



The 2024 European Society of Cardiology Guidelines for Diagnosis and Management of Atrial Fibrillation: A Viewpoint from a Practicing Clinician's Perspective

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Abstract

Atrial fibrillation (AF) is a complex disease requiring a multidomain and (usually) long-term management, thus posing a significant burden to patients with AF, practitioners, and health care system. Unlike cardiovascular conditions with a narrow referral pathway (e.g., acute coronary syndrome), AF may be first detected by a wide range of specialties (often noncardiology) or a general practitioner. Since timely initiated optimal management is essential for the prevention of AF-related complications, a concise and simple guidance is essential for practitioners managing AF patients, regardless of their specialty. Guideline-adherent management of patients with AF has been shown to translate to improved patient outcomes compared with guideline-nonadherent treatment. To facilitate guideline implementation in routine clinical practice, a good guideline document on AF should introduce only evidence-based new recommendations, while avoiding arbitrary changes, which may be confusing to practitioners. Herein, we discuss the main changes in the 2024 European Society of Cardiology (ESC) AF Guidelines relative to the previous 2020 ESC document. Whether the updates and new recommendations issued by the new guidelines will translate in high adherence in clinical practice (and hence improved prognosis of patients with AF) will need to be addressed in upcoming years.

Keywords

- ▶ atrial fibrillation
- ▶ guidelines
- ▶ evidence-based recommendation

Atrial fibrillation (AF) is associated with increased risk of major cardiovascular adverse events, including ischemic stroke/systemic embolism, heart failure, hospitalization, impaired quality of life, and mortality.¹ The arrhythmia is a complex disease requiring a multidomain, integrated, and (usually) long-term management, thus posing a significant

burden to patients with AF, practitioners, and health care system.

Unlike cardiovascular conditions with a narrow referral pathway (e.g., acute coronary syndrome [ACS]), AF may be first detected by a wide range of specialties (often non-cardiology ones) or a general practitioner in primary care.

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Since timely initiated optimal management is essential for the prevention of AF-related complications, a concise and simple guidance is essential for practitioners managing AF patients, regardless of their specialty.

Guideline-adherent management of patients with AF has been shown to translate to improved patient outcomes compared with guideline-nonadherent treatment.² To facilitate guideline implementation in routine clinical practice, a good guideline document on AF should introduce only evidence-based new recommendations while avoiding arbitrary changes, which may be confusing to practitioners.

Herein we discuss the main changes in the 2024 European Society of Cardiology (ESC) AF Guidelines³ relative to the previous 2020 ESC document¹ and compare the 2024 ESC document with other most recent international AF guidelines.

Integrated Care for Patients with Atrial Fibrillation

Approximately a decade ago, the World Health Organization put forward the concept of integrated care models for chronic diseases in recognition of fragmentation of respective health care services.⁴ Thereafter, a structured, patient-centered, multidisciplinary approach to the management of patients with AF (integrating health care professionals, patients, and their family/carers and outlining the main domains of AF care) to improve patient outcomes and adherence to guidelines has been formally proposed in the 2016 ESC AF guidelines (Class IIa, Level of Evidence [LoE] B).⁵

The 2020 ESC AF Guidelines reiterated this recommendation and streamlined the essential domains of care for AF patients across all health care levels and among different specialties into the simple ABC pathway (► Fig. 1), using gear wheels to emphasize the equal importance of each of the main AF care domains, as follows: “A” Anticoagulation/Avoid stroke, “B” Better symptom management, and “C” Cardiovascular and Comorbidity optimization.¹

The scientific evidence supporting the ABC pathway at that time was already fairly extensive.⁶ There were several observational studies (from retrospective and prospective cohorts) or post hoc analyses of randomized trial cohorts showing a significant association of the ABC pathway implementation with lower health-related costs,⁷ lower rates of cardiovascular adverse events, and lower risk of all-cause death and composite outcome of stroke/major bleeding/cardiovascular death and first hospitalization in comparison to usual care.^{8–10} There was also one published prospective cluster randomized mAFA-II trial, which showed a significant 61% risk reduction in the composite outcome of stroke or thromboembolism, all-cause death, and rehospitalization, with ABC pathway management intervention versus usual care.¹¹ The long-term extension of mAFA-II trial showed a high adherence (over 70%) and persistence (over 90%) with the intervention.¹²

Subsequently, in a systematic review and meta-analysis of 285,000 patients, adherence to the ABC pathway translated to a 58% reduction in all-cause death, a 63% reduction in cardiovascular death, a 45% reduction in ischemic stroke, and a 31% reduction in major bleeding.¹³ A retrospective analysis of a large registry-based cohort showed that adherence to all ABC pathway domains resulted in the greatest magnitude of

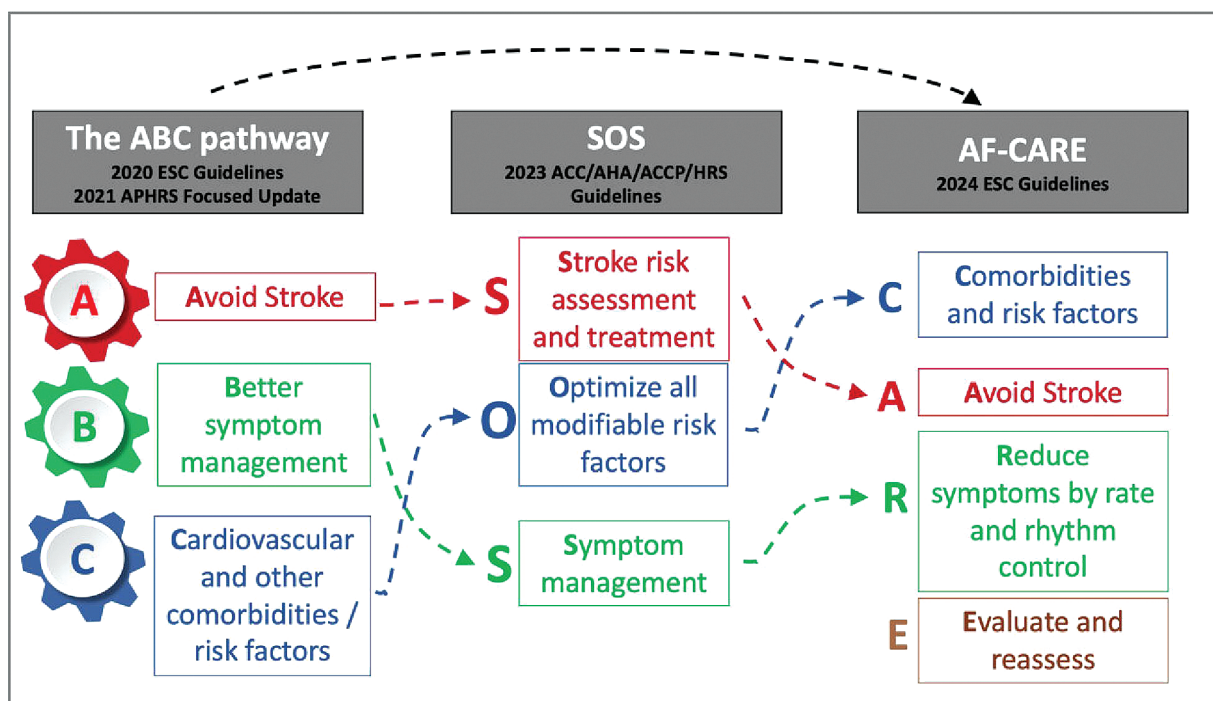


Fig. 1 Integrated management of patients with AF.^{1,3,20} ACC/AHA/ACCP/HRS, American College of Cardiology/American Heart Association/American College of Chest Physicians/Heart Rhythm Society; AF, atrial fibrillation; ESC, European Society of Cardiology.

risk reduction and the longest event-free survival; also, in patients deemed as “clinically complex”¹⁴ and other analyses have shown the impact of the ABC pathway on patients with multimorbidity and thus at higher baseline risk of adverse outcomes.^{15–17}

Most recently, the randomized MIRACLE-AF trial was presented as a Late Breaking Trial at the 2024 ESC Congress in London and reported a cluster randomized trial comparison of ABC pathway intervention versus intensified usual care in rural villages in China—this showed a 36% lower rates of the composite outcome (cardiovascular death, stroke, hospitalization due to worsening of heart failure or ACS, and emergency visits due to AF) with the ABC intervention delivered by village doctors (previously called “barefoot doctors”) supported by telemedicine¹⁸ (www.escardio.org/Congresses-Events/ESC--Congress/Congress-news/hot-line-9-stroke-stop-ii-guard-af-and-miracle-af). Secondary outcomes included a significant reduction in stroke and cardiovascular death.

Clearly, the evidence supporting the ABC pathway for integrated AF care to streamline timely optimal management of patients with AF at all health care levels by noncardiologists and cardiologists has been accumulated, fulfilling LoE A. In addition, an ongoing randomized controlled trial is comparing the ABC pathway versus usual care in elderly patients in Europe within the Horizon Europe funded the AFFIRMO programme.¹⁹

Notwithstanding the significant amount of evidence supporting the ABC pathway, the 2024 ESC AF Guidelines recommended a new, not previously tested acronym AF-CARE, essentially highlighting the same AF care domains as the ABC pathway, although rearranged in a different order (► **Fig. 1**). This change in recommendation, from ABC pathway to AF-CARE, was justified mainly by a concern that the “C” domain (Cardiovascular and Comorbidity management) could be otherwise neglected.

Whether this change, accompanied by a Class I LoE C formal recommendation, will really facilitate the attainment of the “C” domain of AF care, or rather confuse practitioners increasingly familiar with the ABC pathway and compromise guideline implementation in practice, remains to be seen. After all, when managing any cardiovascular disorder, whether AF or other non-AF conditions, it seems common sense that all cardiovascular risk factors and comorbidities should be proactively managed. Hence, the “C” being prioritized is not unique to AF per se.

Of note, the 2023 ACC/AHA/HRS AF Guidelines²⁰ also provided an acronym for integrated AF care, the SOS, streamlining the AF care domains comparably to the ABC pathway (► **Fig. 1**).

Overall, the essential principles of care for AF patients worldwide remain the same, and using a particular acronym is probably only a matter of personal preference, as long as the main domains of AF care are optimally addressed.

Prevention of Stroke and Systemic Embolism

The steps essential to effective stroke prevention include: (1) initial stroke risk assessment to identify AF patients at truly

low risk of stroke, (2) initiation of oral anticoagulant (OAC) therapy in all AF patients with one or more stroke risk factors (preferably a non-Vitamin K antagonist oral anticoagulant [NOAC] in NOAC-eligible patients) and bleeding risk assessment, and (3) regular reassessment of stroke and bleeding risk in periodic time intervals, to account for a dynamic changes in the individual patient's risk profile.¹

When tailoring stroke prevention strategy, ethnic differences in stroke and bleeding risk should also be considered.^{21,22}

In the 2024 ESC AF Guidelines, several changes have been made, mostly regarding stroke and bleeding risk assessment.

Stroke Risk Assessment

Notwithstanding that clinical risk factor-based scores generally have a modest ability to predict the clinical event of interest, most international guidelines recommend the clinical stroke risk factor-based CHA₂DS₂-VASc score for initial stroke risk assessment (► **Table 1**), as the most validated and widely used stroke risk assessment tool to reliably identify AF patients at sufficiently low risk of stroke so that long-term OAC is not needed (i.e., as long as the score is 0 in male and 1 in female AF patients).^{23,24}

The 2024 ESC AF Guidelines recommend using the CHA₂DS₂-VA score for stroke risk assessment (LoE C), considering that the inclusion of female sex “complicates clinical practice both for health care professionals and patients” and “omits individuals who identify as nonbinary, transgender, or are undergoing sex hormone therapy.”³

Indeed, female sex is a stroke risk modifier, rather than a stroke risk factor per se.²⁹ While earlier data showed a greater risk of stroke in female AF patients compared with males (with significant age-dependent interaction between female sex and the presence of additional clinical stroke risk factors)^{30,31} and strokes tended to be more severe in female AF patients compared with males,³² more recent evidence shows that the rates of AF-related strokes are declining in both male and female patients, in the context of decreasing sex-related disparities in OAC use.

Similar observations were made by Nielsen et al in a nationwide cohort study of 158,982 patients with incident AF not on OAC.³³ During the study period 1997 to 2020, the risk of stroke overall has been declining in the last two decades, and the sex difference diminished in most recent years. Whereas the likelihood of prescribing OAC was lower for female patients with AF compared with male AF patients, OAC initiation increased over time, with comparable OAC initiation patterns in male and female AF patients.³³

In a study using UK primary and secondary care data comprising 195,719 patients with AF followed between 1998 and 2016, there was higher thromboembolic events in women compared with men in the population with high CHA₂DS₂-VASc risk scores; however, overall stroke and thromboembolic risk prediction using the CHA₂DS₂-VA and CHA₂DS₂-VASc scores was comparable. Also, the similarity in thromboembolic risk prediction using CHA₂DS₂-VA and CHA₂DS₂-VASc scores was consistent across different ethnicities and socioeconomic status.

Table 1 Thromboembolic and bleeding risk assessment and management in the international atrial fibrillation guidelines

Society	Year	Thromboembolic risk assessment model/score	Recommendation for thrombo-embolic prevention with OAC	Bleeding risk assessment and recommended model/score
NHFA/CSANZ ²⁵ (Australia, New Zealand)	2018	CHA ₂ DS ₂ -VA	CHA ₂ DS ₂ -VA ≥ 2 (Strong)	Identification of reversible bleeding risk factors; no specific score recommended
			CHA ₂ DS ₂ -VA = 1 (Strong)	
APHRs ²⁶ (Asia-Pacific)	2021	CHA ₂ DS ₂ -VASc	CHA ₂ DS ₂ -VASc ≥ 2 (males) or ≥3 (females): recommended	HAS-BLED (to identify modifiable risk factors to be corrected)
			CHA ₂ DS ₂ -VASc = 1 (males) or 2 (females): to be considered	
CCS/CHRS ²⁷ (Canada)	2020	CHADS-65 ("CCS algorithm")	Score ≥ 1 (or 65 y) (Strong)	HAS-BLED (to identify high-risk patients and modifiable risk factors)
ESC/EACTS (Europe) ¹	2020	CHA ₂ DS ₂ -VASc	CHA ₂ DS ₂ -VASc ≥ 2 (males) or ≥3 (females) (Class I)	HAS-BLED (to identify high-risk patients and address modifiable risk factors)
			CHA ₂ DS ₂ -VASc = 1 (males) or = 2 (females) (Class IIa)	
ESC/EACTS (Europe) ³	2024	CHA ₂ DS ₂ -VA	CHA ₂ DS ₂ -VA ≥ 2 (Class I)	Assessment and management of modifiable bleeding risk factors; no specific score recommended
			CHA ₂ DS ₂ -VA = 1 (Class IIa)	
ACC/AHA/ACCP/HRS (United States) ²⁰	2023	CHA ₂ DS ₂ -VASc (or validated clinical risk scores)	CHA ₂ DS ₂ -VASc ≥ 2 (males) or ≥ 3 (females) (Class I)	Identify factors that indicate high risk of bleeding and possible intervention to prevent bleeding; no specific score recommended
			CHA ₂ DS ₂ -VASc = 1 (males) or 2 (females) (Class IIa)	
Chinese Expert Consensus Guidelines ²⁸	2024	CHA ₂ DS ₂ -VASc	CHA ₂ DS ₂ -VASc	HAS-BLED

Abbreviations: ACC, American College of Cardiology; ACCP, American College of Chest Physician AHA, American Heart Association; APHRs, Asia-Pacific Heart Rhythm Society; CCS, Canadian Cardiovascular Society; CHA₂DS₂-VASc, congestive heart failure, hypertension, age ≥75 years (2 points), diabetes mellitus, prior stroke/TIA/thromboembolism (2 points), vascular disease, age 65 to 74 years and female sex; CHS, Canadian Heart Rhythm Society; CSANZ, Cardiac Society of Australia and New Zealand; EACTS, European Association for Cardio-Thoracic Surgery; ESC, European Society of Cardiology; HRS, Heart Rhythm Society; NHFA, National Heart Foundation of Australia; OAC, oral anticoagulant.

A most recent retrospective evaluation of temporal trends in the predictive value of the CHA₂DS₂-VASc relative to the CHA₂DS₂-VA score (using nationwide data on AF patients from all levels of care in Finland during the 2007–2018 period) showed that initial differences favoring the CHA₂DS₂-VASc score in early years (when female AF patients were at much higher stroke risk than males) gradually attenuated over time, resulting in no difference in stroke risk prediction or reclassification between the CHA₂DS₂-VASc and CHA₂DS₂-VA scores in the 2017 to 2018 period.³⁴ Thus, recent data from Finland, Denmark, and the United Kingdom found the female to male differences in AF-related strokes were removing the Sc criterion from the CHA₂DS₂-VASc score did not affect its ability to discriminate thromboembolic events in the AF population.^{31,35,36}

Of note, an analysis from the same Finnish dataset and time period showed how female sex was initially associated

with lower use of OAC, whereas sex-based disparities attenuated during the study and were finally resolved at the end of the observation.³⁷ Other studies have also shown an increase in the use of OAC among female patients over the last decade.³⁸ This evidence suggests that improved use of OAC in females may have contributed to the decreasing sex-based difference in the incidence of AF-related stroke.

Although the concept of not considering female sex in AF-related stroke risk assessment is not new (the CHA₂DS₂-VA score was first proposed in the 2018 Australian/New Zealand AF Guidelines³⁹ albeit with limited evidence then), the evidence supporting the CHA₂DS₂-VA score remained extremely scarce. Fortunately, the subsequently reported most recent data suggest that adopting the CHA₂DS₂-VA score could potentially simplify stroke risk assessment in AF patients.

Still, some caution is needed, as it is very likely that the use of CHA₂DS₂-VASc score contributed to draw attention to

the risk of stroke in women risk and improved OAC use in female AF patients, in addition to improved overall management of concomitant cardiovascular risk factors and underlying comorbidities. Also, the patterns seen in Finland, Denmark, and United Kingdom may not be evident in other health care systems. Hence, it could still be too early to replace the CHA₂DS₂-VASc score with CHA₂DS₂-VA when assessing the risk of stroke in AF patients.

Bleeding Risk Assessment

All international AF Guidelines recognize the need for bleeding risk assessment (and regular reassessment) in AF patients taking OAC and agree that the estimated bleeding risk itself should not preclude OAC prescription (►Table 1). However, the approach to bleeding risk assessment has varied over time in the ESC AF Guideline documents (►Fig. 2).

Bleeding risk factors are classified as nonmodifiable (e.g., age >65 years, prior stroke or bleeding), partially modifiable (e.g., renal impairment, anemia), and modifiable (e.g., hypertension, concomitant antiplatelet therapy, alcohol intake).¹ In interaction with modifiable bleeding risk factors, nonmodifiable factors are important drivers of bleeding events,⁴² hence should not be overlooked.

The importance of reviewing both modifiable and non-modifiable bleeding risk factors to mitigate bleeding risk has been acknowledged in most international AF Guidelines (►Table 1), and the 2020 ESC AF Guidelines explicitly recommended a structured, clinical risk factor-based bleeding risk assessment (►Fig. 2), since relying solely on modifiable bleeding risk consideration has been shown to be inferior to formal bleeding risk assessment using a bleeding risk score inclusive of both modifiable and nonmodifiable bleeding risk

factors,^{43–45} such as the HAS-BLED score^{23,36,45,46} (►Table 1, ►Fig. 2).

From the practical perspective, any bleeding (major or minor) is “red flag” for subsequent ischemic events, yet OAC is often discontinued for the bleeding event.⁴⁷ Nevertheless, the guidance on consideration of individual patient bleeding risk in the 2024 ESC AF Guidelines may be confusing, especially for nonexpert clinicians managing AF patients. While the document mentions that patients with nonmodifiable bleeding risk factors should be reviewed more often, or even referred to a multidisciplinary team, the formal recommendation for bleeding risk assessment refers only to the assessment and management of modifiable bleeding risk factors (Class I, LoE B), while the use of bleeding risk scores is not recommended (Class III, LoE B), to avoid underuse of OAC.³ Of note, none of the three references cited in support of the latter examined the effects of bleeding risk scores on OAC underuse,^{48,49} and one was the 2014 AHA/ACC/HRS AF Guideline document.⁵⁰

Transcatheter Left Atrial Appendage Closure

The evidence supporting nonpharmacological prevention of AF-related stroke using transcatheter left atrial appendage closure (LAAC)⁵¹ has not changed much since consideration of LAAC was recommended in AF patients with a high risk of stroke and contraindications to long-term OAC (Class IIb, LoE B) in the 2012 ESC AF Guideline Update;⁴¹ hence, the recommendation remained unchanged in the 2016 and 2020 ESC AF Guideline documents.^{1,5}

In the 2024 ESC AF Guidelines, the same recommendation is downgraded to LoE C, with the rationale that the available evidence does not refer to patients with contraindications to OAC.³ From the clinicians’ practical perspective, the

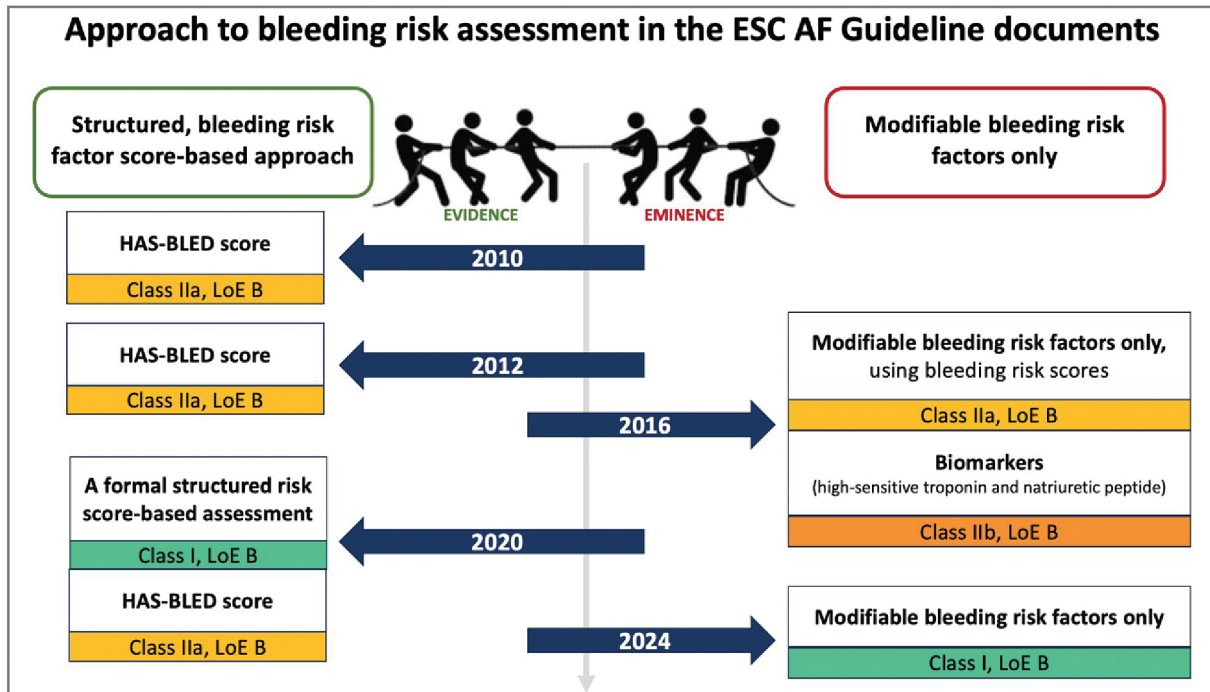


Fig. 2 Bleeding risk assessment in the ESC AF Guidelines 2010 to 2024.^{1,3,5,40,41} AF, atrial fibrillation; ESC, European Society of Cardiology; HAS-BLED, Hypertension (uncontrolled, systolic blood pressure >160 mm Hg), Abnormal renal and/or hepatic function, Stroke, Bleeding history or predisposition, Elderly (>65 years), Drugs or excessive alcohol intake; LoE, level of evidence.

approach proposed in the 2023 ACC/AHA/HRS AF Guideline could be more helpful, as the recommendation referring to LAAC is divided to the recommendation on patients with a contraindication to long-term OAC (Class IIa, LoE B-NR) and another one referring to patients with a high risk of both stroke and bleeding (Class IIb, LoE B-R).²⁰

It is very likely that numerous ongoing randomized trials will change the LAAC landscape soon.⁵¹

Rhythm and Rate Control

It is widely accepted that appropriate rate control is an important background therapy in all AF patients. In addition, a large body of evidence supports the consideration of rhythm control in symptomatic patients with AF to improve symptoms and quality of life (Class I, LoE A in the 2020 ESC AF Guidelines¹ and Class IIa, LoE B-R in the 2023 ACC/AHA/ACCP/HRS AF [American College of Cardiology/American Heart Association/American College of Chest Physicians/Heart Rhythm Society Atrial Fibrillation] Guidelines²⁰), but such formal recommendation is missing in the 2024 ESC AF Guideline document, being mentioned only in the text.³

In line with recently published data,^{52,53} the 2024 ESC AF Guidelines recommended the implementation of a rhythm control strategy within 12 months of diagnosis in selected AF patients at risk of thromboembolism to reduce the risk of cardiovascular death or hospitalization (Class IIa, LoE B).³ However, how to select patients in practice is less clear.

In contrast, the 2023 ACC/AHA/ACCP/HRS AF Guidelines provide a helpful set of goals with rhythm control therapy, including: (1) evaluation of AF contribution to the reduced left ventricular (LV) function in patients with reduced LV function and persistent (high burden) AF (Class I, LoE B-R), (2) symptom improvement in patients with symptomatic AF, (3) reduction in hospitalization, stroke, and mortality in patients recently diagnosed with AF (<1 year), (4) improvement of symptoms and outcomes in patients with AF and heart failure (all Class IIa, LoE B-R), and (5) reduction in AF progression (Class IIa, LoE B-NR).²⁰

Catheter Ablation of Atrial Fibrillation

The recommendation for catheter ablation of AF as the first-line therapy for paroxysmal AF has been upgraded from Class IIa, LoE B¹ to Class I, LoE A³ in the 2024 ESC AF Guidelines, whereas the recommendations regarding AF ablation in patients with heart failure remained unchanged. This is in contrast to the 2023 ACC/AHA/ACCP/HRS AF Guidelines, wherein AF ablation is recommended in appropriate patients with AF and heart failure with reduced ejection fraction to improve symptoms, quality of life, ventricular function, and cardiovascular outcomes (Class I, LoE A).²⁰ A missed opportunity to upgrade the role of AF ablation in patients with heart failure in the 2024 ESC AF Guidelines could result in the therapy being delayed or withheld from patients who would most benefit from it.^{54,55}

While providing a new recommendation on repeat AF ablation (Class IIa, LoE B), the 2024 ESC AF Guidelines have not addressed AF ablation in asymptomatic AF patients, unlike the 2023 ACC/AHA/ACCP/HRS AF Guidelines where

AF ablation may be considered for reducing progression and complication of AF in younger patients with few comorbidities and moderate-to-high burden of AF (Class IIb, LoE B-NR).²⁰

Other Considerations

Optimal management of patients with so-called "subclinical" AF remains debatable, after the two randomized trials (i.e., ARTESiA and NOAH-AFNET 6) showed reduction in ischemic stroke, at the cost of increased risk of (nonfatal) major bleeding with NOAC versus control (either aspirin in ARTESiA, or placebo in NOAH-AFNET 6) in patients with subclinical AF of short duration.⁵⁶⁻⁵⁸ The 2024 ESC AF Guidelines provided a Class IIb, LoE B recommendation for considering an NOAC in such patients, excluding those at high risk of bleeding.³ Questions remain on how to stratify thromboembolic risk and to individualize treatment strategies in these patients.

Concluding Remarks

Overall, the 2024 ESC AF Guidelines claimed 57 new recommendations, of which 17 (29%) were supported with LoE C. Of the latter, some appear rather unlikely to aid management of AF patients in daily practice (e.g., the Class I recommendation, LoE C that "a transthoracic echocardiogram is recommended in patients with an AF diagnosis where this will guide treatment decisions").

There is a strong impression that scientific evidence appreciation was rather unbalanced across some sections, ranging from shifting from an established approach with a significant amount of support evidence (e.g., the ABC pathway) to a new approach (i.e., AF-CARE), which is still to be validated, to meticulous scrutinization of current evidence (e.g., percutaneous LAAC). Whether the updates and new recommendations issued by the new guidelines will translate in high adherence in clinical practice (and hence improved prognosis of patients with AF) will need to be addressed in upcoming years, also taking into account the other changes proposed from previous guidelines (e.g., the ABC pathway vs. the new AF-CARE acronym, CHA₂DS₂-VASC vs. CHA₂DS₂-VA, and removal of the HAS-BLED score).

Clearly, the most striking aspect of the 2024 ESC AF Guideline document is the strong emphasis on the importance of concomitant comorbidity and risk factor management, supported by changing from the ABC pathway to AF-CARE acronym. It remains to be seen whether this change will translate into better guideline implementation in practice and improved patients' outcomes, also considering current knowledge on barriers to guidelines implementations in clinical practice.⁵⁹ However, it is simply common sense that all cardiovascular risk factors and comorbidities should be proactively managed, and regular review implemented, in patients with heart disease.

Conflict of Interest

T.P. declared no conflict of interest; G.F.R. reports consultancy for Boehringer Ingelheim and an educational grant

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