APSC BUSAN 2025

APSC 2025 & KSC

Asian Pacific Society of Cardiology Congress 2025

April 17 (Thur.) - 19 (Sat.), 2025
BEXCO, Busan, South Korea

The essential management of co-morbidities in AF

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17.3.2025

Declaration of Interest

- I have nothing to declare

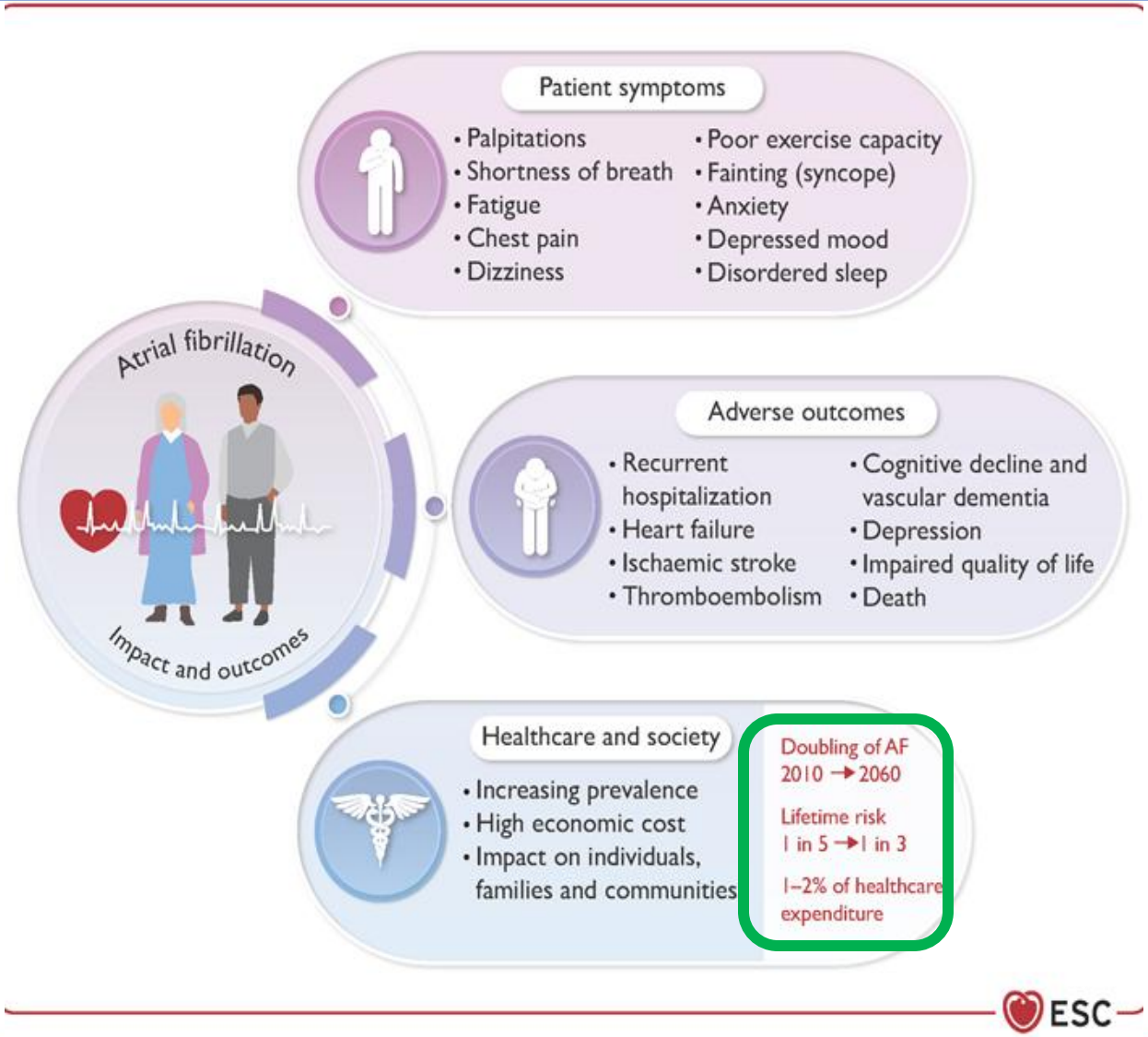
Introduction

-Atrial Fibrillation (AF) - most common cardiac rhythm disorder globally

-Major Health care and Economic burden

-Increasing prevalence with increasing aging population, increasing burden of comorbidities, improved awareness, and new technologies for detection

-Associated with high mortality and morbidity, commonly from stroke, heart failure, and repeated hospitalizations



Introduction

- **Typical drivers of AF onset, recurrence and progression - Comorbidities and associated Risk factors: placed as initial and central component of patient management**
- **To achieve optimal care for AF patients - Comorbidities and risk factors must be managed early and in a dynamic way**
- **Failure to do so contributes to recurrent cycles of AF, treatment failure, poor patient outcomes, and a waste of healthcare resources**
- **In this iteration of the European Society of Cardiology (ESC) practice guidelines on AF, the task force has consolidated and evolved past approaches to develop the AF-CARE framework**

Guidelines evolutions……

ABC pathway

Avoid stroke

Better symptom management

Cardiovascular & other comorbidities (risk factors)

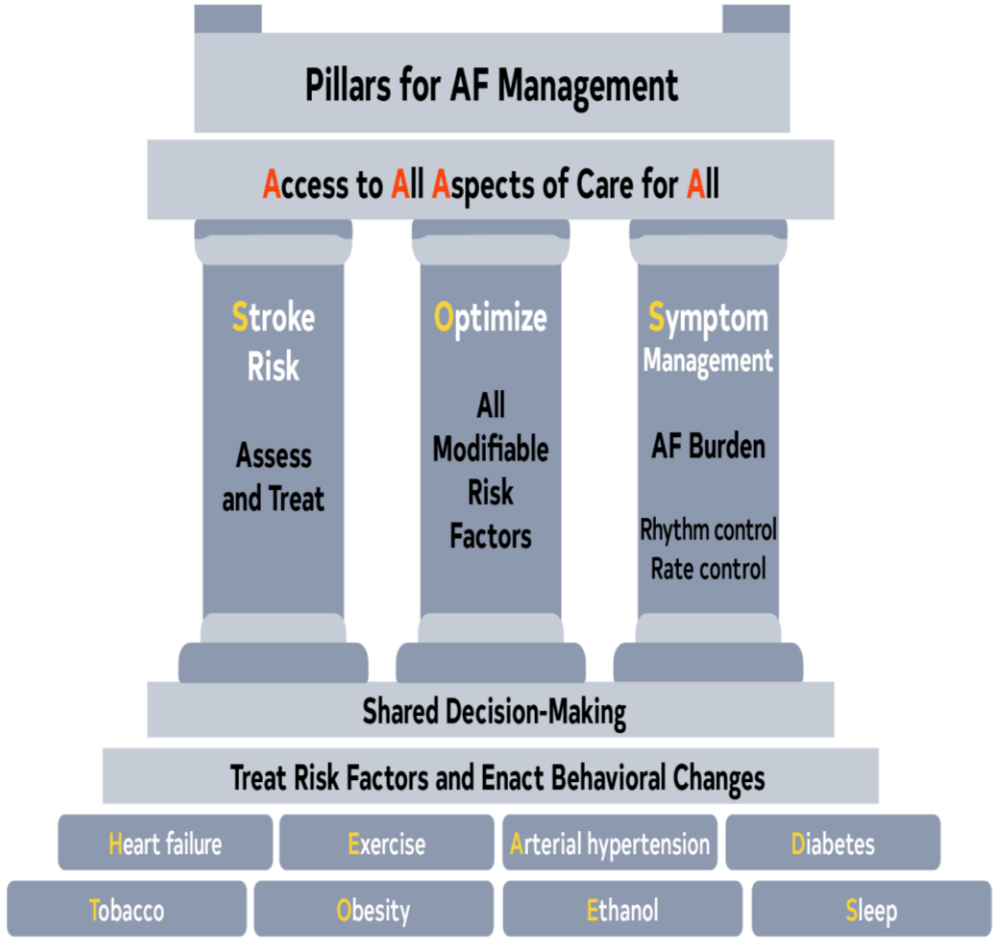
Use in guidelines:
ESC 2020, APHRS 2021, China 2024, ACCP2018

American Heart Association.

AMERICAN COLLEGE of CARDIOLOGY

2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation

- **The basis of therapy is - diagnosis and management of comorbidities: with the acronym HEAD 2 TOES**
- **aided by the 3 central memorable pillars SOS**
- **overarching principle is 4As**

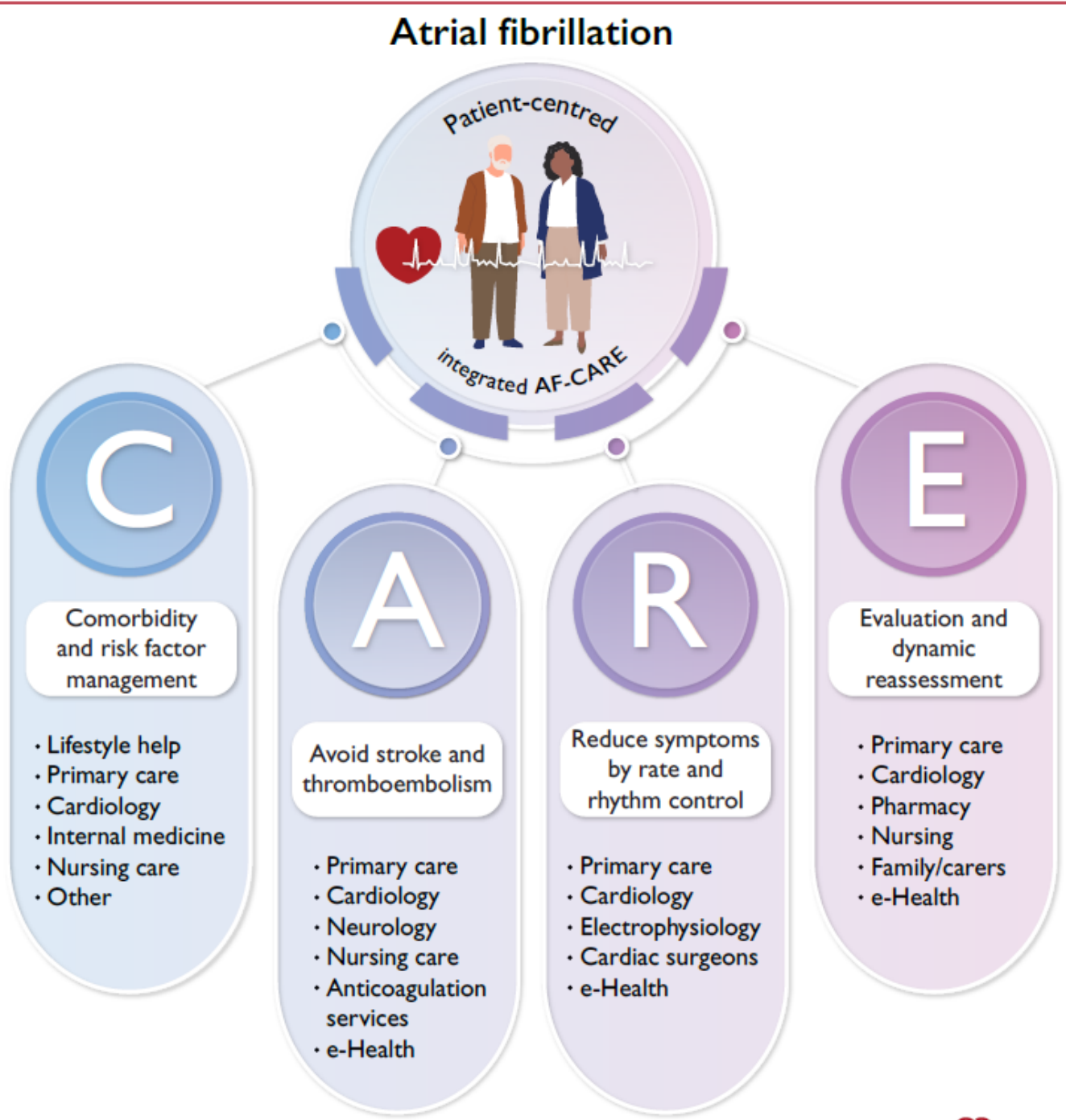


2024 ESC Guidelines for the management of atrial fibrillation

- The ESC guideline - introduced the **CARE** replacing the **ABC** concept as its central acronym

- Thereby positioning the aspects of comorbidities (C) for the first time in front

- Followed by avoiding stroke and thromboembolic events (A), rate and rhythm control (R), and individualized evaluation and follow-up (E).



Key Acronyms in the Management of Patients With AF

ESC

AF

C	Comorbidity and risk factor management
A	Avoidance of stroke and thrombembolism
R	Rate and rhythm control to reduce symptoms
E	Evaluation and dynamic reassessment

ACC

4 As:

Access to All Aspects of Care for All

SOS:

Stroke risk	Optimize	Symptom Management
Assess and Treat	All Modifiable Risk Factors	AF burden Rhythm and rate control

HEAD 2 TOES:

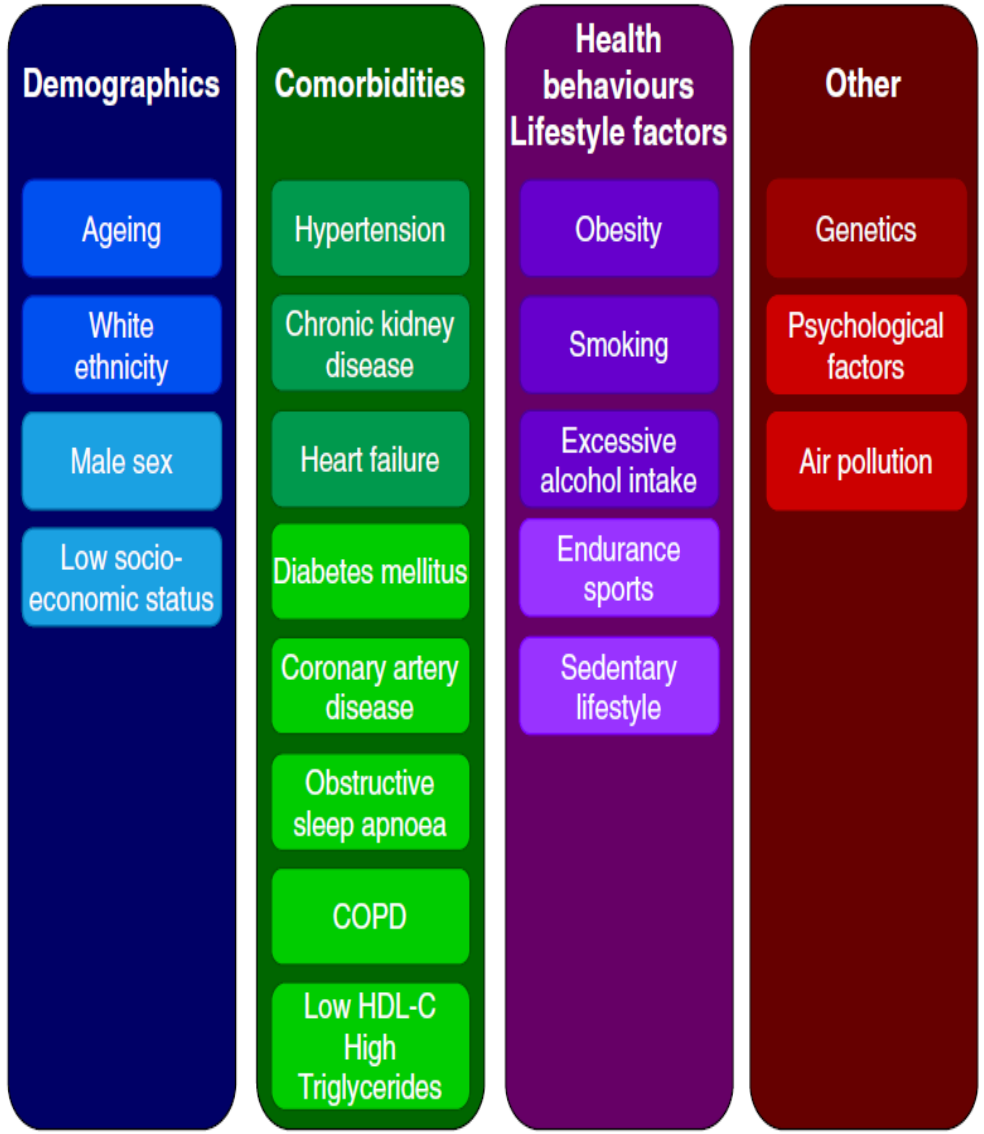
Heart failure	Exercise	Arterial Hypertension	Diabetes
Tobacco	Obesity	Ethanol	Sleep

Key Acronyms in the Management of Patients With AF

- **Both, AF-CARE (ESC) and HEAD 2 TOES (ACC/AHA/ACCP/HRS), address a prominent position of the diagnosis and treatment of comorbidities and risk factors**
- **Represents an important conceptual novelty**
- **Stressed that AF is not an isolated electrocardiographic phenomenon but rather occurs in the context of certain comorbidities or is associated with a certain risk profile**
- **The early treatment of predisposing comorbidities and risk factors is certainly of particular relevance and avoids recurrences and adverse events more sustainable than isolated AF therapy**

Factors associated with Incident AF

Demographic Factors	Age
	Male Sex
	European ancestry
	Lower socioeconomic status
Lifestyle behaviors	Smoking/Tobacco use
	Alcohol intake
	Physical inactivity
	Vigorous exercise
	Competitive or athlete-level endurance sports
	Caffeine



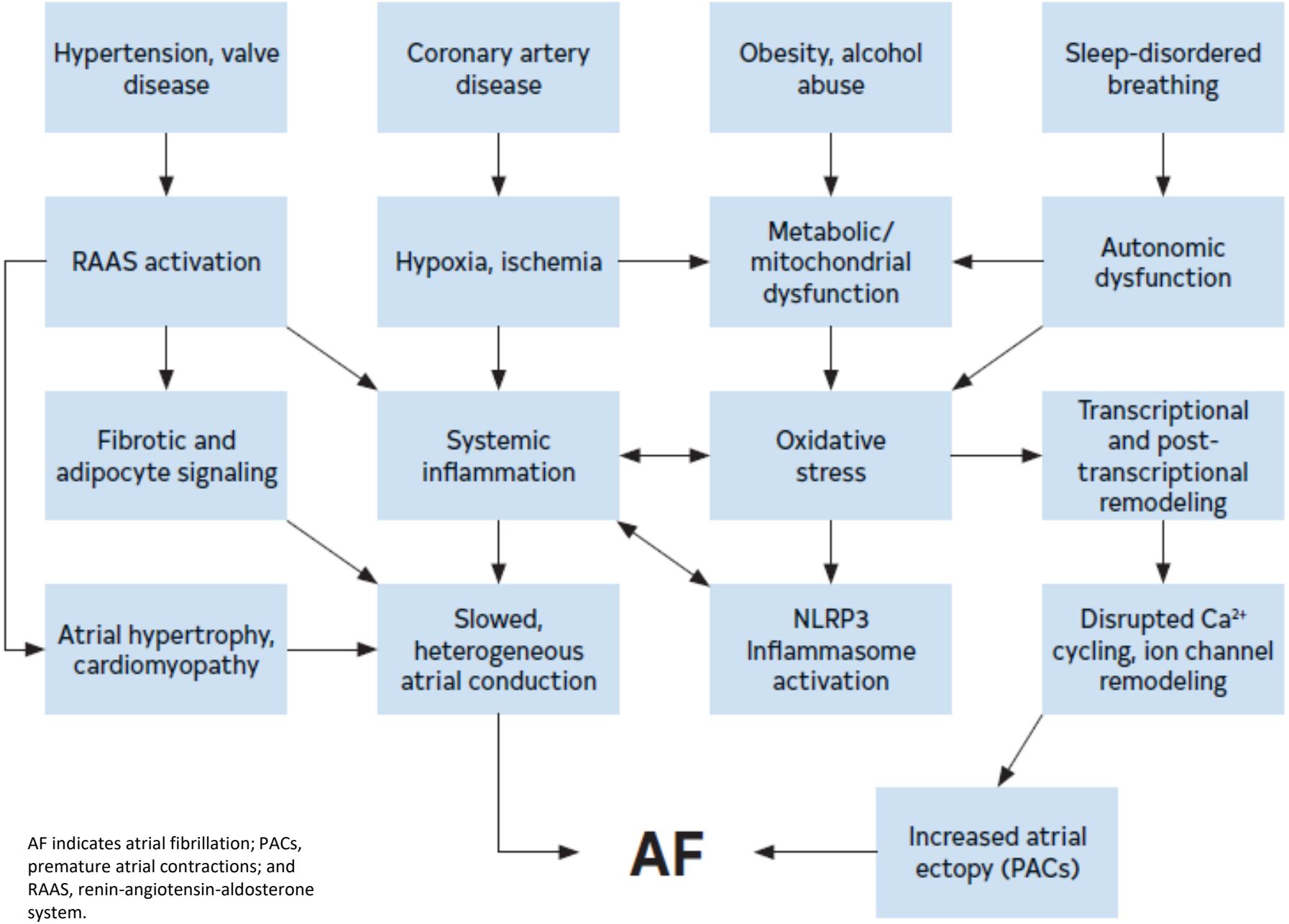
Risk factors with strongest association with atrial fibrillation are highlighted in darker shades

Factors associated with Incident AF: Comorbidities and Risk Factors

Hypertension	Sleep apnea
Heart failure	COPD
Valvular disease	Subclinical atherosclerosis
Coronary artery disease	Genetic factors
Peripheral arterial disease	Increased Inflammatory biomarkers
Congenital heart disease	Thyroid dysfunction
Dyslipidaemia	Autoimmune disease
Diabetes mellitus/Impaired glucose tolerance	Air pollution
Renal dysfunction/CKD	Sepsis
Obesity	Psychological factors

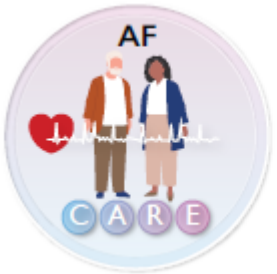
Mechanisms and Pathways Leading to AF

The pathways that contribute to the development of AF create a substrate for re-entry and provide triggers that can initiate arrhythmic activity.



AF indicates atrial fibrillation; PACs, premature atrial contractions; and RAAS, renin-angiotensin-aldosterone system.

Multidisciplinary approach to AF Management



- Equality in healthcare provision (gender, ethnicity, socioeconomic) (Class I)
- Education for patients, families and healthcare professionals (Class I)
- Patient-centred AF management with a multidisciplinary approach (Class IIa)

Equal care: avoid health inequalities based on gender, ethnicity, disability, and socioeconomic factors

Education: for patients, family members, caregivers, and healthcare professionals to aid shared decision-making

Shared care: patient-centered AF management with joint decision- making and a multidisciplinary team

Patient-centered AF Management

- **Patient empowerment** is critical to achieve better outcomes, encourage adherence, and to seek timely guidance on changes in clinical status
- **Patient-centered, shared decision-making approach** - facilitate choice of management that suits each individual patient
- **Education and awareness** are essential, not only for **patients** but also **healthcare professionals** in order to constrain the impact of AF on patients and healthcare services

Components of patient-centred AF management:
• Optimal treatment according to the AF-CARE pathway, which includes:
◦ [C] Comorbidity and risk factor management
◦ [A] Avoid stroke and thromboembolism
◦ [R] Reduce symptoms by rate and rhythm control
◦ [E] Evaluation and dynamic reassessment
• Lifestyle recommendations
• Psychosocial support
• Education and awareness for patients, family members, and caregivers
• Seamless co-ordination between primary care and specialized AF care
How to implement patient-centred AF management:
• Shared decision-making
• Multidisciplinary team approach
• Patient education and empowerment, with emphasis on self-care
• Structured educational programmes for healthcare professionals
• Technology support (e-Health, m-Health, telemedicine)[a]

Patient-centered AF Management

- Patient - at the heart of care
- Therapeutic relationship between the patient and the multidisciplinary team
- Patients are seen not as passive recipients of health services, but as active participants who work as partners alongside healthcare professionals
- Requires integration of all aspects of AF management
- This includes symptom control, lifestyle recommendations, psychosocial support, and management of comorbidities, alongside optimal medical treatment consisting of pharmacotherapy, cardioversion, and interventional or surgical ablation

Comorbidities and Risk factors Management

- Associated with onset, recurrence and progression of AF
- Thorough evaluation and management is critical
  - to avoid recurrence and progression of AF
  - to improve success of AF treatments
  - to prevent AF-related adverse outcomes
- Central to the success of care - with evidence based management for hypertension, heart failure, diabetes mellitus, obesity, and sleep apnea, along with lifestyle changes that improve physical activity and reduce alcohol intake
- Dynamic evaluation: periodically reassess therapy and give attention to new modifiable risk factors
- In the Atherosclerosis Risk in Communities (ARIC) study, hypertension was the most prevalent comorbidity and the highest attributable risk (22%) for AF, followed by elevated body mass index (BMI) (13%), smoking (9.8%), and diabetes (3.1%).
- Over 50% of AF cases in a middle-aged population were accounted for by sub-optimal risk factor control

Hypertension

- Associated with a 1.7–2.5-fold increased risk of AF
- Increased risk of stroke, heart failure, major bleeding, and cardiovascular mortality

- Meta-analysis of 22 randomized trials, a 5 mmHg reduction in systolic BP reduced the risk of major cardiovascular events by 9%
- Secondary analysis of RCTs and observational studies - suggest that ACE inhibitors or ARBs may be superior to beta-blockers, calcium channel blockers, or diuretics for the prevention of incident AF

- Predictor of recurrent AF in long-term follow-up after PVI
- Target systolic blood pressure of under 130 mmHg is associated with 40% lower risk of incident AF

Heart Failure

- **Key determinant of prognosis in patients with AF**
- **Important factor associated with recurrence and progression of AF**
- **During 30 years of follow-up in the Framingham cohort, 57% of those with new heart failure had concomitant AF, and 37% of new AF had heart failure**
- **In patients with acute heart failure attending the emergency department, AF is one of the most prevalent triggering factors**
- **The development of heart failure in patients with AF is associated with a two-fold increase in stroke and thromboembolism, even after anticoagulation, and 25% higher all-cause mortality**

Heart Failure

- Prognosis affected by left ventricular ejection fraction (LVEF), with the rate of death highest with the combination of AF and heart failure with reduced ejection fraction (HFrEF)
- Achieving euvolaemic with diuretics -an important first step to manage heart failure component, and to facilitate better control of heart rate in AF
- Appropriate management of heart failure - Reduce recurrence of AF, e.g. by reducing adverse atrial and ventricular myocardial remodeling
- The use of ACE inhibitors or ARBs in patients with known HFrEF was associated with a 44% reduction in incidence of AF, Beta-blockers 33% reduction, Mineralocorticoid receptor antagonists - 42% reduction
- Combined management of heart failure with ACE inhibitors/ARBs, mineralocorticoid receptor antagonists, statins, and cardiac rehabilitation increased the maintenance of sinus rhythm (RACE 3 Trial)

Heart Failure

- **SGLT2 inhibitors** -several meta-analyses demonstrated 18%–37% reduction in incident AF
- **ARNI** treatment substantially reduced the risk of progression from paroxysmal to persistent AF, associated with a lower risk of AF recurrence after radiofrequency catheter ablation
- Some evidence to suggest that effective **CRT** in eligible patients with HFrEF reduces the risk of incident AF
- The optimal heart rate target in AF with HF remains unclear, although a heart rate under **100–110 bpm** (lenient rate control) is usually recommended

Diabetes Mellitus

- Present in around 25% of patients with AF, 1.28-fold increased relative risk of incident AF
- Patients with both diabetes and AF - worse prognosis
- Following catheter ablation of AF, diabetes and higher HbA1c - associated with increased length of stay and a greater recurrence of AF

- Insulin promotes adipogenesis and cardiac fibrosis with an increased risk of AF
- Observational studies have associated metformin with lower rates of incident AF

- Various recent studies and meta-analyses point to the positive role of SGLT2 inhibitors to reduce the risk of incident AF in diabetic and non-diabetic patients

- Pooled data from 22 trials showed that SGLT2 inhibitors compared with placebo can significantly reduce the incidence of AF by 18% in studies on diabetes, and up to 37% in heart failure with or without type 2 diabetes

Obesity

- **Independently** associated with the development of AF
- **Second most prevalent** comorbidity
- Multiple pathophysiological links between obesity and AF

- Obesity (BMI ≥30 kg/m2) and overweight (BMI >25 kg/m2) - associated with greater risk of **recurrent** atrial arrhythmias after AF ablation (13% increase for every 5 kg/m2 higher BMI)

- Weight loss of **≥10%** in overweight and obese individuals with AF - associated with reduced AF **symptoms** and AF **burden** (aiming for BMI <27 kg/m2), graded response to maintenance of sinus rhythm, improved ablation outcomes, six-fold greater chance of arrhythmia-free survival

- Recent metanalysis found a **13%** excess risk of recurrent AF after PVI per **five units of BMI** increase

Obstructive Sleep Apnoea

- **Highly prevalent condition in patients with AF**

- **Intermittent nocturnal hypoxemia or hypercapnia, oscillations in intrathoracic pressure, sympatho-vagal imbalance, oxidative stress, and systemic inflammation driven by OSA results in the development of a prothrombotic state, atrial fibrosis, and electrical remodeling**

- **Associated with the recurrence of AF after electrical cardioversion or catheter ablation, and there is a dose–response relationship between OSA severity and AF incidence and burden**

- **Continuous positive airway pressure (CPAP)- reduce the incidence, progression, recurrence, and symptoms of AF**

- **Individuals with OSA not treated with CPAP - respond poorly to treatments for AF, with an increased risk of recurrence after cardioversion or ablation**

Physical Inactivity

- A sedentary lifestyle is a risk factor for the development of AF
- High-intensity interval training improves functional capacity and quality of life in AF
- RCTs, meta-analyses, and observational cohorts - shown that regular moderate aerobic exercise reduce the risk of new-onset AF (18% lower AF incidence), improve AF-related symptoms, quality of life, and exercise capacity
- Better cardiorespiratory fitness has a demonstrated inverse relationship to AF burden in both middle-aged and elderly people
- But incidence of AF appears to be increased among athletes, with a meta-analysis of observational studies showing a 2.5-fold increased risk of AF compared with non-athlete controls, whose exercise levels far exceed standard PA recommendations

Smoking

- **Major modifiable risk factor for cardiovascular diseases**
- **There is a strong dose–response relationship between current smoking and AF risk, with a weaker dose-dependent risk for previous smoking**
- **Childhood second-hand smoke exposure increases risk of adulthood AF, demonstrating the chronic deleterious effects on AF risk after the first exposure**
- **Smoking increases the risk of all-cause death and cardiovascular death in AF**
- **Promotion of smoking cessation is essential as this lowers the risk of ischaemic stroke, dementia, and reduces mortality in AF**

Alcohol excess

- Alcohol has a direct effect on the atrium (myocyte injury, inflammation, and fibrosis) and autonomic modulation (sympathetic activation and vagal inhibition), which shorten the atrial action potential and atrial effective refractory period and in turn promote initiation and maintenance of AF

- Alcohol consumption - increase the risk of adverse events in patients with AF, such as thromboembolism, ischaemic stroke, death
- There is a linear dose–response relationship between alcohol use and AF risk, also associated with a dose-dependent increase in the recurrence of AF after catheter ablation

- In patients receiving OAC, alcohol excess is associated with a greater risk of bleeding, mediated by poor adherence, alcohol–drug interactions, liver disease, and variceal bleeding

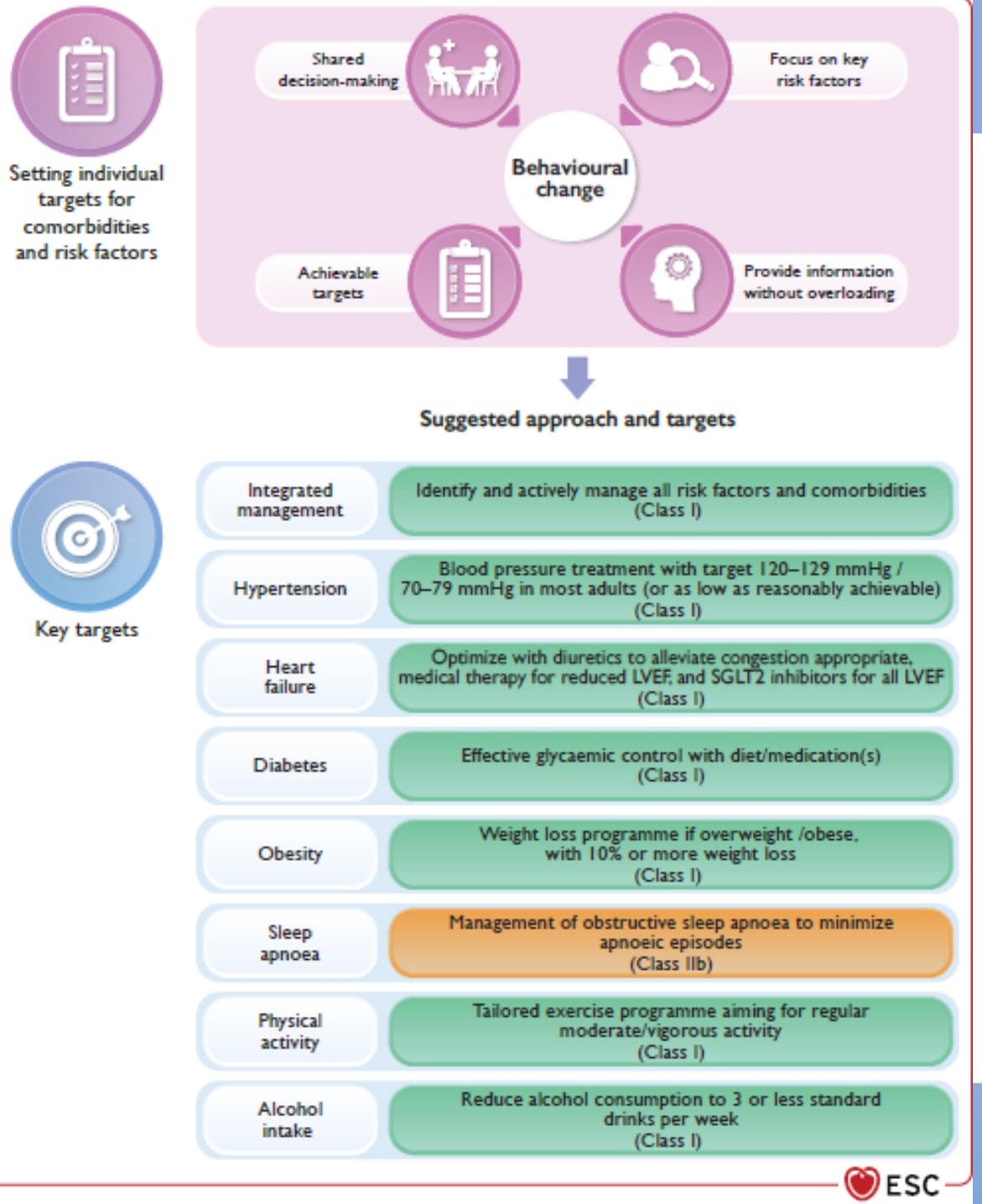
- A recent RCT found that alcohol abstinence for 6 months reduced AF recurrence and burden, and improved AF-related quality of life in patients with AF who previously drank ≥10 drinks/week

Coronary artery disease

- The risk of incident AF rises by 60–77% post-myocardial infarction, and AF itself may increase the risk of acute coronary events
- New-onset AF typically occurs during the first 4 days after acute MI, and is associated with more than doubling of the risk of death, congestive HF, and stroke
- Patients with AF and acute coronary syndromes are more likely to experience adverse outcomes than patients without AF
- 10–15% of AF patients undergo PCI for CAD and combined antithrombotic treatment-related benefits and bleeding need to be carefully balanced

Recommendations for comorbidity and risk factor management in AF		
Identification and management of risk factors and comorbidities is recommended as an integral part of AF care.	I	B
Blood pressure lowering treatment is recommended in patients with AF and hypertension to reduce recurrence and progression of AF and prevent adverse cardiovascular events.	I	B
Diuretics are recommended in patients with AF, HF, and congestion to alleviate symptoms and facilitate better AF management.	I	C
Appropriate medical therapy for HF is recommended in AF patients with HF and impaired LVEF to reduce symptoms and/or HF hospitalization and prevent AF recurrence.	I	B
Sodium-glucose cotransporter-2 inhibitors are recommended for patients with HF and AF regardless of left ventricular ejection fraction to reduce the risk of HF hospitalization and cardiovascular death.	I	A
Effective glycaemic control is recommended as part of comprehensive risk factor management in individuals with diabetes mellitus and AF, to reduce burden, recurrence, and progression of AF.	I	C
Weight loss is recommended as part of comprehensive risk factor management in overweight and obese individuals with AF to reduce symptoms and AF burden, with a target of 10% or more reduction in body weight.	I	B
A tailored exercise programme is recommended in individuals with paroxysmal or persistent AF to improve cardiorespiratory fitness and reduce AF recurrence.	I	B
Reducing alcohol consumption to ≤3 standard drinks (≤30 grams of alcohol) per week is recommended as part of comprehensive risk factor management to reduce AF recurrence.	I	B
When screening for obstructive sleep apnoea in individuals with AF, using only symptom-based questionnaires is not recommended.	III	B

Targets for Risk Factors



Hypertension	120-129/70-79
DM	HbA1C < 7
Obesity	BMI 20-25, ≥10% weight loss
Physical activity	150min/week moderate intensity exercise, 75-150min/week vigorous intensity aerobic physical activity
Alcohol	≤3 standard drinks/week
Smoking	No exposure to Tobacco

CARE

- Equality in healthcare provision (gender, ethnicity, socioeconomic) (Class I)
- Education for patients, families and healthcare professionals (Class I)
- Patient-centred AF management with a multidisciplinary approach (Class IIa)

C — Comorbidity and risk factor management

Hypertension	Heart failure	Overweight or obese	Obstructive sleep apnoea	Alcohol
Blood pressure lowering treatment (Class I)	Diuretics for congestion (Class I)	Weight loss (target 10%)[a] (Class I)	Management of OSA[a] (Class IIb)	Reduce to ≤3 drinks per week (Class I)
Diabetes mellitus	Appropriate HFrEF medical therapy (Class I)	Bariatric surgery if rhythm control[a] (Class IIb)	**Exercise capacity**	**Other risk factors/ comorbidities**
Effective glycaemic control[a] (Class I)	SGLT2 inhibitors (Class I)		Tailored exercise programme (Class I)	Identify and manage aggressively[a] (Class I)

PRIMARY PREVENTION OF AF

- **Preventing the onset of AF before clinical manifestation has clear potential to improve the lives of the general population and reduce the considerable health and social care costs associated with development of AF**

- **Asymptomatic AF is known to be an independent risk factor for stroke and other arterial thromboembolic events, the subject of AF screening to detect asymptomatic AF in patients at high risk of stroke has come into focus, which is represented in all guidelines**

- **ESC guidelines recommend opportunistic AF screening in patients of ≥65 years, systematic screening in patients of ≥75 years or at high risk of stroke**

Take Home Message

- **Comorbidities and Risk factors management – First step in CARE pathway**
- **Essential for management of AF onset, progression and recurrence**
- **Emphasize to do dynamic evaluation and continue management throughout the disease continuum**
- **Recommend opportunistic AF screening to detect Asymptomatic AF to improve QOL of population and to reduce Health care and Economic burden**


THANK YOU