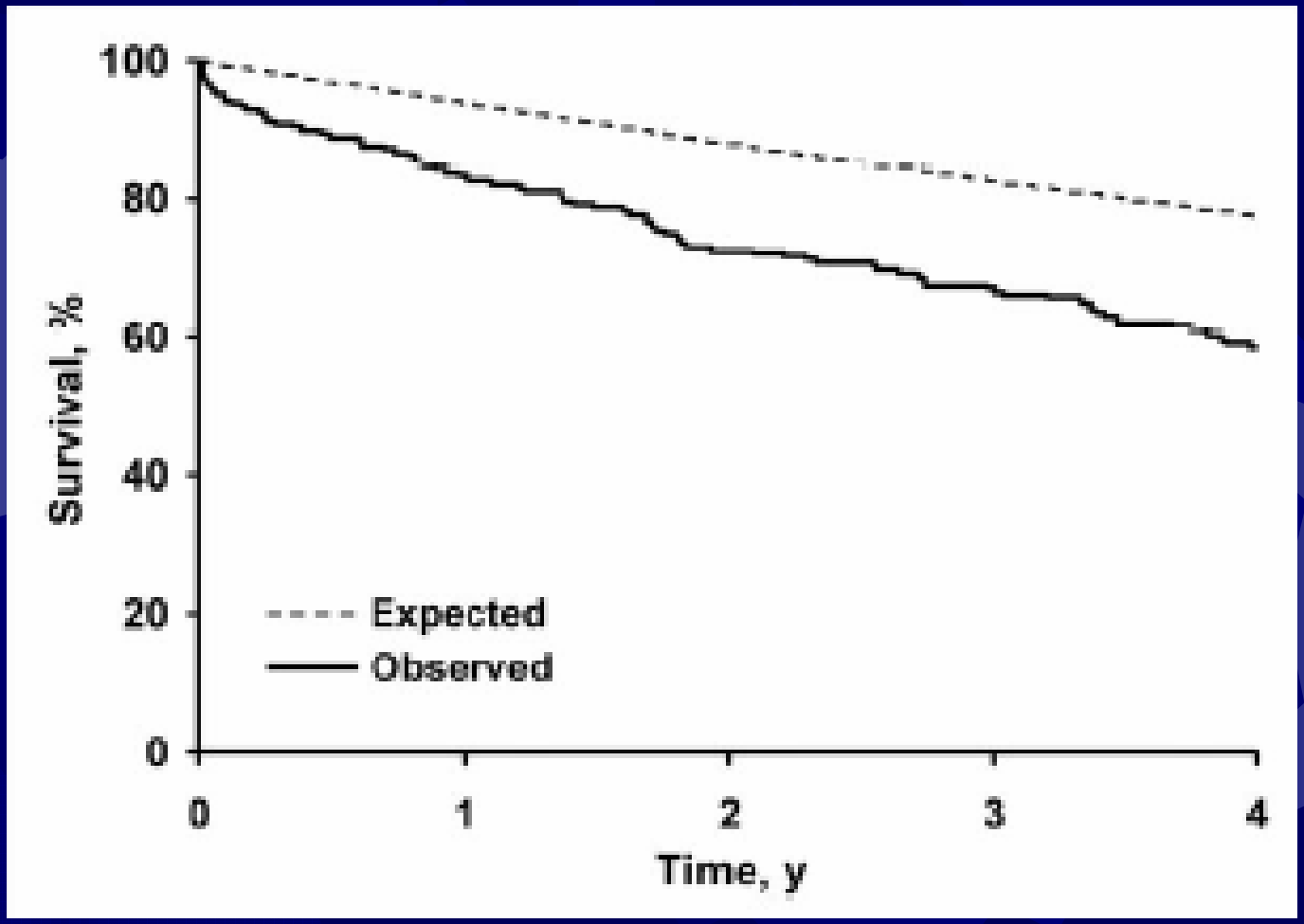
First-line therapy of Paroxysmal Atrial Fibrillation

- Catheter Ablation or Drug Therapy -

- PROS -

가톨릭 의과대학
성모병원
오 용 석

Observed versus expected survival in patients from date of onset of AF to death or last follow-up.



- Am J Cardiol 2005;96:1420 –1424 -

Progression of AF

Sinus rhythm

↓

PAC

↓

Paroxysmal AF

⇢ ↓

Atrial Remodeling

↓

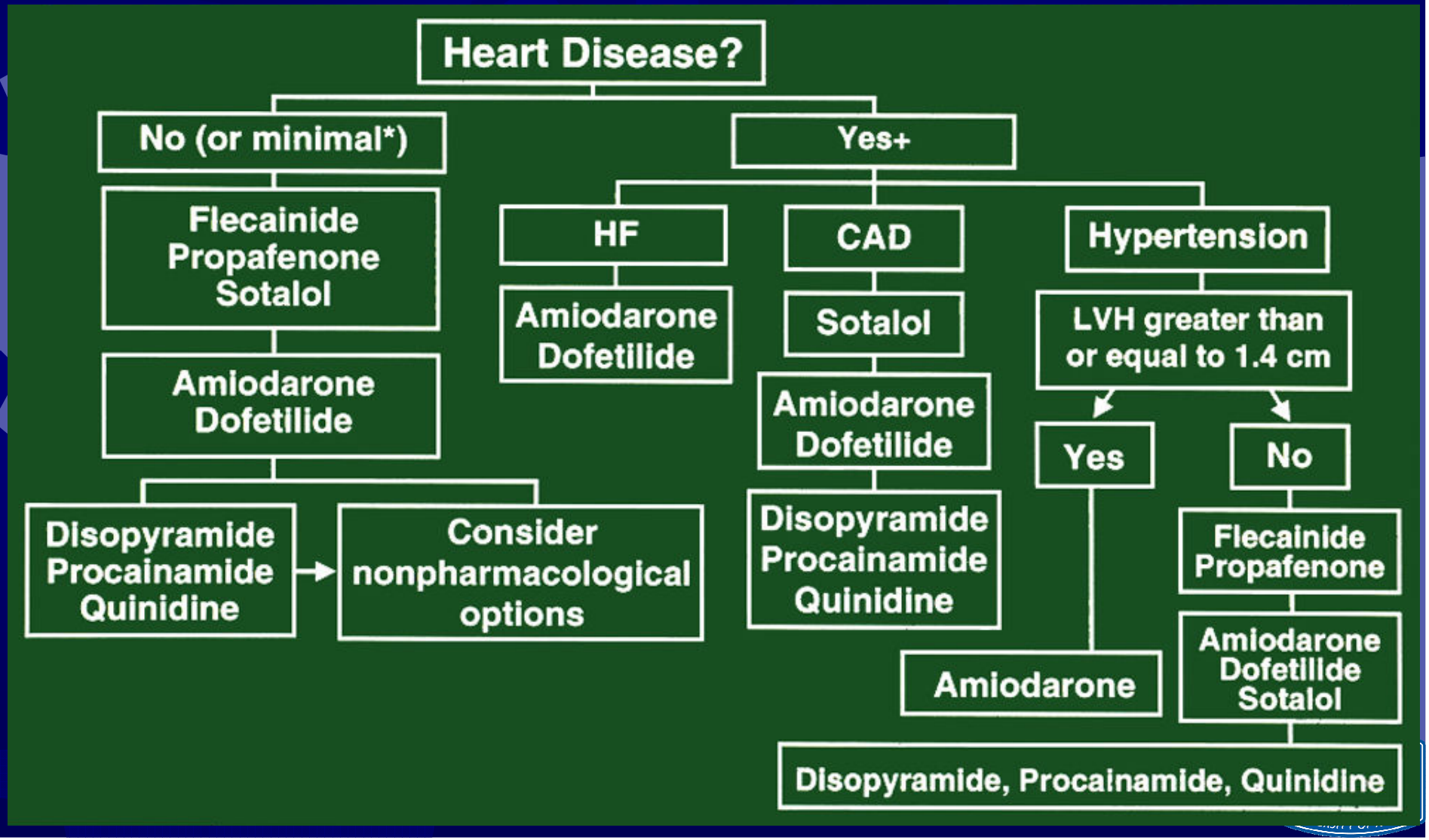
Chronic Persistent AF

⇢ ↓

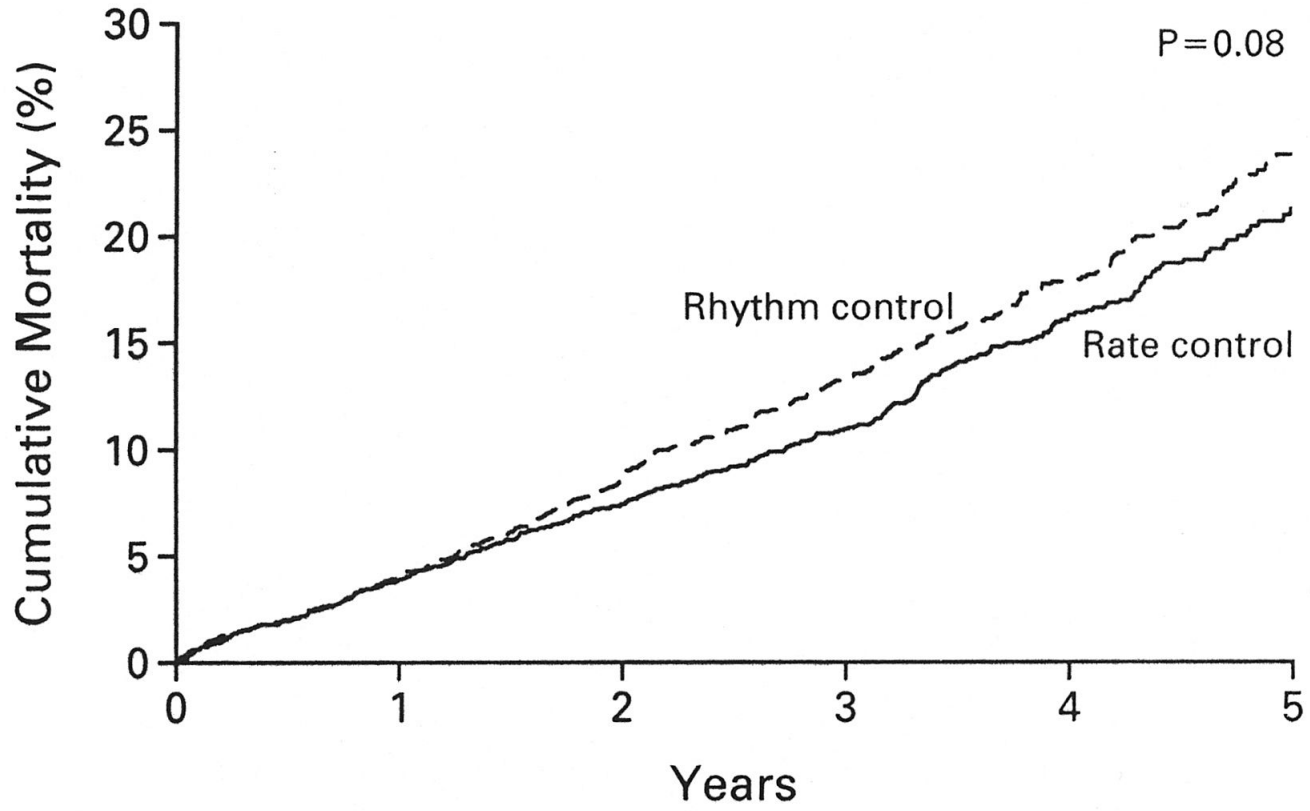
Chronic Permanent AF

Antiarrhythmic Drug Therapy to maintain Sinus Rhythm in Patients with Recurrent Paroxysmal or Persistent AF

ACC/AHA/ESC Guidelines, 2001



Rate Versus Rhythm Control in Patients with A. Fib (AFFIRM)



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)

From: AFFIRM investigators NEJM 2002; 347:1825

Rhythm versus Rate Control Trials in Patients with Atrial Fibrillation: General Characteristics

	N	Mean Age (yr)	Follow Up (yr)	Inclusion Criteria	Primary Endpoint	Rate Control Pts (%) (primary endpoint)	Rhythm Control Pts (%) (primary endpoint)	P value
AFFIRM (42)	4060	69.7	3.5	PAF or Persistent AF; ≥65 y/o or risk for stroke or death	Overall mortality	310/2027 (25.9)	356/2033 (26.7)	0.08
RACE (41)	522	68	2.3	Persistent AF or Flutter < 1 yr duration and 1 or 2 CV over 2 yr and oral anticoagulation	Composite: Cardiovascular death; CHF; Severe bleeding; PM implantation; Thromboembolic events; Severe adverse effects of AAD	44/256 (17.2)	60/266 (22.6)	0.11
PIAF (40)	252	61	1.0	Persistent AF (7-360 days)	Symptom improvement	76/125 (60.8)	70/127 (55.1)	0.317
STAF (39)	200	66	1.6	Persistent AF (> 4 weeks and < 2 yrs); LA size > 45mm; CHF NYHA II to IV; LVEF < 45%	Composite: Overall mortality; Cerebrovascular complications; CPR; Embolic events	10/100 (10%)	9/100 (9%)	0.99
PAF2 (38)	137	68	1.3	Symptomatic PAF (> 1 yr); Failure of ≥ 3 AAD; > 50 y/o; AVJ ablation	AAD are able to prevent development of permanent AF in long term F/U		57% relative reduction rate of risk of permanent AF	

Limitations of AFFIRM trial

1. Not comparison of sinus rhythm and AF, compared rate control to rhythm control
2. ‘on-treatment” analysis : 47% mortality reduction in sinus rhythm along with warfarin
3. Study population

   - high risk thromboembolic events
   - few congestive heart failure, young patients

Relationships Between Sinus Rhythm, Treatment, and Survival in the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) Study

The AFFIRM Investigators*

Background—The AFFIRM Study showed that treatment of patients with atrial fibrillation and a high risk for stroke or death with a rhythm-control strategy offered no survival advantage over a rate-control strategy in an intention-to-treat analysis. This article reports an "on-treatment" analysis of the relationship of survival to cardiac rhythm and treatment as they changed over time.

Methods and Results—Modeling techniques were used to determine the relationships among survival, baseline clinical variables, and time-dependent variables. The following baseline variables were significantly associated with an increased risk of death: increasing age, coronary artery disease, congestive heart failure, diabetes, stroke or transient ischemic attack, smoking, left ventricular dysfunction, and mitral regurgitation. Among the time-dependent variables, the presence of sinus rhythm (SR) was associated with a lower risk of death, as was warfarin use. Antiarrhythmic drugs (AADs) were associated with increased mortality only after adjustment for the presence of SR. Consistent with the original intention-to-treat analysis, AADs were no longer associated with mortality when SR was removed from the model.

Conclusions—Warfarin use improves survival. SR is either an important determinant of survival or a marker for other factors associated with survival that were not recorded, determined, or included in the survival model. Currently available AADs are not associated with improved survival, which suggests that any beneficial antiarrhythmic effects of AADs are offset by their adverse effects. If an effective method for maintaining SR with fewer adverse effects were available, it might be beneficial. (*Circulation*. 2004;109:1509-1513.)

Key Words: antiarrhythmia agents ■ anticoagulants ■ arrhythmia ■ fibrillation

CATHOLIC UNIVERSITY OF KOREA

Relationships Between Sinus Rhythm, Treatment, and Survival in the Atrial Fibrillation Follow-Up Investigation of rhythm Management (AFFIRM) Study

- The association of SR but not AADs with improved survival may reflect the fact that currently available AADs are neither highly efficacious nor completely safe.

- These results suggest that if an effective method for maintaining SR with fewer adverse effects were available, it might improve survival.

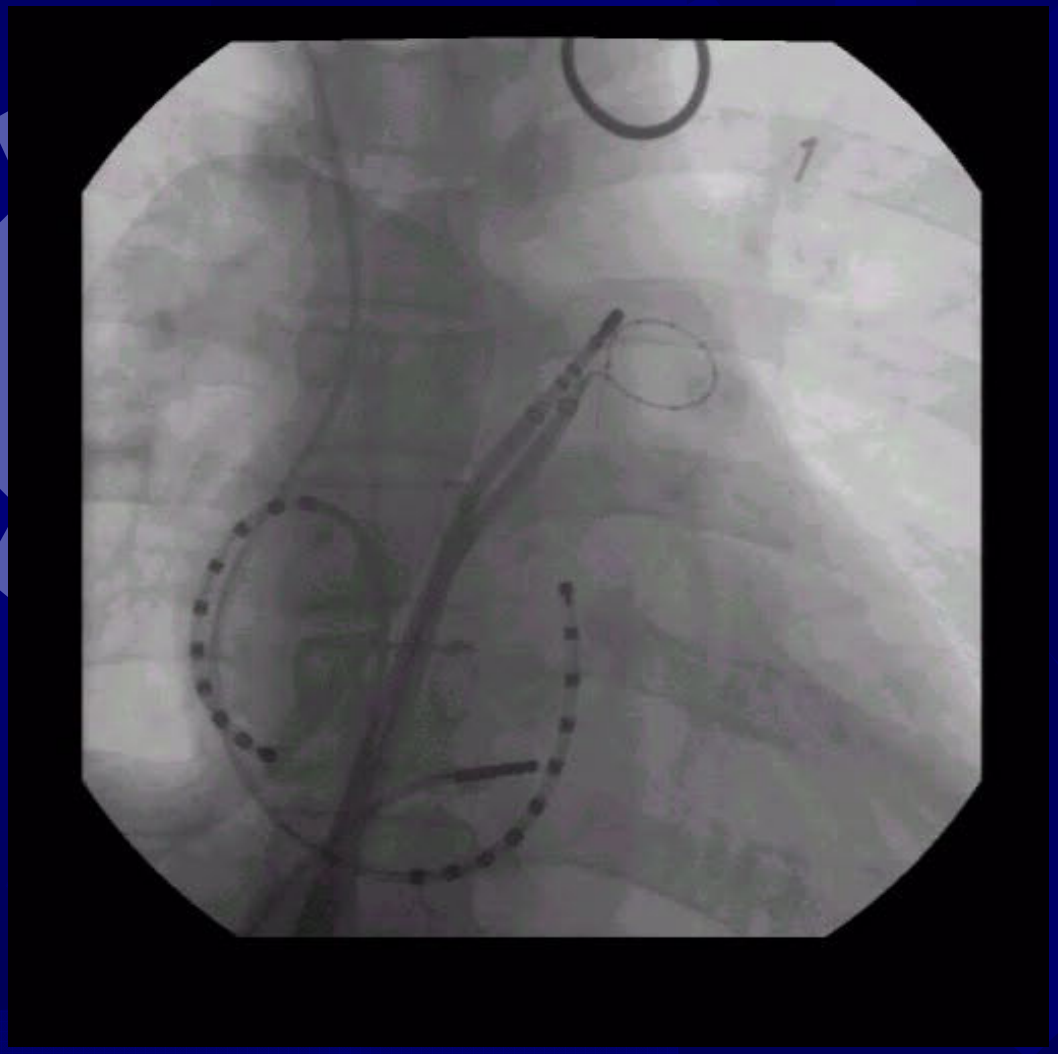
"If rhythm control is selected, what is the role for curative ablation procedures and how do they work?"

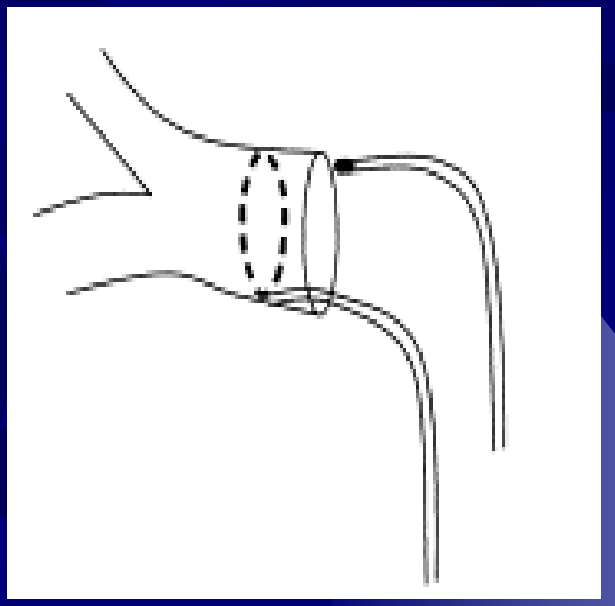
AF ablation therapy

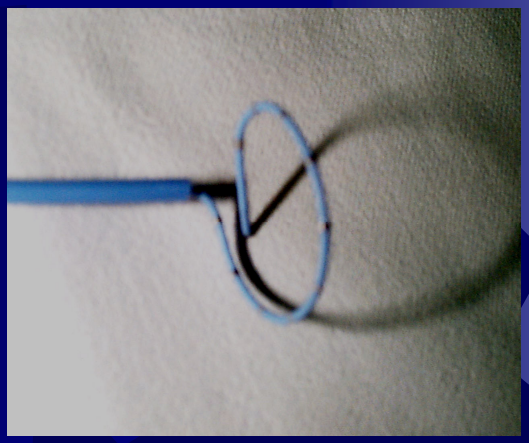
- PVs play a major role in both triggering and maintaining AF,
- AF including adolescents and, adults with structural heart disease
- disconnect PVs from the rest of atrium
- 1) Pulmonary vein isolation and
  2) circumferential left antrial ablation

Limitations of AF ablation is ‘uncertain technique and high complications’

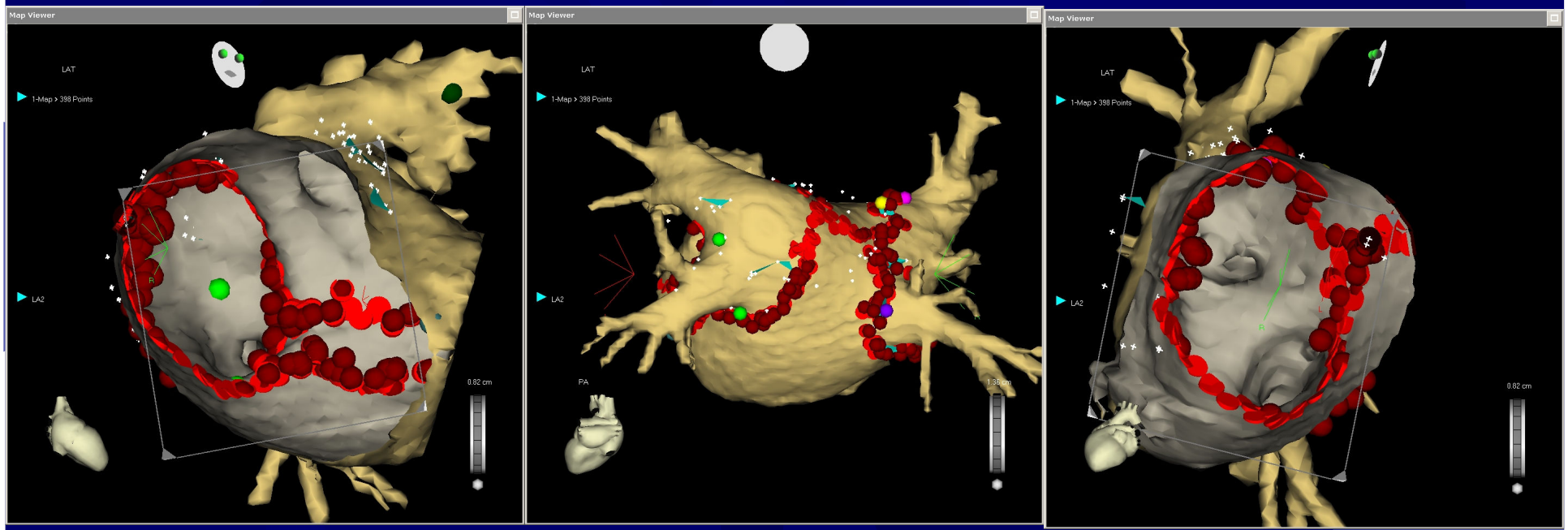
Pulmonary vein isolation







Substrate-guided ablation



Left endoscopic view

PA

Right endoscopic view

CATHOLIC UNIVERSITY OF KOREA

Substrate-guided ablation

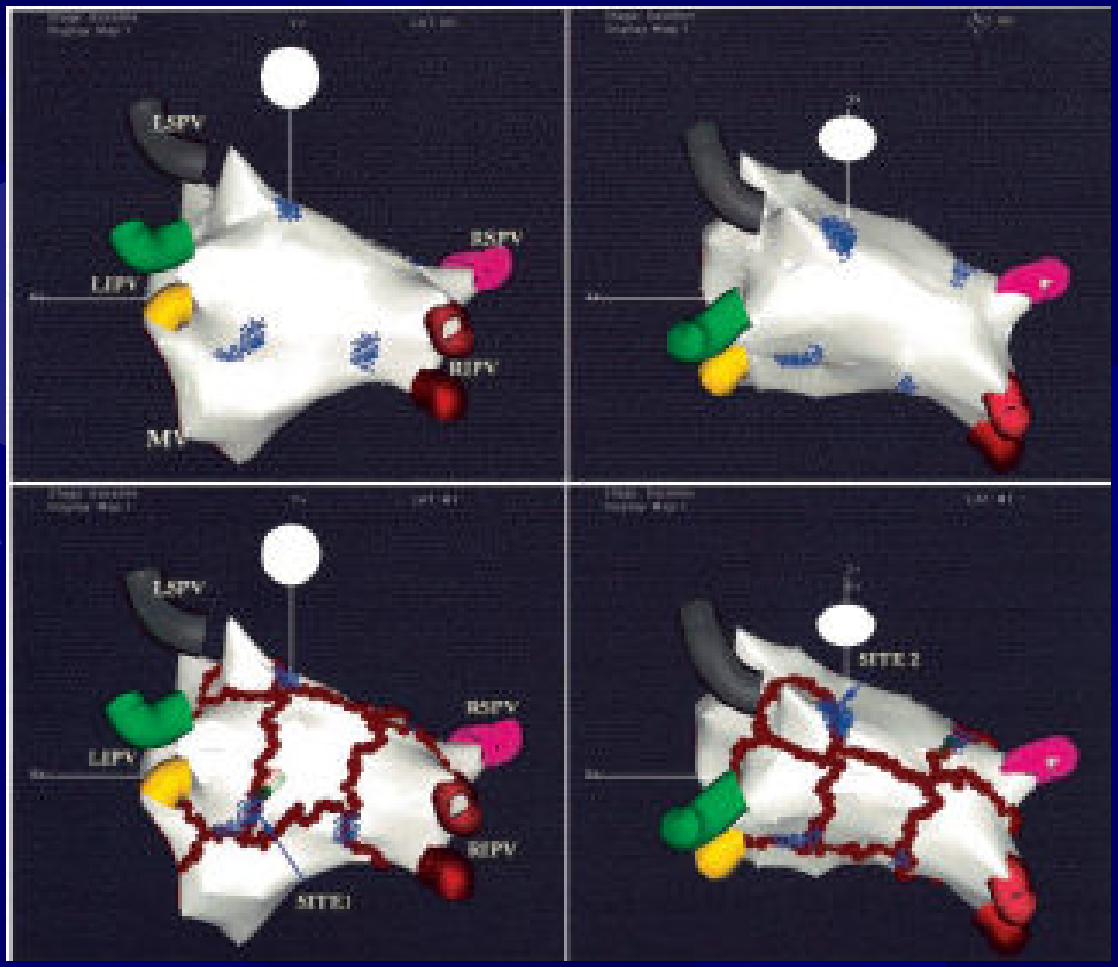
- Target key atrial regions responsible for perpetuating AF rather than targetting the trigger

  "pivot' points, "rotar" points
- Nademanee et al, JACC 43(11), 2004
- Targeting CFAE during AF

  - fragmented electrogram composed of 2 deflections or more and continous deflection of baseline

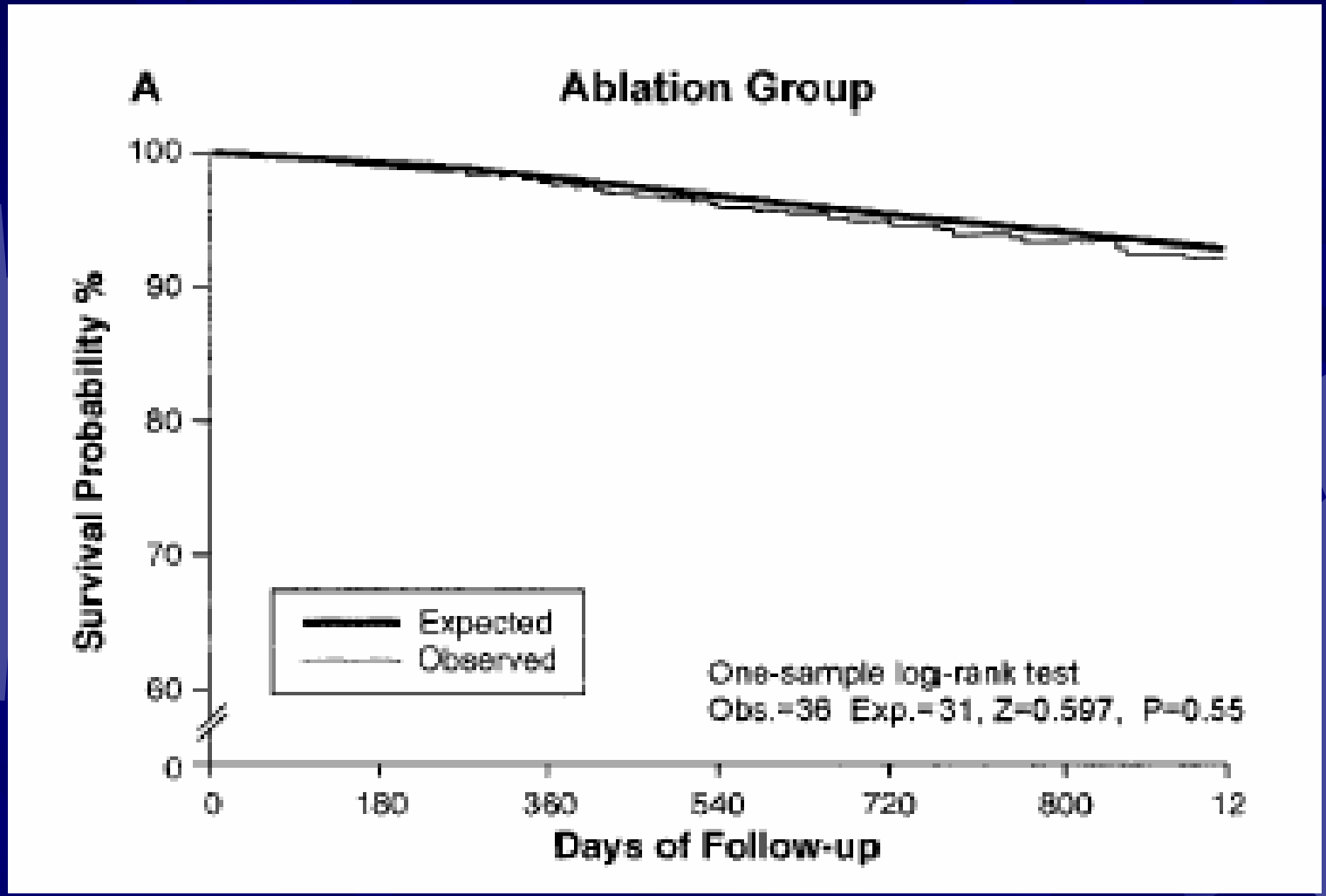
  - Atrial EGMs with very short CL < 120ms

Ablation Vagal Input

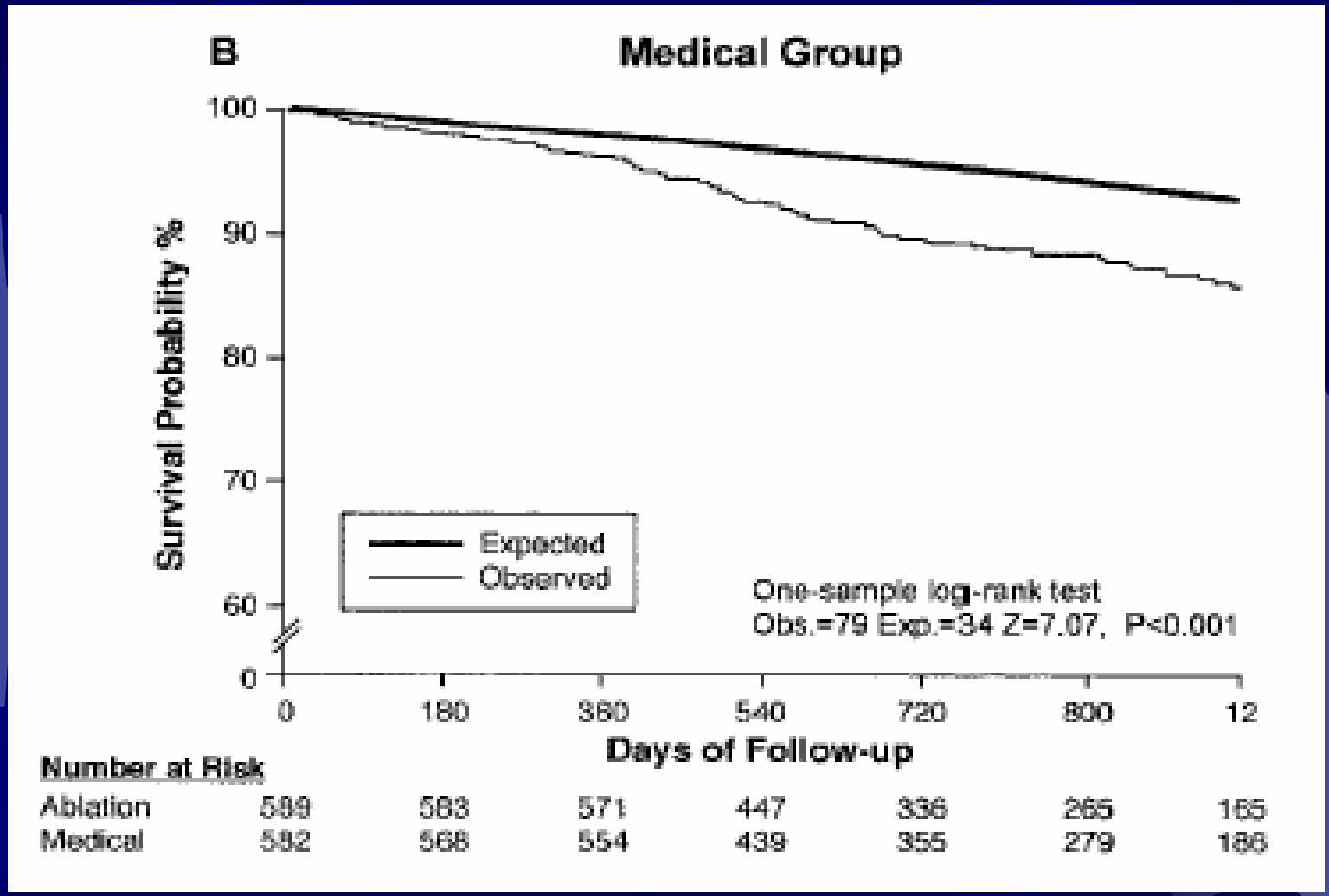


Pappone et al, Circulation 2004

- The cure rate off drug is 80.5% overall.
- 10-25% become responsive to previously ineffective drugs
- 2-3 folds better than antiarrhythmic drugs



Pappone et al, *J Am Coll Cardiol, 2003*

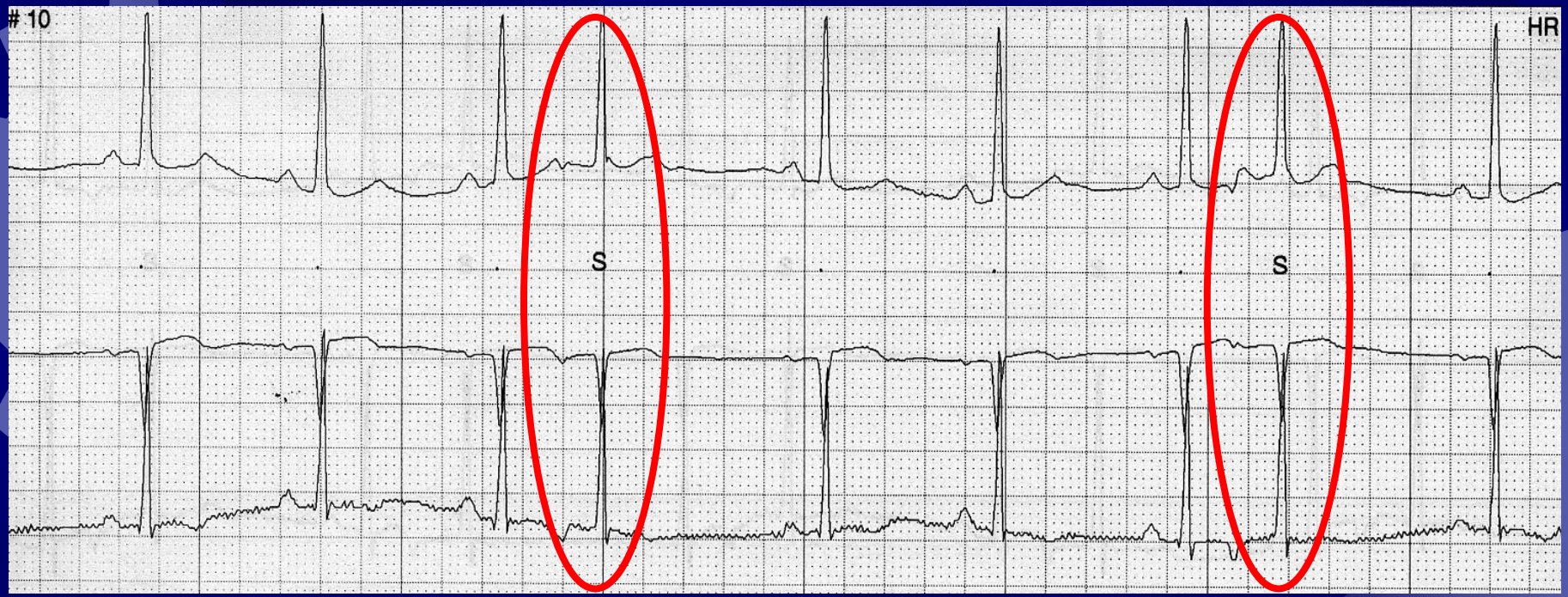


Pappone et al, *J Am Coll Cardiol, 2003*

Complications of AF ablation

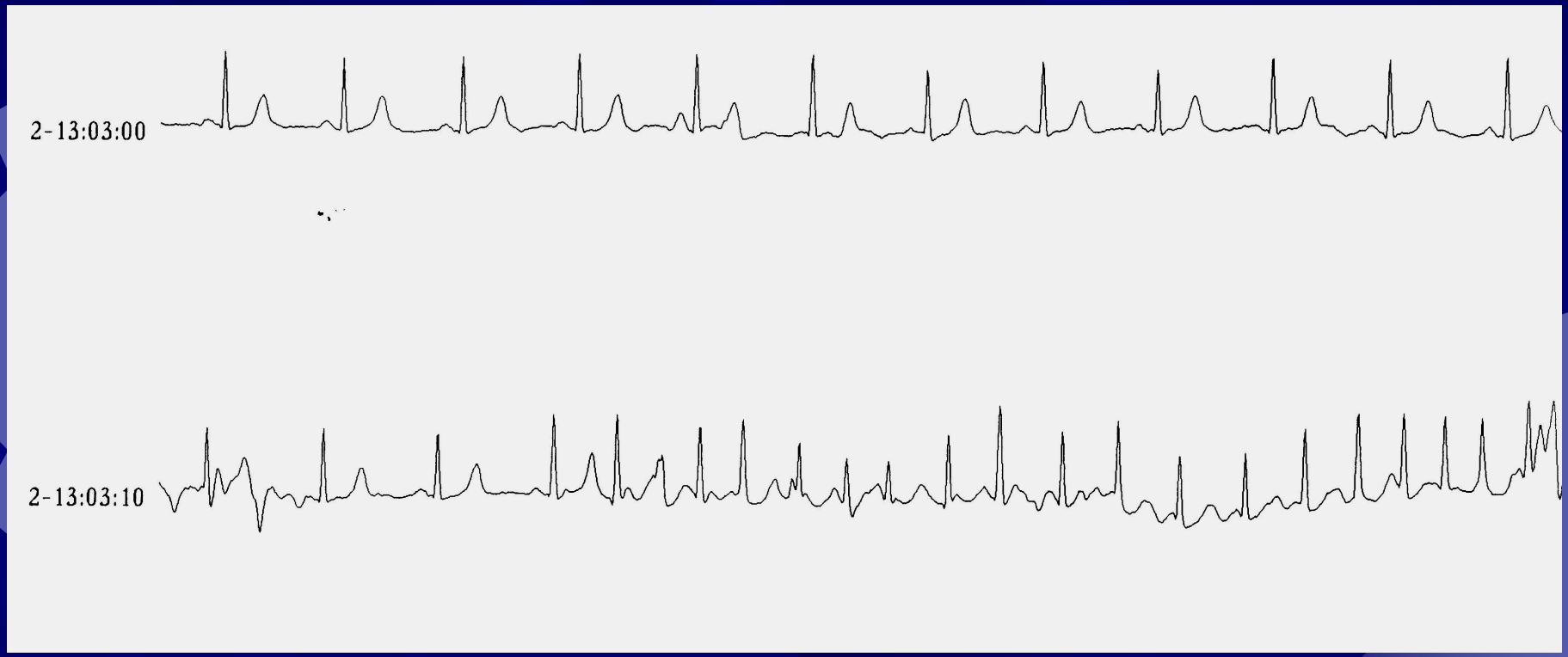
- CVA : 0.5% (12/2425)
- Severe PV stenosis : 0.7% (16/2425)
- Hematoma : 0.8% (19/2425)
- Tamponade : 0.3% (8/2425)

44/F, palpitation



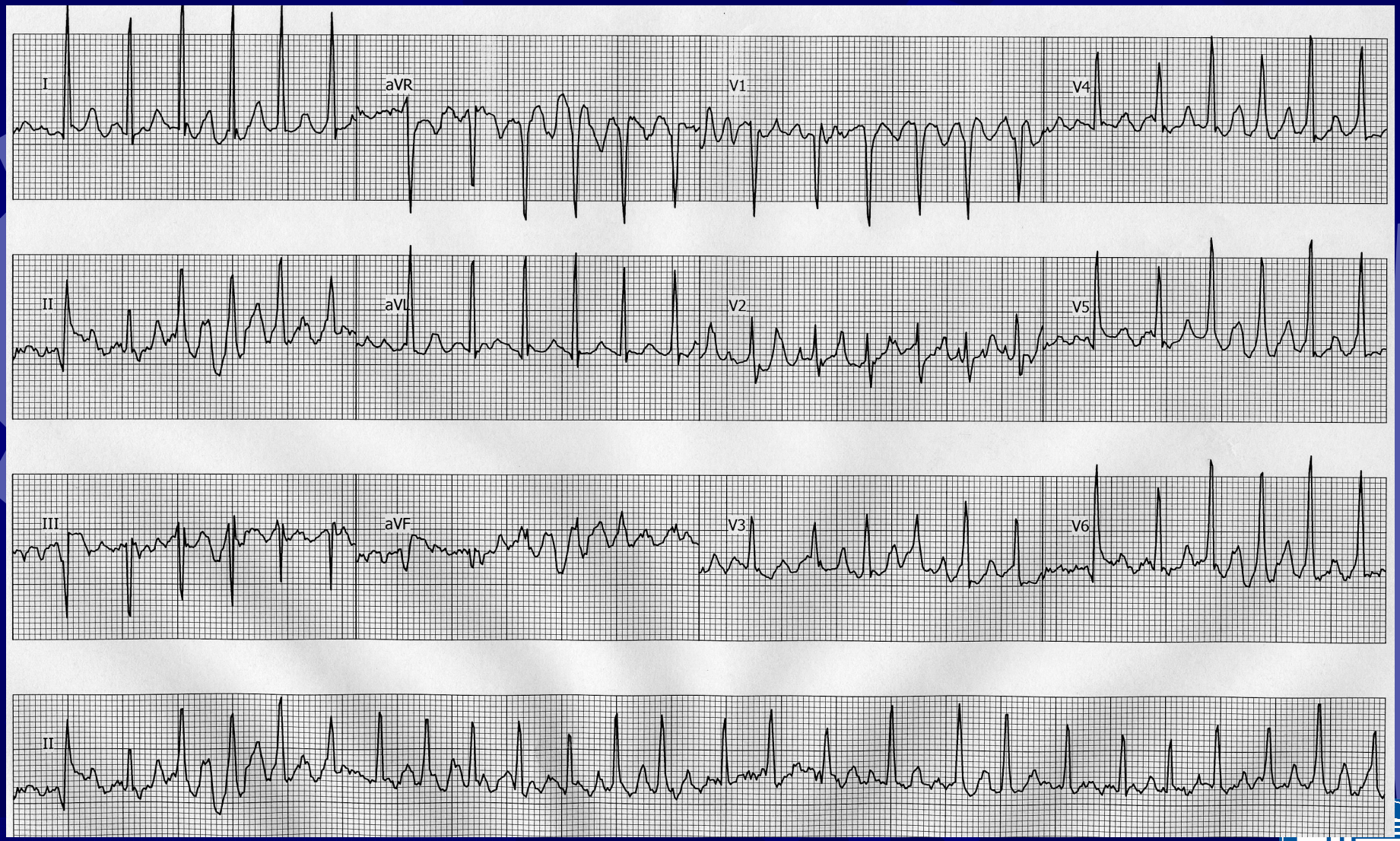
Premature atrial contraction (심방조기 수축)

2 years later, palpitation & dizziness



Atrial fibrillation, paroxysmal (발작성 심방세동)

4 years later



"How many paroxysmal AF patients will convert to chronic AF and what is risk factors?"

Electrophysiology

Progression to chronic atrial fibrillation after the initial diagnosis of paroxysmal atrial fibrillation: Results from the Canadian Registry of Atrial Fibrillation

Charles R. Kerr, MD,[a] Karin H. Humphries, DSc,[a] Mario Talajic, MD,[b] George J. Klein, MD,[c] Stuart J. Connolly, MD,[d] Martin Green, MD,[e] John Boone, MD,[a] Robert Sheldon, MD, PhD,[f] Paul Dorian, MD,[g] and David Newman, MD[g] *Vancouver, British Columbia, Montreal, Quebec, London, Hamilton, Ottawa, and Toronto, Ontario, and Calgary, Alberta, Canada*

Background After its initial diagnosis, atrial fibrillation (AF) may progress from paroxysmal to chronic AF (CAF). The rate of progression and risk factors for progression are not clearly defined.

Methods The Canadian Registry of Atrial Fibrillation (CARAF) enrolled patients from 6 Canadian cities at the time of their first electrocardiographic diagnosis of AF. Comprehensive clinical and echocardiographic data were collected and patients were followed annually, carefully documenting clinical outcomes, recurrence of paroxysmal AF, and progression to CAF. Baseline clinical, electrocardiographic, and echocardiographic variables were evaluated by univariate Cox proportionate hazards analysis. A stepwise approach was used to model the association between echocardiographic and clinical variables with progression to CAF.

Results A total of 757 patients with a baseline diagnosis of paroxysmal AF were evaluated. Median follow-up was 8.0 years (range 2 days to 11.1 years). The probability of progression to CAF by 1 year was 8.6% and thereafter there was a slow but steady progression to 24.7% by 5 years. By 5 years, the probability of documented recurrence of any AF (chronic or paroxysmal) was 63.2%. Increasing age, significant aortic stenosis or mitral regurgitation, left atrial enlargement, and diagnosis of cardiomyopathy were independently associated with progression to CAF. A more rapid heart rate during AF was associated with decreased risk of progression.

Conclusions After the initial diagnosis of paroxysmal AF, there is a slow but steady progression to CAF. Baseline echocardiographic variables, age, cardiomyopathy, and heart rate were independently associated with progression to CAF.
(Am Heart J 2005;149:489-96.)

CATHOLIC UNIVERSITY OF KOREA

Progression of paroxysmal AF to chronic AF

- 30% per year, 60-70% for 6-7 years
- 8.6% per year, 24,7% by 5 years,
  63.2% (chronic or recurrent paroxysmal AF)

Factors associated with progression to CAF

1, Age
2. CHF
3. Valvular heart disease : AS, MS, MR
4. LA dimension >40mm

BMC Cardiovascular Disorders

BioMed Central

Research article

Open Access

Predictors and prognosis of paroxysmal atrial fibrillation in general practice in the UK

Ana Ruigómez*[1], Saga Johansson[2,3], Mari-Ann Wallander[2,4] and Luis Alberto García Rodríguez[1]

Address: [1]Centro Español de Investigación Farmacoepidemiológica (CEIFE), Madrid, Spain, [2]AstraZeneca R&D Mölndal, Sweden, [3]Section of Preventive Cardiology, Göteborg University, Sweden and [4]Department of Public Health and Caring Science, Uppsala University, Sweden

Email: Ana Ruigómez* - aruigomez@ceife.es; Saga Johansson - Saga.Johansson@astrazeneca.com; Mari-Ann Wallander - Mari-Ann.Wallander@astrazeneca.com; Luis Alberto García Rodríguez - lagarcia@ceife.es

* Corresponding author

Published: 11 July 2005

BMC Cardiovascular Disorders 2005, 5:20 doi:10.1186/1471-2261-5-20

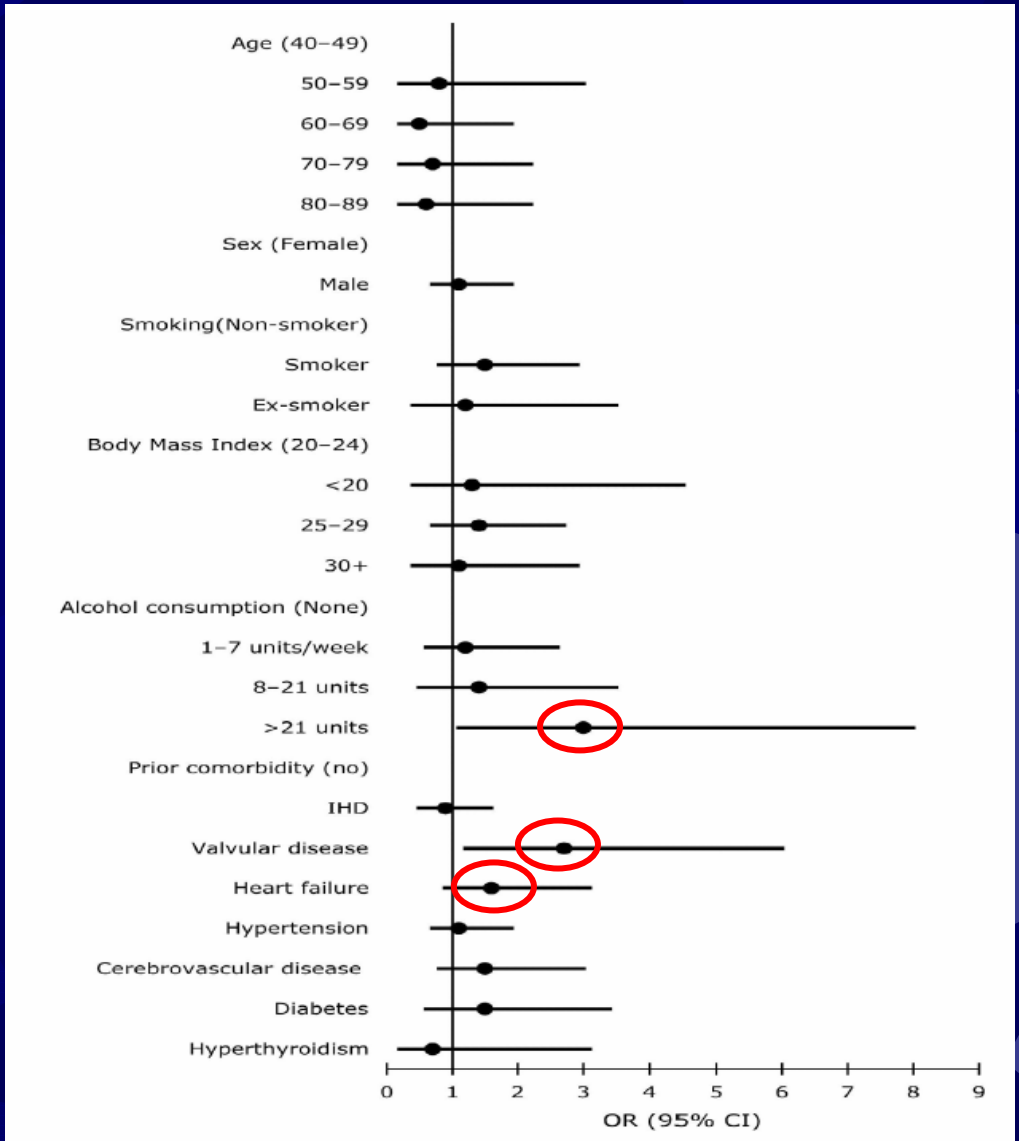
Received: 18 January 2005
Accepted: 11 July 2005

This article is available from: http://www.biomedcentral.com/1471-2261/5/20

Risk factors of progression to chronic AF

1. Heart failure
2. Valvular disease
3. Alcohol consumption

: <21 units / week



CLINICAL INVESTIGATIONS

Circ J 2004; **68:** 729–733

Long-Term Prognosis of Patients With Paroxysmal Atrial Fibrillation Depends on Their Response to Antiarrhythmic Therapy

Takashi Komatsu, MD; Shin Nakamura, MD; Osamu Suzuki, MD;
Daisuke Horiuchi, MD; Kunihiko Yomogida, MD; Ken Okumura, MD*

Background The rhythm control treatment strategy for persistent atrial fibrillation (AF) has been shown not to improve quality of life or prognosis any more than rate control. It is unclear whether the prognosis of the patients with paroxysmal AF (PAF) is influenced by the response to antiarrhythmic drug therapy (AAT).

Methods and Results The relationship between the response to AAT and long-term prognosis was evaluated in 290 patients with PAF (mean age, 69 years). During a mean follow-up period of 51 months, 114 patients (39%) had no recurrence of AF (Group 1), 113 (39%) had repeated AF recurrence (Group 2), and the remaining 63 (22%) had permanent AF despite AAT (Group 3). The survival rate without any cardiovascular deaths at 60 months was 99% in Group 1, 95% in Group 2 and 94% in Group 3 (p=NS among 3 groups). Survival rate without symptomatic ischemic stroke was 99% in Group 1, 88% in Group 2 and 76% in Group 3 ($p<0.05$ Group 1 vs Groups 2 and 3). The annual rate of stroke in the patients with warfarin treatment was similar among the 3 groups, whereas that in the patients without warfarin was higher in Groups 2 and 3 than in Group 1.

Conclusions Long-term prognosis of patients with PAF varies with the response to AAT: When sinus rhythm is maintained, the prognosis is good even without anticoagulation therapy. (*Circ J* 2004; **68:** 729–733)

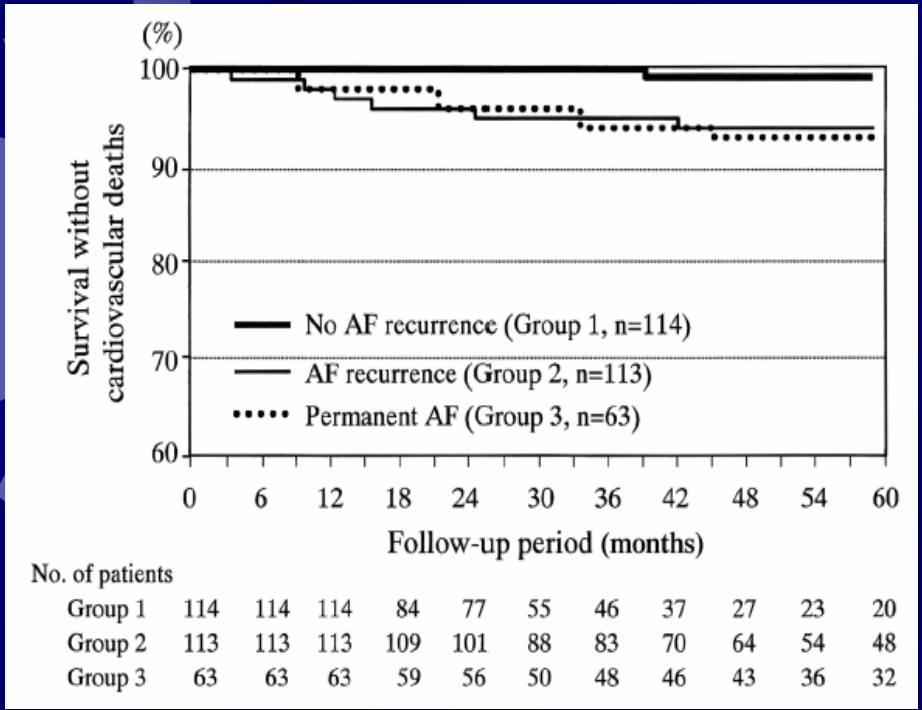
Key Words: Antiarrhythmic therapy; Atrial fibrillation; Prognosis; Stroke

Conversion rate to Chronic AF

51 months follow-up

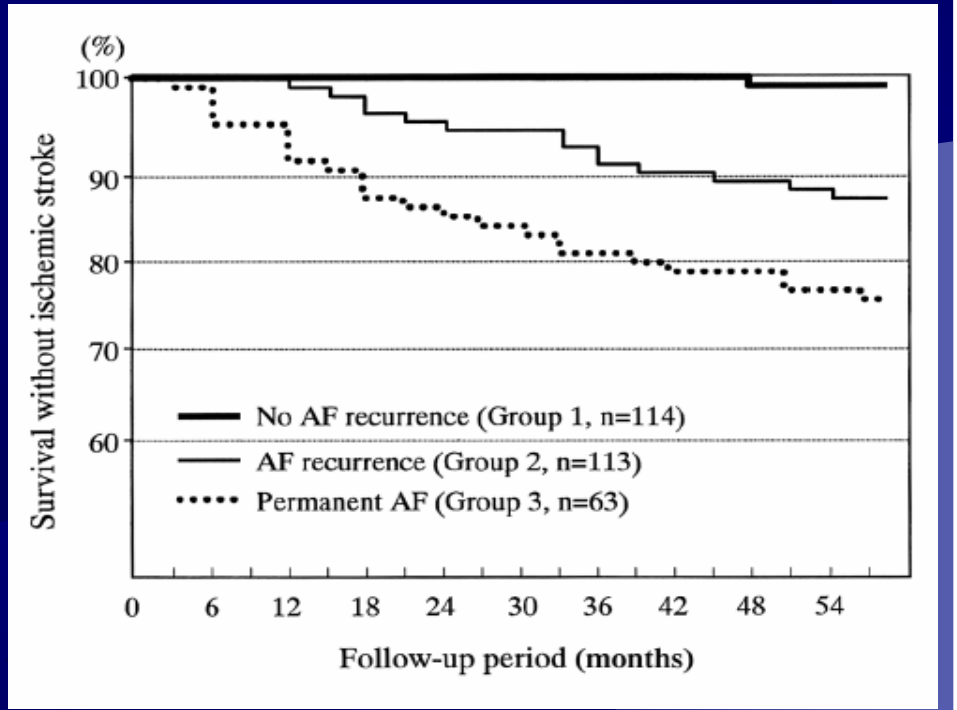
1. 39% : no recurrence
2. 39% : repeated AF recurrence
3. 22% : Chronic permanent AF

Prognosis



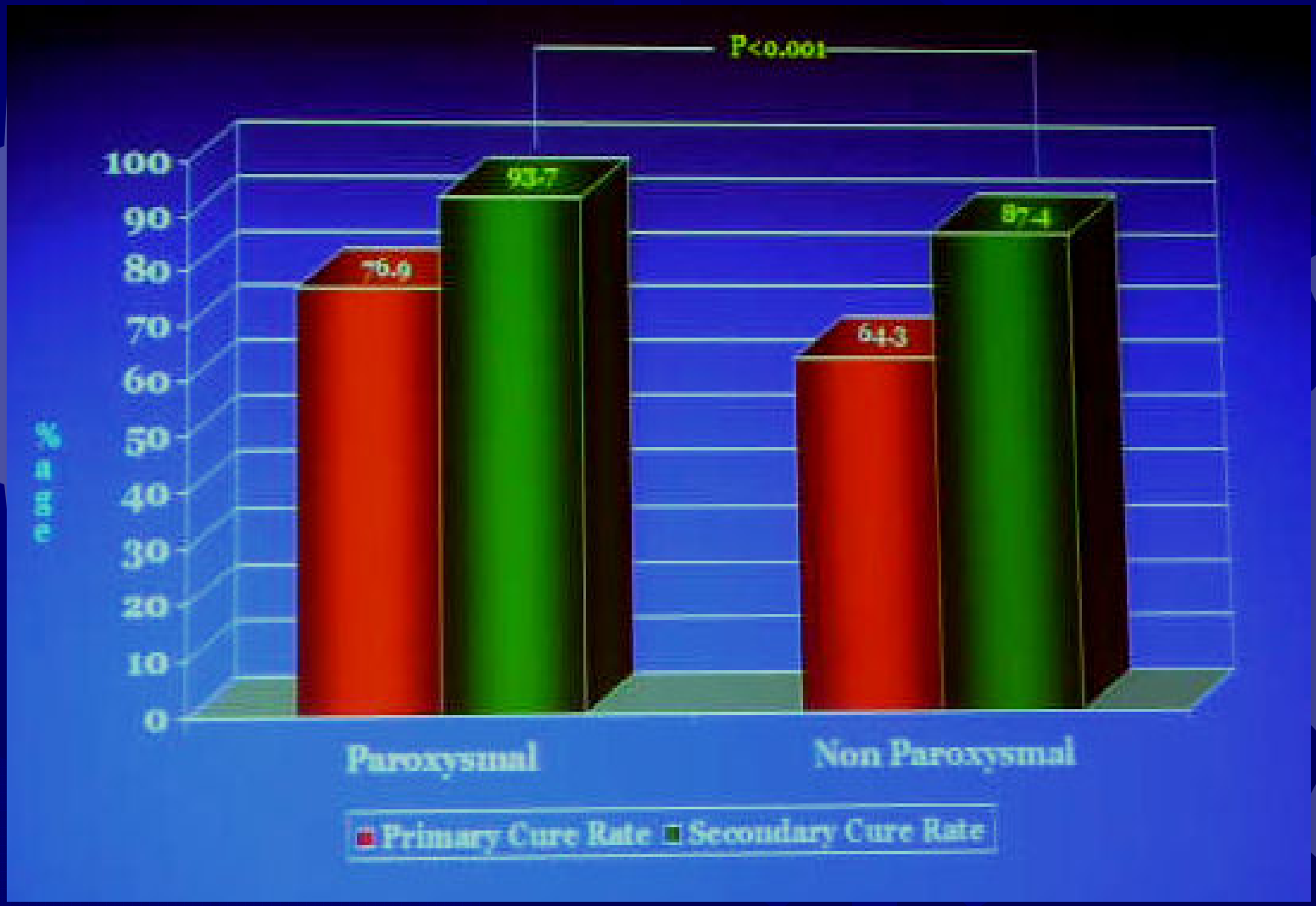
No. of patients

Group 1	114	114	114	84	77	55	46	37	27	23	20
Group 2	113	113	113	109	101	88	83	70	64	54	48
Group 3	63	63	63	59	56	50	48	46	43	36	32



“What’s the results of AF ablation”
‘PAF vs NPAF’

Results : PAF vs NPAF



RAAFT
Radiofrequency Ablation vs antiarrhythmic Drugs as First-line Treatment of Symptomatic Atrial Fibrillation -A Randomized Trial -

Oussama M. Wazni, MD, Nassir F. David O. Martin, MD, Atul Verma, MD, Mandeep Bhargava, MD, Robert Schweikert, MD, Ennio Pisano, MD, Dominico Potenza, MD, Raffaele Fanelli, MD, Antonio Raviele, MD, Antonio Rossillo, MD, Andrea Natale, MD

- JAMA 2005-

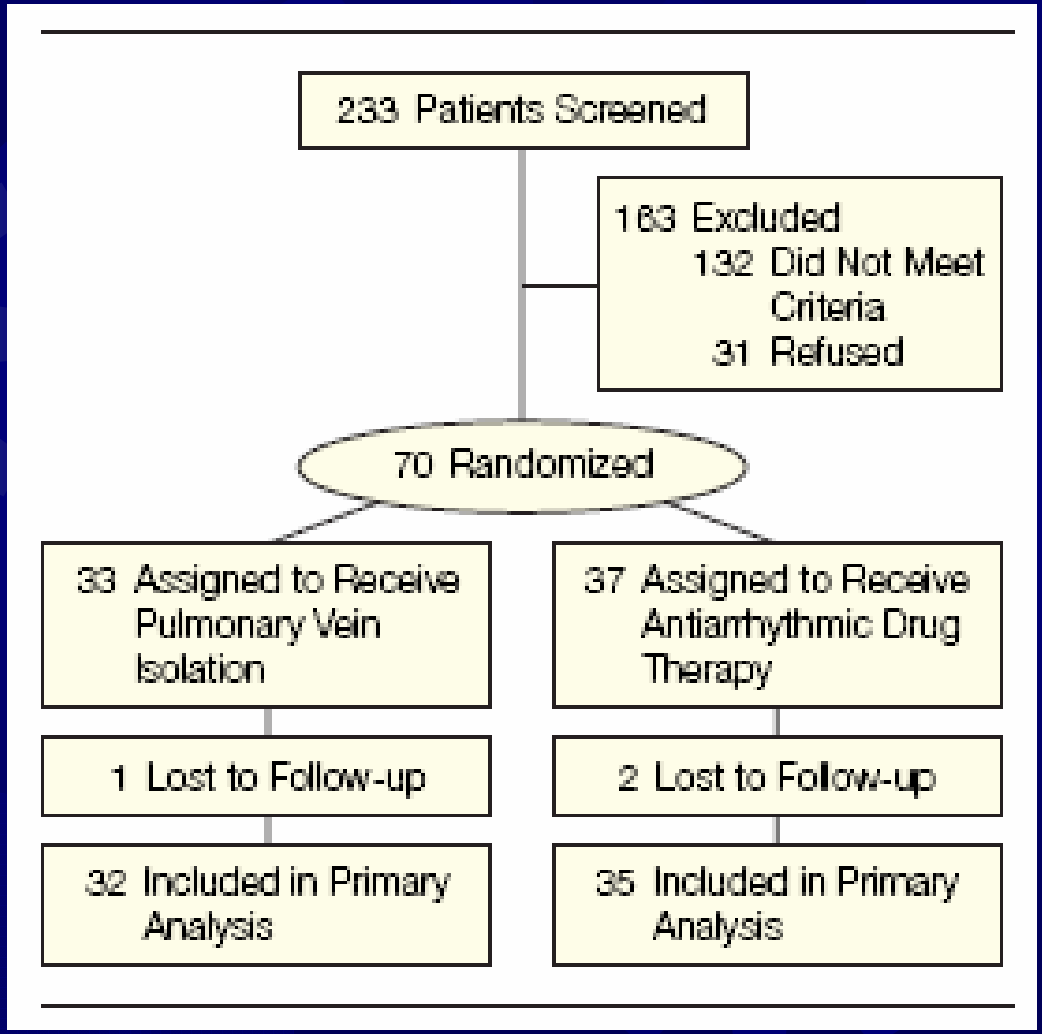
CATHOLIC UNIVERSITY OF KOREA

Patients selection

1. Inclusion criteria
 - Patients with symptomatic AF
 - Monthly episode of AF > 3months

2. Exclusion criteria
 - Age 18< and < 75
 - Previous Hx of AF/AFL ablation
 - Previous Tx with AAD
 - Hx of of heart surgery
 - contraindication of long term anticoagulation treatment

Flow of patients with atrial fibrillation



One-Year Follow-up Results by Treatment Group

	No. (%) of Patients		
	Pulmonary Vein Isolation Group (n = 32)	Antiarrhythmic Drug Group (n = 35)	*P* Value
Symptomatic atrial fibrillation recurrence	4 (13)	22 (63)	<.001
Hospitalization	3 (9)	19 (54)	<.001
Thromboembolic events*	0	0	NA
Bleeding	2 (6.3)	1 (2.9)	.60
Bradycardia	0	3 (8.6)	.20
Pulmonary vein stenosis†			
Mild	1 (3)	0	.50
Moderate	1 (3)	0	.50
Severe	0	0	NA

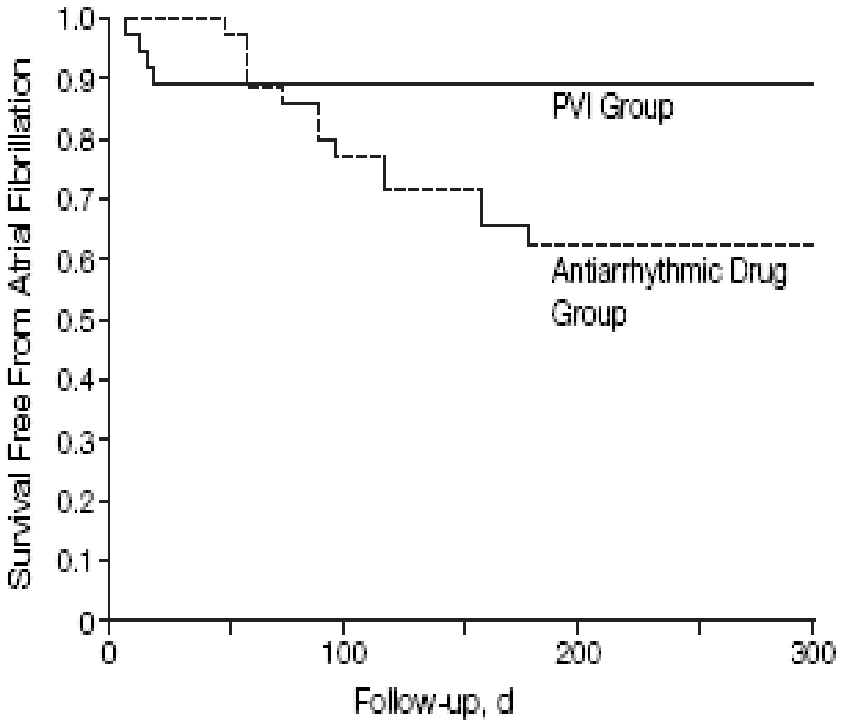
Abbreviation: NA, not applicable.
*Defined as transient ischemic events, stroke, deep vein thrombosis, or pulmonary embolism.
†Mild pulmonary vein stenosis is defined as less than 50%; moderate, 50% to 70%; and severe, more than 70%.

Atrial fibrillation event recording

	Pulmonary Vein Isolation (n = 4)		Antiarrhythmic Drugs (n = 22)			
	Study Initiation	Study Completion	Study Initiation	Study Completion	Corrected Difference in Mean Change (95% CI)	*P* Value
No. of episodes, mean (SD)	13 (6)	1 (2)	12 (7)	6 (4)	−6 (−13 to 1)	.05
Duration of episodes, mean (SD), s	480 (30)	15 (12)	520 (40)	45 (15)	10 (−7 to 27)	.63
Ventricular rate, mean (SD), beats/min	138 (26)	126 (18)	126 (35)	92 (21)	22 (16 to 28)	.001
Time patients are in asymptomatic episodes of AF, %	0	2	0	16		

Abbreviations: AF, atrial fibrillation; CI, confidence interval.

Freedom from AF after PVI and AAD



No. at Risk							
PVI Group	32	28	28	28	28	28	28
Antiarrhythmic Drug Group	35	34	23	19	13	13	13

PVI indicates pulmonary vein isolation.

성모병원 paroxysmal AF ablation 결과

- 2001- 2006년 paroxysmal AF ablation : 134 명
- 진단 후 2개월 이내 Ablation : 37명
  2개월 이상 약 치료 후 ablation : 62명
  진단 시점을 모름 (전원 환자) : 35명, 제외
- RF ablation : Ostial ablation (Lasso guided)
  Antral ablation (CARTO)

결과

	Early ABL (37)	Late ABL (62)	*p* value
Age (year)	62 ± 7	67 ± 3	NS
Male Sex (%)	22 (59%)	42 (77%)	NS
Time from Dx to ablation(day)	53 ± 7	1492 ±23	0.0001
LA size (mm)	38 ± 4	43 ± 6	0.007
LA size increase		3.2 ± 3	
Post ablation FU (days)	413 ± 220	456 ± 278	NS
Primary cure rate	83.7%	71.9%	0.01
Secondary cure rate	96.4%	87.6%	0.027

“ It seems to be reasonable that ablation be moved up to first-line therapy for some patients”

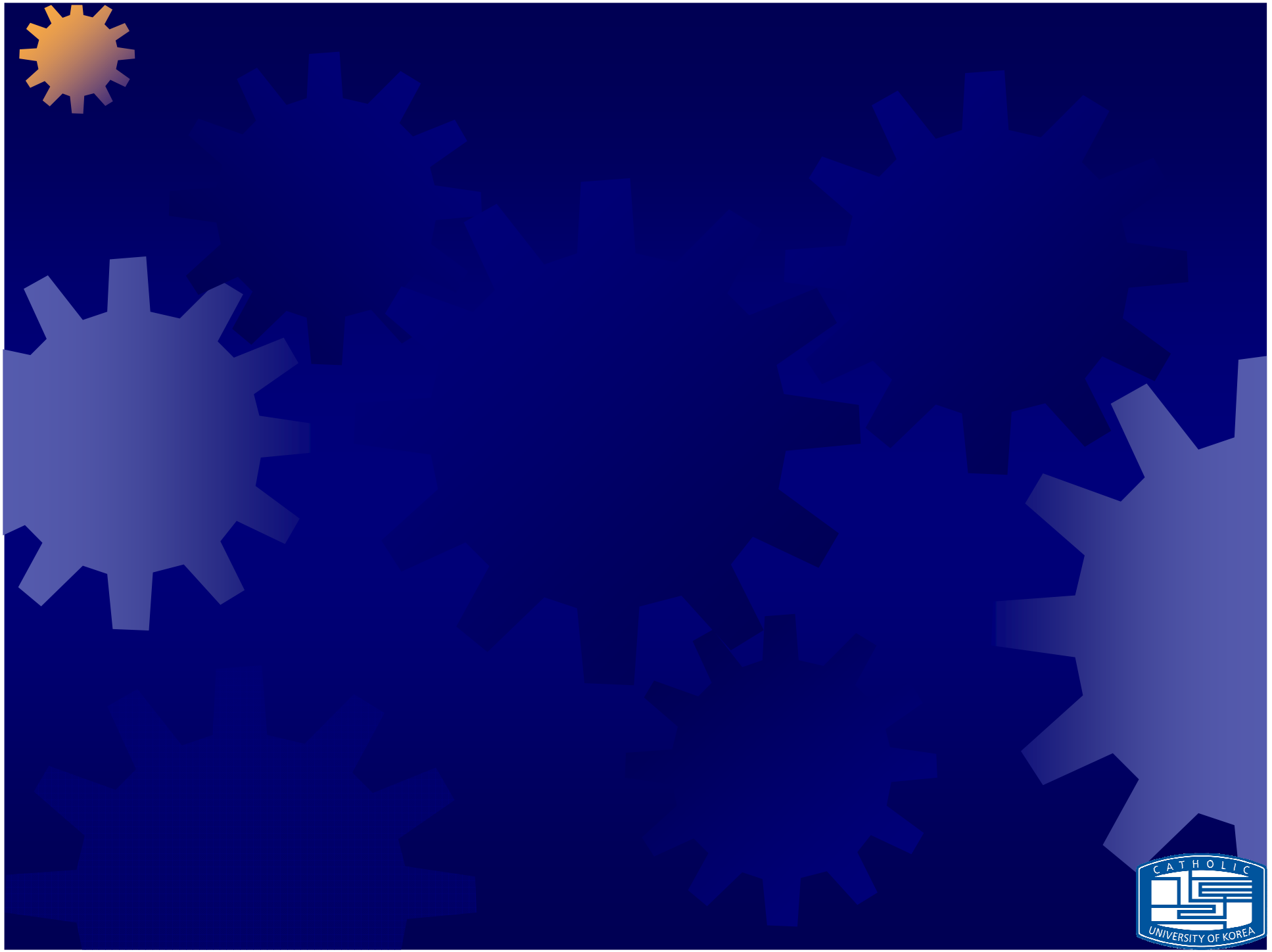
Indications of first-line ablation therapy

1. Those patients with symptomatic AF, who have high risk of conversion to chronic AF.
   1) mild to moderate structural heart disease,
   2) old age with good performance,
   3) heavy alcohol drinker and
   4) big LA size.

2. Younger patients with lone AF who are frequently symptomatic and very long term antiarrhythmic and poses higher risks and lifestyle costs

CATHOLIC UNIVERSITY OF KOREA

경청해 주셔서 감사합니다.


CATHOLIC
UNIVERSITY OF KOREA

Factors associated with progression to CAF

Table III. Univariate analysis of factors associated with progression to chronic AF*

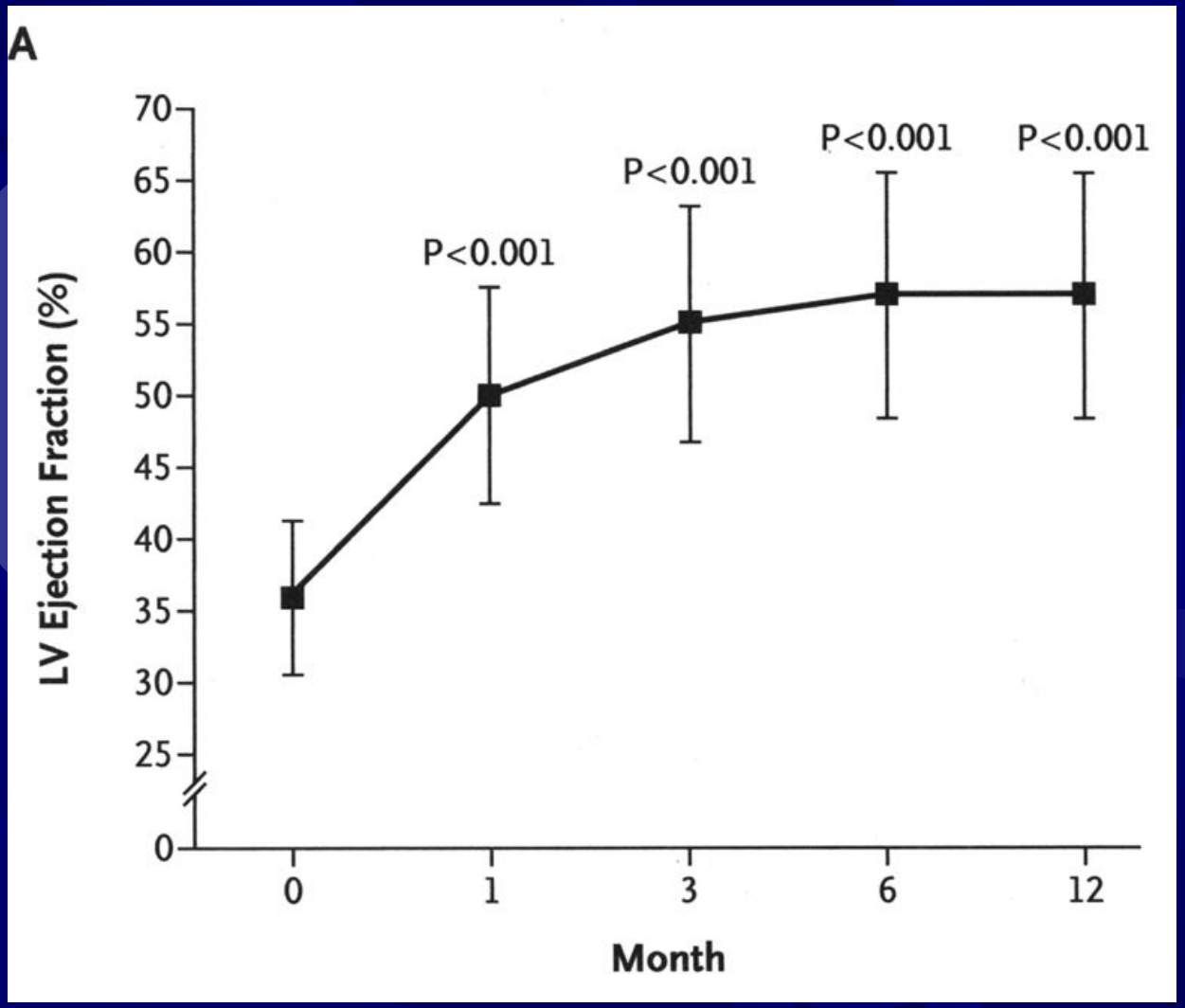
Variable	n	RR	95% CI Lower	95% CI Upper	P
Age (10-y increments)	757	1.41	1.24	1.60	<.0001
Male	757	0.88	0.65	1.20	.43
CHF	757	1.61	1.12	2.38	.01
Cardiomyopathy	757	2.41	1.06	5.47	.04
MI or CABG or angioplasty	757	0.86	0.58	1.28	.46
Left ventricular hypertrophy (electrocardiogram or echocardiogram)	757	1.73	1.22	2.45	.002
Moderate to severe mitral stenosis	741	2.07	0.76	5.64	.15
Moderate to severe mitral regurgitation	741	2.47	1.67	3.66	<.0001
Moderate to severe aortic stenosis	741	3.72	1.64	8.45	.002
Fractional shortening	666	0.98	0.97	0.99	.02
LV intraventricular septum dimension (5-mm increments)	688	1.31	0.95	1.80	.10
LV posterior wall diastolic dimension (5 mm increments)	686	1.50	0.99	2.28	.055
Left atrial dimension	711				
40-45 mm		2.43	1.68	3.51	<.0001
>45 mm		3.54	2.38	5.27	<.0001
Hypokinetic	743	1.38	0.97	1.97	.08
Heart rate (5 beats/min)	720	0.94	0.92	0.96	<.0001

RR, Relative risk.
*Adjusted for age and sex.

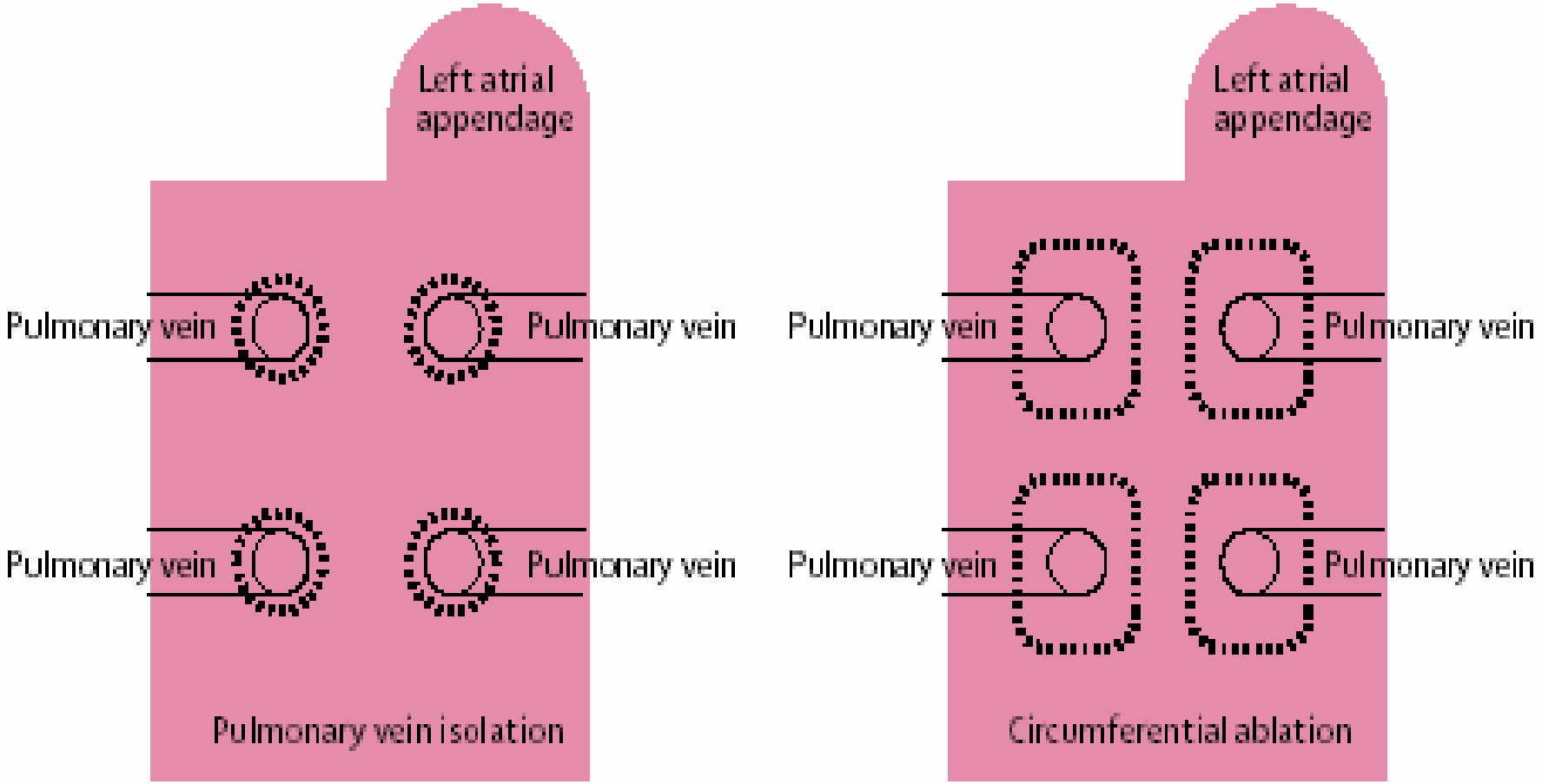
Table IV. Multivariate analysis of factors associated with progression to CAF

Variable	RR	95% CI Lower	95% CI Upper	P
Age (10-y increments)	1.40	1.21	1.63	<.0001
Male	0.83	0.60	1.15	.26
Study center	1.08	0.99	1.18	.10
Hypertension	0.87	0.62	1.21	.41
CHF	1.16	0.78	1.7	.45
Cardiomyopathy	2.41	1.02	5.67	.04
Moderate to severe aortic stenosis	3.04	1.29	7.19	.01
Moderate to severe mitral regurgitation	1.69	1.10	2.57	.02
Left atrial dimension (as categorical)				
40-45 mm	2.07	1.40	3.05	.0003
>45 mm	2.72	1.78	4.17	<.0001
Heart rate (5 beats/min)	0.94	0.92	0.96	<.0001
β-Blockers	0.97	0.6	1.55	.91
Anti-arrhythmic drugs	1.04	0.75	1.46	.81

Improvement in Left Ventricular Function After Ablation of Atrial Fibrillation in Patients with Congestive Heart Failure



- Hsu L et al. NEJM 2004; 351: 2373-83 -

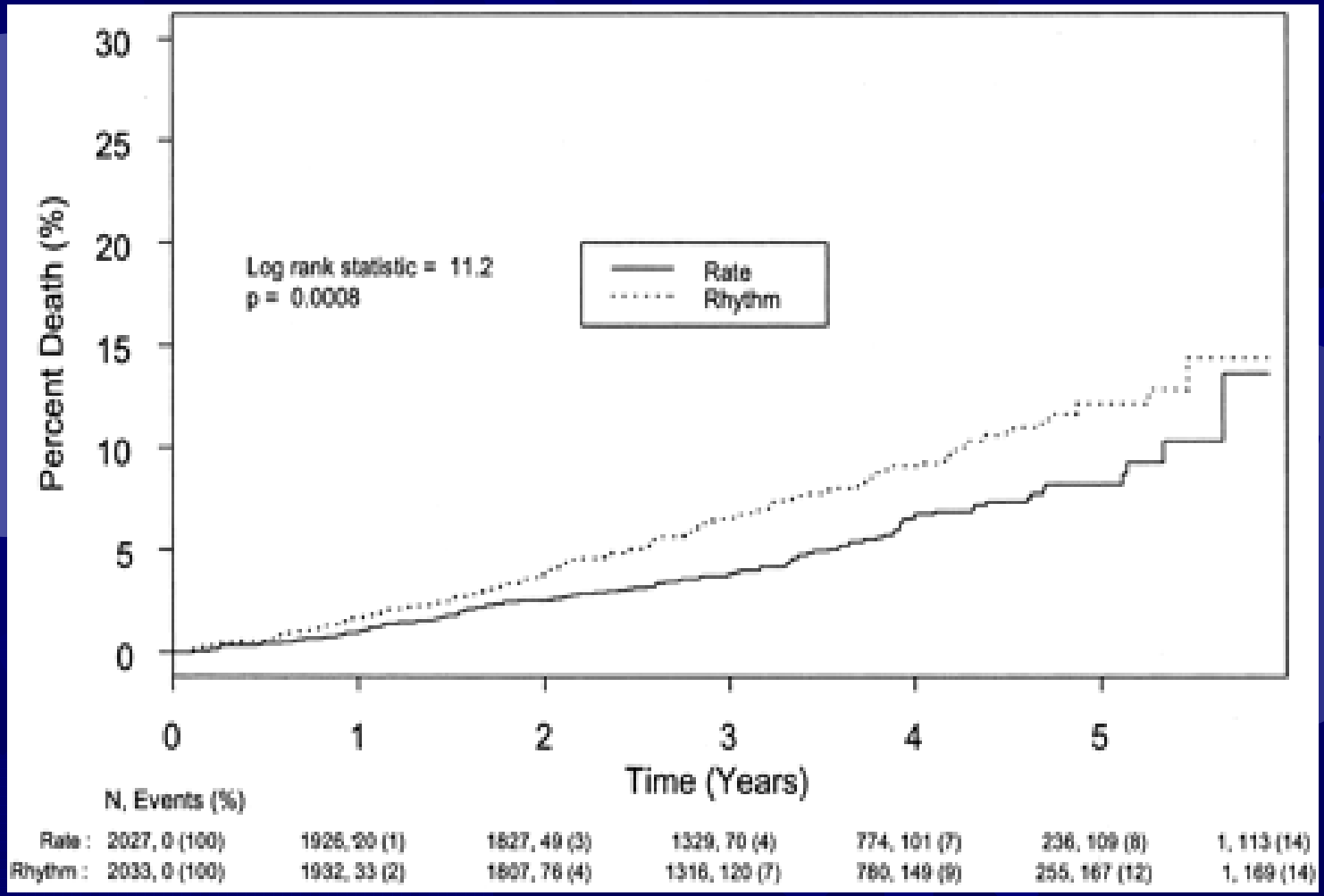

Left atrial appendage
Pulmonary vein
Pulmonary vein
Pulmonary vein
Pulmonary vein
Pulmonary vein isolation
Left atrial appendage
Pulmonary vein
Pulmonary vein
Pulmonary vein
Pulmonary vein
Circumferential ablation

Relationships Between Sinus Rhythm, Treatment, and Survival in the Atrial Fibrillation Follow-Up Investigation of rhythm Management (AFFIRM) Study

- The association of SR but not AADs with improved survival may reflect the fact that currently available AADs are neither highly efficacious nor completely safe.

- These results suggest that if an effective method for maintaining SR with fewer adverse effects were available, it might improve survival.

Cumulative non-cardiovascular mortality in the rhythm-control and rate-control groups.

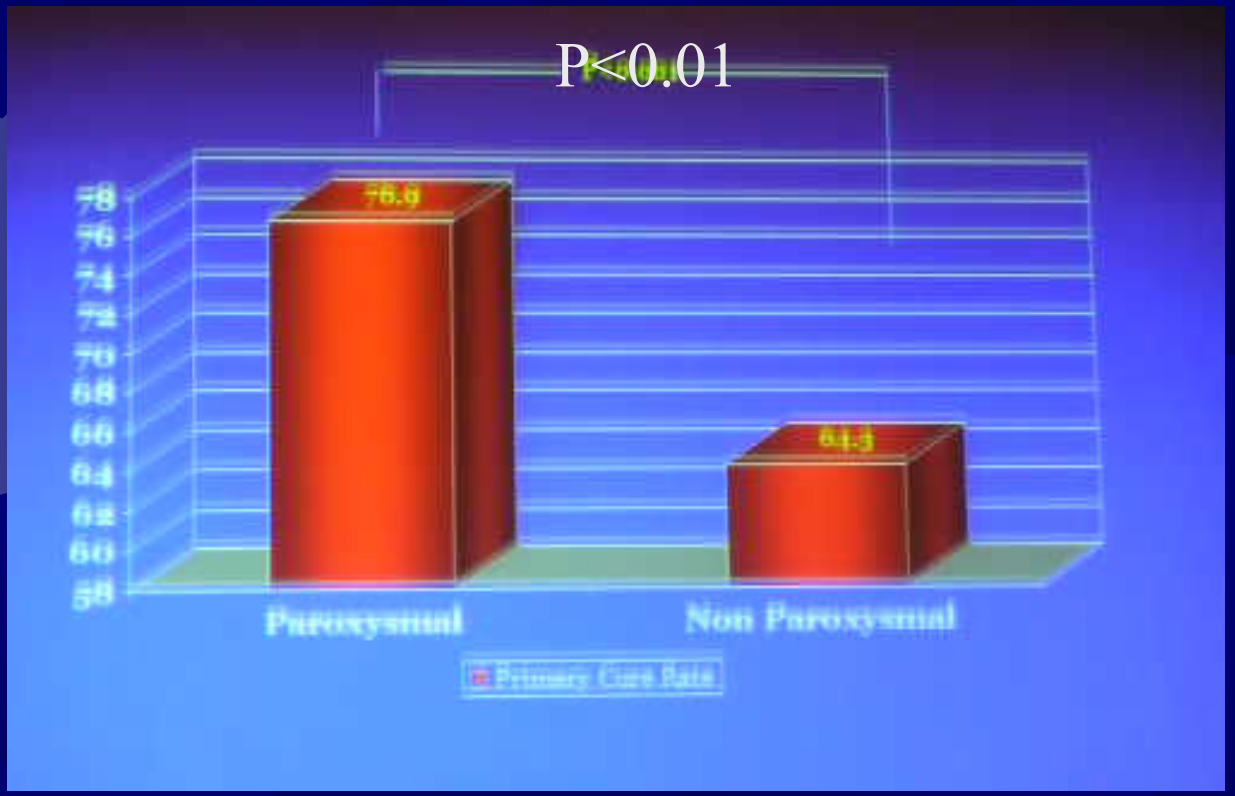


Meta-analysis of randomised controlled trials of the effectiveness of antiarrhythmic agents at promoting sinus rhythm in patients with atrial fibrillation

Table 3 Short term and long term effect of antiarrhythmic agents on sinus rhythm in placebo controlled trials

Comparators	Follow up duration (days)	Number of trials	Treatment difference (%), mean (95% CI),	p Value
1A v placebo	≥7 (all studies)	6	21.1 (15.0 to 27.2)	0.0003
1C v placebo	<7	17	31.9 (22.6 to 41.1)	<0.0001
III v placebo	<7	12	17.3 (9.6 to 25.0)	0.0002
III v placebo	≥7	3	17.6 (3.3 to 31.9)	0.03
Digoxin v placebo	<7 (all studies)	4	13.1 (–7.2, 33.3)	0.15
IA v III	<7	4	12.5 (–29.7 to 33.3)	0.11
IA v III	≥7	2	–6.6 (–36.7 to 23.5)	0.22
IC v III	<7	9	2.5 (–12.2 to 17.2)	0.71

Results : PAF vs NPAF



2. Antiarrhythmic drugs therapy

(1) Effectiveness

- AFFIRM

sinus rhythm, 60% in amiodarone, 23% in class I, 38% in sotalol whereas 34.6% in rate control

‘ Antiarrhythmic drugs do not cure AF; at best they are palliative treatment.’

(2) Debilitating side effects

- In AFFIRM, 12.35, 11.1%, and 28.1% of amiodarone, sotalol, and class I agents : had to stop within 1 year
- antiarrhythmic increased cardiac mortality and arrhythmic death particularly in heart failure patients.

‘Efficacy and danger of antiarrhythmic drugs’

CATHOLIC UNIVERSITY OF KOREA

Which is the better strategy for atrial fibrillation rhythm control or rate control?

Conditions Favoring Rhythm over Rate Control in Patients with A Fib

Definite

Significant symptoms during good rate control

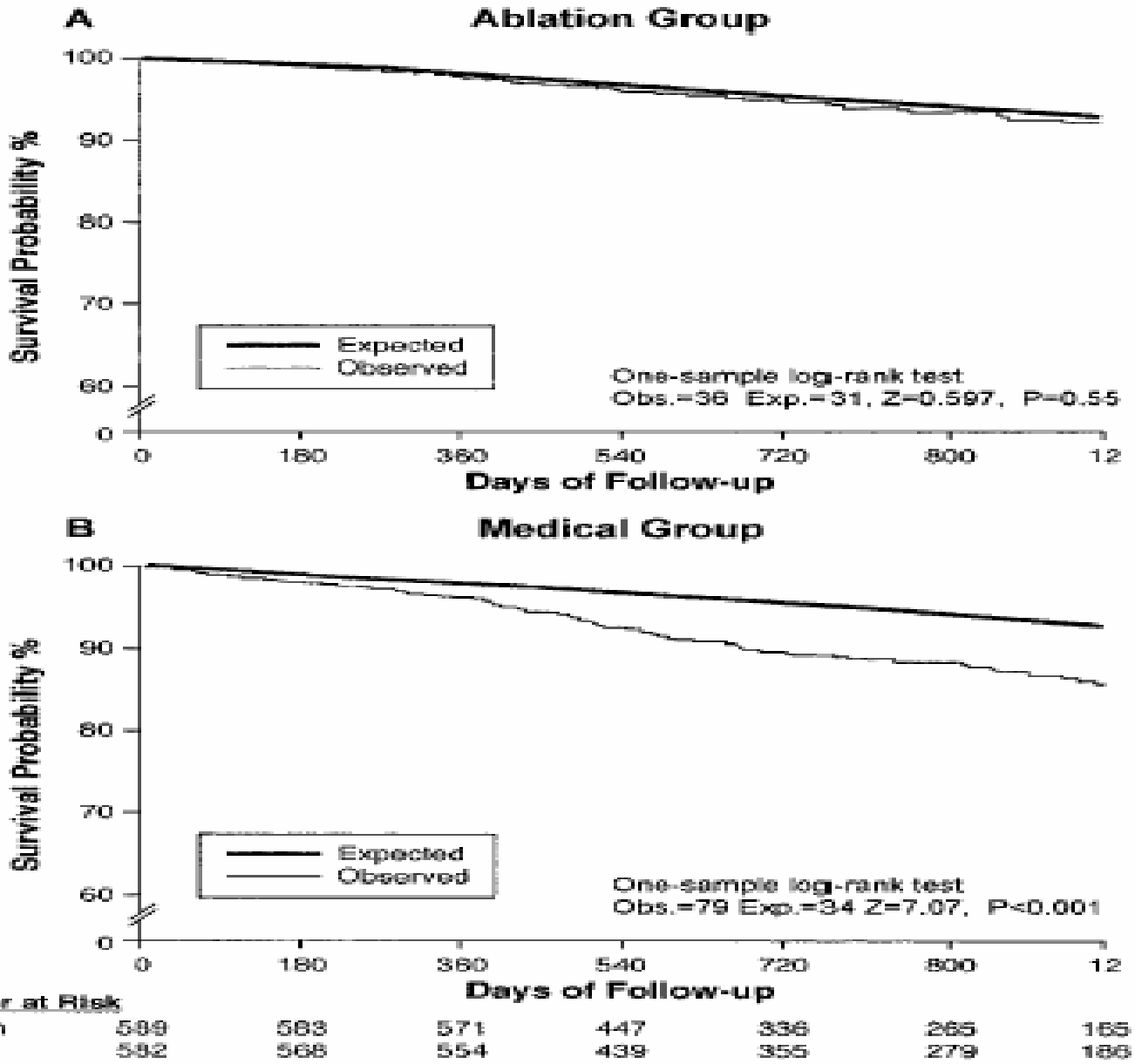
Hemodynamic compromise during good rate control

Younger patients with potential for decades of A Fib

Possible

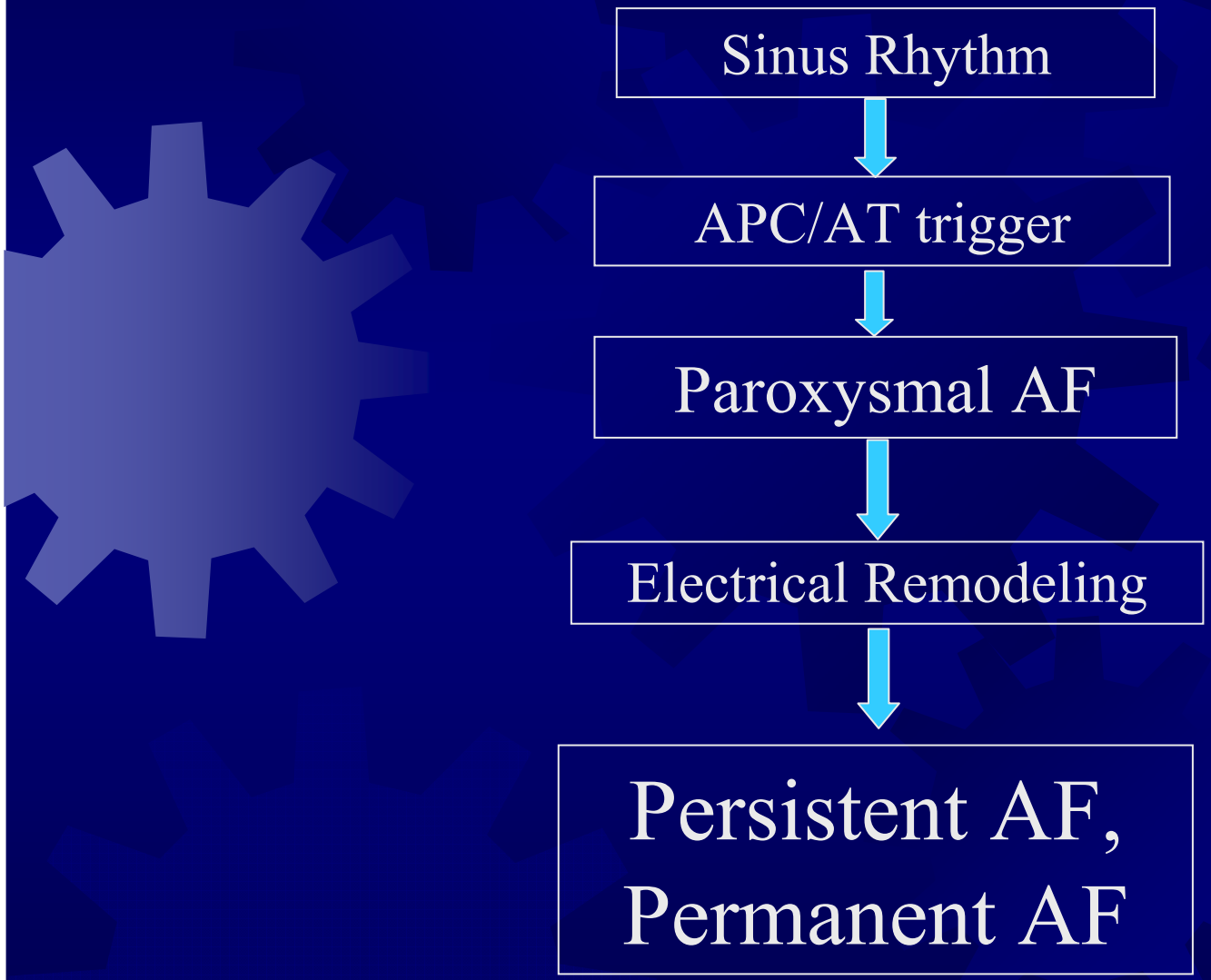
Conditions that predispose to future diastolic compliance problems (e.g. HCM)

"Middle-aged" patients with acceptable symptoms during good rate control



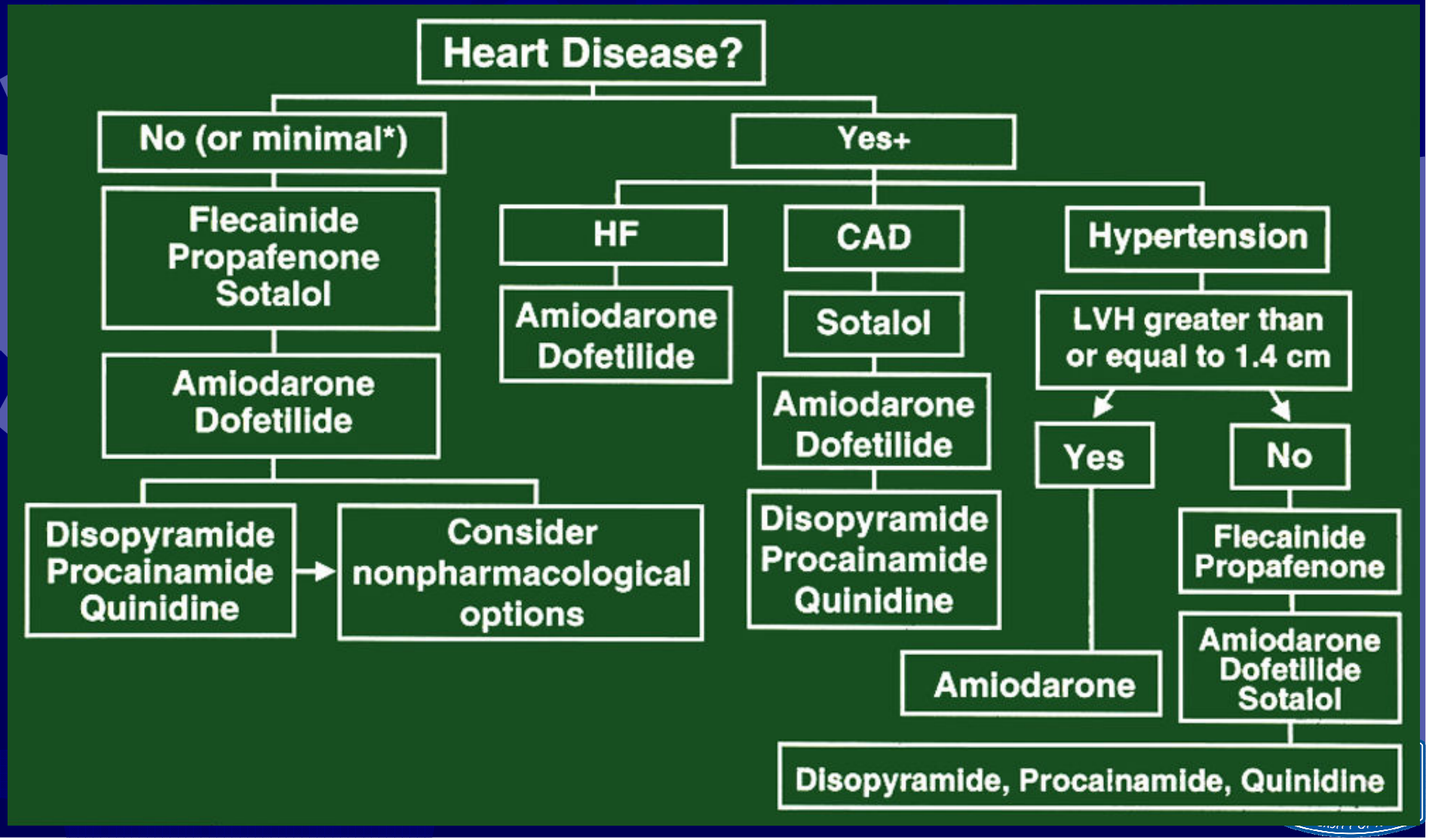
Pappone et al, *J Am Coll Cardiol, 2003*

AF Triggered by APCs Begets AF

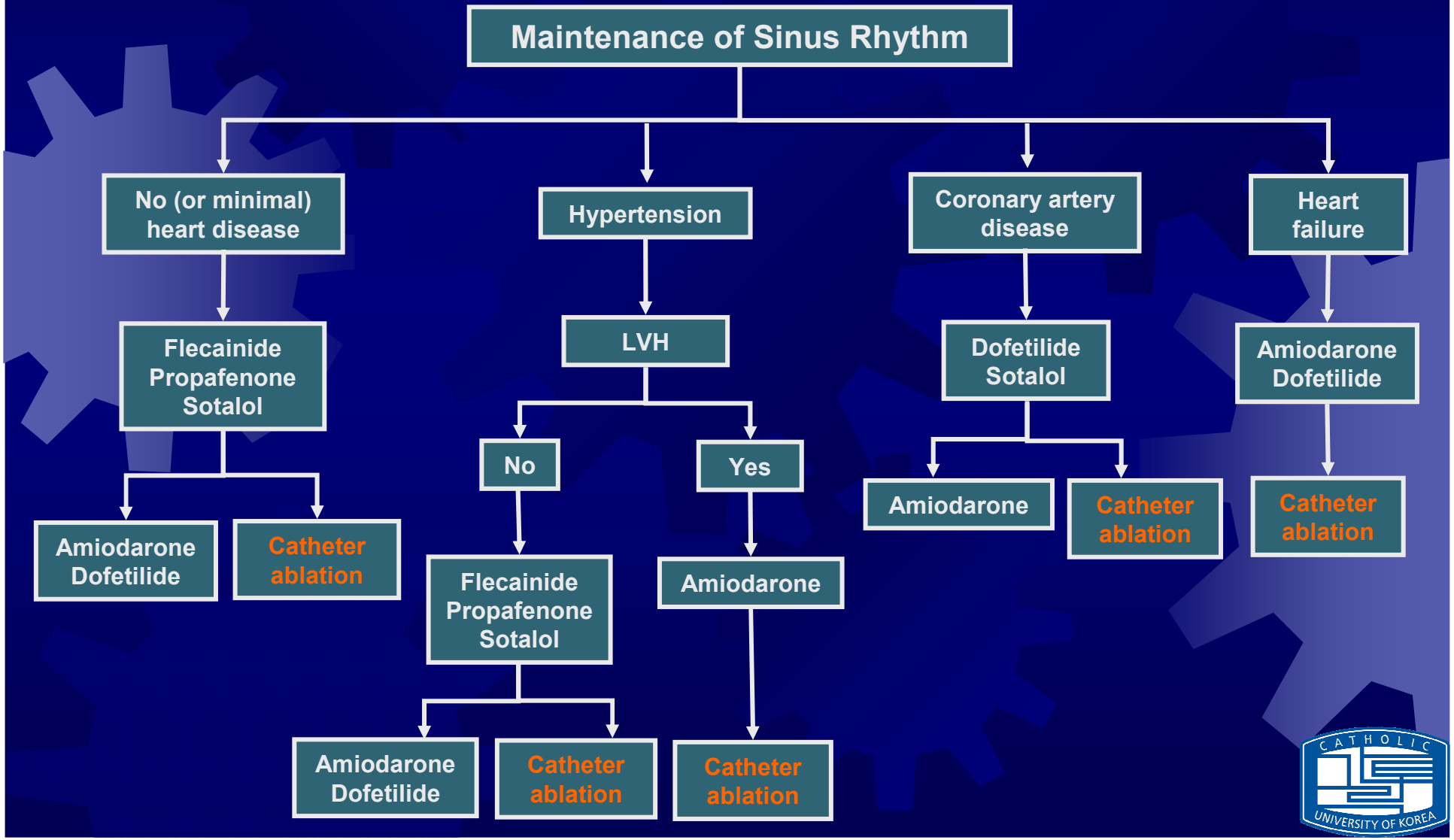


Antiarrhythmic Drug Therapy to maintain Sinus Rhythm in Patients with Recurrent Paroxysmal or Persistent AF

ACC/AHA/ESC Guidelines, 2001



Antiarrhythmic Therapy to Maintain Sinus Rhythm in Patients with Recurrent Paroxysmal or Persistent Atrial Fibrillation



Complications of AF ablation

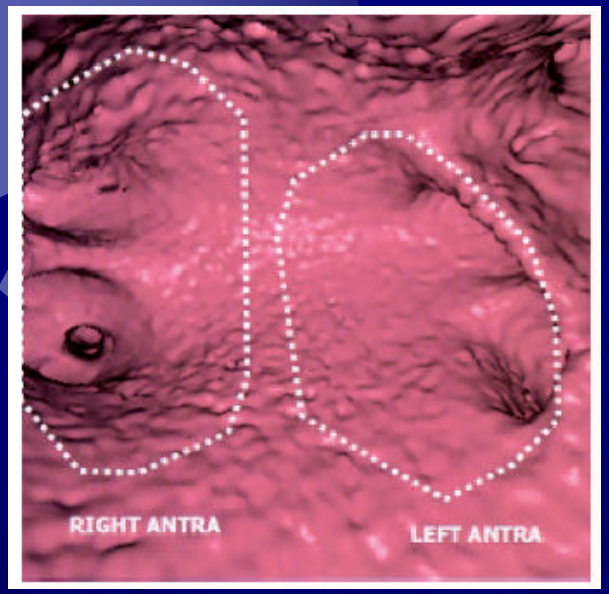
TABLE 2. Complication Rates Compiled From 1033 Patients in the Studies in Table 1

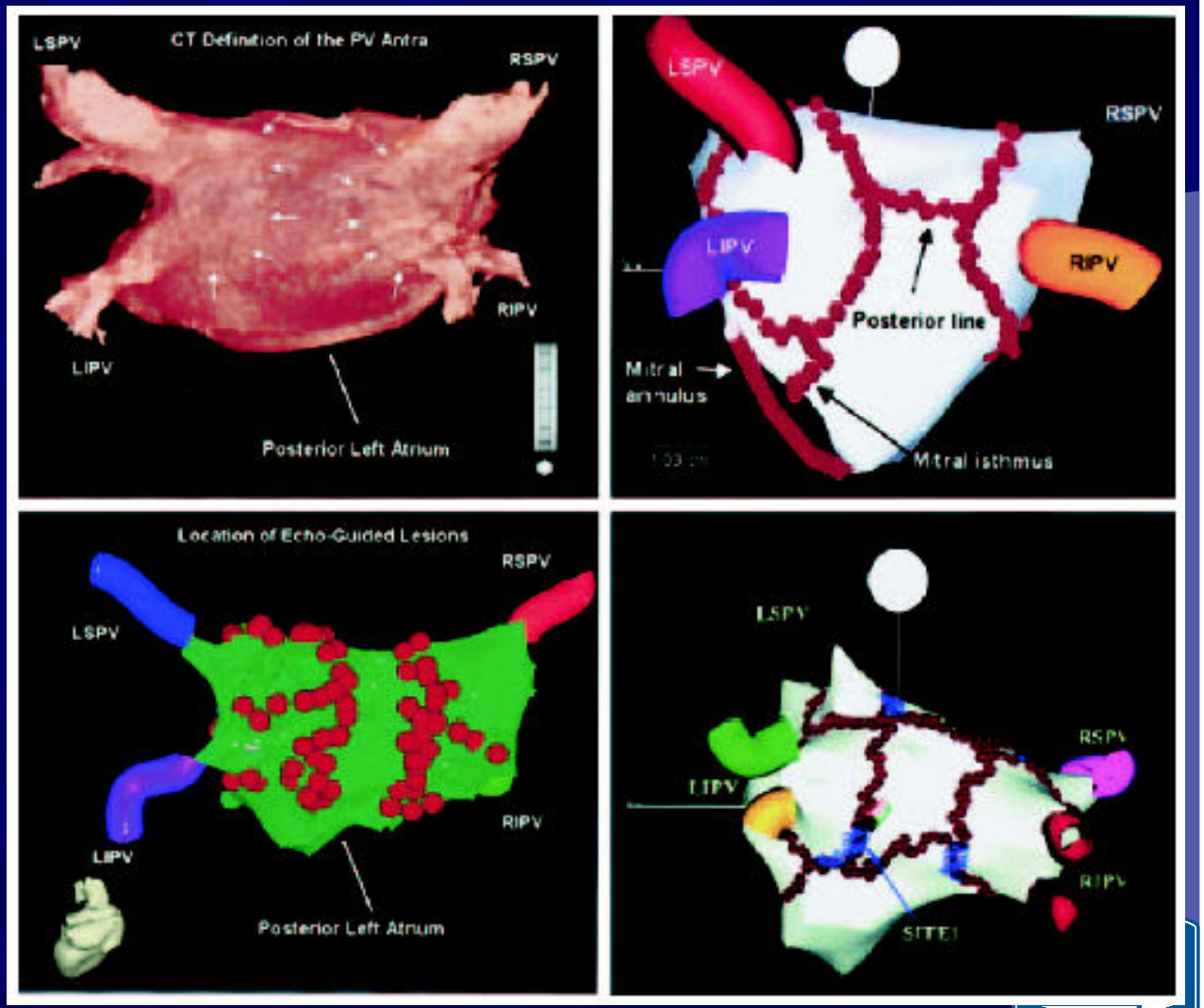
Complication	Events, n	Rate, %	Range in Studies, %
Transient ischemic attack	4	0.4	0–3
Permanent stroke	1	0.1	0–1
Severe PV stenosis (>70%, symptomatic)	3	0.3	0–3
Moderate PV stenosis (40–70%, asymptomatic)	13	1.3	0–5
Tamponade/perforation	5	0.5	0–3
Severe vascular access complication	3	0.3	0–4

- Finta and Haines, from 63 clinical studies

  : cerebrovascular event in average 1.0%, PV stenosis in 0.9%, and atrial macroreentry tachycardia in 29%

Substrate-guided ablation





Study Populations

Characteristics	Pulmonary Vein Isolation Group (n = 33)	Antiarrhythmic Drug Group (n = 37)
Age, mean (SD), y	53 (8)	54 (8)
Left atrial size, mean (SD), cm	4.1 (0.8)	4.2 (0.7)
Duration of atrial fibrillation, mean (SD), mo	5 (2.0)	5 (2.5)
Atrial fibrillation		
Paroxysmal	32 (97)	35 (95)
Persistent	1 (3)	2 (5)
Structural heart disease and hypertension	8 (25)	10 (28)
Left ventricular ejection fraction, mean (SD), %	53 (5)	54 (6)
Use of β-blocker therapy	19 (57)	23 (62)

*Data are presented as No. (%) unless otherwise specified.

Progression of paroxysmal AF to chronic AF

- 30% per year, 60-70% for 6-7 years
- 9-30% per year, 35-60% for 6 years
- 8.6% per year, 24,7% by 5 years,
  63.2% (chronic or recurrent paroxysmal AF)

AF mortality

- Framingham heart study -

Odd ratio for death

- Men : 1.5% (95% C.I.: 1.2 -1.6)
- Women : 1.9% (95 C.I.: 1.5 – 2.2)

Atrial fibrillation : Risk of Increased Mortality AVID registry

- 3762 patients
- Mean follow up : 773 ± 420 days
- 24.4% had history of AF
- AF was an independent predictor of mortality

(relative risk : 1,20, 95% C.I. = 1.03 – 1.40)

Failure of AFFIRM, RACE, or STAF

- Maintenance of sinus rhythm could not be achieved in the long term
- Main modality :
  1. Device based therapy
     - atrial defibrillators : highly effective
       repeated shock make discomfort, intolerant
     - dual-site atrial pacing : failed to demonstrate any reduction in AF burden

2. Antiarrhythmic drugs therapy

(1) Effectiveness

- AFFIRM

  sinus rhythm, 60% in amiodarone, 23% in class I, 38% in sotalol whereas 34.6% in rate control

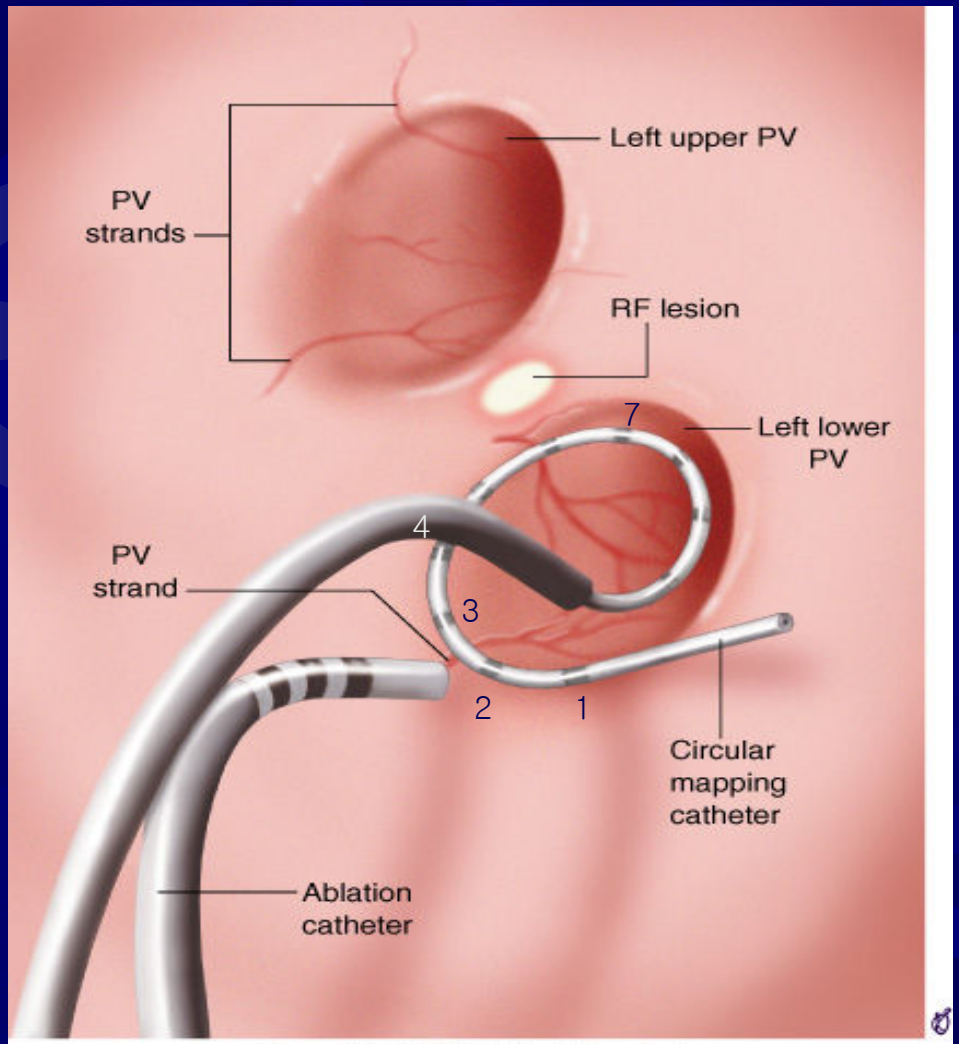
‘ Antiarrhythmic drugs do not cure AF; at best they are palliative treatment.’

(2) Debilitating side effects

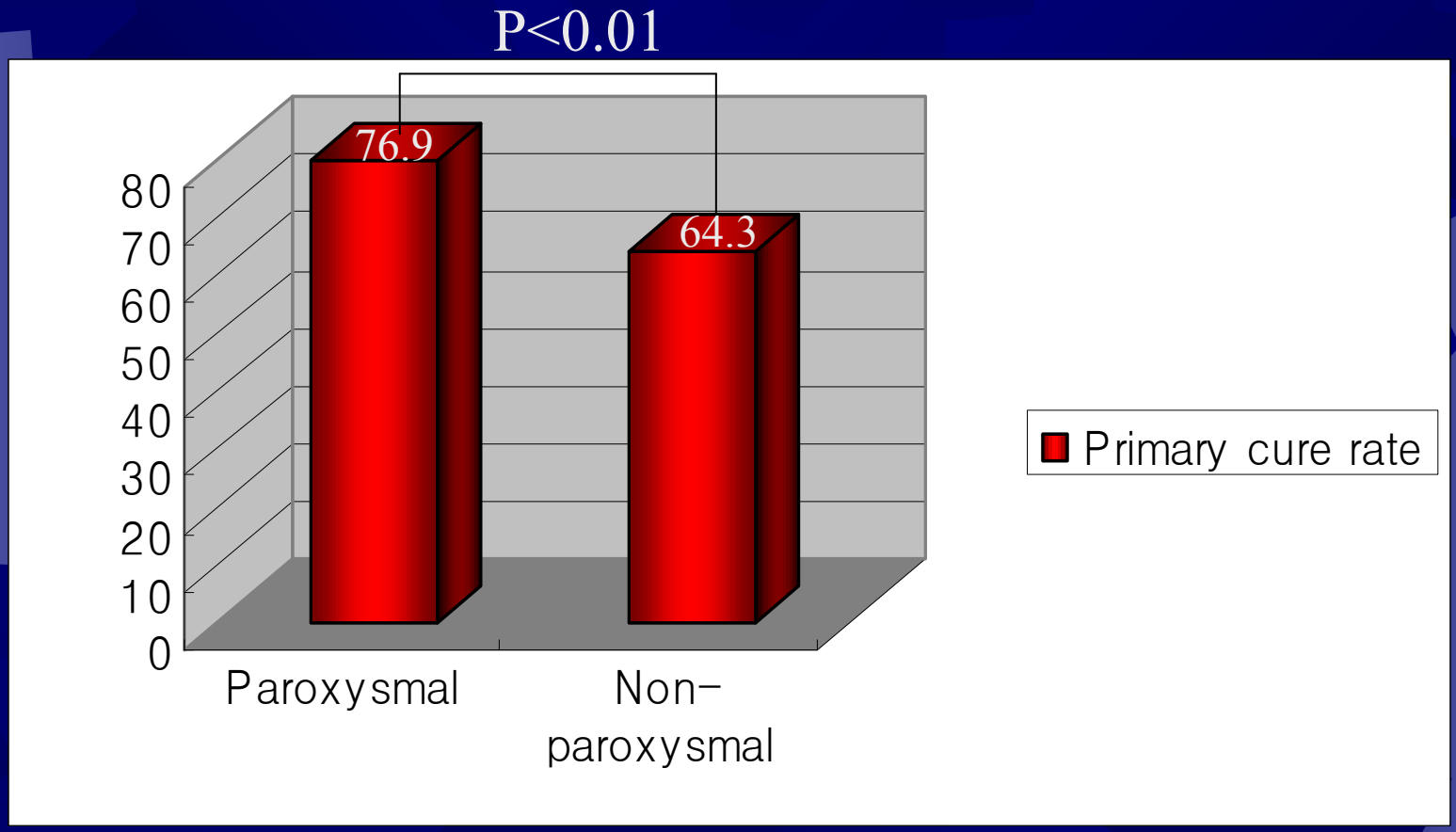
- In AFFIRM, 12.35, 11.1%, and 28.1% of amiodarone, sotalol, and class I agents : had to stop within 1 year
- Antiarrhythmic increased cardiac mortality and arrhythmic death particularly in heart failure patients.

'Efficacy and danger of antiarrhythmic drugs'

Segmental PV ablation



AF ablation Results : PAF vs NPAF



Quality of Life Assessment

Short-Form 36 Subscale	Mean (SD)				Corrected Difference in Mean Change at 6 mo (95% CI)	*P* Value
	Pulmonary Vein Isolation Group (n = 32)		Antiarrhythmic Drug Group (n = 35)			
	Baseline	Follow-up	Baseline	Follow-up		
General health	57 (2)	9 (1)	57 (2)	68 (2)	11 (8 to 14)	<.001
Physical functioning	71 (3)	97 (3)	69 (2)	75 (7.5)	20 (13.2 to 24.2)	.001
Role physical	73 (5)	71 (2)	51 (5)	53 (3)	14.9 (9.9 to 19.9)	.047
Bodily pain	71 (3)	97 (1)	70 (3)	90 (3)	6 (1.5 to 9.5)	.004
Mental health	65 (4)	65 (2)	64 (2)	68 (3)	−4 (−3.5 to −7.5)	.62
Social functioning	78 (3)	93 (3)	76 (3)	82 (2)	9 (7.5 to 11.5)	.004
Role emotional	70 (1)	76 (1)	70 (1)	75 (1)	1 (−4.0 to 4.3)	.90
Vitality	52 (4)	65 (1)	51 (1)	60 (2)	4 (1.7 to 5.7)	.21

Abbreviation: CI, confidence interval.
*Quality of life was assessed using the Medical Outcomes Study 36-item Short-Form health survey (Short-Form 36) and was measured at enrollment and 6-month follow-up visit.

CATHOLIC UNIVERSITY OF KOREA