ECAS-WSA Joint Session 2 In Memory of Professor Massimo Santini

Device-Detected AF: OAC, Nothing, or Call a Friend... More Information??

Carlos A Morillo, MD, FRCPC, FACC, FHRS, FESC
Professor Department of Cardiac Sciences, Libin Cardiovascular Institute
Division of Cardiology
Cumming School of Medicine, Calgary, Alberta
Senior Visiting Scientist, Molecular & Novel Arrhythmia Therapeutics
Centro Nacional de Investigaciones Cardiovasculares (CNIC) Carlos III
Madrid, Spain

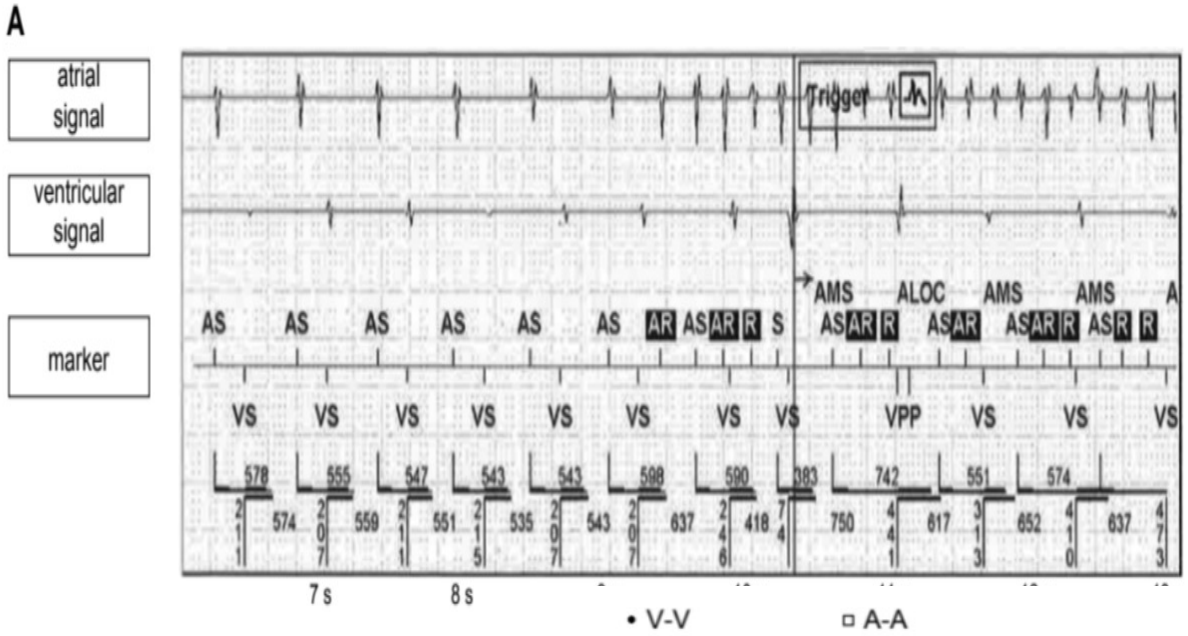
LIBIN CARDIOVASCULAR INSTITUTE

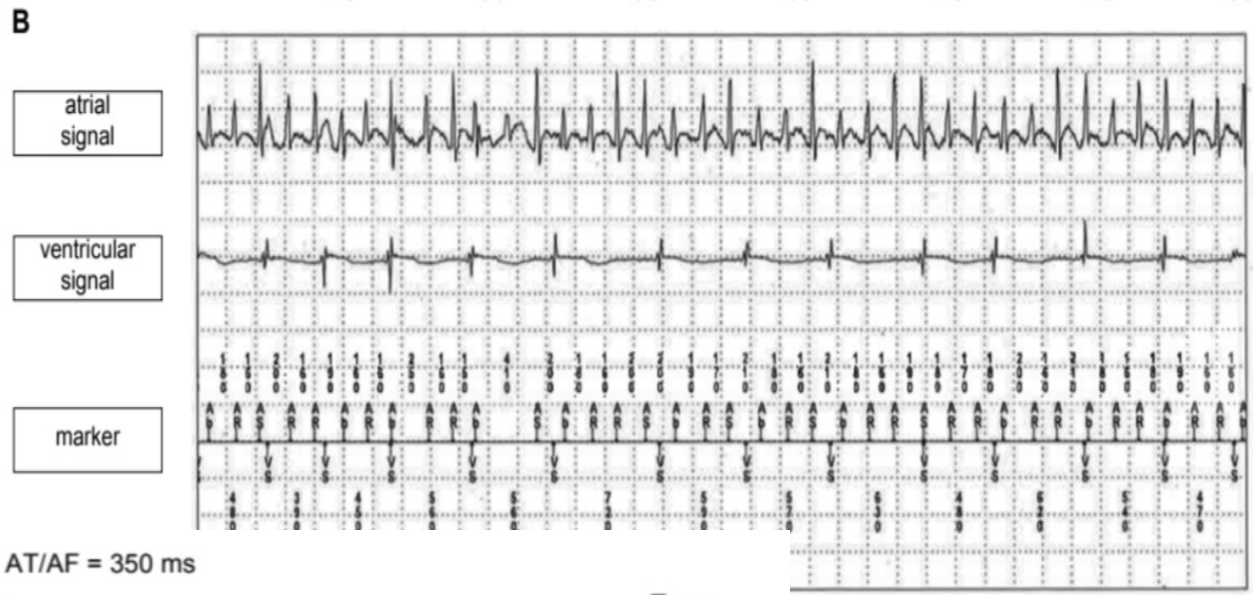
cnic Desde la investigación a la salud

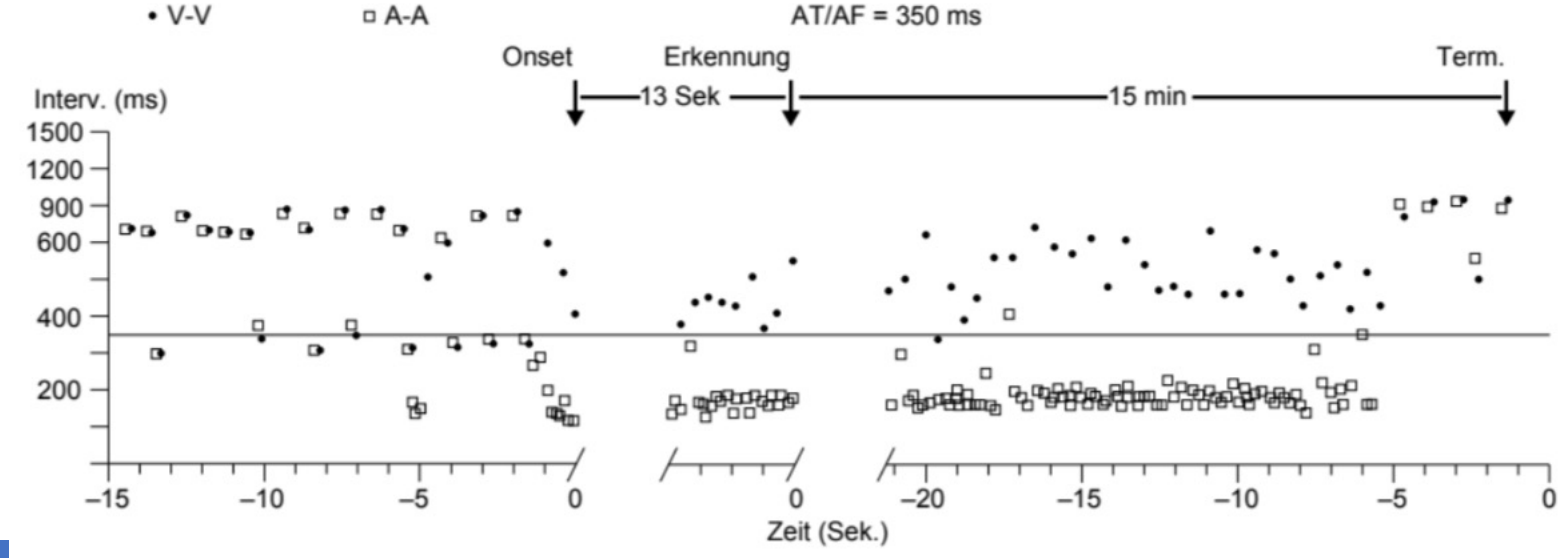
UNIVERSITY OF CALGARY

ECAS securing life's rhythm

DDAF

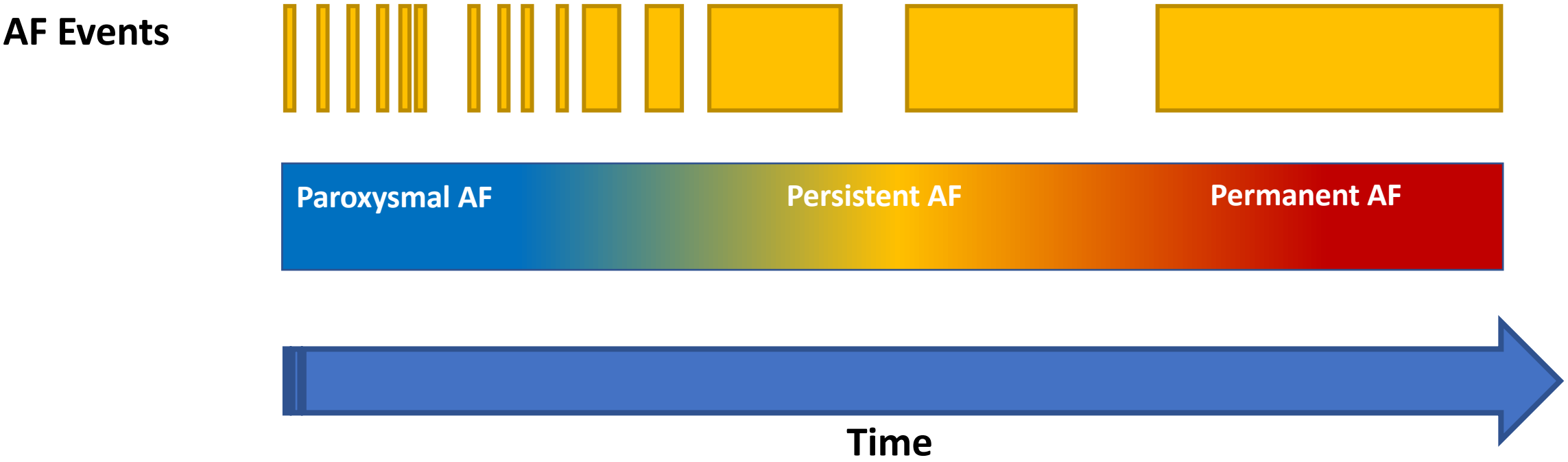

A
atrial signal
ventricular signal
marker
Trigger
AS AS AS AS AS AS AR AS AR R S
AMS ALOC AMS AMS
AS AR R AS AR AS AR R AS R R
VS VS VS VS VS VS VS VS VPP VS VS VS
578 555 547 543 543 598 590 383 742 551 574
574 559 551 535 543 637 418 750 617 652 637
7 s
8 s


B
atrial signal
ventricular signal
marker


• V-V
□ A-A
AT/AF = 350 ms
Onset
Erkennung
13 Sek
15 min
Term.
Interv. (ms)
1500
1200
900
600
400
200
−15
−10
−5
0
0
−20
−15
−10
−5
0
Zeit (Sek.)

BACKGROUND

- **Atrial Fibrillation is a CHRONIC and PROGRESSIVE disease**



AF is a Chronic Progressive Disease

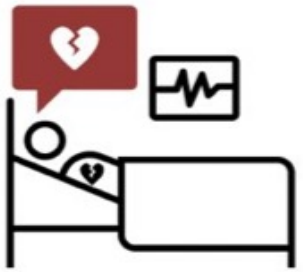
Subclinical → Paroxysmal AF → Persistent AF → Permanent AF

SCAF Progression
8.8%/year

Clinical AF Progression
~7%/year

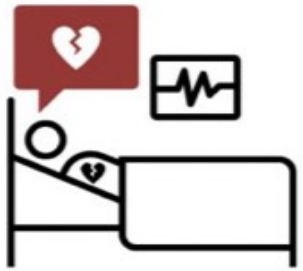
Death
HR 1.2-1.3

Stroke
HR 1.4-1.6

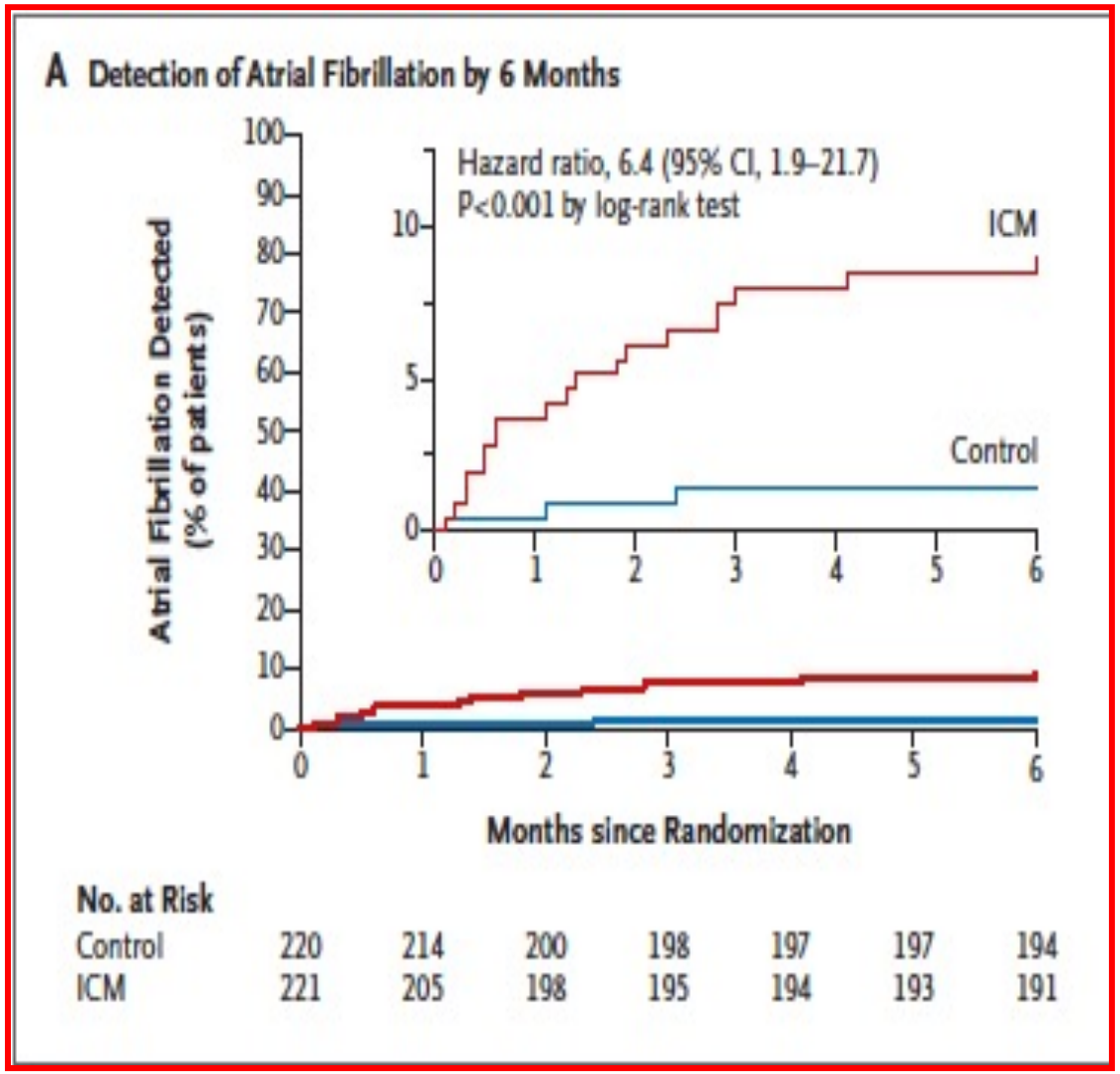


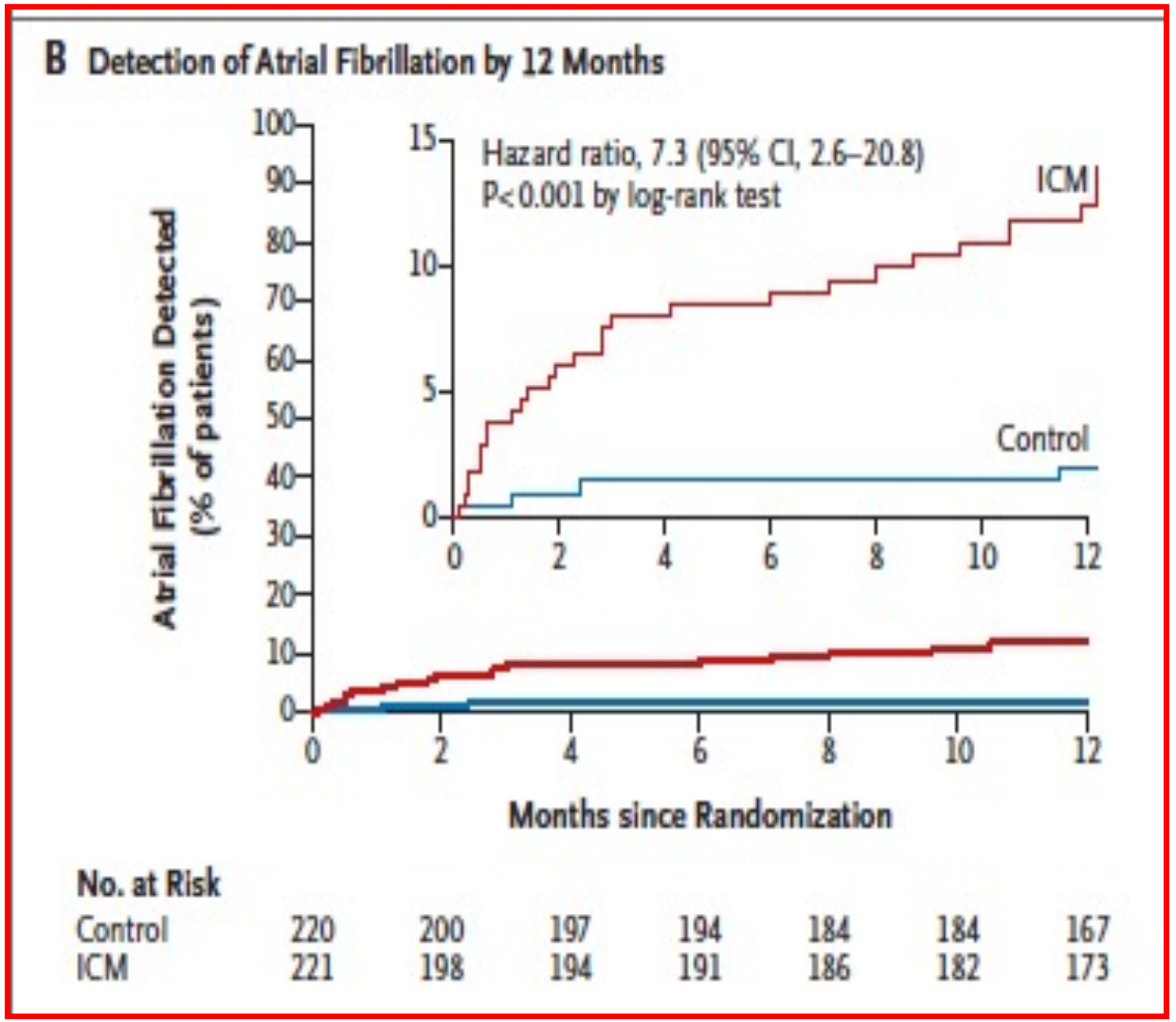
Heart Failure Hospitalisation
HR 4.6

Heart Failure Hospitalisation
HR >2



Detection Rates: Primary & Secondary Endpoints



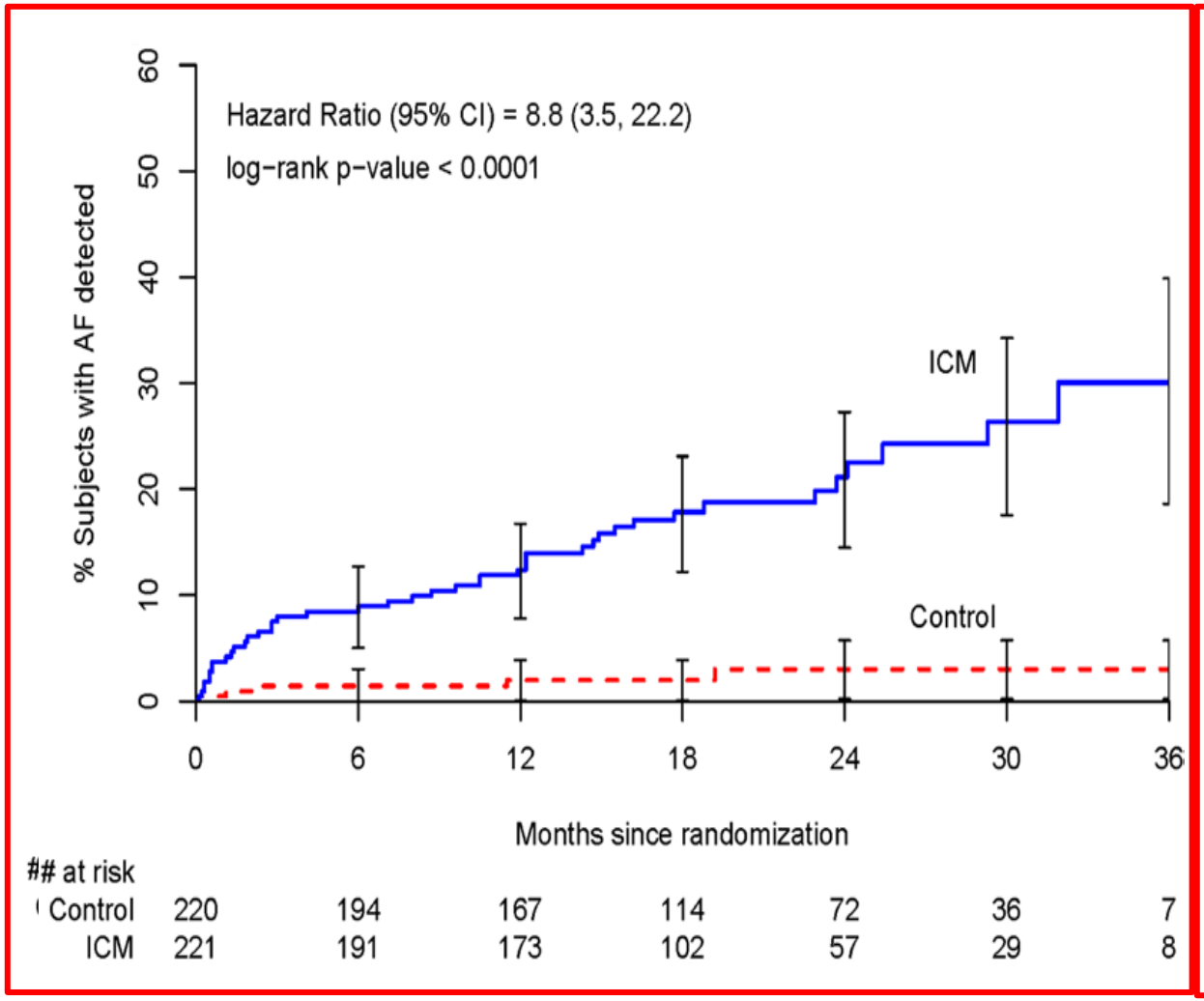


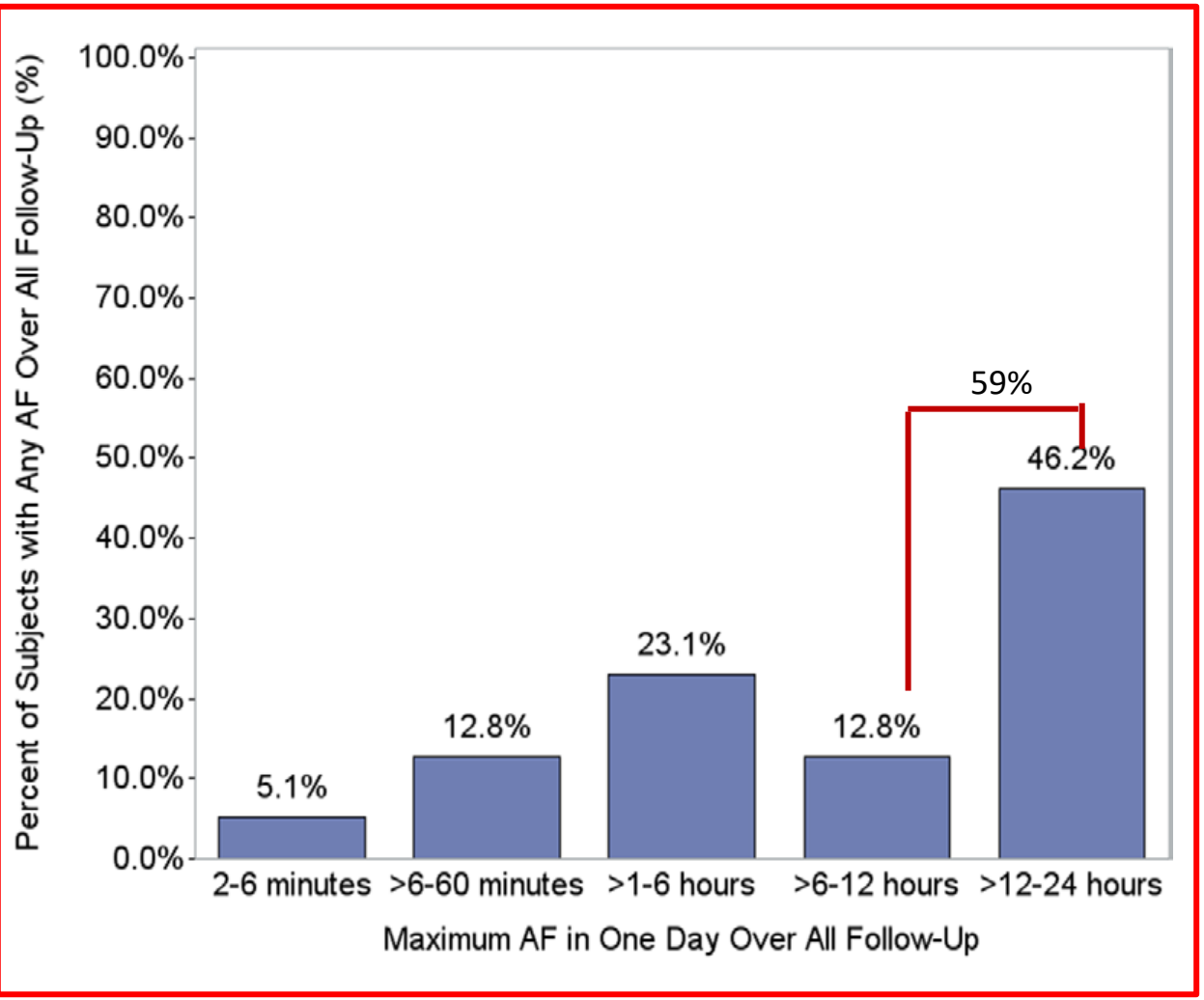
N Engl J Med 370;26 nejm.org june 26, 2014.

Uncovering Atrial Fibrillation Beyond Short-Term Monitoring in Cryptogenic Stroke Patients

Three-Year Results From the Cryptogenic Stroke and Underlying Atrial Fibrillation Trial

Johannes Brachmann, MD; Carlos A. Morillo, MD; Tommaso Sanna, MD; Vincenzo Di Lazzaro, MD; Hans-Christoph Diener, MD, PhD; Richard A. Bernstein, MD, PhD; Marylin Rymer, MD; Paul D. Ziegler, MS; Shufeng Liu, MS; Rod S. Passman, MD, MSCE





Circ Arrhythm Electrophysiol. 2016 Jan;9(1):e003333. doi: 10.1161/CIRCEP.115.003333.

Predictors for atrial fibrillation detection after cryptogenic stroke

Results from CRYSTAL AF

Thijs VN, Brachmann J. Morillo CA, et al.

Table 3 Multivariable Cox model results for atrial fibrillation detected by 12 or 36 months

	12 mo		36 mo	
Variable	HR (95% CI)	p Value	HR (95% CI)	p Value
PAC (max in 24 h) (n = 192)				
First quartile (0)	1.00 (reference)	0.0094	1.00 (reference)	0.0029
Second quartile (>0–15.5)	0.57 (0.10–3.09)		0.39 (0.08–1.95)	
Third quartile (>15.5–123.0)	1.61 (0.45–5.71)		1.76 (0.64–4.86)	
Fourth quartile (>123.0)	3.94 (1.30–11.97)		3.47 (1.38–8.70)	
Left atrial diameter (n = 115)				
First quartile (≤3.45 cm)	1.00 (reference)	0.75	1.00 (reference)	0.44
Second quartile (>3.45–3.90 cm)	0.94 (0.19–4.66)		2.10 (0.54–8.13)	
Third quartile (>3.90–4.40 cm)	1.65 (0.41–6.61)		2.89 (0.81–10.39)	
Fourth quartile (>4.40 cm)	1.79 (0.40–7.99)		2.41 (0.58–10.10)	

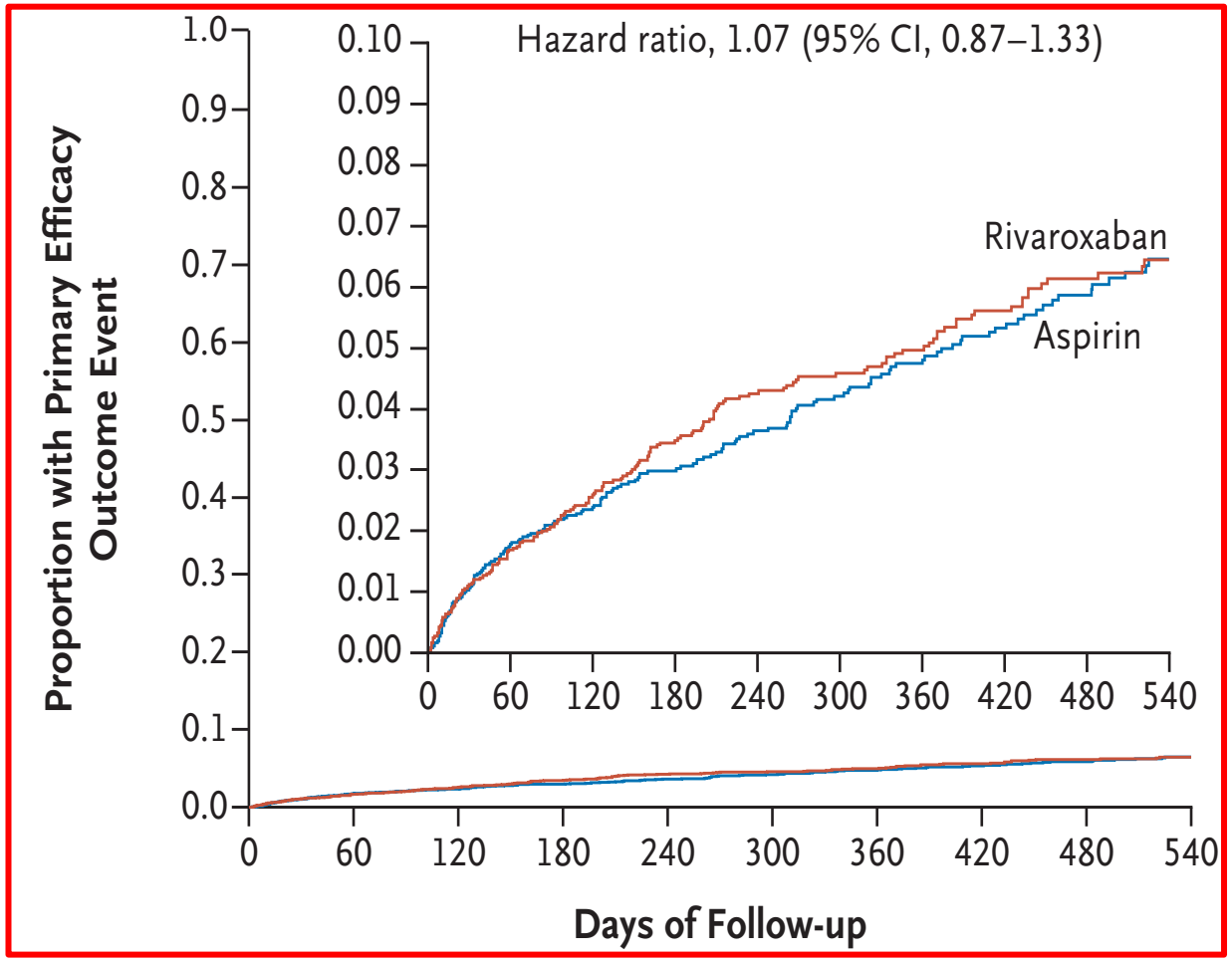
Neurology® 2016;86:261-269

ILR-detected subclinical AF in patients with cryptogenic stroke or TIA

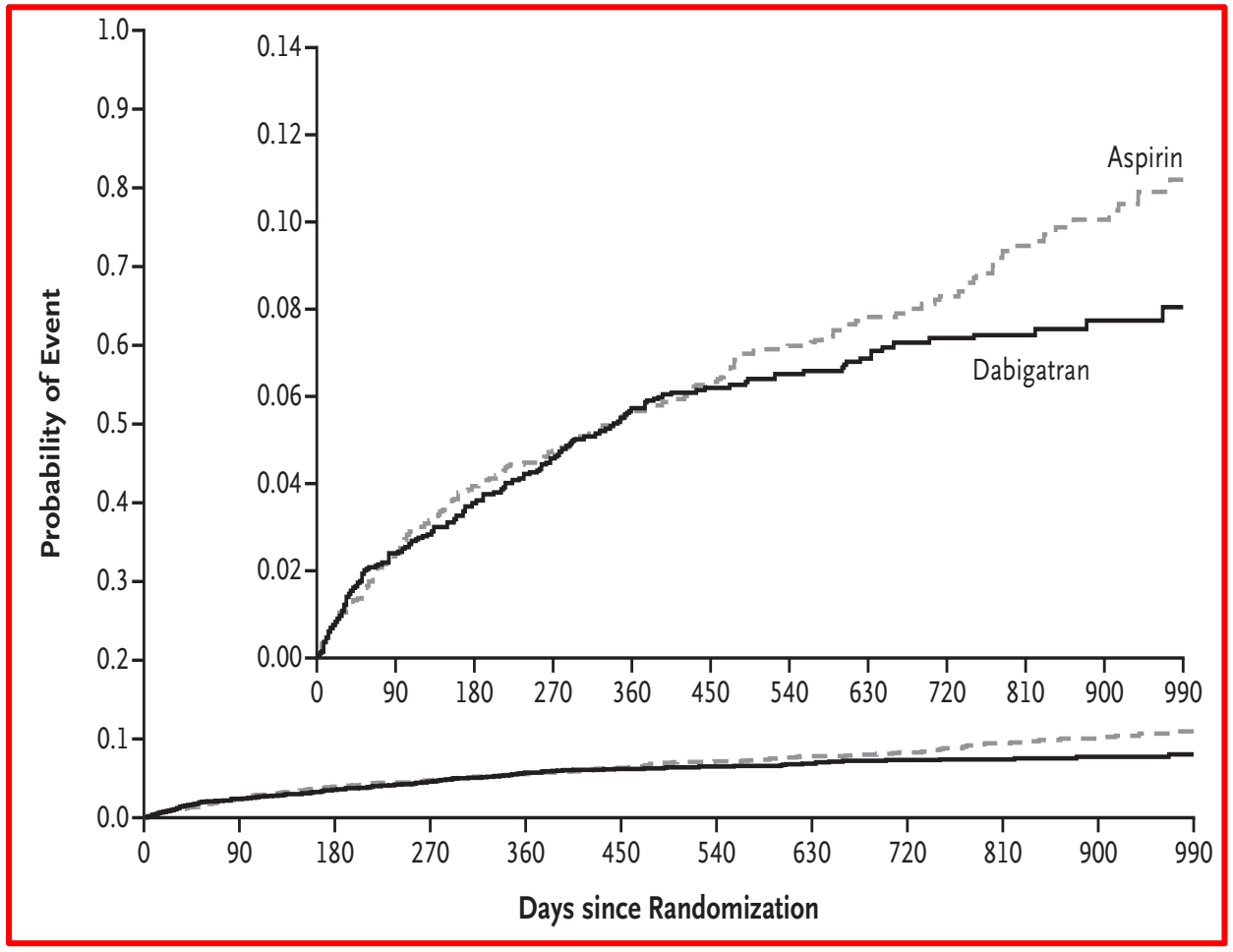
Europace (2019) 21, 1459–1467.

Study	Number of patients included	Mean age (years)	% male	Mean CHA_2DS_2-VASc score	Duration of follow-up	Definition of AHRE	Patients with AHRE	Time to first AHRE episode
Dion *et al.* (2010)	24	49 ± 13.6	62.5%	NR	Mean 14.5 months	Ventricular rate >165 b.p.m. for >32 complexes	1/24 (4.2%) with AF <30 s	NR
Cotter *et al.* (2013)	51	51.5 ± 13.9	54.9%	Median 3 (2–4)	Mean 229 ± 112 days in patients without AHRE	AF >2 min	13/51 (25.5%)	Median 48 days (0–154)
Ritter *et al.* (2013)	60	Median 63 (48.5–72.0)	56.7%	Median 4 (3–5) without AHRE; median 4 (3–5) with AHRE	Median 397 days (337–504) without AHRE; median 312 days (242–397) with AHRE	AF >2 min	10/60 (16.7%)	Median 64 days (1–556)
Etgen *et al.* (2013)	22	60.0 without AF; 65.8 with AF	43.8% without AF; 66.7% with AF	NR	12 months	AF ≥6 min	6/22 (27.3%)	Mean 152.8
Rojo-Martinez *et al.* (2013)	101	67	46.5%	NR	281 ± 212 days	AF >2 min	34/101 (33.7%)	Median 102 days (26–240)
SURPRISE (2014)	85	54.0 without AF; 66.9 with AF	58.0% without AF; 44.4% with AF	Median 3 without AHRE; median 4 with AHRE	569 ± 310 days	AF >2 min	18/85 (20.7%)	109 ± 48 days
CRYSTAL AF (2014)	441 (208 ICM)	61.5 ± 11.3	63.5%	NR	12 months	AF >2 min	8.9% at 6 months; 12.4% at 12 months	Median 41 days (14–84)
CRYSTAL AF (2016)	48 (24 ICM)?	61.6 ± 11.4	?	NR	36 months	AF >2 min	30%	?
Poli *et al.* (2016)	74	66.4 ± 12.5	47%	Median 5 (4–6)	12 months	AF >2 min	21/74 (28.4%) at 6 months; 25/74 (33.8%) at 12 months	105 ± 135 days
Israel *et al.* (2017)	123	65.0 ± 9.4	60.2%	4.5 ± 1.3	12.7 ± 5.5 months	AF ≥2 min	29/123 (23.6%)	Average 3.6 months
Reinke *et al.* (2018)	105	64.4 ± 12.6	56.2%	Median 4 (3–6)	?	AF >2 min	19/105 (18%)	Median 217 days (72.5–338)
Pedersen *et al.* (2018)	105	Median 65.4 (27.1–80.8)	45.7%	Median 4 (2–7)	Median 381 days (371–390)	AF ≥2 min	7/105 (6.7%)	Median 21 days (5–146)

DOACs AND ESUS



N Engl J Med. 2018 Jun 7;378(23):2191-2201.



N Engl J Med 2019 May 16;380(20):1906-1917.

Apixaban to Prevent Recurrence After Cryptogenic Stroke in Patients With Atrial Cardiopathy The ARCADIA Randomized Clinical Trial

JAMA

QUESTION Is anticoagulation superior to antiplatelet therapy for prevention of recurrent stroke in patients with cryptogenic stroke and evidence of atrial cardiopathy?

CONCLUSION This randomized trial found that in patients with cryptogenic stroke and evidence of atrial cardiopathy without atrial fibrillation, apixaban did not significantly reduce recurrent stroke risk compared with aspirin.

POPULATION

551 Women
464 Men

Adults ≥45 years with cryptogenic stroke and evidence of atrial cardiopathy

Mean age: 68 years

LOCATIONS

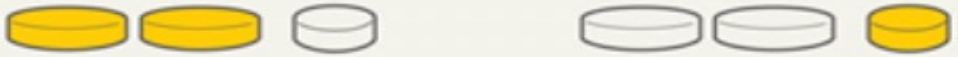
185
Sites in the US and Canada

INTERVENTION

1015 Patients randomized

507 Apixaban
Oral dose of apixaban, 5 mg or 2.5 mg, twice daily + aspirin placebo

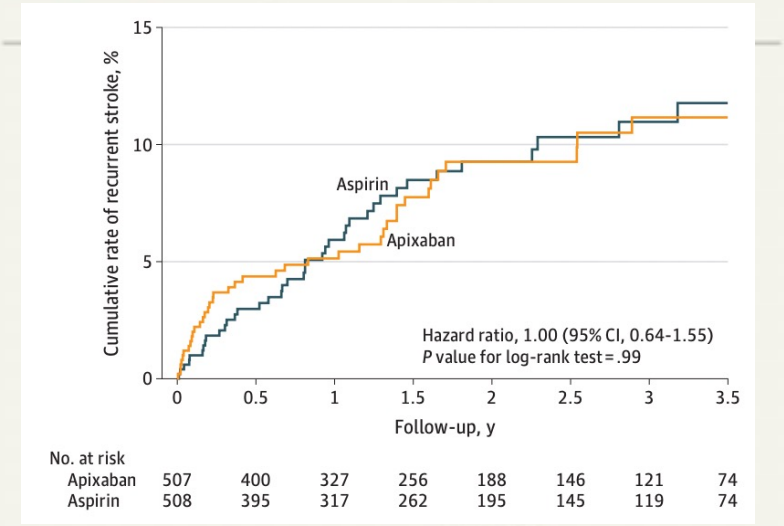
508 Aspirin
Oral dose of aspirin, 81 mg, once daily + apixaban placebo



PRIMARY OUTCOME

Recurrent stroke of any type

FINDINGS

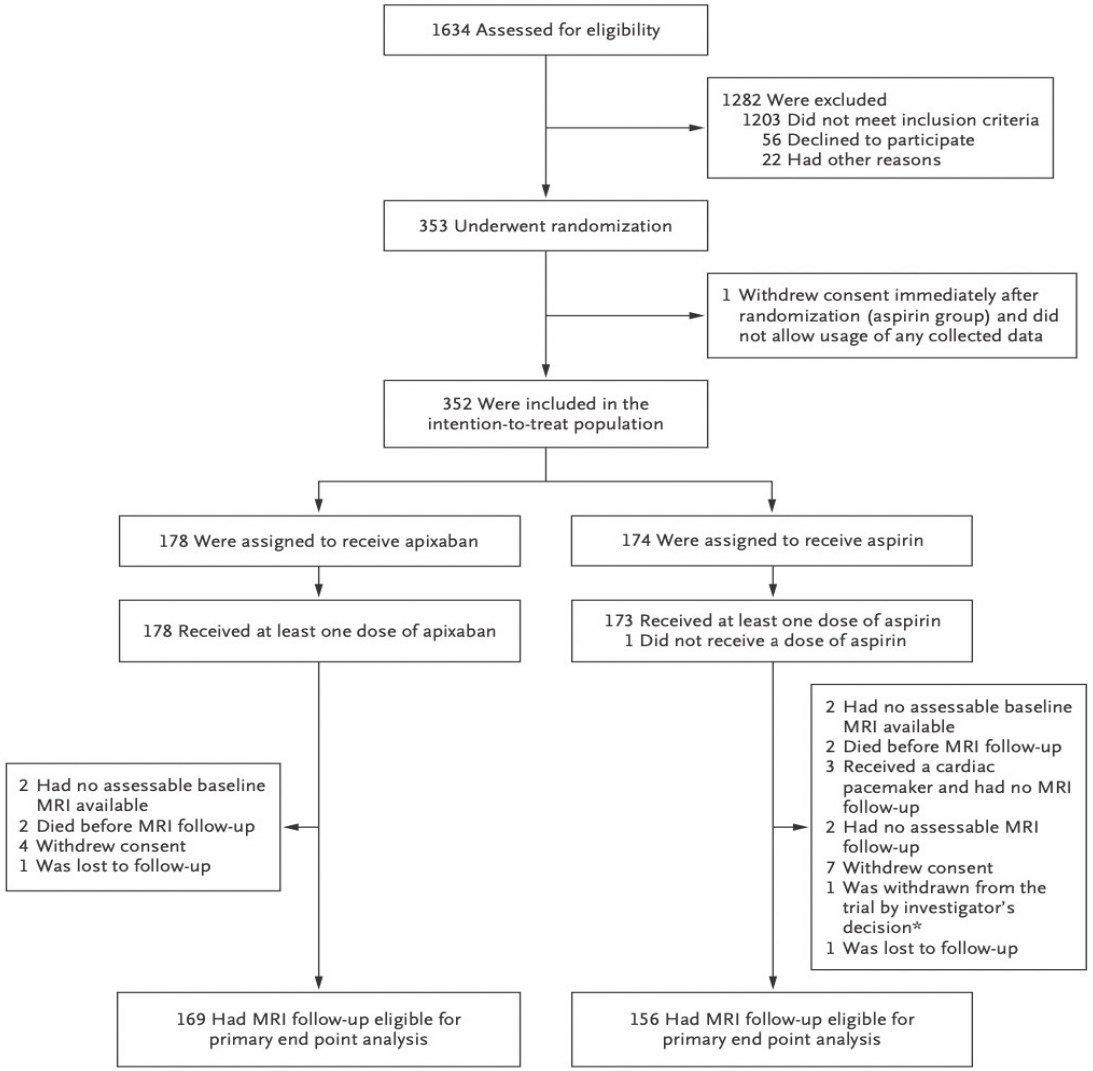


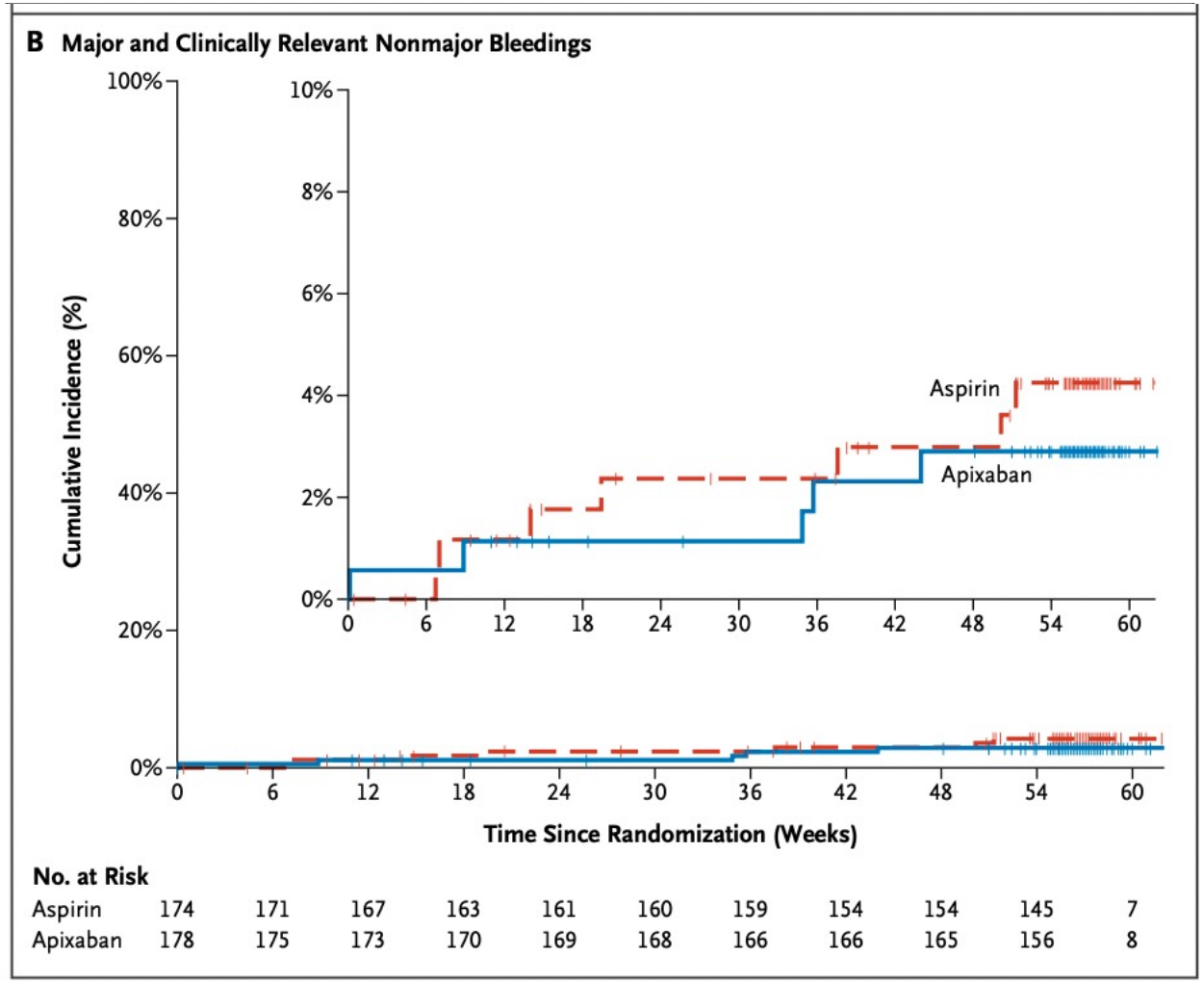
Hazard ratio, 1.00
(95% CI, 0.64 to 1.55)

Kamel H, Longstreth WT Jr, Tirschwell DL, et al; ARCADIA Investigators. Apixaban to prevent recurrence after cryptogenic stroke in patients with atrial cardiopathy: the ARCADIA randomized clinical trial. *JAMA*. Published online February 7, 2024. doi:10.1001/jama.2023.27188

JAMA. 2024;331(7):573-581. doi:10.1001/jama.2023.27188 Published online February 7, 2024

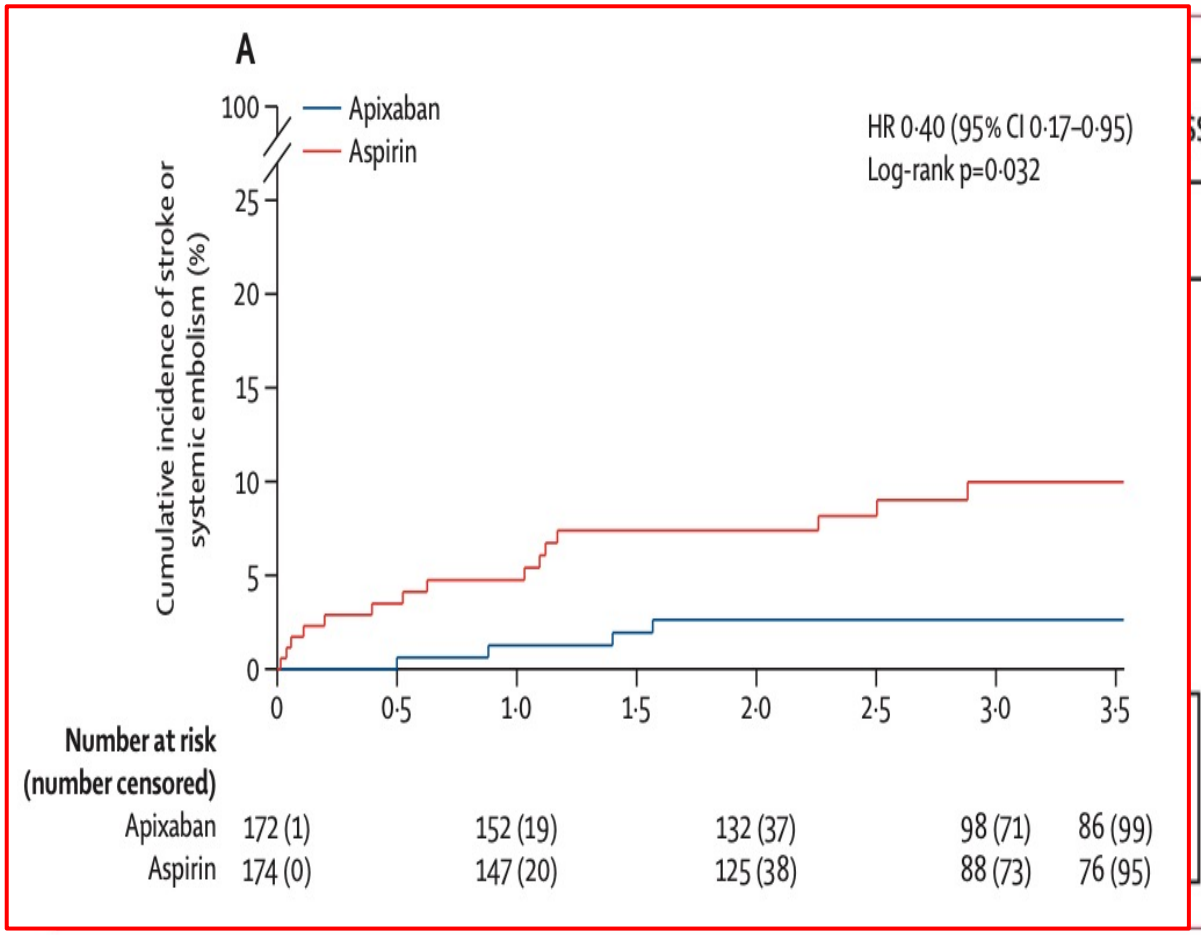
Apixaban versus Aspirin for Embolic Stroke of Undetermined Source (ATTICUS)

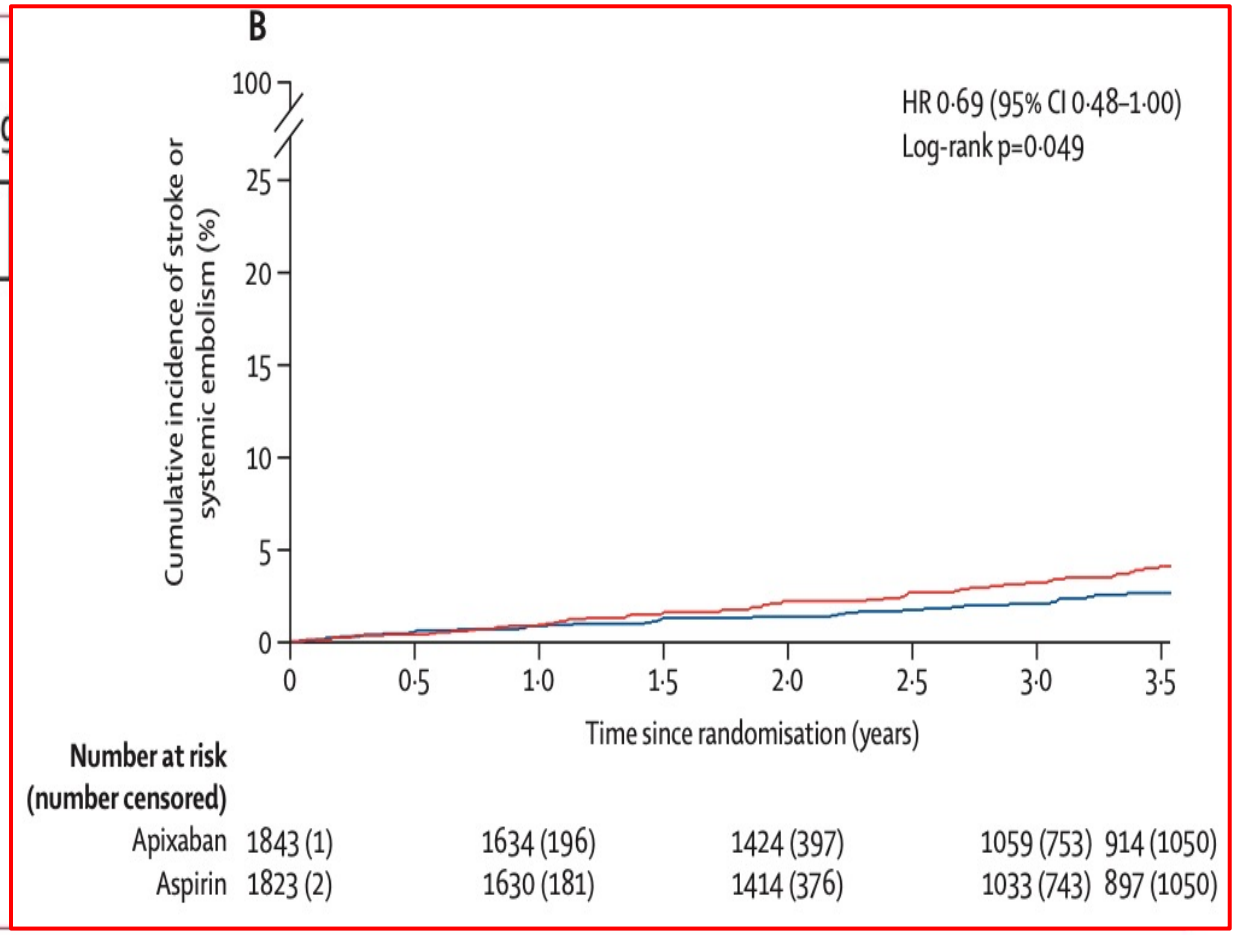




Geisler T, et al. NEJM Evid 2023; 3 (1) DOI: 10.1056/EVIDoa2300235

Apixaban versus aspirin for stroke prevention in people with subclinical AF and a history of stroke or TIA: subgroup analysis of the ARTESiA RCT





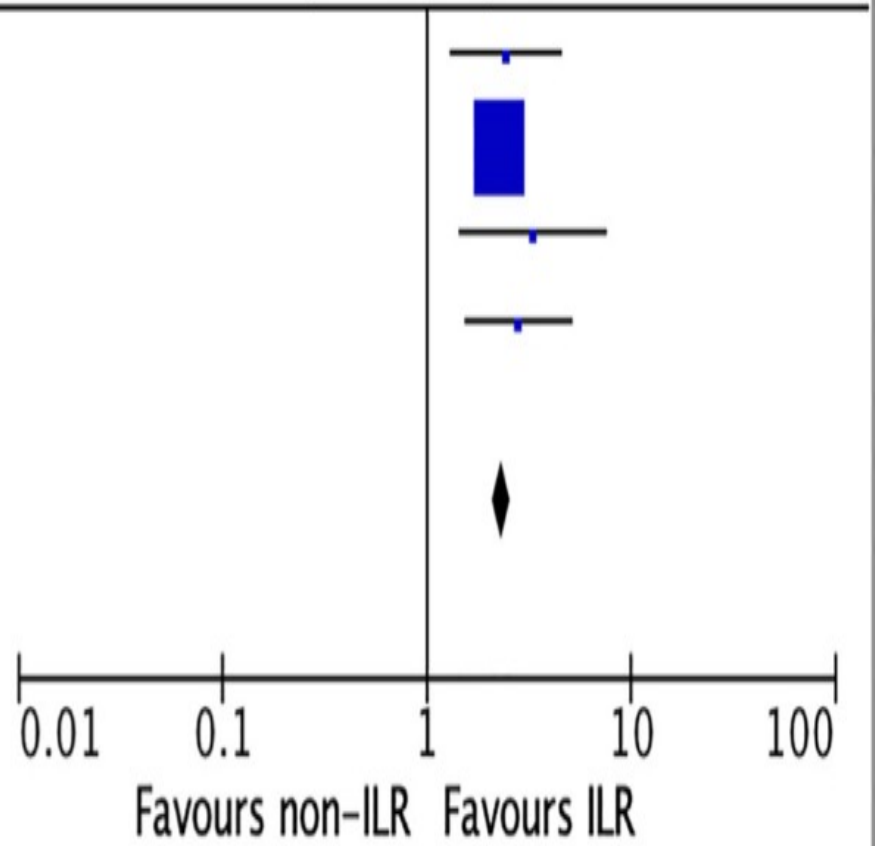
Lancet Neurol 2025; 24: 140–51

Effect of implantable loop recorder–based continuous rhythm monitoring on incident atrial fibrillation and stroke: An updated systematic review and meta-analysis of randomized controlled trials

Study or Subgroup	ILR Events	ILR Total	non-ILR Events	non-ILR Total	Weight	Risk Ratio M-H, Random, 95% CI
CRYSTAL AF 2014	32	221	13	220	2.8%	2.45 [1.32, 4.54]
LOOP 2021	445	1501	591	4503	92.4%	2.26 [2.03, 2.52]
PER DIEM 2021	23	150	7	150	1.6%	3.29 [1.45, 7.42]
STROKE AF 2021	38	242	14	250	3.1%	2.80 [1.56, 5.04]
Total (95% CI)		**2114**		**5123**	**100.0%**	**2.29 [2.07, 2.55]**
Total events	538		625			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.34$, df = 3 (P = 0.72); $I^2 = 0\%$

Test for overall effect: Z = 15.64 (P < 0.00001)



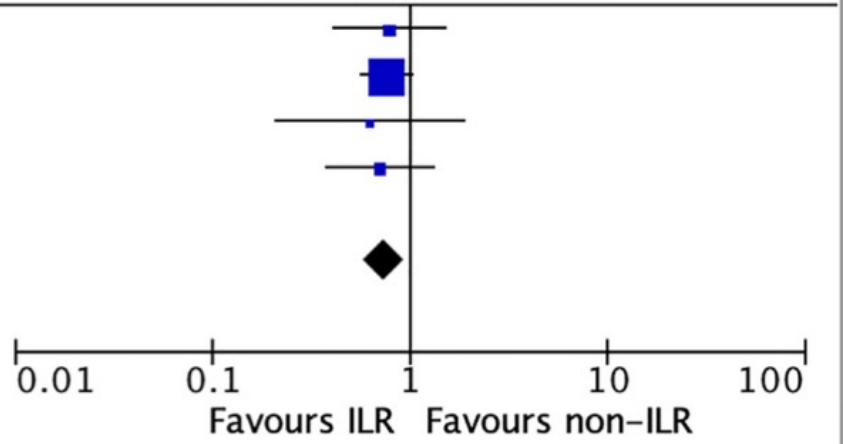
Heart Rhythm 2024;21:2536–2542.

Effect of implantable loop recorder–based continuous rhythm monitoring on incident atrial fibrillation and stroke: An updated systematic review and meta-analysis of randomized controlled trials

Study or Subgroup	ILR Events	ILR Total	non-ILR Events	non-ILR Total	Weight	Risk Ratio M-H, Random, 95% CI
CRYSTAL AF 2014	15	221	19	220	13.4%	0.79 [0.41, 1.51]
LOOP 2021	55	1501	217	4503	67.6%	0.76 [0.57, 1.02]
PER DIEM 2021	5	150	8	150	4.7%	0.63 [0.21, 1.87]
STROKE AF 2021	15	242	22	250	14.2%	0.70 [0.37, 1.33]
Total (95% CI)		**2114**		**5123**	**100.0%**	**0.75 [0.59, 0.95]**
Total events	90		266			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.17$, df = 3 (P = 0.98); $I^2 = 0\%$

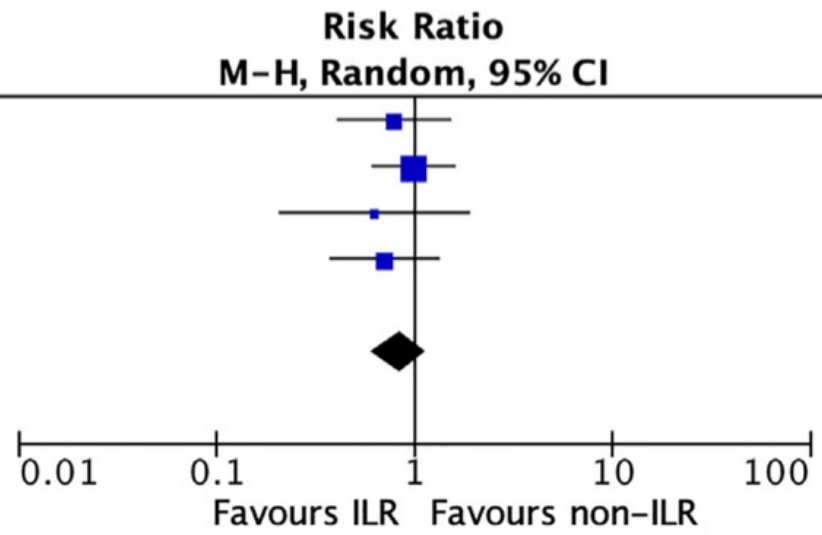
Test for overall effect: Z = 2.38 (P = 0.02)



Study or Subgroup	ILR Events	ILR Total	non-ILR Events	non-ILR Total	Weight	Risk Ratio M-H, Random, 95% CI
CRYSTAL AF 2014	15	221	19	220	23.2%	0.79 [0.41, 1.51]
LOOP 2021	21	262	64	794	44.0%	0.99 [0.62, 1.60]
PER DIEM 2021	5	150	8	150	8.2%	0.63 [0.21, 1.87]
STROKE AF 2021	15	242	22	250	24.6%	0.70 [0.37, 1.33]
Total (95% CI)		**875**		**1414**	**100.0%**	**0.83 [0.61, 1.14]**
Total events	56		113			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.11$, df = 3 (P = 0.78); $I^2 = 0\%$

Test for overall effect: Z = 1.15 (P = 0.25)



Heart Rhythm 2024;21:2536–2542.

DOACs vs Aspirin for Secondary Stroke Prevention in Patients with ESUS: An updated Meta-Analysis of RCTs

DOAC versus Aspirin in patients with ESUS

Key question Is direct oral anticoagulation (DOAC) therapy a superior strategy compared with aspirin for secondary stroke prevention in patients with embolic stroke of undetermined source (ESUS)?

Study design Systematic review and meta-analysis of randomized controlled trials (RCTs)

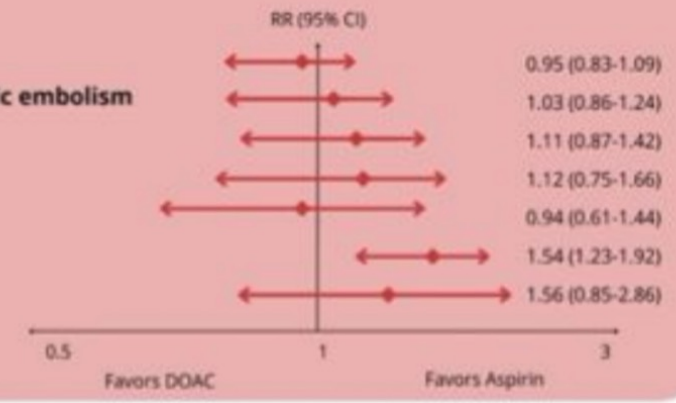
Databases PubMed Embase

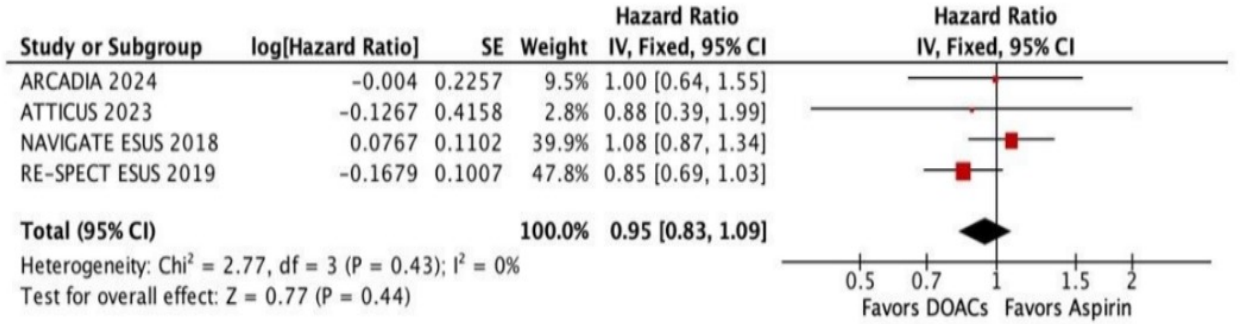
Statistical analysis

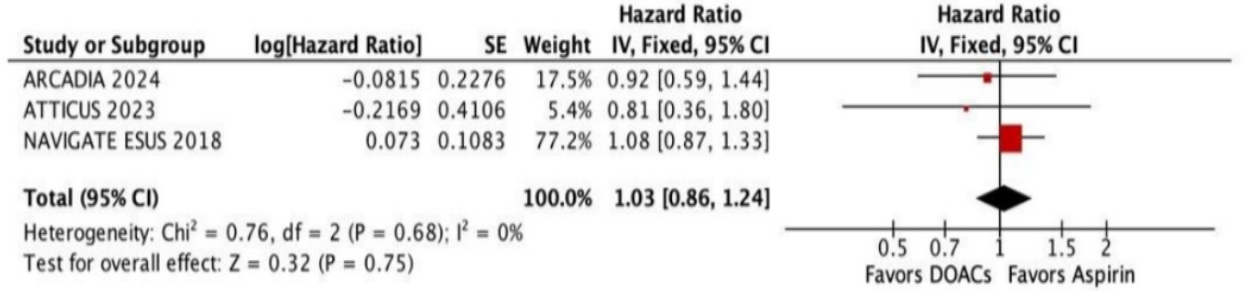
Population Patients with ESUS — 4 RCTs | 13,970 patients

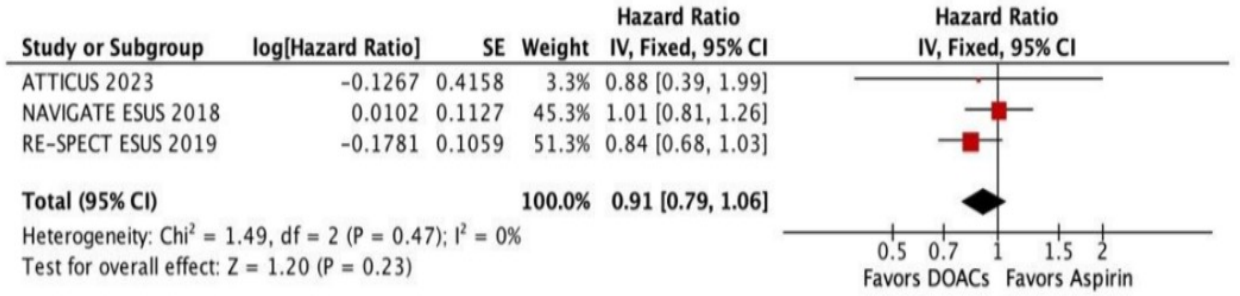
Comparison Anticoagulation with DOACs VS Antiplatelet therapy with aspirin

Main results

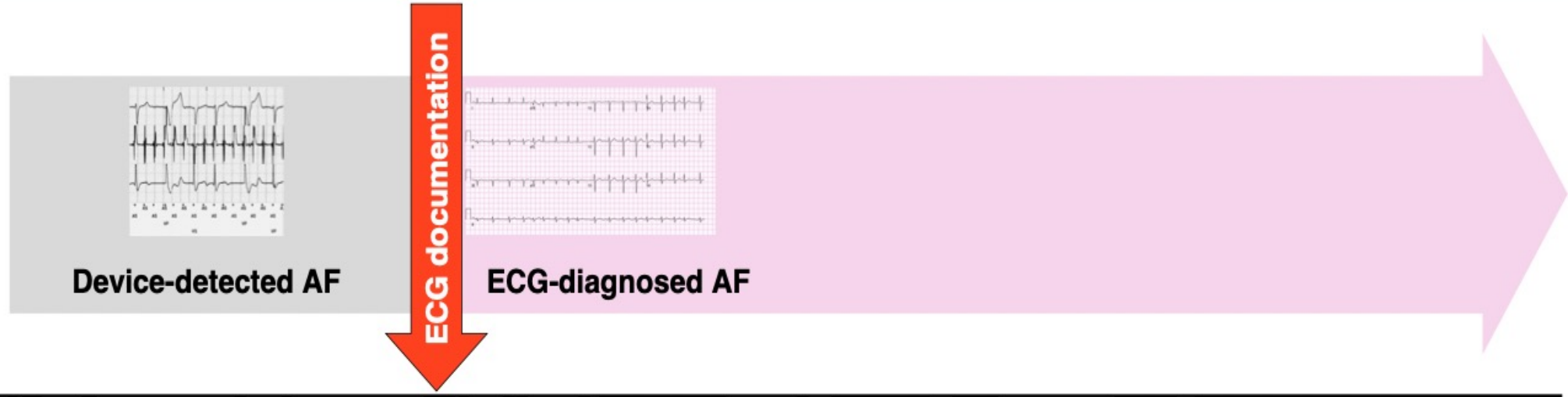




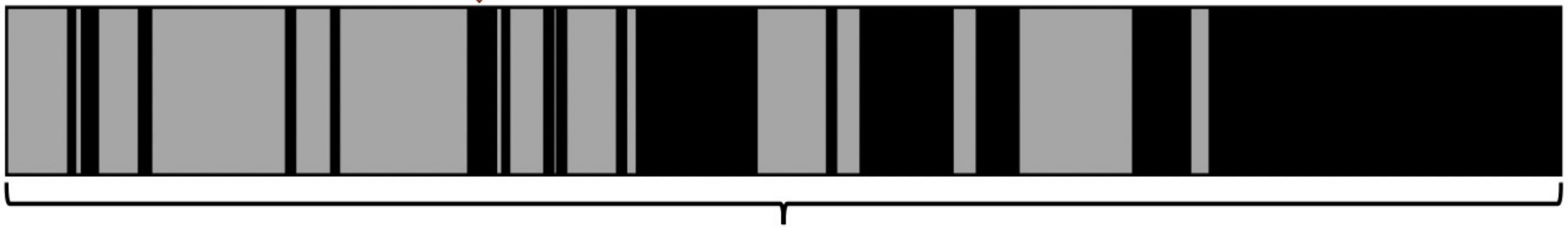




Arq Bras Cardiol 2025.



Time in
Sinus rhythm &
Atrial fibrillation



Several months to years

Risk factor and comorbidity management

Active rhythm and rate control therapy

Possibly anticoagulation

(Shared decision-making
& considering stroke/bleeding risk)

Anticoagulation (according to guideline-recommended risk scores)

Europace (2024) **26**, euae070 https://doi.org/10.1093/europace/euae070

EHRA CONSENSUS DOCUMENT

Table 5 Summary of studies on atrial fibrillation detected by CIEDs and thromboembolic risk

Year	Trial	Number of patients	Duration of follow-up	Atrial rate cut-off	AF burden threshold	Hazard ratio for TE event	TE event rate (below vs. above AF burden threshold)
2003	Ancillary MOST[5]	312	27 months (median)	>220 bpm	5 min	6.7 (P=0.020)	3.2% overall (1.3% vs. 5%)
2005	Italian AT500 Registry[18]	725	22 months (median)	>174 bpm	24 h	3.1 (P=0.044)	1.2% annual rate
2009	Botto *et al.*[19]	568	1 year (mean)	>174 bpm	$CHADS_2$+AF burden	n/a	2.5% overall (0.8% vs. 5%)
2009	TRENDS[20]	2486	1.4 years (mean)	>175 bpm	5.5 h	2.2 (P=0.060)	1.2% overall (1.1% vs. 2.4%)
2012	Home Monitor CRT[22]	560	370 days (median)	>180 bpm	3.8 h	9.4 (P=0.006)	2.0% overall
2012	ASSERT[7]	2580	2.5 years (mean)	>190 bpm	6 min	2.5 (P=0.007)	(0.69% vs. 1.69%)
2014	SOS AF[23]	10016	2 years (median)	>175 bpm	1 h	2.11 (P=0.008)	0.39% per year Overall

Europace (2017) 19, 1556–1578.

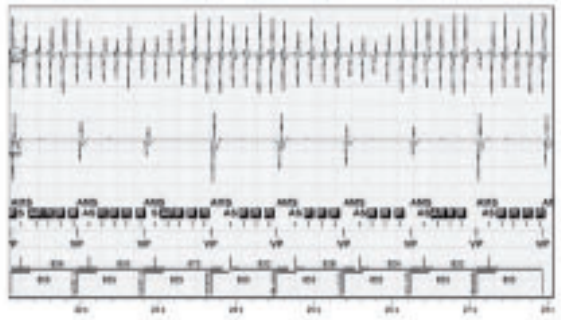
Key studies examining the utility of monitoring for the detection of previously undetected AF

EHRA CONSENSUS DOCUMENT

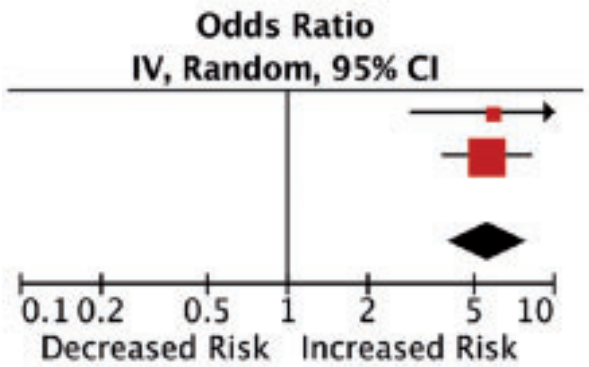
Study (Year)	Design (number)	Monitoring device	Population	Definition of AF	Prevalence of AF
EMBRACE[68] (2014)	RCT (286 with monitor vs. 285 with Holter)	Braemar ER910AF event monitor with dry electrode belt; automatic AF detection vs. 24-hr Holter	Cryptogenic Stroke	≥30 s Detected within 90 days	Monitor: 16.1% Holter 3.2
Grond *et al.*[56] (2013)	Cohort (1172)	72-hr Holter; Lifecard CF (Spacelabs)	Ischemic stroke or TIA	>30 s	4.3% after 72 hr 2.6% after 24 hr
Jabaudon *et al.*[69] (2004)	Cohort (149)	7-day; *R*-test Evolution II, (Novacor)	Stroke or TIA	Not stated	ECG: 2.7% 24-hr Holter: 5% ELR: 5.7%[b]
Tung *et al.*[64] (2014)	Cohort (1171)	14-day continuous ECG monitor (Ziopatch; iRhythm)	Stroke or TIA	>30 s	5%
ASSERT-III[67] (2015)	Cohort (100)	30-day event monitor; automatic AF detection (Vitaphone 3100), wireless central monitoring (m-Health Solutions)	Age≥80 years with hypertension and at least one additional AF risk factor)	≥6 min	15%
SCREEN-AF (NCT02392754)[70]	Ongoing Cohort (1800)	Two 14-day continuous ECG monitors (Ziopatch; iRhythm)	Age≥75 years without prior AF	≥5 min	Ongoing study

Europace (2017) 19, 1556–1578.

DDAF & Stroke Risk



AHRE detected in 13.9% patients annually



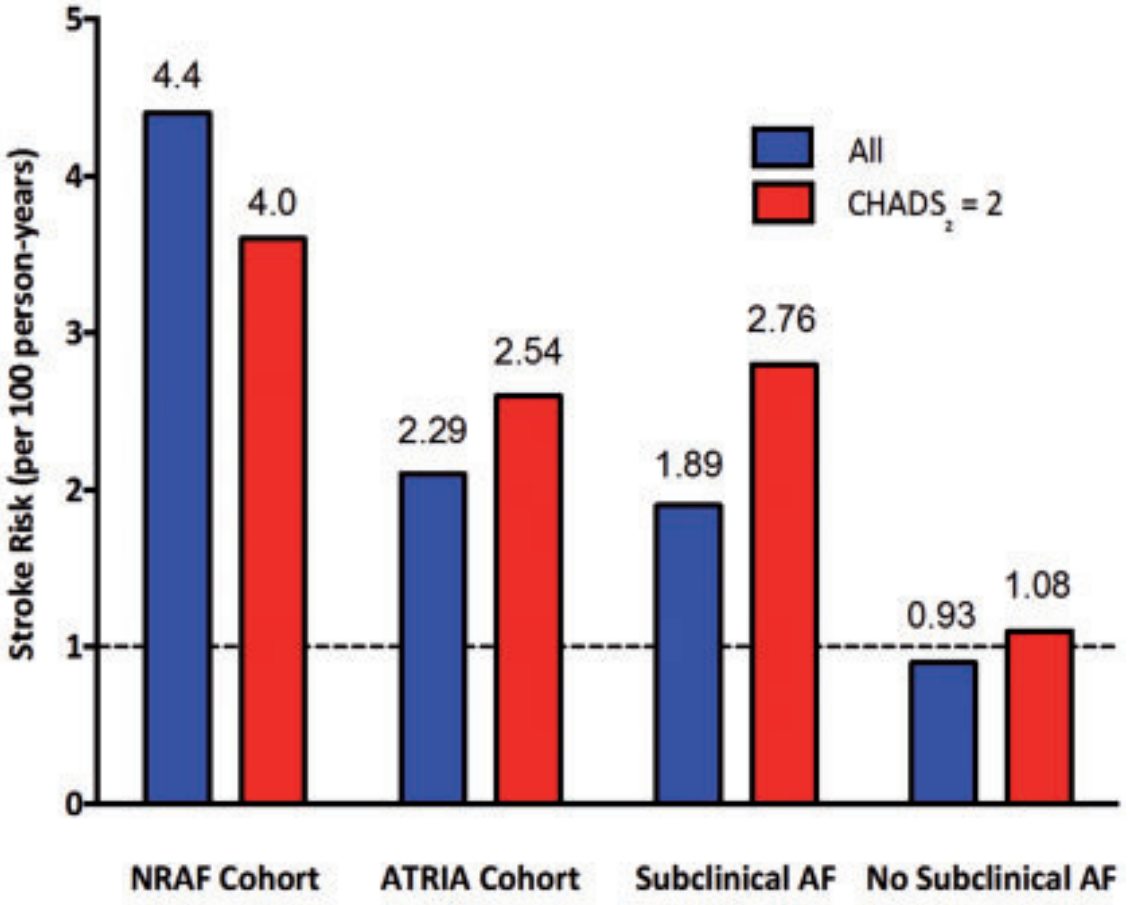
Patients with AHRE 5.7 fold more like to have clinical AF

PPV of AHRE

SJM- 83% >6min - 6 hour
97% >6 hour
Medtronic- 95%
Biotronik- 91%

AHRE duration associated with stroke risk

ASSERT- >6min episode (SJM)
TRENDS->5.5hr daily burden (Medtronic)
Home CARE and everesT trials-3.8hr daily burden (Biotronik)



Subclinical AF and stroke risk

European Heart Journal (2018) **39**, 1407–1415
doi:10.1093/eurheartj/ehx731

Duration of device-detected subclinical atrial fibrillation and occurrence of stroke in ASSERT

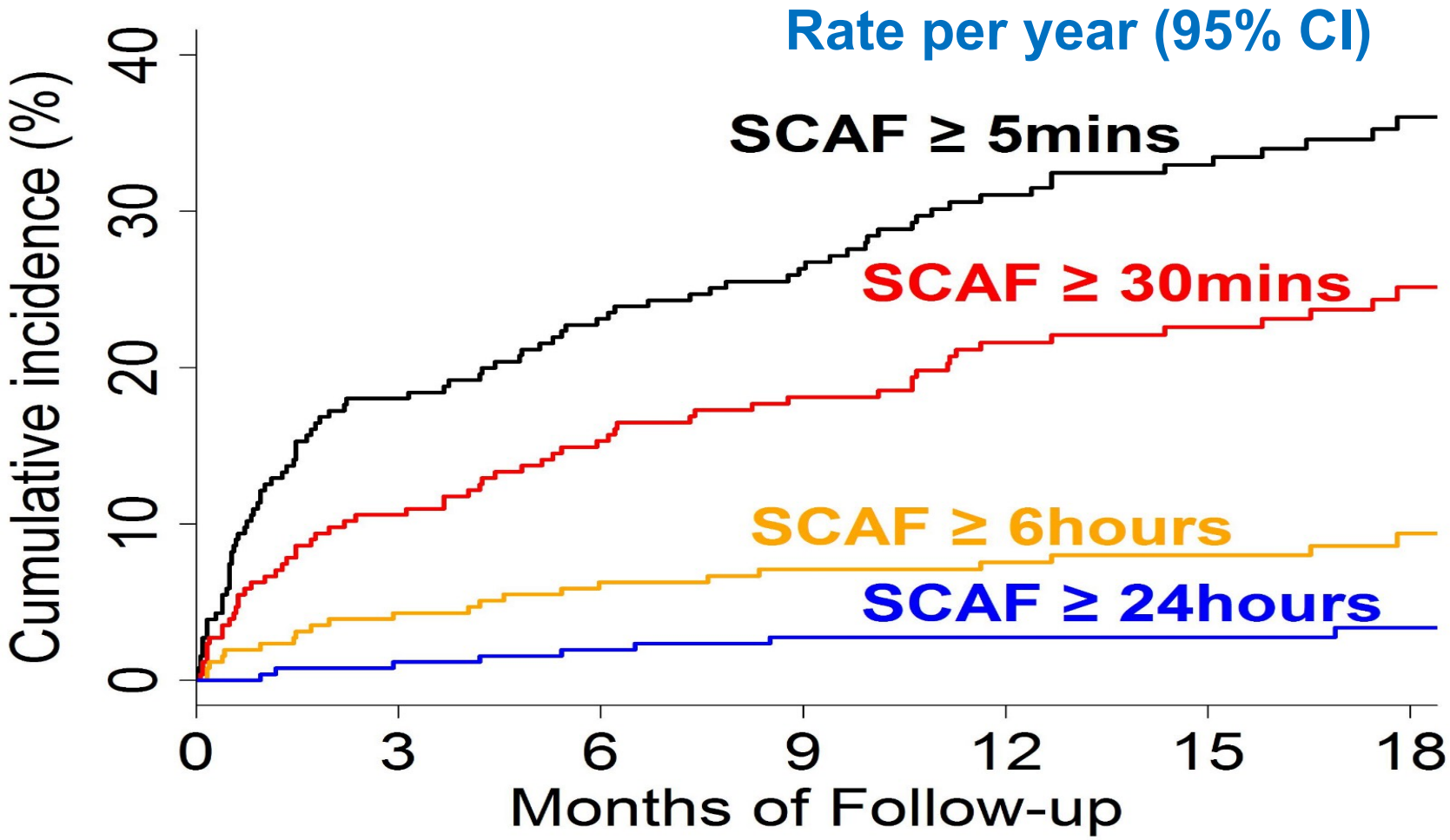
Isabelle C. Van Gelder[1]*, Jeff S. Healey[2], Harry J.G.M. Crijns[3], Jia Wang[2], Stefan H. Hohnloser[4], Michael R. Gold[5], Alessandro Capucci[6], Chu-Pak Lau[7], Carlos A. Morillo[2], Anne H. Hobbelt[1], Michiel Rienstra[1], and Stuart J. Connolly[2]

Table 4 Landmark analysis showing ischemic stroke/systemic embolism occurring after 1 year follow-up, according to SCAF durations between enrollment and 1 year follow-up[a]

SCAF duration	Number events/patients	Event rate (%/year)	Unadjusted		Adjusted[b]	
			Hazard ratio (95% CI)	*P*-value	Hazard ratio (95% CI)	*P*-value
No SCAF	19/1811	0.54	1	–	1	–
>6 min–6 h	7/310	1.14	2.11 (0.89–5.02)	0.091	1.75 (0.69–4.44)	0.242
>6–24 h	2/105	0.95	1.79 (0.42–7.69)	0.433	1.85 (0.43–8.01)	0.413
>24 h	7/129	3.08	5.73 (2.41–13.64)	<0.001	5.37 (2.08–13.87)	<0.001

European Heart Journal (2017) **0**, 1–6
doi:10.1093/eurheartj/ehx042

ASSERT-2 Incidence of SCAF



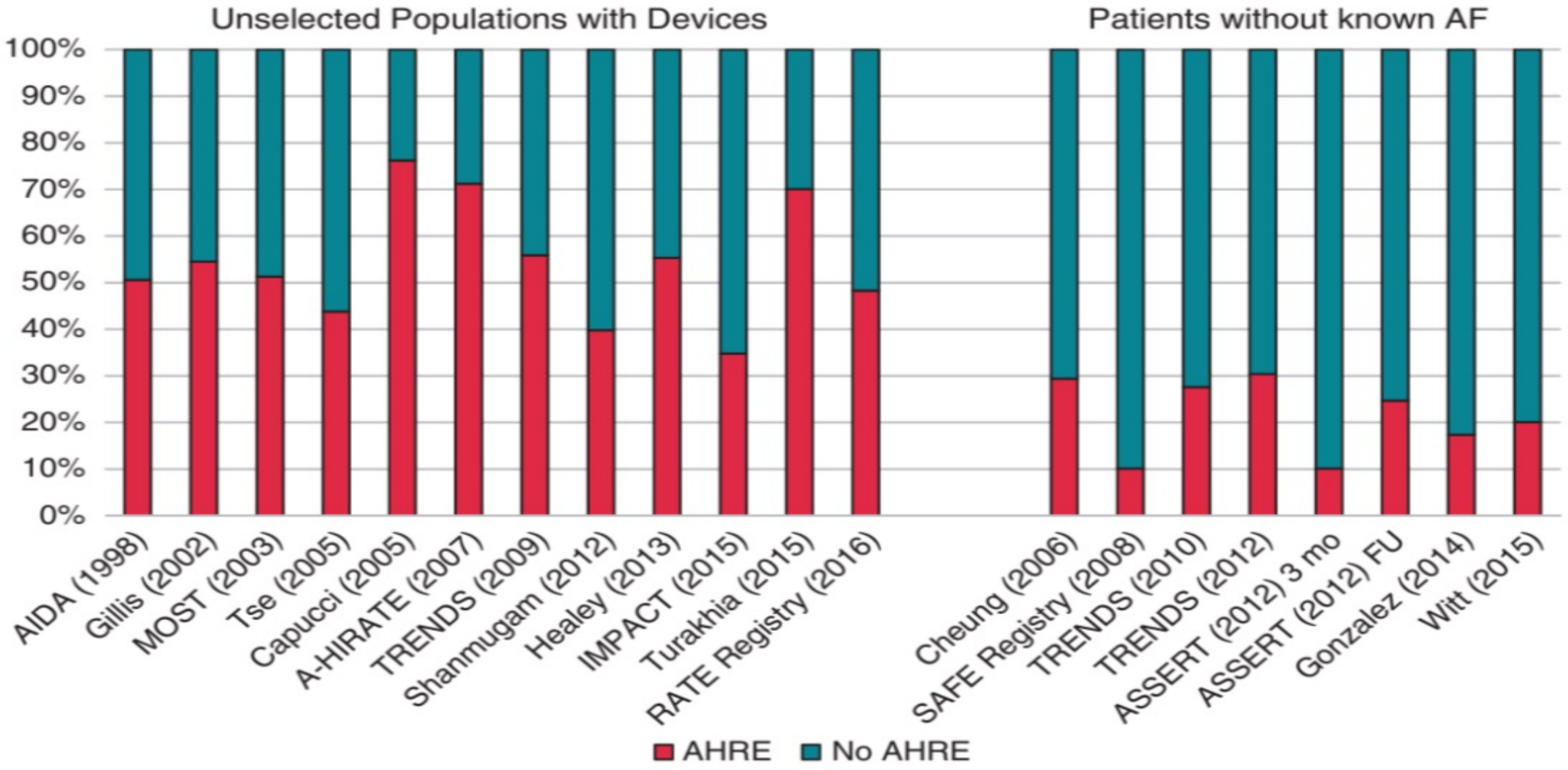
21.8% (16.7% – 27.8%)

7.1% (4.5% – 10.6%)

2.7% (1.2% – 5.0%)

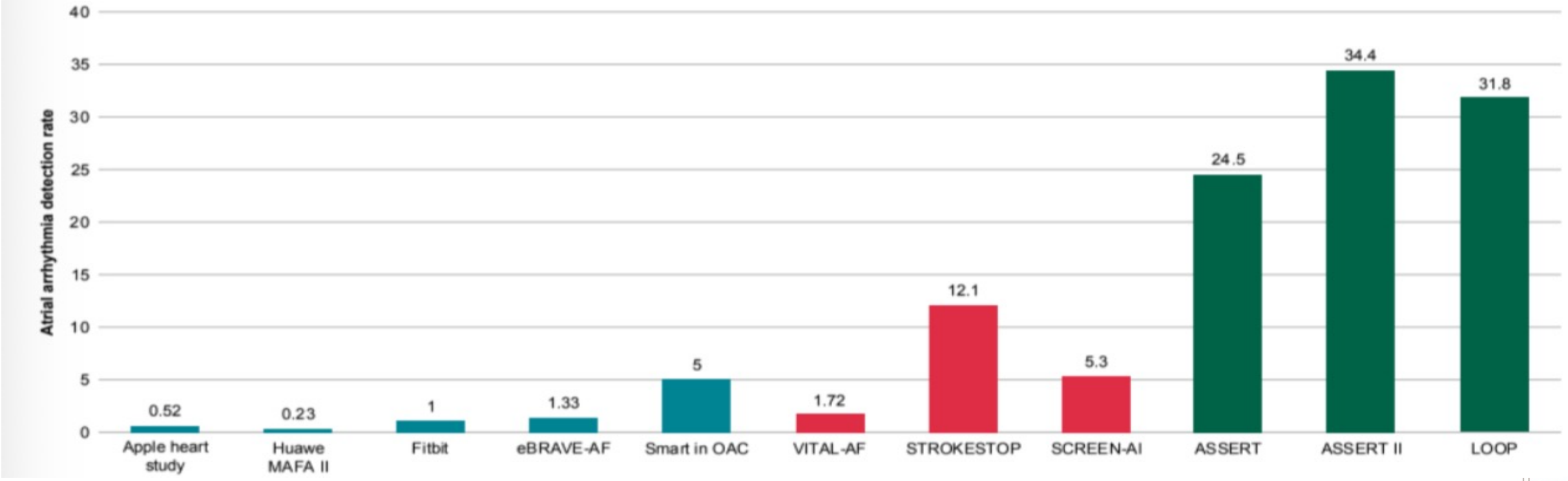
Circulation. 2017;136:1276–1283. DOI: 10.1161/CIRCULATIONAHA.117.028845

Incidence of ILR-detected subclinical AF in patients at high risk of stroke



The influence of atrial high-rate episodes on stroke and cardiovascular death: an update

	PPG-based screening			ECG-based screening					Continuous monitoring by CIED		
									DDDR	ICM	
	Apple heart study	Huawei MAFA II	Fitbit	eBRAVE-AF	Smart in OAC	VITAL-AF	STROKESTOP	SCREEN-AI	ASSERT	ASSERT II	LOOP
Part	0.50	0.23	0	1.33	5	1.72	12.1	5.3	24.5	34.4	31.8
Control	–	–	–	0.63	–	1.59	12.8	0.5	–	–	12.2
n part	419297	187912	455699	2860	882	15393	14387	434	2580	256	1501
n control	–	–	–	2691	–	15322	14381	422	–	–	4503
FU	–	14 d	7 d	6 m	8 w	1y	6.9y	6m	2.5y	1.3y	5.4y
Age [y]	≥22	≥18	≥22	50–90 + RF	65–90 + RF	≥65	75–76	≥75	≥65	≥65 + RF	70–90 + RF



Europace (2019) 21, 1459–1467.

Screening for AF: How?

Sensitivity and specificity of various AF screening tools with the 12-lead ECG as the gold standard

	Sensitivity	Specificity
Pulse taking[203]	87 – 97%	70 – 81%
Automated BP monitors[204–207]	93 – 100%	86 – 92%
Single lead ECG[208–211]	94 – 98%	76 – 95%
Smartphone apps[188,189,191,195,212,213]	91.5 – 98.5%	91.4 – 100%
Watches[196,198,213,214]	97 – 99%	83 – 94%

EHJ, Volume 42, 2021, Pages 373–498.

Direct Oral Anticoagulants for Stroke Prevention in Patients With Device-Detected Atrial Fibrillation: A Study-Level Meta-Analysis of the NOAH-AFNET 6 and ARTESiA Trials

Table. Characteristics of Included Studies

	NOAH-AFNET 6	ARTESiA
N	2536	4012
Intervention	Edoxaban	Apixaban
Comparator	ASA or placebo	ASA
Trial registration (ClinicalTrials.gov identifier)	NCT02618577	NCT01938248
Age, y (mean±SD)	77.5±6.7	76.8±7.6
Female sex	37.4%	36.1%
CHA_2DS_2-VASc score (median, IQR/mean±SD)	4 (3–5)	3.9±1.1
Hypertension	86.9%	81.5%
Diabetes	26.9%	29.1%
Heart failure	27.4%	28.3%
Previous stroke, systemic embolism, or TIA	10.0%	9.0%
Creatinine clearance (mL/min, mean±SD)	66.0±23.4	71.4±28.7
Received reduced-dose DOAC (study drug)	28.7%	9.4%
Received ASA (study drug)	53.9%	100%
Device type		
Pacemaker	81.7%	69.4%
ICD	7.4%	13.8%
CRT-ICD or CRT pacemaker	9.9%	11.6%
ICM	1.0%	5.2%
Duration of device-detected AF before enrollment* (median, IQR)	2.8 h (0.8–9.4)	1.5 h (0.2–5.0)
Median number of device-detected AF episodes before enrollment	2.8	NR
Follow-up	Median 1.8 y	Mean 3.5±1.8 y
Incidence of clinical AF†	8.7% per patient-year	6.3% per patient-year

McIntyre W et al. Circulation. 2024;149:981–988. DOI:10.1161/CIRCULATIONAHA.123.067512

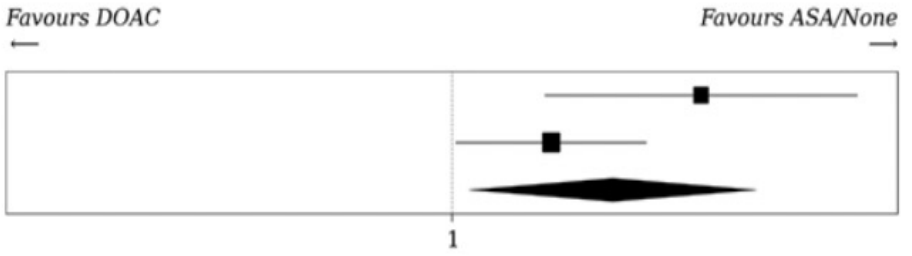
Direct Oral Anticoagulants for Stroke Prevention in Patients With Device-Detected Atrial Fibrillation: A Study-Level Meta-Analysis of the NOAH-AFNET 6 and ARTESiA Trials

Major Bleeding

Study	DOAC	(%)	ASA/None	(%)	Weight	RR [95% CI]
NOAH-AFNET 6	53/1,270	(4.2%)	25/1,266	(2.0%)	41.1%	2.11 [1.32, 3.38]
ARTESiA	106/2,015	(5.3%)	78/1,997	(3.9%)	58.9%	1.35 [1.01, 1.79]
Pooled Estimate	159/3,285	(4.8%)	103/3,263	(3.2%)	I^2: 61%	1.62 [1.05, 2.5]

Mantel-Haenszel, DerSimonian-Laird Random Effects *p=0.03, z=2.18* *τ^2=0.06*

RR: Risk Ratio *CI: Confidence Interval*

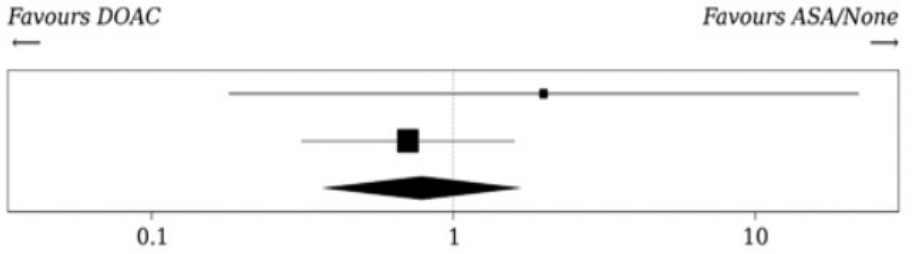


Fatal Bleeding

Study	DOAC	(%)	ASA/None	(%)	Weight	RR [95% CI]
NOAH-AFNET 6	2/1,270	(0.2%)	1/1,266	(0.1%)	10.2%	1.99 [0.18, 21.96]
ARTESiA	10/2,015	(0.5%)	14/1,997	(0.7%)	89.8%	0.71 [0.32, 1.59]
Pooled Estimate	12/3,285	(0.4%)	15/3,263	(0.5%)	I^2: 0%	0.79 [0.37, 1.69]

Mantel-Haenszel, DerSimonian-Laird Random Effects *p=0.54, z=0.61* *τ^2=0.00*

RR: Risk Ratio *CI: Confidence Interval*

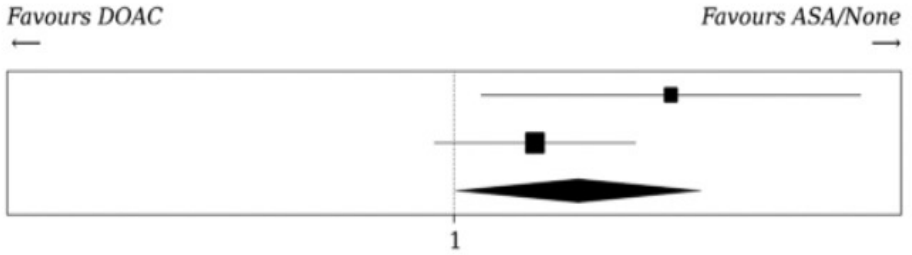


All-cause Mortality or Major Bleeding

Study	DOAC	(%)	ASA/None	(%)	Weight	RR [95% CI]
NOAH-AFNET 6	149/1,270	(11.7%)	114/1,266	(9.0%)	31.9%	1.3 [1.03, 1.64]
ARTESiA	431/2,015	(21.4%)	387/1,997	(19.4%)	68.1%	1.1 [0.98, 1.25]
Pooled Estimate	580/3,285	(17.7%)	501/3,263	(15.4%)	I^2: 35%	1.16 [1.0, 1.35]

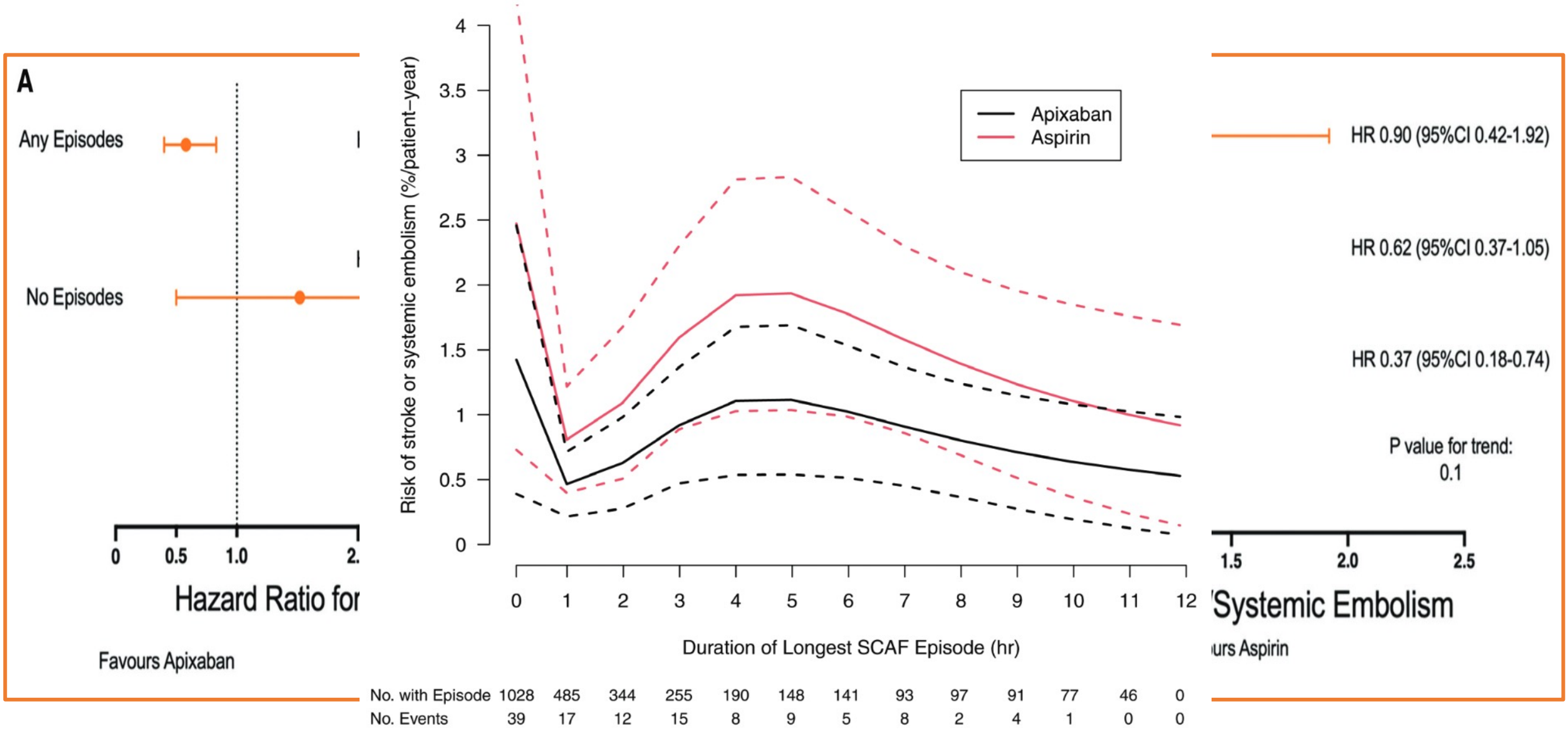
Mantel-Haenszel, DerSimonian-Laird Random Effects *p=0.05, z=1.96* *τ^2=0.00*

RR: Risk Ratio *CI: Confidence Interval*



McIntyre W et al. Circulation. 2024;149:981–988. DOI:10.1161/CIRCULATIONAHA.123.067512

Risk of Stroke or Systemic Embolism According to Baseline Frequency and Duration of Subclinical Atrial Fibrillation: Insights From the ARTESiA Trial



Circulation. 2024;150:1747–1755. DOI: 10.1161/CIRCULATIONAHA.124.069903.

EUROPEAN STROKE JOURNAL

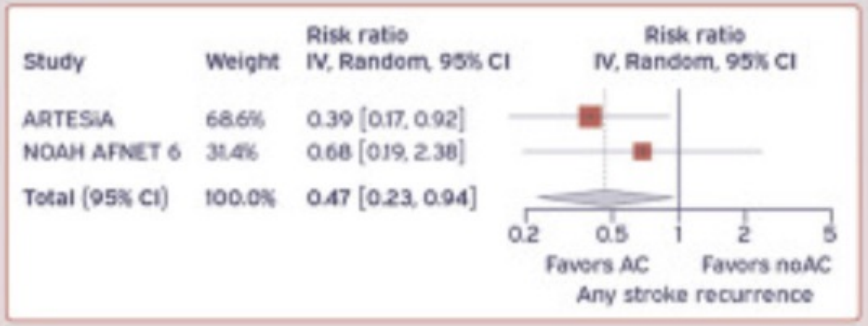
Recurrent stroke in patients with history of stroke/ transient ischemic attack and device-detected atrial fibrillation: a systematic review and meta-analysis

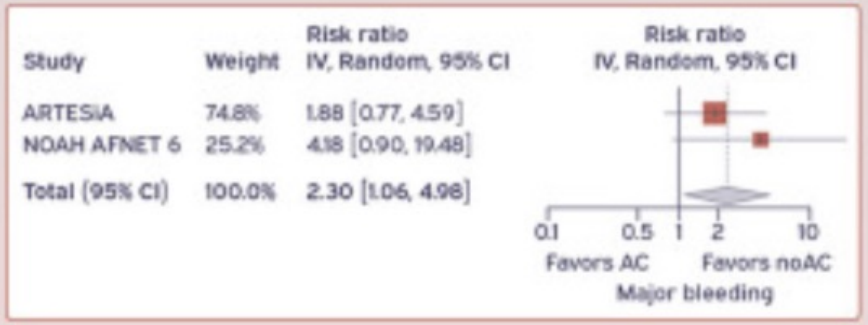
What is the efficacy and safety of anticoagulation in patients with a history of stroke or transient ischemic attack and device-detected atrial fibrillation?

Methods

- Systematic review and meta-analysis
- 2 RCTs
- Patients with a history of stroke or TIA and device-detected AF
- 294 patients receiving AC
  vs.
  305 patients receiving no AC

Results



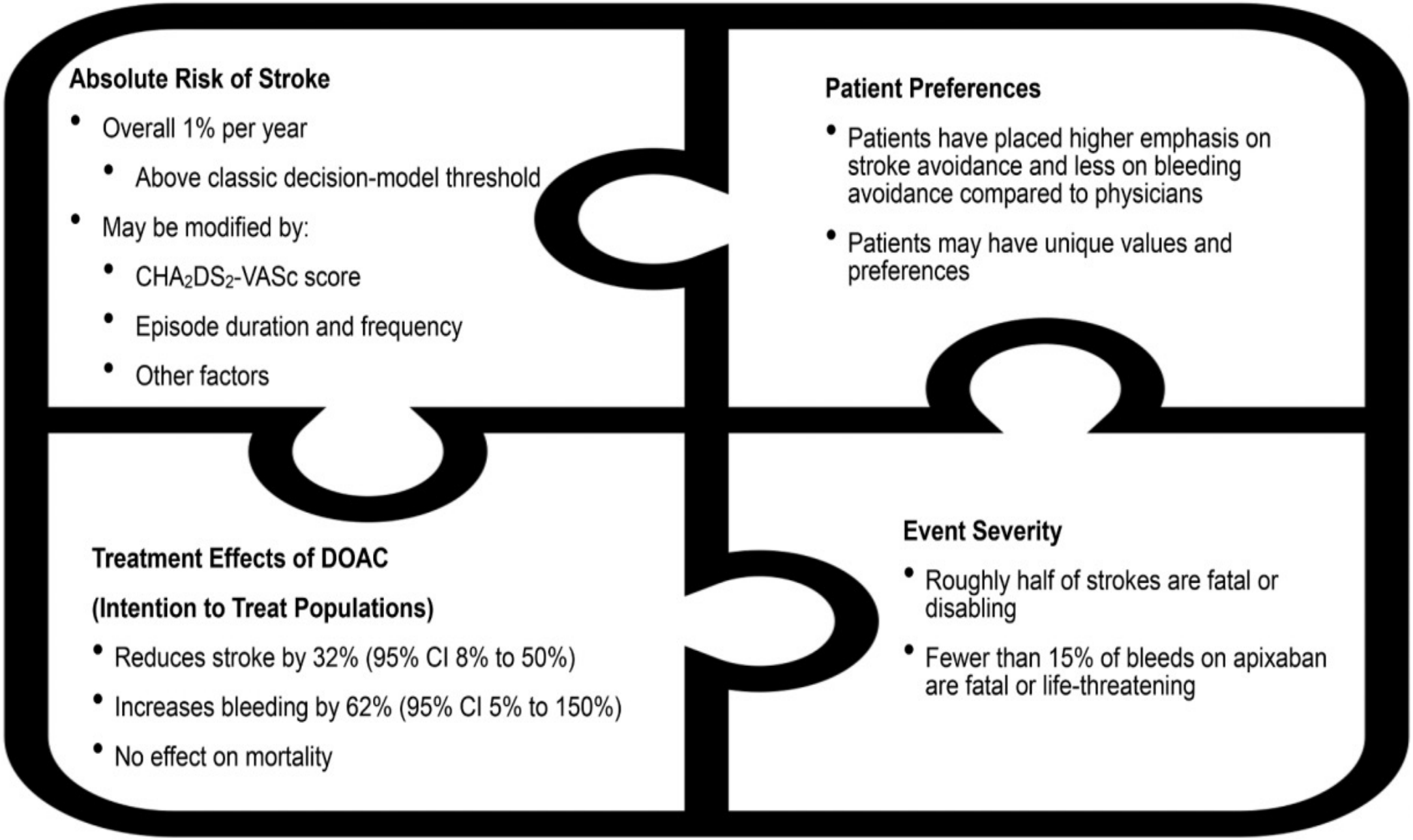


Conclusion

Anticoagulation in patients with prior stroke or TIA and device-detected AF reduces any stroke recurrence but increases major bleeding risk without raising hemorrhagic stroke incidence.

Abbreviations:
RCT: randomized-controlled clinical trials
TIA: transient ischemic attack
AF: atrial fibrillation
AC: anticoagulation
RR: risk ratio
CI: confidence interval

Palaiodimou, L., et al. European Stroke Journal, 2025 tsivgoulisgiorg@yahoo.gr doi.org/10.1177_23969873251334278



Patel S & Ruff Circulation. 2024;149:989–992. DOI: 10.1161/CIRCULATIONAHA.123.067919

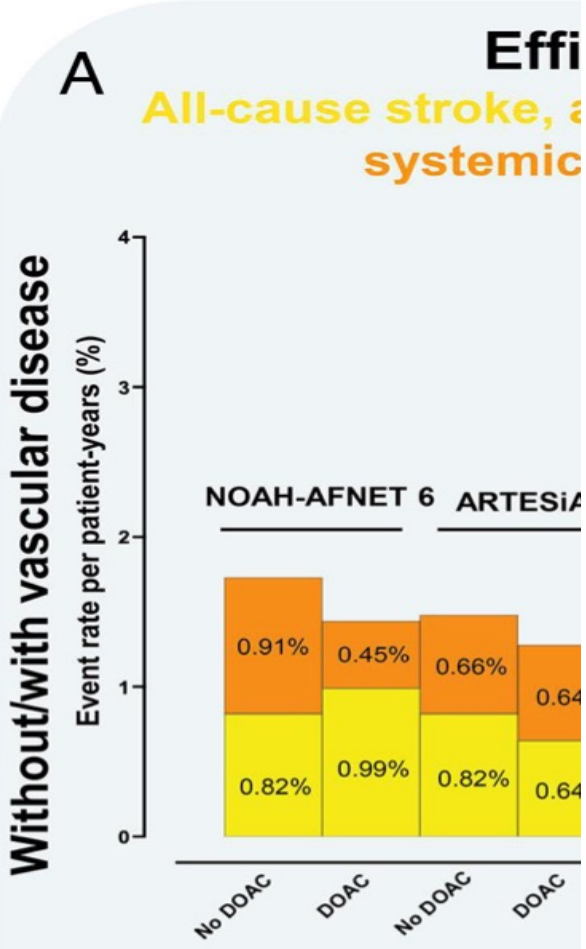
Atrial Fibrillation Management in 2021: An Updated Comparison of the Current CCS/CHRS, ESC, and AHA/ACC/HRS Guidelines

Anticoagulation in Special Circumstances

Indication	2020 CCS/CHRS	2020 ESC	2019 AHA/ACC/HRS
Device-detected AF	▪ OAC reasonable in patients ≥65 years or $CHADS_2$ score ≥1 with subclinical AF >24 hr (**Weak Recommendation**).	▪ No specific recommendations.	▪ No specific recommendations.
Elderly	▪ OAC should be prescribed for most frail elderly patients with AF (**Strong Recommendation**).	▪ No specific recommendations.	▪ No specific recommendations.

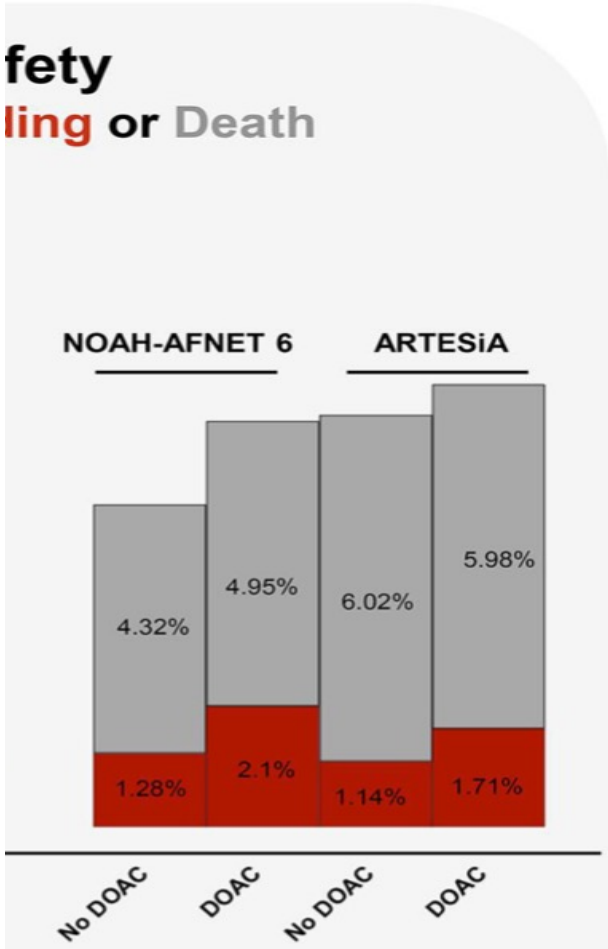
Can J Cardiol 2021 Jun 26;S0828-282X(21)00313-5.

Anticoagulation in patients with low- burden atrial fibrillation: new evidence focussing on device- detected AF



BOX 1 SUMMARY OF THE RECENT EVIDENCE THAT CAN HELP TO ADVISE PATIENTS WITH DEVICE-DETECTED ATRIAL FIBRILLATION (AF) ON THE USE OF ANTICOAGULATION THERAPY

- ⇒ AF burden modulates stroke risk, and lowering AF burden can lower the risk of stroke in patients with AF
- ⇒ The rate of stroke is low without anticoagulation in patients with device-detected AF and clinical stroke risk factors. Based on a combined subanalysis of Non-Vitamin K Antagonist Oral Anticoagulants in Patients with Atrial High Rate Episodes and Apixaban for the Reduction of Thromboembolism in Patients With Device-Detected Subclinical Atrial Fibrillation, patients with device-detected AF without vascular disease are probably best managed without antithrombotic therapy
- ⇒ In patients with device-detected AF and vascular disease, anticoagulation can slightly reduce thromboembolic events with an increased risk of bleeding that may be acceptable in some patients. Shared decision-making, potentially also considering the individual AF burden, seems justified in these patients.



Becher N, et al. Heart 2025;0:1–5.

Atrial fibrillation burden: a new outcome predictor and therapeutic target

Becher N, et al. EHJ (2024) 45, 2824–2838

Atrial fibrillation burden: a paradigm shift

Current classification of atrial fibrillation

Imprecise patterns

- Device-detected
- Paroxysmal
- Persistent
- Long-standing persistent
- Permanent

Atrial fibrillation burden-based quantitative classification of atrial fibrillation

AF burden quantification

Precise

Duration
Frequency
Distribution

Loop recorder

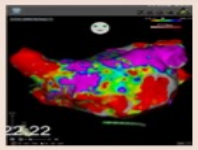
Smart watches

Cardiac implantable electronic devices

ECG patch

Interact with

Atrial substrate and cardiovascular comorbidities



- Atrial cardiomyopathy
- Acute and chronic exposure to stressors
- Age, risk factors, and comorbidities

Refined risk prediction

- Stroke, systemic embolism
- Heart failure
- Hospitalization
- Dementia
- Quality of life

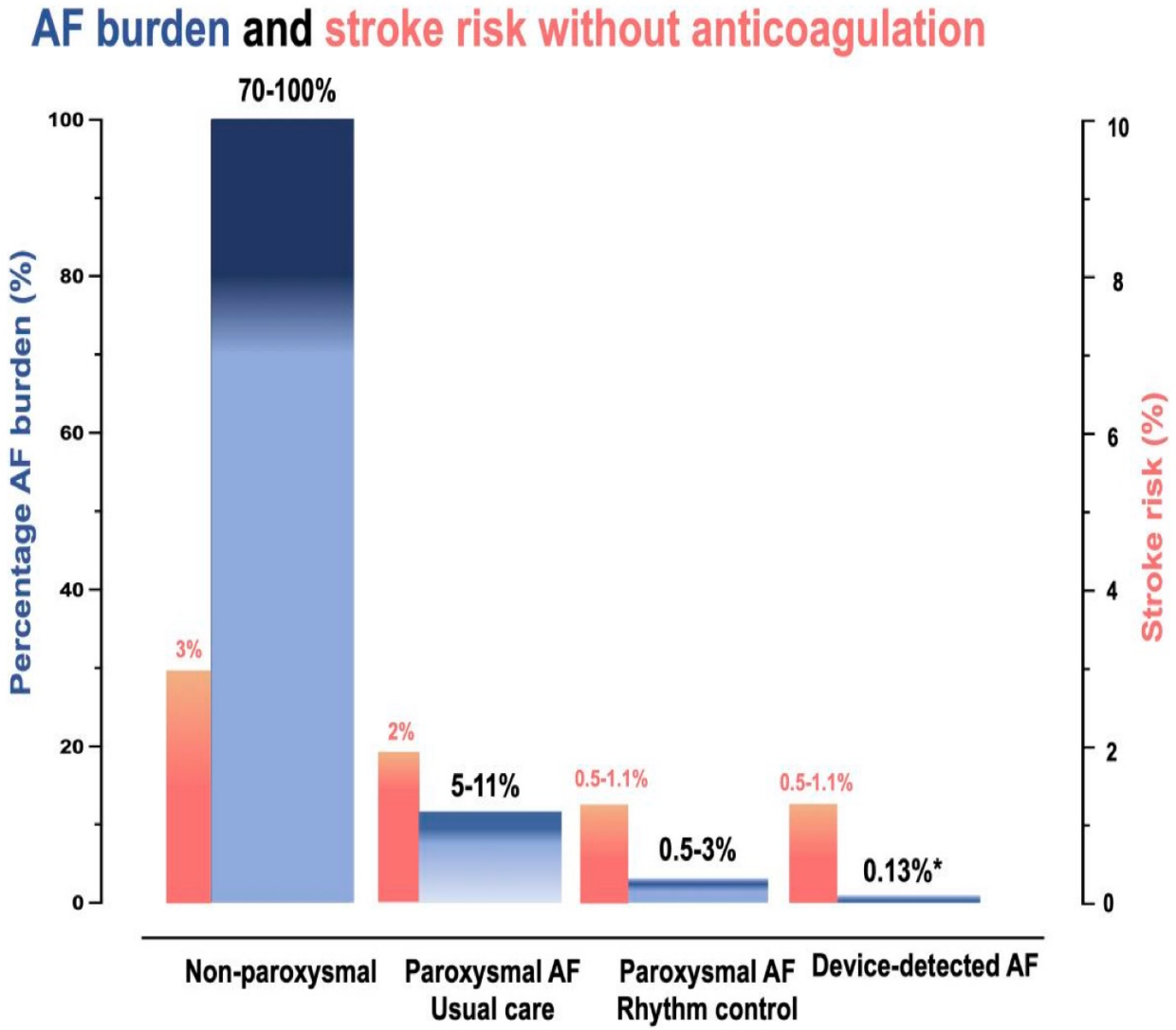
Refined therapy selection

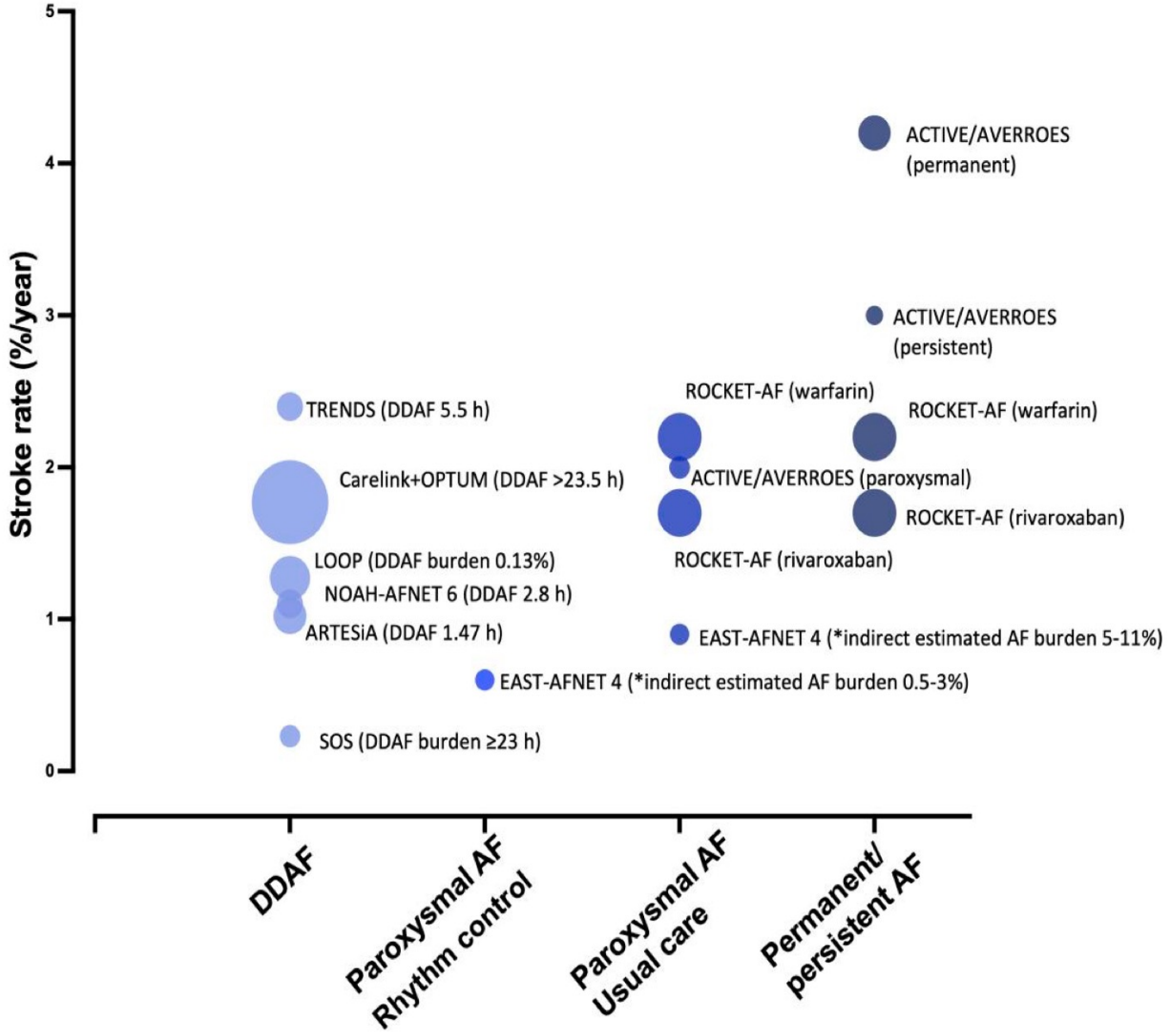
- Rhythm control/ablation
- Antiarrhythmic drugs
- Oral anticoagulation
- Follow-up visits
- Symptom control
- Quality of life

Refined clinical research

- Enrolment criteria
- Quantifiable intermediate outcomes

Atrial fibrillation burden: a new outcome predictor and therapeutic target

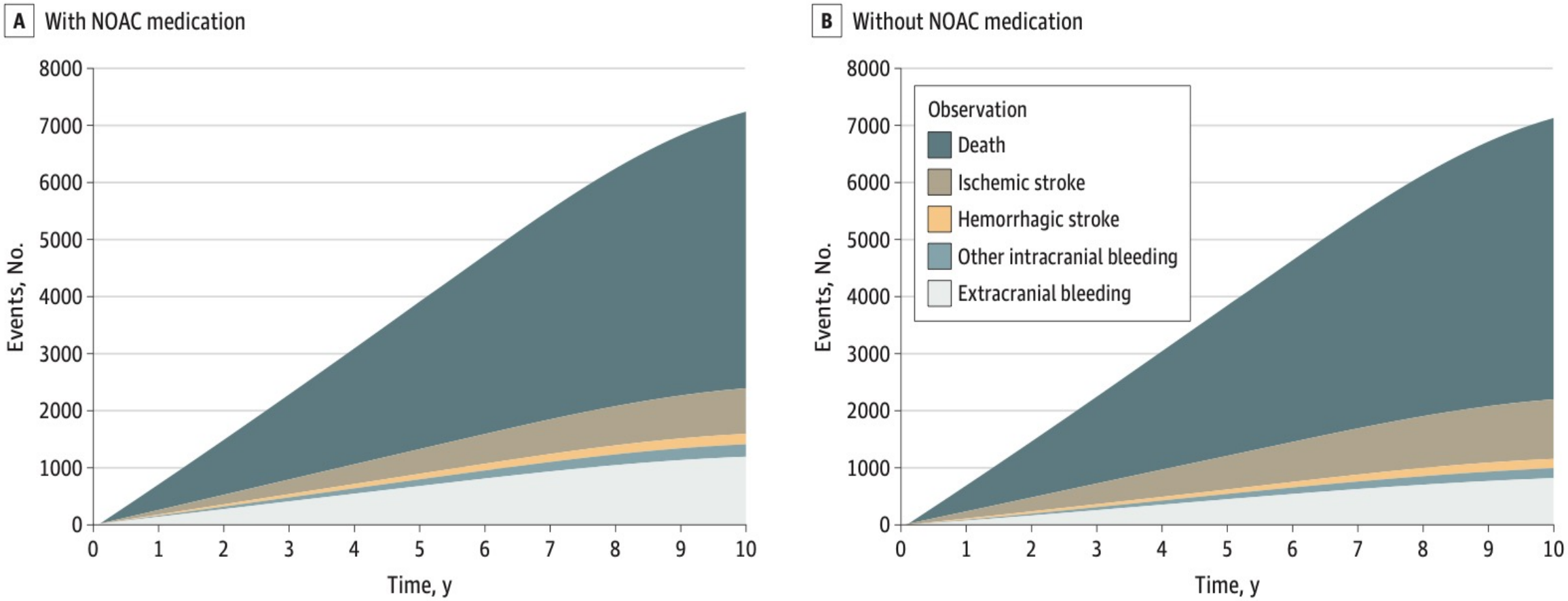




Becher N, et al. European Heart Journal (2024) 45, 2824–2838

Net Benefit of Anticoagulation in Subclinical Device-Detected Atrial Fibrillation

Incidence of Different Outcome Events During the 10-Year Simulation



JAMA Network Open. 2025;8(5):e258461. doi:10.1001/jamanetworkopen.2025.8461

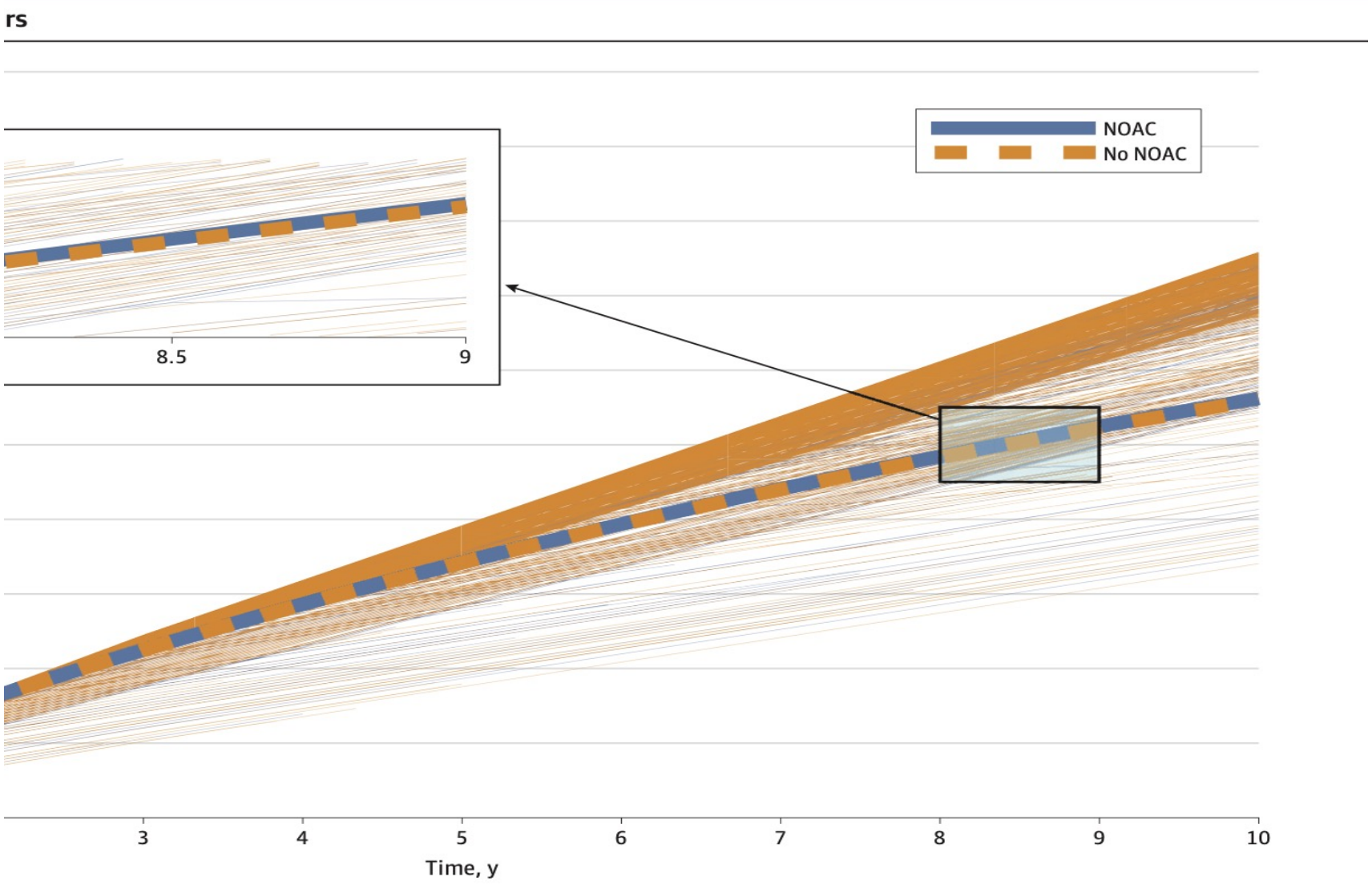
Net Benefit of Anticoagulation in Subclinical Device-Detected Atrial Fibrillation

Key Points

Question Does anticoagulation provide a net benefit in patients with device-detected subclinical atrial fibrillation?

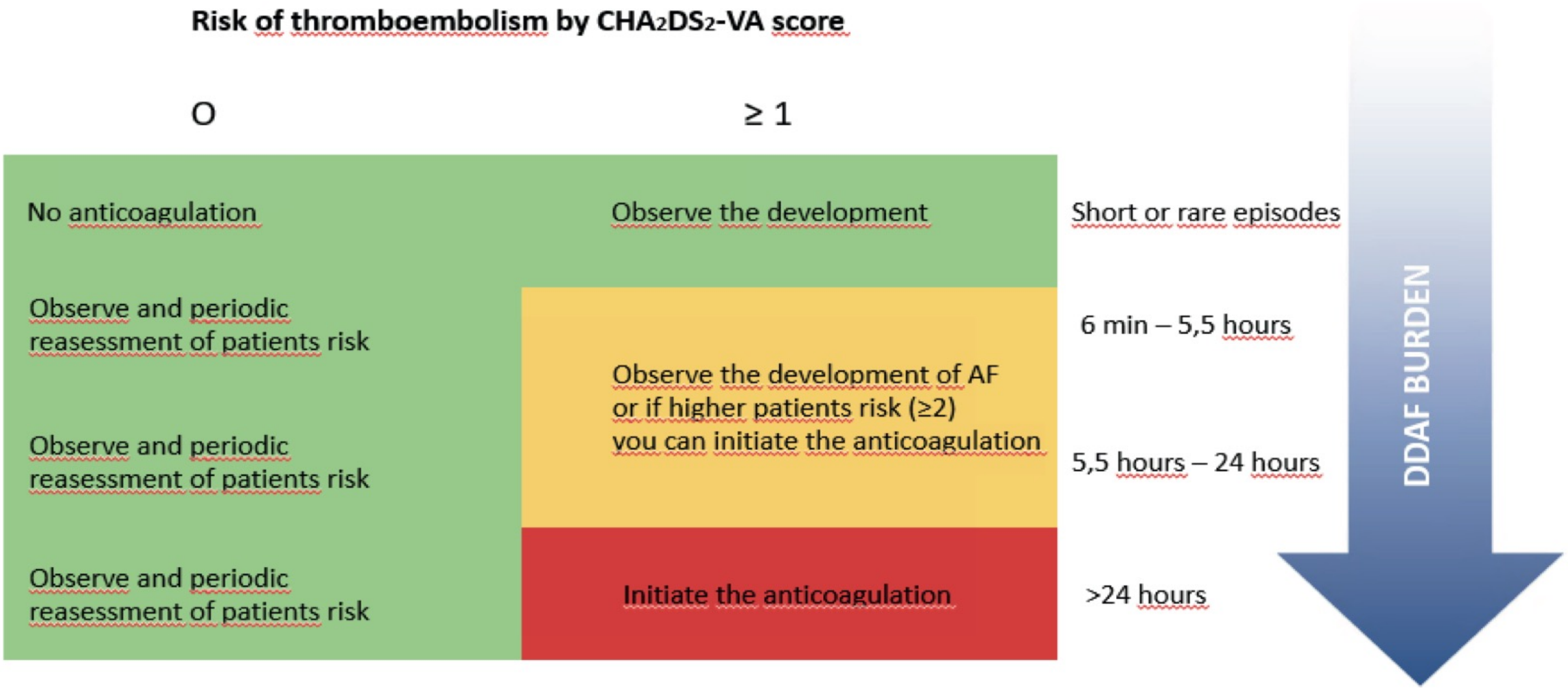
Findings In this analytical model study, nonvitamin K antagonist oral anticoagulant (NOAC) therapy in patients with subclinical atrial fibrillation resulted in a net benefit of approximately 1 additional week of quality-adjusted life per patient. When uncertainty in treatment effects was considered, there was only a 66% probability that NOAC treatment would result in more quality-adjusted life than withholding treatment.

Meaning These findings suggest that net benefit of anticoagulation for device-detected subclinical atrial fibrillation is uncertain, and the effect size is not clinically meaningful.



letwork Open. 2025;8(5):e258461. doi:10.1001/jamanetworkopen.2025.8461

Atrial fibrillation detected by cardiac implantable electronic devices



Joglar JA et al. Circulation. 2024;149(1):e1-e156.

Device-Detected AF: OAC, Nothing, or Call a Friend… More Information

- Cryptogenic Stroke / ESUS: No Evidence OAC provides any benefit

- DDAF-PM/ICDs: Depends on several factors CHADASVASC >5? AF Burden. Overall, no net clinical benefit in general.

- DDAF-Wearables/Loop Recorders: More information please!