

# Atrial Fibrillation: The Importance of Risk Factor Modification

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# Disclosures

- I have no disclosures

# The Scope of Atrial Fibrillation

- Arrhythmia of epidemic proportions
  - Estimated that the prevalence will rise from 5.2 million in 2010 to 12.1 million in 2030
    - Ageing population is the main driver
  - Associated with increased morbidity, mortality, increase in AF hospitalizations and rising health care expenses

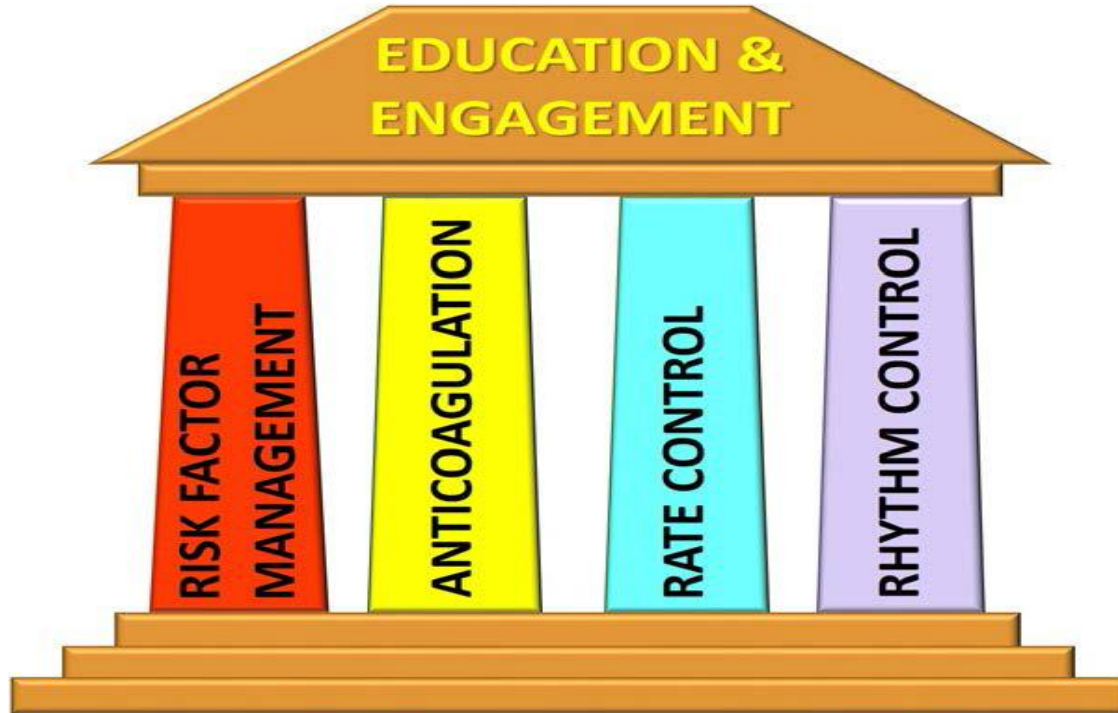
# Atrial Fibrillation: The Pillars of Care

- Rate Control
- Rhythm Control
- Anticoagulation
- Now Research Indicates a Fourth Pillar may be Indicated: Risk Factor Modification
  - Heart Rhythm Society (HRS) recognized in 2013 “advancing AF prevention efforts by focusing on risk modification,” as a key research focus (Van Wagoner, 2015)
  - Inadequately treated risk factors may be a significant factor to AF recurrence (Lau, 2017; Miller, 2015)

Lau, Dennis H.; Nattel, Stanley et al. Modifiable Risk Factors and Atrial Fibrillation. *Circulation* 2017; 136: 583-596

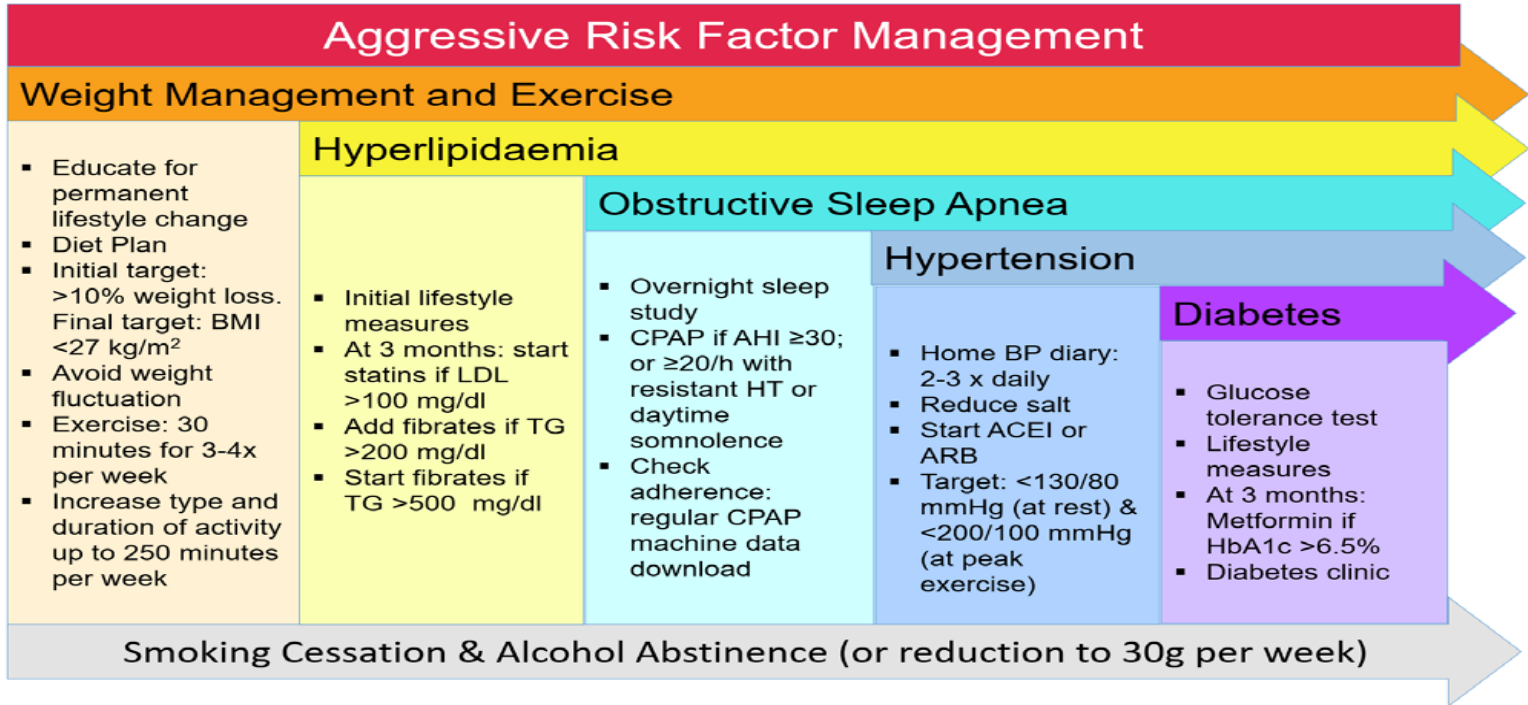
Miller, Jared D.; Aronis, Konstantinos et al. Obesity, Exercise, Obstructive Sleep Apnea, and Modifiable Atherosclerotic Cardiovascular Risk Factors in Atrial Fibrillation. *JACC*, Dec2015; 66(25) 2899-2906

# The Four Pillars of Atrial Fibrillation Treatment



Lau, Dennis H.; Nattel, Stanley et al. Modifiable Risk Factors and Atrial Fibrillation. *Circulation* 2017; 136: 583-596

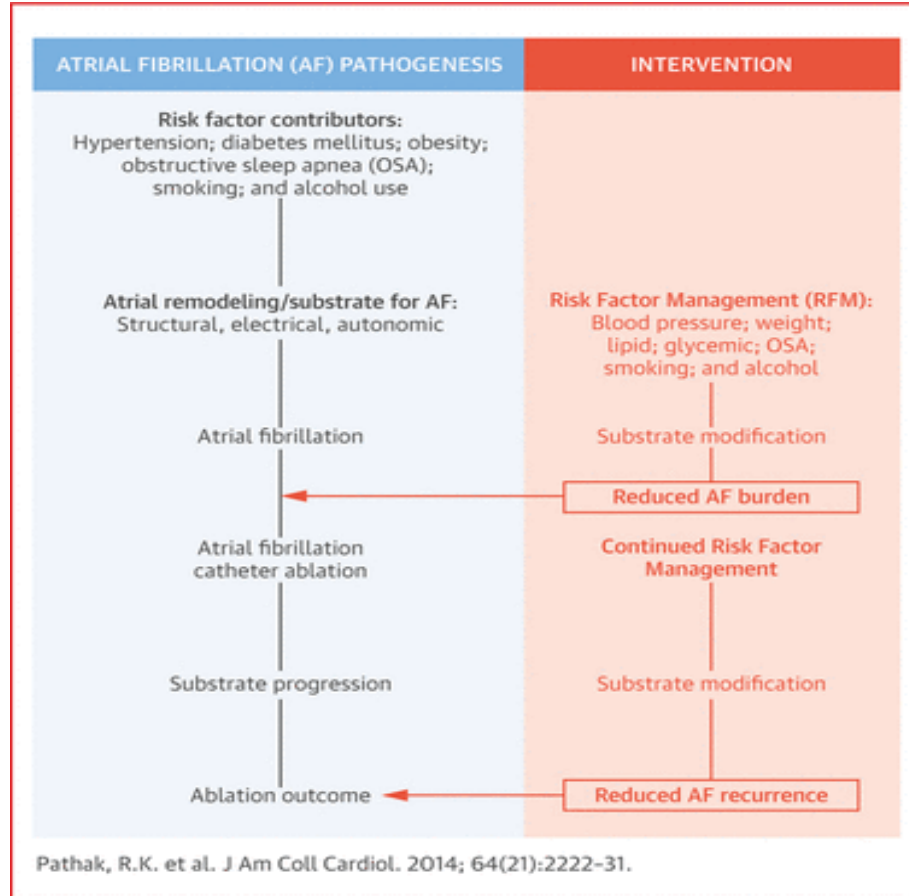
# Aggressive Risk Factor Management



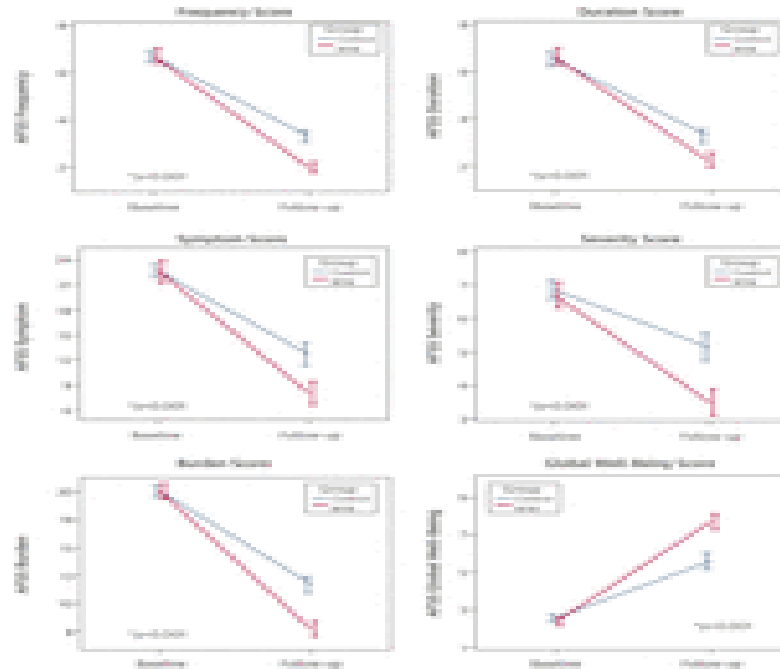
# Aggressive Risk Factor Reduction: the ARREST AF study

- JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY  
a 2014 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION PUBLISHED BY  
ELSEVIER INC.
- VOL. 64, NO. 21, 2014 ISSN 0735-1097
- <http://dx.doi.org/10.1016/j.jacc.2014.09.028>
- Aggressive Risk Factor Reduction  
Study for Atrial Fibrillation and Implications for the Outcome of Ablation The ARREST-AF  
Cohort Study
- Rajeev K. Pathak, MBBS,\* Melissa E. Middeldorp,\* Dennis H. Lau, MBBS, PHD,\* Abhinav  
B. Mehta, MACTST,y Rajiv Mahajan, MD,\* Darragh Twomey, MBBS,\* Muayad Alasady,  
MBBS,\*y Lorraine Hanley, BSC,\*  
Nicholas A. Antic, MBBS, PHD,z R. Doug McEvoy, MBBS, MD,z Jonathan M. Kalman,  
MBBS, PHD,x  
Walter P. Abhayaratna, MBBS, PHD,k Prashanthan Sanders, MBBS, PHD\*

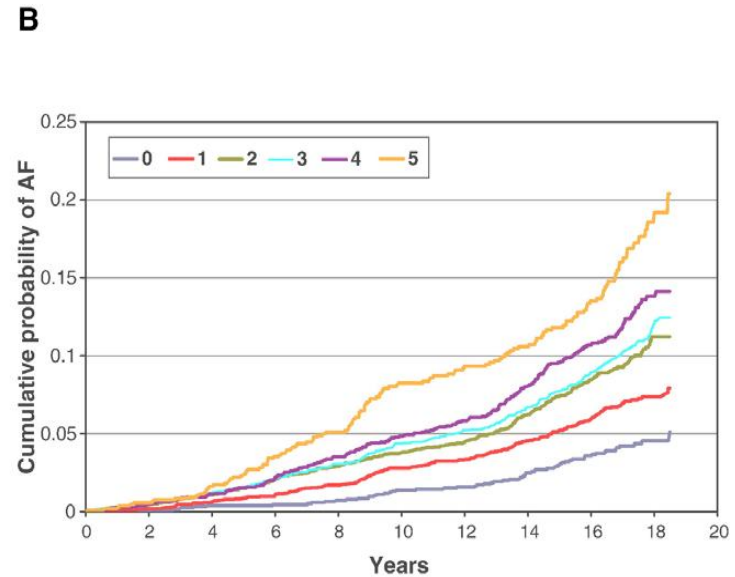
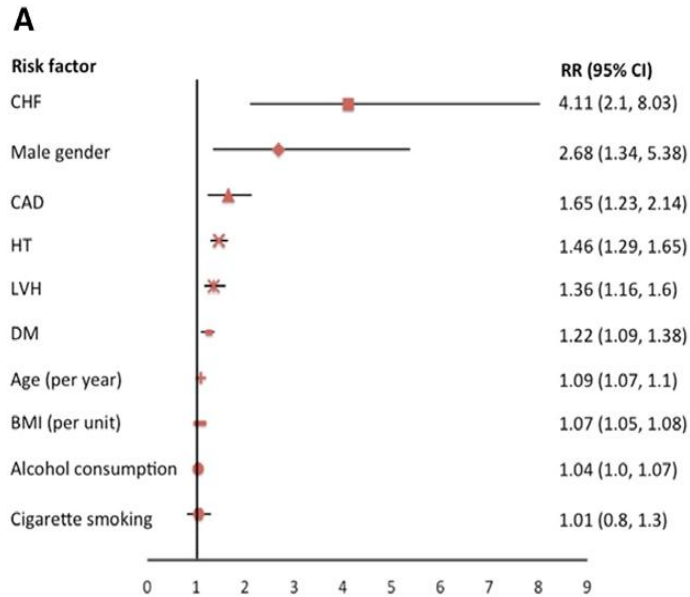
# Impact of Risk Factor and Weight Management on AF Ablation Outcomes



# Changes in Atrial Fib Burden using the Atrial Fib Severity Scale at Baseline and Final Follow Up



# Association of Risk Factors with AF Development



# Current Research Update

- Obesity and Weight Loss
  - Connection between obesity and AF has been shown to occur independently of the many comorbidities associated with obesity (Miller et al, 2015)
  - In the Atherosclerosis Risk in Communities (ARIC) study 17% of AF risk was attributed to obesity or overweight status (Huxley, 2011)
  - In the Women's Health Initiative (WHI) for every 1kg/m<sup>2</sup> increase in BMI, the relative AF risk increased 5%
  - Obesity is associated with an increased Left Atrial size, which leads to changes in electrophysiological properties
  - Higher levels of activity, light to moderate exercise, attenuated the AF risk conferred by obesity (Miller et al, 2015)
  - In the CARDIO-FIT study for patients who improved their fitness by  $\geq 2$  METs there was a 2 fold higher probability of AF-free survival, as well as lower AF burden and symptom severity (Grader, 2012)

# Current Research Update

- Hypertension
  - Elevated BP has consistently been one of the strongest predictors of AF
  - Increased afterload leads to atrial and ventricular remodeling which leads to diastolic dysfunction as well as left atrial changes which, in turn, lead to AF
  - Treatment of HTN has not consistently been shown to decrease AF risk, it has been demonstrated to be an important component of reducing thromboembolic risk as well as an important component of any AF management strategy (Miller, 2015)

# Current Research Update

- Diabetes
  - Independent risk factor for AF, just as it is for ASCVD
  - Framingham study: diabetes associated with a 40% higher risk of AF in men and 60% in women after 38 years of follow up (Framingham Heart Study)
    - Dysfunctional autonomic activity from diabetes leads to sympathetic overactivity and can trigger AF
  - No current evidence to suggest that any one specific management strategy for diabetes is best, but optimal management of diabetes and prevention of cardiovascular complications may indirectly reduce the risk of AF (Miller, 2015)

# Obstructive Sleep Apnea (OSA)

- Multivariate analysis performed by Miller et al. revealed that AF has a greater association with OSA than BMI, HTN, or diabetes (Miller, 2015)
- Prospective study found that 50% of AF patients had OSA (Gami, 2004)
- Mechanisms include intermittent nocturnal hypoxemia, surges in sympathetic tone and BP during apneic episodes and increased inflammation
- Recurrence of AF after DCCV higher in patients with OSA who are not treated(82%) vs treated (42%)
- Arrhythmia free survival post PVI similar in patients who do not have OSA and patients with OSA appropriately treated
- Risk of AF recurrence after PVI in untreated OSA patients the same as the risk of recurrence in patients with AF who are medically managed without PVI
- Take home messages:
  - With AF, OSA treatment an important management tool especially if DCCV or PVI used
  - Also important to screen for OSA prior to use of a rhythm control strategy (Miller, 2015)

# More Evidence for OSA and Atrial Fibrillation

- **Associations of Obstructive Sleep Apnea With Atrial Fibrillation and Continuous Positive Airway Pressure Treatment**A Review
- [Dominik Linz, MD, PhD<sup>1</sup>](#); [R. Doug McEvoy, MD<sup>2,3</sup>](#); [Martin R. Cowie, MD<sup>4</sup>](#); [et al](#)[Virend K. Somers, MD, PhD<sup>5</sup>](#); [Stanley Nattel, MD<sup>6,7,8</sup>](#); [Patrick Lévy, MD, PhD<sup>9,10</sup>](#); [Jonathan M. Kalman, MBBS, PhD<sup>11,12</sup>](#); [Prashanthan Sanders, MBBS, PhD<sup>1</sup>](#)
- Author Affiliations
- *JAMA Cardiol.* Published online March 14, 2018. doi:10.1001/jamacardio.2018.0095
- Data from nonrandomized studies of patients with AF suggest that treatment of OSA by continuous positive airway pressure may help to maintain sinus rhythm after electrical cardioversion and improve catheter ablation success rates. Randomized clinical trials are needed to confirm the association between OSA and AF the benefits of treatment of OSA and the need for and cost-effectiveness of routine OSA screening and treatment.

# References

- Lau, Dennis H.; Nattel, Stanley; Kalman, Jonathan and Sanders, Prashanthan. “Modifiable Risk Factors in Atrial Fibrillation.” *Circulation*. 8/8/2017; 136 (6): 583-596.
- Miller, Jared D.; Aronis, Konstantinis, N.; Chrispin, Jonathan et al. “Obesity, Exercise, Obstructive Sleep Apnea, and Modifiable Atherosclerotic Cardiovascular Disease Risk Factors in Atrial Fibrillation.” *Journal of the American College of Cardiology (JACC)*. Dec2015; 66(25): 2899-2906.
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# Thank You for Your Attention

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