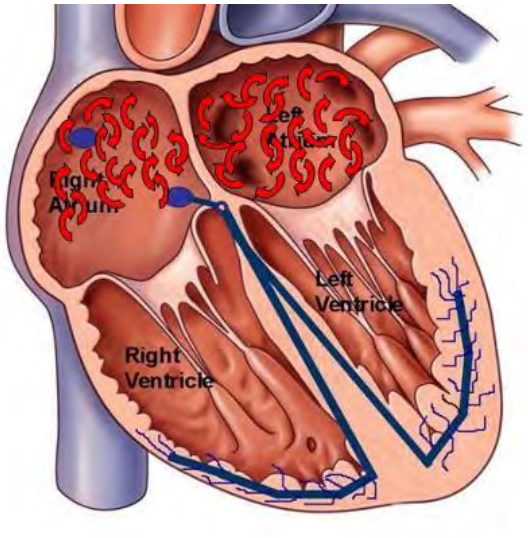
Fibrillation auriculaire: quelle prise en charge en 2022?

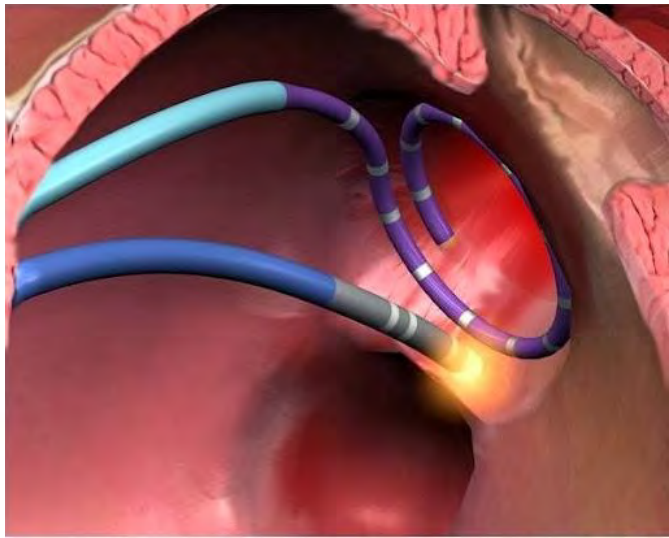
Dr Patrice Carroz

Médecin agréé Hôpital de Sion – Hôpital Riviera Chablais - CHUV

patrice.carroz@hopitalvs.ch

10 mars 2022





Epidemiology

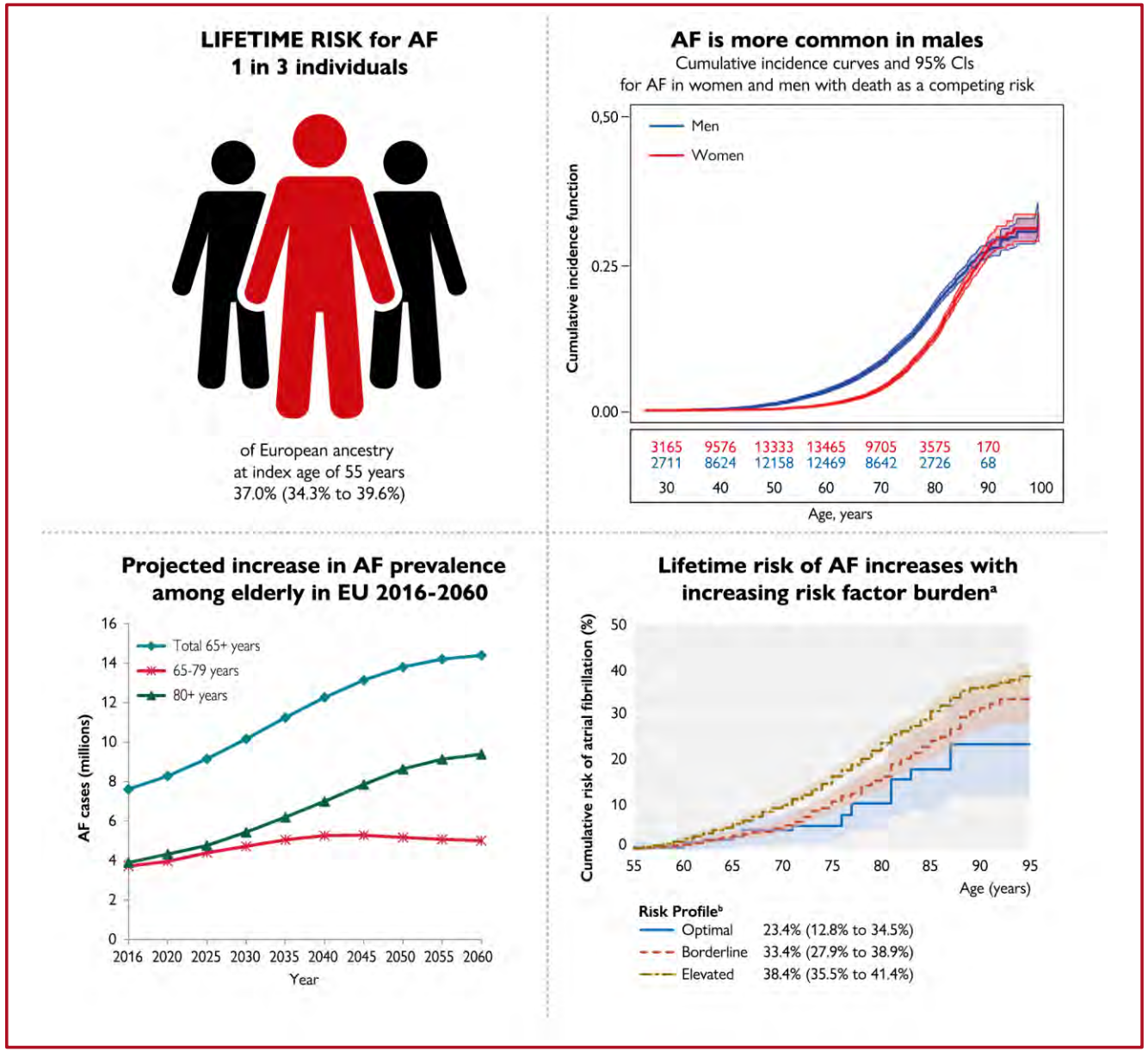


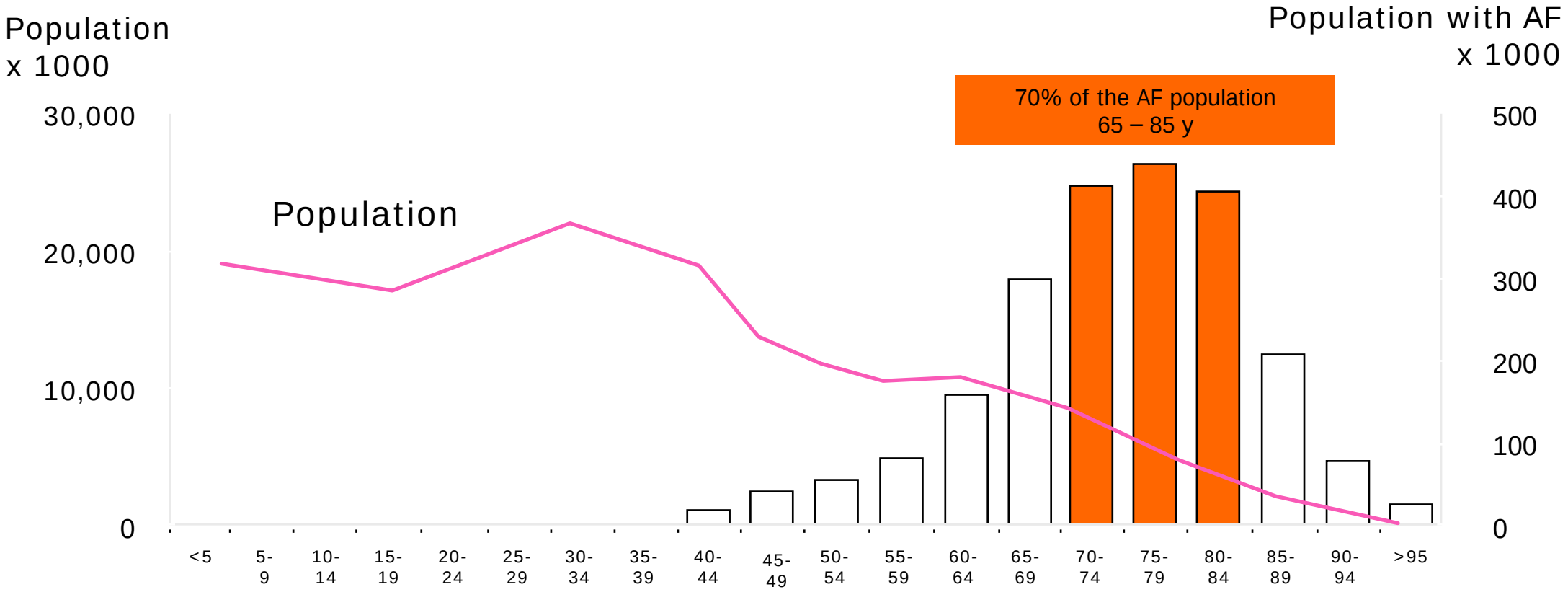
Figure 2 (2)

Epidemiology of AF: lifetime risk and projected rise in the incidence and prevalence

[a]Smoking, alcohol consumption, body mass index, BP, diabetes mellitus (type 1 or 2), and history of myocardial infarction or heart failure. [b]Risk profile: *optimal* – all risk factors are negative or within the normal range; *borderline* – no elevated risk factors but >1 borderline risk factor; *elevated* – >1 elevated risk factor.

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

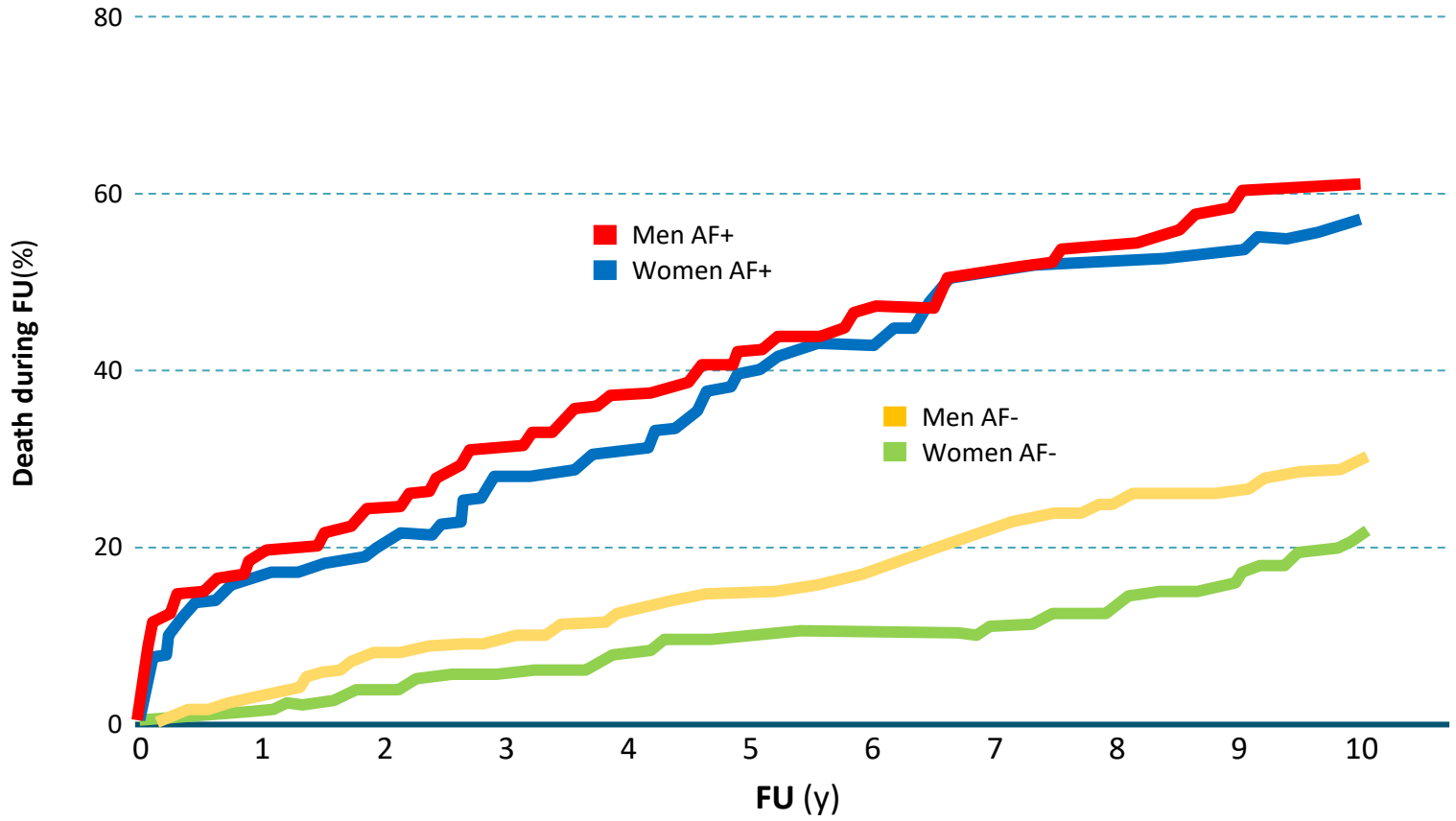
Prevalence, Age distribution and Gender of patients with AF



- Based on data from 4 large population-based studies (PAF + sustained AF)
- Median age of pts with AF = 75 y old
- AF present in 2.3% of > 40 y, and 5.9% > 65 y old $\Rightarrow$ 2.3×10^6 in the US
- 50% of AF population is >75 y and 32% > 80 y old

Feinberg WM et al. AIM 1995;155:469-73

AF and Mortality



Framingham. Benjamin et al. Circulation 1998;98:946-952

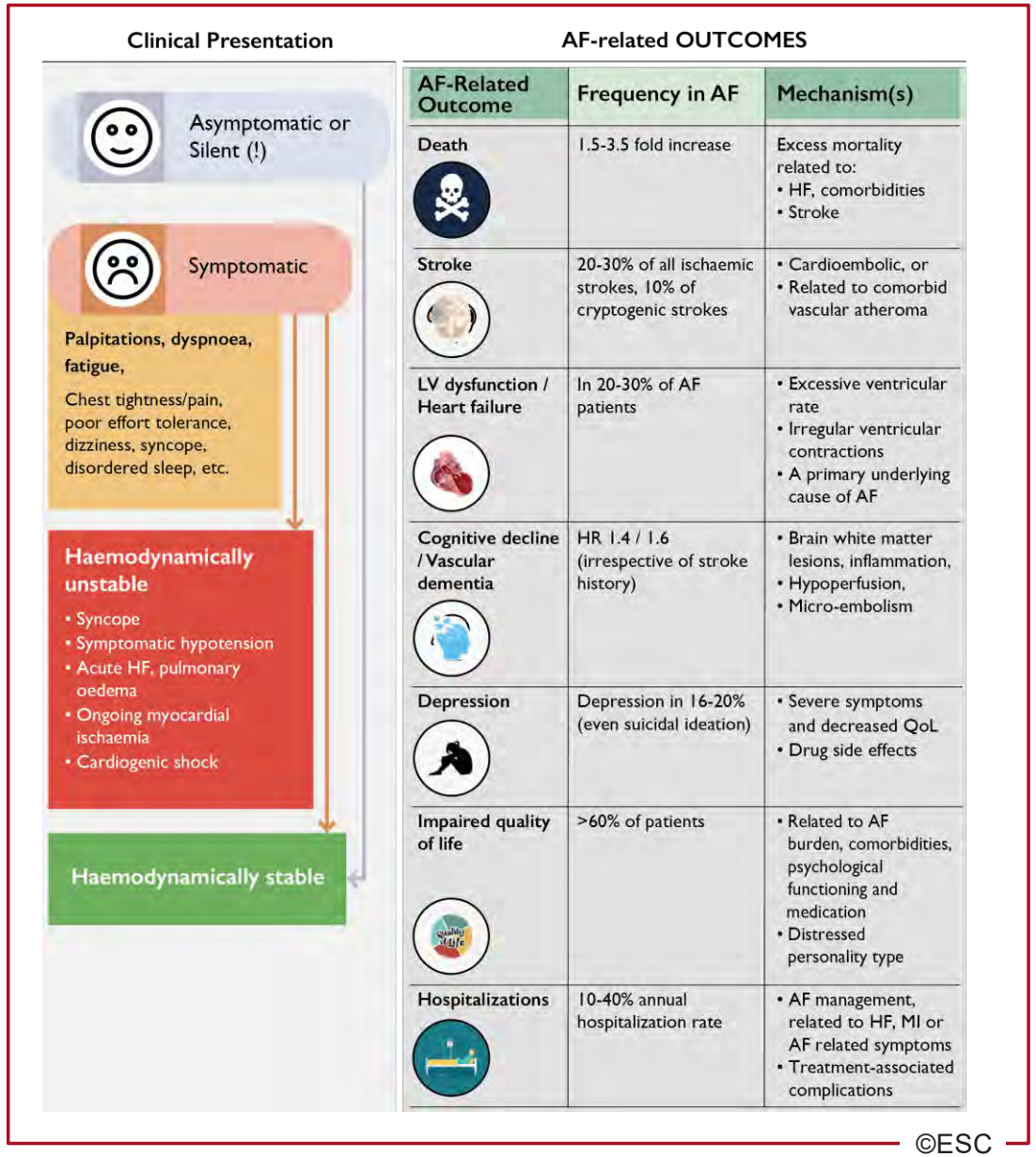


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Figure 4 Clinical presentation of AF and AF-related outcomes

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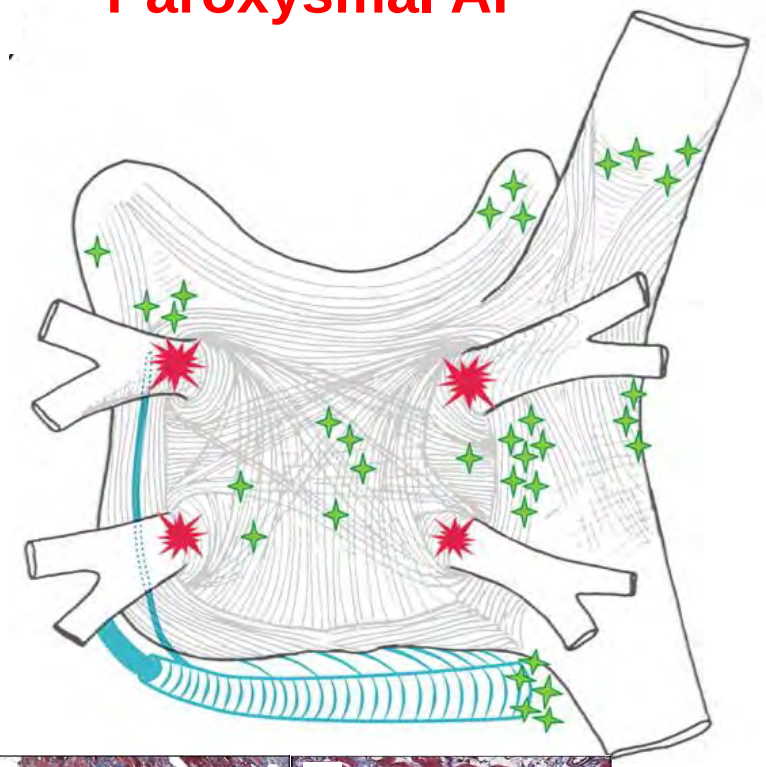
Pathophysiology and mechanism of AF

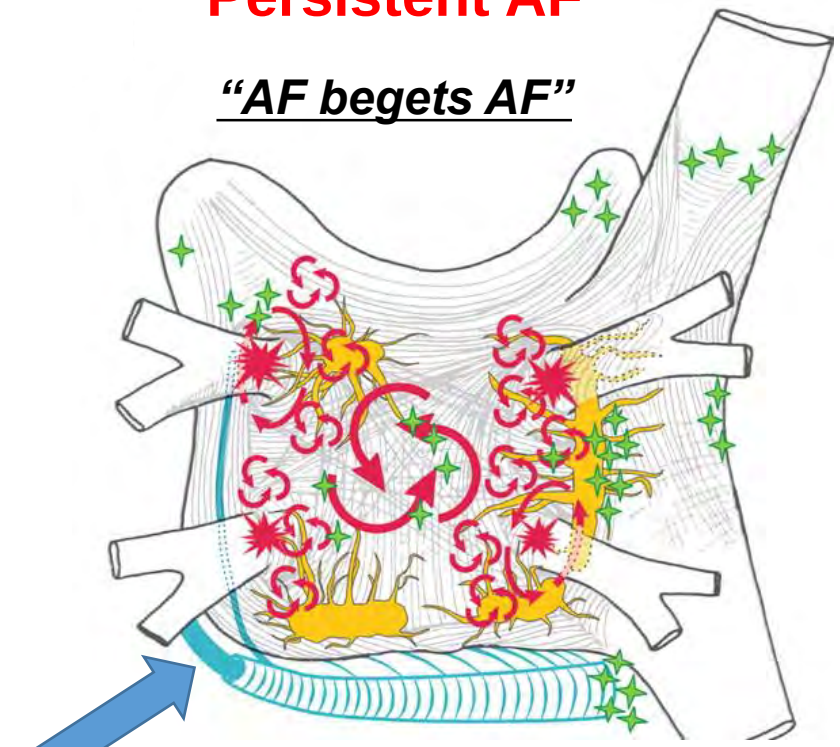
Different Mechanism of Paroxysmal AF vs Persistent AF

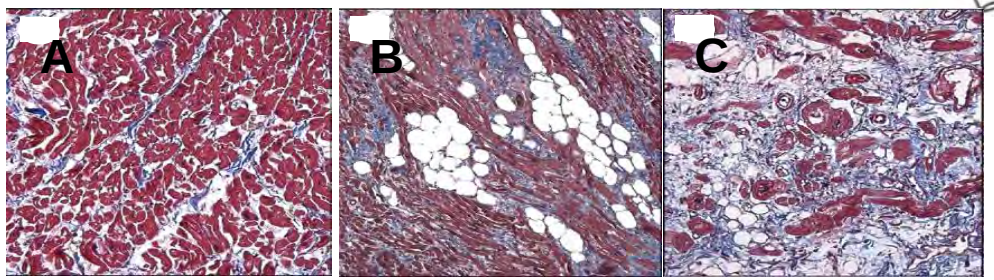
Paroxysmal AF



Persistent AF

"AF begets AF"





w/o AF *5%*

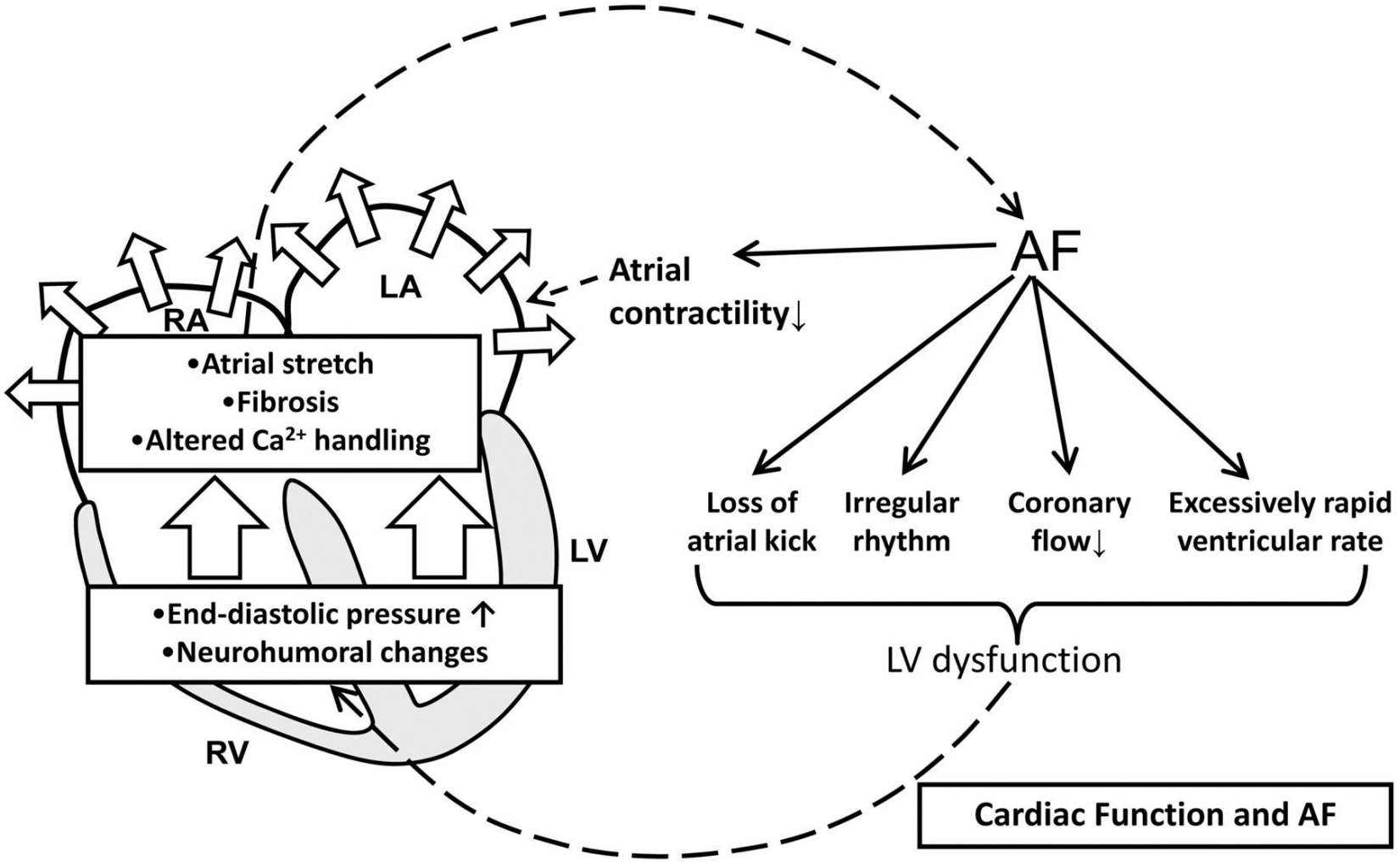
Paroxysmal AF *14%*

Permanent AF *51%*

- Limited success of PV isolation (40-50%?)
- AF persists du to tissue and electrical remodelling:
  - AF itself(« AF begets AF »)
  - Secondary factors (HTN, valvular heart disesase…)

HRS-EHRA-Expert Consensus AF Ablation 2012

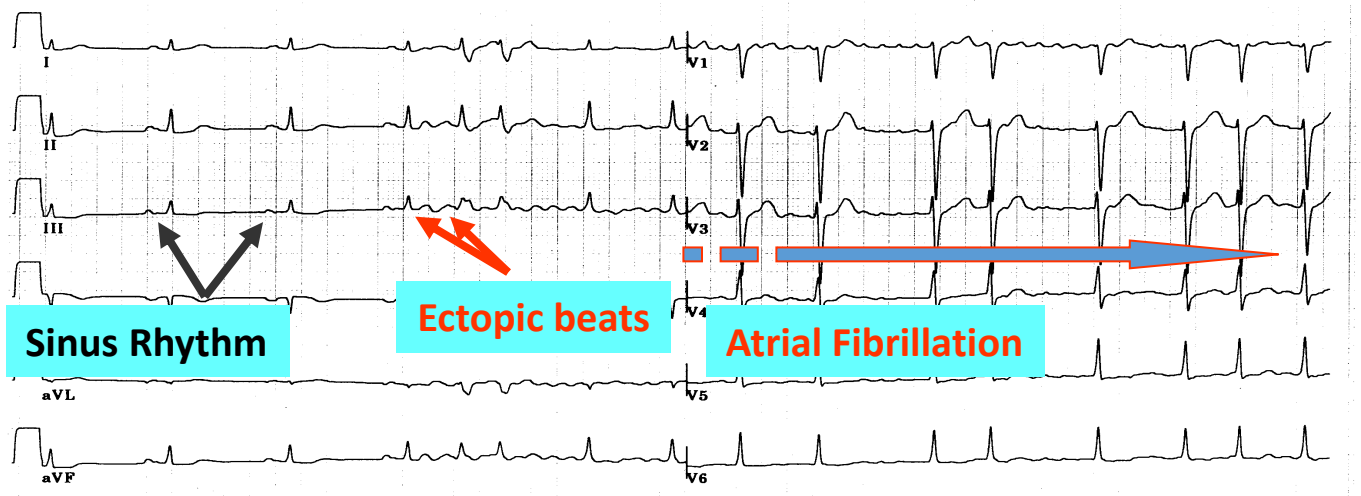
“AF begets AF”


AF
Atrial contractility↓
LA
RA
•Atrial stretch
•Fibrosis
•Altered Ca^{2+} handling
LV
•End-diastolic pressure ↑
•Neurohumoral changes
RV
Loss of atrial kick
Irregular rhythm
Coronary flow↓
Excessively rapid ventricular rate
LV dysfunction
Cardiac Function and AF

Definition

Definition

- **Supraventricular tachyarrhythmia** with **uncoordinated atrial electrical activation** and consequently **ineffective atrial contraction**
- **Irregularly irregular R-R intervals** (when atrioventricular conduction is not impaired)
- **Absence** of distinct repeating **P waves**
- Irregular atrial activations
- Minimum duration of an ECG tracing of AF required to establish the diagnosis of clinical AF is **at least 30 seconds**



2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)

The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC)

ESC European Society of Cardiology
European Heart Journal (2020) **42**, 373–498
doi:10.1093/eurheartj/ehaa612
ESC GUIDELINES

Patterns of atrial fibrillation

- **First diagnosed AF**:
  - AF that has **not been diagnosed before**, irrespective of the duration of the arrhythmia or the presence and severity of AF-related symptoms.
- **Paroxysmal AF**:
  - **AF that terminates spontaneously or with intervention within 7 days of onset**
- **Persistent AF:**
  - AF that lasts **longer than 7 days**, including episodes that are **terminated by cardioversion**, either with drugs or by direct current cardioversion, **after 7 days** or more.
- **Long-standing persistent AF:**
  - Continuous AF lasting for **≥1 year** when it is decided to adopt a **rhythm control** strategy.
- **Permanent AF:**
  - AF that is **accepted** by the patient (and physician). Hence**, rhythm control** interventions are, by definition, **not pursued** in patients with permanent AF. Permanent AF **represents a therapeutic attitude** of the patient and physician rather than an inherent pathophysiological attribute of AF. The term should not be used in the context of a rhythm control strategy with antiarrhysthmic drug therapy or AF ablation

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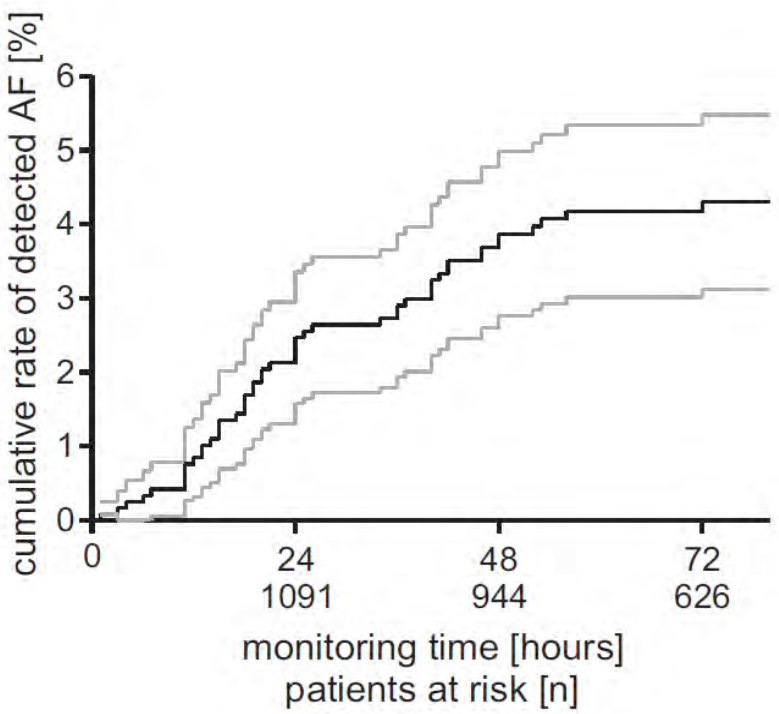
ESC GUIDELINES

Screening

Screening



AF detected in **4.3% by 72h** Holter monitor
AF detected in **2.6% by 24h** Holter monitor

The **number needed to screen by 72-hour** ECG was **55 patients** for each additional AF diagnosis

Improved Detection of Silent Atrial Fibrillation Using 72-Hour Holter ECG in Patients With Ischemic Stroke
A Prospective Multicenter Cohort Study

Martin Grond, MD; Marek Jauss, MD; Gerhard Hamann, MD; Erwin Stark, MD; Roland Veltkamp, MD; Darius Nabavi, MD; Markus Horn, MD; Christian Weimar, MD; Martin Köhrmann, MD; Rolf Wachter, MD; Ludger Rosin, MD; Paulus Kirchhof, MD, FESC

Stroke. 2013;44:3357-3364.

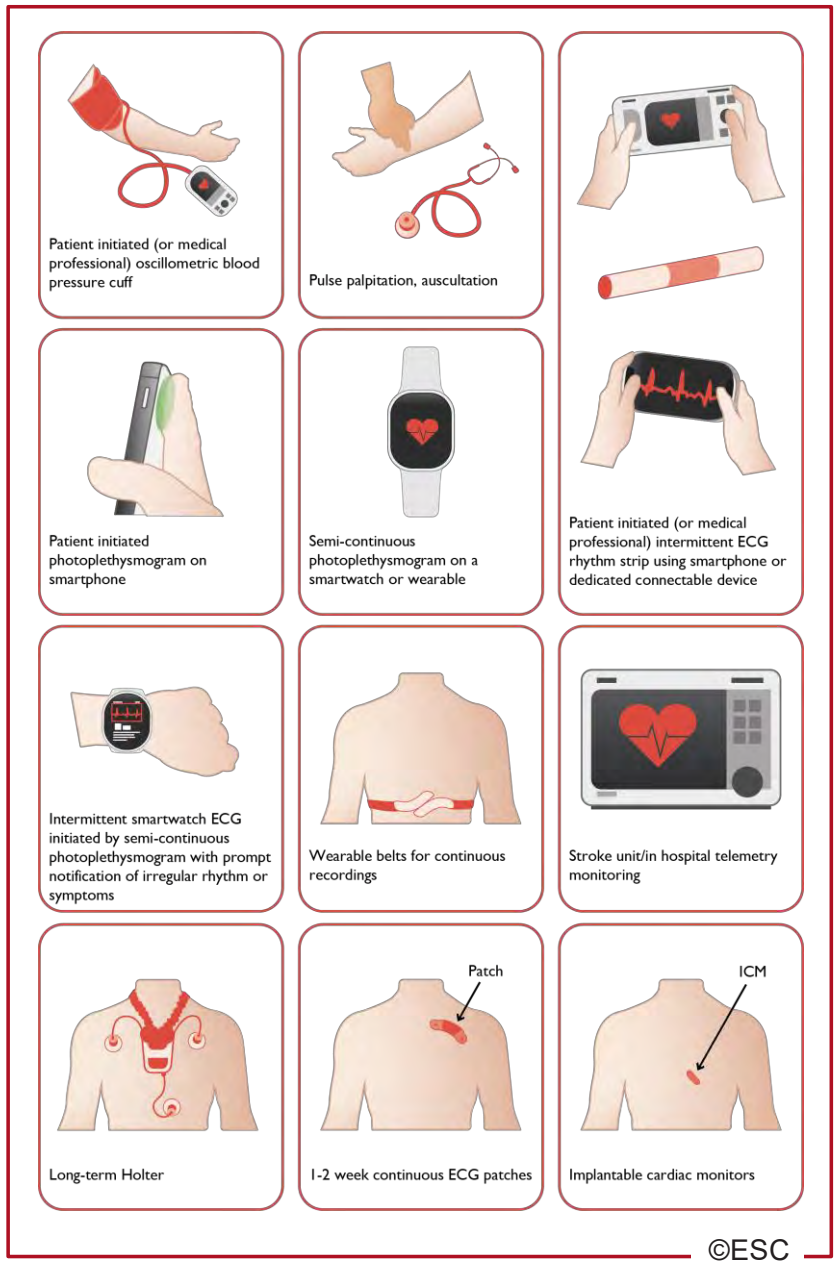


Figure 6 Systems used for AF screening

Pulse palpation, automated BP monitors, single-lead ECG devices, PPG devices, other sensors (using seismocardiography, accelerometers, and gyroscopes, etc.) used in applications for smartphones, wrist bands, and watches. Intermittent smartwatch detection through PPG or ECG recordings. Smartwatches and other 'wearables' can passively measure pulse rate from the wrist using an optical sensor for PPG and alerting the consumer of a pulse irregularity (based on a specific algorithm for AF detection analysing pulse irregularity and variability

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
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Recommendations for screening to detect AF (1)

Recommendations	Class	Level
Opportunistic screening for AF by pulse taking or ECG rhythm strip is recommended in patients ≥65 years of age.	I	B
It is recommended to interrogate pacemakers and implantable cardioverter defibrillators on a regular basis for AHRE.[a]	I	B

[a]See *sections* for diagnostic criteria for AF and AHRE, and for the management of patients with AHRE.

Symptom burden of Atrial Fibrillation

- Poorer quality of life
- Lethargy
- Palpitations
- Dyspnoea
- Chest tightness
- Sleeping difficulties
- Psychosocial distress
- Cognitive impairment
- None (silent AF)

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
2b	**Moderate**	Normal daily activity not affected by symptoms related to AF, but **patient troubled by symptoms**
3	**Severe**	**Normal daily activity affected** by symptoms related to AF
4	**Disabling**	**Normal daily activity discontinued**

Wynn GJ, Todd DM,Webber M, Bonnett L, McShane J, Kirchhof P, Gupta D. The European Heart Rhythm Association symptom classification for atrial fibrillation: validation and improvement through a simple modification. Europace 2014;16: 965–972.

Figure 8 Diagnostic work-up and follow-up in AF patients

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All AF patients

Medical history:
- AF-related symptoms
- AF pattern
- Concomitant conditions
- CHA_2DS_2-VASc score

12-lead ECG

Thyroid and kidney function, electrolytes and full blood count

Transthoracic echocardiography

→

Selected AF patients

Ambulatory ECG monitoring:
- Adequacy of rate control
- Relate symptoms to AF recurrences

Transoesophageal echocardiography:
- Valvular heart disease
- LAA thrombus

cTnT-hs, CRP, BNP/NT-ProBNP

Cognitive function assessment

Coronary CTA or ischaemia imaging:
- Patients with suspected CAD

Brain CT and MRI:
- Patients with suspected stroke

LGE-CMR of the LA:
- To help decision-making in AF treatment

→

Structured follow-up

- **To ensure continued optimal management**
- **A cardiologist / AF specialist coordinates the follow-up in collaboration with specially trained nurses and primary care physicians**

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
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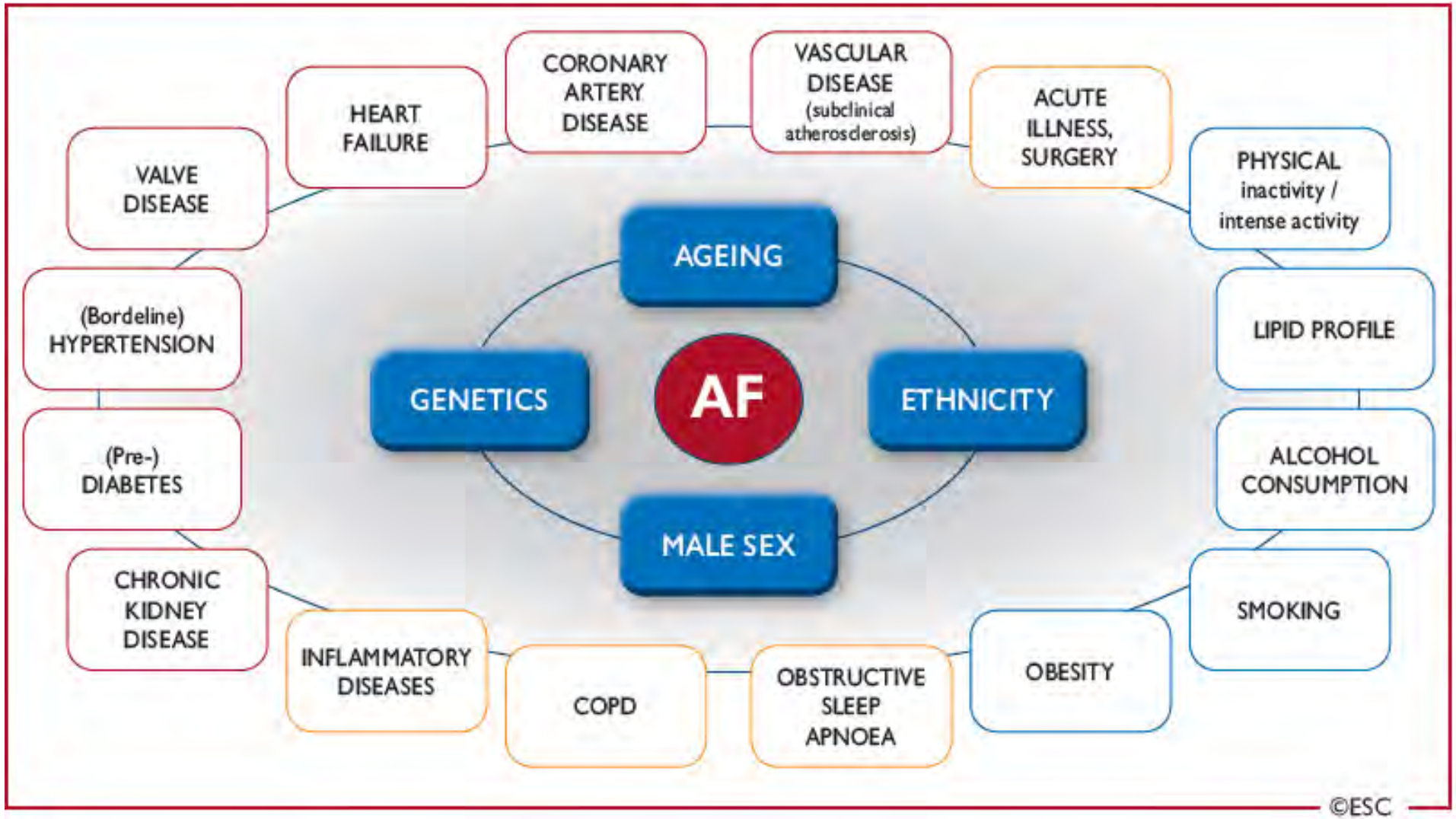
Risk Factors for developing AF

Figure 3 Summary of risk factors for incident AF



2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
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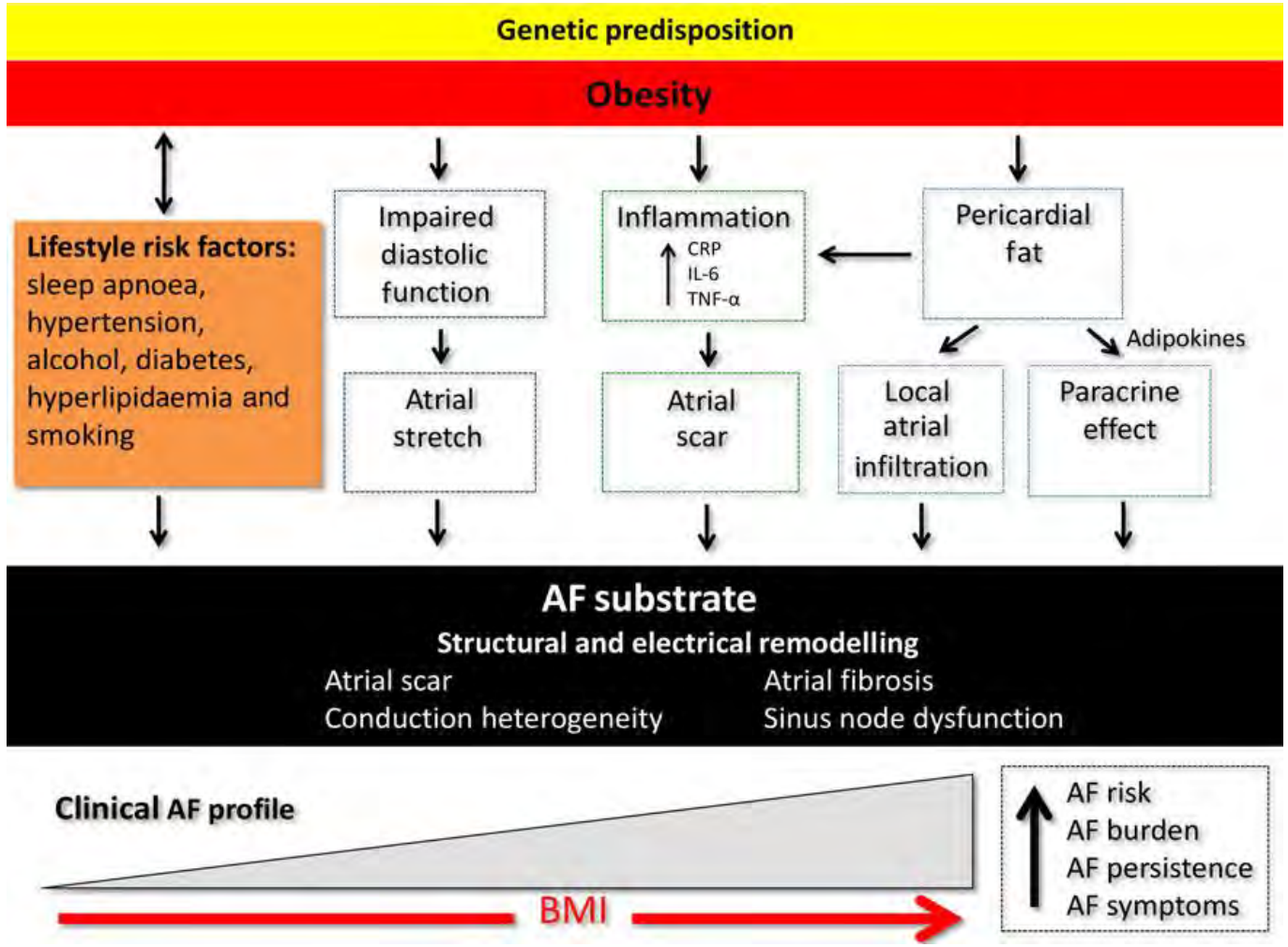
The Role of Obesity in AF

- Overweight: BMI 25-30kg/m^2
- Obese: BMI >30kg/m^2
- **Overweight populations** have **higher incidence**, **prevalence**, **severity** and **progression of AF** compared with their normal weight counterparts
- Stable **weight loss decreases AF burden and AF recurrence following treatment**. **Structural remodelling** in response to weight loss suggests that reverse remodelling of the AF substrate mediates improvement of arrhythmia profile
- **Obesity often co-exists with multiple AF risk factors that improve in response to weight loss**, making a consolidated approach of weight loss and AF risk factor management preferable



The role of obesity in atrial fibrillation

Chrishan Joseph Nalliah[1,2,3], Prashanthan Sanders[3], Hans Kottkamp[4], and Jonathan M. Kalman[1,2]*

[1]Department of Cardiology, Royal Melbourne Hospital, Melbourne 3050, Australia; [2]Department of Medicine, University of Melbourne, Melbourne, Australia; [3]Centre for Heart Rhythm Disorders (CHRD), South Australian Health and Medical Research Institute (SAHMRI), University of Adelaide and Royal Adelaide Hospital, Adelaide, Australia; and [4]Department of Electrophysiology, Hirslanden Hospital, Zurich, Switzerland

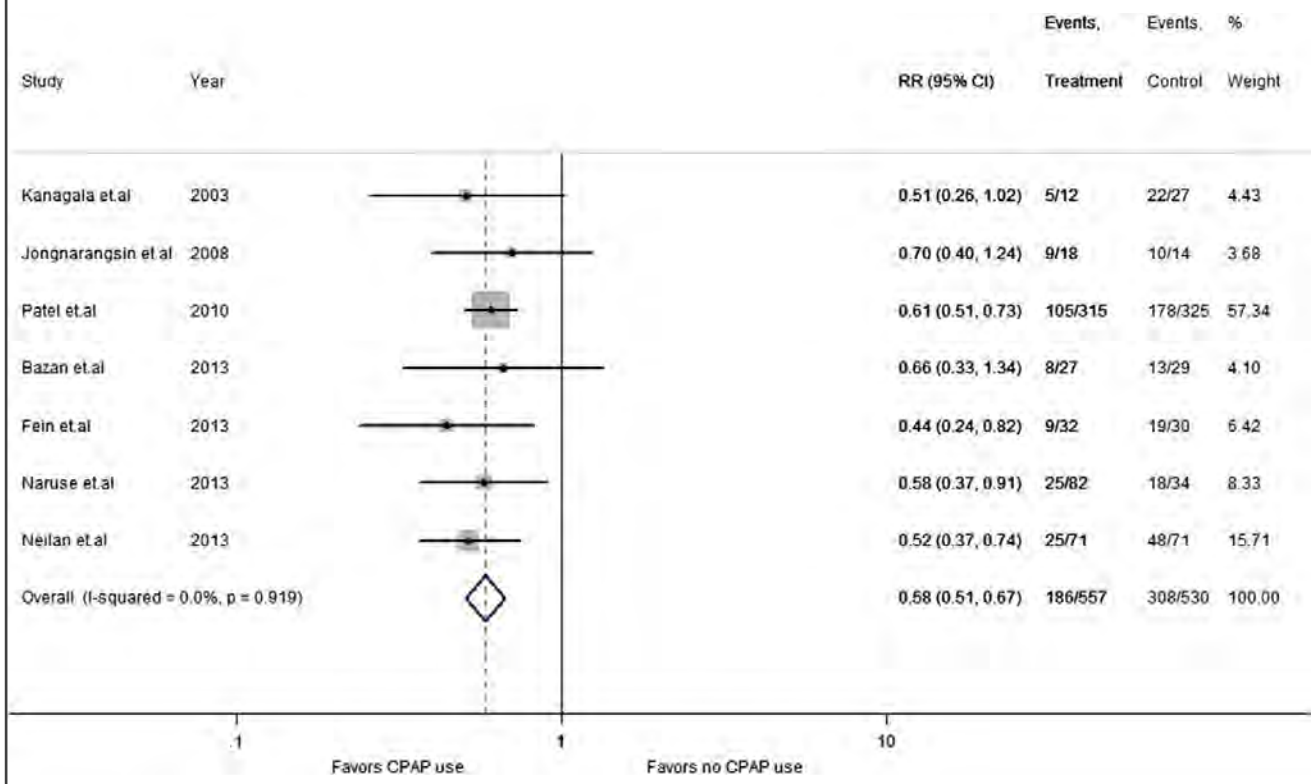
Received 19 June 2015; revised 10 August 2015; accepted 25 August 2015; online publish-ahead-of-print 14 September 2015

EUROPEAN SOCIETY OF CARDIOLOGY®

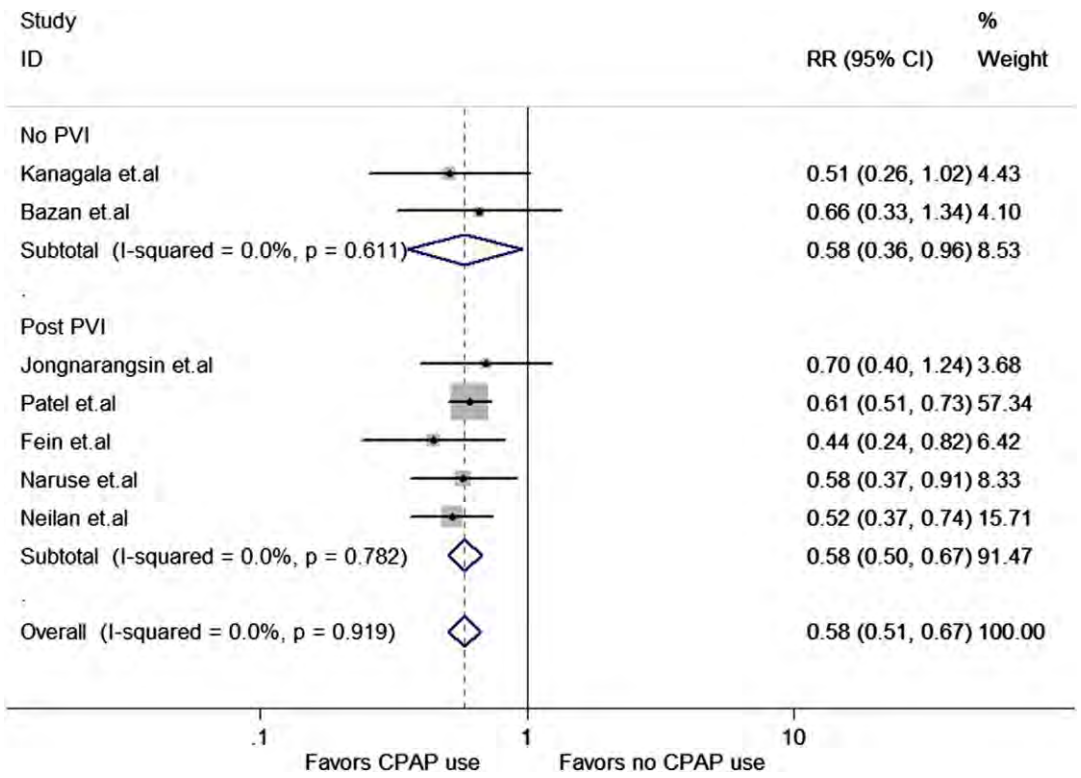
European Heart Journal (2016) **37**, 1565–1572
doi:10.1093/eurheartj/ehv486

Effect of Obstructive Sleep Apnea Treatment on Atrial Fibrillation Recurrence

AF Recurrence in Users versus Nonusers of CPAP in patients with OSA



AF Recurrence in Users versus Nonusers of CPAP in 2 groups of Patients with OSA: PVI and non-PVI groups



Effect of Obstructive Sleep Apnea Treatment on Atrial Fibrillation Recurrence
A Meta-Analysis

Ashish Shukla, MD, MPH, Anthony Aizer, MD, MSc, Douglas Holmes, MD, Steven Fowler, MD, David S. Park, MD, PhD, Scott Bernstein, MD, Neil Bernstein, MD, Larry Chinitz, MD

JACC: CLINICAL ELECTROPHYSIOLOGY

Alcohol and AF

Potential Mechanisms for Acute Alcohol Consumption as a Trigger for AF

CELLULAR EFFECTS
- Damage to gap junction intercellular channels
- Direct myocyte injury and/or inflammation
- Acute oxidative stress

AUTONOMIC EFFECTS
- Sympathetic activation (increased ß receptor density)
- Vagal inhibition
- Reduced heart rate variability

ELECTROPHYSIOLOGICAL EFFECTS
- Shorter atrial and pulmonary vein action potential
- Shorter atrial effective refractory period
- Slowing of intra- and inter-atrial conduction
- Enhanced AV-nodal conduction

RE-ENTRY

Alcohol and Atrial Fibrillation

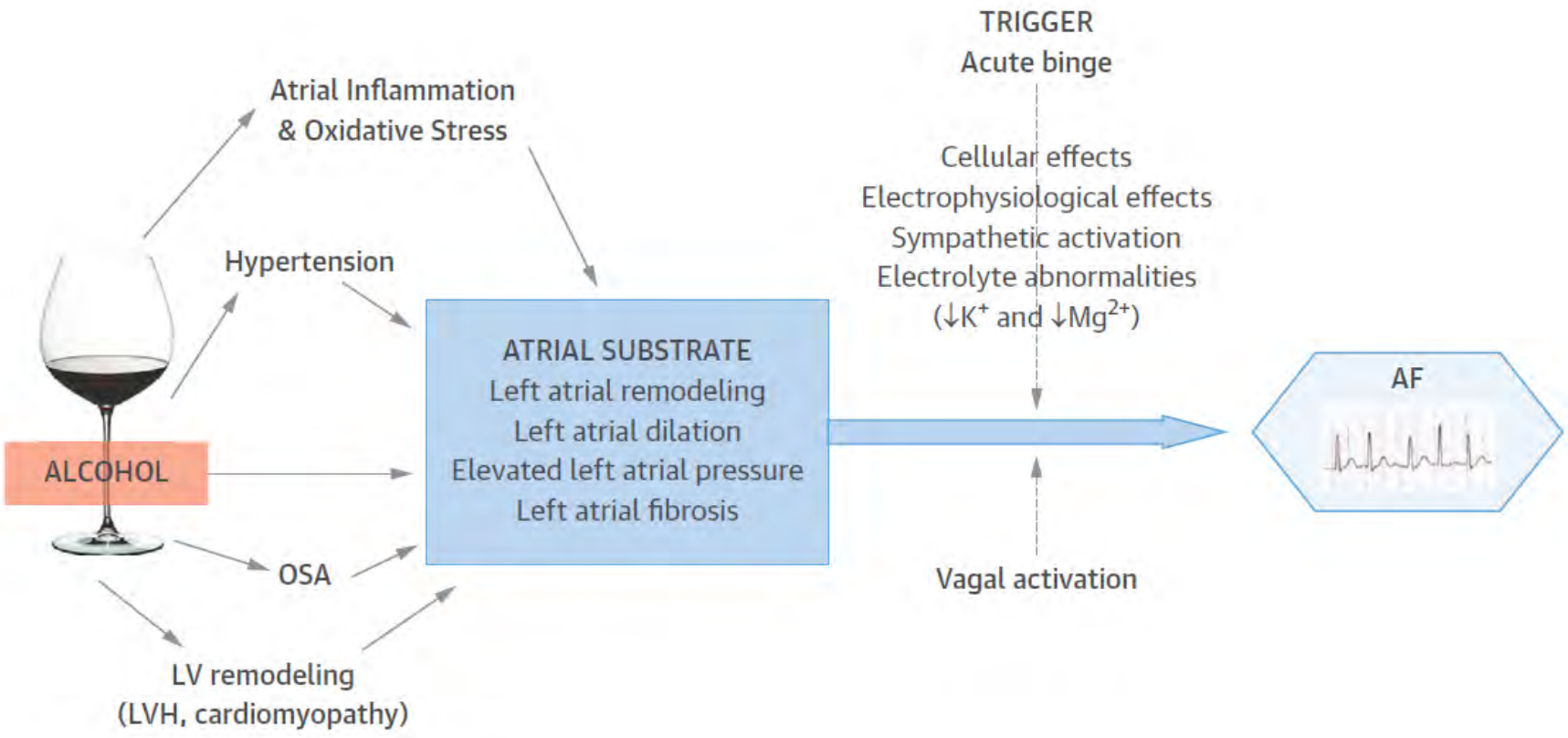
A Sobering Review

Aleksandr Voskoboinik, MBBS,[a,b,c] Sandeep Prabhu, MBBS,[a,b,c] Liang-han Ling, MBBS, PhD,[a,b,c] Jonathan M. Kalman, MBBS, PhD,[c,d] Peter M. Kistler, MBBS, PhD[a,b,c]

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

Alcohol and AF

Habitual Alcohol Consumption and AF: Pathophysiology



Alcohol and Atrial Fibrillation

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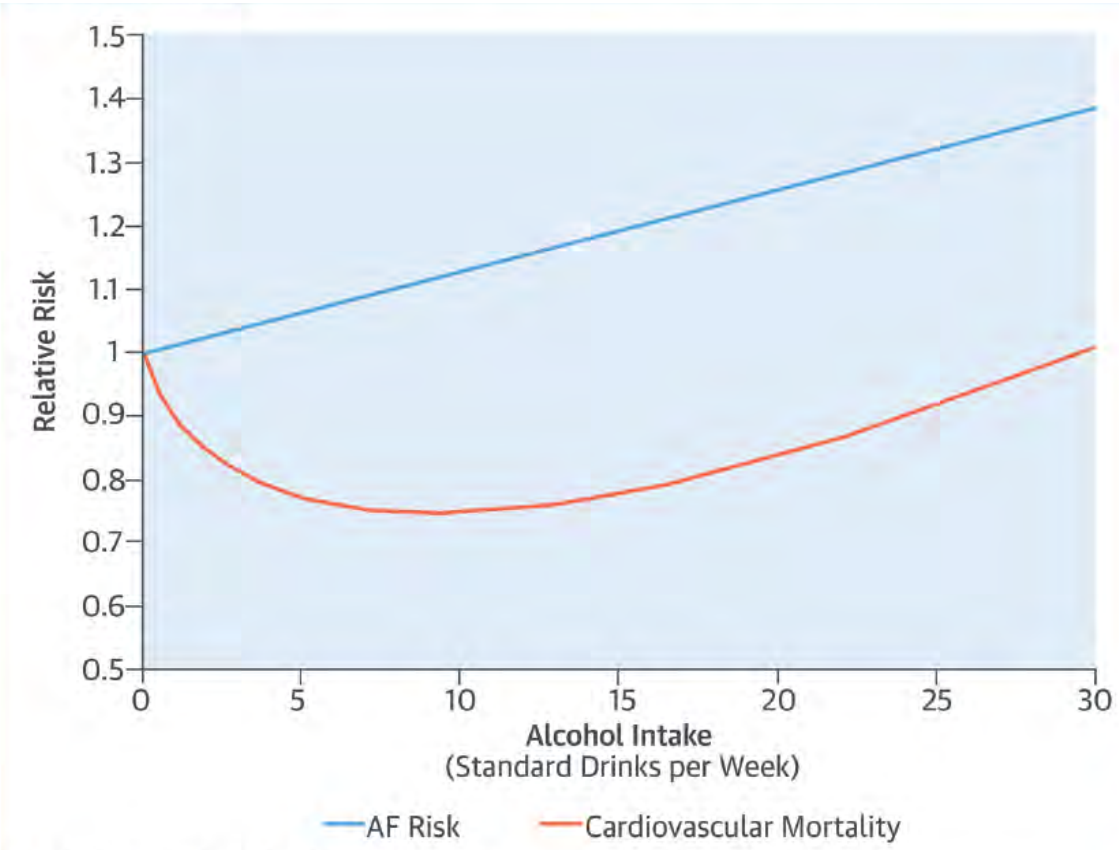
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

Alcohol and AF

Habitual Alcohol Consumption: Long-Term Risk of Atrial Fibrillation and Cardiovascular Mortality



- Positive association between AF and alcohol (**binge drinking >5 standard drinks**; **moderate** 7-21 drinks/weeks, **heavy** drinking >21 drinks/week)
- 1 standard drink = 12g of alcohol
- **For each extra alcoholic drink** per day, AF incidence increased **8%**
- Although a **small amount of alcohol is considered cardioprotective, these benefits do not extend to AF**!

Alcohol and Atrial Fibrillation

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JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

Alcohol Abstinence in Drinkers with Atrial Fibrillation

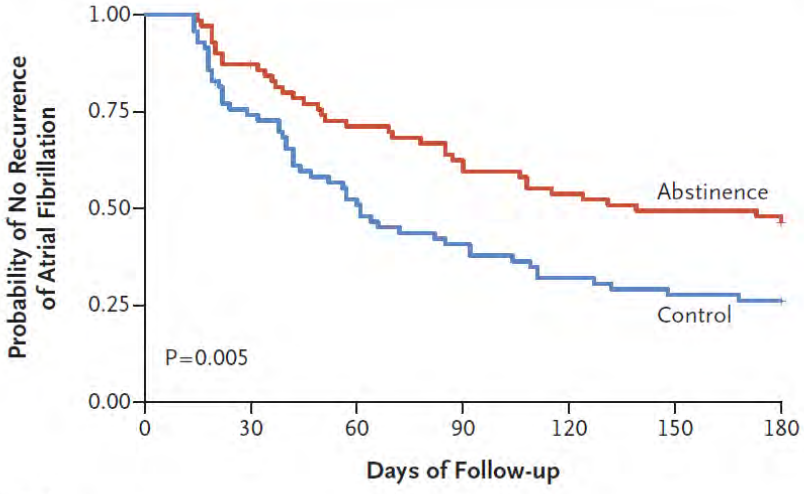


Figure 2. Time to Recurrence of Atrial Fibrillation.

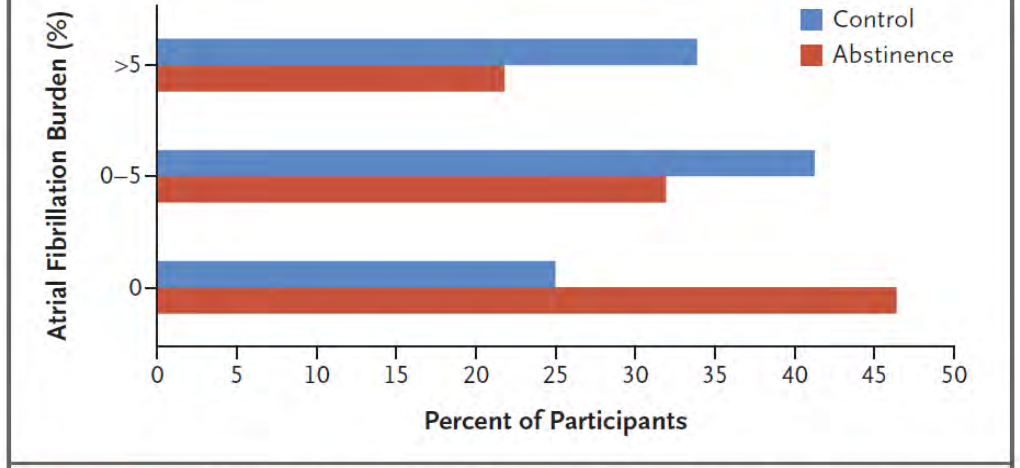


Figure 3. Atrial Fibrillation Burden in the Abstinence and Control Groups.
Atrial fibrillation burden is the percentage of time the patient was in atrial fibrillation during the entire 6-month follow-up period.

- 85% Men
- Symptomatic Paroxysmal AF or symptomatic persistent AF with rhythm control strategy
- **<u>Abstinence group</u>**: reduced alcohol intake from 16.8±7.7 to 2.1±3.7 standard drinks per week (**reduction of 87%**)
- **<u>Control group</u>**: reduced alcohol intake from 16.4±6.9 to 13.2±6.5 drinks per week (**reduction of 19.5%**)

- AF recurred in 53% in abstinence group
- AF recurred in 73% in control group
- Abstinence group had a longer period before recurrence of AF than control group

ORIGINAL ARTICLE

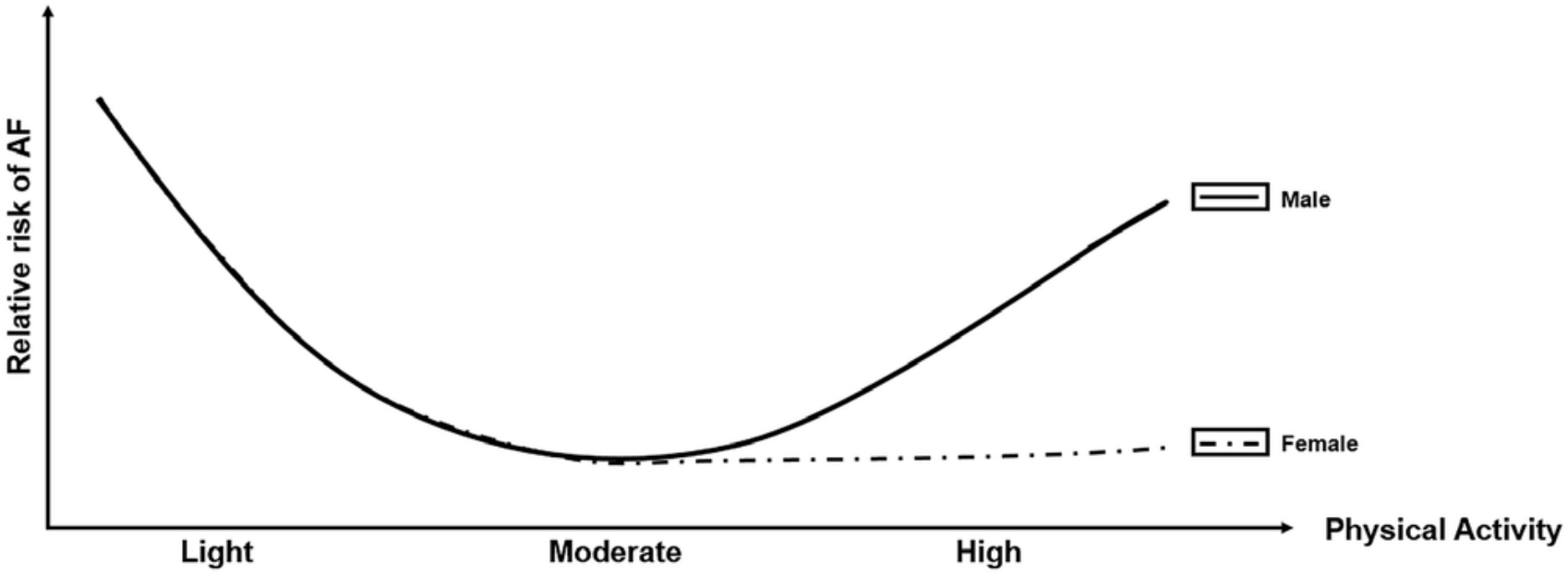
Alcohol Abstinence in Drinkers with Atrial Fibrillation

Aleksandr Voskoboinik, M.B., B.S., Ph.D., Jonathan M. Kalman, M.B., B.S., Ph.D., Anurika De Silva, Ph.D., Thomas Nicholls, M.B., B.S., Benedict Costello, M.B., B.S., Shane Nanayakkara, M.B., B.S., Sandeep Prabhu, M.B., B.S., Ph.D., Dion Stub, M.B., B.S., Ph.D., Sonia Azzopardi, R.N., Donna Vizi, R.N., Geoffrey Wong, M.B., B.S., Chrishan Nalliah, M.B., B.S., Hariharan Sugumar, M.B., B.S., Michael Wong, M.B., B.S., Ph.D., Emily Kotschet, M.B., B.S., David Kaye, M.B., B.S., Ph.D., Andrew J. Taylor, M.B., B.S., Ph.D., and Peter M. Kistler, M.B., B.S., Ph.D.

The NEW ENGLAND JOURNAL of MEDICINE

N Engl J Med 2020;382:20-8.

Physical Activity and AF



- Proposed Cutoffs for the ascending flank of the U-Curve:
  - **5h/week vigorous intensity** 30y
  - **Accumulated** sport practice **>1500h**
- Gender difference might be explained by (in women):
  - Fewer comorbidities, shorter duration of exposure to vigorous exercise, lower sympathetic resting tone, lower BP, sex hormones…

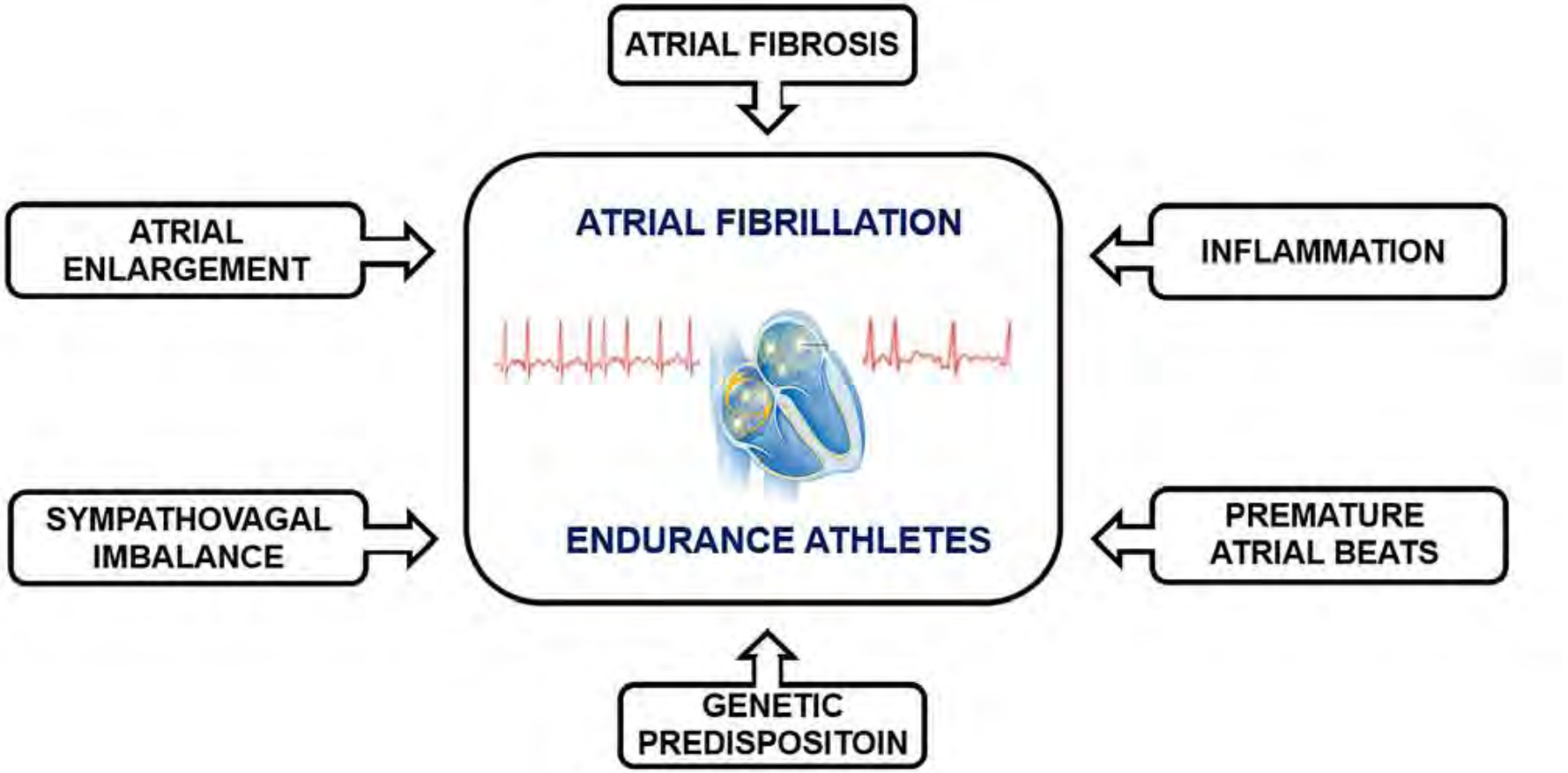
Endurance Exercise and Atrial Fibrillation – A State of the Art Review

Ausdauersport und Vorhofflimmern – Eine aktuelle Übersicht

Sareban M[1], Guasch E[2], Mont L[2], Niebauer J[1]

GERMAN JOURNAL OF SPORTS MEDICINE • 71 • 10/2020

Physical Activity and AF



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Ausdauersport und Vorhofflimmern – Eine aktuelle Übersicht

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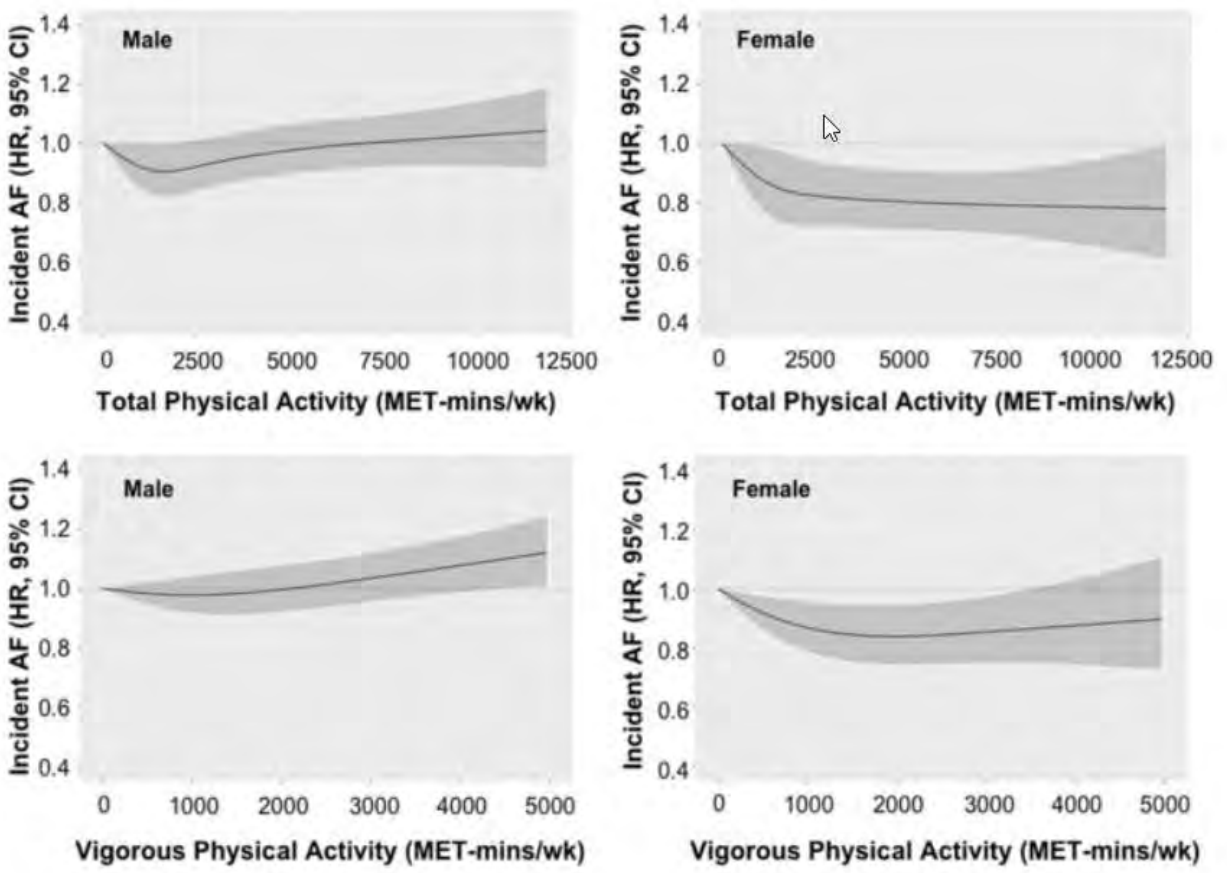
Association between physical activity and risk of incident AF



- 3 types of activity (walking, moderate, vigorous-intensity activities)
- Moderate 4-6METs
- Vigorous >6METs
- *Running at 10km/h ≈ 10METs*
- *Jogging at 8km/h ≈ 8METs*
- *Brisk walking at 6.4Km/h ≈ 5METs*

- Example: Brisk walk (6.4km/h) 3 days a week @ 5METs for 60minutes = 3x5x60 = 900METs/min/wk
- **Lower cut-off of 500 MET-min/wk** to reflect the **lower range of guideline-recommended physical activity**

Association between physical activity and risk of incident arrhythmias in 402 406 individuals: evidence from the UK Biobank cohort

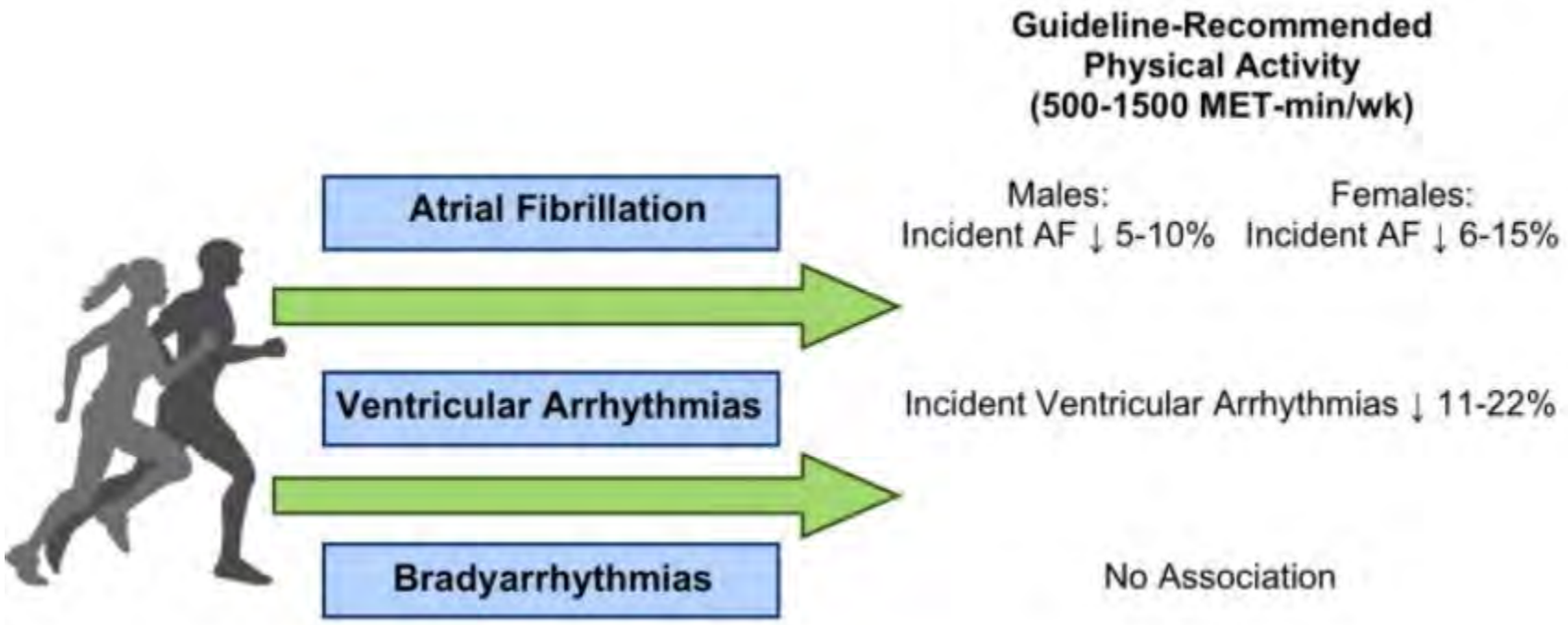
Adrian D. Elliott [1]*, Dominik Linz [1], Ricardo Mishima [1], Kadhim Kadhim [1], Celine Gallagher [1], Melissa E. Middeldorp [1], Christian V. Verdicchio [1], Jeroen M.L. Hendriks [1], Dennis H. Lau [1], Andre La Gerche[2], and Prashanthan Sanders [1]

[1]Centre for Heart Rhythm Disorders, University of Adelaide and Royal Adelaide Hospital, Adelaide SA 5000, Australia; and [2]Sports Cardiology Laboratory, Baker Heart & Diabetes Institute, Melbourne, Victoria 3004, Australia

ESC European Society of Cardiology
European Heart Journal (2020) **41**, 1479–1486
doi:10.1093/eurheartj/ehz897

CLINICAL RESEARCH
Arrhythmia/electrophysiology

Association between physical activity and risk of incident AF



Association between physical activity and risk of incident arrhythmias in 402 406 individuals: evidence from the UK Biobank cohort

Adrian D. Elliott [1]*, Dominik Linz [1], Ricardo Mishima [1], Kadhim Kadhim [1], Celine Gallagher [1], Melissa E. Middeldorp [1], Christian V. Verdicchio [1], Jeroen M.L. Hendriks [1], Dennis H. Lau [1], Andre La Gerche[2], and Prashanthan Sanders [1]

[1]Centre for Heart Rhythm Disorders, University of Adelaide and Royal Adelaide Hospital, Adelaide SA 5000, Australia; and [2]Sports Cardiology Laboratory, Baker Heart & Diabetes Institute, Melbourne, Victoria 3004, Australia

ESC European Society of Cardiology

European Heart Journal (2020) **41**, 1479–1486
doi:10.1093/eurheartj/ehz897

CLINICAL RESEARCH
Arrhythmia/electrophysiology

Recommendations for lifestyle interventions and management of risk factors and concomitant diseases in patients with AF (1)

Recommendations	Class	Level
Identification and management of risk factors and concomitant diseases is recommended as an integral part of treatment in AF patients.	I	B
Modification of unhealthy lifestyle and targeted therapy of intercurrent conditions is recommended to reduce AF burden and symptom severity.	I	B
Opportunistic screening for AF is recommended in hypertensive patients.	I	B
Attention to good BP control is recommended in AF patients with hypertension to reduce AF recurrences and risk of stroke and bleeding.	I	B
In obese patients with AF, weight loss together with management of other risk factors should be considered to reduce AF incidence, AF progression, AF recurrences, and symptoms.	IIa	B

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

Recommendations for lifestyle interventions and management of risk factors and concomitant diseases in patients with AF (2)

Recommendations	Class	Level
Advice and management to avoid alcohol excess should be considered for AF prevention and in AF patients considered for OAC therapy	IIa	B
Physical activity should be considered to help prevent AF incidence or recurrence, with the exception of excessive endurance exercise, which may promote AF.	IIa	C
Opportunistic screening for AF should be considered in patients with OSA.	IIa	C
Optimal management of OSA may be considered, to reduce AF incidence, AF progression, AF recurrences, and symptoms.	IIb	C

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

Stroke prevention in AF

Stroke Prevention in AF

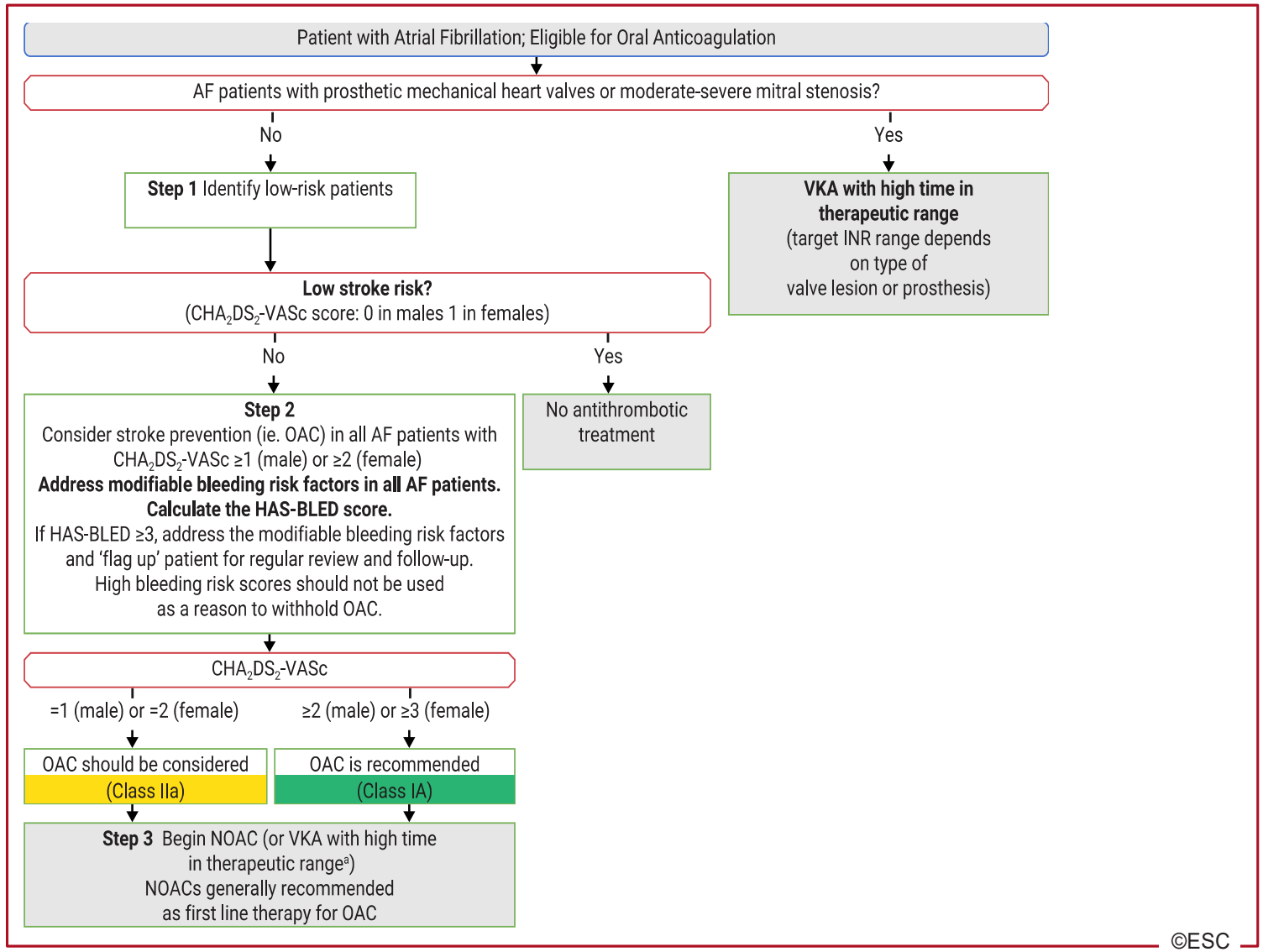


Table 11 Clinical risk factors for stroke, transient ischaemic attack, and systemic embolism in the CHA_2DS_2-VASc score

CHA_2DS_2-VASc risk factor	Points
Congestive heart failure Signs/symptoms of heart failure or objective evidence of reduced left ventricular ejection fraction	+1
Hypertension Resting blood pressure >140/90 mmHg on at least two occasions or current antihypertensive treatment	+1
Age 75 years or older	+2
Diabetes mellitus Fasting glucose >125 mg/dL (7 mmol/L) or treatment with oral hypoglycaemic agent and/or insulin	+1
Previous stroke, transient ischaemic attack, or thromboembolism	+2
Vascular disease Previous myocardial infarction, peripheral artery disease, or aortic plaque	+1
Age 65–74 years	+1
Sex category (female)	+1

CHA_2DS_2-VASc = Congestive Heart failure, hypertension, Age ≥75 (doubled), Diabetes, Stroke (doubled), Vascular disease, Age 65–74, and Sex (female).

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation (European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

Table 10 Clinical risk factors in the HAS-BLED score (1)

Risk factors and definitions		Points awarded
H	**Uncontrolled hypertension** Systolic BP >160 mmHg	1
A	**Abnormal renal and/or hepatic function** Dialysis, transplant, serum creatinine >200 µmol/L, cirrhosis, bilirubin > × 2 upper limit of normal, AST/ALT/ALP >3 × upper limit of normal	1 point for each
S	**Stroke** Previous ischaemic or haemorrhagic[a] stroke	1
B	**Bleeding history or predisposition** Previous major haemorrhage or anaemia or severe thrombocytopenia	1

[a]Haemorrhagic stroke would also score 1 point under the 'B' criterion.

Table 10 Clinical risk factors in the HAS-BLED score (2)

Risk factors and definitions		Points awarded
L	**Labile INR**[b] TTR <60% in patient receiving VKA	1
E	**Elderly** Aged >65 years or extreme frailty	1
D	**Drugs or excessive alcohol drinking** Concomitant use of antiplatelet or non-steroidal anti-inflammatory drugs; and/or excessive[c] alcohol per week	1 point for each
Maximum score		**9**

[b]Only relevant if patient receiving a VKA.
[c]Alcohol excess or abuse refers to a high intake (e.g. >14 units per week), where the clinician assesses there would be an impact on health or bleeding risk.

Non-Vitamin K antagonist oral anticoagulants

- **Direct thrombin inhibitor** : Dabigatran (Pradaxa®)
- **Factor Xa inhibitors**: Apixaban (Eliquis ®), Edoxaban (Lixiana®), Rivaroxaban (Xarelto®)
- A meta-analysis based on the **high-dose treatment groups** of the pivotal studies of **warfarin vs. NOACs** included 42 411 patients receiving a NOAC and 29 272 receiving warfarin. NOACs in these dosages significantly **reduced stroke or systemic embolic events** by **19% compared with warfarin** (RR 0.81; 95% CI 0.73– 0.91; P<0.0001), **mainly driven by a reduction in haemorrhagic stroke** (RR 0.49; 95% CI 0.38–0.64; P< 0.0001)[1]
- **Mortality is 10% lower** in patients randomized to NOAC therapy (RR 0.90; 95% CI 0.85 – 0.95; P=0.0003)[1]
- **Intracranial haemorrhage is halved** (RR 0.48; 95% CI 0.39 – 0.59; P<0.0001)[1]
- **Gastrointestinal bleeding events are more frequent** (RR 1.25; 95% CI 1.01 – 1.55; P=0.04)[1]

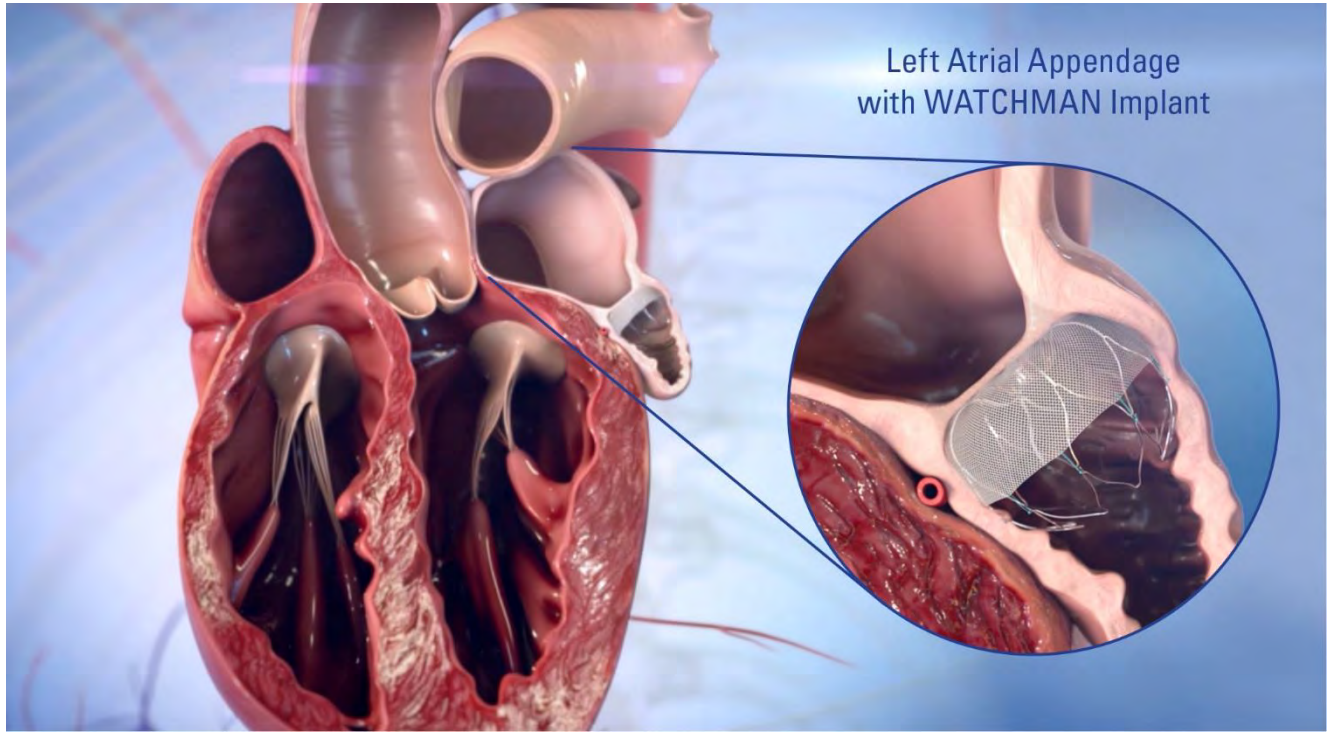
1. Ruff CT, Giugliano RP, Braunwald E, Hoffman EB, Deenadayalu N, Ezekowitz MD, Camm AJ, Weitz JI, Lewis BS, Parkhomenko A, Yamashita T, Antman EM. Comparison of the efficacy and safety of new oral anticoagulants with warfarin in patients with atrial fibrillation: a meta-analysis of randomised trials. Lancet 2014;383: 955–962.

Table 11 Dose selection criteria for NOACs

	Dabigatran	Rivaroxaban	Apixaban	Edoxaban
Standard dose	150 mg b.i.d.	20 mg o.d.	5 mg b.i.d.	60 mg o.d.
Lower dose	110 mg b.i.d.			
Reduced dose		15 mg o.d.	2.5 mg b.i.d.	30 mg o.d.
Dose-reduction criteria	Dabigatran 110 mg b.i.d. in patients with: • Age ≥80 years • Concomitant use of verapamil, or • Increased bleeding risk	CrCl 15–49 mL/min	At least 2 of 3 criteria: • Age ≥80 years, • Body weight ≤60 kg, or • Serum creatinine ≥1.5 mg/dL (133 µmol/L)	If any of the following: • CrCl 15–50 mL/min, • Body weight ≤60 kg, • Concomitant use of dronedarone, ciclosporin, erythromycin, or ketoconazole

Left atrial appendage occlusion and exclusion

- Only one device (Watchman®) has been compared with VKA therapy in randomized trials[1]
- **LAA occlusion is non-inferior to VKA treatment for the prevention of stroke in AF patients** with moderate stroke risk, with a possibility of lower bleeding rates in the patients who continued follow-up[1]
- LAA occlusion may also **reduce stroke risk in patients with contraindications to OAC**[2]
- A large recent European registry reported a **high rate of implantation success (98%**), with an acceptable procedure-related complication rate of **4% at 30 days**[3] (device embolization, pericardial effusion with or without tamponade, device thrombus with stroke, femoral hematoma)



1.Reddy VY, Doshi SK, Sievert H, Buchbinder M, Neuzil P, Huber K, Halperin JL, Holmes D. Percutaneous left atrial appendage closure for stroke prophylaxis in patients with atrial fibrillation: 2.3-Year Follow-up of the PROTECT AF (Watchman Left Atrial Appendage System for Embolic Protection in Patients with Atrial Fibrillation) Trial. Circulation 2013;127:720–729.
2.Reddy VY, Mobius-Winkler S, Miller MA, Neuzil P, Schuler G, Wiebe J, Sick P, Sievert H. Left atrial appendage closure with the Watchman device in patients with a contraindication for oral anticoagulation: the ASAP study (ASA Plavix Feasibility Study With Watchman Left Atrial Appendage Closure Technology). J Am Coll Cardiol 2013;61:2551–2556.
3. Boersma LV, Schmidt B, Betts TR, Sievert H, Tamburino C, Teiger E, Pokushalov E, Kische S, Schmitz T, Stein KM, Bergmann MW, EWOLUTION investigators. Implant success and safety of left atrial appendage closure with the WATCHMAN device: peri-procedural outcomes from the EWOLUTION registry. Eur Heart J 2016;37:2465–2474.

Recommendations for the prevention of thromboembolic events in AF (5)

Recommendations for occlusion or exclusion of the LAA	Class	Level
LAA occlusion may be considered for stroke prevention in patients with AF and contraindications for long-term anticoagulant treatment (e.g. intracranial bleeding without a reversible cause).	IIb	B
Surgical occlusion or exclusion of the LAA may be considered for stroke prevention in patients with AF undergoing cardiac surgery.	IIb	C

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

Cardioversion

Cardioversion Recommendations

Recommendations	Class	Level
Electrical cardioversion of AF is recommended in patients with **acute haemodynamic instability** to restore cardiac output.	I	B
Cardioversion of AF (either electrical or pharmacological) is recommended in symptomatic patients with persistent or long-standing persistent AF as part of rhythm control therapy.	I	B
Pre-treatment with amiodarone, flecainide, ibutilide, or propafenone should be considered to enhance success of electrical cardioversion and prevent recurrent AF	IIa	B
In patients with **no history of ischaemic or structural heart disease**, **flecainide, propafenone**, or vernakalant are recommended for pharmacological cardioversion of new-onset AF	I	A
In selected patients with **infrequent recent-onset AF** and no significant structural or ischaemic heart disease, a single oral dose of flecainide or propafenone (the '**pill in the pocket**' approach) should be considered for patient-led cardioversion, following safety assessment.	IIa	B
In patients with **ischaemic and/or structural heart disease, amiodarone** is recommended for cardioversion of AF.	I	A
Vernakalant may be considered as an alternative to amiodarone for pharmacological conversion of AF in patients without hypotension, severe heart failure or severe structural heart disease (especially aortic stenosis).	IIb	B

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)

The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC)

ESC European Society of Cardiology

European Heart Journal (2020) **42**, 373–498
doi:10.1093/eurheartj/ehaa612

ESC GUIDELINES

Stroke Risk Management Pericardioversion

Recommendations	Class	Level
Anticoagulation with heparin or a NOAC should be initiated **as soon as possible before every cardioversion** of AF or atrial flutter.	IIa	B
For cardioversion of AF/atrial flutter, effective anticoagulation is recommended for a **minimum of 3 weeks before** cardioversion.	I	B
Transoesophageal echocardiography (**TOE**) is recommended to exclude cardiac thrombus as an **alternative to preprocedural** anticoagulation when early cardioversion is planned.	I	B
Early cardioversion can be performed **without TOE** in patients with a definite duration of **AF <48 hours.**	IIa	B
In patients at risk for stroke, anticoagulant therapy should be continued **long-term** after cardioversion according to the long-term anticoagulation recommendations, irrespective of the method of cardioversion or the apparent maintenance of sinus rhythm. In patients **without stroke risk factors, anticoagulation is recommended for 4 weeks after cardioversion.**	I	B
In patients where thrombus is identified on TOE, effective anticoagulation is recommended for at least 3 weeks.	I	C
In patients with a **definite duration of AF<24hours** and a very low stroke risk (CHA_2DS_2-VASc of 0 in men or 1 in women) post-cardioversion, **anticoagulation for 4 weeks may be omitted**	IIb	C

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)

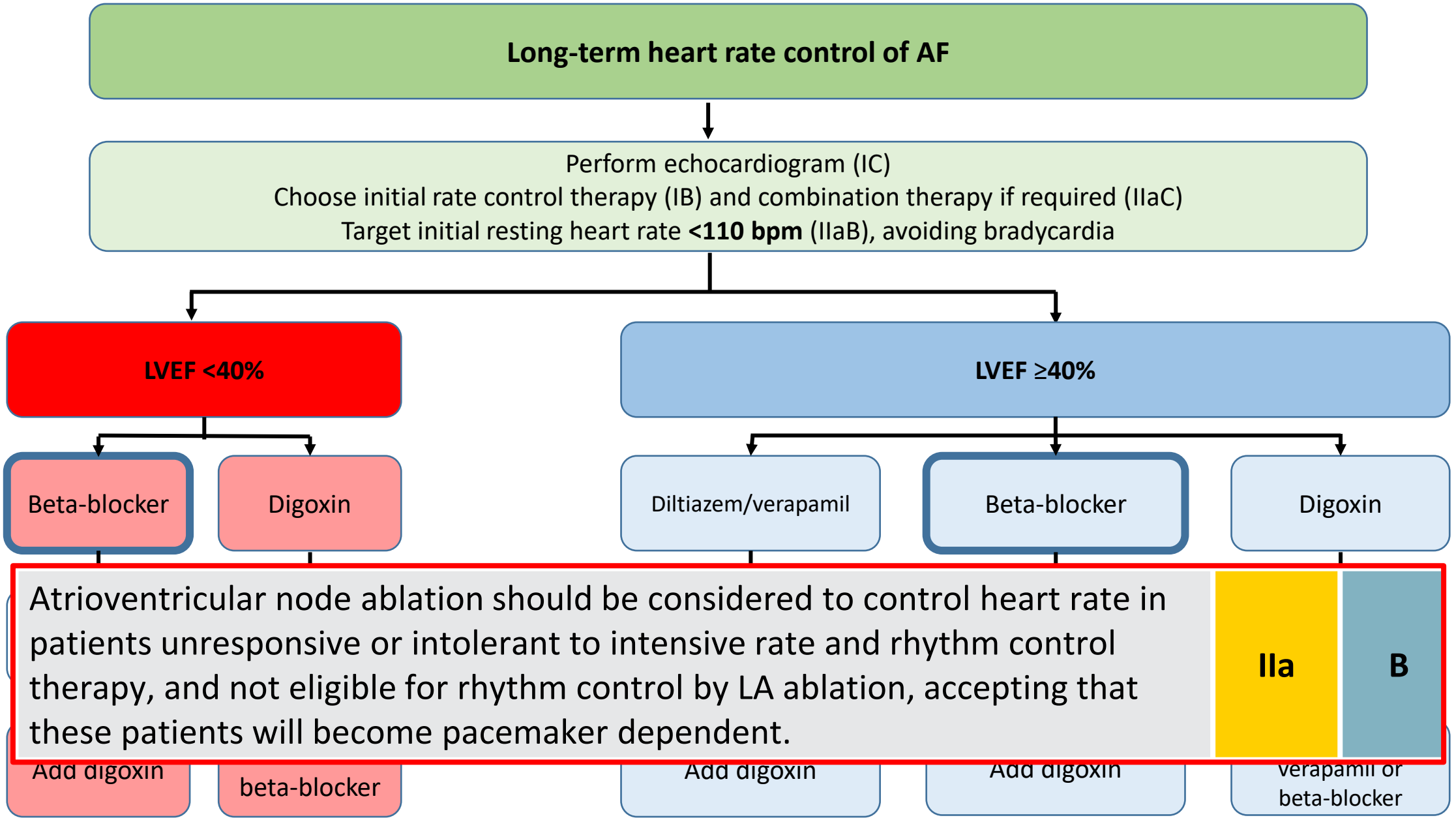
The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC)

ESC European Society of Cardiology

European Heart Journal (2020) **42**, 373–498
doi:10.1093/eurheartj/ehaa612

ESC GUIDELINES

Rate control



2020 ESC Guidelines for the management of atrial fibrillation European Heart Journal (2020)

Rhythm control

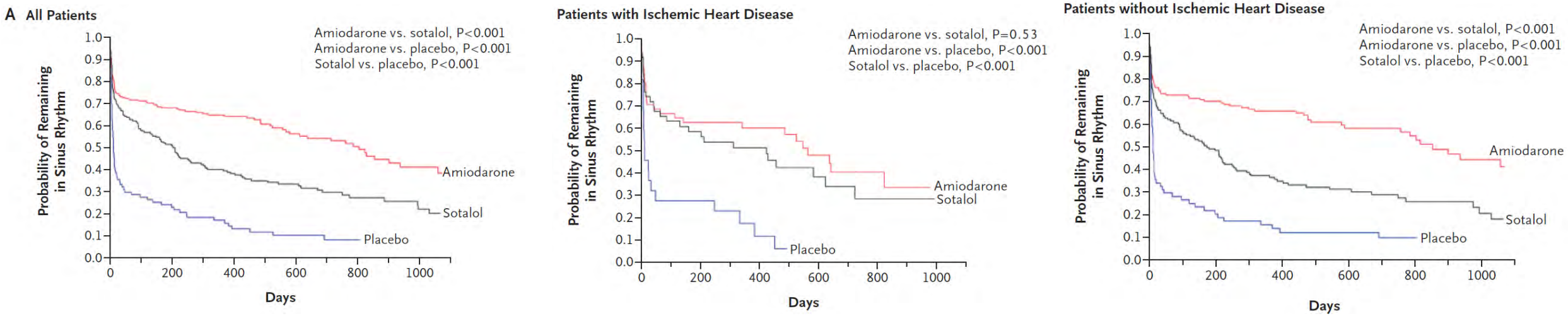
Recommendations for rhythm control

Recommendations	Class	Level
Rhythm control therapy is recommended for symptom and QoL improvement in symptomatic patients with AF.	I	A

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

Drug	Dose	Main Contra-indications and precautions	Warning signs warranting discontinuation	AV nodal slowing	Suggested ECG monitoring during initiation
Amiodarone	600mg in divided doses for 4 weeks, 400mg for 4 weeks, then 200mg once daily	Caution when using concomitant therapy with QT-prolonging drugs and in patients with SAN or AV nodeand conduction disease. The dose of VKAs and of digitalis should be reduced. Increased risk of myopathy with statins. Caution in patients with pre-existing liver disease.	**QT prolongation >500 ms**	10–12 bpm in AF	**Baseline, 1 week, 4 weeks**
Flecainide	100-150mg twice daily	Contra-indicated if CrCl <50 mg/mL, liver disease, IHD or reduced LV ejection fraction Caution in the presence of SAN or AV node or conduction disease. CYP2D6 inhibitors (e.g. fluoxetine or tricyclic antidepressants) increase plasma concentration.	**QRS duration increases >25%** above baseline	None	**Baseline, day 1, day 2–3**
Propafenone	150mg-300mg three times daily	Contra-indicated in IHD or reduced LV ejection fraction. Caution in the presence of SAN or AV node and conduction disease, renal or liver impairment, and asthma. Increases concentration of digitalis and warfarin.	**QRS duration increase >25%** above baseline	Slight	**Baseline, day 1, day 2–3**
Sotalol	80-160mg twice daily	Contra-indicated in the presence of significant LV hypertrophy, systolic heart failure, asthma, pre-existing QT prolongation, hypokalaemia, CrCl<50 mg/mL. Moderate renal dysfunction requires careful adaptation of dose.	**QT interval >500 ms**, QT prolongation by >60 ms upon therapy initiation	Similar to high dose blockers	**Baseline, day 1, day 2–3**

Amiodarone vs Sotalol



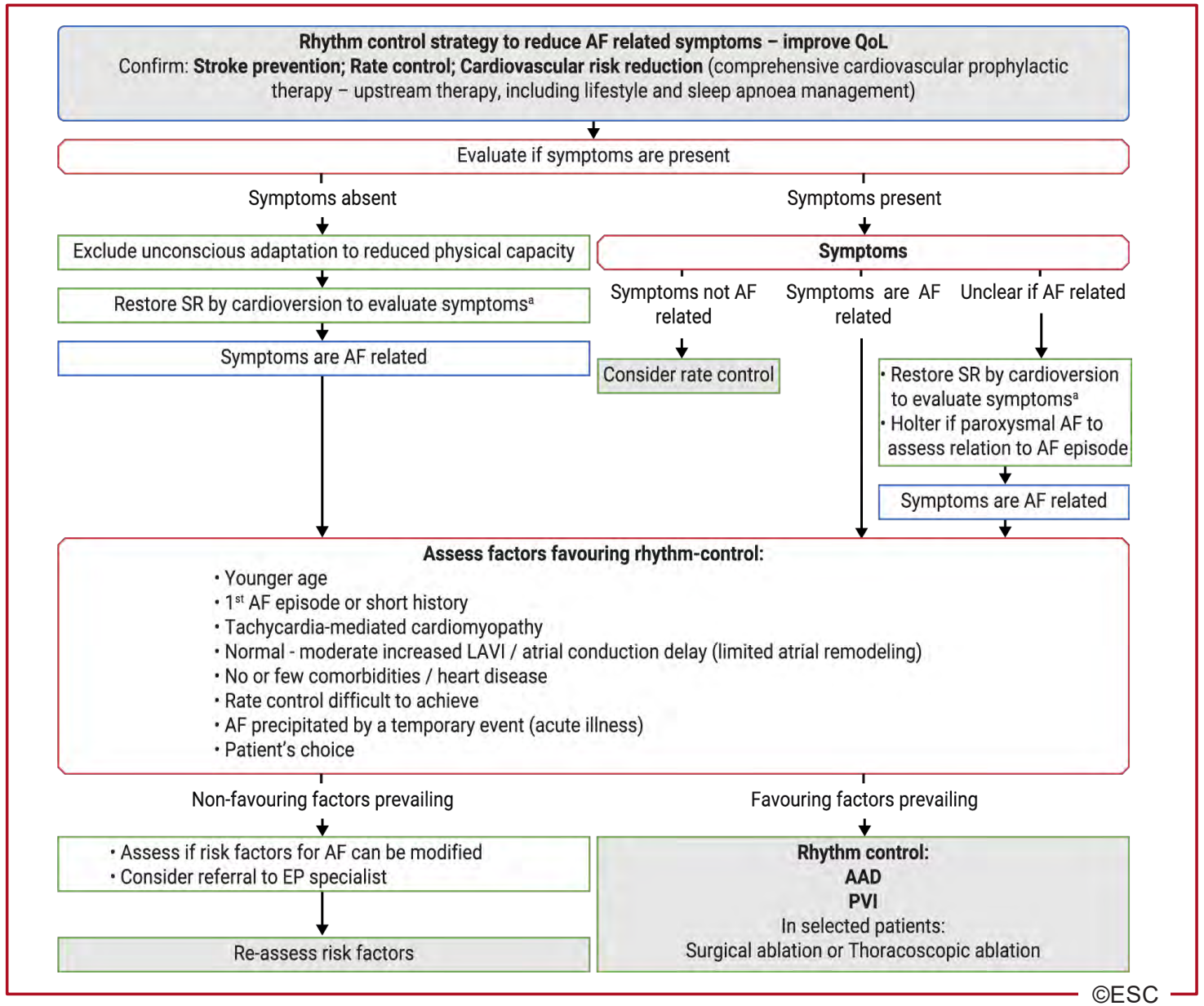
Amiodarone and sotalol are equally efficacious in converting atrial fibrillation to sinus rhythm. **Amiodarone is superior** for **maintaining sinus rhythm**, but both drugs have similar efficacy in patients with ischemic heart disease.

ORIGINAL ARTICLE

Amiodarone versus Sotalol for Atrial Fibrillation

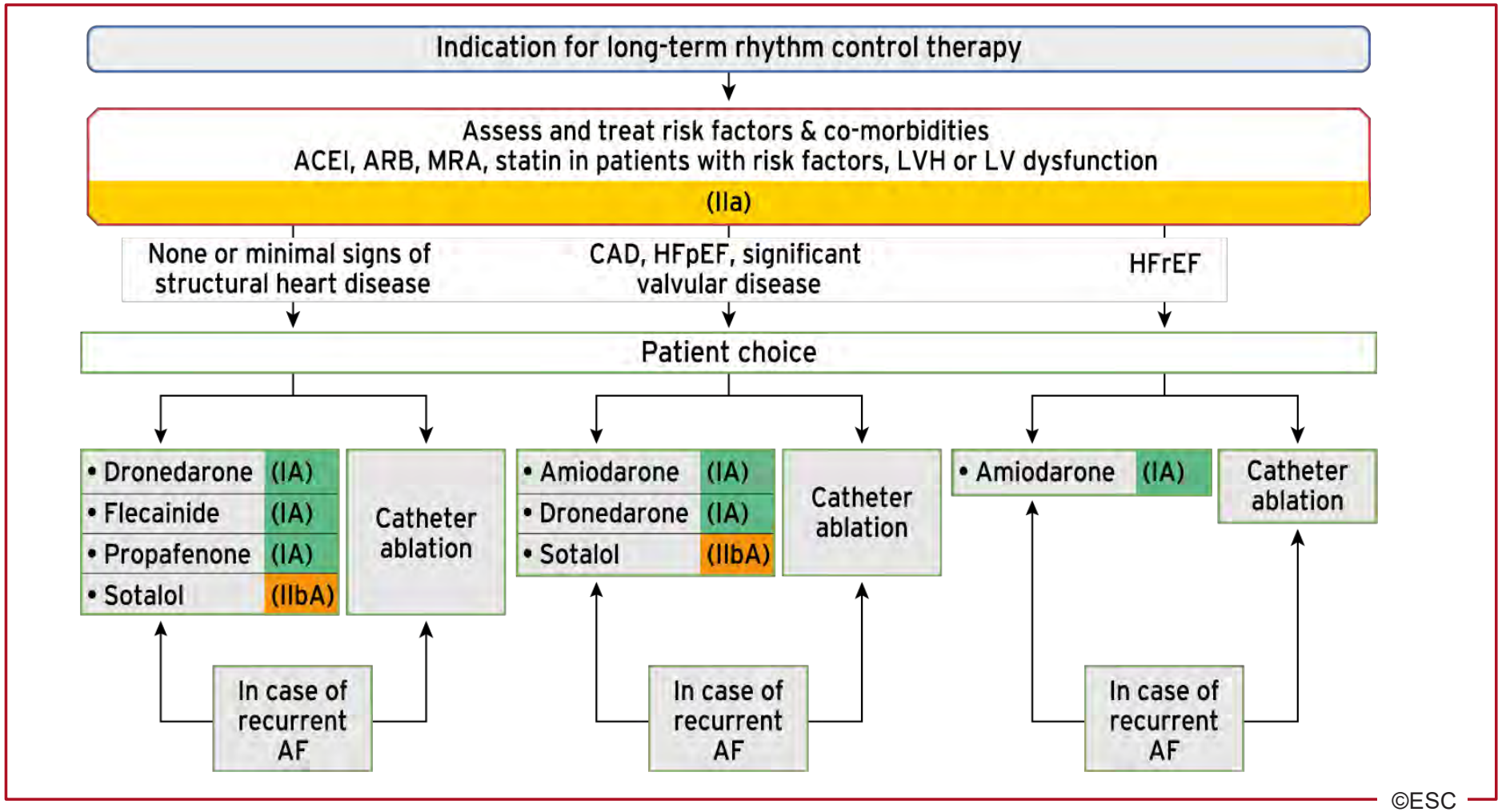
Bramah N. Singh, M.D., D.Sc., Steven N. Singh, M.D., Domenic J. Reda, Ph.D., X. Charlene Tang, M.D., Ph.D., Becky Lopez, R.N., Crystal L. Harris, Pharm.D., Ross D. Fletcher, M.D., Satish C. Sharma, M.D., J. Edwin Atwood, M.D., Alan K. Jacobson, M.D., H. Daniel Lewis, Jr., M.D., Dennis W. Raisch, Ph.D., and Michael D. Ezekowitz, M.B., Ch.B., Ph.D., for the Sotalol Amiodarone Atrial Fibrillation Efficacy Trial (SAFE-T) Investigators*

N Engl J Med 2005;352:1861-72.



[a]Consider cardioversion to confirm that the absence of symptoms is not due to unconscious adaptation to reduced physical and/or mental capacity.

Figure 19 Long-term rhythm control therapy



2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

Rate control vs rhythm control

Rate vs rhythm control

Rhythm control	Rate control
Advantages • Fewer symptoms • Better exercise tolerance • Improved haemodynamic function • Less need for anticoagulation	**Advantages** • Avoidance of antiarrhythmic drugs • Good efficacy of rate control drugs • Fewer admissions to hospital • More cost effective • Risk of stroke similar to rhythm control • Mortality similar to rhythm control
Disadvantages • Side effects of antiarrhythmic drugs • Poor efficacy of antiarrhythmic drugs • Expensive • High rates of recurrence • Increased admissions to hospital	**Disadvantages** • Risks of anticoagulation • Risk of tachycardiomyopathy • Symptoms of persisting arrhythmia • Atrial remodelling (permanent)

Iqbal et al. BMJ 2005

Rate vs rhythm control

The strategy of restoring and maintaining sinus rhythm had **no clear advantage** over the strategy of controlling the ventricular rate and allowing atrial fibrillation to persist.

Trend toward increased mortality in association with the **rhythm-control** strategy (P=0.08)

The rates of the **composite end point** of *death*, *disabling stroke*, *disabling anoxic encephalopathy*, *major bleeding*, and *cardiac arrest* were also **similar in the two groups** (P=0.33).

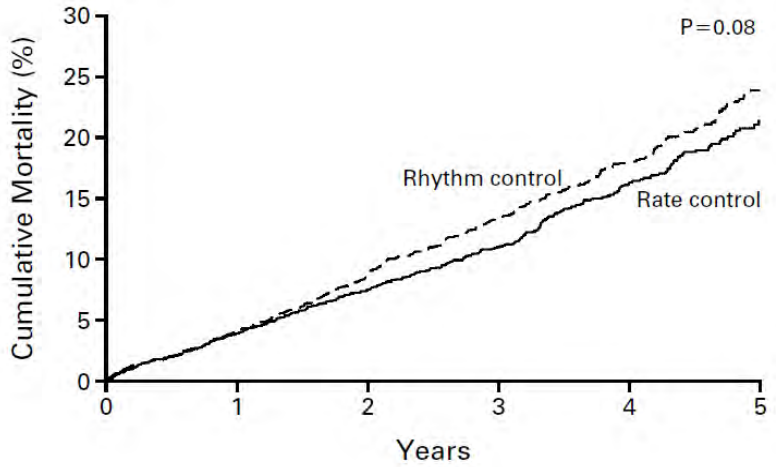
The majority of strokes in both groups occurred in patients who had **stopped taking warfarin or whose INR was subtherapeutic** at the time of the stroke, in general agreement with previously reported observations.

Torsade de pointes or **bradycardic arrest** occurred **more often in the rhythm-control group** than in the rate-control group.

The patients in the **rhythm-control group** were significantly **more likely to be hospitalized and have adverse drug effects** than those in the rate-control group

This study also suggest **that continuous anticoagulation is warranted in all patients** with atrial fibrillation and **risk factors for stroke**, **even when sinus rhythm appears to be restored** and **maintained.**

Mortality (any cause)



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)

Figure 1. Cumulative Mortality from Any Cause in the Rhythm-Control Group and the Rate-Control Group.

A COMPARISON OF RATE CONTROL AND RHYTHM CONTROL IN PATIENTS WITH ATRIAL FIBRILLATION

The Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) Investigators*

The New England Journal of Medicine

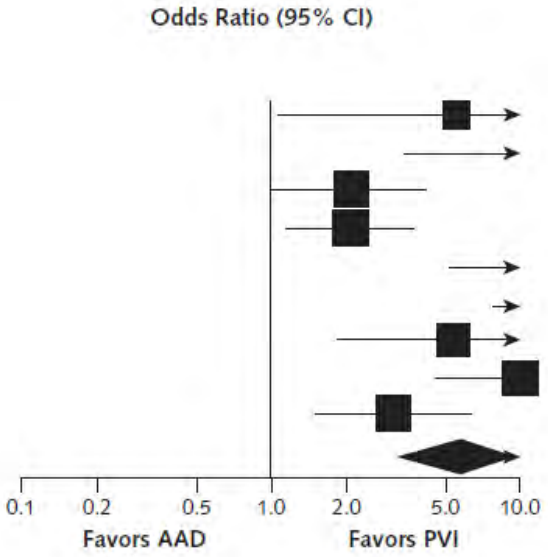
VOLUME 347 DECEMBER 5, 2002 NUMBER 23

Rate vs rhythm control

Maintenance of SR AAD vs PVI

E.

Study, Year (Reference)	Odds Ratio (95% CI)	Maintenance of Sinus Rhythm/Total, *n/N*	
		PVI	AAD
Krittayaphong et al, 2003 (147)	5.500 (1.065–28.416)	11/14	6/15
Wazni et al, 2005 (157)	11.846 (3.387–41.433)	28/32	13/35
Oral et al, 2006 (114)	2.066 (1.028–4.155)	57/77	40/69
Pappone et al, 2006 (115)	2.048 (1.130–3.711)	72/99	56/99
Stabile et al, 2006 (119)	13.300 (5.069–34.894)	38/68	6/69
Jaïs et al, 2008 (143)	24.769 (8.634–71.059)	46/52	13/55
Forleo et al, 2009 (112)	5.333 (1.839–15.471)	28/35	15/35
Wilber et al, 2010 (126)	9.917 (4.509–21.808)	70/106	10/61
Mont et al, 2014 (132)	3.059 (1.494–6.263)	69/98	21/48
Overall	5.874 (3.180–10.849)		



REVIEW | Annals of Internal Medicine

Rate- and Rhythm-Control Therapies in Patients With Atrial Fibrillation

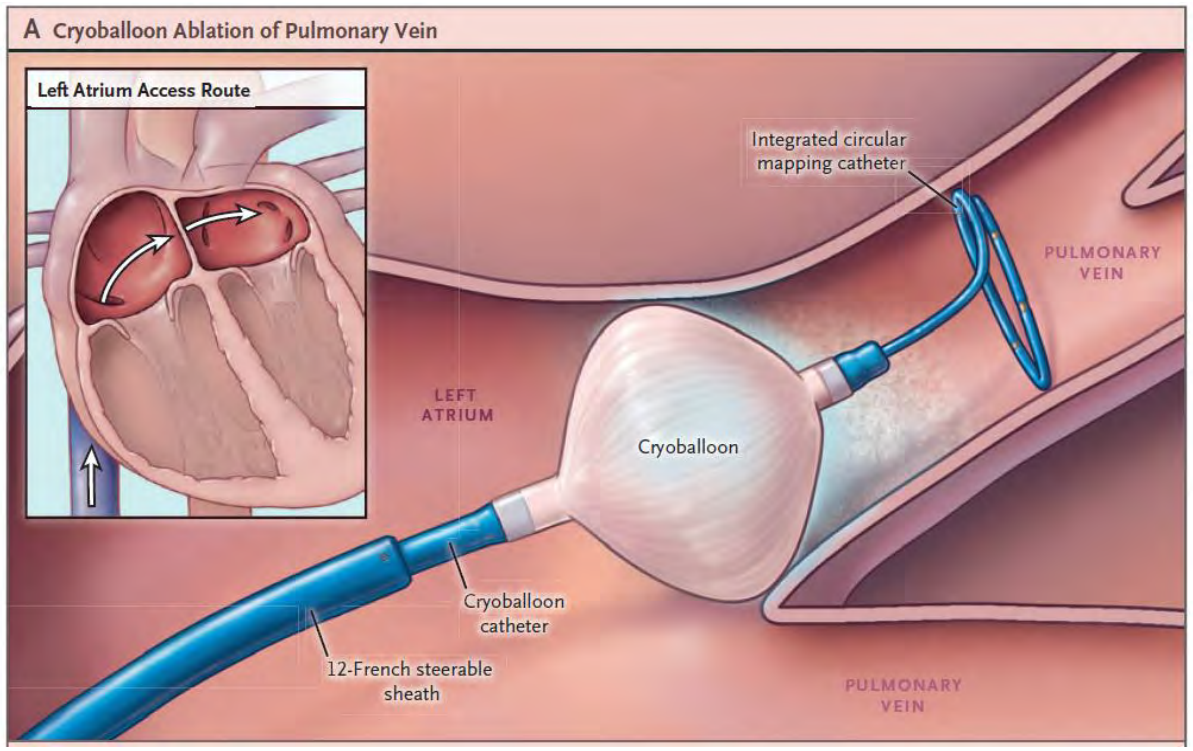
A Systematic Review

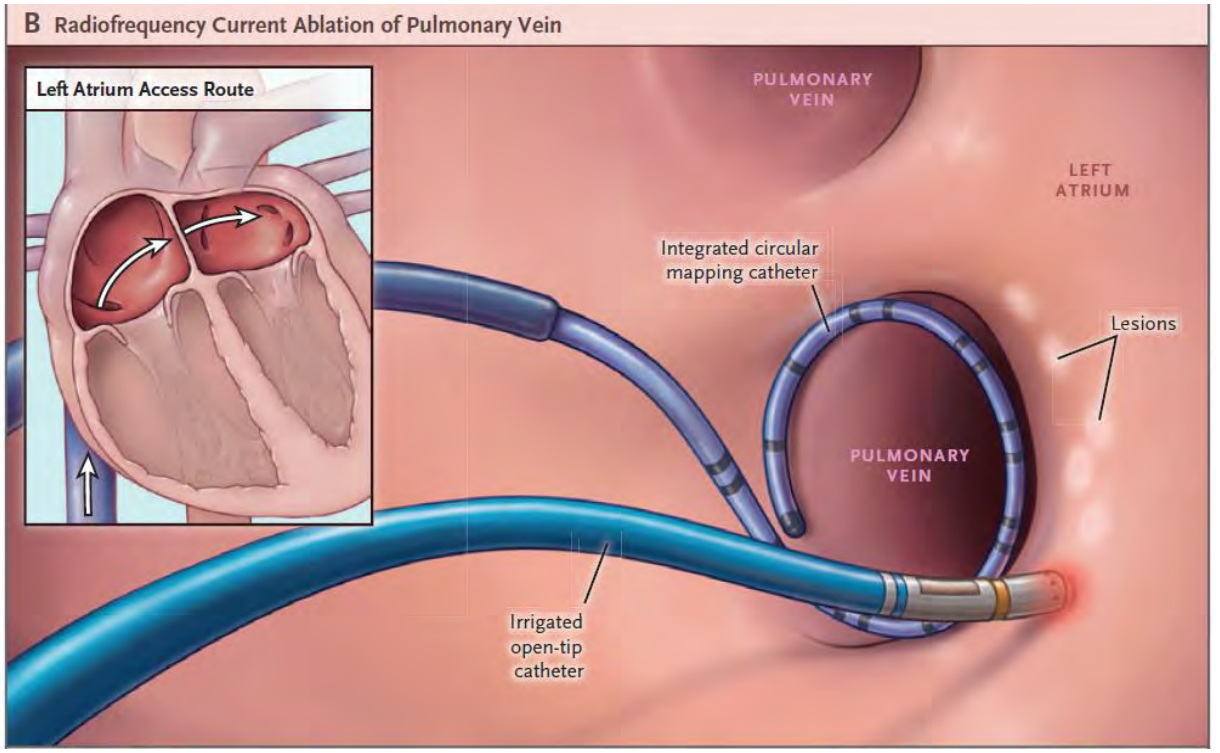
Sana M. Al-Khatib, MD, MHS; Nancy M. Allen LaPointe, PharmD; Ranee Chatterjee, MD, MPH; Matthew J. Crowley, MD; Matthew E. Dupre, PhD; David F. Kong, MD; Renato D. Lopes, MD, PhD; Thomas J. Povsic, MD, PhD; Shveta S. Raju, MD; Bimal Shah, MD; Andrzej S. Kosinski, PhD; Amanda J. McBroom, PhD; and Gillian D. Sanders, PhD

Ann Intern Med. 2014;160:760-773.

Catheter Ablation vs Medical Therapy

Catheter Ablation of AF





ORIGINAL ARTICLE

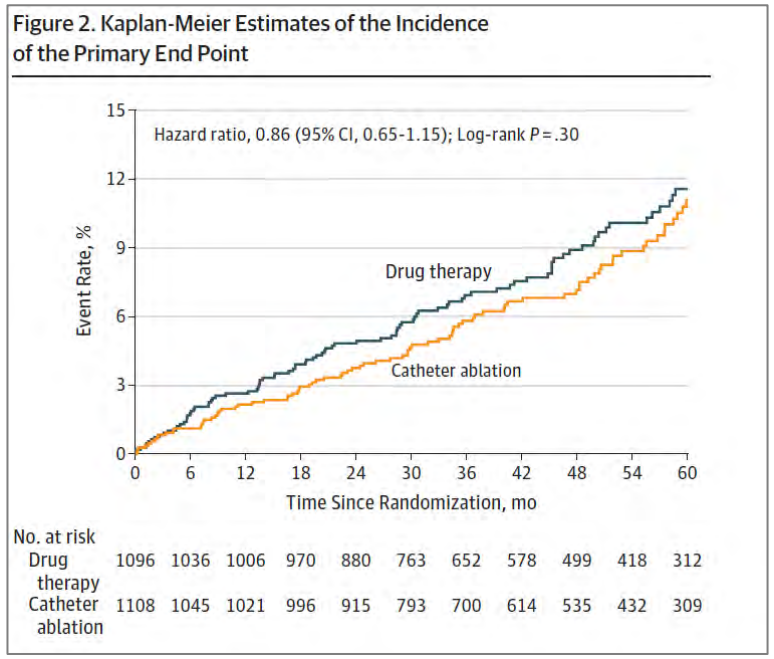
Cryoballoon or Radiofrequency Ablation for Paroxysmal Atrial Fibrillation

Karl-Heinz Kuck, M.D., Josep Brugada, M.D., Alexander Fürnkranz, M.D., Andreas Metzner, M.D., Feifan Ouyang, M.D., K.R. Julian Chun, M.D., Arif Elvan, M.D., Ph.D, Thomas Arentz, M.D., Kurt Bestehorn, M.D., Stuart J. Pocock, Ph.D., Jean-Paul Albenque, M.D., Ph.D., and Claudio Tondo, M.D., Ph.D., for the FIRE AND ICE Investigators*

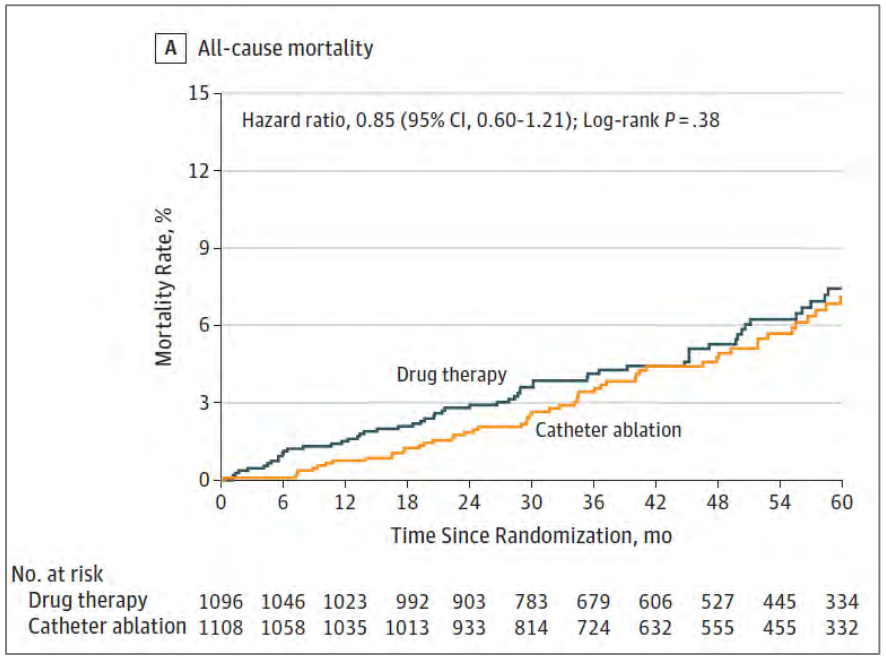
N Engl J Med 2016;374:2235-45.

Catheter Ablation vs Medical Therapy

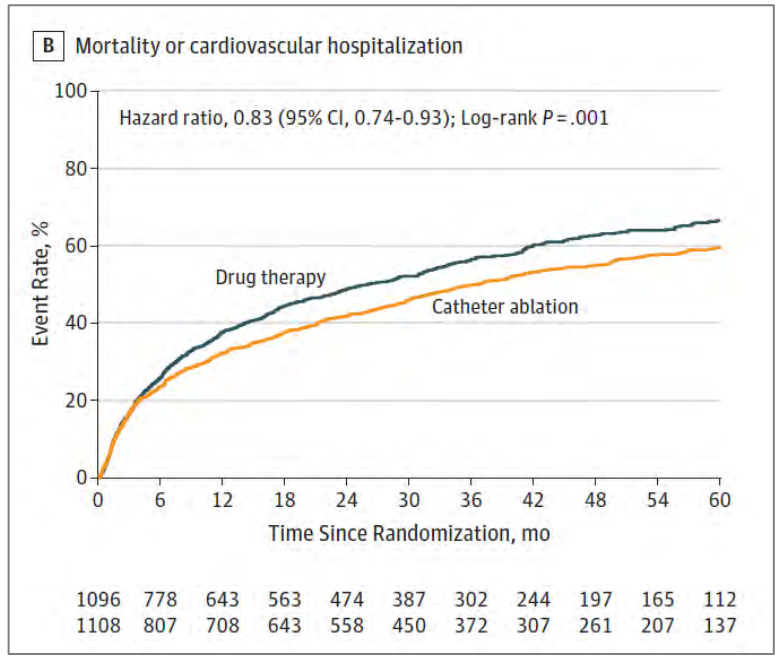
Cumulative risk of **death**, **disabling stroke**, serious **bleeding** or **cardiac arrest**



All cause mortality



Mortality or Cardiovascular Hospitalization



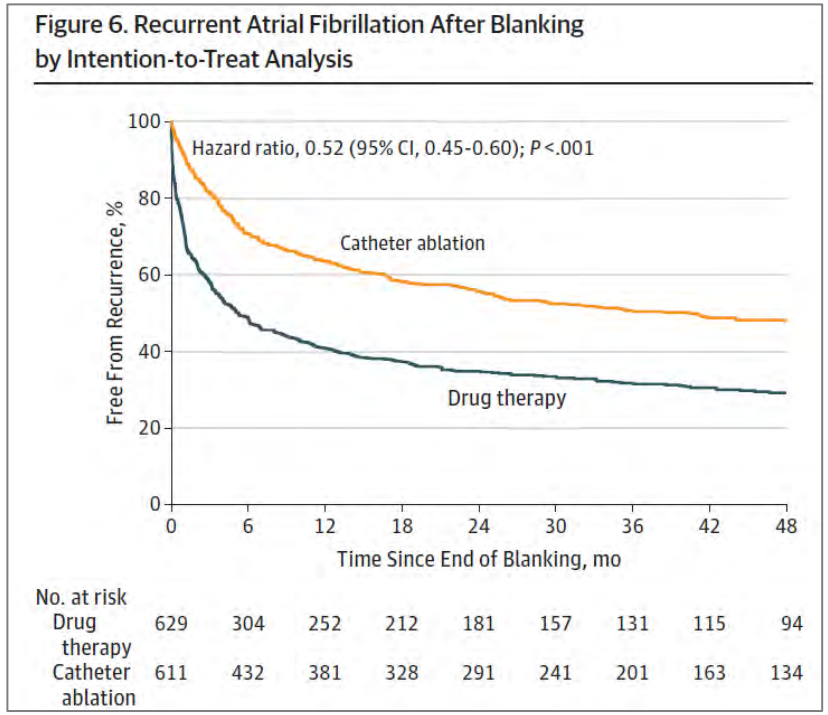
Among patients with **AF,** the strategy of **catheter ablation**, compared with medical therapy**, does not significantly reduce the primary composite end point of death, disabling stroke, serious bleeding, or cardiac arrest.**

JAMA | Original Investigation

Effect of Catheter Ablation vs Medical Therapy on Quality of Life Among Patients With Atrial Fibrillation
The CABANA Randomized Clinical Trial

Daniel B. Mark, MD, MPH; Kevin J. Anstrom, PhD; Shubin Sheng, PhD; Jonathan P. Piccini, MD, MHS; Khaula N. Baloch, MPH; Kristi H. Monahan, RN; Melanie R. Daniels, BA; Tristram D. Bahnson, MD; Jeanne E. Poole, MD; Yves Rosenberg, MD, MPH; Kerry L. Lee, PhD; Douglas L. Packer, MD; for the CABANA Investigators

Catheter Ablation vs Medical Therapy



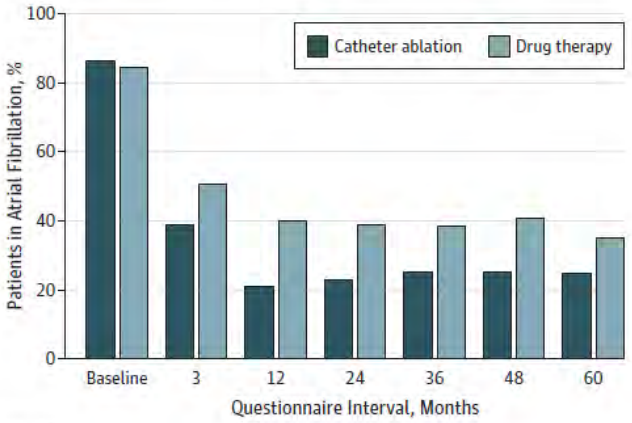
Catheter ablation is associated with a lower AF recurrence rate than drug therapy (50% vs 69% at 3years post blanking follow-up).

JAMA | Original Investigation
Effect of Catheter Ablation vs Medical Therapy on Quality of Life Among Patients With Atrial Fibrillation
The CABANA Randomized Clinical Trial

Daniel B. Mark, MD, MPH; Kevin J. Anstrom, PhD; Shubin Sheng, PhD; Jonathan P. Piccini, MD, MHS; Khaula N. Baloch, MPH; Kristi H. Monahan, RN; Melanie R. Daniels, BA; Tristram D. Bahnson, MD; Jeanne E. Poole, MD; Yves Rosenberg, MD, MPH; Kerry L. Lee, PhD; Douglas L. Packer, MD; for the CABANA Investigators

Catheter Ablation vs Medical Therapy

Figure 1. Patients Who Reported Being in Atrial Fibrillation Currently or Within the Past Month



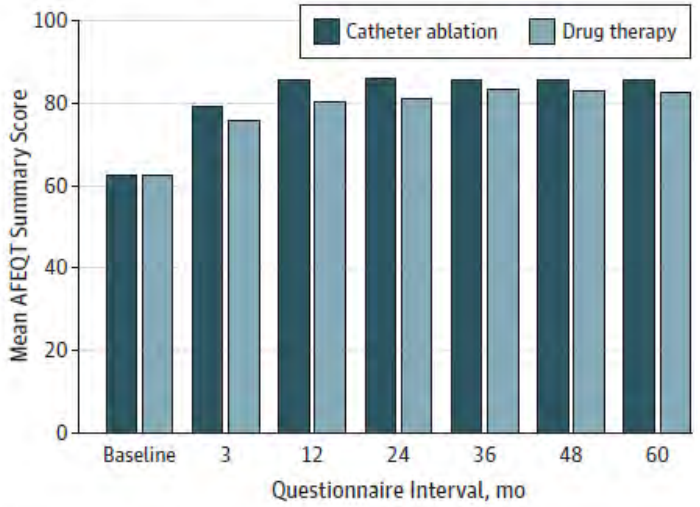
No. of patients

Catheter ablation	915	374	195	198	164	127	85
Drug therapy	885	493	362	314	239	199	117

Responses to the first item in the Atrial Fibrillation Effect on Quality of Life instrument.

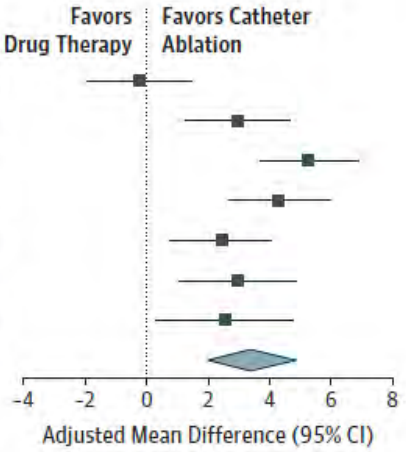
Figure 2. Atrial Fibrillation Effect on Quality of Life (AFEQT) Summary Scores

A Mean AFEQT summary score



B Between-group AFEQT summary score difference

Interval, mo	No. of Patients Ablation (n = 1108)	No. of Patients Drug Rx (n = 1096)	Adjusted Mean Difference (95% CI)
Baseline	1084	1078	-0.2 (-1.9 to 1.5)
3	971	983	3.0 (1.3 to 4.7)
12	915	903	5.3 (3.7 to 6.9
24	856	798	4.3 (2.7 to 6.0)
36	645	605	2.5 (0.8 to 4.1)
48	476	473	3.0 (1.1 to 4.9)
60	329	320	2.6 (0.3 to 4.8)
All	4192	4082	3.4 (2.1 to 4.8)



Catheter **ablation** provides **incremental symptomatic and QOL benefits over drug therapy** that is clinically important and statistically significant for patients with AF

JAMA | Original Investigation

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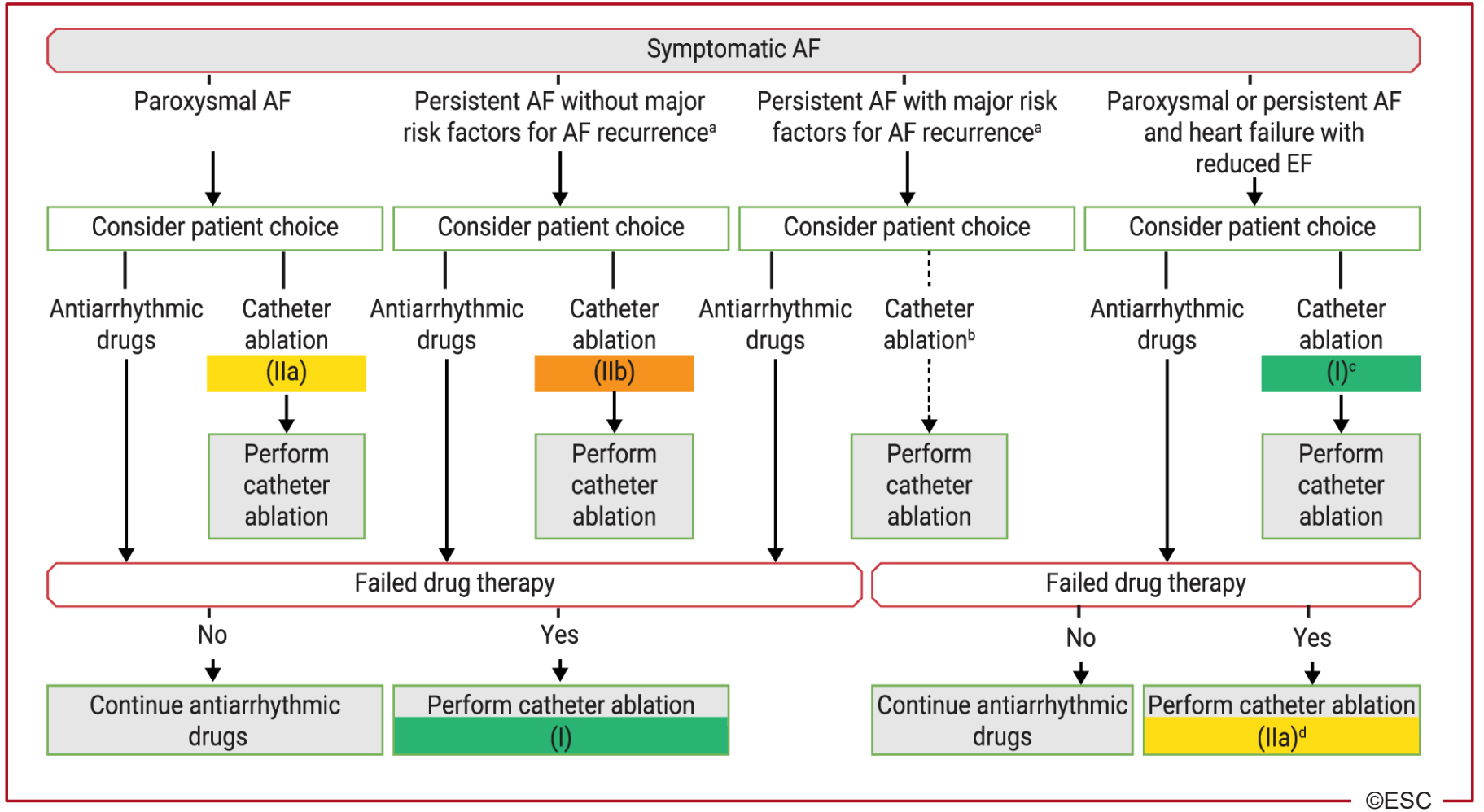
Figure 17 Indications for catheter ablation of symptomatic AF



[a]Significantly enlarged LA volume, advanced age, long AF duration, renal dysfunction, and other cardiovascular risk factors. [b]In rare individual circumstances, catheter ablation may be carefully considered as first-line therapy. [c]Recommended to reverse LV dysfunction when tachycardiomyopathy is highly probable.[d]To improve survival and reduce hospitalization.

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation
(European Heart Journal 2020-doi/10.1093/eurheartj/ehaa612)

Follow-up after Catheter Ablation of AF

- **Recurrences beyond the first month** post-ablation **are generally predictive of late recurrences**, but recurrent symptoms may be due to ectopic beats or other non-sustained arrhythmia; conversely the presence of asymptomatic AF after ablation is well described
- Monitoring may be performed with intermittent **ECG**, **Holter, external or implanted loop** recorder, or smartphone monitor. Patients should be **first reviewed at a minimum of 3 months and annually thereafter**
- Continuing **AAD treatment for 6 weeks to 3 months** may **reduce early AF recurrences**, **rehospitalizations and cardioversions** during this period
- AADs may be **weaned, ceased, or continued** according to **symptoms and rhythm status**
- **OAC therapy is continued for 2 months** following ablation in all patients. **Beyond this time**, a decision to continue OAC is determined **primarily by the presence of CHA_2-DS_2-VASc stroke risk factors rather than the rhythm status!**

2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)

The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC)

ESC European Society of Cardiology

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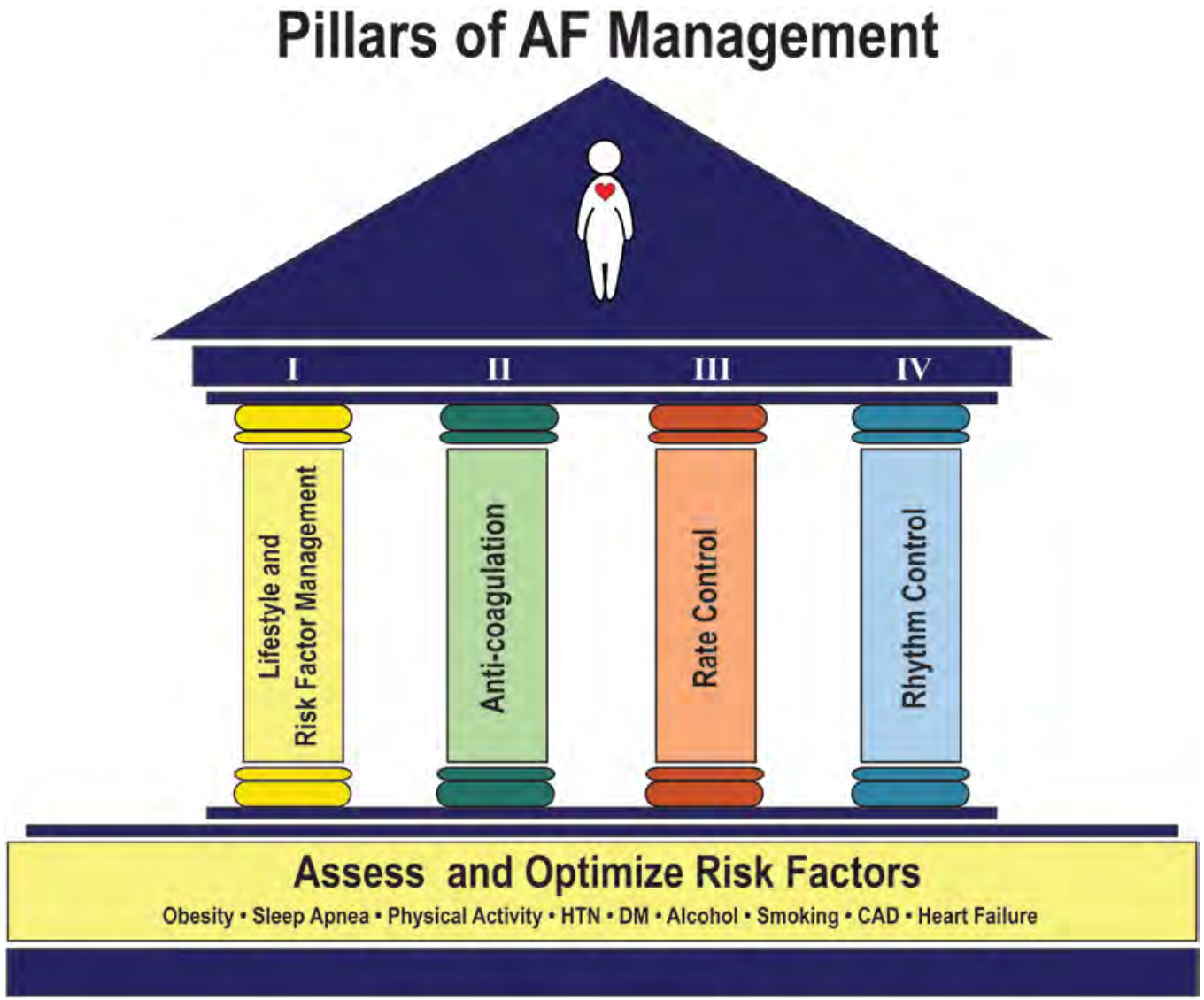
ESC GUIDELINES

Conclusions



Chung et al., Circulation 2020

Fin

Merci pour votre attention!