



# KHRS 2023

## Epidemiology and Modifiable Risk Factors for AF



**Prashanthan Sanders, MBBS, PhD**

Professor of Medicine, Centre for Heart Rhythm Disorders, University of Adelaide, Australia

Director of Cardiac Electrophysiology, Department of Cardiology, Royal Adelaide Hospital, Adelaide, Australia



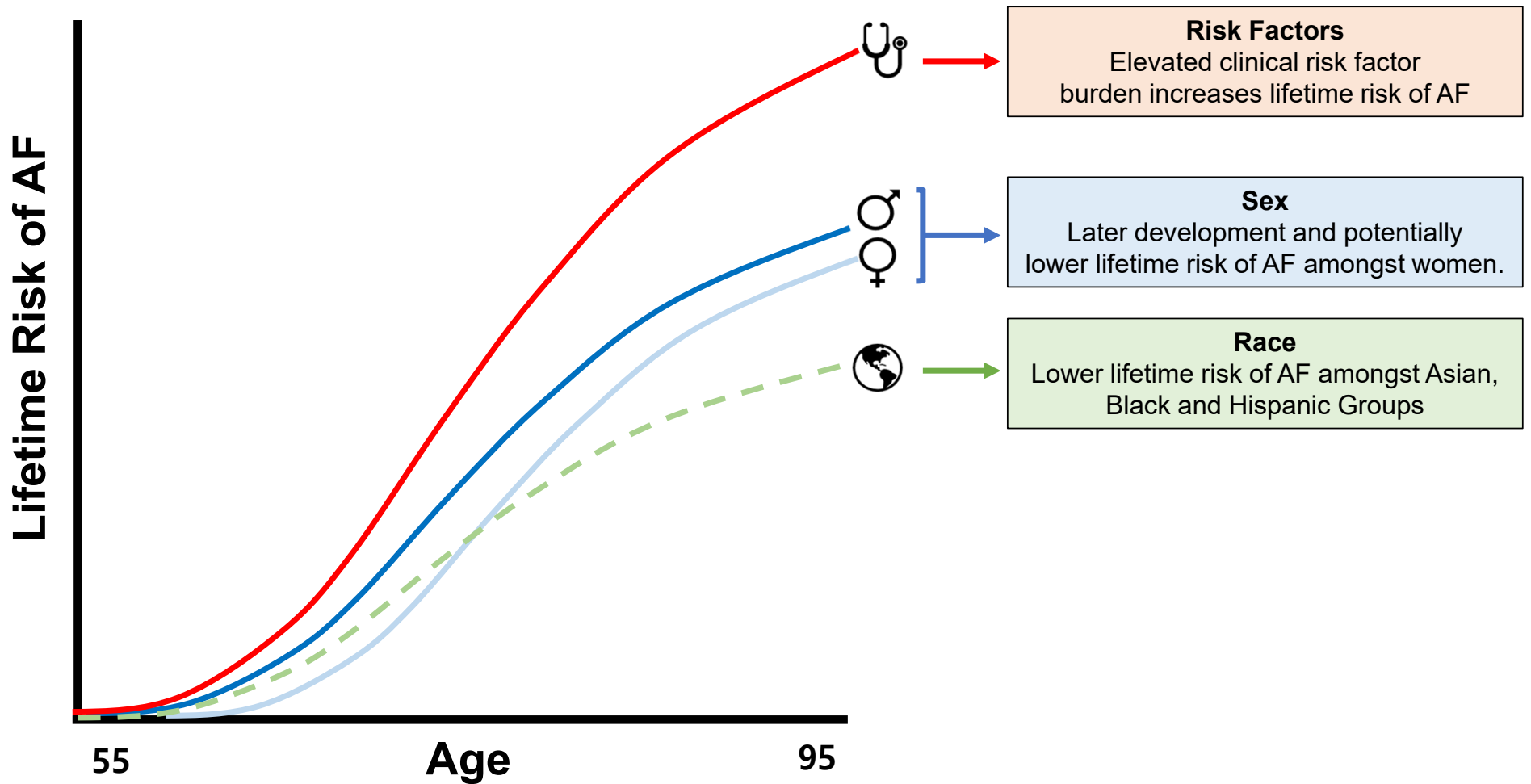
---

# Disclosure

**Advisory Board:** Medtronic, Abbott Medical, Boston-Scientific, CathRx, Pacemate

**Research Funding:** Medtronic, Abbott Medical, Boston-Scientific, Microport, Becton Dickinson

# Lifetime risk of AF





**Framingham Heart Study**  
Lifetime Risk of AF  
Optimal Risk Profile: 23.4%  
Borderline Risk Profile: 33.4%  
Elevated Risk Profile: 38.4%



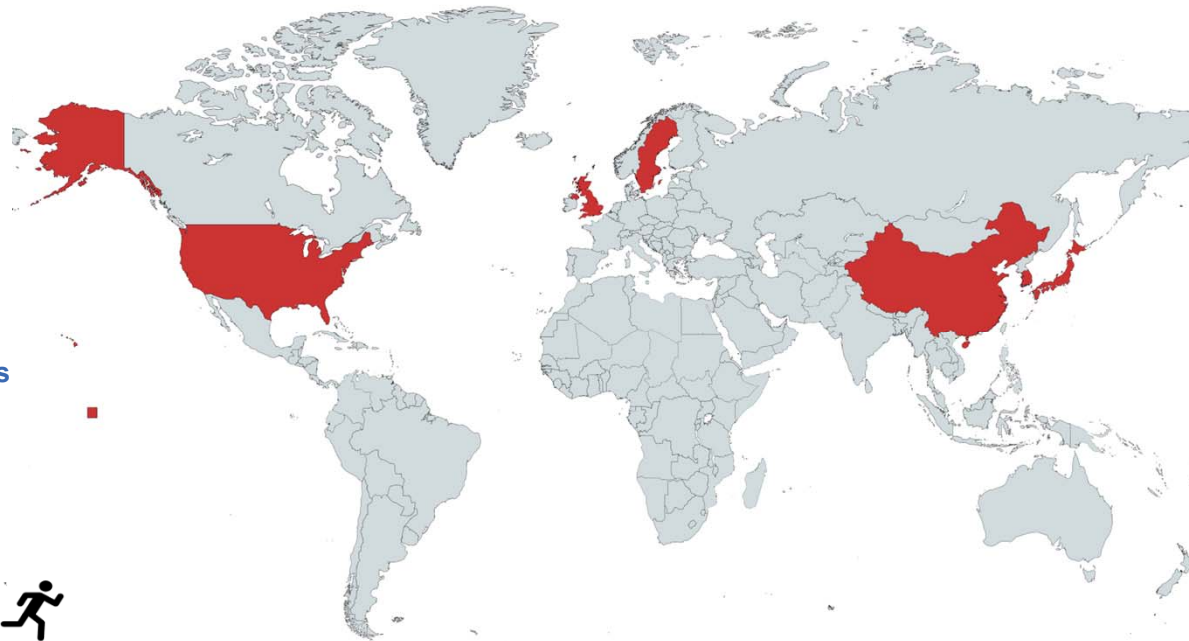
**EPIC-NORFOLK Study [UK]**  
Incident AF  
Optimal Risk Profile: REF  
1-2 Risk Factors: ↑25-56%  
3-4 Risk Factors: ↑83-282%



**Larsson et al [Sweden]**  
Incident AF  
Optimal Risk Profile: REF  
1-2 Risk Factors: ↑17-26%  
3-4 Risk Factors: ↑38-50%



**REGARDS Study**  
Incident AF  
Inadequate Risk Profile: REF  
Average Risk Profile: ↔  
Optimal Risk Profile: ↓32%



**Yang et al., 2017 [China]**  
Incident AF  
0-2 Ideal Components: REF  
2-4 Ideal Components: ↓58%  
5-7 Ideal Components: ↓56%



**Atherosclerosis Risk in Communities**  
Incident AF  
Inadequate Risk Profile: REF  
Average Risk Profile: ↓50%  
Optimal Risk Profile: ↓67%



**Nishikawa et al., 2021 [Japan]**  
Incident AF  
Inadequate Risk Profile: REF  
Average Risk Profile: ↔  
Optimal Risk Profile: ↓21%



**Multi-Ethnic Study of Atherosclerosis**  
Incident AF  
Inadequate Risk Profile: REF  
Average Risk Profile: ↓15%  
Optimal Risk Profile: ↓27%

	Smoking		Blood Pressure		Heart Disease
	Obesity/BMI		Alcohol Intake		Diet
	Diabetes		Physical Activity		Cholesterol

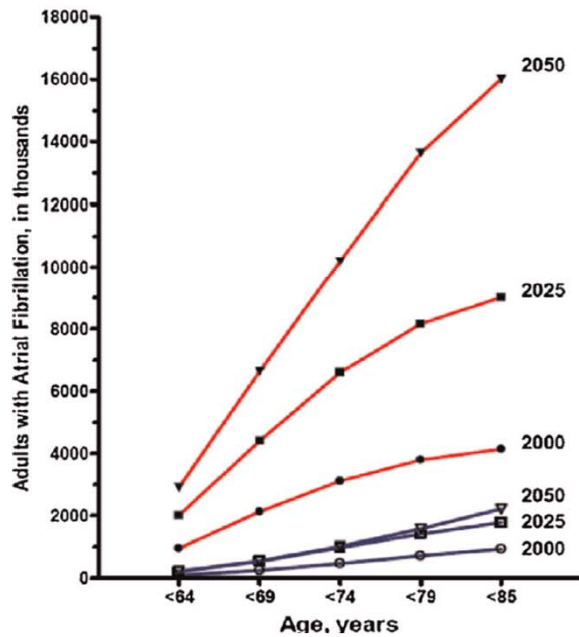
Created with mapchart.net



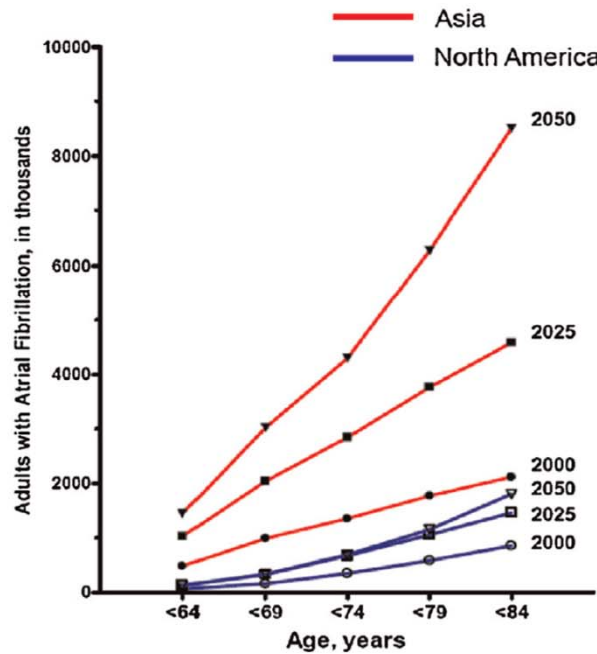
**Lee et al., 2020 [Korea]**  
Incident AF  
0 Ideal Components: ↑22%  
1-2 Ideal Components: ↑6-21%  
3 Ideal Components: REF

# Projected AF prevalence

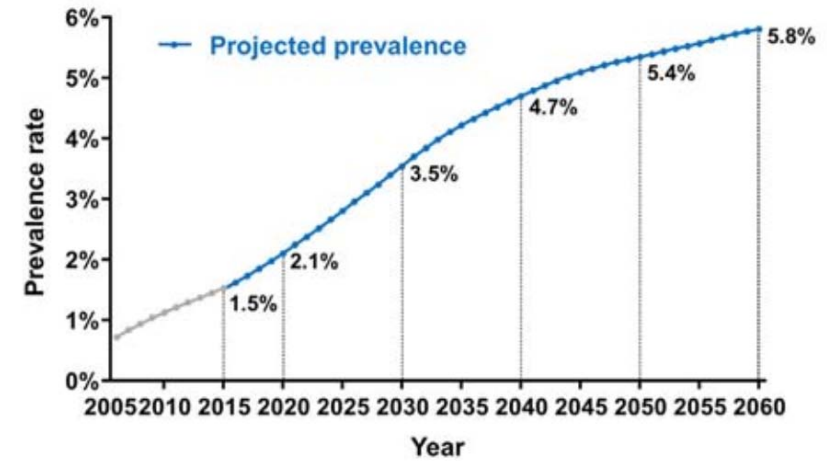
## Men



## Women



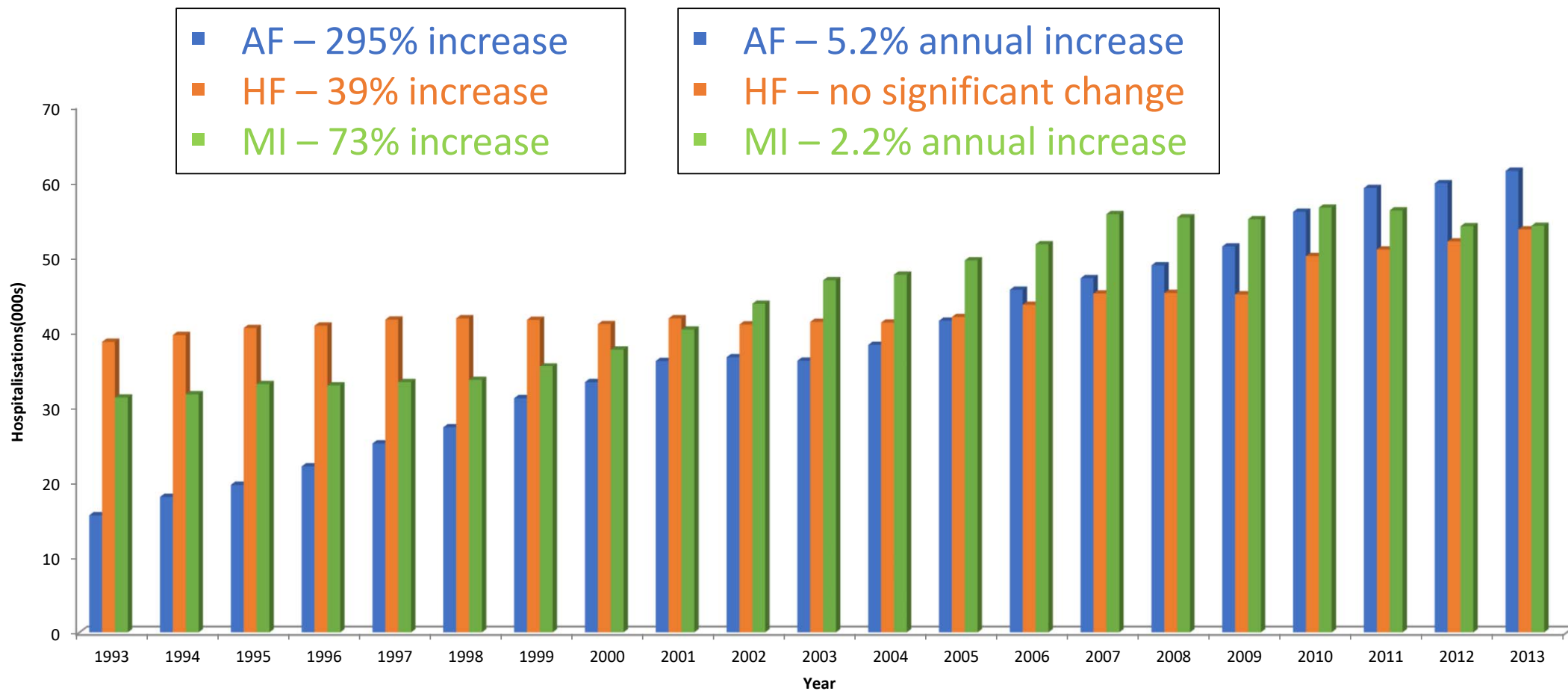
## Korea



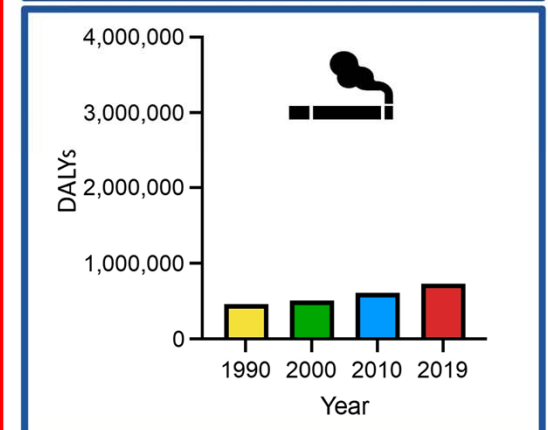
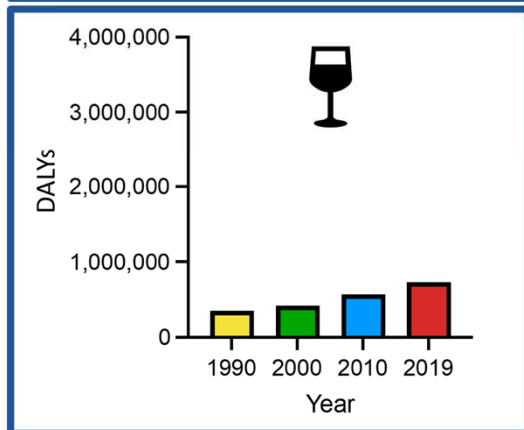
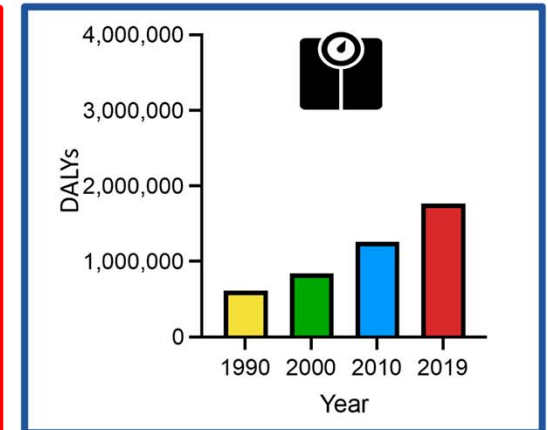
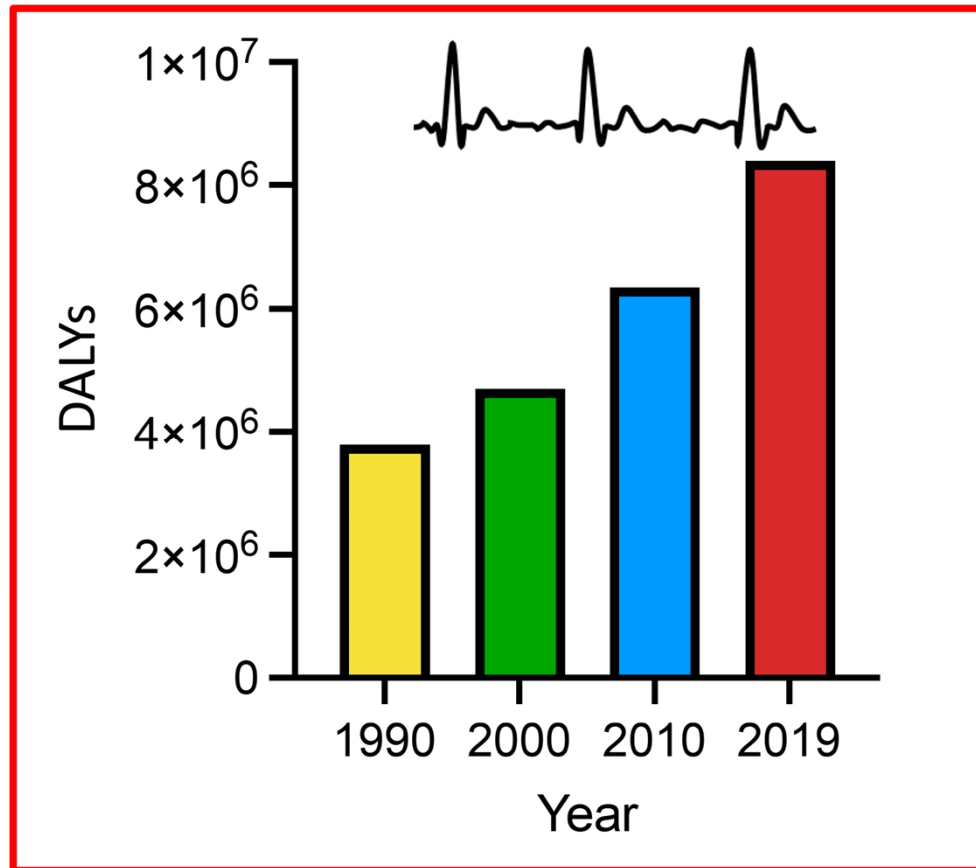
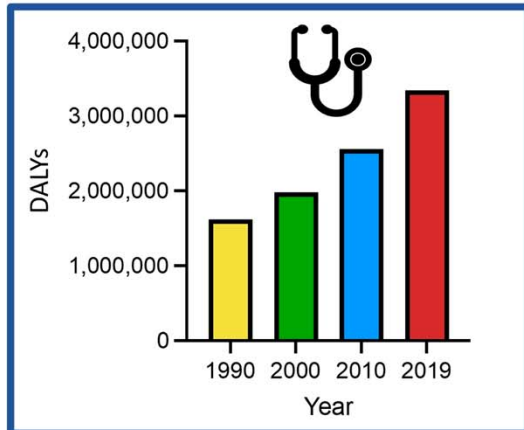
Wong CX et al. HLC 2017

Kim D et al. AHJ 2018

# AF hospitalisations 1993-2013

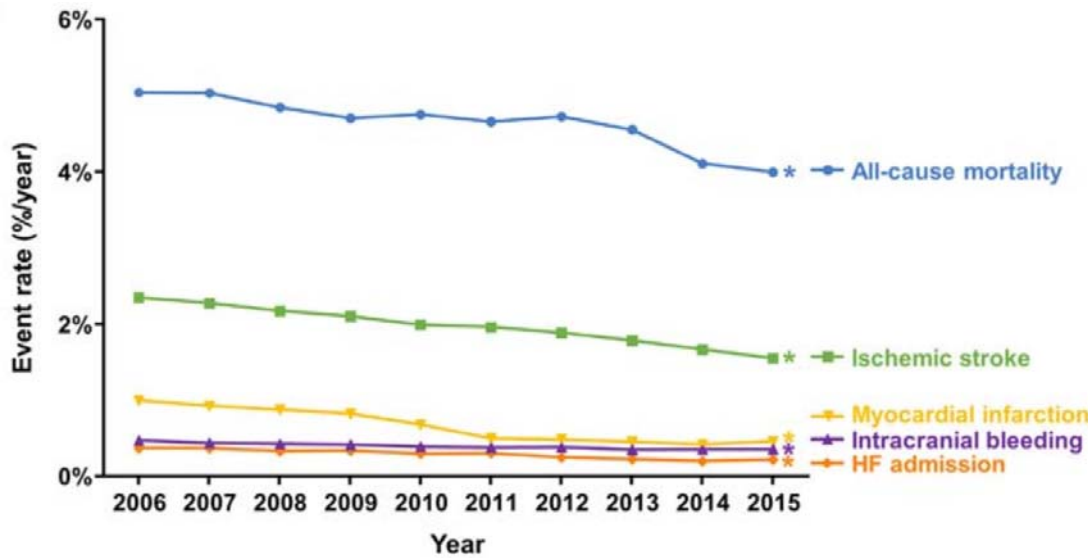


# DALYs due to AF & risk factors

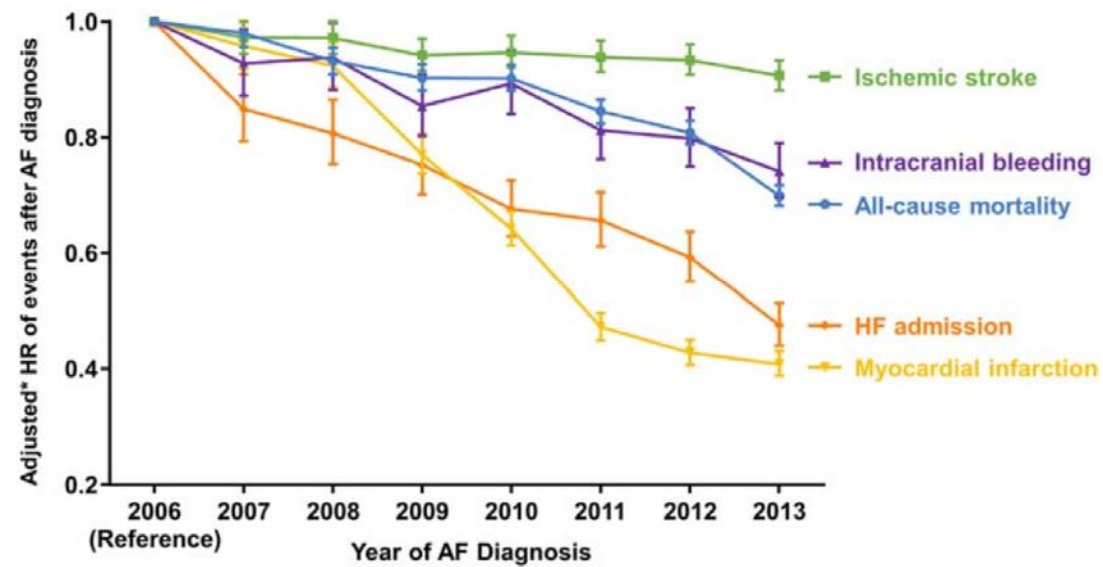


# Trends in AF outcomes

## Temporal trends



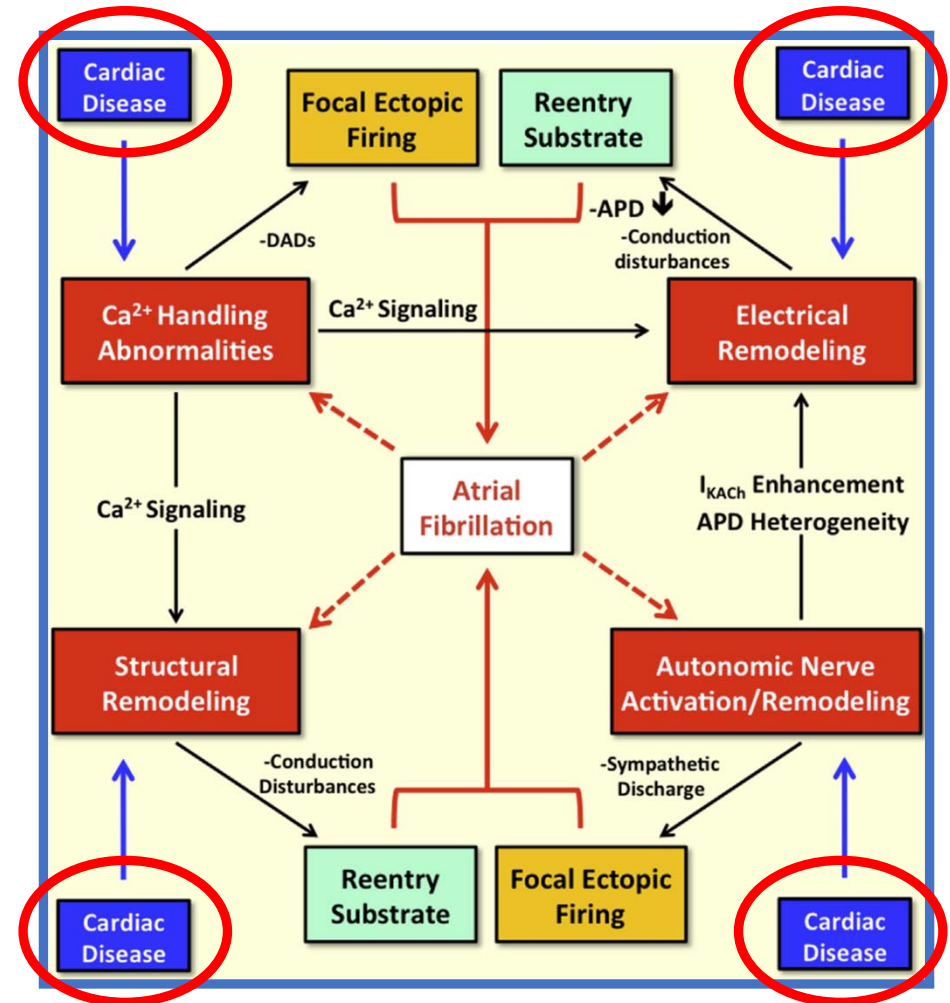
## Adjusted HR for event



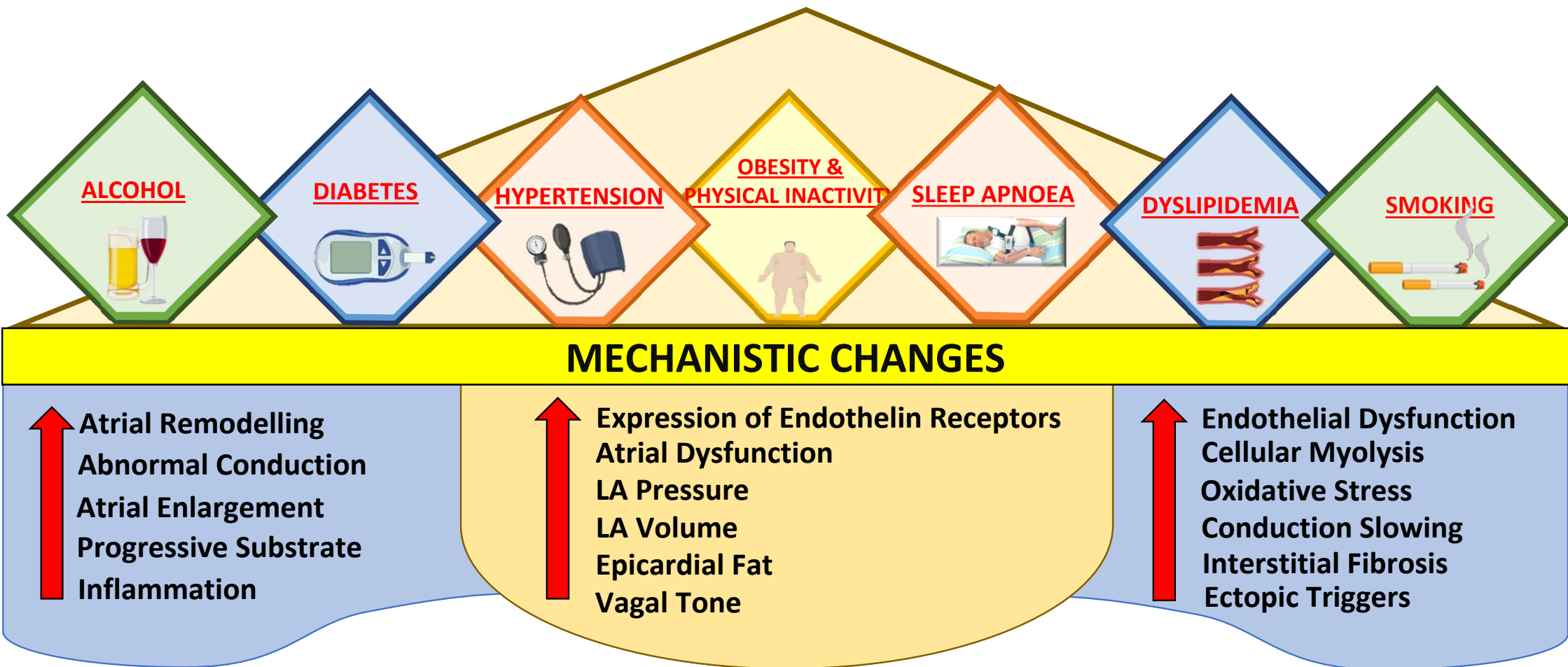


# Remodeling & the substrate for AF

- Valvular heart disease
- Heart Failure
- IHD
- Hypertension
- Diabetes



# Modifiable risk factors

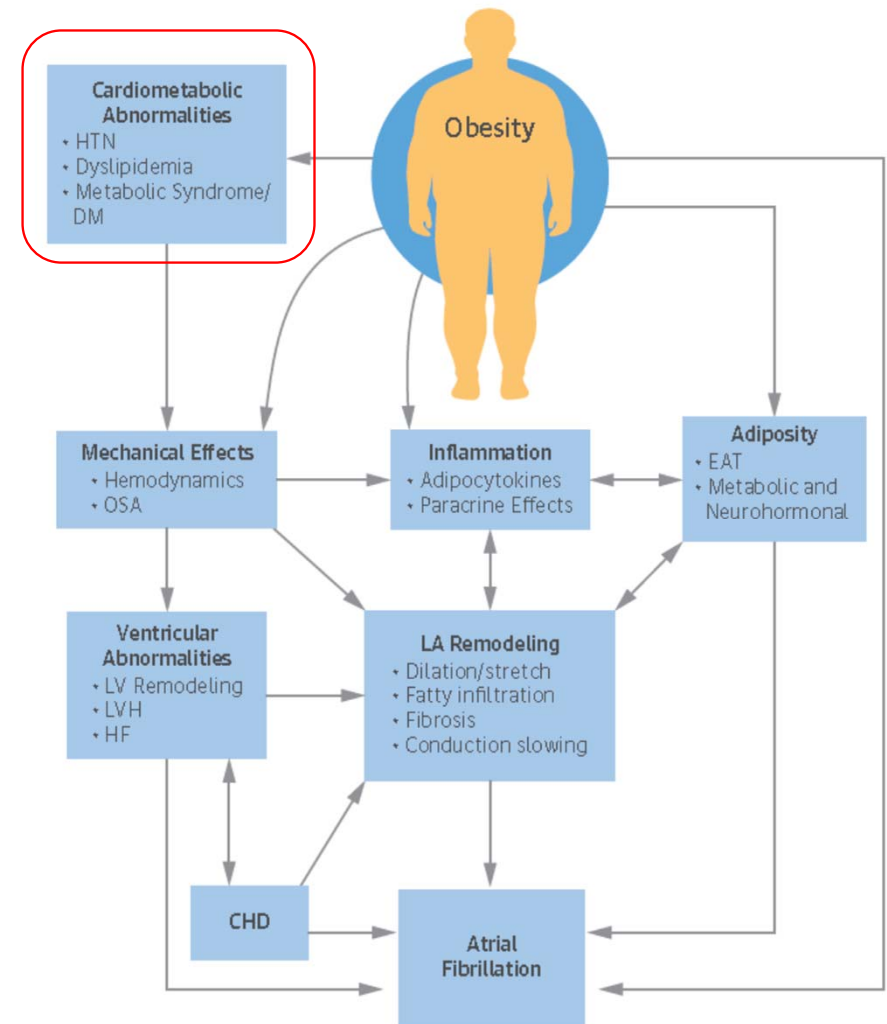


# Obesity & AF

For every 5 BMI units there is:

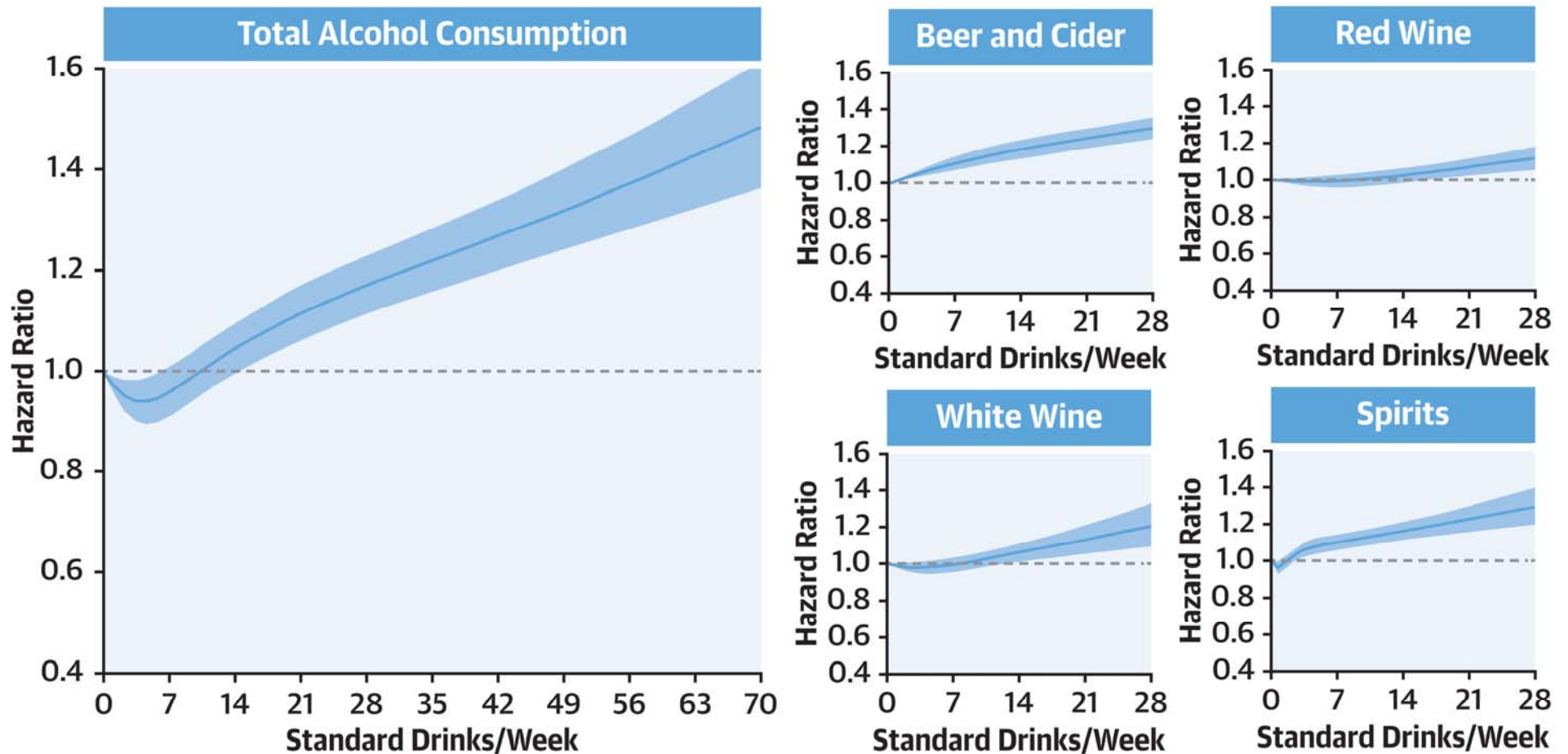
- 29% greater AF risk
- 10% greater risk of post-op AF
- 13% greater risk of AF after ablation

*Wong CX et al, JACC:EP 2015*



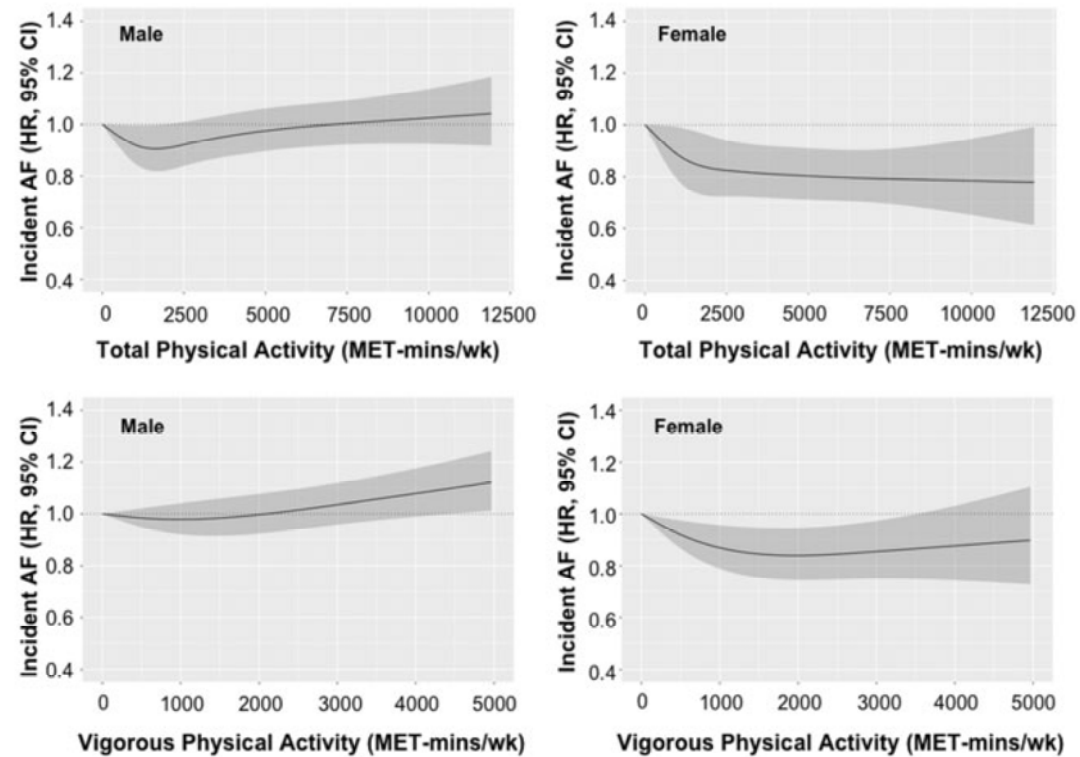
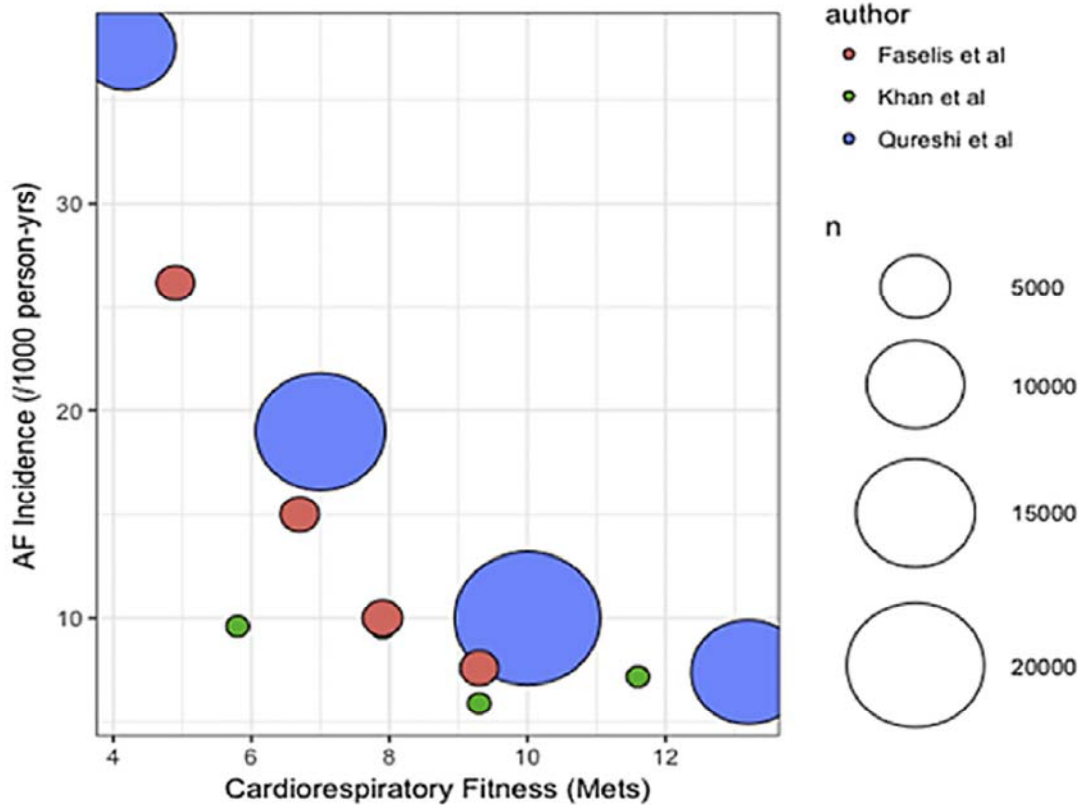
*Lavie, Pandey, Lau, Alpert, Sanders. JACC 2017*

# Alcohol & incident AF



Tu S et al. JACC: Clinical Electrophysiol 2021

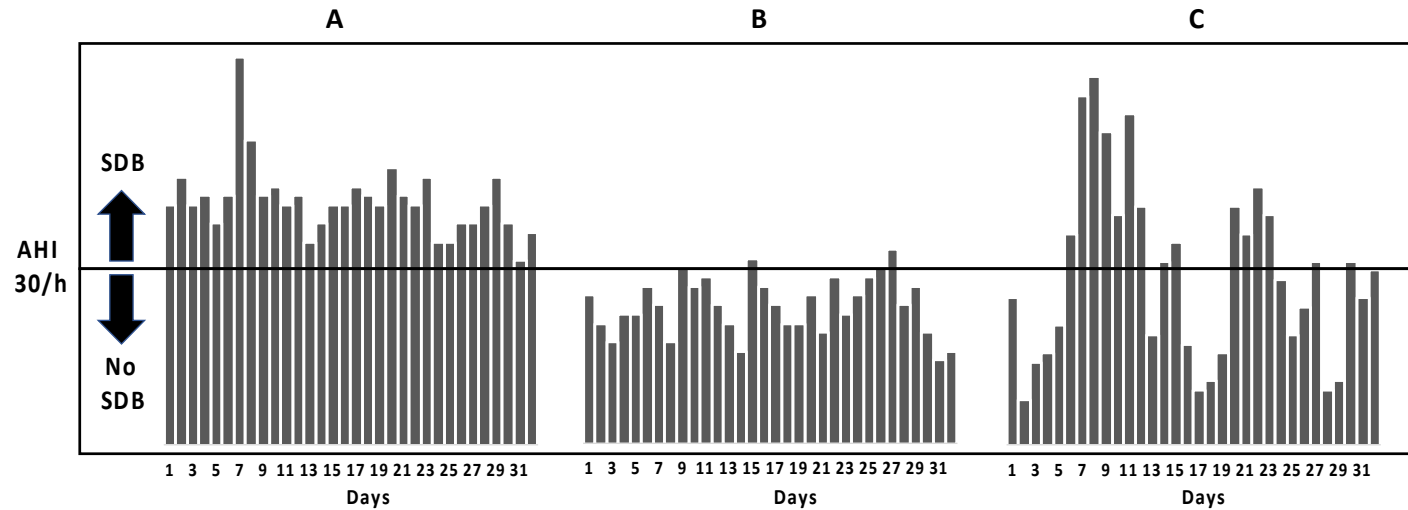
# Physical activity & incident AF



*Elliott AD et al. Heart Rhythm 2017*

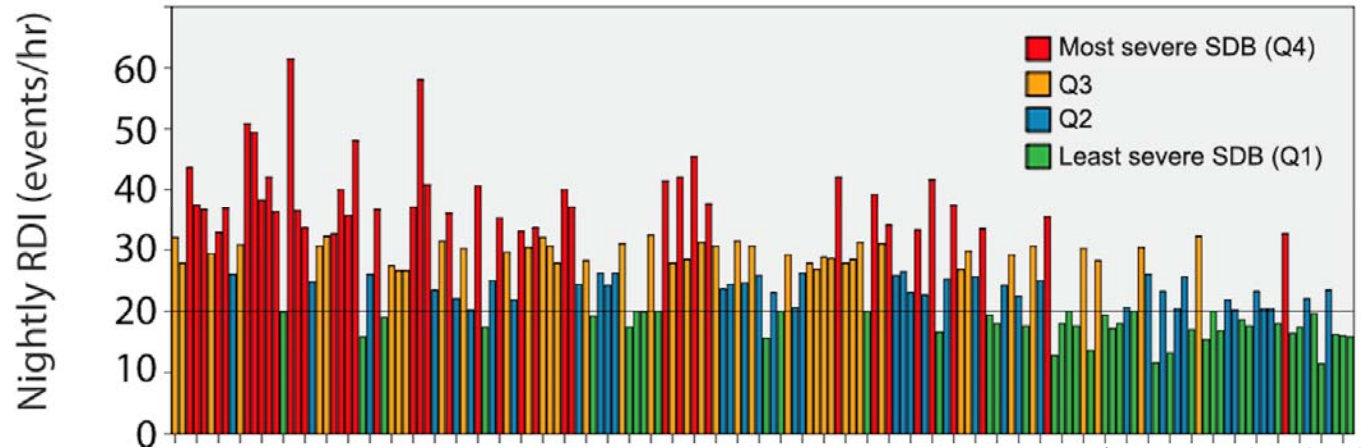
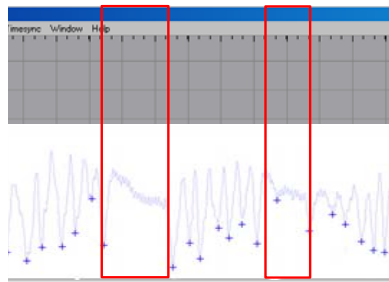
*Elliott AD et al. Eur Heart J 2020*

# Nightly variation in SDB - severity



Sleep Study

Transthoracic Impedance



*Linz et al, Int J Card 2018*

*Linz et al, JACC 2018*



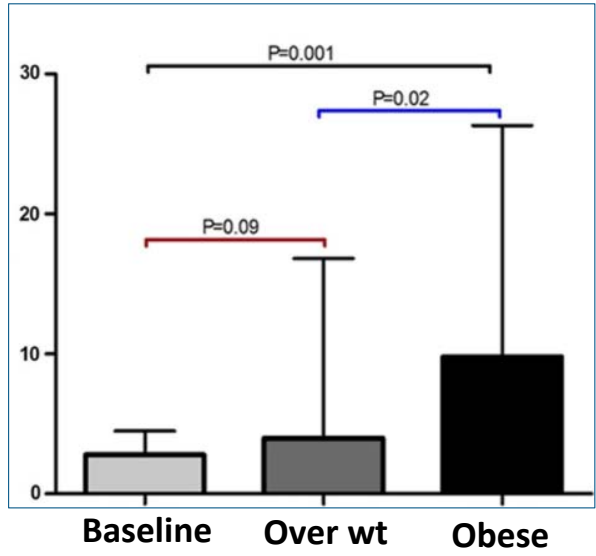
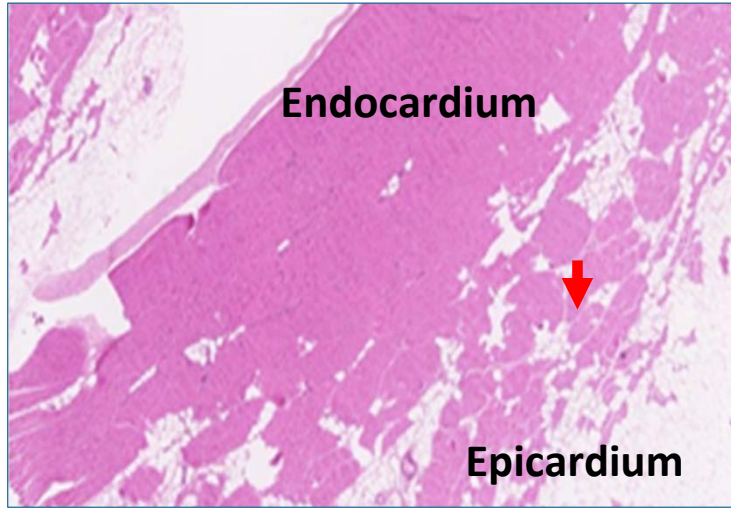
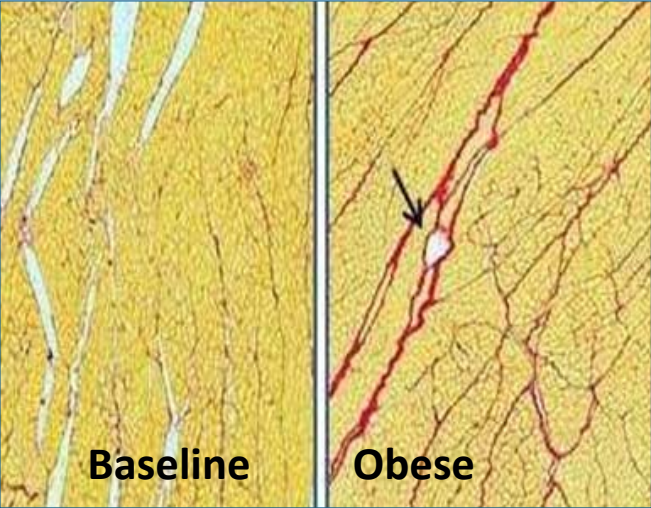
# Atrial substrate with progressive weight gain



Atrial Fibrosis

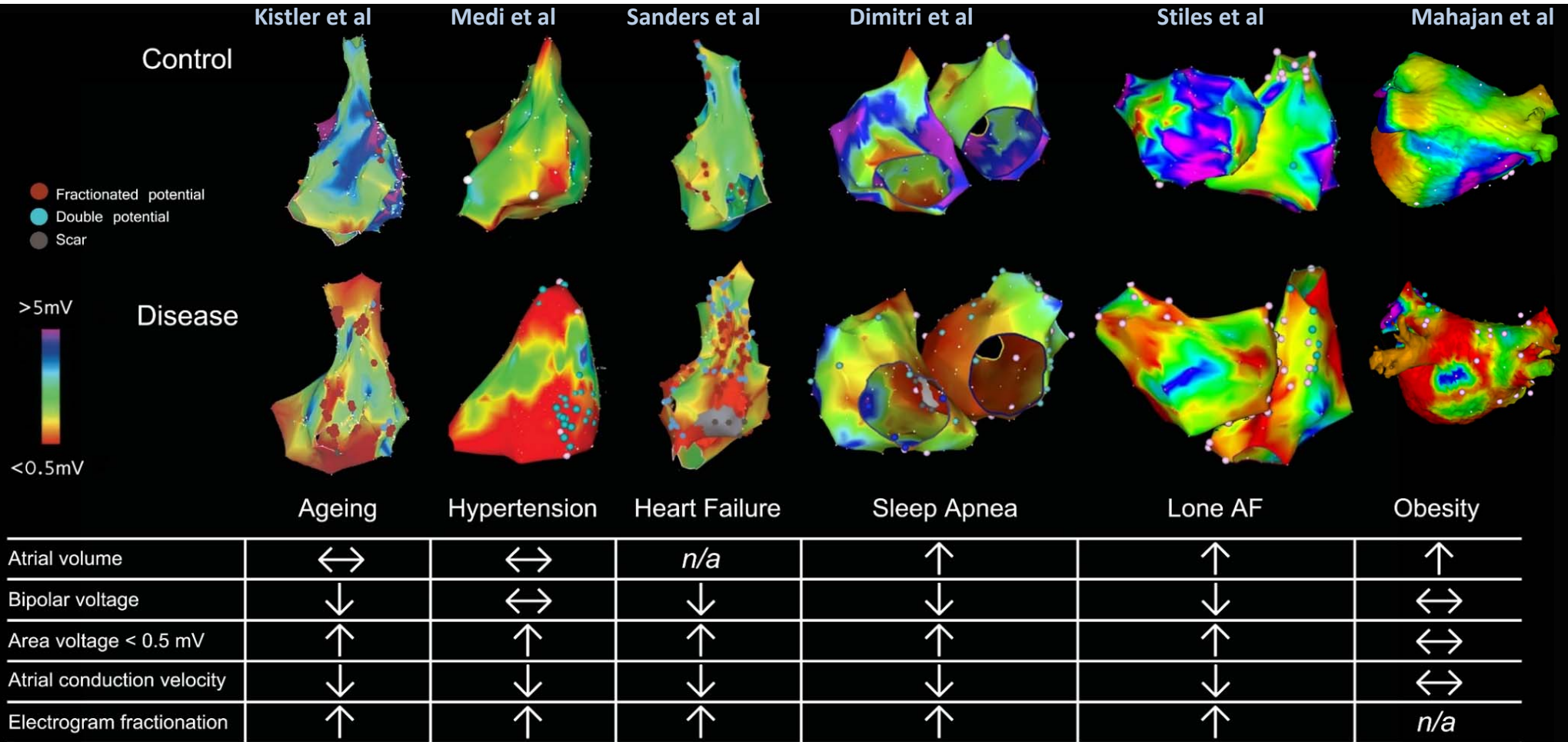
Fat Infiltration

Increased AF



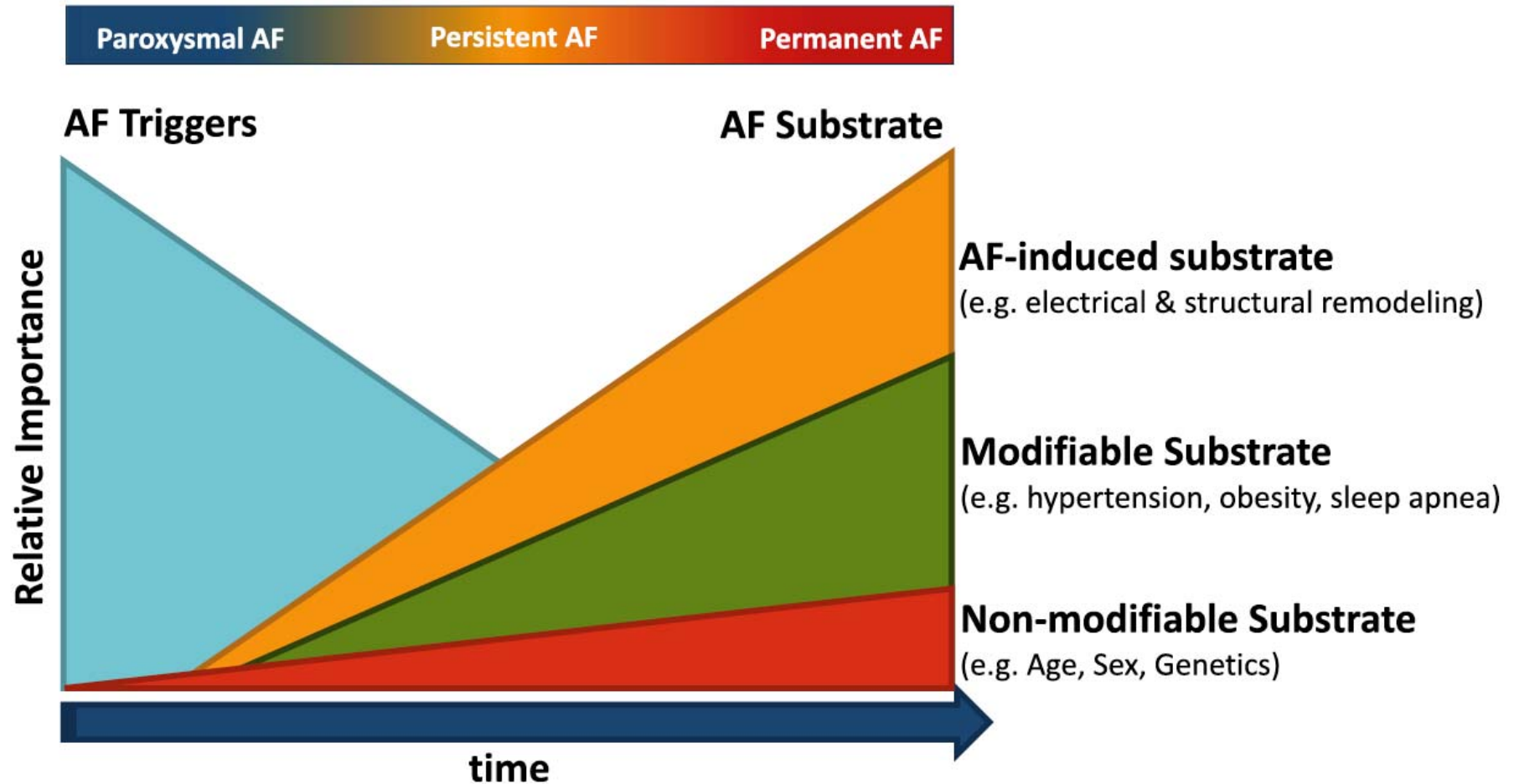
Abed H et al, Heart Rhythm 2013; Mahajan R et al. JACC 2015

# Clinical substrate for AF





# Contributors to the AF substrate



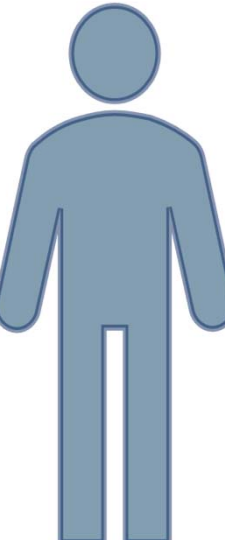
# Prevention of AF

➤ Focus beyond the ablation procedure alone

➤ Treat the condition that caused AF

➤ Reverses the AF substrate

➤ Improves ablation outcomes



Acronym	Risk factor	Primary prevention targets	Secondary prevention targets
H	Heart failure (with reduced ejection fraction)	ACE inhibitor or ARB, $\beta$ -blocker, MRA, SGLT2 inhibitor	ACE inhibitor or ARB, MRA
E	Exercise (physical inactivity)	$\geq 150$ min per week MVPA	$\geq 200$ min/per week MVPA
A	Arterial hypertension	BP $< 130/80$ mmHg	BP $< 130/80$ mmHg (rest) and $< 200/100$ mmHg (exercise)
D2	Diabetes mellitus type 2	HbA1c $< 6.5\%$	Dietary changes and HbA1c $< 6.5\%$
T	Tobacco smoking	Complete cessation	Complete cessation
O	Obesity	BMI $\leq 25$ kg/m <sup>2</sup>	10% weight reduction; BMI $\leq 27$ kg/m <sup>2</sup>
E	Ethanol consumption	$\leq 1$ standard drink <sup>a</sup> per day	$\leq 3$ standard drinks <sup>a</sup> per week
S	Sleep apnoea	AHI $< 15$	AHI $< 15$ without CPAP; CPAP for AHI $\geq 30$ or AHI $\geq 20$ with hypertension

# SAVE THE DATE

# APHRS

## 2024 SYDNEY

26 September – 29 September 2024

International Convention Centre, Sydney, Australia



26th - 29th  
September  
2024



International  
Convention Centre  
Sydney, Australia



Over 2,500 attendees  
from 40 countries  
worldwide

[www.aphrs2024.com](http://www.aphrs2024.com)