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CLINICAL PRACTICE GUIDELINES

2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

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ESC European Society of Cardiology
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ESC GUIDELINES

2024 ESC Guidelines for the management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS)

Developed by the task force for the management of atrial fibrillation of the European Society of Cardiology (ESC), with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC.
Endorsed by the European Stroke Organisation (ESO)

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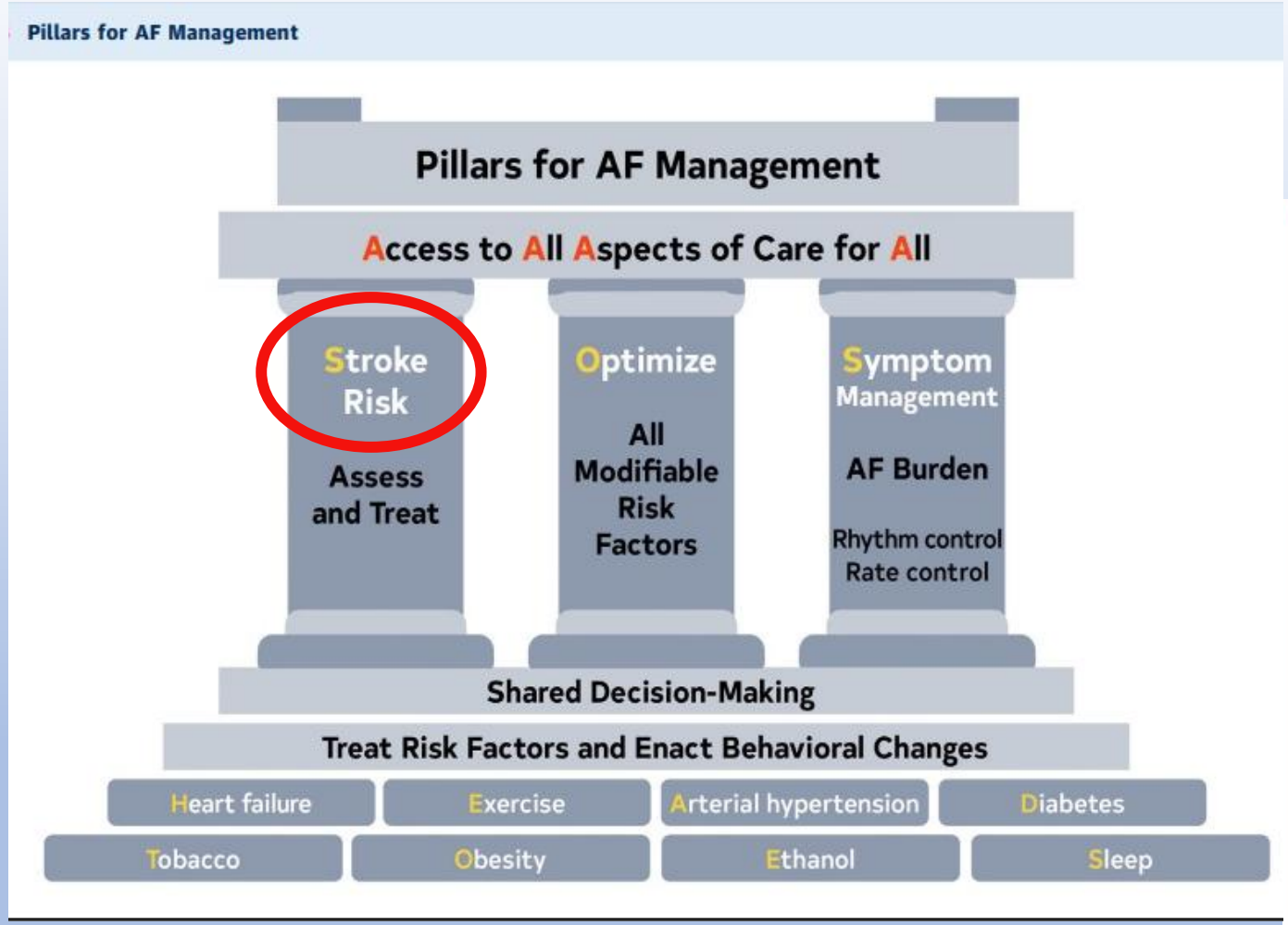
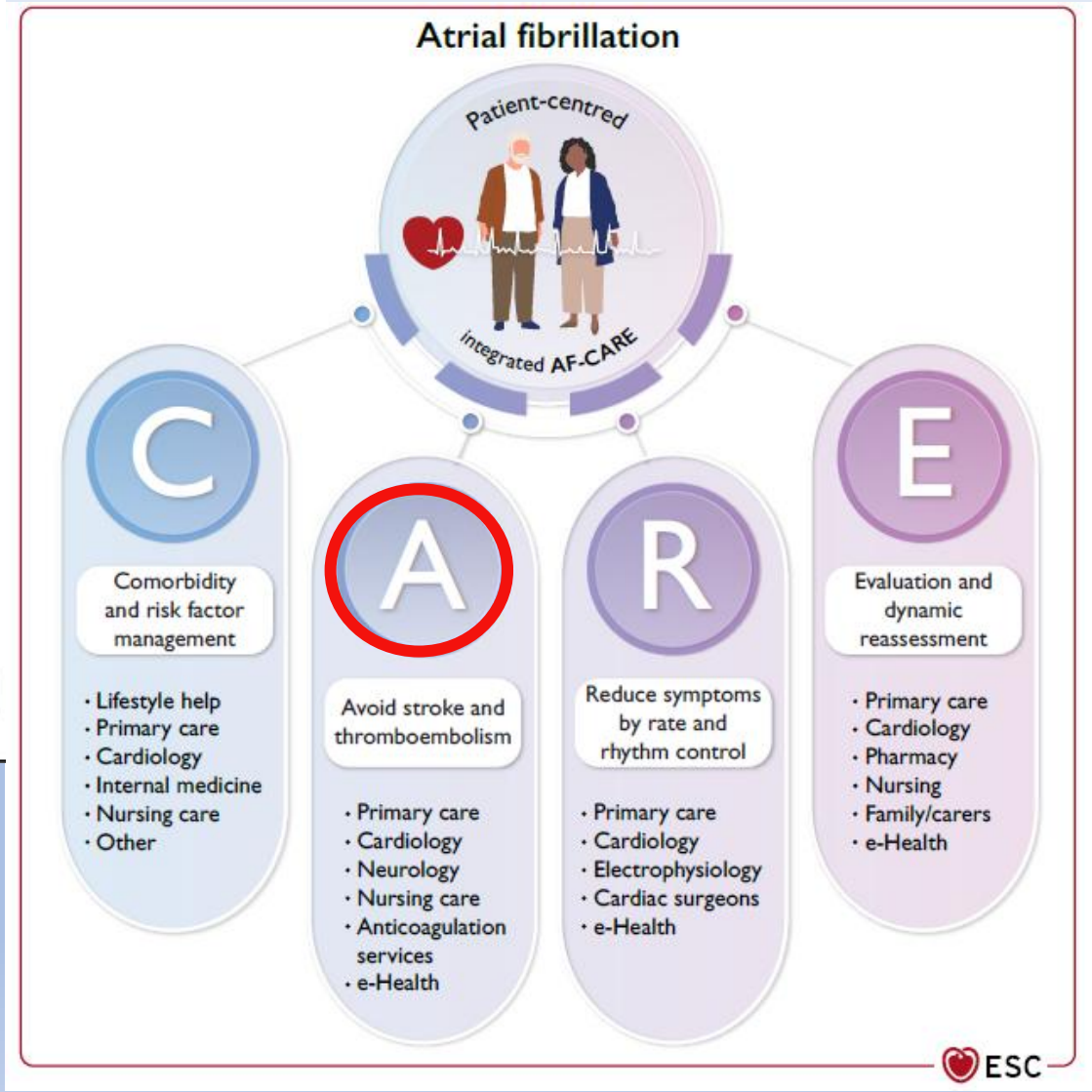


2023 ACC/AHA/ACCP/HRS AF guide, Circulation 1.2024



2024 ESC AF guide, EHJ 9.2024

TABLE 10 Risk Factor Definitions for CHA_2DS_2-VASc Score as in the Original Article[2]

C	Heart Failure	The presence of signs and symptoms of either right (elevated central venous pressure, hepatomegaly, dependent edema) or left ventricular failure (exertional dyspnea, cough, fatigue, orthopnea, paroxysmal nocturnal dyspnea, cardiac enlargement, rales, gallop rhythm, pulmonary venous congestion) or both, confirmed by noninvasive or invasive measurements demonstrating objective evidence of cardiac dysfunction
H	Hypertension	A resting blood pressure >140 mm Hg systolic and/or >90 mm Hg diastolic on at least 2 occasions or current antihypertensive pharmacological treatment
A_2	Age, additional risk/point	Age ≥75 y
D	Diabetes	Fasting plasma glucose level ≥7.0 mmol/L (126 mg/dL) or treatment with hypoglycemic agent and/or insulin
S_2	Thromboembolism	Either an ischemic stroke, transient ischemic attack, peripheral embolism, or pulmonary embolism
V	Vascular Disease	Coronary artery disease (prior myocardial infarction, angina pectoris, percutaneous coronary intervention, or coronary artery bypass surgery) or peripheral vascular disease (the presence of any of the following: intermittent claudication, previous surgery or percutaneous intervention on the abdominal aorta or the lower extremity vessels, abdominal or thoracic vascular surgery, arterial and venous thrombosis)
A	Age standard risk/ weight	Age 65–74 y
Sc	Sex Category	Female sex

TABLE 8 Three Validated Risk Models for Stroke

Risk Factor	CHA_2DS_2-VASc[2]	ATRIA[1]	GARFIELD[3]
Age ≥85 y		6	0.98
Age ≥75 y	2	5	0.59
Age 65-74 y	1	3	0.20
Female sex	1	1	
Hypertension	1		0.16
Renal disease		1	0.35
Diabetes	1	1	0.21
Current smoking			0.48
Congestive heart failure	1	1	0.23
Previous stroke or TIA	2	2-8*	0.80
Vascular disease	1		0.20
Dementia			0.51
Previous bleeding			0.30
Proteinuria		1	
Low risk score	0	0-5	0-0.89
Intermediate risk score	1	6	0.90-1.59
High risk score	≥2	7-15	≥1.60
C-index (11)	0.63	0.66	-
C-index (13)	0.67	-	0.71

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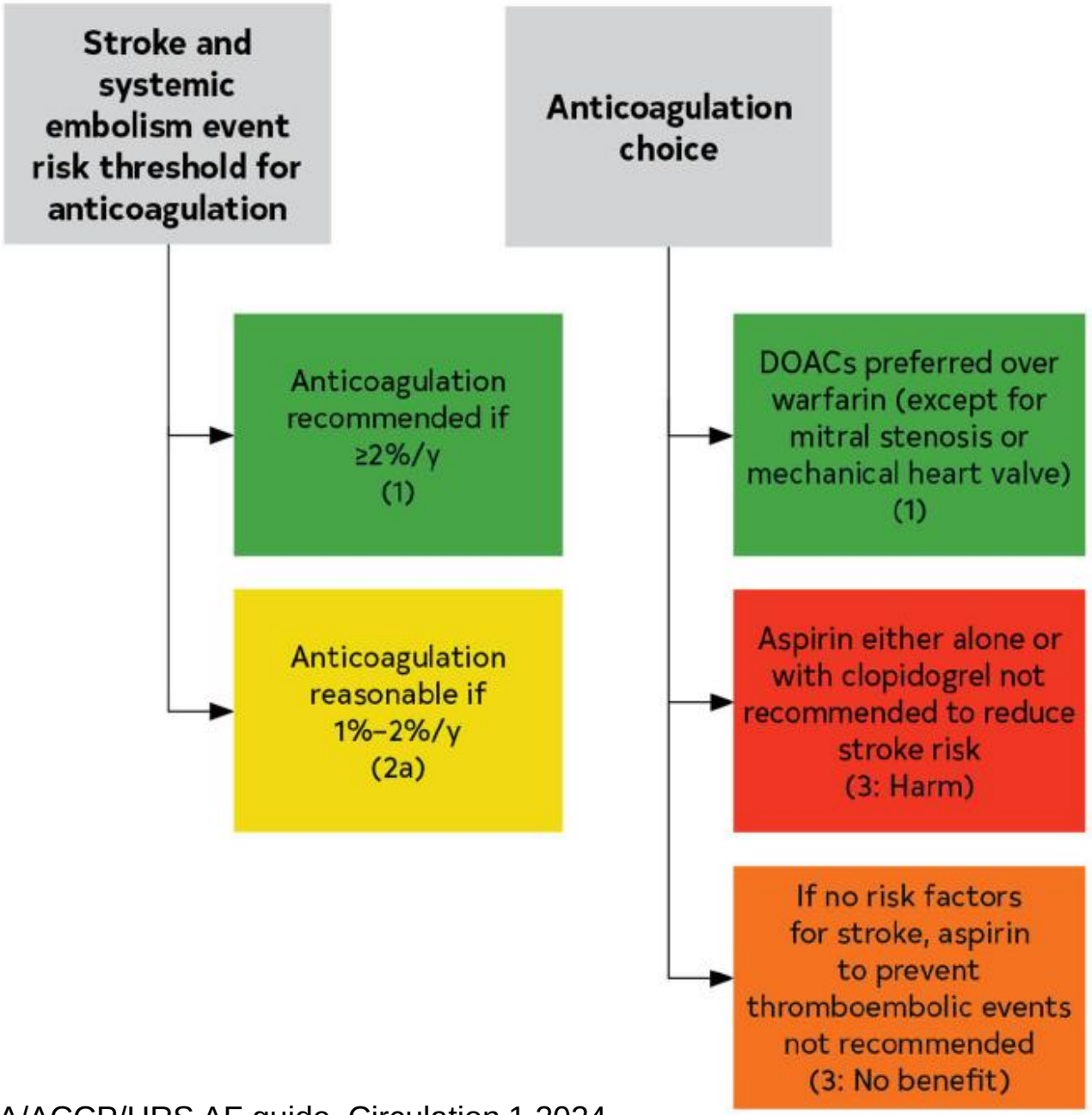
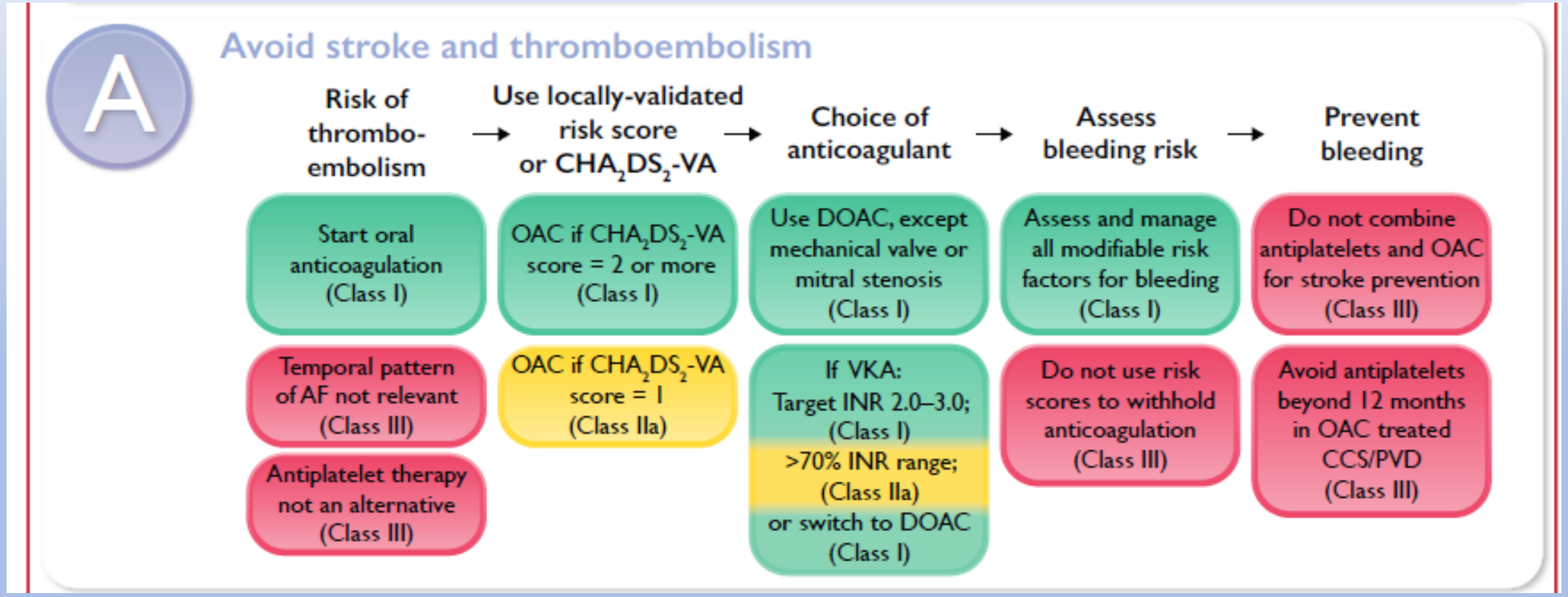
FIGURE 10 Antithrombotic Options in Patients With AF



CHA_2DS_2-VASc score	Adjusted stroke rate (%/year)[b]
0	0.2%
1	1.3%
2	2.2%
3	3.2%
4	4.0%
5	6.7%
6	9.8%
7	9.6%
8	6.7%
9	15.2%

2023 ACC/AHA/ACCP/HRS AF guide, Circulation 1.2024



2024 ESC AF guide, EHJ 9.2024

Table 10 Updated definitions for the CHA_2DS_2-VA score

CHA_2DS_2-VA component		Definition and comments	Points awarded[a]
C	Chronic heart failure	Symptoms and signs of heart failure (irrespective of LVEF, thus including HFpEF, HFmrEF, and HFrEF), or the presence of asymptomatic LVEF ≤40%.[261–263]	1
H	Hypertension	Resting blood pressure >140/90 mmHg on at least two occasions, or current antihypertensive treatment. The optimal BP target associated with lowest risk of major cardiovascular events is 120–129/70–79 mmHg (or keep as low as reasonably achievable).[162,264]	1
A	Age 75 years or above	Age is an independent determinant of ischaemic stroke risk.[265] Age-related risk is a continuum, but for reasons of practicality, two points are given for age ≥75 years.	2
D	Diabetes mellitus	Diabetes mellitus (type 1 or type 2), as defined by currently accepted criteria,[266] or treatment with glucose lowering therapy.	1
S	Prior stroke, TIA, or arterial thromboembolism	Previous thromboembolism is associated with highly elevated risk of recurrence and therefore weighted 2 points.	2
V	Vascular disease	Coronary artery disease, including prior myocardial infarction, angina, history of coronary revascularization (surgical or percutaneous), and significant CAD on angiography or cardiac imaging.[267] OR Peripheral vascular disease, including: intermittent claudication, previous revascularization for PVD, percutaneous or surgical intervention on the abdominal aorta, and complex aortic plaque on imaging (defined as features of mobility, ulceration, pedunculation, or thickness ≥4 mm).[268,269]	1
A	Age 65–74 years	1 point is given for age between 65 and 74 years.	1

BP, blood pressure; CAD, coronary artery disease; CHA_2DS_2-VA, chronic heart failure, hypertension, age ≥75 years (2 points), diabetes mellitus, prior stroke/transient ischaemic attack/arterial thromboembolism (2 points), vascular disease, age 65–74 years; HFmrEF, heart failure with mildly reduced ejection fraction; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; LVEF, left ventricular ejection fraction; PVD, peripheral vascular disease.

[a]In addition to these factors, other markers that modify an individual's risk for stroke and thromboembolism should be considered, including cancer, chronic kidney disease, ethnicity (black, Hispanic, Asian), biomarkers (troponin and BNP), and in specific groups, atrial enlargement, hyperlipidaemia, smoking, and obesity.

However, implementation has varied in terms of gender. Female sex is an age-dependent stroke risk modifier rather than a risk factor per se.[112,256,257] The inclusion of gender complicates clinical practice both for healthcare professionals and patients.[258] It also omits individuals who identify as non-binary, transgender, or are undergoing sex hormone therapy. Previous guidelines from the ESC (and globally) have not actually used CHA_2DS_2-VASc; instead providing different score levels for women and men with AF to qualify for OAC. Hence, CHA_2DS_2-VA (excluding gender) has effectively been in place (*Table 10*).[78] This task force proposes, in the absence of other locally validated alternatives, that clinicians and patients should use the CHA_2DS_2-VA score to assist in decisions on OAC therapy (i.e. without a criterion for birth sex or gender). Pending further trials in lower risk

2024 ESC AF guide, EHJ 9.2024

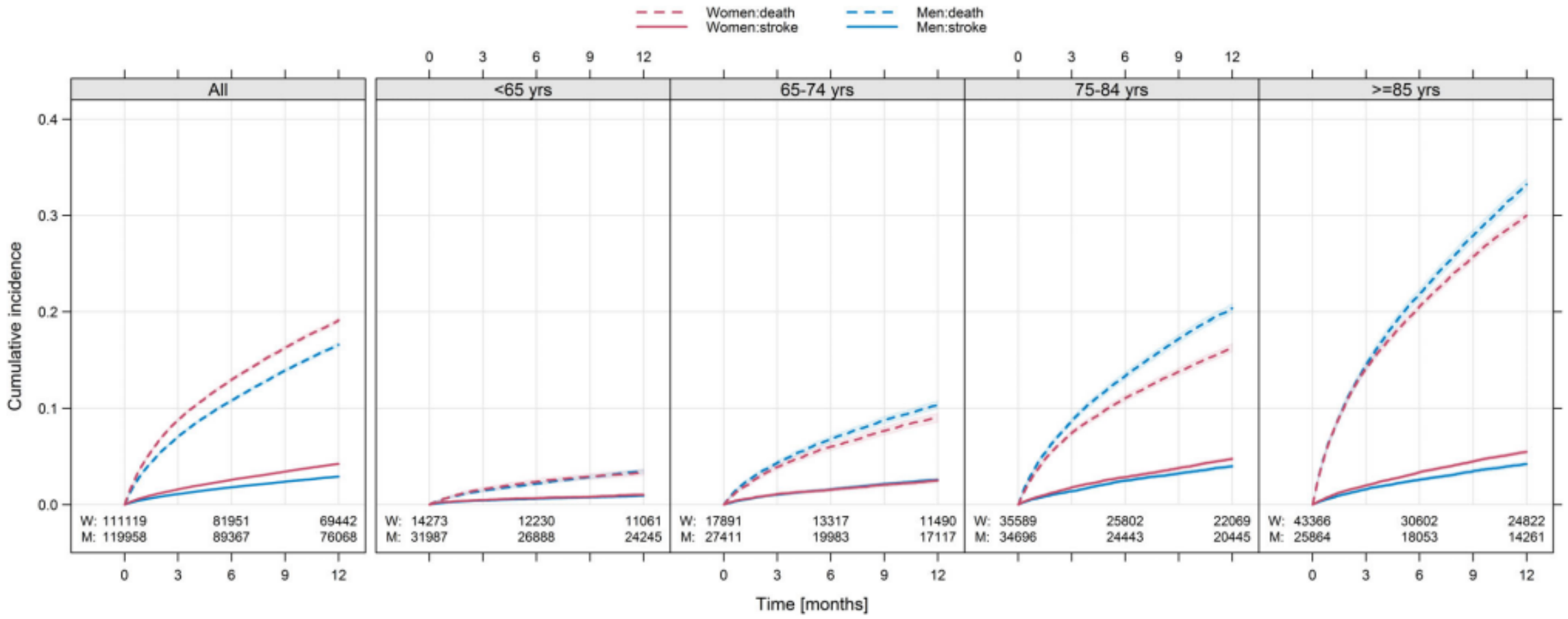


FIGURE 1 Cumulative incidence of ischemic stroke and death. Cumulative incidence of ischemic stroke (solid lines) and death (broken lines) in women (red lines) compared to men (blue lines). Shaded area represents 95% confidence intervals. The total group of the 231 077 included patients is shown to the far left and then divided into four different age groups to the right. Follow-up limited to 12 months. M, number of men; W, number of women

Tomasdottir M Risk of ischemic stroke and utility of CHADSVASc in women and men, Clin Cardiol 4.2019

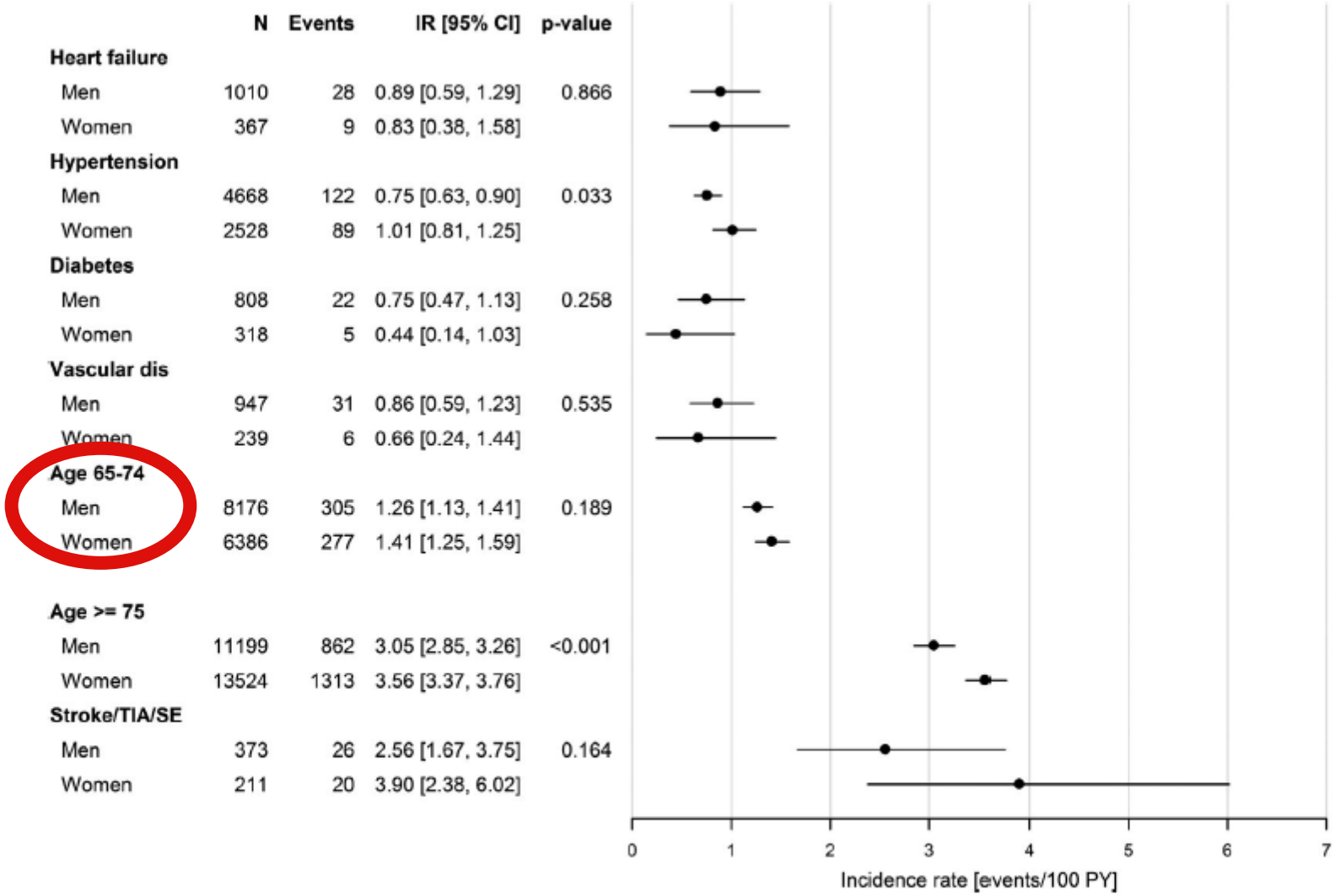


FIGURE 4 Incidence rates of ischemic stroke per 100 person-years with 95% confidence interval in men and women with one additional non-sex CHA_2DS_2-VASc risk factor. Incidence rates of ischemic stroke per 100 person-years of follow-up with 95% confidence intervals in patients with one additional non-sex CHA_2DS_2-VASc risk factor divided by gender and CHA_2DS_2-VASc risk factors. The *P*-value for a test of no gender difference within each CHA_2DS_2-VASc score category was calculated using a Cox regression model including gender as the only covariate. CI, confidence interval; dis, disease; IR, incidence rate; N, number of patients; PY, person-years; SE, systemic embolism

Tomasdottir M Risk of ischemic stroke and utility of CHADSVASc in women and men, Clin Cardiol 4.2019

Recommendation Table 6 — Recommendations to assess and manage thromboembolic risk in AF (see also Evidence Table 6)

Recommendations	Class[a]	Level[b]
Oral anticoagulation is recommended in patients with clinical AF at elevated thromboembolic risk to prevent ischaemic stroke and thromboembolism.[239,240]	I	A
A CHA_2DS_2-VA score of 2 or more is recommended as an indicator of elevated thromboembolic risk for decisions on initiating oral anticoagulation.	I	C
Oral anticoagulation is recommended in all patients with AF and hypertrophic cardiomyopathy or cardiac amyloidosis, regardless of CHA_2DS_2-VA score, to prevent ischaemic stroke and thromboembolism.[270–276]	I	B
Individualized reassessment of thromboembolic risk is recommended at periodic intervals in patients with AF to ensure anticoagulation is started in appropriate patients.[277–280]	I	B
A CHA_2DS_2-VA score of 1 should be considered an indicator of elevated thromboembolic risk for decisions on initiating oral anticoagulation.	IIa	C
Direct oral anticoagulant therapy may be considered in patients with asymptomatic device-detected subclinical AF and elevated thromboembolic risk to prevent ischaemic stroke and thromboembolism, excluding patients at high risk of bleeding.[281,282]	IIb	B
Antiplatelet therapy is not recommended as an alternative to anticoagulation in patients with AF to prevent ischaemic stroke and thromboembolism.[242,283]	III	A
Using the temporal pattern of clinical AF (paroxysmal, persistent, or permanent) is not recommended to determine the need for oral anticoagulation.[284,285]	III	B

Continued

AF, atrial fibrillation; CHA_2DS_2-VA, congestive heart failure, hypertension, age ≥75 years (2 points), diabetes mellitus, prior stroke/transient ischaemic attack/arterial thromboembolism (2 points), vascular disease, age 65–74 years; DOAC, direct oral anticoagulant.

[a]Class of recommendation.

[b]Level of evidence.

Anticoagulation reasonable if 1%–2%/y (2a)

A CHA_2DS_2-VA score of 1 should be considered an indicator of elevated thromboembolic risk for decisions on initiating oral anticoagulation.	IIa

TABLE 11 Additional Risk Factors That Increase Risk of Stroke Not Included in CHA_2DS_2-VASc

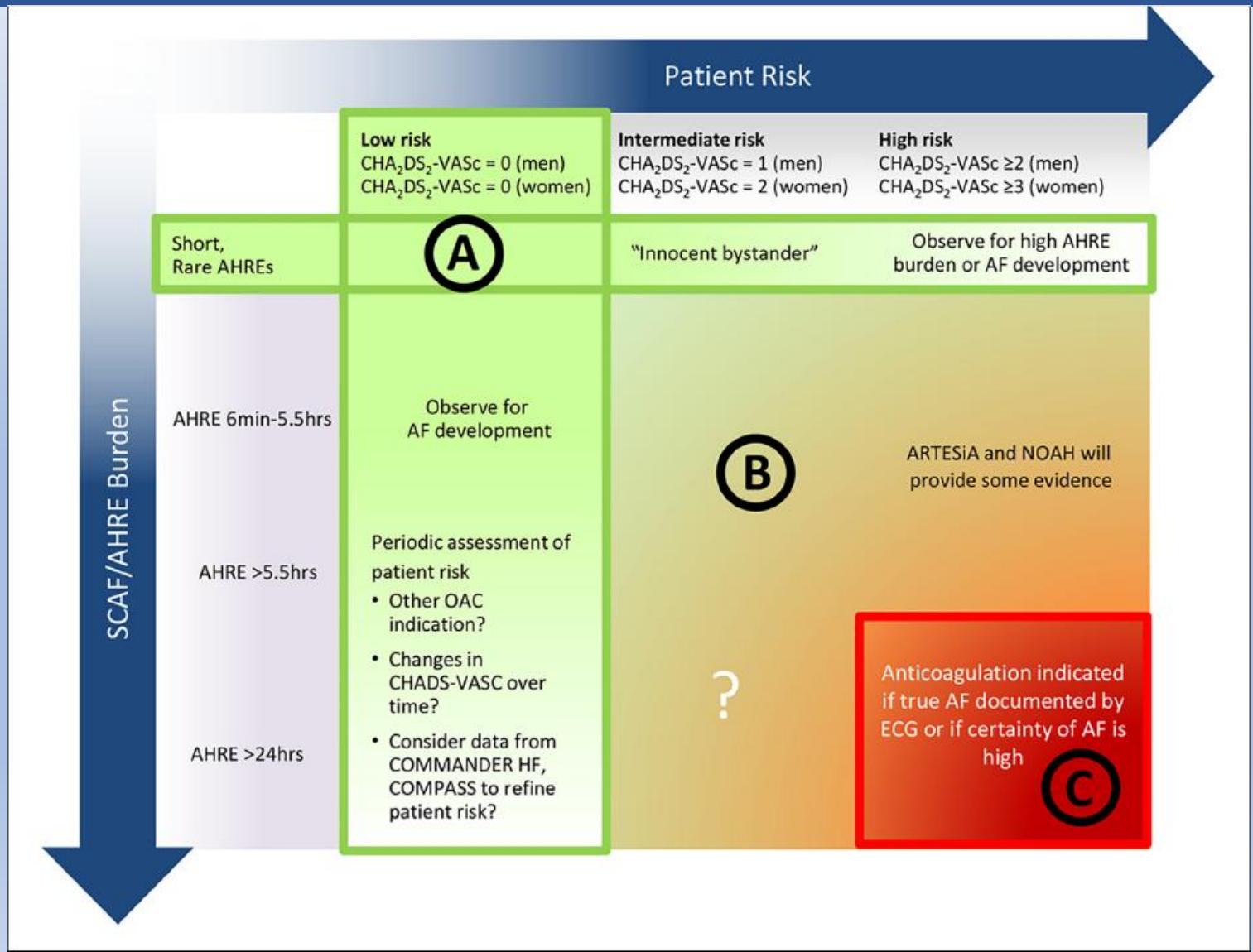
Higher AF burden/Long duration
Persistent/permanent AF versus paroxysmal
Obesity (BMI, ≥30 kg/m^2)
HCM
Poorly controlled hypertension
eGFR (<45 mL/h)
Proteinuria (>150 mg/24 h or equivalent)
Enlarged LA volume (≥73 mL) or diameter (≥4.7 cm)

AF indicates atrial fibrillation; BMI, body mass index; eGFR, estimated glomerular filtration rate; HCM, hypertrophic cardiomyopathy; and LA, left atrium.

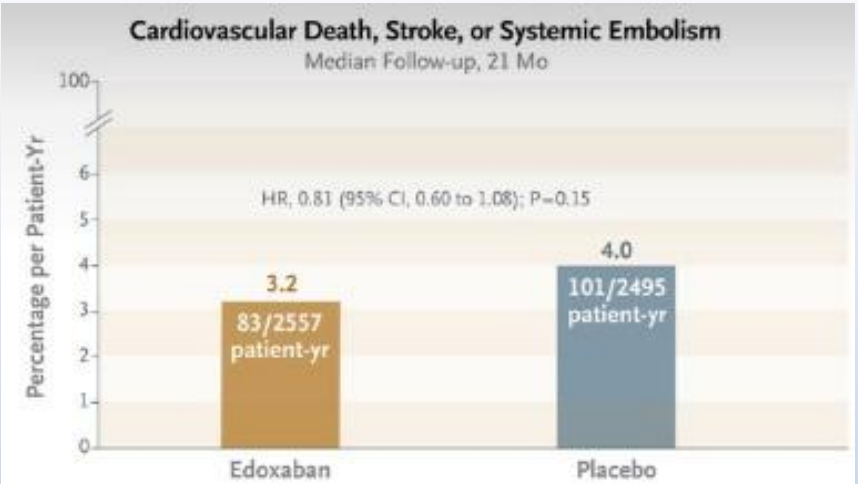
Věk 65-74 ?

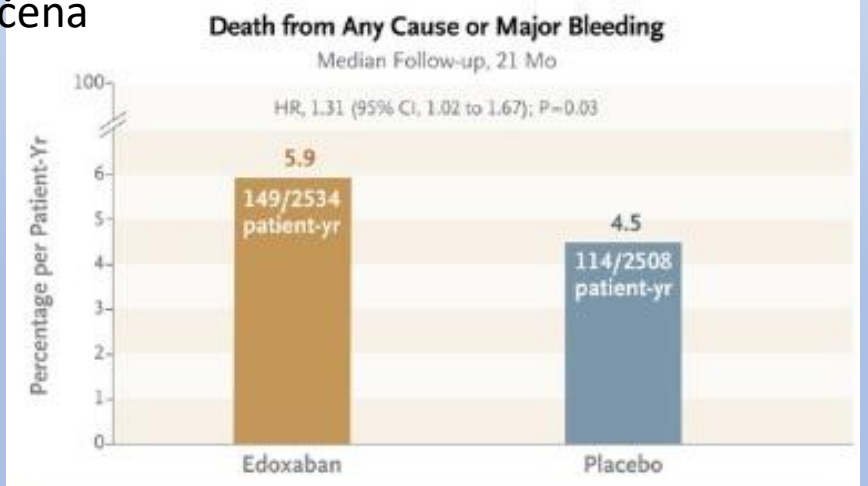
2023 ACC/AHA/ACCP/HRS AF guide, Circulation 1.2024

Subklinická – „device detected“ FS



AHRE nad 6min
CHA_2DS_2VASc 4
Předčasně ukončena
Stroke 1%

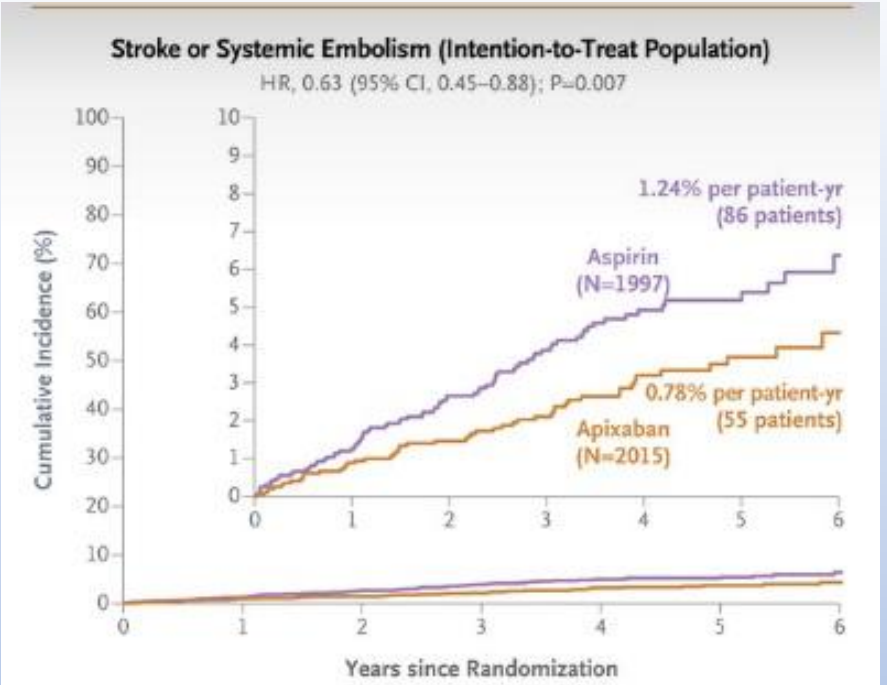


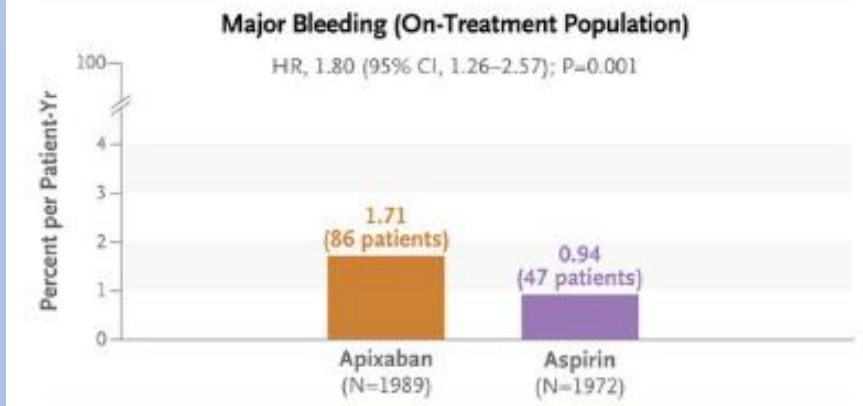


CONCLUSIONS

Among patients with AHREs but without atrial fibrillation, the incidence of a composite of cardiovascular death, stroke, or systemic embolism with edoxaban was not significantly different from that with placebo, but treatment with edoxaban led to a higher incidence of a composite of death or major bleeding.

NOAH, NEJM 8.2023





CONCLUSIONS

Among patients with subclinical atrial fibrillation, apixaban lowered the risk of stroke or systemic embolism but increased the risk of major bleeding.

ARTESIA, NEJM 11.2023

FS 6min-24H
CHA_2DS_2VASc 3,9
Stroke ±1%
Fatální krvácení
5x api, 8x asp

„Subklinická – device detected“ FS

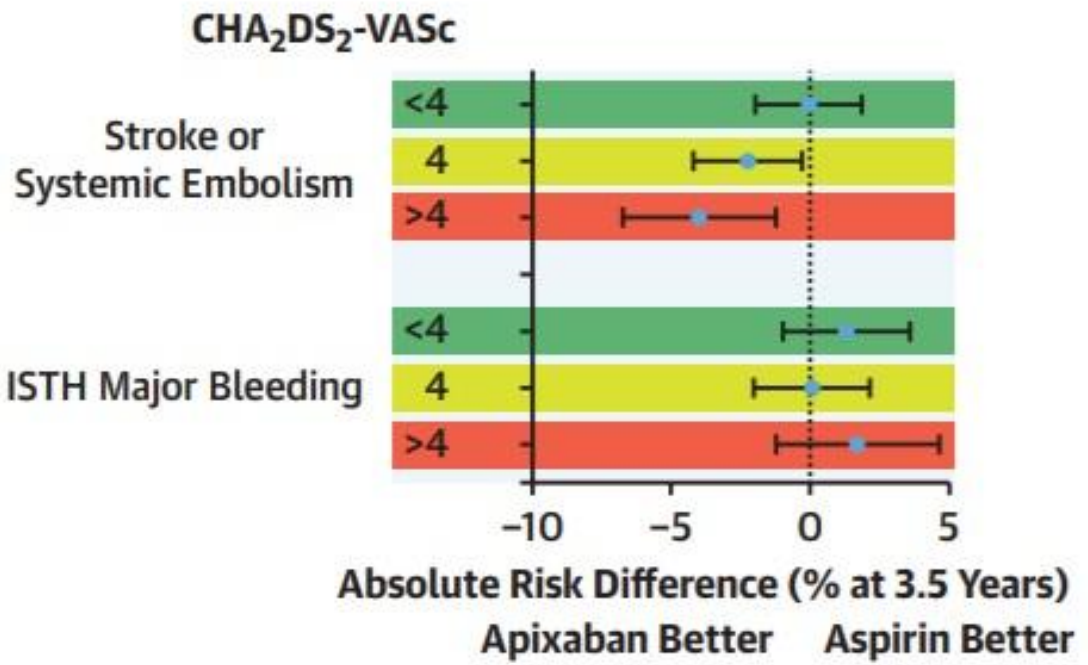
Recommendations for Oral Anticoagulation for Device-Detected Atrial High-Rate Episodes Among Patients Without a Previous Diagnosis of AF
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	RECOMMENDATIONS
2a	B-NR	1. For patients with a device-detected atrial high-rate episode (AHRE) lasting ≥24 hours[1] and with a CHA_2DS_2-VASc score ≥2 or equivalent stroke risk,[2] it is reasonable to initiate oral anticoagulation[3] within a SDM framework that considers episode duration and individual patient risk.
2b	B-NR	2. For patients with a device-detected AHRE lasting between 5 minutes and 24 hours and with a CHA_2DS_2-VASc score ≥3 or equivalent stroke risk,[2] it may be reasonable to initiate anticoagulation within a SDM framework that considers episode duration and individual patient risk.
3: No Benefit	B-NR	3. Patients with a device-detected AHRE lasting <5 minutes and without another indication for oral anticoagulation should not receive oral anticoagulation.[4,5]

Direct oral anticoagulant therapy may be considered in patients with asymptomatic device-detected subclinical AF and elevated thromboembolic risk to prevent ischaemic stroke and thromboembolism, excluding patients at high risk of bleeding.[281,282]	IIb	B

CENTRAL ILLUSTRATION **Apixaban for the Reduction of Thrombo-Embolism in Patients With Device-Detected Subclinical Atrial Fibrillation: Apixaban vs Aspirin in Patients With Subclinical Atrial Fibrillation**

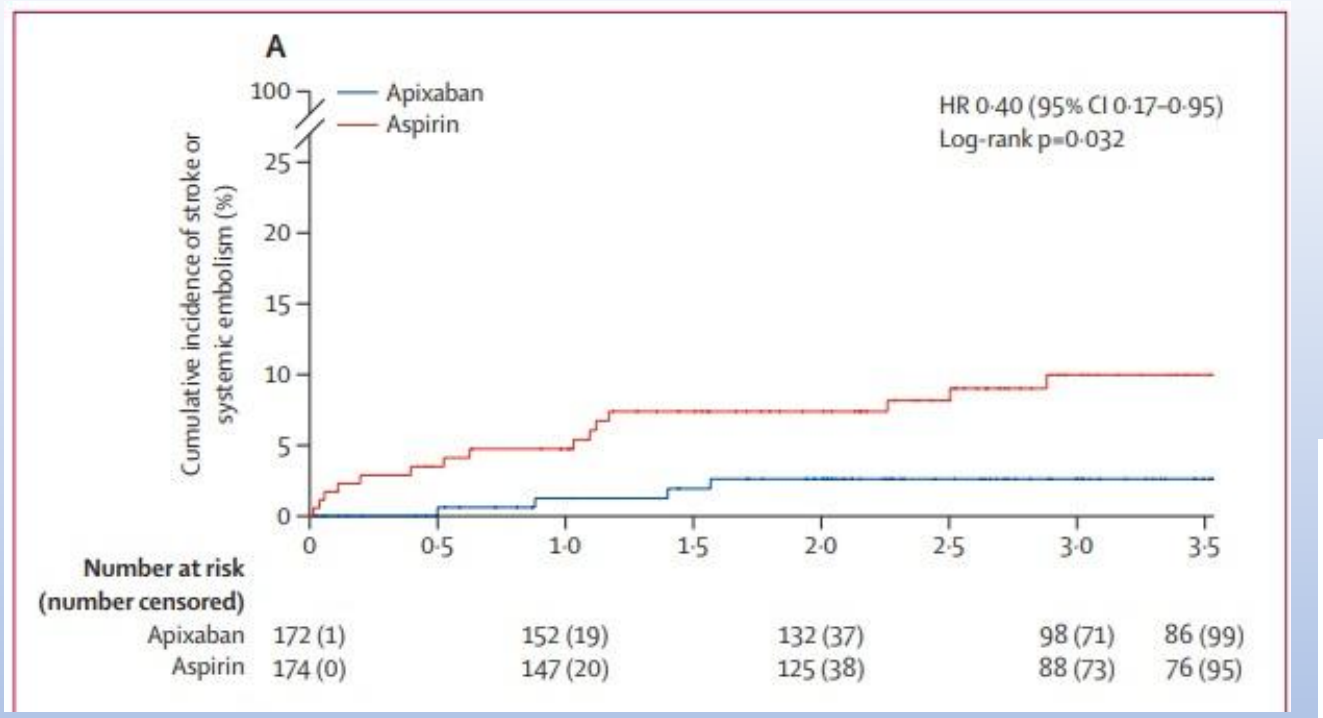
Patients With Device-Detected Subclinical Atrial Fibrillation in the ARTESiA Trial



CHA_2DS_2-VASc <4	CHA_2DS_2-VASc =4	CHA_2DS_2-VASc >4
Low risk of stroke	Intermediate risk of stroke	High risk of stroke
Bleeding risk outweighs benefit	Similar risk and benefit	Stroke benefit outweighs risk

Lopes RD, et al. J Am Coll Cardiol. 2024;84(4):354-364.

Treatment benefit according to CHA_2DS_2-VASc score. ARTESiA = Apixaban for the Reduction of Thrombo-Embolism in Patients With Device-Detected Sub-Clinical Atrial Fibrillation; ISTH = International Society on Thrombosis and Haemostasis.



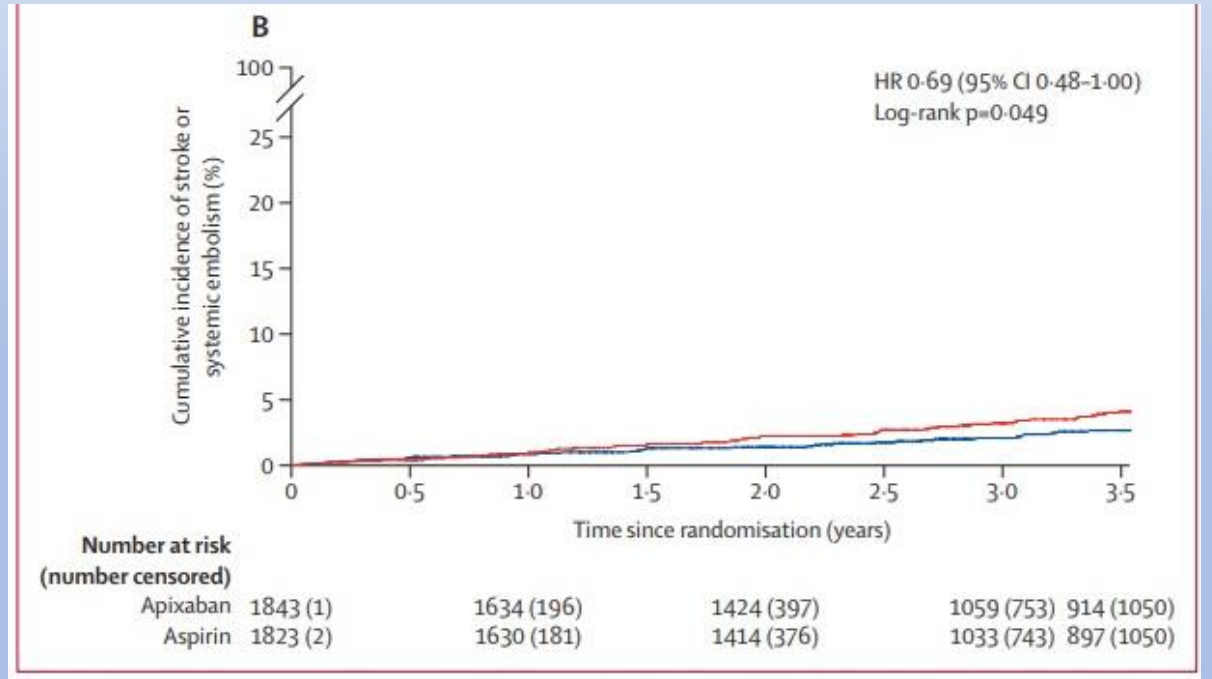


Figure 2: Time to stroke or systemic embolism during 3·5 years of follow-up in participants with a history of stroke or transient ischaemic attack (A) and those without (B) according to treatment assignment (apixaban *vs* aspirin)

Apixaban versus aspirin for stroke prevention in people with subclinical atrial fibrillation and a history of stroke or transient ischaemic attack: subgroup analysis of the ARTESiA randomised controlled trial

*Ashkan Shoamanesh, Thalia S Field, Shelagh B Coutts, Mukul Sharma, David Gladstone, Robert G Hart, Giuseppe Boriani, David J Wright, Christian Sticherling, David H Birnie, Michael R Gold, Julia W Erath, Valentina Kutyifa, Rajibul Mian, Alexander P Benz, Christopher B Granger, William F McIntyre, Stuart J Connolly, Jens Cosedis Nielsen, Marco Alings, Lena Rivard, Renato D Lopes, Jeff S Healey, on behalf of the ARTESiA study investigators**

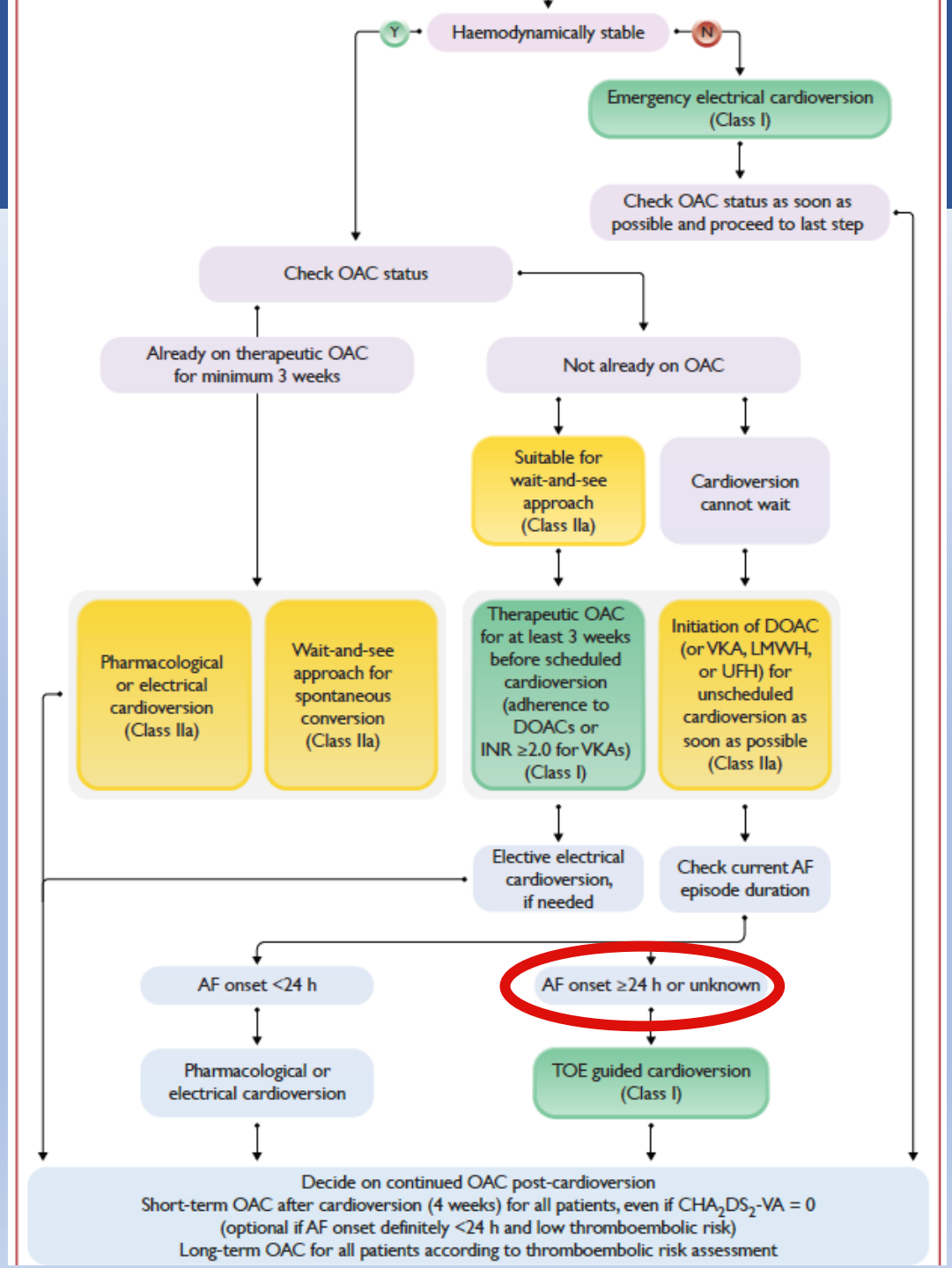
Lancet Neurol 2025; 24: 140–51

Summary

Background People with subclinical atrial fibrillation are at increased risk of stroke, albeit to a lesser extent than those

LancetNeurol 2025

EKV



SAFETY FIRST

Cardioversion: AF duration threshold 48h → 24h

Cardioversion is not recommended if **AF duration is longer than 24 hours,** unless the patient has already received at least 3 weeks of therapeutic anticoagulation or a TOE is performed to exclude intracardiac thrombus.

…task force reached consensus…

2024 ESC AF guide, EHJ 9.2024

Comprehensive medical history to determine all bleeding risk factors at OAC initiation/follow-up (Class I)

Do not use bleeding risk scores to decide starting or withdrawing OAC (Class III)

Manage all **modifiable bleeding risk factors** with shared decision-making (Class I)

Hypertension

Optimize blood pressure lowering treatment (Class I)

NSAIDs

Offer alternative analgesia or disease-modifying therapy

Antiplatelet drugs

Do not use antiplatelet therapy beyond 12 months in stable OAC-treated patients with chronic coronary/vascular disease (Class III)

Do not add antiplatelet therapy to OAC to prevent thromboembolic events (Class III) or recurrent stroke (Class III)

DOAC instead of VKA when antiplatelet treatment is needed (Class I)

Alcohol intake

Reduce alcohol to <3 standard drinks per week (Class I)

Other factors

- Consider drug interactions
- Reduce corticosteroid use if possible
- Offer proton pump inhibitors if high GI bleeding risk
- Advise restricting hazardous hobbies/occupations

Unstable/variable INR

Keep INR 2.0–3.0 (Class I) and TTR >70% (Class IIa)

Switch to DOAC if eligible and failed to maintain TTR on VKA (Class I)

Minimize duration of heparin-bridging therapy

Address all **potentially modifiable bleeding risk factors** with shared decision-making

- Anaemia
- Reduced platelet count or function
- Renal impairment
- Risk of falls
- Diabetes mellitus
- Congestive heart failure

Work with multidisciplinary team on each element
Ensure correct OAC dose and monitoring

Manage heart failure and achieve euvolaemia (Class I)

Effective glycaemic control for patients with diabetes (Class I)

Consider the impact of **non-modifiable bleeding risk factors** with shared decision-making

- Age
- Previous major bleeding
- Severe renal impairment, dialysis or renal transplant
- Severe hepatic dysfunction or cirrhosis
- Malignancy
- Genetic factors (e.g. *CYP2C9* polymorphisms)
- Previous stroke
- Cognitive impairment or dementia
- Intracerebral pathology

Review patient more regularly
Work with multidisciplinary team to monitor risk factors

If clear contraindications for OAC[a], consider left atrial appendage occlusion (Class IIb)

Okluze ouška

Recommendations for Cardiac Surgery—LAA Exclusion/Excision
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
1	A	1. In patients with AF undergoing cardiac surgery with a CHA_2DS_2-VASc score ≥2 or equivalent stroke risk, surgical LAA exclusion, in addition to continued anticoagulation, is indicated to reduce the risk of stroke and systemic embolism.[1–3]
1	A	2. In patients with AF undergoing cardiac surgery and LAA exclusion, a surgical technique resulting in absence of flow across the suture line and a stump of <1 cm as determined by intraoperative transesophageal echocardiography should be used.[1,4,5]
2b	A	3. In patients with AF undergoing cardiac surgery with CHA_2DS_2-VASc score ≥2 or equivalent stroke risk, the benefit of surgical LAA exclusion in the absence of [illegible] the risk of st[illegible] uncertain.[1–3]

Recommendations for Percutaneous Approaches to Occlude the LAA
Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
2a	B-NR	1. In patients with AF, a moderate to high risk of stroke (CHA_2DS_2-VASc score ≥2), and a contraindication (Table 14) to long-term oral anticoagulation due to a nonreversible cause, percutaneous LAAO (pLAAO) is reasonable.[1–4]
2b	B-R	2. In patients with AF and a moderate to high risk of stroke and a high risk of major bleeding on oral anticoagulation, pLAAO may be a reasonable alternative to oral anticoagulation based on patient preference, with careful consideration of procedural risk and with the understanding that the evidence for oral anticoagulation is more extensive.[1–3,5,6]

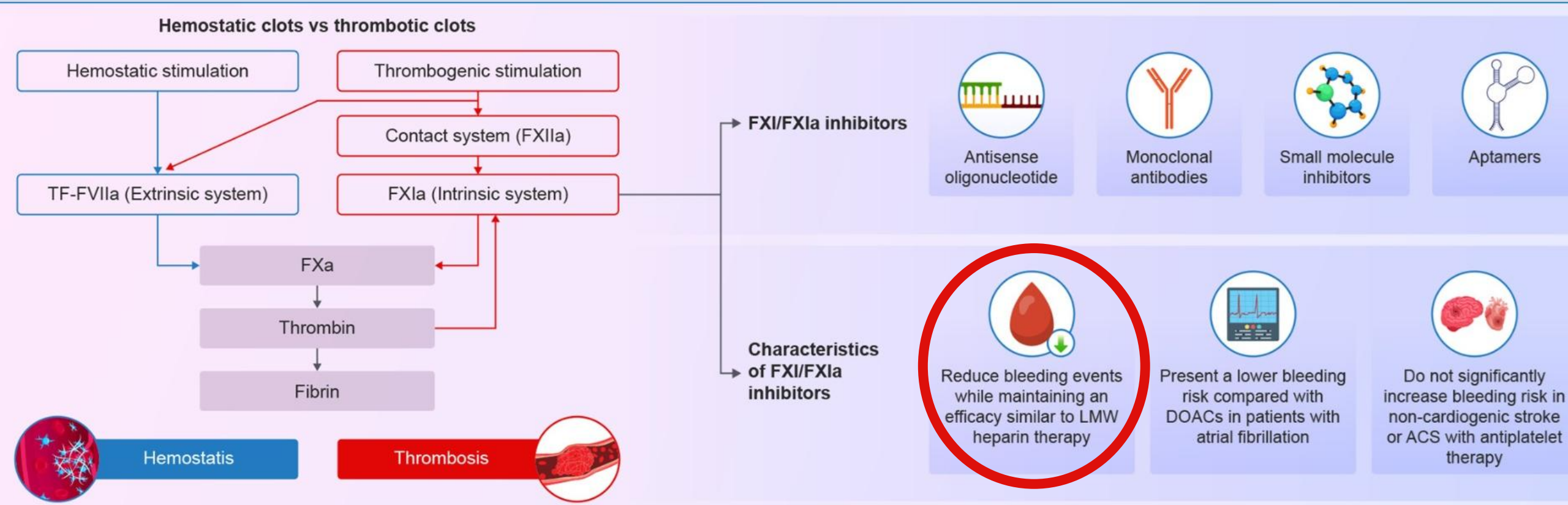
Recommendation Table 11 — Recommendations for surgical left atrial appendage occlusion (see also Evidence Table 11)

Recommendations	Class[a]	Level[b]
Surgical closure of the left atrial appendage is recommended as an adjunct to oral anticoagulation in patients with AF undergoing cardiac surgery to prevent ischaemic stroke and thromboembolism.[400,401,408–412]	I	B
Surgical closure of the left atrial appendage should be considered as an adjunct to oral anticoagulation in patients with AF undergoing endoscopic or hybrid AF ablation to prevent ischaemic stroke and thromboembolism.[402,403]	IIa	C
Stand-alone endoscopic surgical closure of the left atrial appendage may be considered in patients with AF and contraindications for long-term anticoagulant treatment to prevent ischaemic stroke and thromboembolism.[399,405,406,413]	IIb	C

Recommendation Table 10 — Recommendations for percutaneous left atrial appendage occlusion (see also Evidence Table 10)

Recommendation	Class[a]	Level[b]
Percutaneous LAA occlusion may be considered in patients with AF and contraindications for long-term anticoagulant treatment to prevent ischaemic stroke and thromboembolism.[372,376,386,387]	IIb	C

FXI/FXIa inhibitory



FXI: Inhibiting coagulation factor XI; FXIa: Activated factor XI; DOACs: Direct oral anticoagulants; LMW: Low molecular weight; ACS: Acute coronary syndrome; TF: Tissue factor

FXI/FXIa inhibitory

TABLE 2. Current FXI Inhibitors in Clinical Trials and Their Properties[28]

	Small molecules		Monoclonal antibodies			Antisense oligonucleotides
Drug	Asundexian	Milvexian	Abelacimab	Osocimab	Xisomab	Fesomersen
Phase of development	Phase 3	Phase 3	Phase 3	Phase 2	Phase 2	Phase 2
Mechanism of action	Reversibly binds FXIa and blocks activity		Binds to FXI or FXIa and blocks activity			Reduces the hepatic synthesis of FXI
Onset of action	Rapid		Rapid			Slow
Offset of action	Rapid		Slow			Slow
Administration route	IV or oral		IV or SC			SC
Frequency of administration	Daily		Monthly			Weekly to monthly

STOP

10/2026
LILAC TIMI 76

5/27
LIBREXIA-AF

Pharmacy TIMES March 2025

Pill in the Pocket

Study Overview

Brief Summary

REACT-AF is a multicenter prospective, randomized, open-label, blinded endpoint (PROBE design), controlled trial comparing the current Standard Of Care (SOC) of continuous Direct Oral Anticoagulation (DOAC) use versus time-delimited (1 month) DOAC guided by an AF-sensing Smart Watch (AFSW) in participants with a history of paroxysmal or persistent Atrial Fibrillation (AF) and low-to-moderate stroke risk.

Detailed Description

REACT-AF is a prospective, unblinded, randomized (1:1 allocation), multi-center, investigational clinical trial of men and women aged 22-85 with a documented history of symptomatic or asymptomatic paroxysmal or persistent (AF) and a moderate risk of stroke measured by CHA2DS2-VASc score 1-4 for men, 2-4 for women (which stands for Congestive heart failure, Hypertension, Age ≥75 (doubled), Diabetes, Stroke (doubled), Vascular disease, age 65 to 74 and sex category (female)). Participants randomized to the experimental arm (on demand DOAC) will take the participants DOAC for 30 consecutive days following a qualifying AF episode (i.e., greater than1 hour) detected by the AFSW. Participants randomized to the standard of care (control) arm will remain on previously prescribed continuous DOAC throughout the study.

A total of 5350 participants will be enrolled across up to 100 study sites targeting two-thirds academic and one-third private practices, with academic practices also enrolling from affiliated community sites. The investigators anticipate evaluating 7643 consented individuals with external monitoring to ensure that a low AF burden population will be randomized. Up to 200 participants may be enrolled at any one site, and participation will last up to 60 months.

Study Start (Ac
2023-07-13

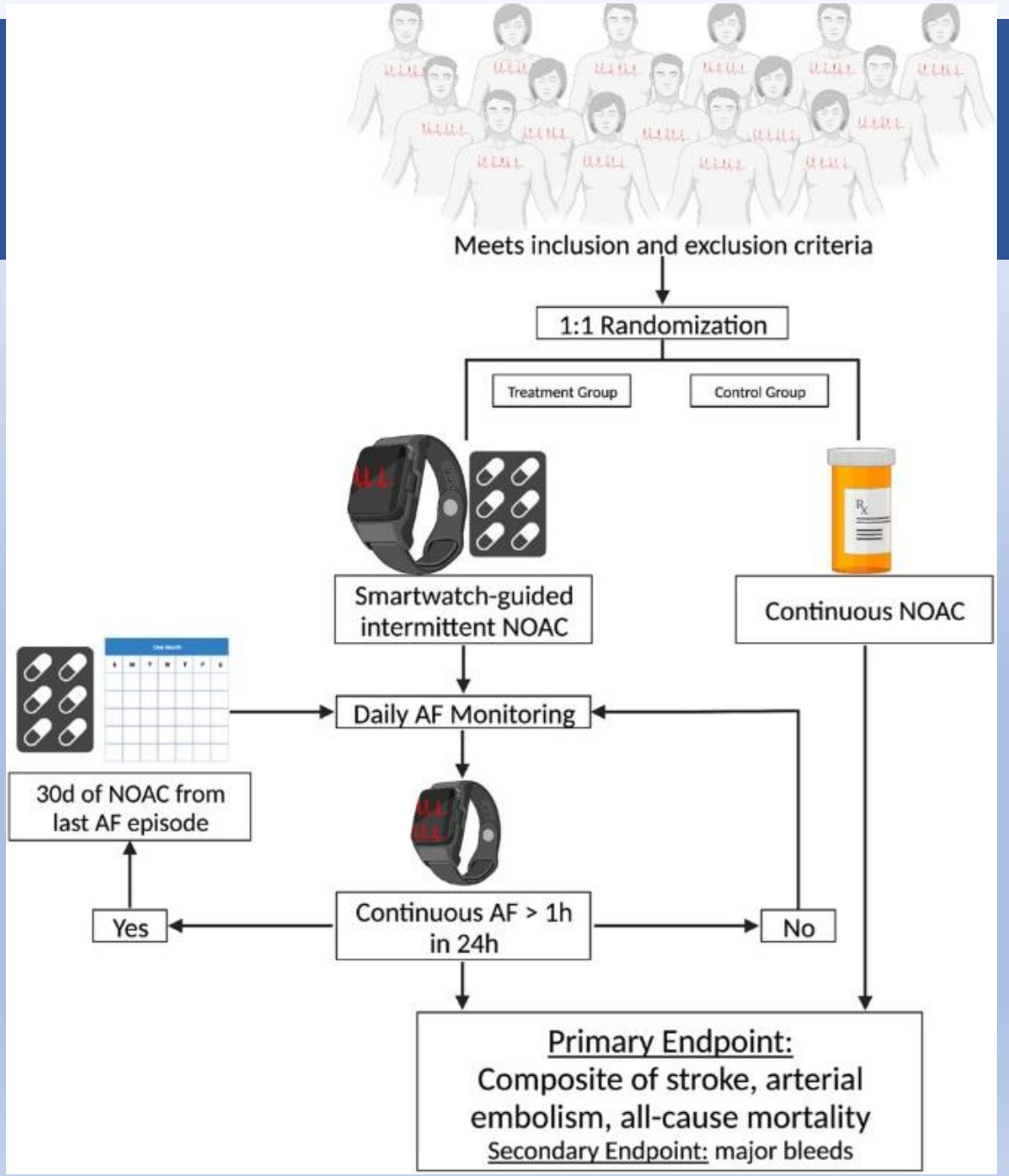
Primary Compl
2029-07-31

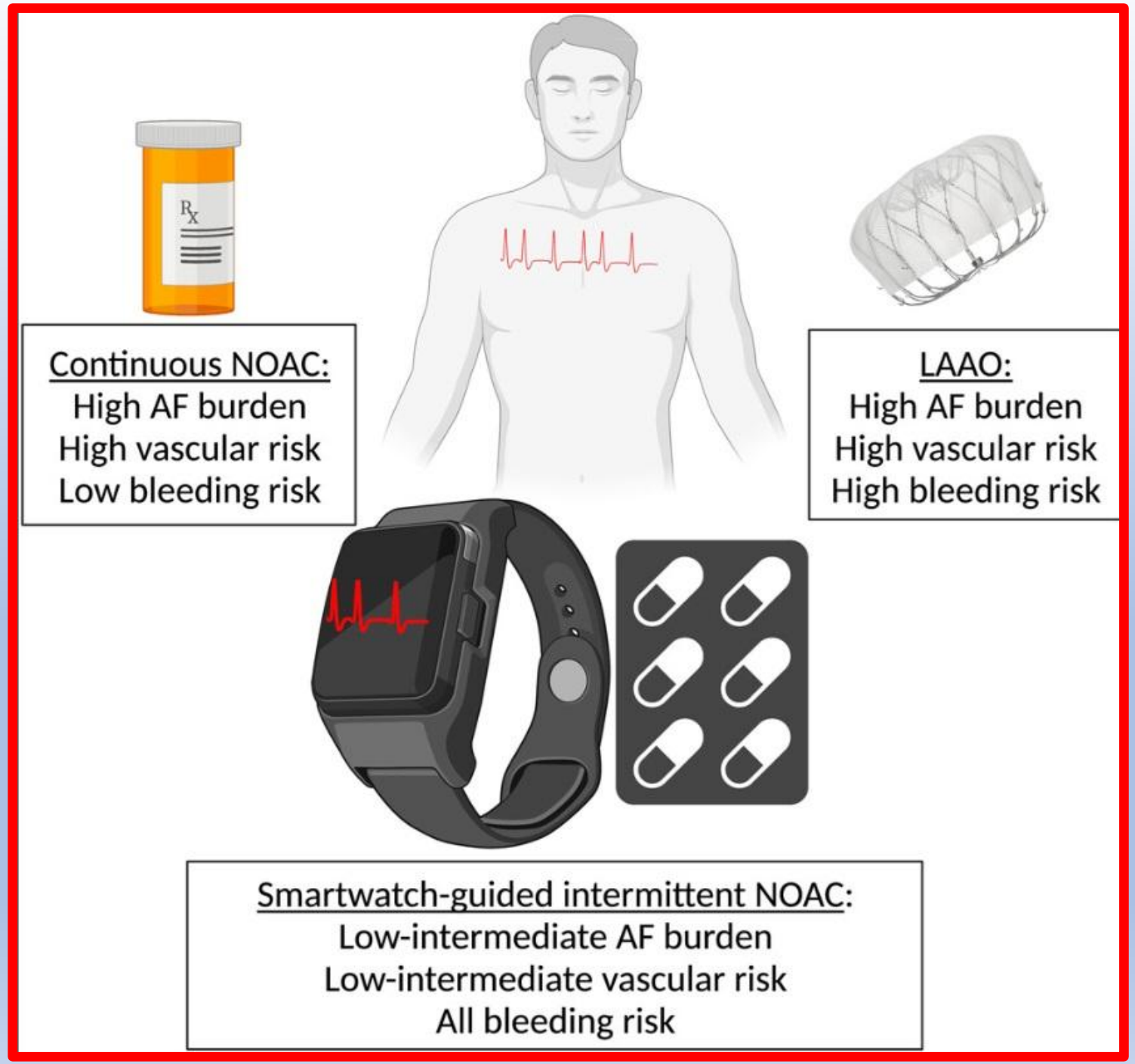
Study Complet
2029-07-31

Enrollment (Es
5350

Study Type
Interventiona

Phase
Phase 3





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Pill in Pocket anticoagulation for stroke prevention in AF
JCE 2023

Závěr

- **Základní principy prevence tromboembolismu u FS zůstávají stejné**
- CHADSVASc vs CHADSVA
- Antikoagulans 1. volby - DOAC
- *FS a střední riziko – dle ACC + věk 65-74?*
- *Antikoagulace u „device-detected“ FS - ? (>4, po CMP/TIA)*
- *Antikoagulace u ESRD - ? (LAAO)*
- Výběr DOAC individuální