

# *AF Risk Factor Modification: Don't Stop Believin'*

Subha L. Varahan, MD, FHRS, CCDS

*Electrophysiologist*

Oklahoma Heart Hospital

Oklahoma City, OK

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*"Give it to me straight, Doc. How long do I have to ignore your advice?"*



**Patient Satisfaction Scores**  
**All Patient Comments Sorted by Physician**  
**November 2018.Q4**

Rating	Comment
Positive	On every respect my care provider, *Dr. Varahan was excellent. My whole time with her and her staff (asst.) was perfect.
Positive	Doctor and staff very nice.
Positive	No delays, very good experience.
Positive	Very good experience for me!
Negative	Chastised me about my lack of weight loss and eating habits.
Negative	There is too much paperwork to do while waiting in the reception area. Most of it is information I have provided on previous visits and not subject to change. Example: I am not a recipient of black lung benefits. Please refer to previous questionnaires for items that won't change since last appointment.
Positive	About 1 min. wait.
Positive	I like *Dr. Varahan very much.
Positive	Very caring professionals.
Positive	Very pleasant & professional.
Positive	Very professional staff.
Positive	good
Positive	There were no delays



# Epidemiology

- Atrial fibrillation (AF) is the most common sustained arrhythmia
  - Prevalence will increase from 5.2 million in 2010 to **12.1 million** in 2030
  - Associated with increased morbidity, mortality, and rising health care–associated expenses
    - ↑ risk for mortality (1.5- to 1.9-fold)
    - Ischemic stroke, dementia, cognitive dysfunction, heart failure (HF), MI and all-cause mortality.

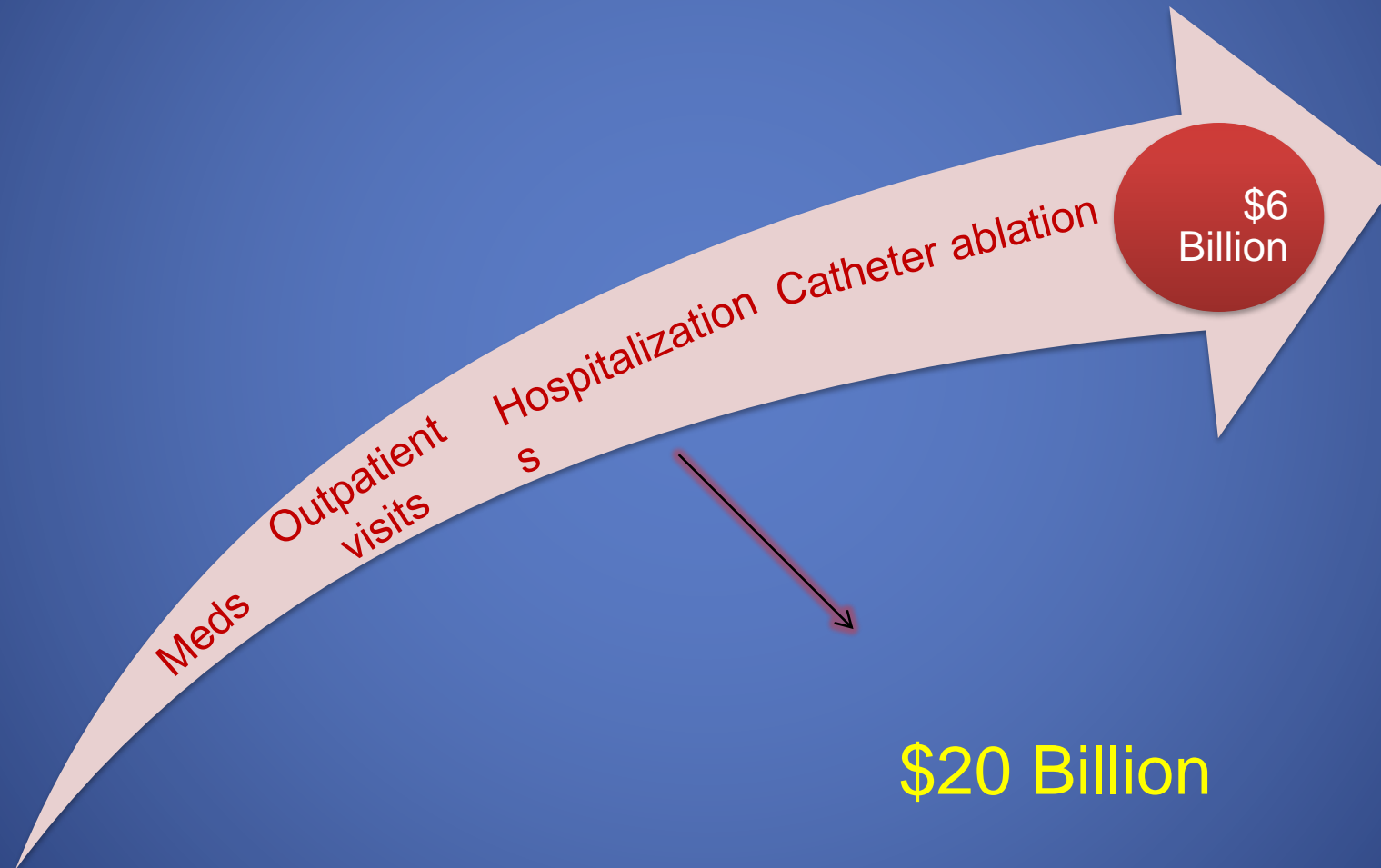


# Disease of Aging Population

- ATRIA study
  - Cross-sectional study of ~1.9 million subjects in a health maintenance organization in the US
    - Overall prevalence of AF was 1 percent
    - 70 percent were at least 65 years old
    - 45 percent were  $\geq 75$  years old



# The Cost of Treating AF



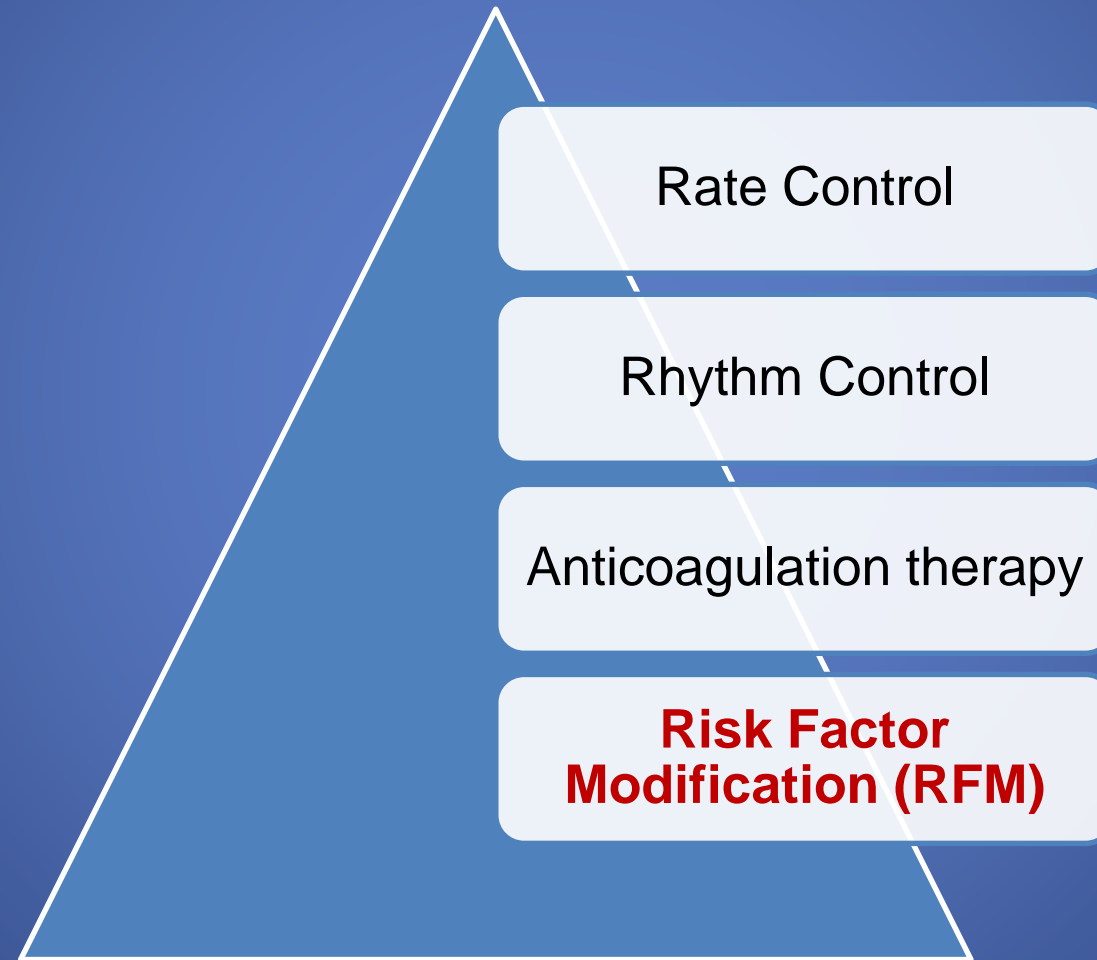


“AF management should also no longer solely address single domains such as stroke prevention, symptom relief or preservation of left ventricular function, but increasingly rely on a broader individual and complete approach with timely detection and optimal treatment of risk factors and underlying conditions to improve outcomes and reduce AF burden by targeting the substrate for AF in a more fundamental way.”

Kirchhof *et al.* Eur Heart J. 2016;37:2893–962.  
Alings *et al.* Neth Heart J. 2013;21:354–63.



# Pillars of AF Treatment







# AF Mechanisms

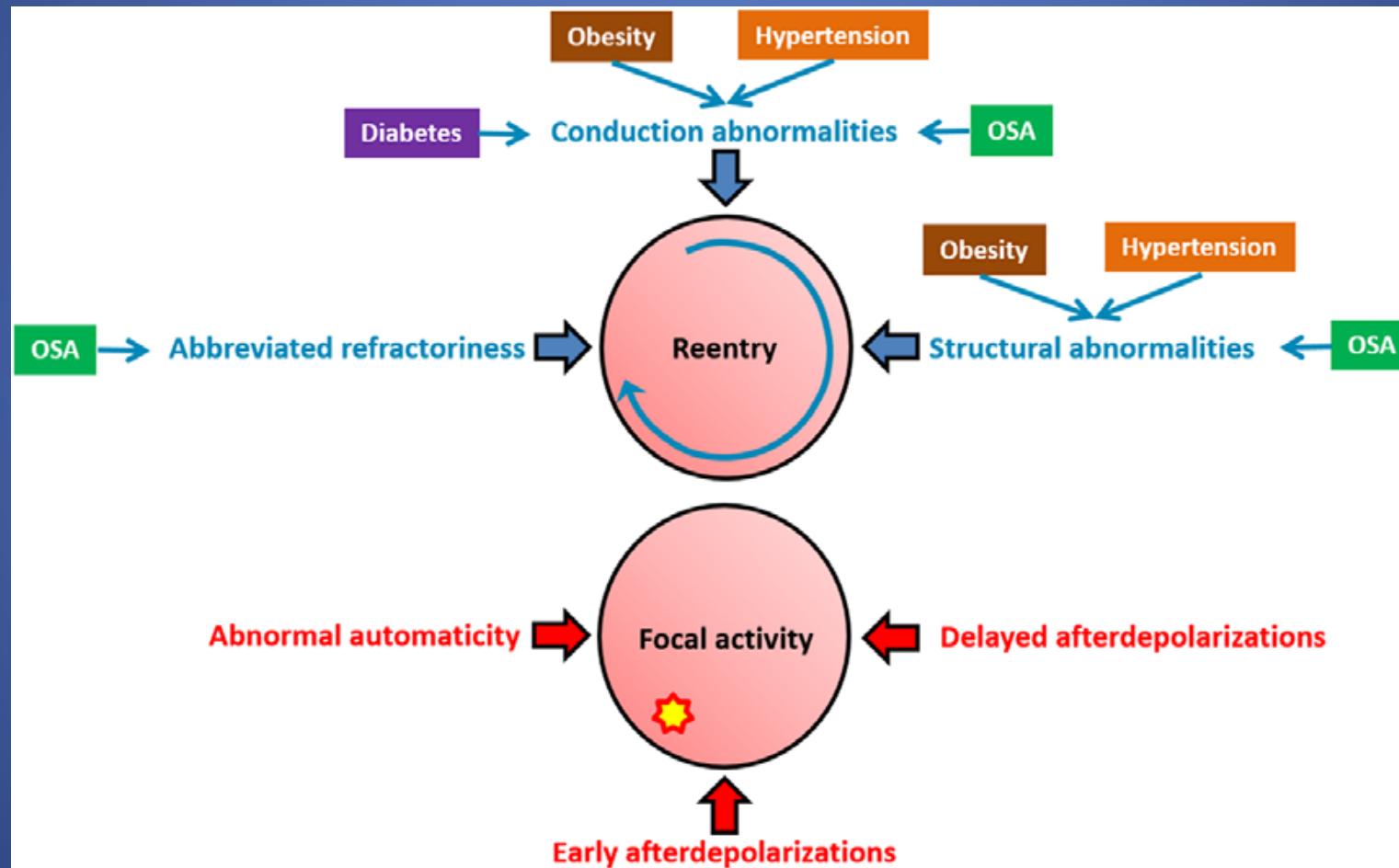
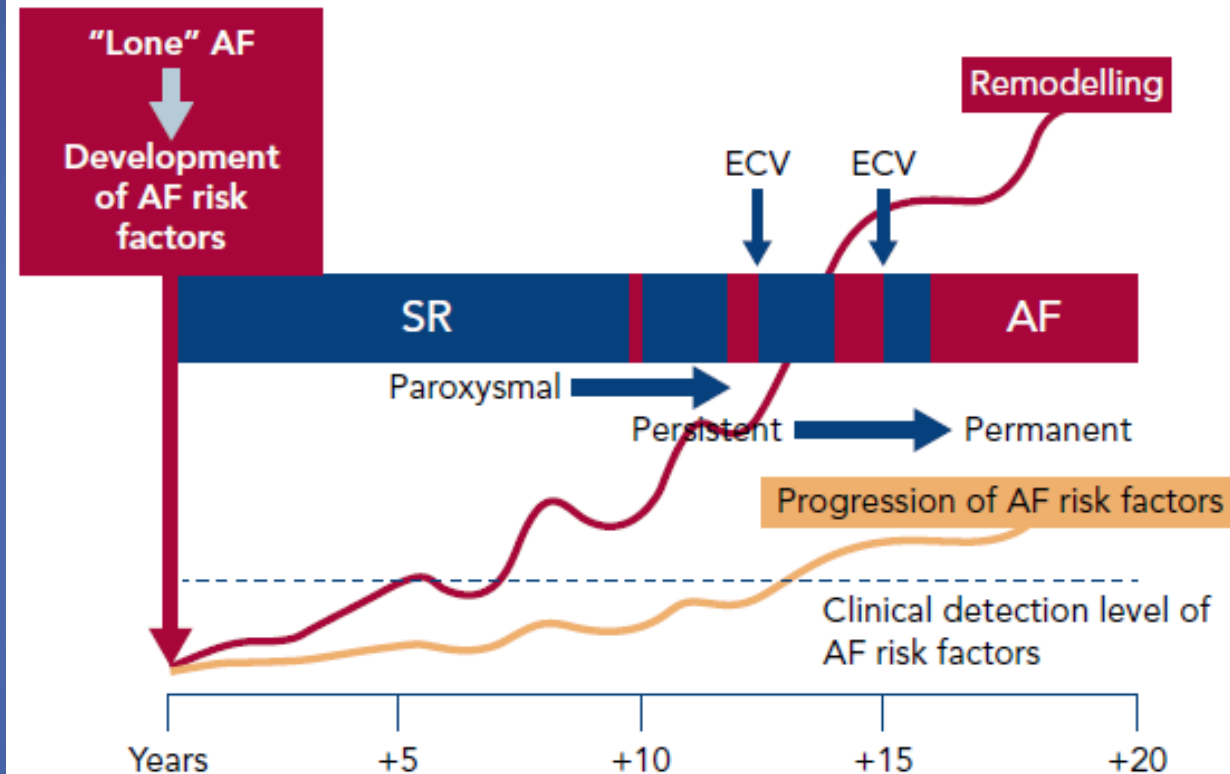




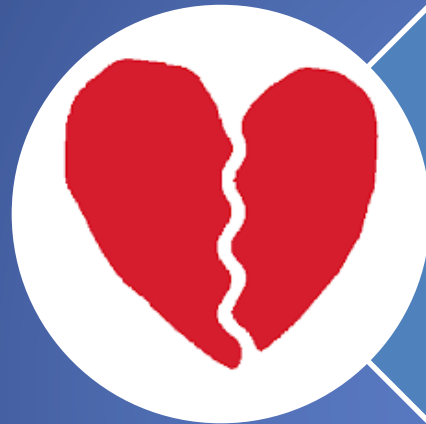
Figure 2: Time-dependent Atrial Remodelling and Development of Atrial Fibrillation



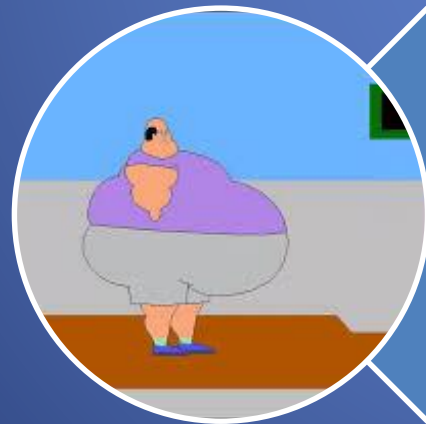
A hypothetical construct over time indicating the interrelationship between time, risk factors for atrial fibrillation (AF), atrial remodelling, detection of risk factors for atrial remodelling and progression from sinus rhythm (SR) through paroxysmal and persistent to permanent AF. ECV = electrical cardioversion. Source: J Am Coll Cardiol, 63, Wyse DG, Van Gelder IC, Ellinor PT, et al, Lone atrial fibrillation: does it exist?, 1715–23, 2014, with permission from Elsevier.<sup>45</sup>



# AF Progression and Recurrence



↑ risk of AF recurrence and major adverse cardiovascular events increased with increasing risk scores (CHADS2 and CHA2DS2-VASc) in a cohort of 2179 patients 5 years after catheter ablation



**Obesity** is associated with AF recurrence, with a recent meta-analysis showing that there was a 10-29% higher RR of new onset or post-operative AF

- Increased total body fat/BMI
- Pericardial and epicardial fat
- A state of chronic, low grade inflammation



# AF Progression and Recurrence



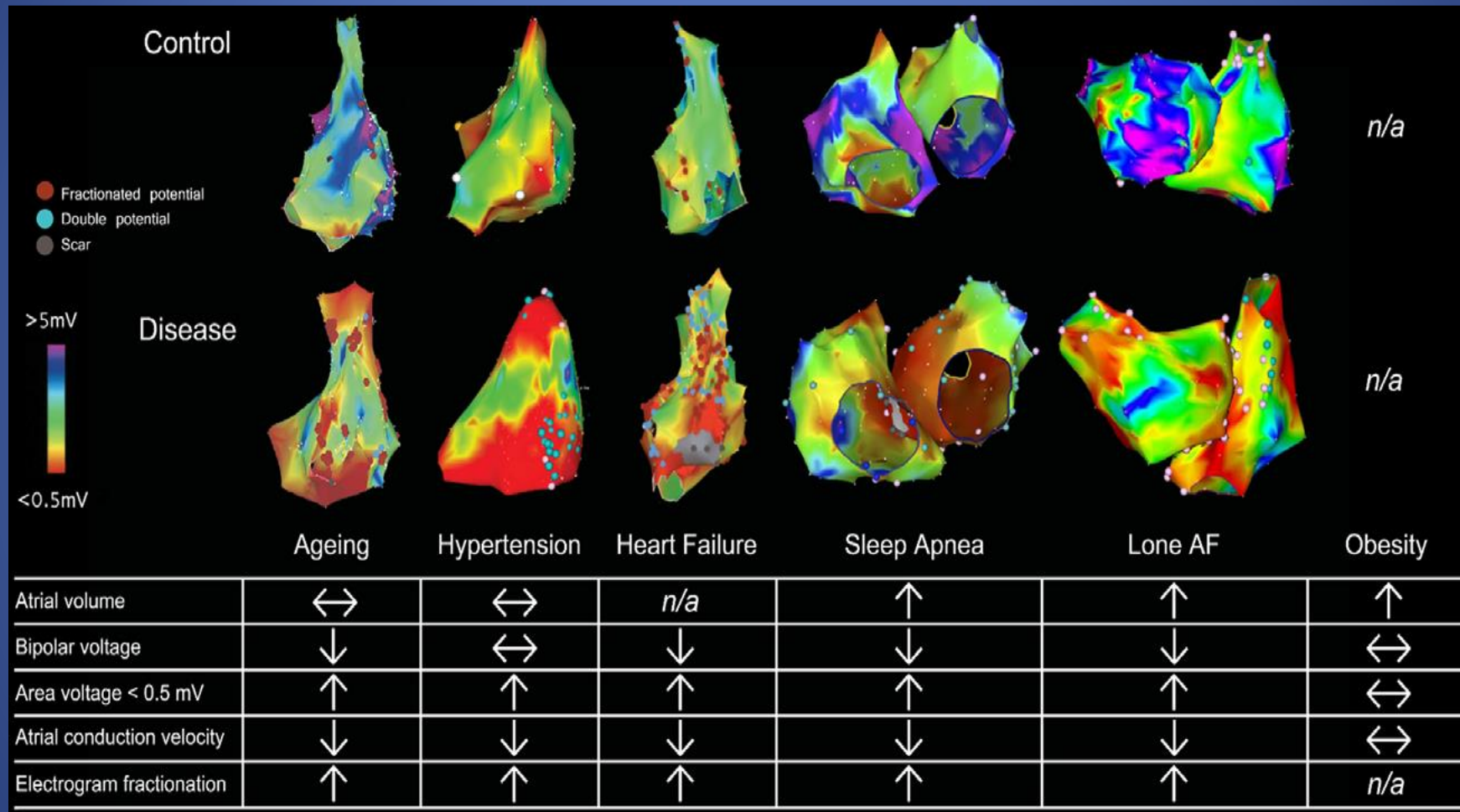
Meta-analysis ~4000 patients from 6 studies showed that the presence of **OSA** confers a 25% higher AF recurrence risk following PVI



**HTN, DM, Alcohol consumption**

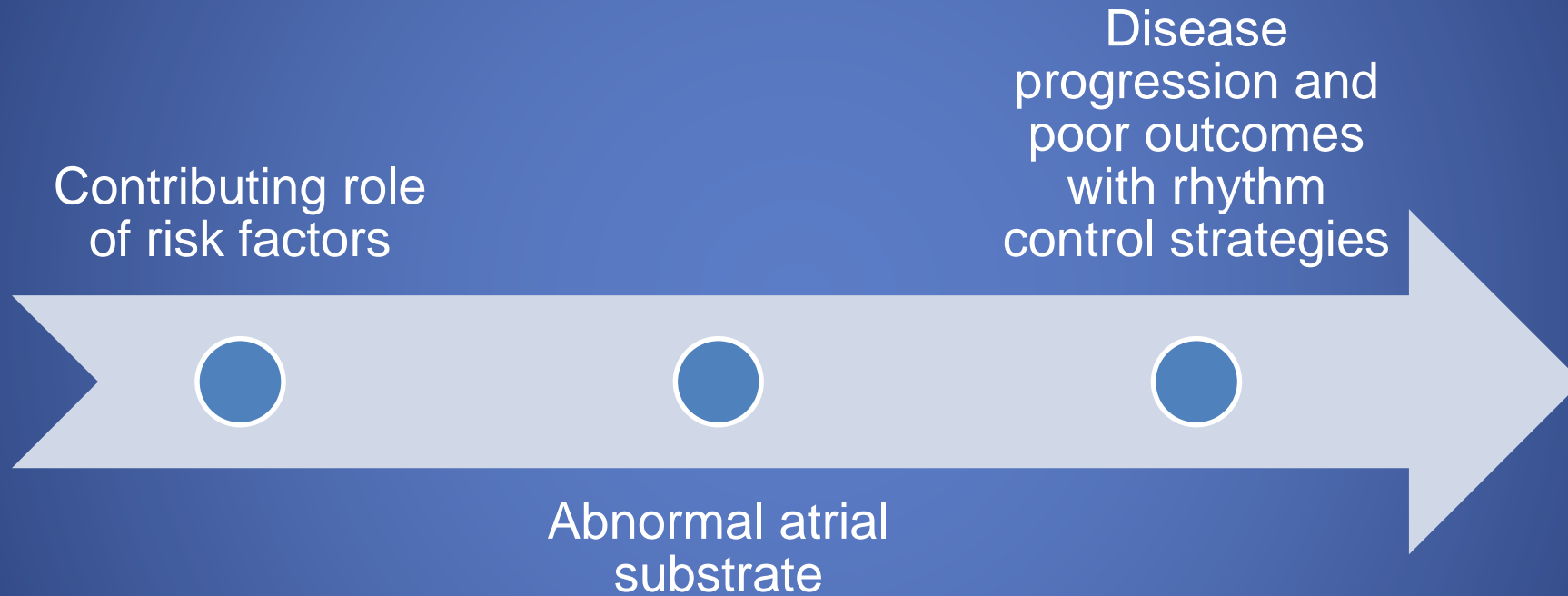


# Electroanatomical map in different AF substrates





# AF Progression and Recurrence





# Obesity

- LEGACY-AF
  - Impact of RFM and weight loss in long term AF management
  - BMI  $\geq 27$  kg/m<sup>2</sup> (n=825)
  - Patients followed for 5 years
  - Weight loss  $\geq 10\%$  was associated with a > 6-fold decrease in arrhythmia-free survival



# Obesity

- **ARREST-AF**
  - Patients with AF and obesity undergoing catheter ablation followed for 42 months
    - Single center, nonrandomized, placebo control trial
    - Intervention
      - RFM by a physician-led clinic( HTN, weight management, lipid management, glycemic control, OSA management, smoking and alcohol counseling)



Significant reductions in AF frequency,  
duration, symptoms, and arrhythmia free  
survival

Pathak *et al.* JACC 2014; 64:



# Obesity

- The data is in: epidemiological link between obesity and AF is clear
- Weight loss does result in atrial structural changes, supporting a direct link between weight loss and improved AF outcomes
- Most recent European guidelines include weight loss as a Class IIA recommendation for obese patients with AF



# Audience Question

- Is high-intensity exercise or light-to-moderate intensity exercise better reducing the incidence of AF?
  - A. High-intensity
  - B. Low to moderate intensity

**ANSWER: Light-to-moderate intensity**



# Exercise and Fitness

- Increased risk of AF in young athletes doing endurance training
- **Cardiovascular Health Study and Women's Health Initiative study**
  - Incidence of AF was lower in patients performing light-to-moderate exercise compared with those performing no exercise





# Exercise and Fitness

- **CARDIO-FIT**

- 308 obese (BMI  $\geq 27$  kg/m<sup>2</sup>) patients with AF were enrolled in a tailored exercise program
  - $\uparrow$  cardiorespiratory fitness had greater arrhythmia-free survival with and without rhythm-control strategies.
  - Patients who improved their fitness level by  $\geq 2$  METs had a 2-fold higher probability of AF-free survival, as well as lower AF burden and symptom severity

Pathak *et al.* JACC

2015; 66: 985-96.



# Obstructive Sleep Apnea (OSA)

- Dimitri *et al.*
  - Forty patients undergoing ablation for paroxysmal AF
  - 20 patients with moderate to severe OSA (apnea–hypopnea index  $\geq 15$ )
  - 20 patients with none or mild OSA (apnea–hypopnea index  $< 15$ )
  - OSA is associated with significant atrial remodeling characterized by atrial enlargement, reduction in voltage, site specific, widespread conduction abnormalities, and longer sinus node recovery



# Obstructive Sleep Apnea (OSA)

- Prospective study of AF patients with OSA referred for index pulmonary vein isolation (PVI) procedure
  - Arrhythmia-free survival at 1 year was higher in those who were compliant with positive pressure therapy (71.9%) compared with patients who were not (36.7%)
  - Risk of AF recurrence after PVI in untreated OSA patients was the same as the risk of recurrence in OSA patients with AF who were medically managed without PVI



# Hyperlipidemia

## HDL

- Multiple studies have shown that low levels of high-density lipoprotein cholesterol ( $\leq 35$  mg/dl) are associated with an increased risk of AF)

## Statins

- Meta-analysis of randomized controlled and observational studies in cardiac surgery of 17,643 patients demonstrated less postoperative AF with pre-operative statin use

## Fish oil

- Failed to show a reduction in AF recurrence in patients with a history of paroxysmal or persistent AF

Fauchier *et al.* JACC. 2008; 51: 828-35.

Liakopoulos *et al.* J Thorac Cardiovasc Surg 2009; 138: 678-86



# Diabetes

- In the Framingham Heart Study, diabetes was associated with 40% higher risk of AF in men and 60% higher risk in women after 38 years of follow-up
- ↑ risk of procedural complications including stroke, cardiac tamponade, and hematomas among those with diabetes



# Hypertension

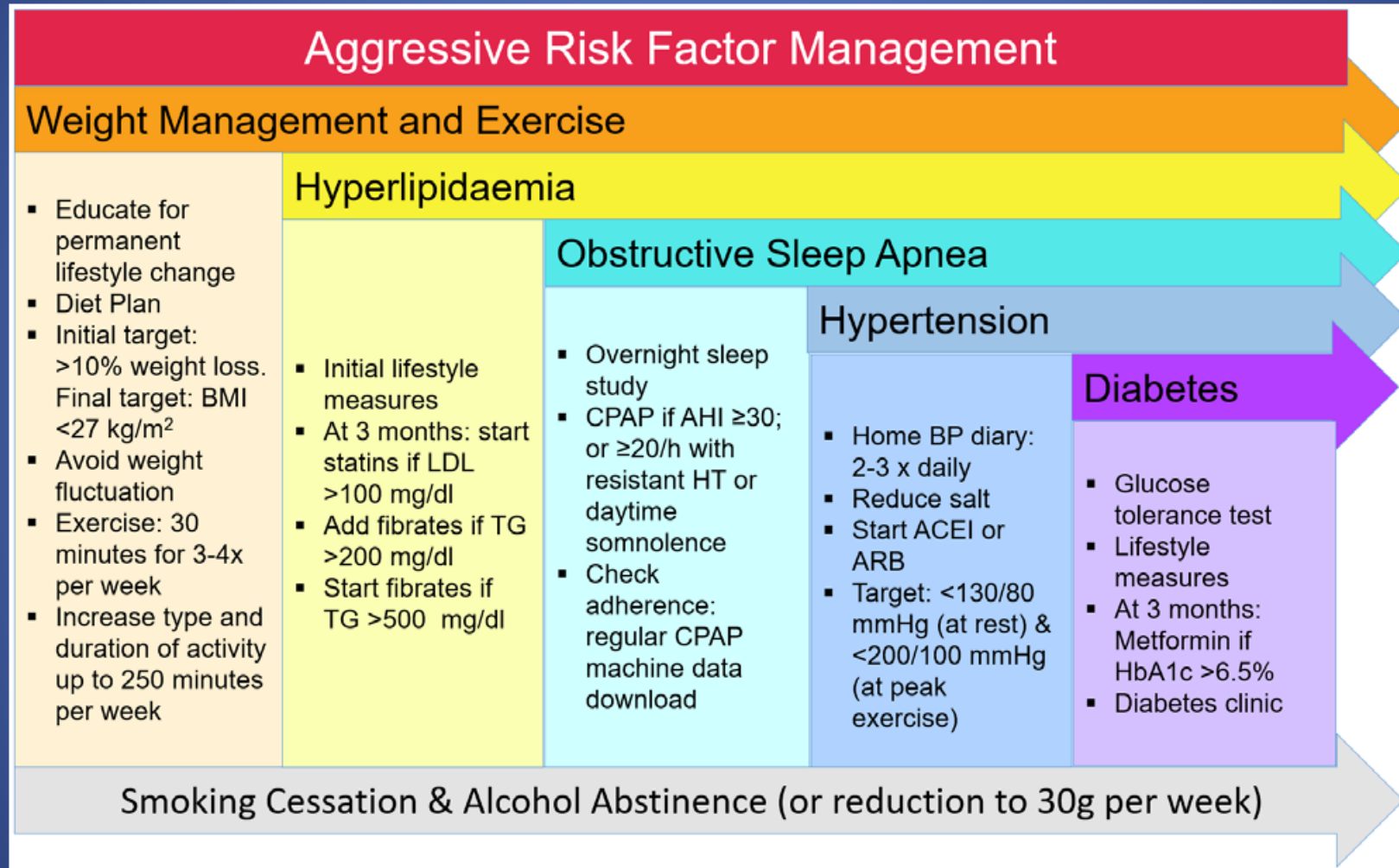
- Elevated blood pressure has consistently been one the strongest predictors of the development of AF
- Plays an important role in the management of AF in regard to thromboembolic risk



# Tobacco and Alcohol

- Conflicting results in regard to the association of tobacco use and incident AF
- Alcohol consumption has been associated with an increased risk of developing AF in a dose dependent manner







# Summary

- Compelling argument in favor of integrating RFM into the routine care of our patients with AF
- May be able to consider RFM the “optimal medical therapy” for AF, reserving antiarrhythmic therapy and catheter ablation for those for whom a trial of RFM has “failed”

# THANK YOU

