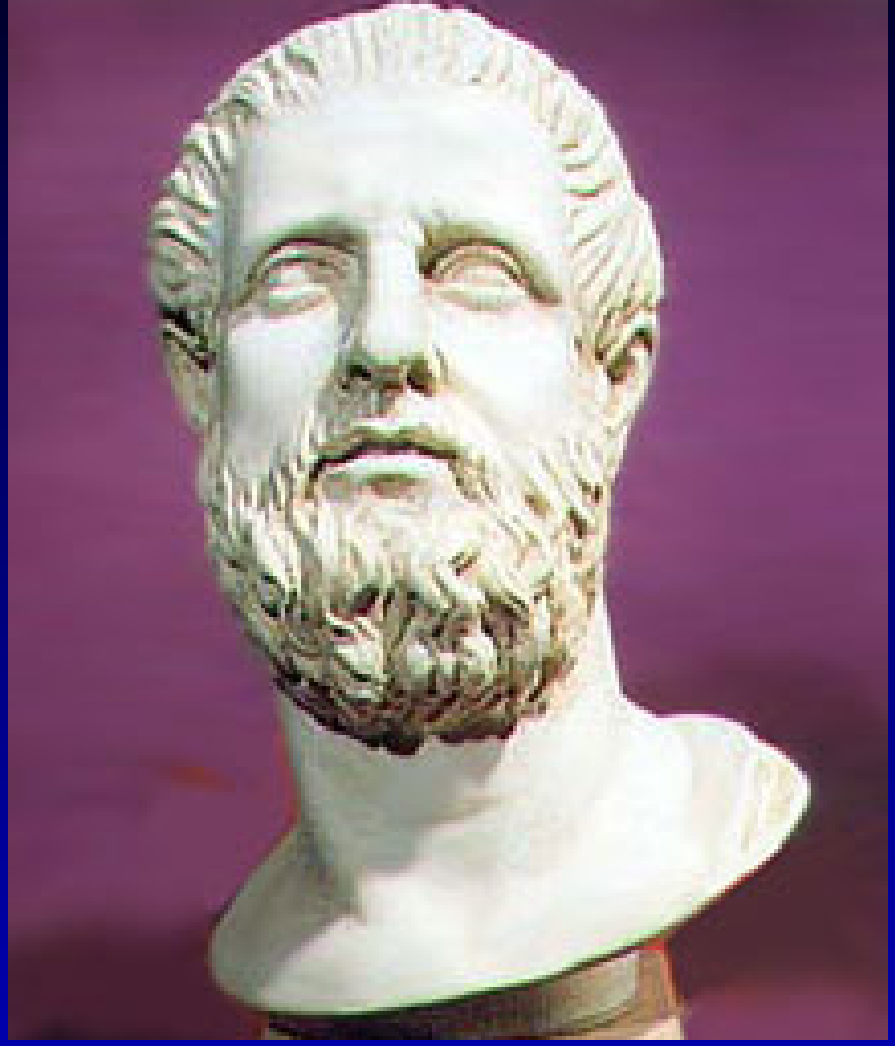
Number at Risk				
Prevalent HFrEF	99	56	37	25
Prevalent HFpEF	91	58	37	24
No HF	977	715	590	444

Predictors of Mortality



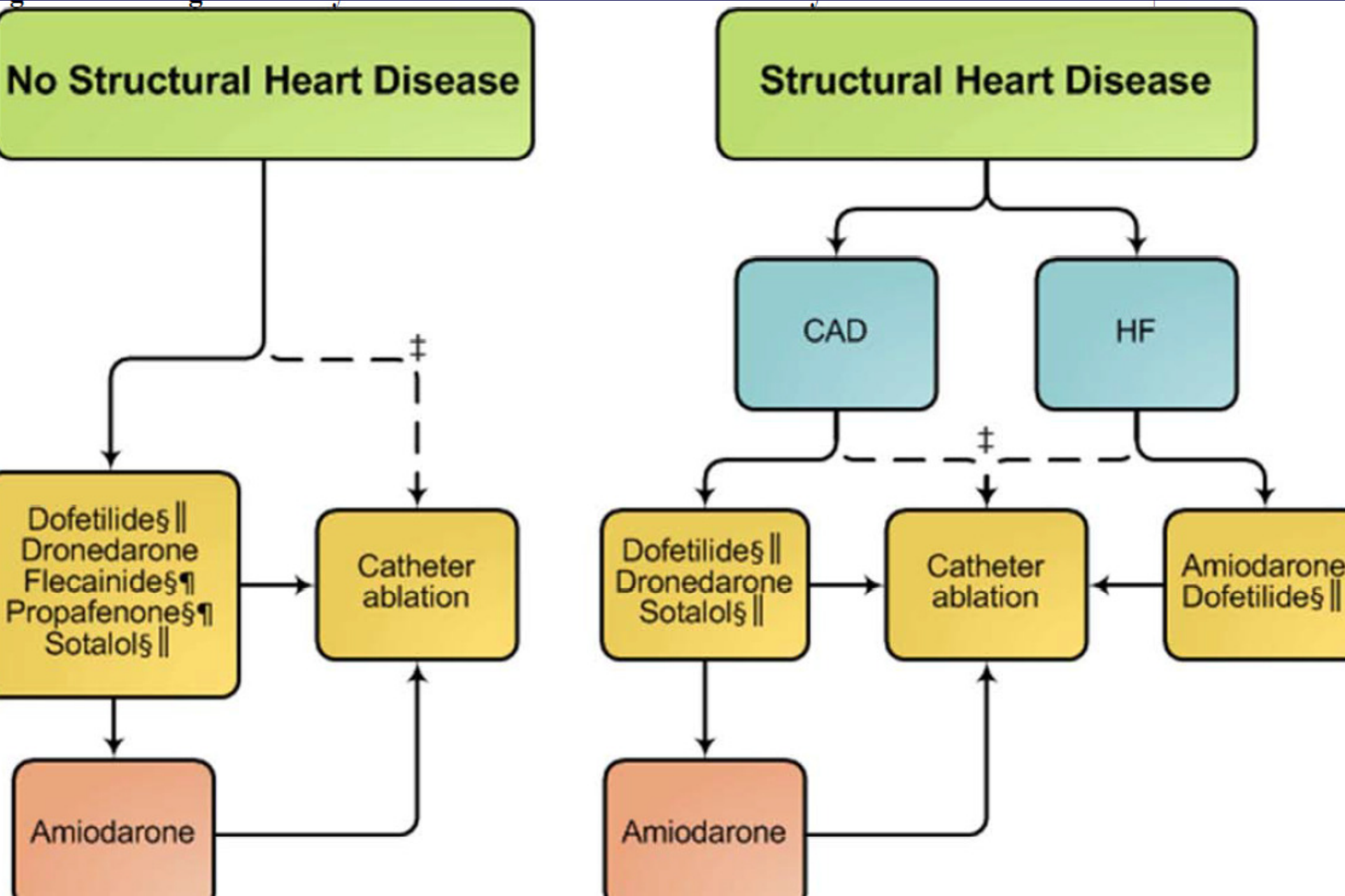
Maintaining NSR ≥6 Months



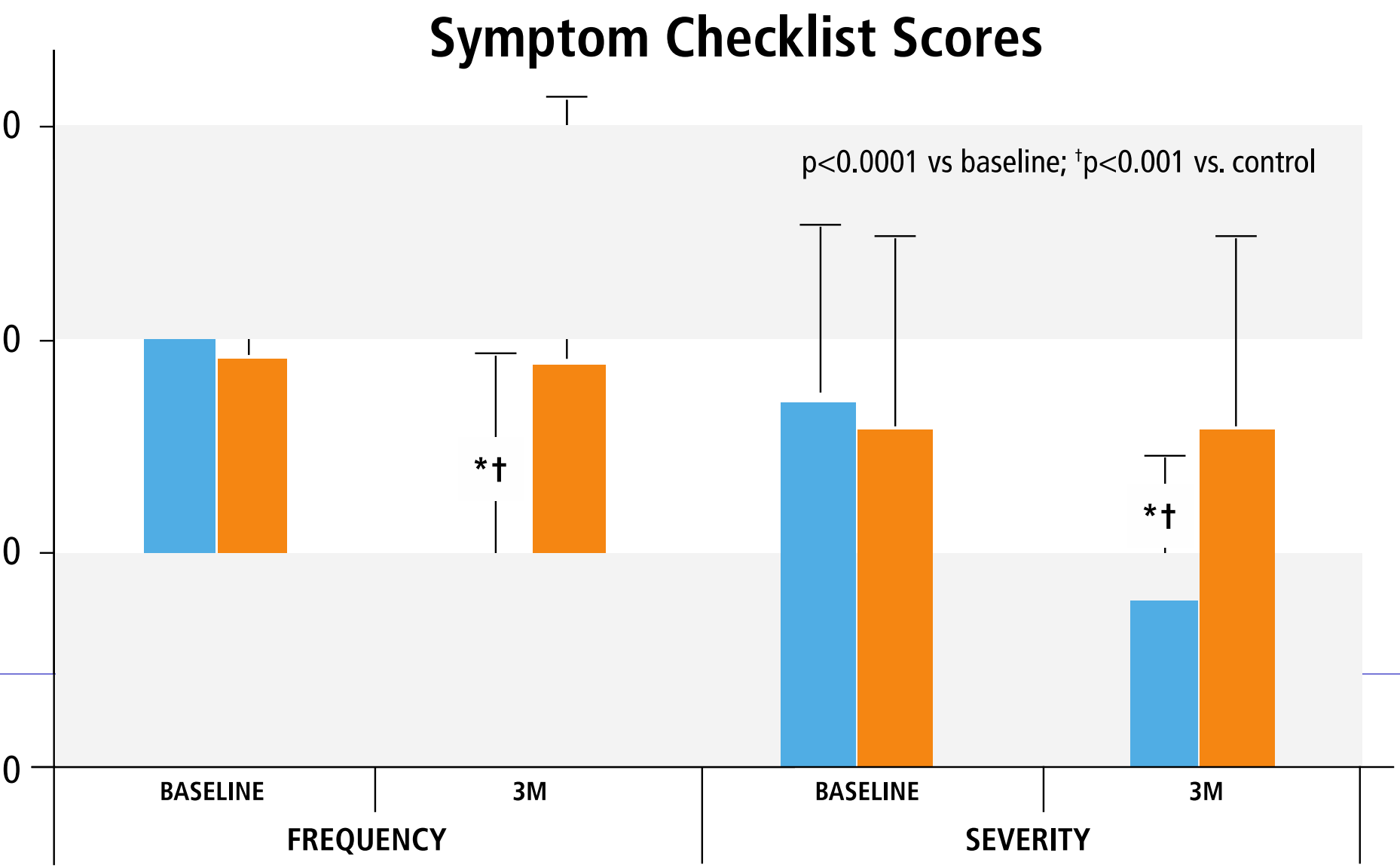


"What medicines do not heal…fire will."

anagement of Patients with Atrial Fibrillatio

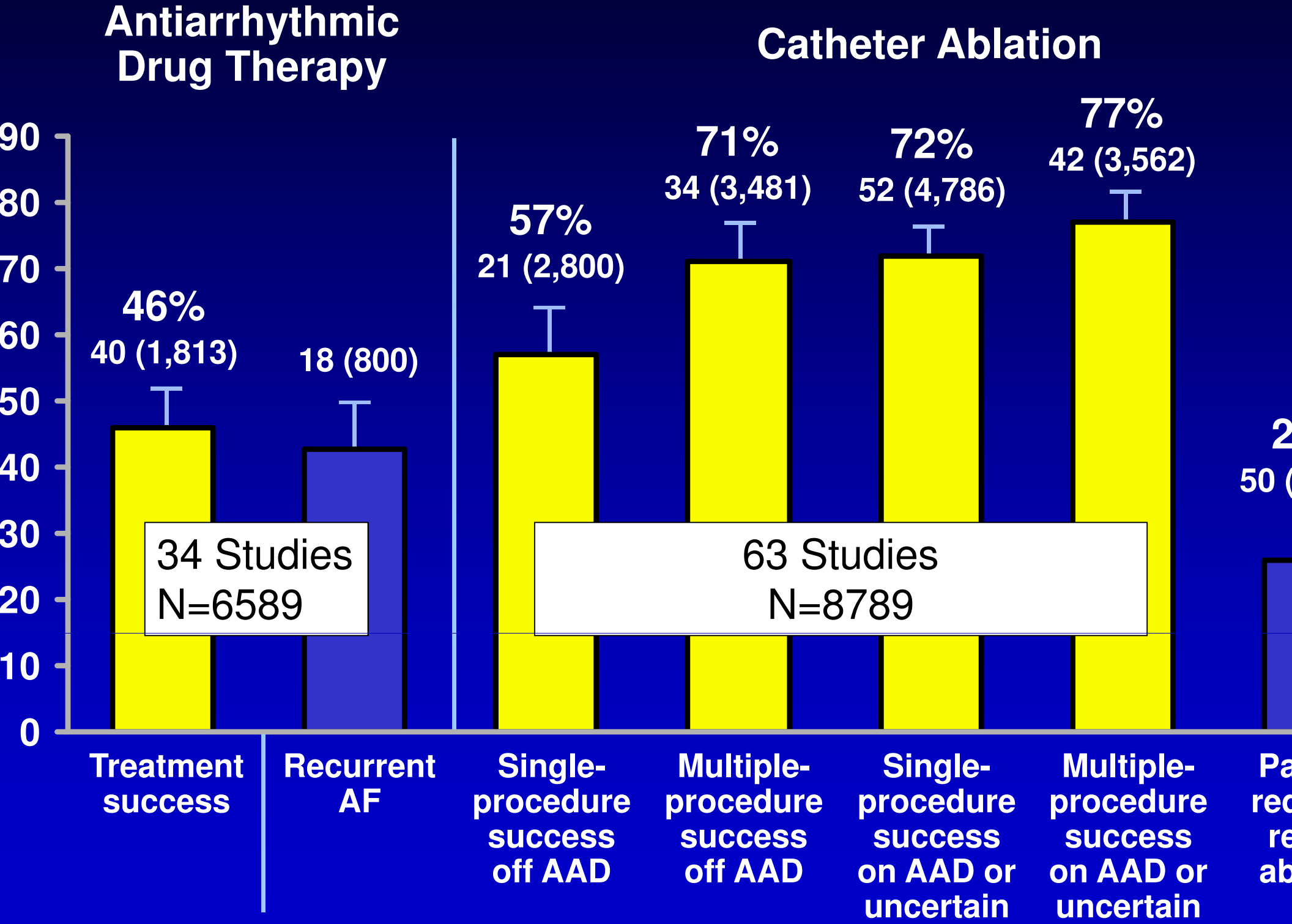


bration Improves Quality of Li

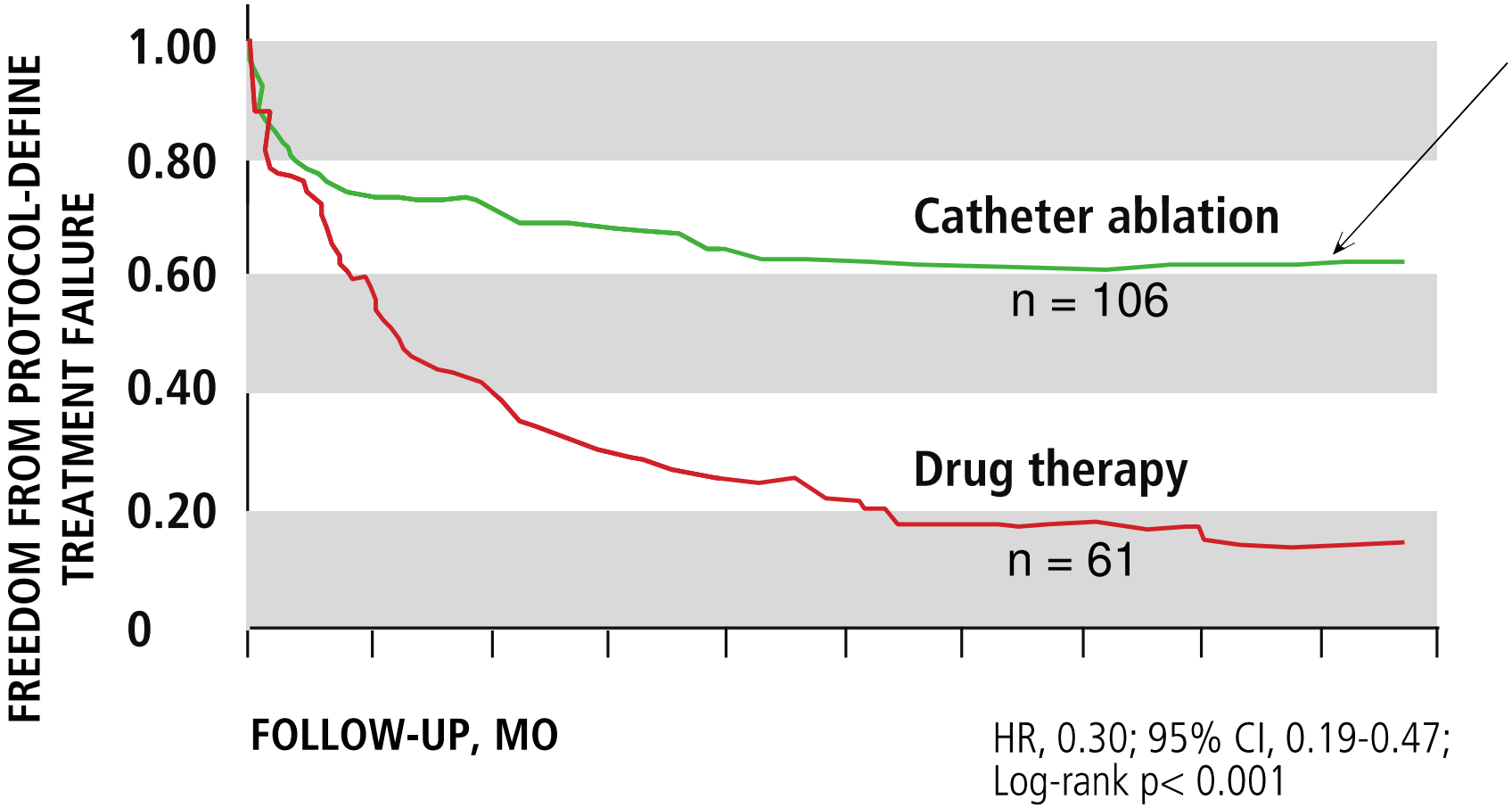


AF symptom frequency and severity scores at baseline and 3 months are shown for both study groups.

Ablation in Patients with Atrial Fibrillation



Catheter Ablation vs AAD

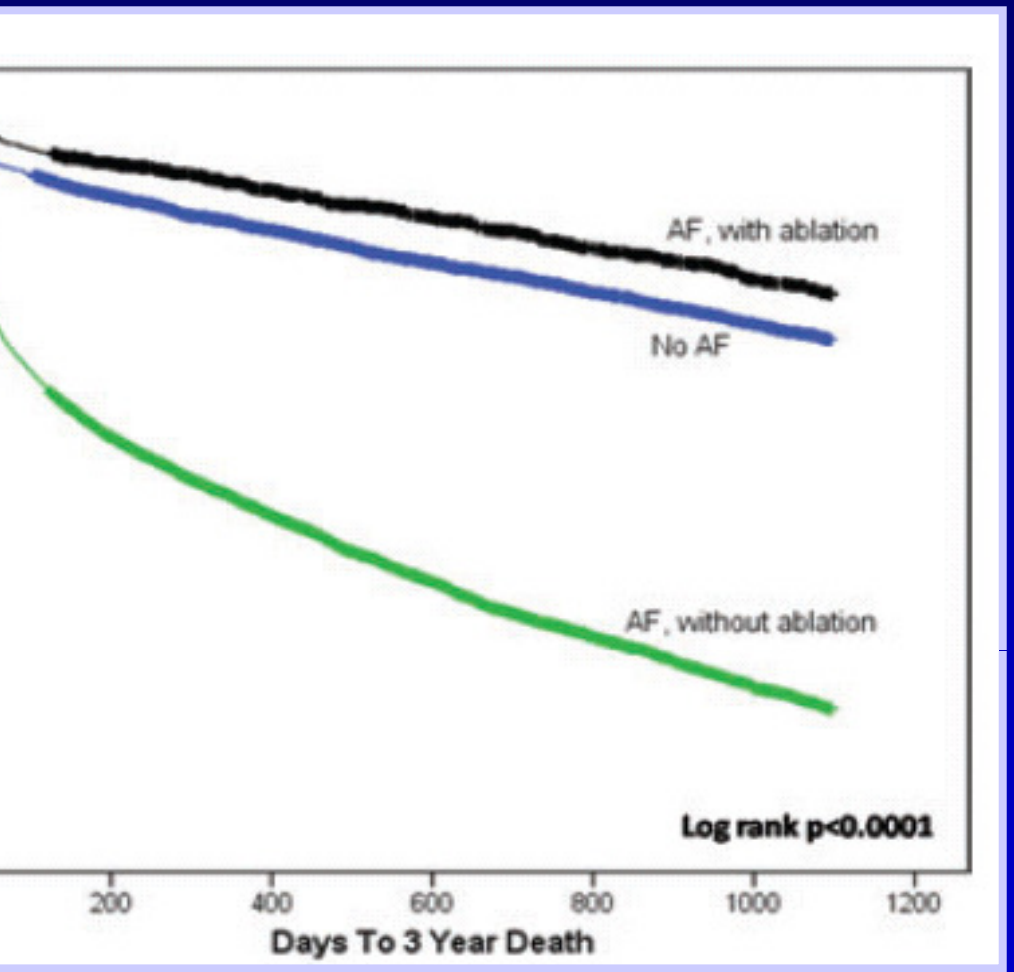


Patients who had catheter ablation had fewer episodes of Afib than patients who took medication

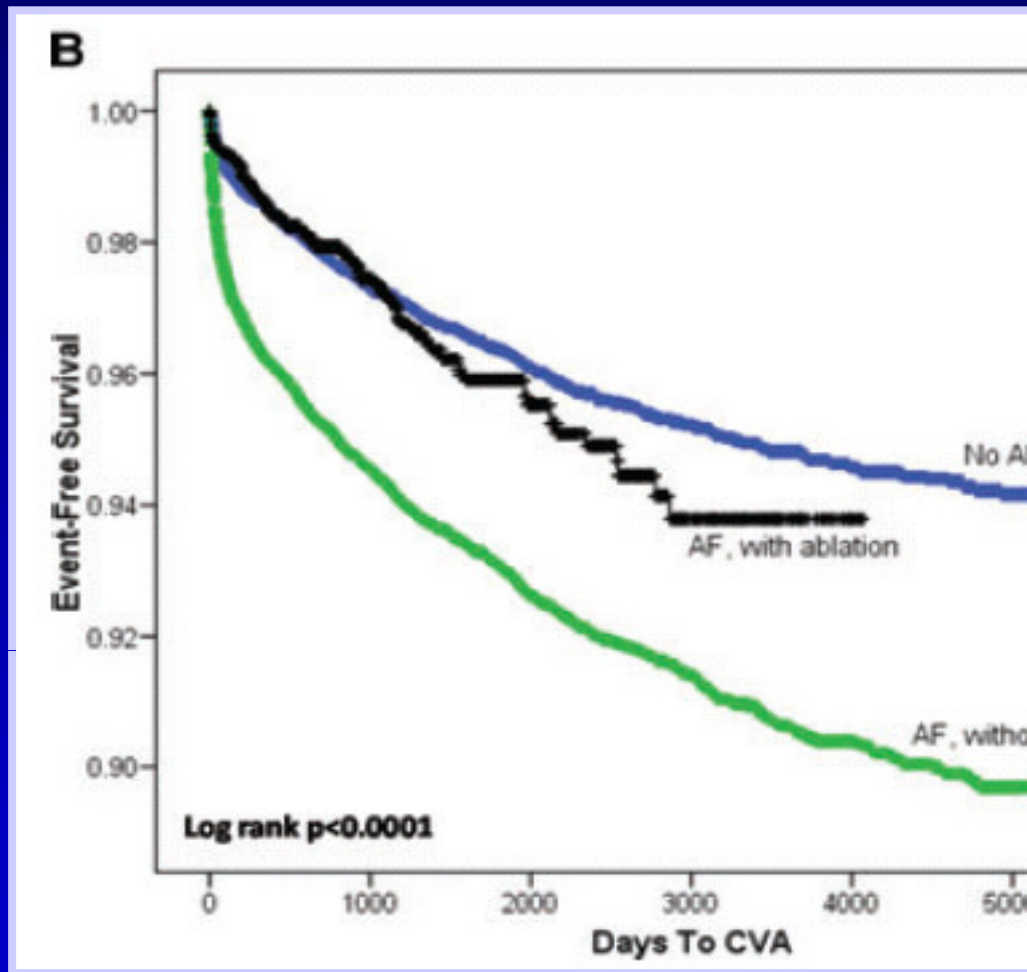
to Patients Without Atrial Fibrillation

T. JARED BUNCH, M.D.,*,† BRIAN G. CRANDALL, M.D.,*,† J. PETER WEISS,*,†
HEIDI T. MAY, PH.D., M.S.P.H.,† TAMI L. BAIR,† JEFFREY S. OSBORN, M.D.,*,†
JEFFREY L. ANDERSON, M.D.,† JOSEPH B. MUHLESTEIN, M.D.,†
AMIN D. HORNE, PH.D., M.P.H.,† DONALD L. LAPPE, M.D.,† and JOHN D. DAY, M

Death



Stroke



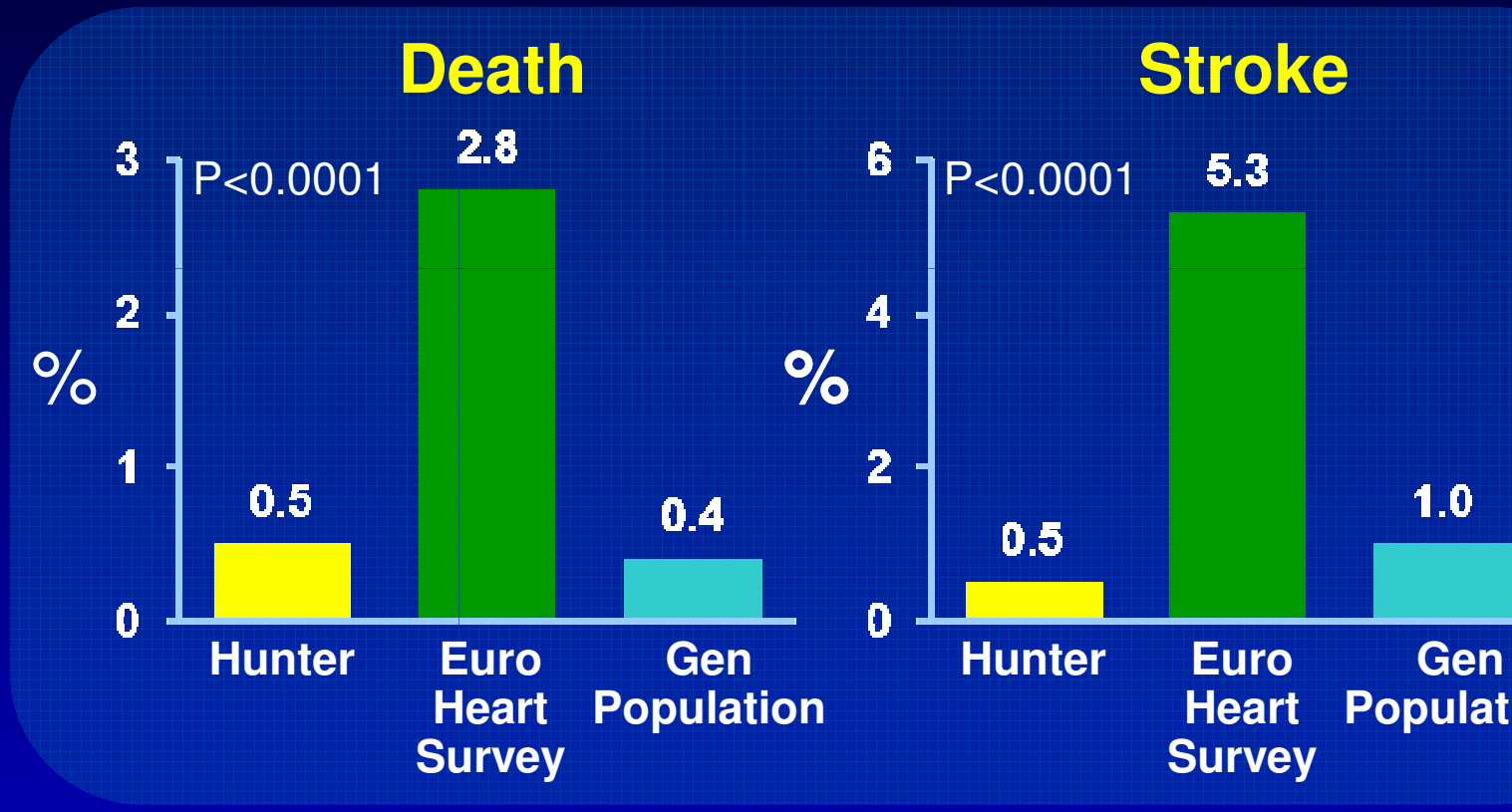
000 AF ablation pts were compared to almost 17,000 matched controls

Death and Stroke After PV Ablation

Outcome in a Large Ablation Center

Population

tients	1,273
e	58±11
F	56%
ADS_2	1.8±0.9

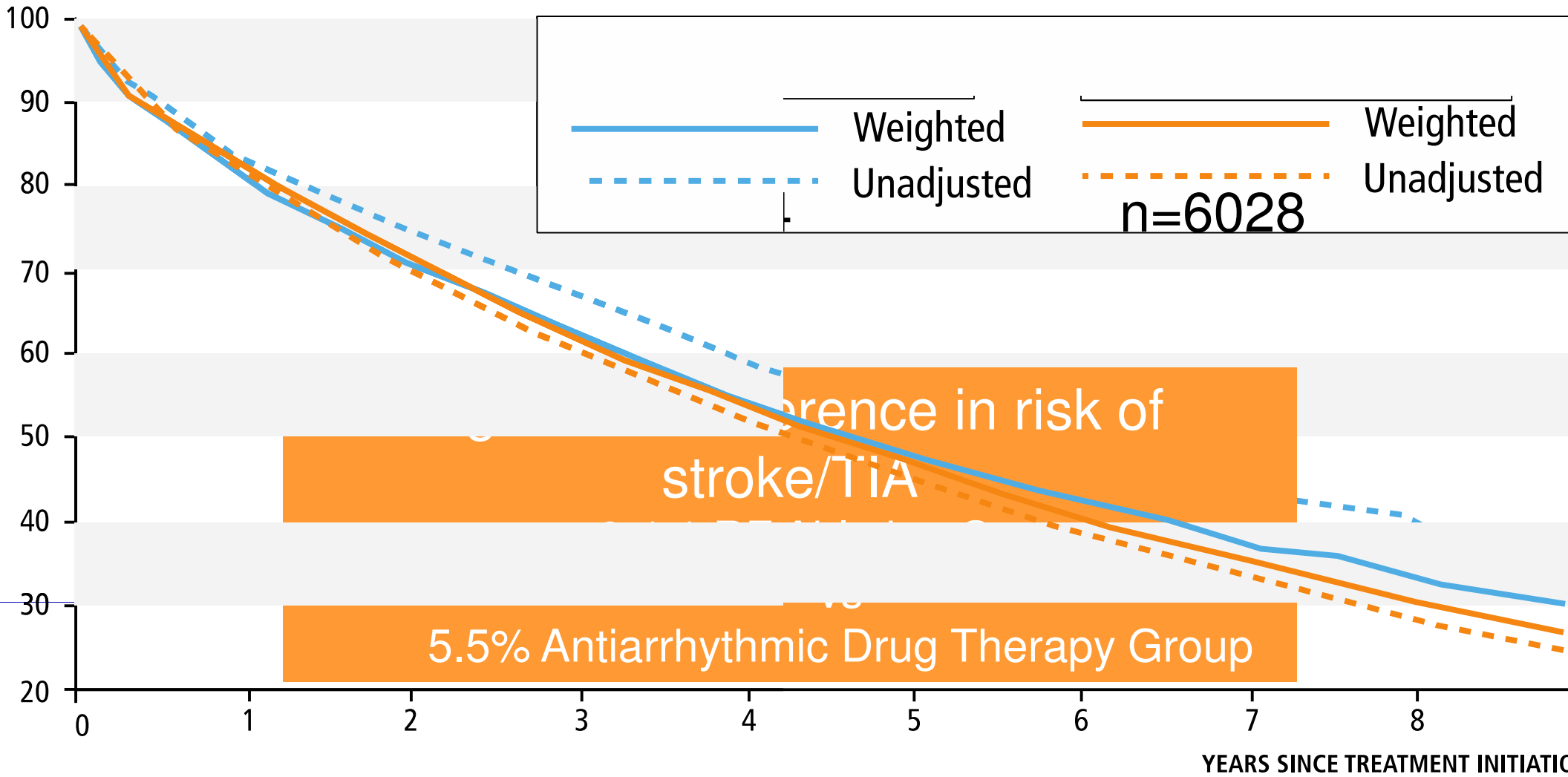


Outcome

	PAF	PER AF
Freedom from AF off AARx	85%	72%

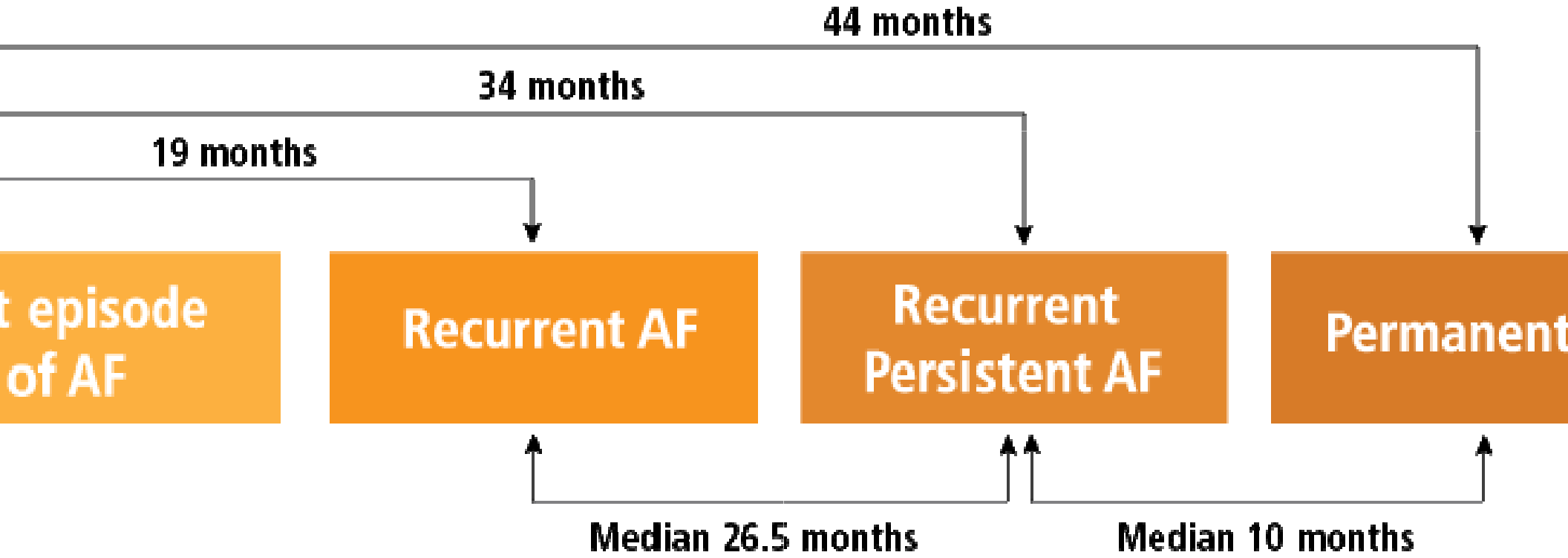
	HR	CI	P
Freedom from AF CVA Free	0.3	0.16-0.55	<0.001

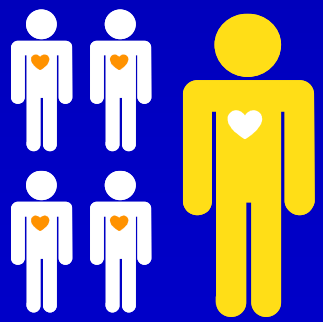
Ablation vs AAD



Weighted survival of patients with atrial fibrillation (AF) on rhythm vs rate control treatment. The weighted survival curves were weighted by inverse probabilities of treatment that are equivalent to the standardization of the survivial curves to the whole study population.[20] The deaths in the footnote are counted in the preceding 1-year interval. The number of patients at risk in the footnote are counted at he end of each 1-year interval.

AF is a Progressive Disease

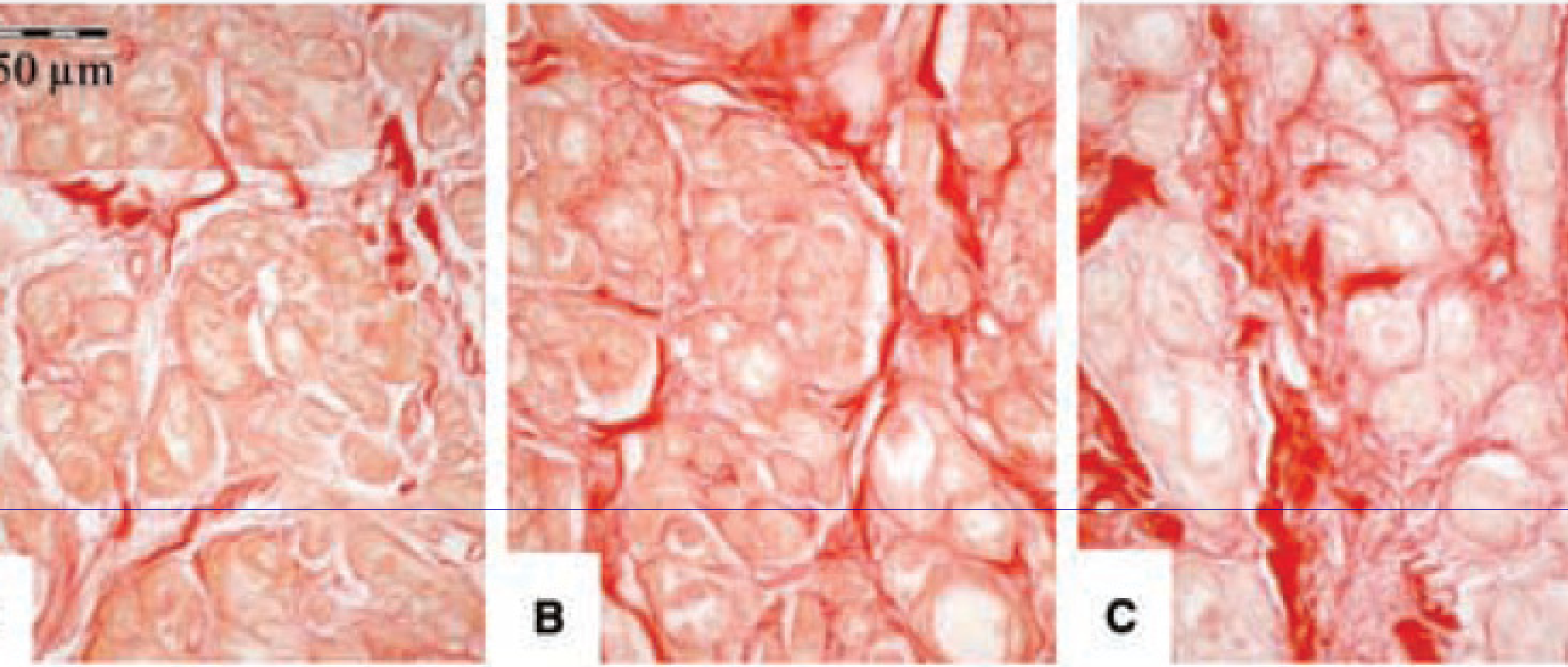




20% of patients progress from Paroxysmal to Persistent AF within 1 year of diagnosis

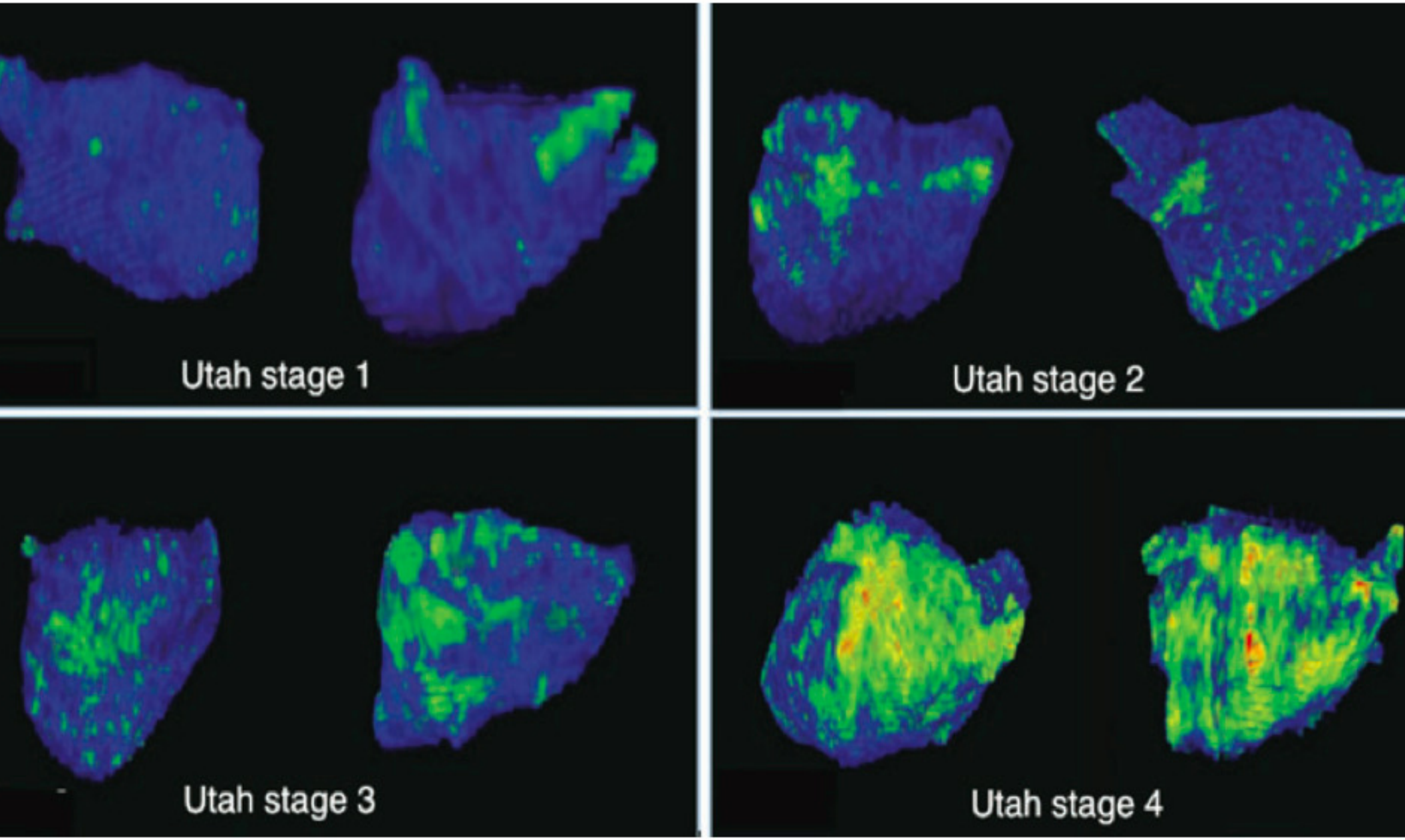
Atrial Remodeling

Sinus Rhythm | **Paroxysmal or Persistent AF** | **Permanent AF**

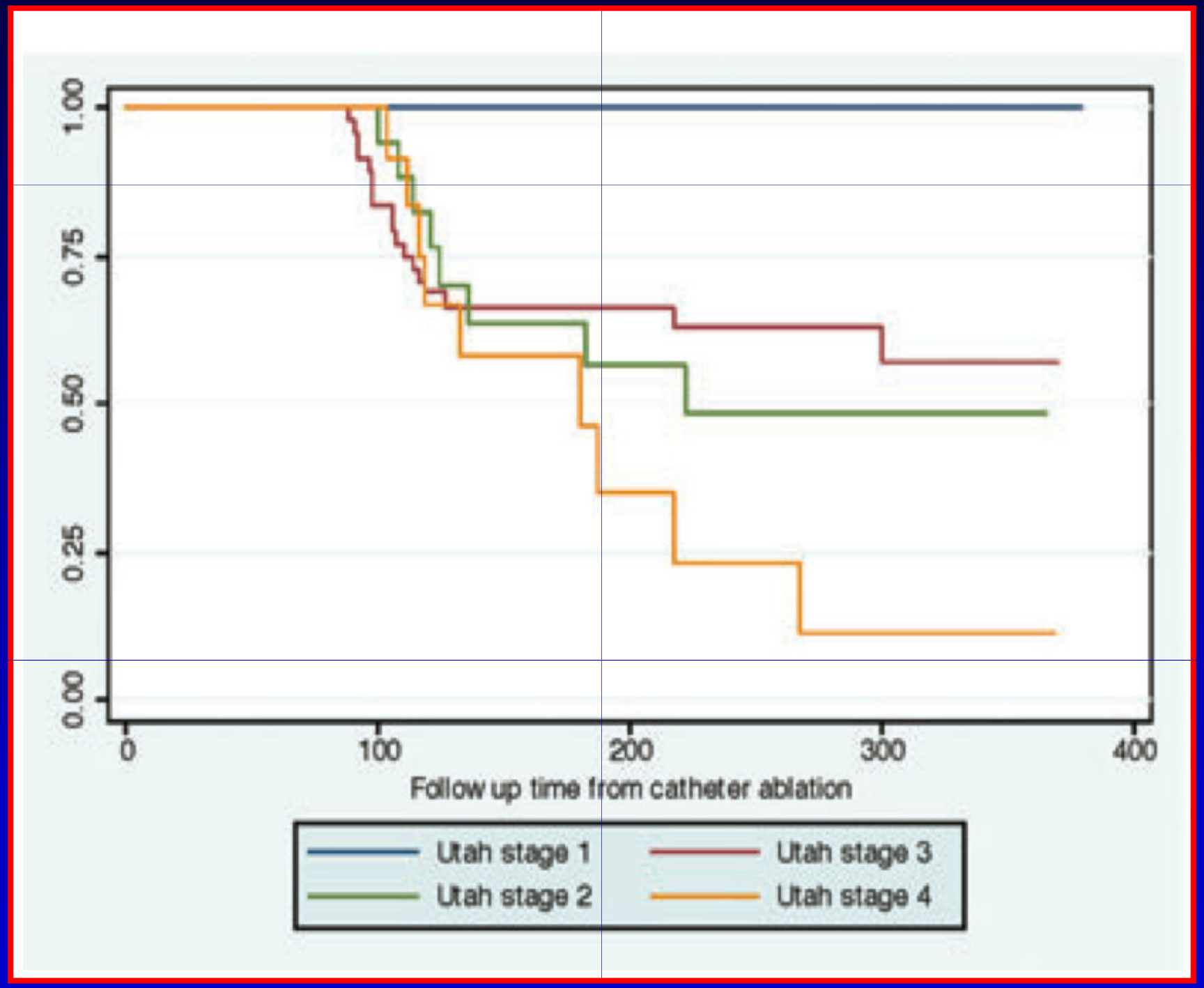


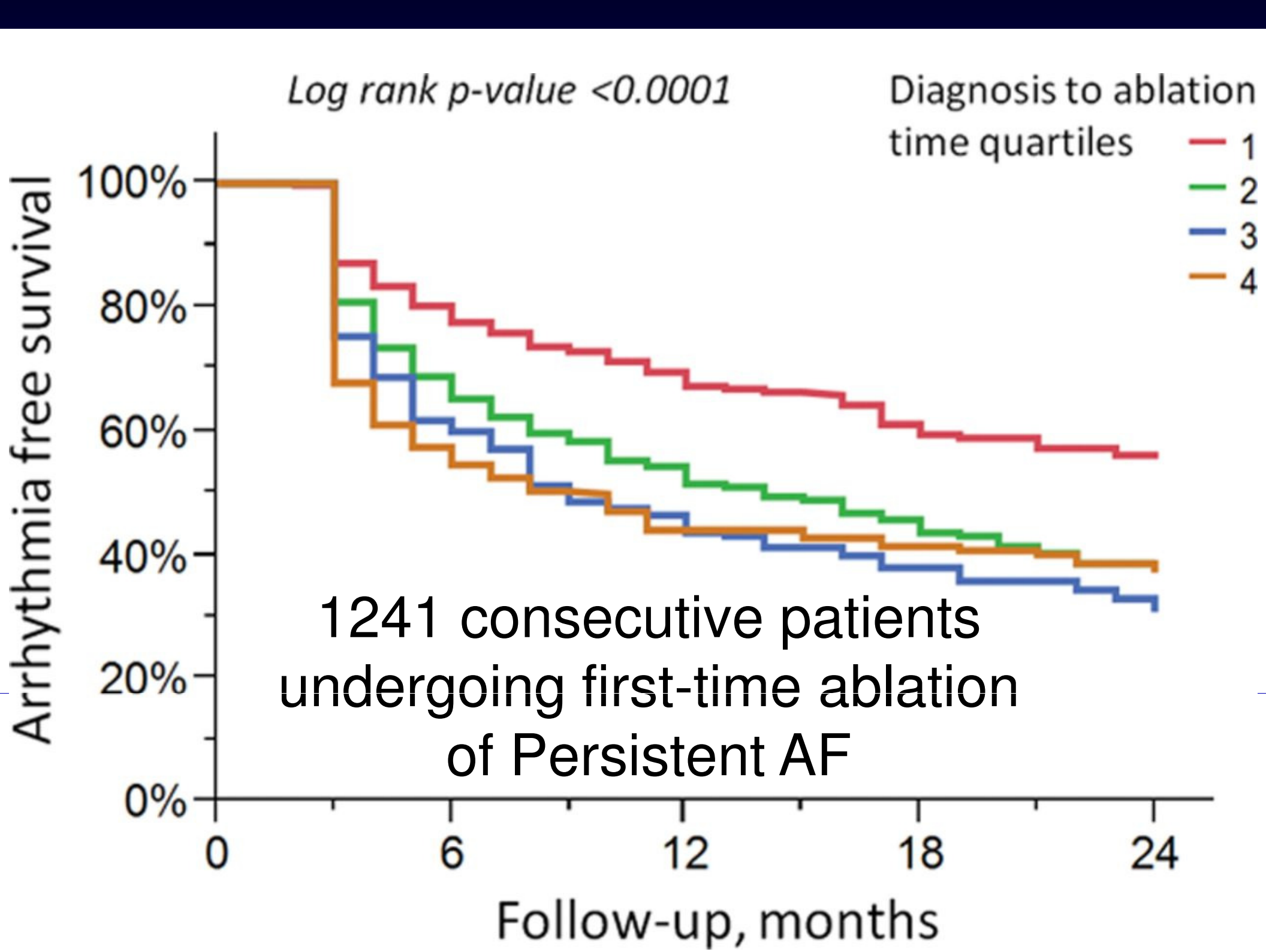
5% Fibrosis | **14% Fibrosis** | **35% Fibrosis**

LA Fibrosis by MRI



Fibrosis predicts AF recurrence




Log rank p-value <0.0001
Diagnosis to ablation time quartiles
1
2
3
4
Arrhythmia free survival
100%
80%
60%
40%
20%
0%
0
6
12
18
24
Follow-up, months
1241 consecutive patients undergoing first-time ablation of Persistent AF

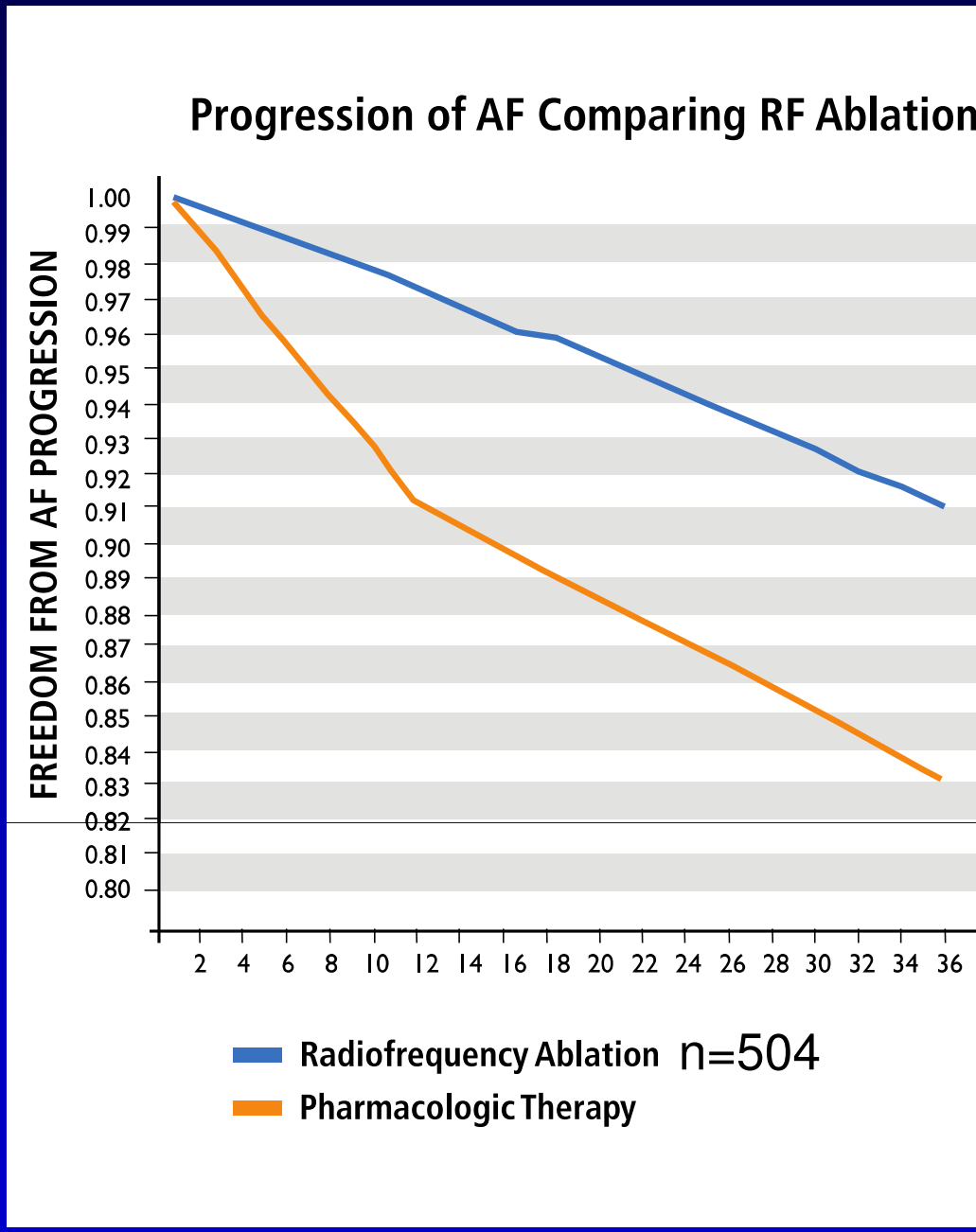
with Catheter Ablation

n patients were less likely to show
ssion than AAD patients

- ablation group showed AF
gression
- AAD group showed AF
gression

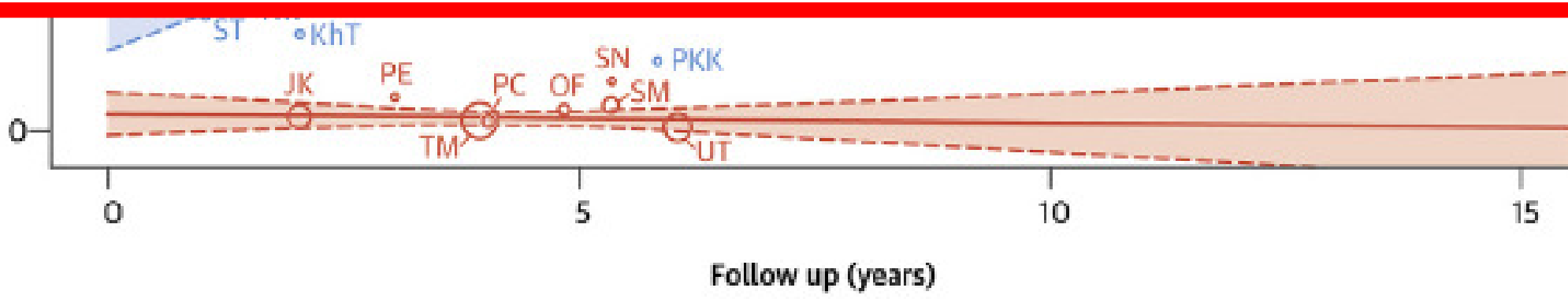
patients with AF progression:

- had developed permanent AF
- had developed persistent AF



Progression of AF

"AF ablation is associated with significantly reduce
rogression to persistent forms compared with stud
n the general population. Prevention of long-term A
rogression may be a clinically relevant outcome af
F ablation. Further research is required to determi
whether delaying progression of AF by catheter
ablation reduces morbidity and mortality."



high-burden atrial fibrillation: Implications for early ablative intervention

Tomos E. Walters, PhD,[*†] Ashley Nisbet, PhD,[*] Gwilym M. Morris, PhD,[*] Gabriel Tan, MD,[*†] Megan Mearns,[*] Eliza Teo, MBBS,[*] Nigel Lewis, MBChB,[*] AiVee Ng, MBBS,[*] Paul Gould, PhD,[‡§] Geoffrey Lee, PhD,[*†] Stephen Joseph, PhD,[*] Joseph B. Morton, PhD,[*†] Dominica Zentner, PhD,[*] Prashanthan Sanders, PhD,[‖¶] Peter M. Kistler, PhD,[†**] Jonathan M. Kalman, PhD[*†]

OUND Advanced atrial remodeling predicts poor clinical s in human atrial fibrillation (AF).

VE The purpose of this study was to define the magnitude ictors of change in left atrial (LA) structural remodeling months of AF.

S Thirty-eight patients with paroxysmal AF managed y (group 1), 20 undergoing AF ablation (group 2), and ol patients with no AF history (group 3) prospectively nt echocardiographic assessment of strain variables of LA function at baseline and at 4, 8, and 12 months. In P-wave duration (P_{max}, P_{mean}) and dispersion (P_{dis}) were d. AF burden was quantified by implanted recorders. Twenty undergoing ablation underwent electroanatomic mapping 33 ± 40 points) for correlation with LA strain.

Group 1 demonstrated significant deterioration in total (26.3% ± 1.2% to 21.7% ± 1.2%, $P < .05$) and increases 132 ± 3 ms to 138 ± 3 ms, $P < .05$) and P_{dis} (37 ± 2 ms to s, $P < .05$). AF burden ≥10% was specifically associated with n strain and with P-wave prolongation. Conversely, group 2 manifest improvement in total LA strain (21.3% ± 1.7% ± 1.7%, $P < .05$) and reductions in P_{max} (136 ± 4 ms to 1 $P < .05$) and P_{dis} (47 ± 3 ms to 32 ± 3 ms, $P < .05$). Chan significant in group 3. LA mean voltage ($r = 0.71$, $P = .000$ low voltage electrograms ($r = -0.59$, $P = .006$), percen electrograms ($r = -0.68$, $P = .0009$), and LA activation time $P = .001$) correlated with total strain as a measure of L function.

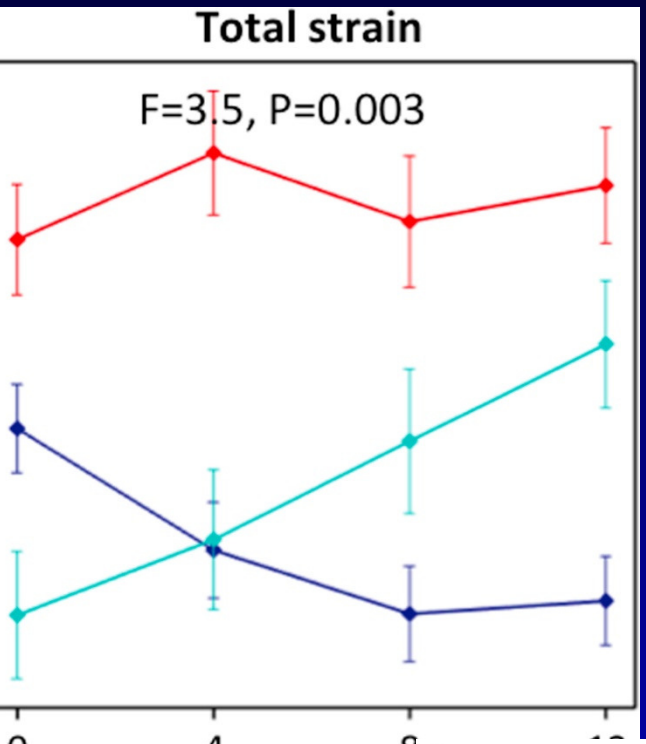
CONCLUSION High-burden AF is associated with prog structural remodeling. In contrast, AF ablation results in reverse remodeling. These data may have implications fo ablative intervention.

KEYWORDS Atrial fibrillation; Atrial remodeling; Strain i

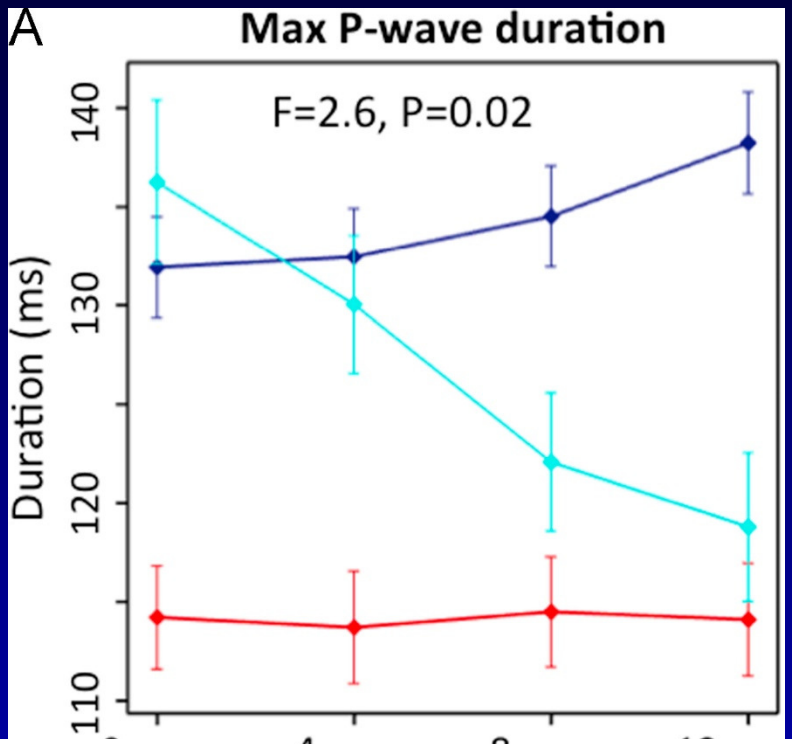
ABBREVIATIONS **2D-STE** = 2-dimensional speckle trac cardiogram; **AF** = atrial fibrillation; **ECG** = electrocardiog left atrium; **LV** = left ventricle; **OSA** = obstructive slee

(Heart Rhythm 2016;13:331–339)

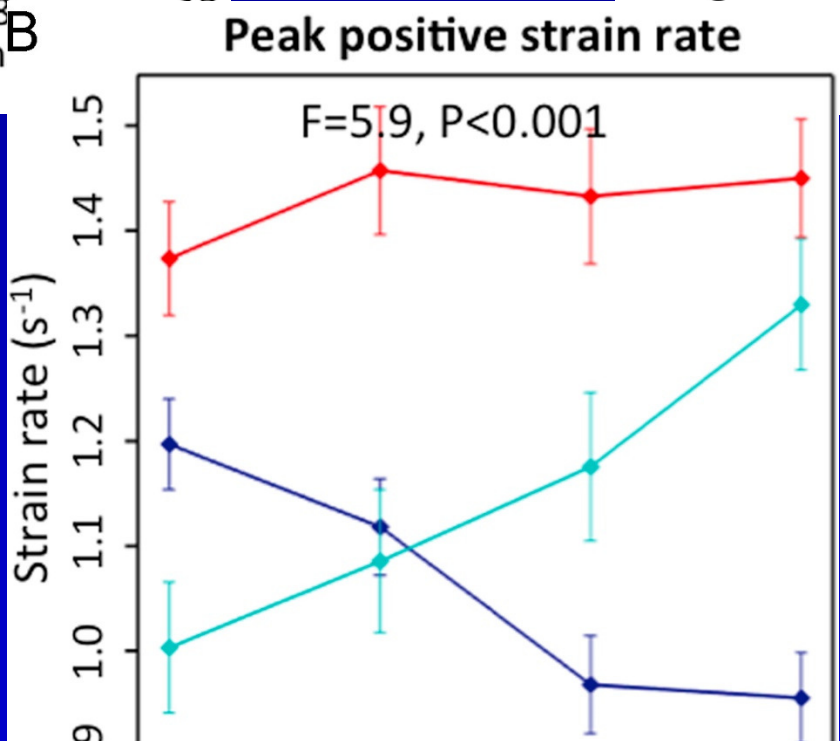
early ablative intervention



A



B



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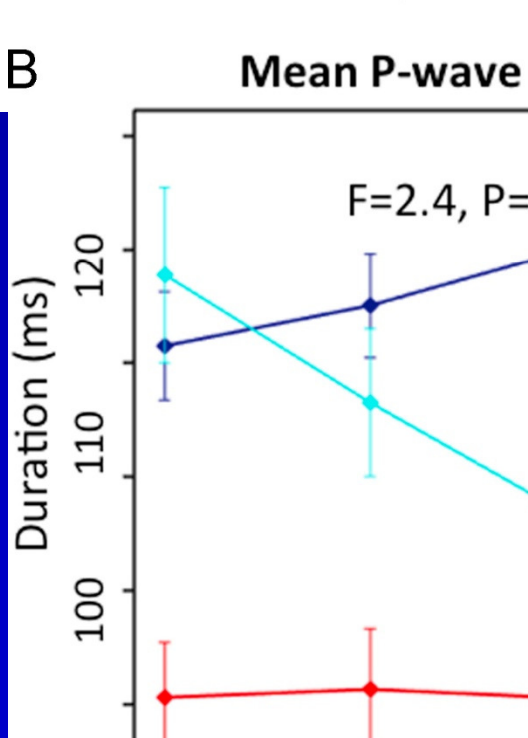


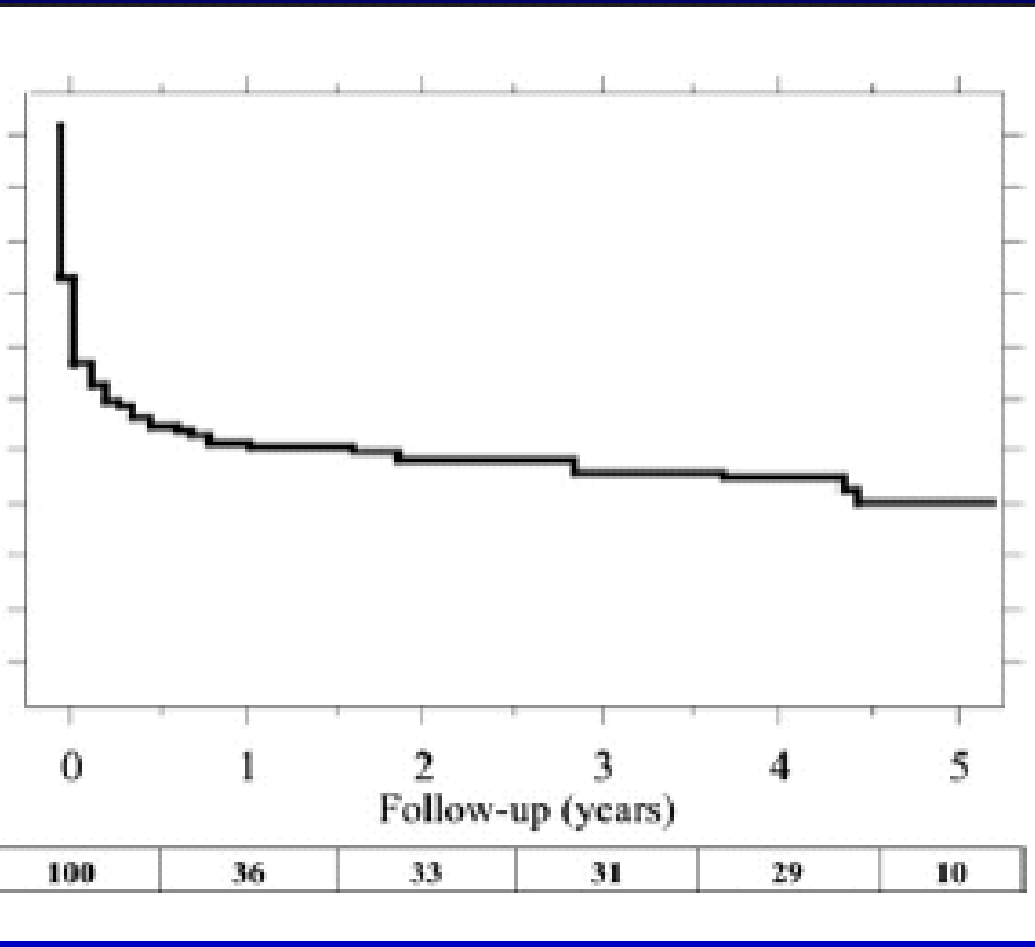
AF ablation
AF medical Mx

ne Second International AF Ablation Regist

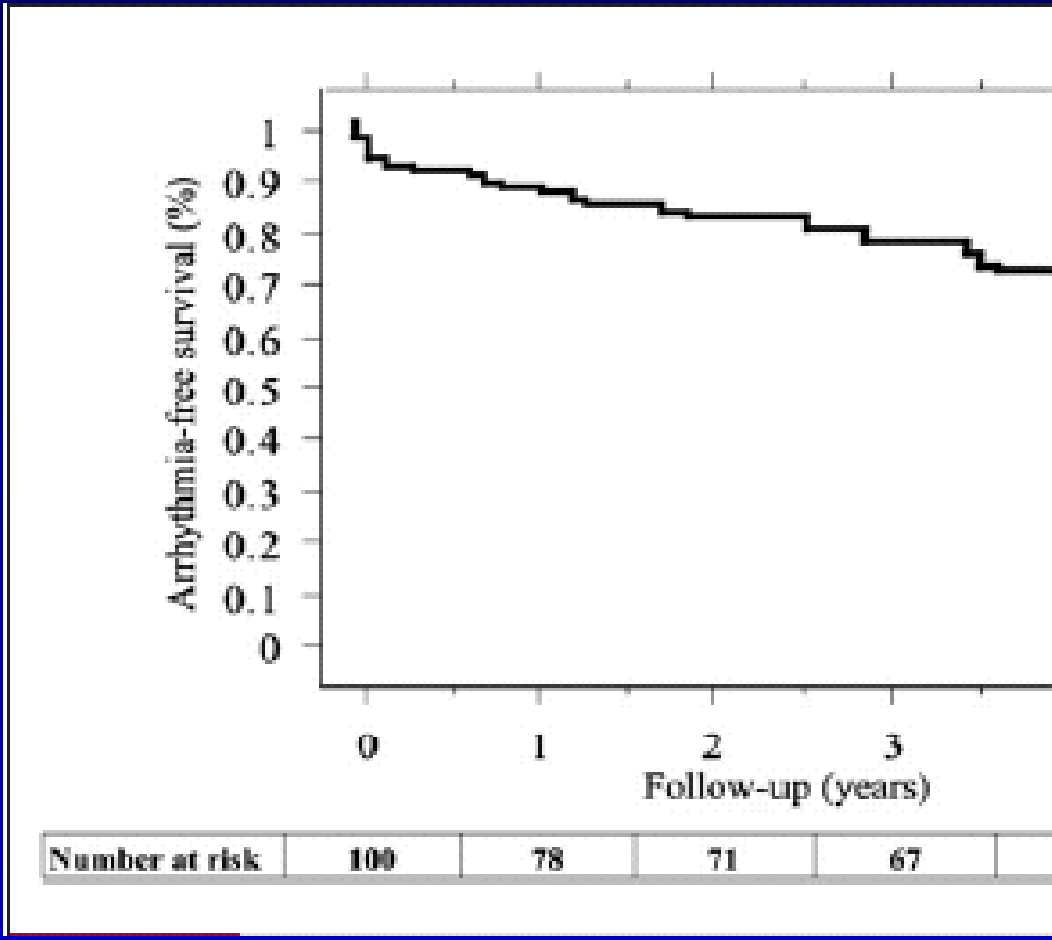
of complication	Pt (no.)	Rate (%)
h	25	0.15
onade	213	1.31
mo/hemothorax	19	0.11
is, abscesses or endocarditis	2	0.01
anent diaphragmatic paralysis	28	0.17
oral pseudoaneurysm/A-V fistula	152/88	0.93/0.54
e damage/requiring surgery	11/7	0.07
m-esophageal fistula	3	0.02
ke/TIA	37/115	0.23/0.71
onary vein stenoses requiring intervention	48	0.29
	741	4.54

any Patients Require Multiple Procedu

Single Procedure



Multiple Procedure



Catheter ABlation vs ANtiarrhythmic Drug Therapy in Atrial Fibrillation (CABANA) Trial

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CABANA Trial

Primary Objective and Hypothesis

tment strategy of percutaneous left atrial cathe
tion for purpose of eliminating AFib is superior t
ent state-of-the-art medical therapy with either r
rol or rhythm control drugs for reducing total
tality (primary endpoint) and decreasing compo
point of total mortality, disabling stroke, serious
ding or cardiac arrest (key secondary endpoint)
ents with untreated or incompletely treated AF
anting therapy

Atrial fibrillation
ible for ablation and/or drug therapy

≥65 years of age or
<65 years with ≥1 CVA risk factor

- Hypertension
- Diabetes
- CHF (including systolic or diastolic failure)
- Prior stroke or TIA
- LA size >5.0 cm (or volume index ≥ cc/m2)
- EF ≤35

R

g Rx & AC

te control

ythm Rx

1° ablation & AC

- PV isolation
- Adjunctive

Descriptive analysis

- NSR vs AF impact
- With or w/o heart disea
- AF type (paroxysmal; persistent; long-standi persistent)
- CT/MR image analysis
- ECG/EGM analysis

Follow-up
36 months

Case

- yo man with h/o typical atrial flutter –s/p RFA 200
  oxysmal AF
- Previous rx w/ propafenone, now on amio 100 mg
  y and beta-blocker
- CHA_2DS_2-VASc = 0 (never on anticoagulation)
- No palpitations, mild fatigue. Very active with Tae
  Bo kickboxing.
- Paroxysmal AF on recent holter.
- Echo: normal LVEF, normal LA size.
- Presenting rhythm: AF with CVR (HR 75). Pt
  eeling fine in office

you recommend?

. Increase amiodarone to 200 mg daily.
. Discontinue amiodarone and pursue rate-control strategy.
. Change amiodarone to sotalol or tikosyn.
. Recommend catheter ablation.
. Continue present care and follow.
. Screen for enrollment in CABANA.

Patient Selection for AF Ablation

Variable	More Optimal Patient	Less Optimal Patien
ptoms	Highly symptomatic	Minimally symptomat
ed antiarrhythmics	≥ 1	0
ype	Paroxysmal	Longstanding persiste
	Younger (<70)	Older (>70)
size	Smaller (<5 cm)	Larger (>5cm)
tion fraction	Normal	Reduced
gestive heart failure	No	Yes
er cardiac disease	No	Yes
nonary disease	No	Yes
p apnea	No	Yes
sity	No	Yes
r stroke/TIA	No	Yes

you recommend?

. Increase amiodarone to 200 mg daily.
. Discontinue amiodarone and pursue rate-control strategy.
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Conclusions

AF adversely impacts mortality, stroke, heart failure, dementia, and QOL.

While rate control is important, a rhythm control strategy should be considered early in the course of treatment since AF is a progressive disease.

Catheter ablation is useful in addressing sx from AF and appears to improve outcomes.

CABANA will answer many questions about AF ablation, including whether catheter ablation reduces mortality as compared to medical therapy

Long Live Silas Rhythm!