Current Status of AF Management and the Role of Catheter ablation

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Introduction

Prevalence

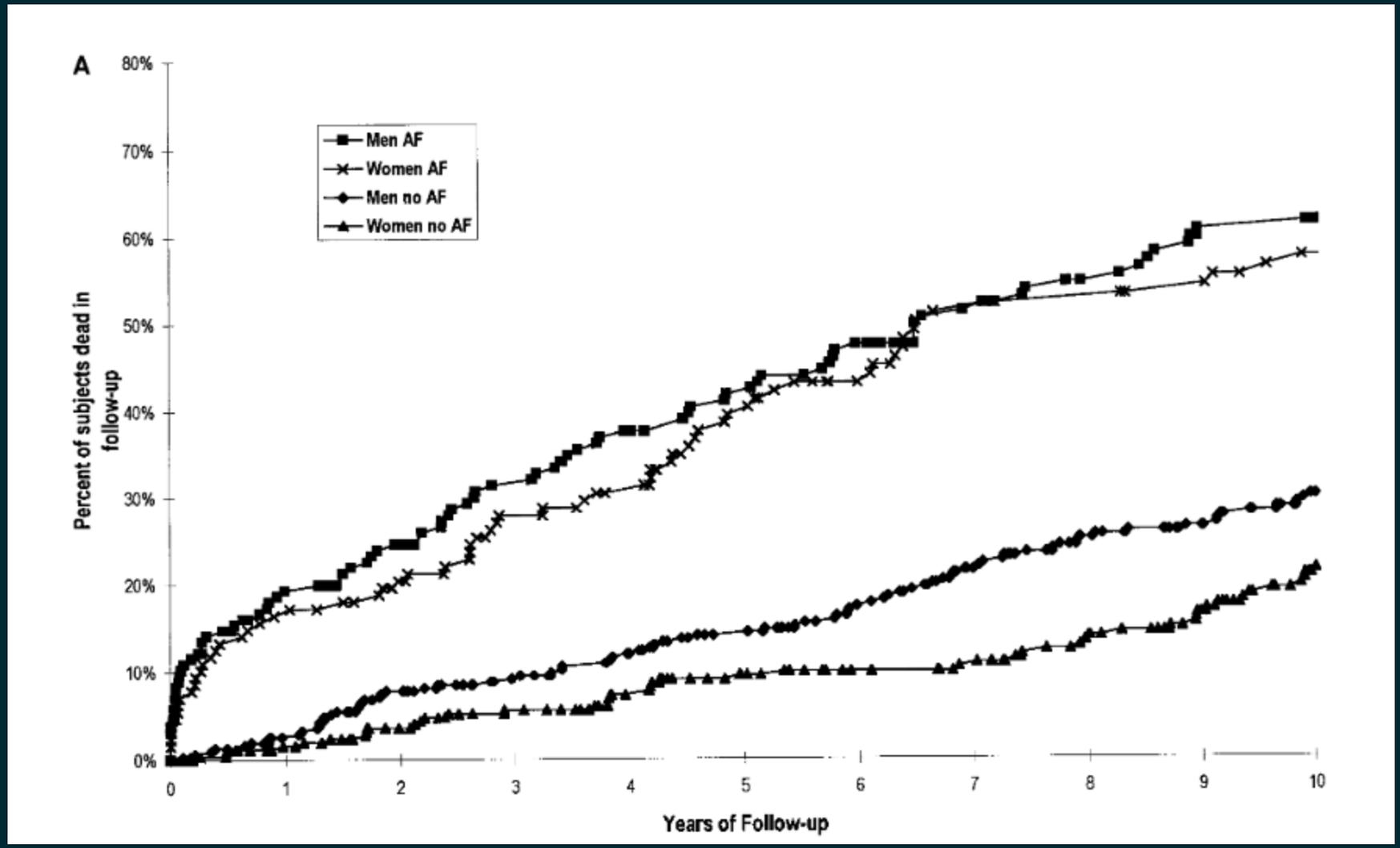
- 3% of adults 20 y of age and older (1)
- Worldwide 20.9 and 12.6 million men and women affected (2)

1. Haim et al. Prospective national study of the prevalence, incidence, management and outcome of a large contemporary cohort of patients with incident non-valvular atrial fibrillation. J Am Heart Assoc 2015; 4 :e001486
2. Chugh et al. Worldwide epidemiology of atrial fibrillation: A Global Burden of Disease 2010 Study. Circulation 2014;129:837 – 847.

Morbidity due to AF

- Cause of 20-30% of all strokes
- LV dysfunction and failure in 20-30%
- Impaired QOL independent of other factors
- Cognitive impairment

AF and mortality



Benjamin et al. Impact of atrial fibrillation on the risk of death: the Framingham Heart Study. Circulation 1998; 98:946 – 952.

Identification of AF

Asymptomatic AF

- Silent AF is common
- 12% in AFFIRM (1)
- At least one third of patients with AF are asymptomatic (2)
- Significant risk of stroke and death

1. Flaker GC, Belew K, Beckman K, Vidaillet H, Kron J, Safford R, Mickel M, Barrell P. Asymptomatic atrial fibrillation: demographic features and prognostic information from the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) study. Am Heart J. 2005;149:657–663.
2. Clinical Relevance of Silent Atrial Fibrillation: Prevalence, Prognosis, Quality of Life, and Management. Journal of Interventional Cardiac Electrophysiology 2000, Volume 4,pp 369–382.

Community level and Opportunistic screening

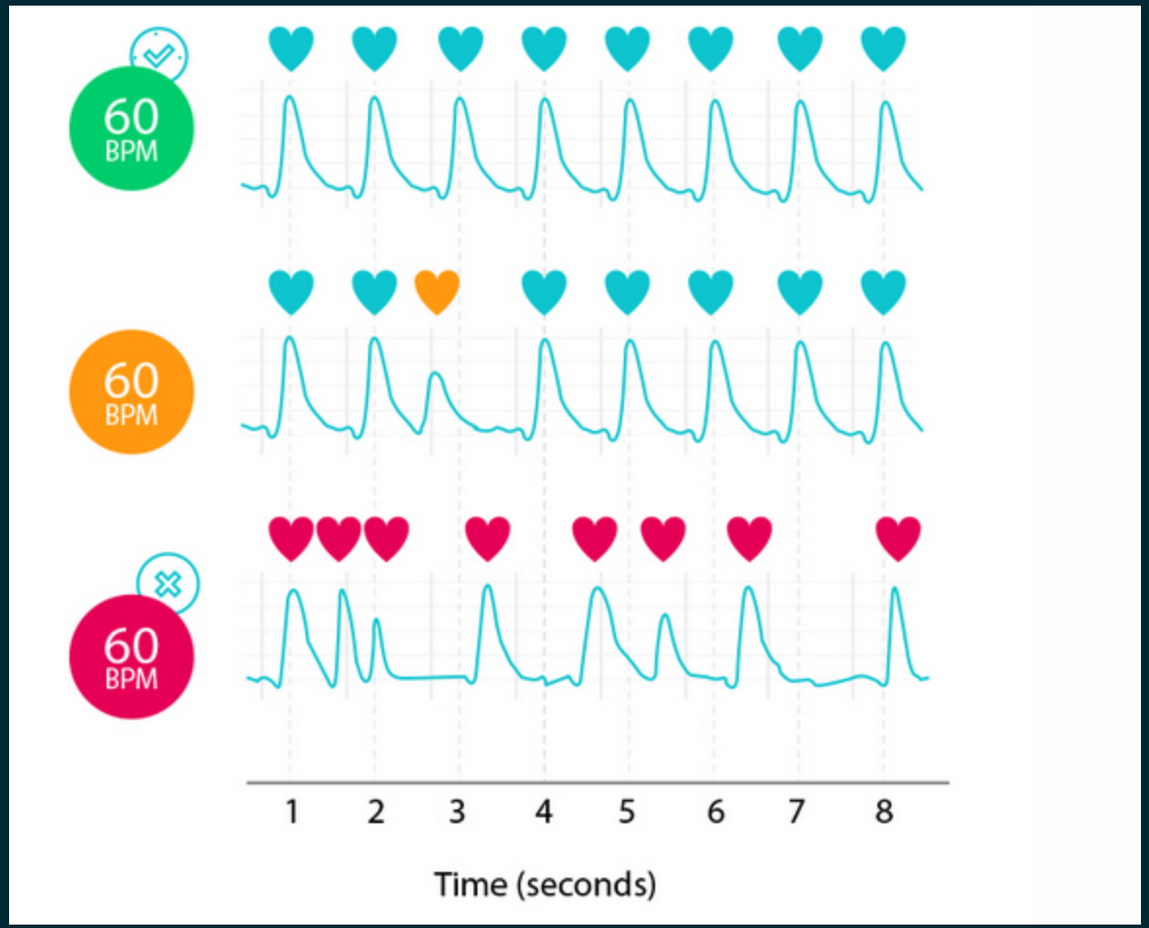
- Target older patients - 65 yrs / 75 yrs
- About 2% of patients above 65 yrs of age
- Short term ECG / pulse palpation / smartphone apps

Smartphone detection of AF

- Using photoplethysmography
- 12,328 patients recruited by newspaper ad
- Two measurements daily for 7 days
- AF identified in 1.1% overall, 11% for those older than 80 yrs

Vandervoort PM. Digital-AF. Late-Breaking Science in Telemedicine. Presented at: European Society of Cardiology Congress; Aug. 25-29, 2018; Munich.

Fibricheck



Device detected AF

- Atrial high rate episodes in pacemakers
- Increased risk of ischemic stroke or systemic embolism (HR 2.49)
- Longer AHRE episodes (5 min)
  - Evaluate for thrombo-embolic risk
  - Evaluate for AF

Stroke survivors

- AF identified by long term rhythm monitoring in 11.5% of patients (1)
- May need prolonged monitoring with loop recorders
- Most useful in cryptogenic stroke
- Prolonged monitoring reasonable in ischemic stroke survivors without known cause

1. Kishore et al. Detection of atrial fibrillation after ischemic stroke or transient ischemic attack: a systematic review and meta-analysis. Stroke 2014; 45:520 – 526

Anticoagulation

Risk estimation

- CHA2DS2-VASc score
- Female sex alone does not confer risk
- OAC for score more than 1 (men) or 2 (women)
- OAC should be considered for risk score of 1 (men) or 2 (women)

Non Vit K antagonist Oral Anticoagulants

- More predictable effect
- In general, similar efficacy to Warfarin in reducing thromboembolic events
- Less bleeding, especially hemorrhagic strokes

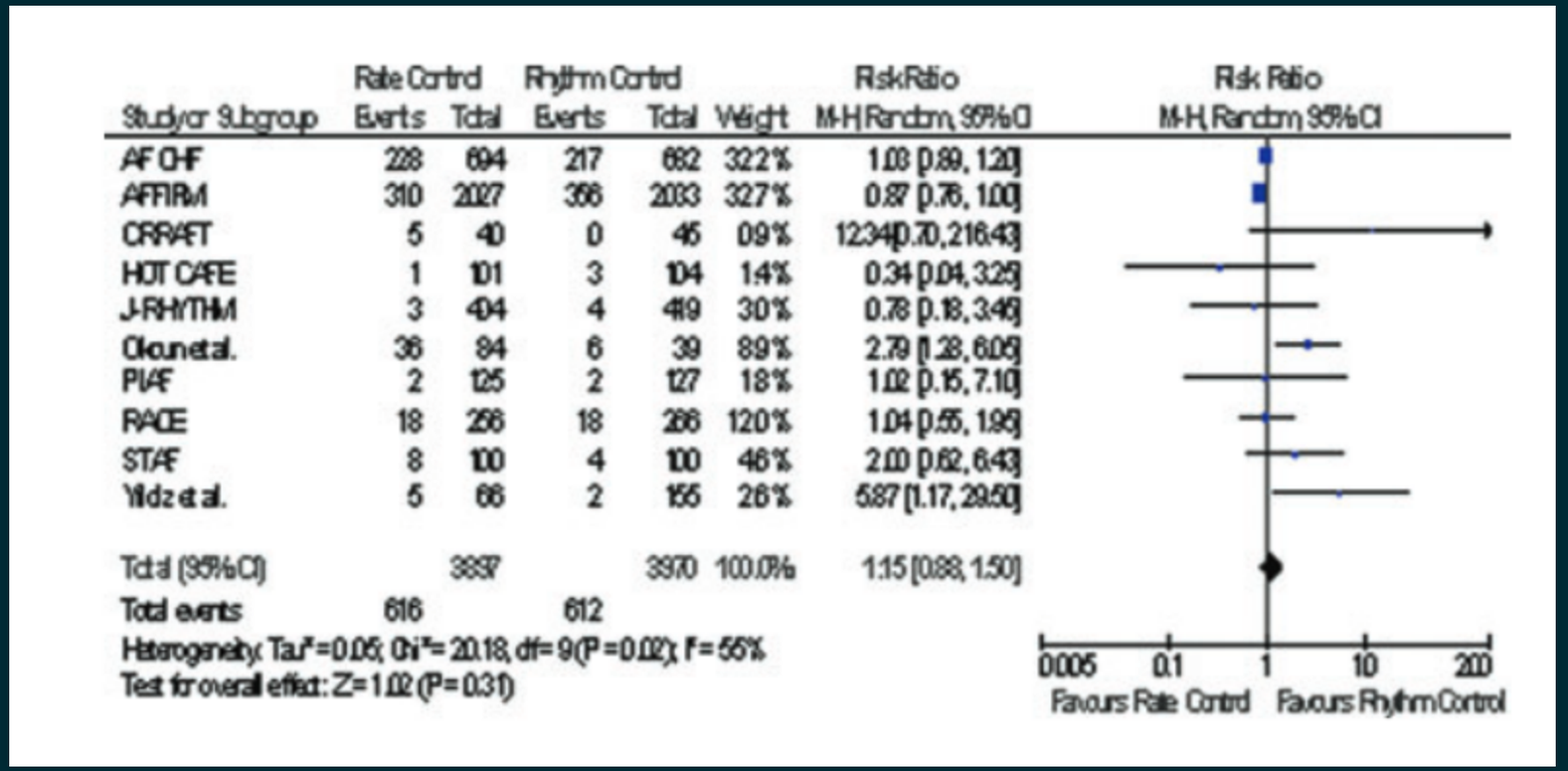
Antiplatelets

- Less effective than Warfarin (1)
- High bleeding risk, equal to Warfarin with dual antiplatelets (2)
- Not recommended

1. Connolly et al. Clopidogrel plus aspirin versus oral anticoagulation for atrial fibrillation in the Atrial fibrillation Clopidogrel Trial with Irbesartan for prevention of Vascular Events (ACTIVE W): a randomised controlled trial. Lancet 2006; 367 :1903 – 1912.
2. Connolly et al. Effect of clopidogrel added to aspirin in patients with atrial fibrillation. N Engl J Med 2009; 360 :2066 – 2078

Living with AF (rate control)

Rate vs rhythm - Metanalysis

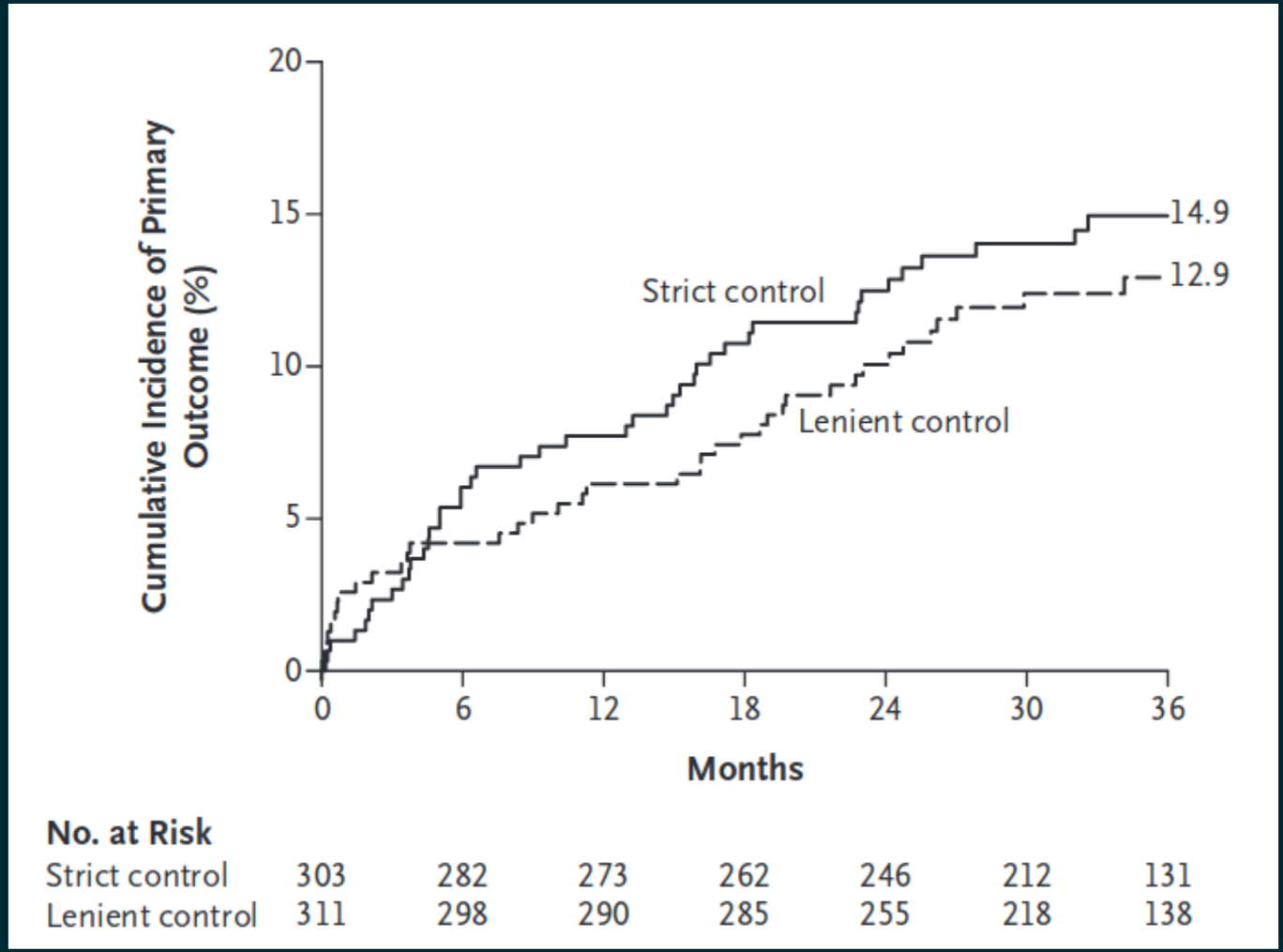


Pharmacologic Rate versus Rhythm-Control Strategies in Atrial Fibrillation: An Updated Comprehensive Review and Meta-Analysis. PACE 2013; 36:122–133

Modified European Heart Rhythm Association symptom scale

Modified EHRA score	Symptoms	Description
I	None	AF does not cause any symptoms
2a	Mild	Normal daily activity not affected by symptoms related to AF[a]
2b	Moderate	Normal daily activity not affected by symptoms related to AF, but patient troubled by symptoms[a]
3	Severe	Normal daily activity affected by symptoms related to AF
4	Disabling	Normal daily activity discontinued

Target for rate control - RACE II



No. at Risk							
Strict control	303	282	273	262	246	212	131
Lenient control	311	298	290	285	255	218	138

Lenient versus Strict Rate Control in Patients with Atrial Fibrillation. N Engl J Med 2010;362:1363-73.

AV node ablation

- Simple method of rate control
- Consider in selected patients
- VVI or CRT pacing depending on LVEF

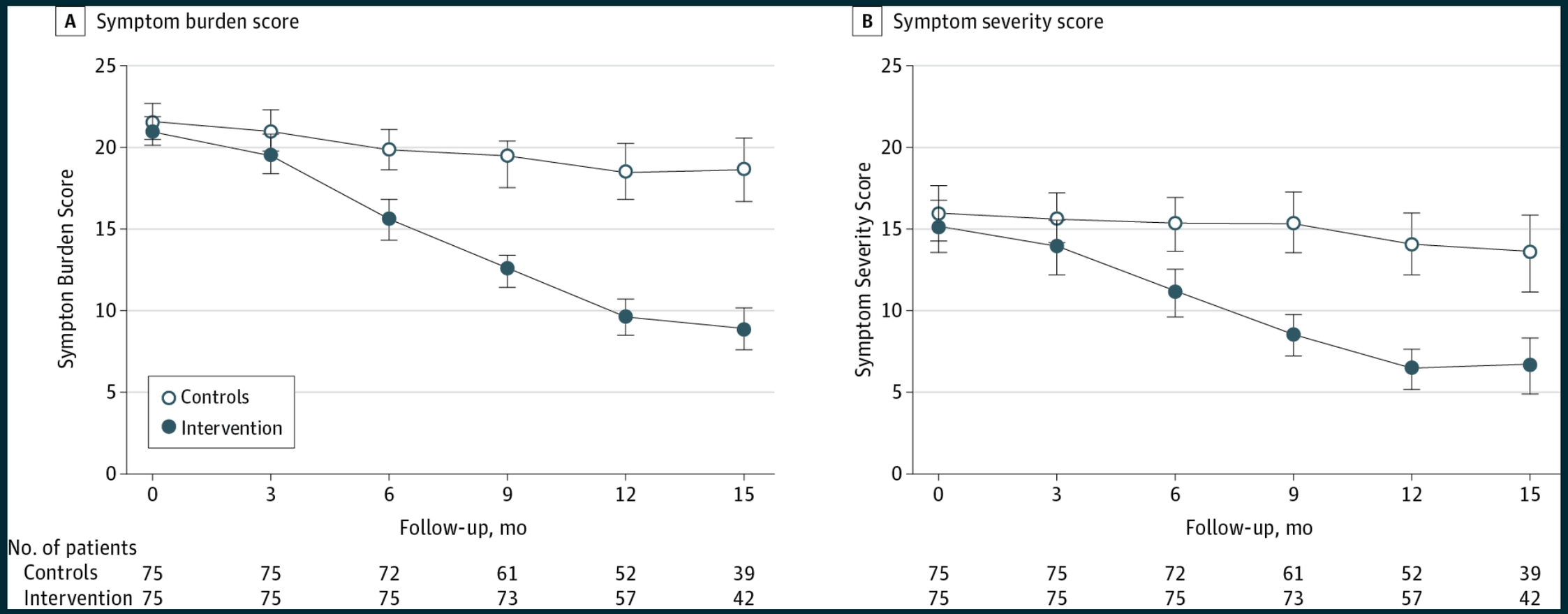
Achieving and maintaining sinus rhythm - Rhythm control

Reversible conditions with AF

- Hypertension (1)
- Thyroid dysfunction
- Obesity (2)
- COPD
- Obstructive sleep apnea
- Smoking
- Alcohol
- Cardiorespiratory fitness (3)

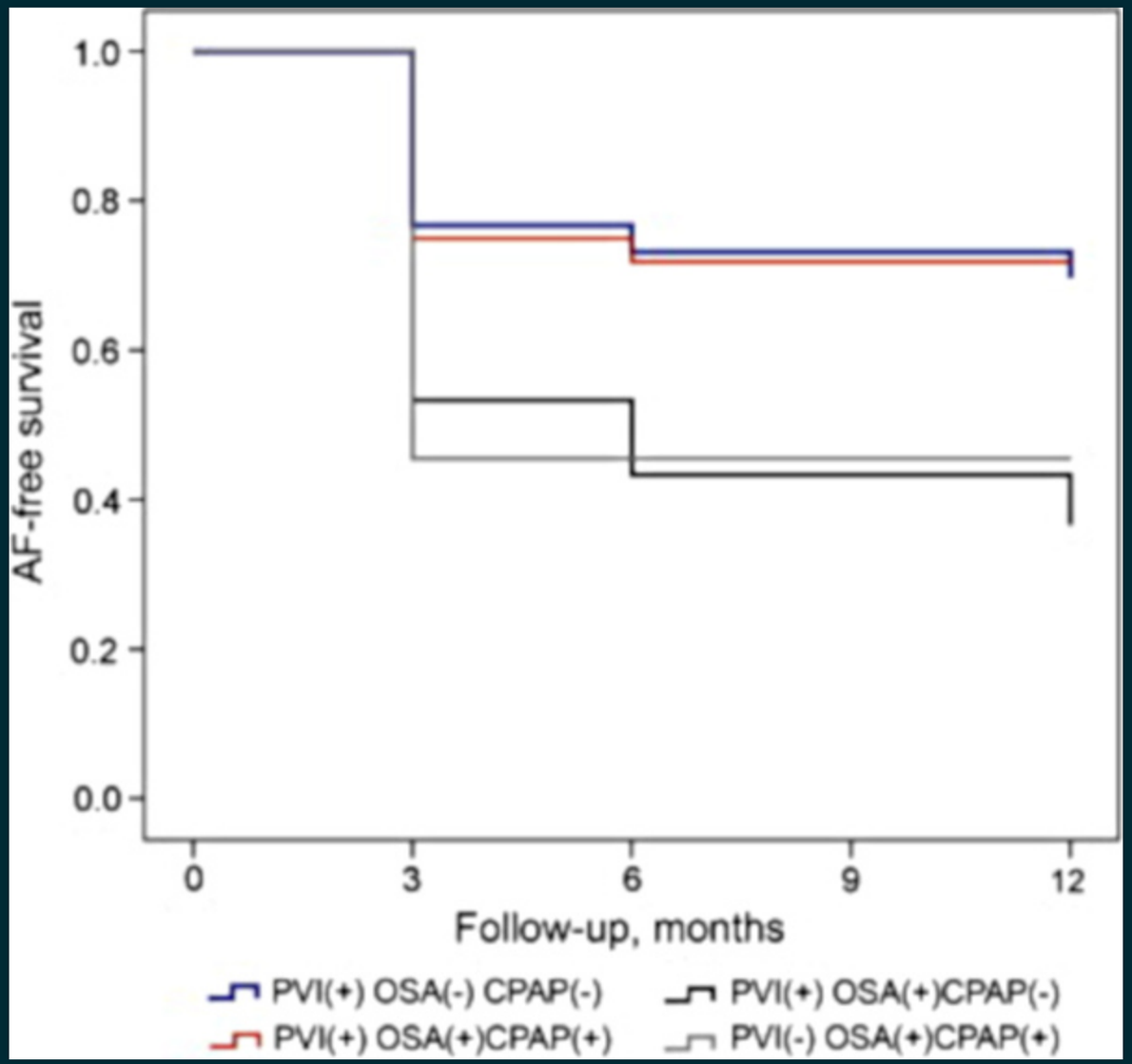
1. Scheider et al. Prevention of Atrial Fibrillation by Renin-Angiotensin System Inhibition: A Meta-Analysis. JACC Volume 55, Issue 21, 25 May 2010, Pages 2299-2307
2. Abed HS et al. Effect of Weight Reduction and Cardiometabolic Risk Factor Management on Symptom Burden and Severity in Patients With Atrial FibrillationA Randomized Clinical Trial. JAMA. 2013;310(19):2050–2060. doi:10.1001/jama.2013.280521
3. Pathak RK et al. Impact of cardiorespiratory fitness on arrhythmia recurrence in obese individuals with atrial fibrillation: The CARDIO-FIT study. J Am Coll Cardiol 2015; 10.1016/jack.2015.06.488

Weight reduction in AF



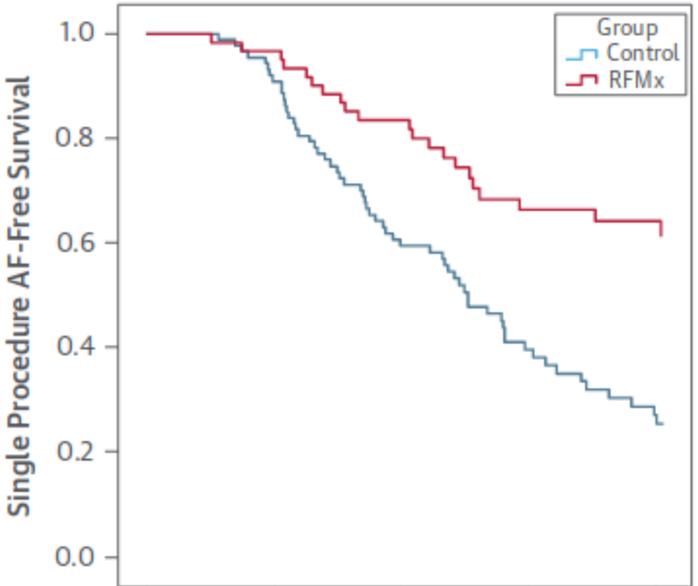
Abed HS et al. Effect of Weight Reduction and Cardiometabolic Risk Factor Management on Symptom Burden and Severity in Patients With Atrial FibrillationA Randomized Clinical Trial. JAMA. 2013;310(19):2050–2060. doi:10.1001/jama.2013.280521

OSA treatment and PVI outcomes

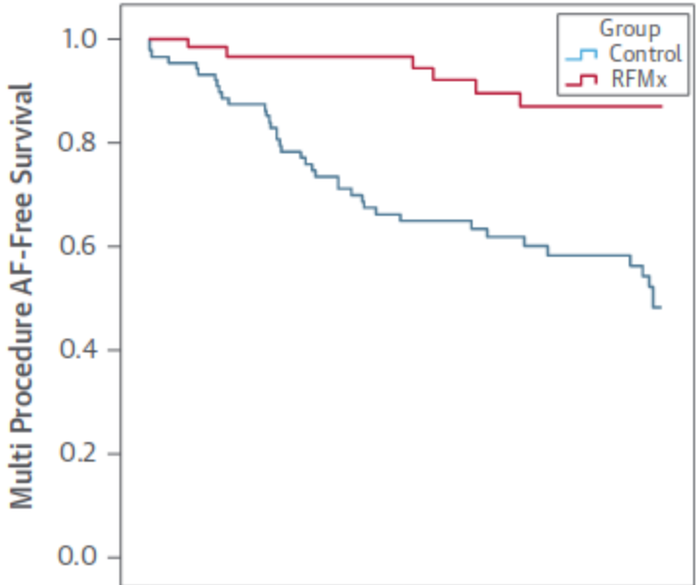


Treatment of Obstructive Sleep Apnea Reduces the Risk of Atrial Fibrillation Recurrence After Catheter Ablation. Journal of the American College of Cardiology Volume 62, Issue 4, 23 July 2013, Pages 300-305

Risk factor management and outcomes in AF ablation



Time (days)	0	180	360	540	730
RFM	61	59	48	33	27
Control	88	79	51	28	16



0	180	360	540	730
61	55	46	32	25
88	72	51	36	23

Pathak, R. K. Aggressive risk factor reduction study for atrial fibrillation and implications for the outcome of ablation: The ARREST-AF cohort study. JACC 2014, 64(21), 2222-2231. DOI: 10.1016/j.jacc.2014.09.028

Anti-arrhythmic Drugs

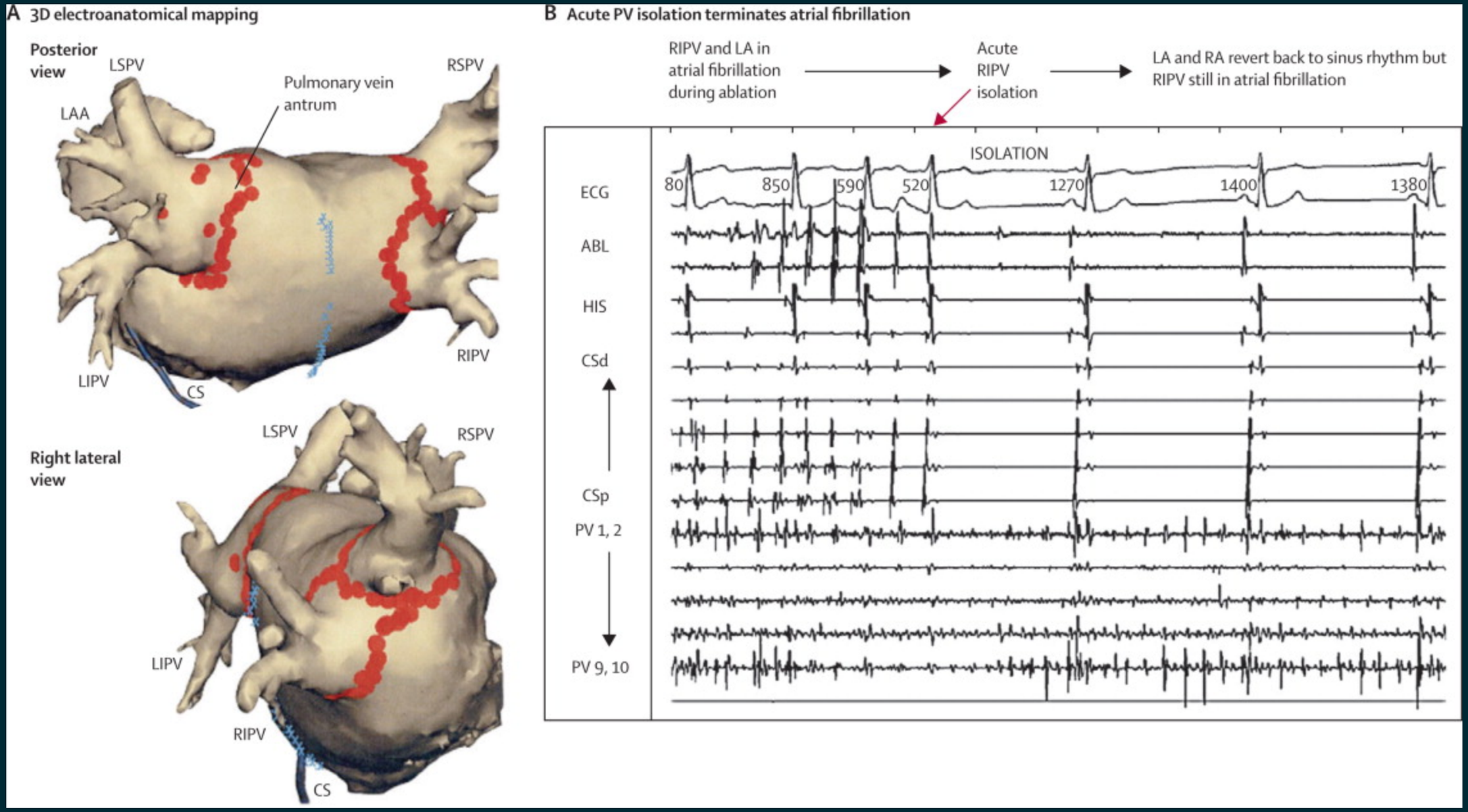
- Ibutilide - For acute conversion
- Flecainide
  - Long term treatment in structurally normal heart
  - Pill in pocket approach
  - Loading / establishment of safety in hospital

Catheter Ablation of AF

Technique

- Pulmonary vein isolation at atrial level
- Extended ablation - insufficient data, higher risk
  - Additional lines
  - CFAE ablation
  - "Rotor" ablation

Pulmonary vein isolation



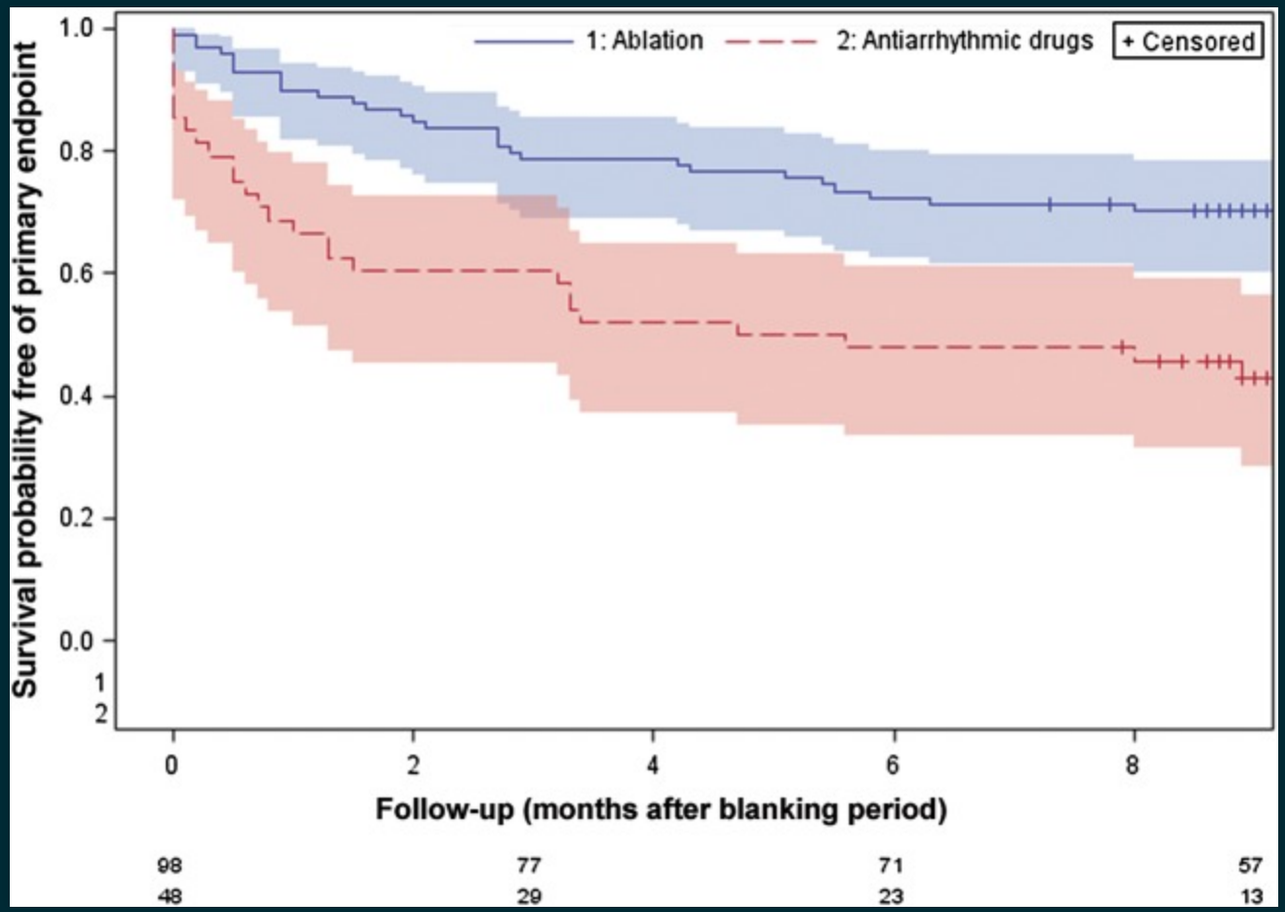
Paroxysmal AF - Ablation as initial strategy (vs class Ic / III drugs)

- Somewhat better than drugs
- Freedom from AF at 2 yrs - 85% / 71%
- 146 patients - 1 death (procedure related stroke), 3 tamponade

Nielsen. MANTRA PAF - Radiofrequency ablation as initial therapy in paroxysmal atrial fibrillation. N Engl J Med. 2012 Oct 25;367(17):1587-95

MANTRA PAF. Small difference in outcomes. Worth the complication rate?

Ablation vs drugs for persistent AF



Mont L … Brugada J; SARA investigators. Catheter ablation vs. antiarrhythmic drug treatment of persistent atrial fibrillation: a multicentre, randomized, controlled trial (SARA study). Eur Heart J. 2014 Feb;35(8):501-7. doi: 10.1093/eurheartj/eht457

Rhythm control - will ablation make a difference?

- EAST AFNET
  - Will early comprehensive rhythm control improve outcomes
  - Recruitment completed in 2016
- CABANA (1)
  - Ablation vs drug therapy for new onset AF
  - No difference in outcomes at 5 years (death / stroke)

Presented at ESC congress and HRS 2018

What to expect

- Most patients require more than one procedure
- Freedom from severe symptomatic AF recurrence
  - Paroxysmal AF - 70%
  - Persistent AF - 50%
- Severe complications - 5-7% (1)
- Does not reduce thrombo-embolic risk
- Shared, informed decision making

Cappato et al. Updated Worldwide Survey on the Methods, Efficacy, and Safety of Catheter Ablation for Human Atrial Fibrillation. Circ Arrhythm Electrophysiol. 2010;3:32-38

AF and heart failure

AF with HFrEF

- Beta blockers / Digoxin for rate control
- CRT candidates benefit with AV nodal ablation
- AF ablation may be beneficial (1)

1. A randomized trial to assess catheter ablation versus rate control in the management of persistent atrial fibrillation in heart failure. J Am Coll Cardiol 2013; 61 :1894 – 1903.

AF Ablation in HFrEF

- Technically more demanding
- Reduces AF recurrence (1)
- Improves outcomes (2)
- May improve LV function

1. Ablation vs. Amiodarone for Treatment of Persistent Atrial Fibrillation in Patients With Congestive Heart Failure and an Implanted Device: Results From the AATAC Multicenter Randomized Trial. Circulation ; doi:10.1161/CIRCULATIONAHA.115.019406 .
2. CASTLE-AF Investigators. Catheter Ablation for Atrial Fibrillation with

Heart Failure. N Engl J Med. 2018 Feb 1;378(5):417-427

Tachycardia induced cardiomyopathy

- Arrhythmia in first reported case in 1913
- Heart failure / LV dysfunction often attributed to other causes
- Irregularity of response may contribute ?
- High index of suspicion to diagnose
- LVEDD < 66 may predict TIC (1)
- Rhythm control strategy preferred in tachycardiomyopathy

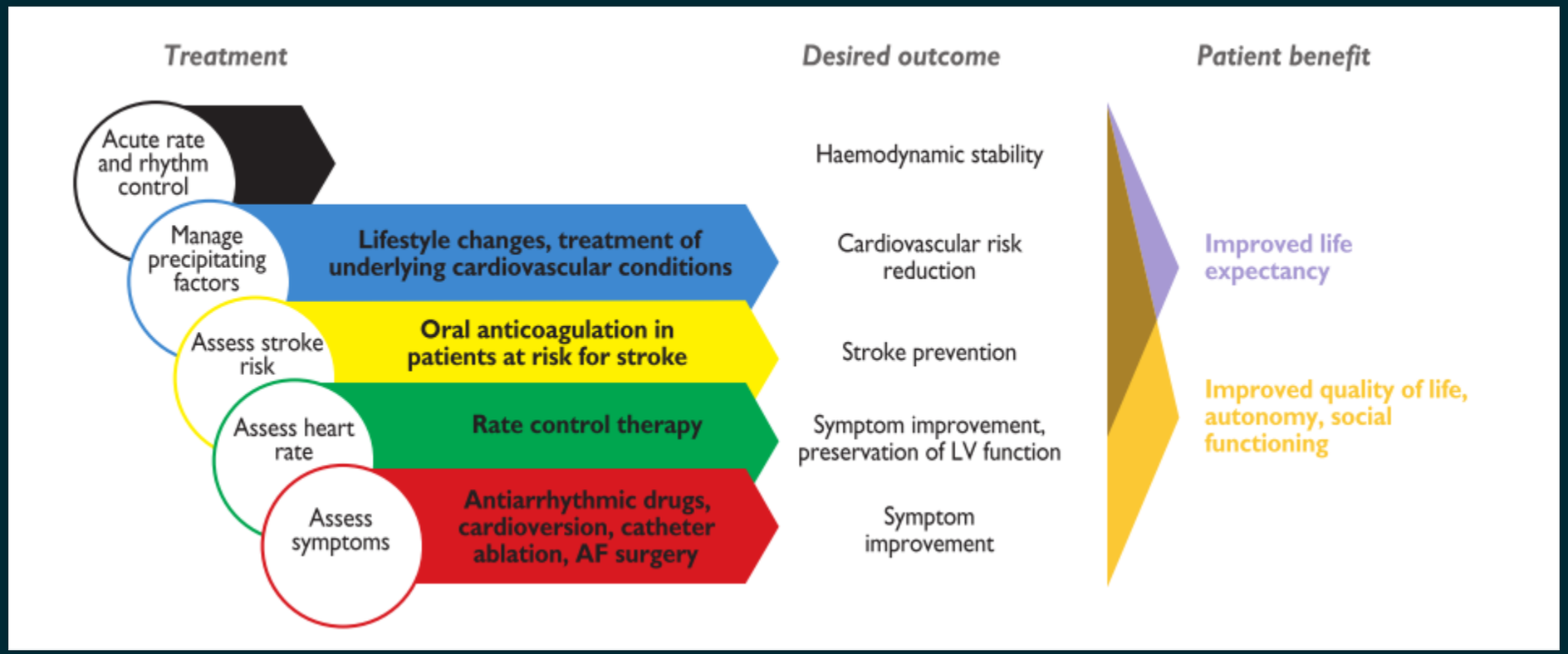
1. Jeong YH et al. Diagnostic approach and treatment strategy in tachycardia-induced cardiomyopathy. Clin Cardiol. 2008;31:172–178

Integrated AF management

Integrated management approach

- Multidisciplinary AF team (AF Heart team)
- Role for non-specialists
- Patient involvement
- Structured follow up

Integrated management



Goal based management

Table 10 Goal-based follow-up

Category	Intervention	Follow-up aspects	Performance indicator (examples)
Prognostic	Comorbidity control (relevant examples given)	Obesity Arterial hypertension Heart failure Coronary artery disease Diabetes Valvular heart disease	Weight loss Blood pressure control Heart failure therapy and hospitalizations Statin and antiplatelet therapy; revascularization Glycaemic control Valve repair or replacement
Prognostic	Anticoagulation	Indication (risk profile; timing, e.g. post-cardioversion). Adherence (NOAC or VKA) and INR (if VKA). NOAC dosing (co-medications; age; weight; renal function).	Stroke Bleeding Mortality
Mainly symptomatic Partly prognostic	Rate control	Symptoms Average resting heart rate <110 bpm	Modified EHRA score Heart failure status LV function Exercise capacity Hospitalization Therapy complications
Symptomatic at present	Rhythm control	Symptoms vs. side effects Exclusion of pro-arrhythmia (PR; QRS; QTc interval)	
Relevant for implementation of therapy and adherence	Patient education and self-care capabilities	Knowledge (about disease; about treatment; about management goals) Capabilities (what to do if…)	Adherence to therapy Directed evaluation, preferably based on systematic checklists
Relevant for chronic care management	Caregiver involvement	Who? (spouse; GP; home nurse; pharmacist) Clearly spelling out participation roles Knowledge and capabilities	Directed evaluation of task performance (e.g. via patient card) Dispensed medication Log of follow-up visits

Summary

- AF is a disease with a multifactorial pathogenesis
- Needs a multi-pronged approach to treatment
- Integrated management with team approach
- Lifestyle and drug management are still key
- Ablation has a role in selected patients