ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

A szívritmuszavarok szerepe az intracerebralis kiserek keringési zavarában: az ocularis stroke és a szívritmuszavarok kapcsolata, differenciál diagnosztika, korszerű kezelés

Dr. Polgár Balázs

2026.05.15.

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

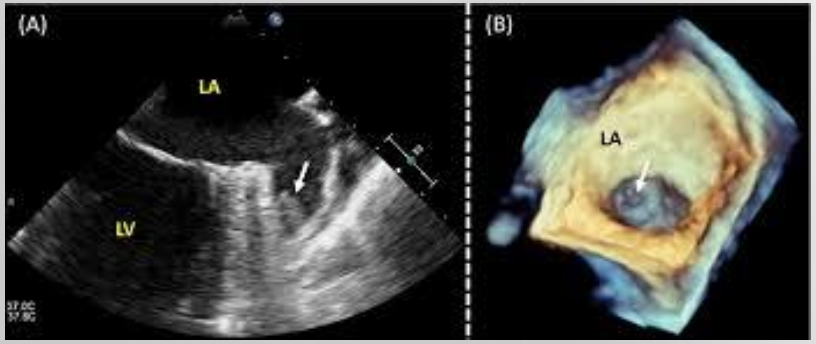
Miről lesz szó?

- Afib és stroke, ocularis stroke kapcsolata
- Afib diagnosztika / screening
- Afib thromboembolia profilaxis lehetőségei
- Stroke megelőzés – vérzés balance

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Pitvarfibrilláció

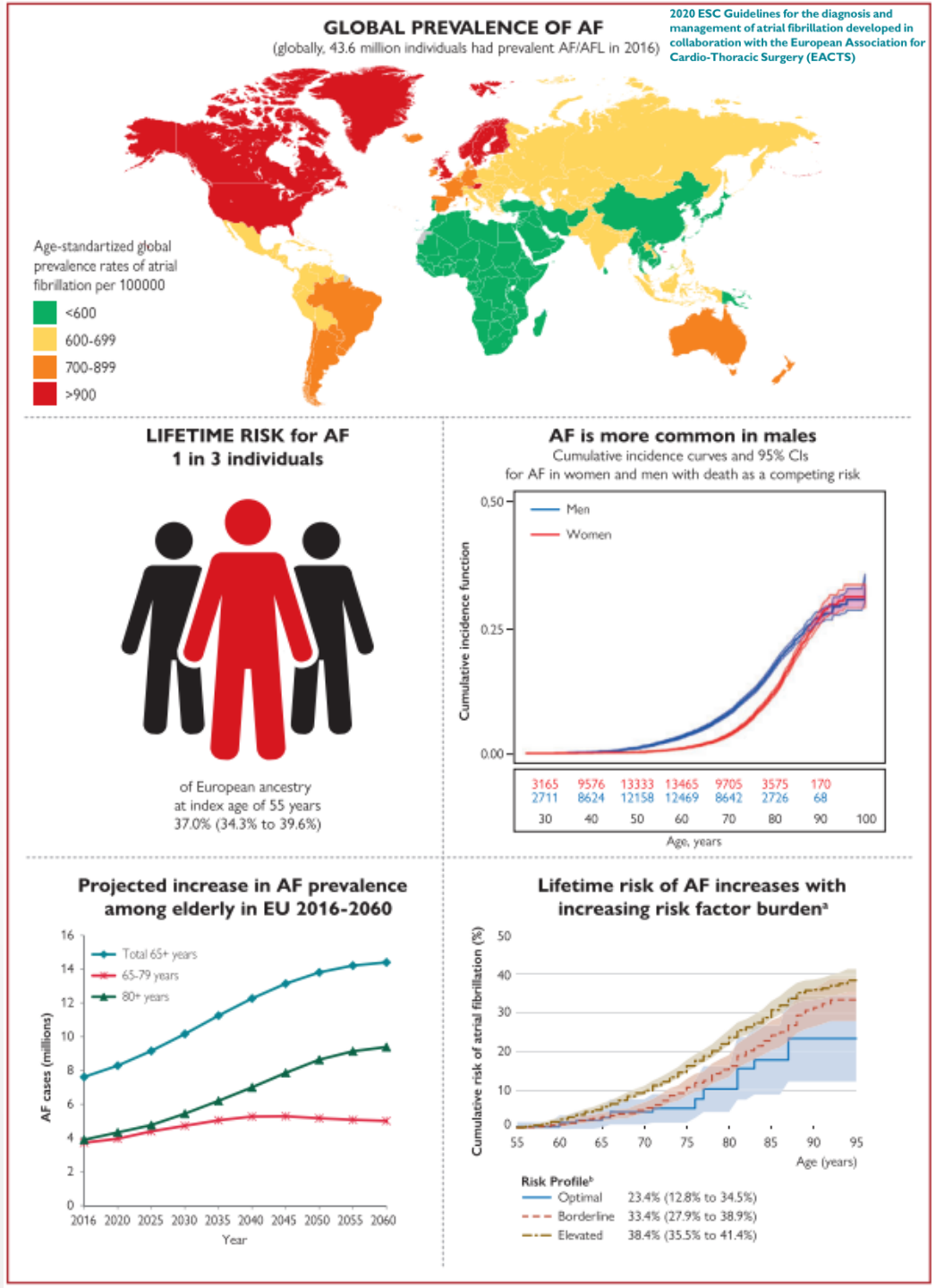
- a leggyakoribb ritmuszavar, prevalencia 3-6%
- Magyarországon ~300 000 embert érint
- az életkor előrehaladtával nő a gyakorisága
- az egyik legsúlyosabb szövődménye a **stroke**



- az esetek 92%-ában a **bal pitvari fülcsé**ben keletkezik a **thrombus**!

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

Tomcsányi, János és Bózsik, Béla és Rokszin, György és Abonyi-Tóth, Zsolt és Katona, Lajos (2012) *A pitvarfibrilláció prevalenciája Magyarországon = The Prevalence of Atrial Fibrillation in Hungary.* ORVOSI HETILAP, 153 (9). pp. 339-342. ISSN 0030-6002 (nyomtatott); 1788-6120 (elektronikus)



ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

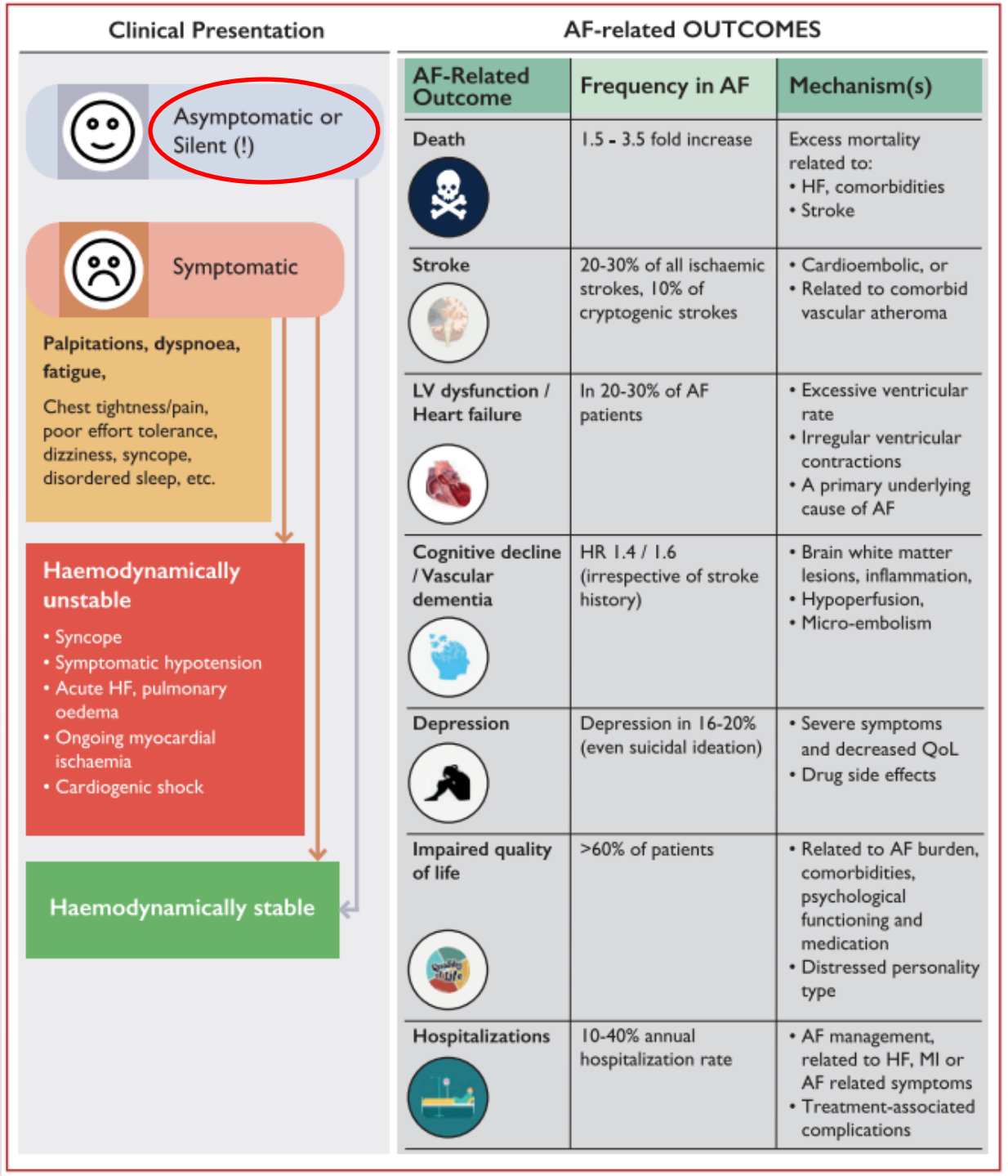
27%

ESC European Society of Cardiology
European Journal of Preventive Cardiology (2025) **00**, 1–12
https://doi.org/10.1093/eurjpc/zwaf138

FULL RESEARCH PAPER
Arrhythmias

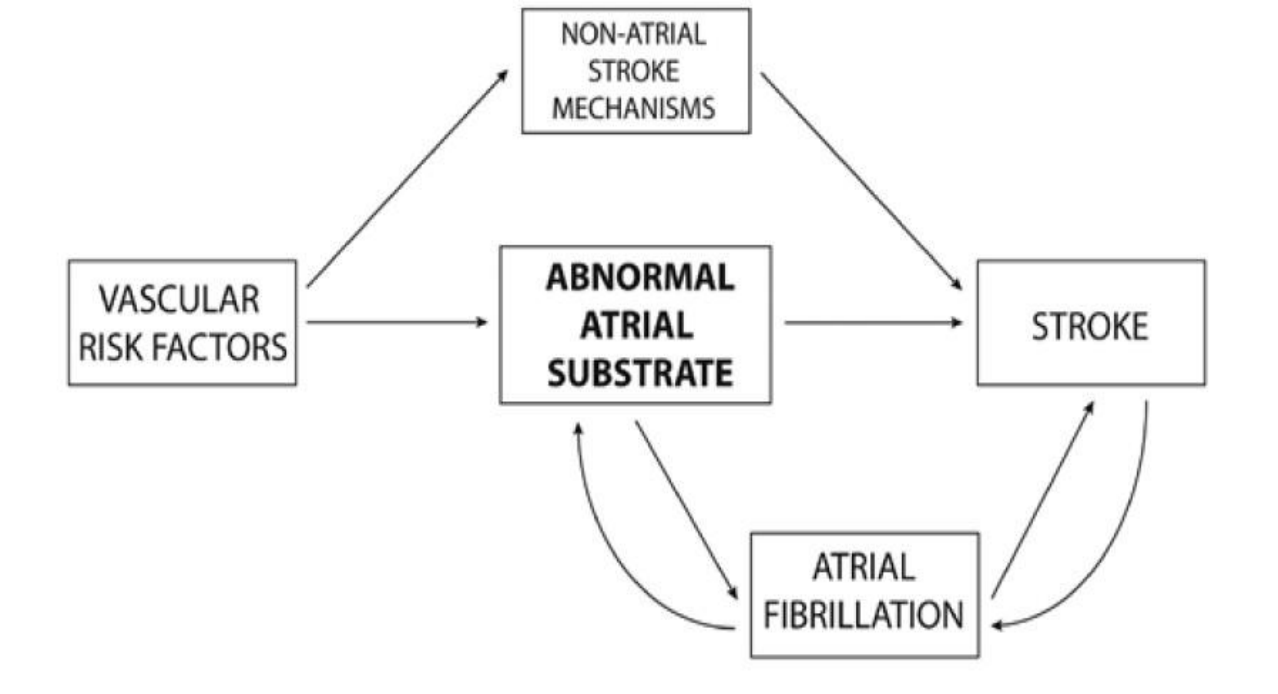
Prevalence of asymptomatic atrial fibrillation and risk factors associated with asymptomatic status: a systematic review and meta-analysis

Konstantinos Pamporis [1,2,3]*, Paschalis Karakasis [2,4], Marios Sagris [1], Panagiotis Theofilis [1], Nikias Milaras [1], Antonia Pantelidaki[3], Iordanis Mourouzis [3], Nikolaos Fragakis [4], Konstantinos Vlachos [5,6], Athanasios Kordalis[1], and Dimitrios Tsiachris[1]



ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Pitvarfibrilláció (PF) és stroke
A PF az ok vagy csak marker?

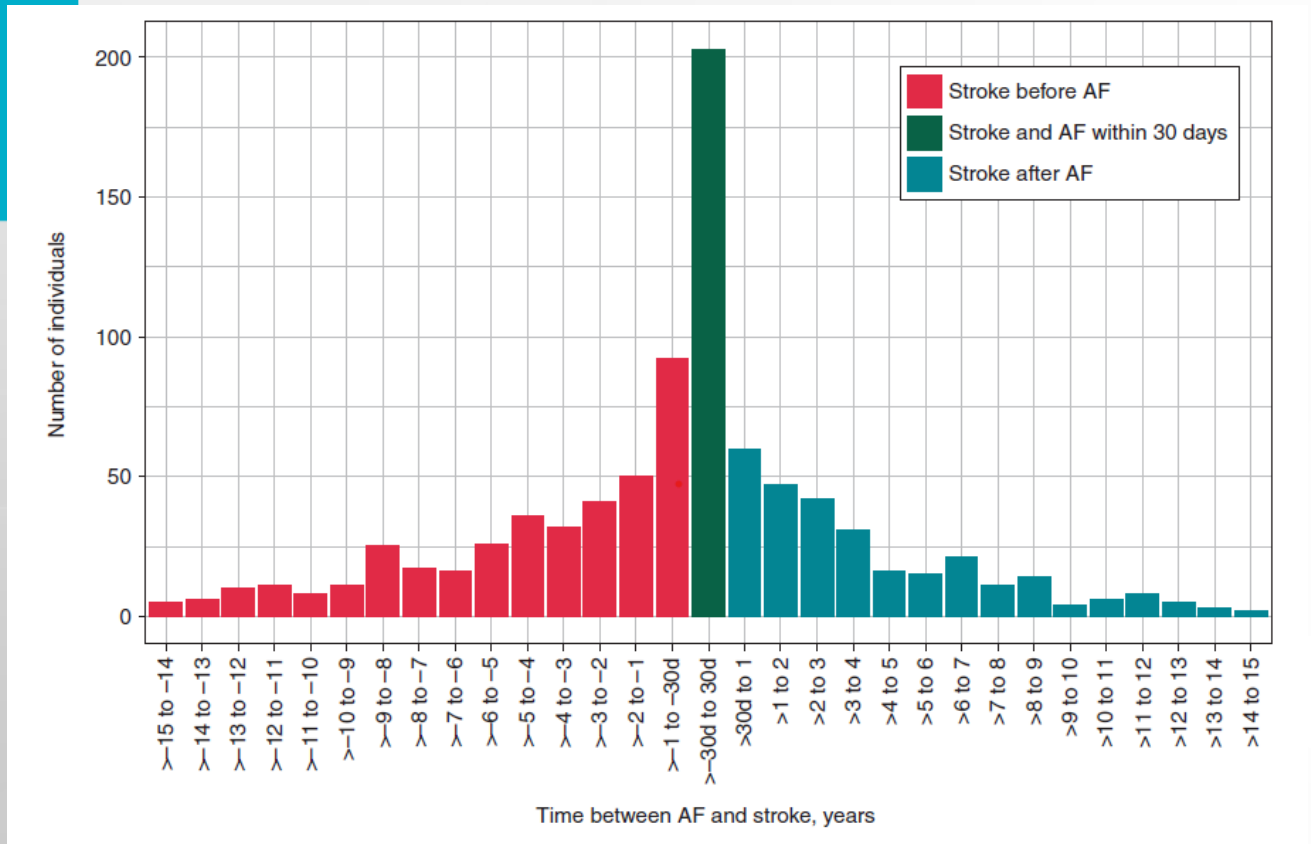


Rizikó faktor

Direkt ok-okozati összefüggés

Rizikó marker

Csupán azonosítja a magas vascularis rizikójú egyéneket

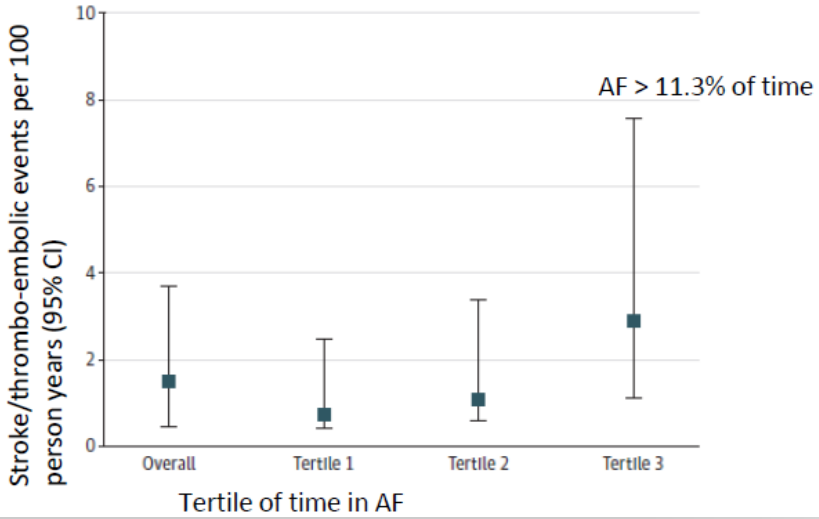


ESC European Society of Cardiology
Europace (2020) 22, 522–529
doi:10.1093/europace/euz312

CLINICAL RESEARCH
Atrial fibrillation

Temporal relations between atrial fibrillation and ischaemic stroke and their prognostic impact on mortality

Stephan Camen [1,2], Francisco M. Ojeda[1], Teemu Niiranen[3,4], Francesco Gianfagna[5,6], Julie K. Vishram-Nielsen[7,8], Simona Costanzo[9], Stefan Söderberg[10], Erkki Vartiainen[3], Maria Benedetta Donati[9], Maja-Lisa Løchen[11], Gerard Pasterkamp[12], Christina Magnussen[1,2], Frank Kee[13], Pekka Jousilahti[3], Maria Hughes[13], Jukka Kontto[3], Ellisiv B. Mathiesen[14], Wolfgang Koenig[15,16,17], Tarja Palosaari[3], Stefan Blankenberg[1,2], Giovanni de Gaetano[9], Torben Jørgensen[7,18,19], Tanja Zeller[1,2], Kari Kuulasmaa[3], Allan Linneberg[7,20], Veikko Salomaa [3], Licia Iacoviello[5,9], and Renate B. Schnabel[1,2]*; on behalf of the BiomarCaRE consortium



KP-RHYTHM STUDY
JAMA Cardiol 2018;3:601-8

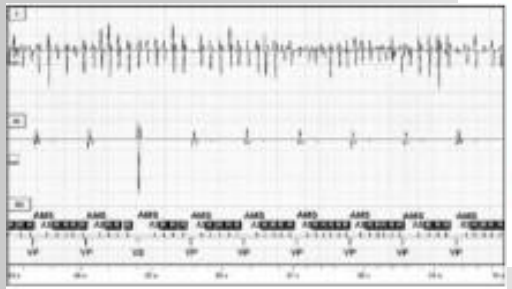
Within paroxysmal AF, stroke risk is associated with AF burden..

Population: 1,965 adults who underwent 2 weeks of ZIO patch continuous ECG monitoring and were not anticoagulated. Median CHA_2DS_2-VASc score = 3.

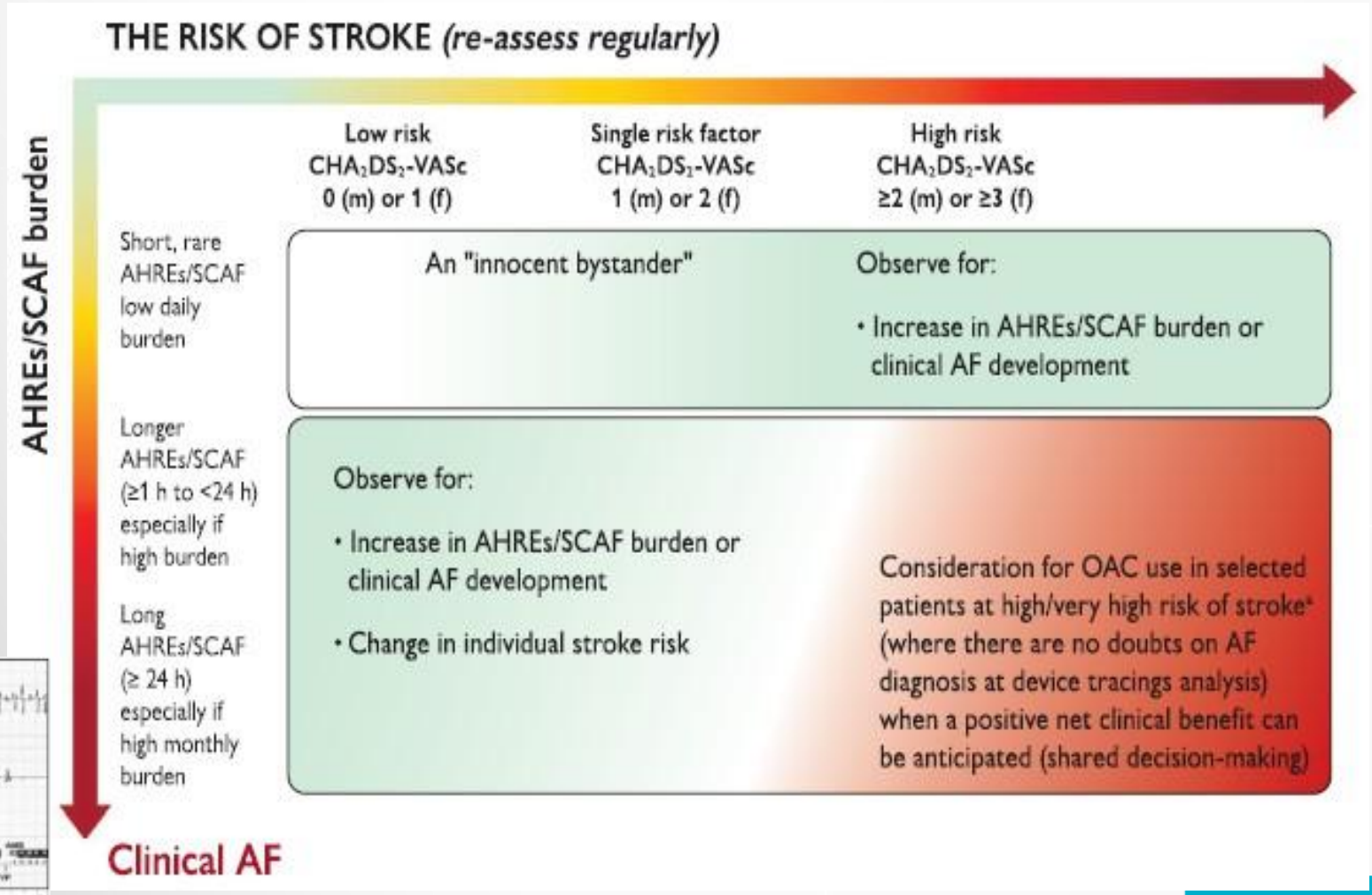
ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Emelkedett stroke rizikóval járó pitvarfibrilláció tartam / pitvarfibrilláció terhelés

Year	Study	# Pts	AF Burden	Hazard ratio for stroke event
2003	MOST	312	5 min	6.7 p = 0.020
2005	Capucci	725	> 24hrs AF	3.1 p = 0.044
2009	Botto	568	$CHADS_2$ + AF	.8% vs. 5% (6.25)
2009	TRENDS	2486	5.5 hours	2.4 p = 0.060
2012	Home Monitor	560	3.8 hours	9.4 p = 0.006
2012	ASSERT	2580	6 min	2.5 p = 0.008
2014	SOS	10,016	1 hour	2.11 p = 0.008



EGM showing AHRE



2020 ESC guideline

Milyen hosszú Afib tesz szükségessé AC ter.-t?

Bármilyen

> 6 perc

> 6 óra

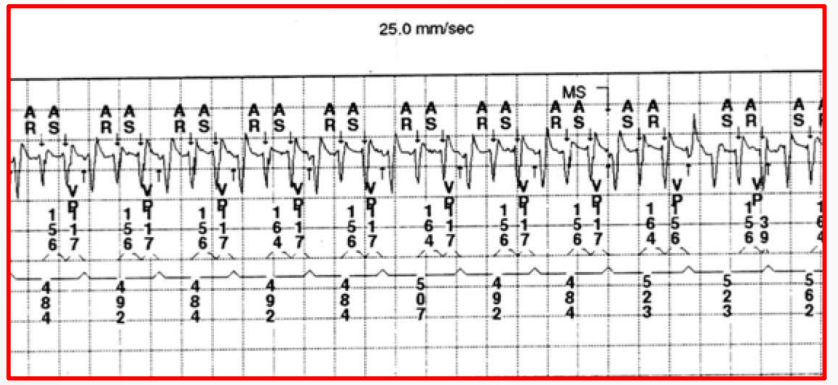
> 12 óra

> 24 óra

Nincs egyértelmű válasz.

Az alábbiak kombinációjával függhet össze:

- CHA_2DS_2VA score
- Afib terhelés (burden)
- Afib epizód időbeli közelsége



ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

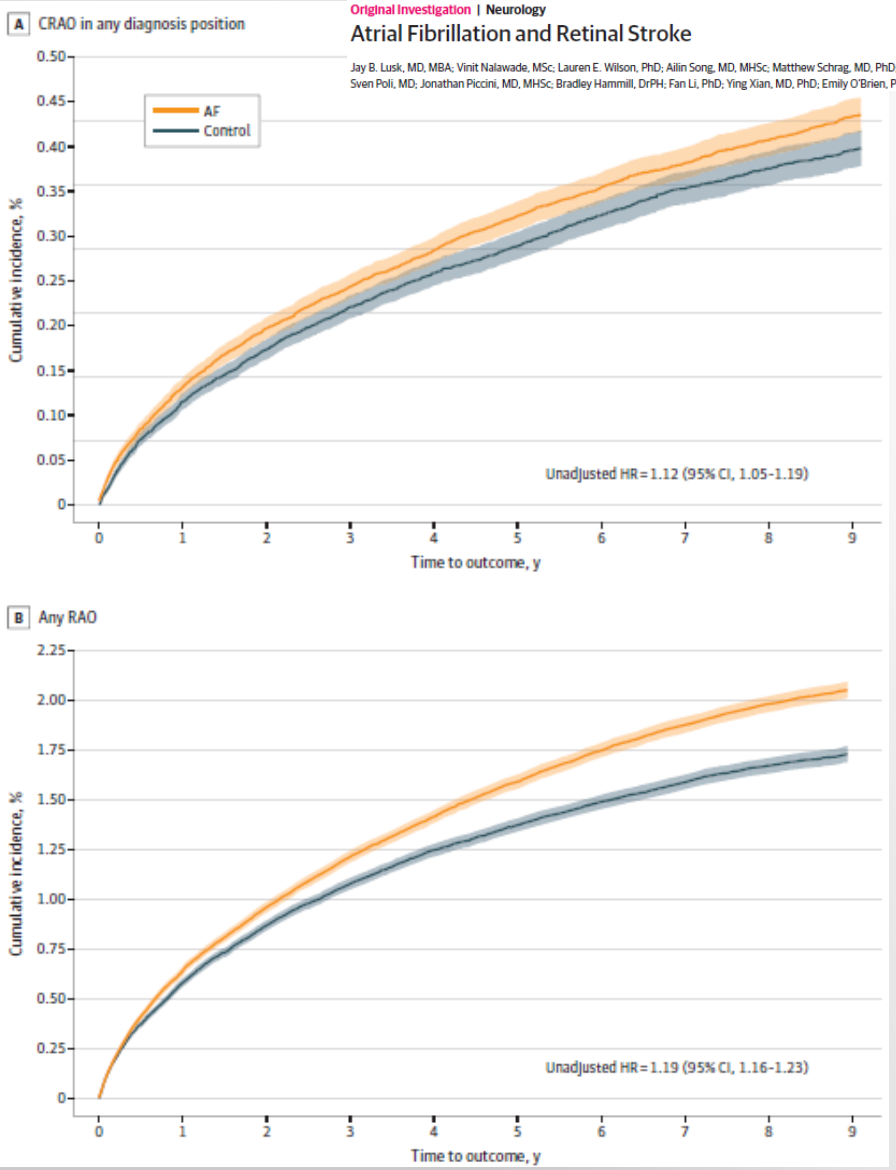
Az Afib és az ocularis stroke kapcsolata

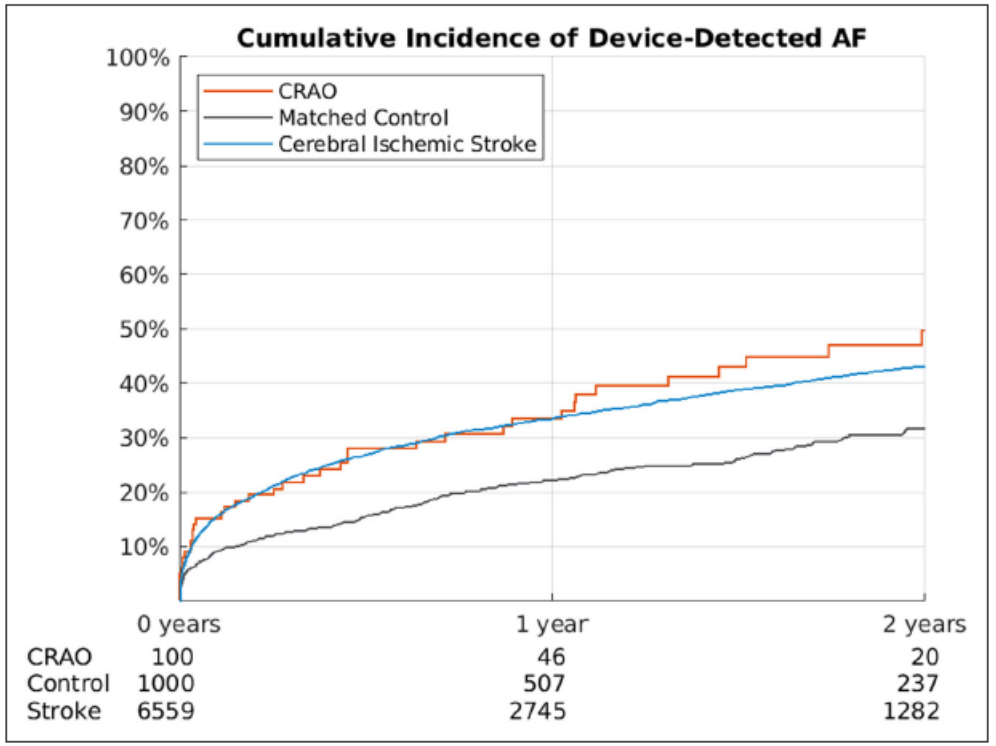
JAMA Network Open

Original Investigation | Neurology

Atrial Fibrillation and Retinal Stroke

Jay B. Lusk, MD, MBA; Vinit Nalawade, MSc; Lauren E. Wilson, PhD; Ailin Song, MD, MHSc; Matthew Schrag, MD, PhD; Valerie Biousse, MD; Oana Dumitrascu, MD; Sven Poli, MD; Jonathan Piccini, MD, MHSc; Bradley Hammill, DrPH; Fan Li, PhD; Ying Xian, MD, PhD; Emily O'Brien, PhD; Brian Mac Grory, MB BCh BAO, MRCP





Stroke

Check for updates

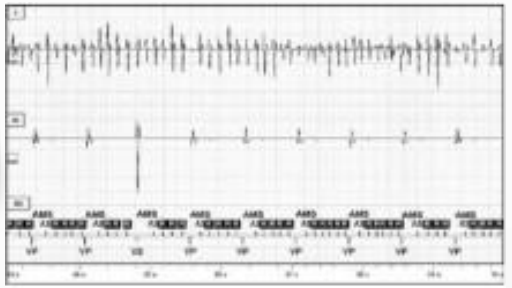
CLINICAL AND POPULATION SCIENCES

Detection of Atrial Fibrillation After Central Retinal Artery Occlusion

Brian Mac Grory, MB BCh BAO, MRCP; Sean R. Landman, PhD; Paul D. Ziegler, MS; Chantal J. Boisvert, MD; Shane P. Flood, MB BCh BAO; Christoph Stretz, MD; Tracy E. Madsen, MD, ScM; Michael E. Reznik, MD; Shawna Cutting, MD, MS; Elizabeth E. Moore, BS; Hunter Hewitt, BS; James B. Closser, BS; Jose Torres, MD; Patrick J. Lavin, MB BCh BAO, MRCPI; Karen L. Furie, MD, MPH; Ying Xian, MD, PhD; Wayne Feng, MD, MSc; Valérie Biousse, MD; Matthew Schrag, MD, PhD; Shadi Yaghi, MD

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

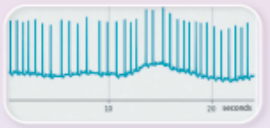
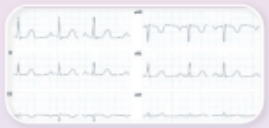
Afib diagnosztika / screening



EGM showing AHRE

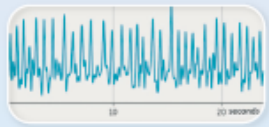
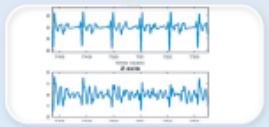
ECG-based methods

Diagnostic for AF if diagnosis is confirmed by a physician (Class I)

No of leads	1 or 2	6	>6
Tracing			

Non ECG-based methods

Not diagnostic (may be indicative for AF)

Method	Pulse palpation	Oscillometry	PPG		Mechano-cardiography	Smart speaker
			Contact	Contactless		Contactless
Tracing						

ESC

Tools for AF screening

(i) Pulse palpation[1045]

(ii) Use of artificial intelligence algorithms to identify patients at risk[1046]

(iii) ECG-based devices

(a) Conventional ECG devices

(1) Classic 12-lead ECG [1047]

(2) Holter monitoring (from 24 h to a week or more)[1048]

(3) Mobile cardiac telemetry (during hospitalization)[1049]

(4) Handheld devices[1050–1052]

(5) Wearable patches (up to 14 days)[1053–1067]

(6) Biotextiles (up to 30 days)[1068–1072]

(7) Smart devices (30 s)[1073–1091]

(b) Implantable loop recorders (3–5 years)[1092–1099] >96%

(iv) Non-ECG-based devices

(a) Photoplethysmography and automatic algorithms: contact (fingertip, smart device, band) and contactless (video)

(b) Oscillometry (blood pressure monitors that derive heart rhythm regularity algorithmically)[1107–1110]

(c) Mechanocardiography (accelerometers and gyroscopes to sense the mechanical activity of the heart)[1111]

(d) Contactless video plethysmography (through video monitoring)[1112–1115]

(e) Smart speakers (through the identification of abnormal heart rate patterns)[1116]

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Afib diagnosztika / screening

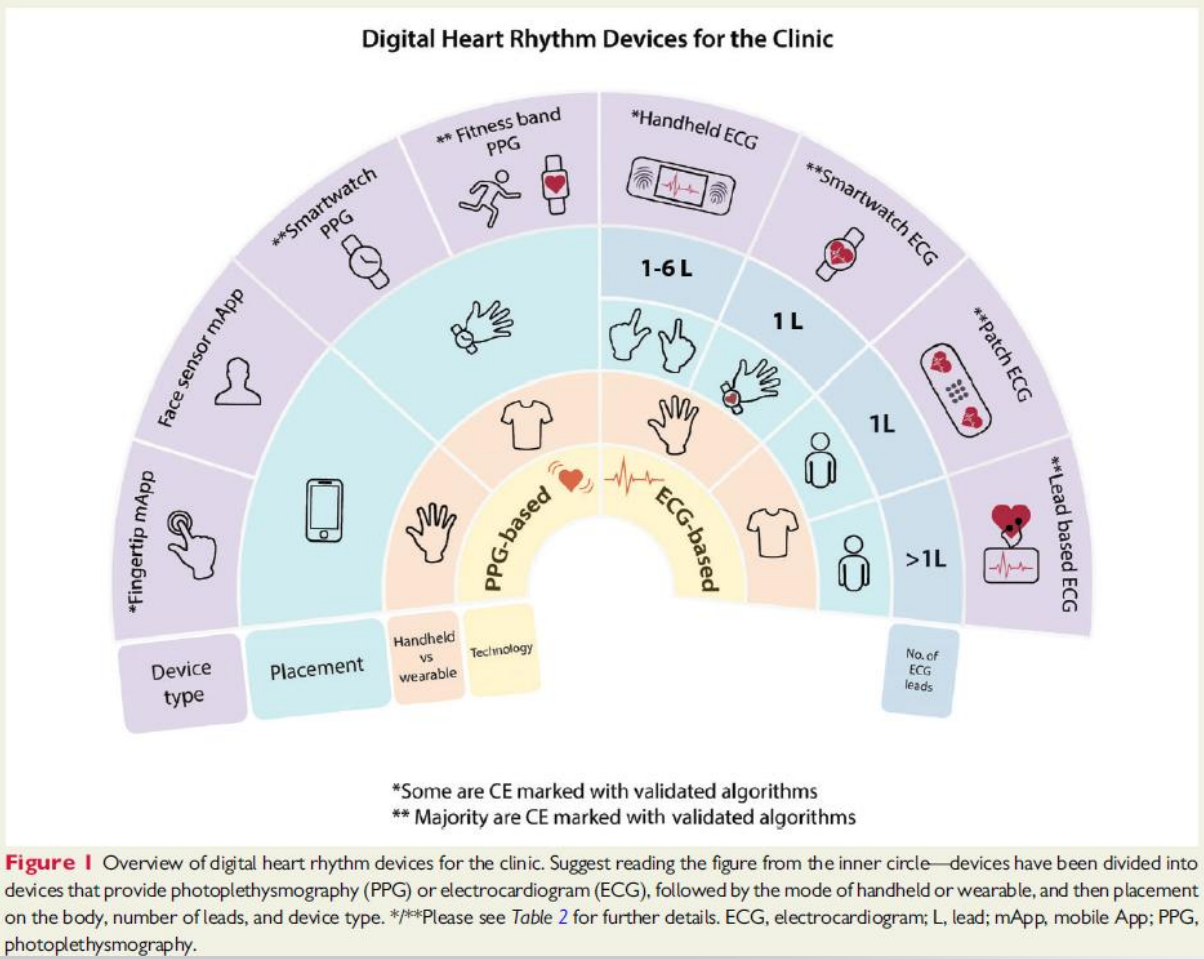
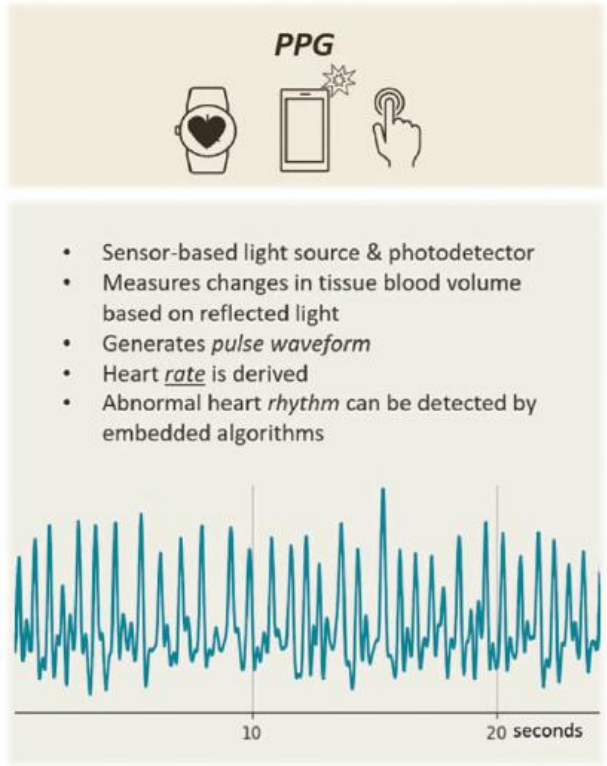
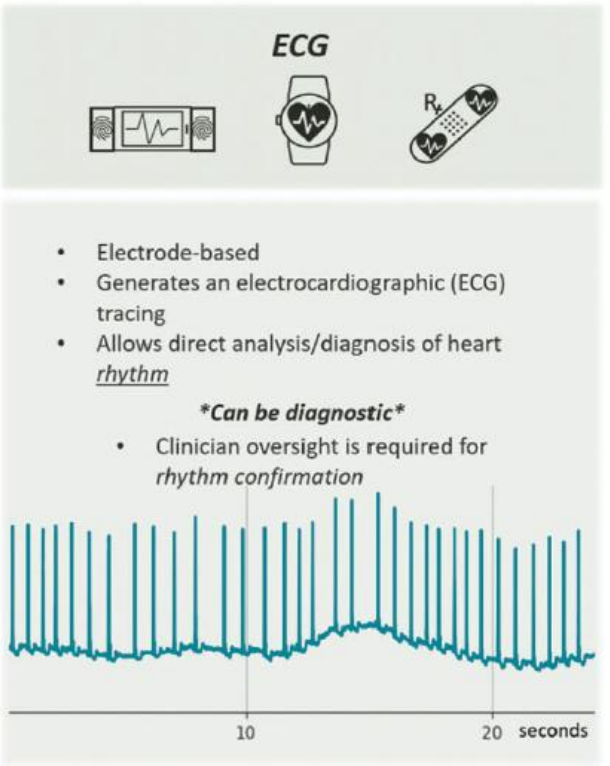


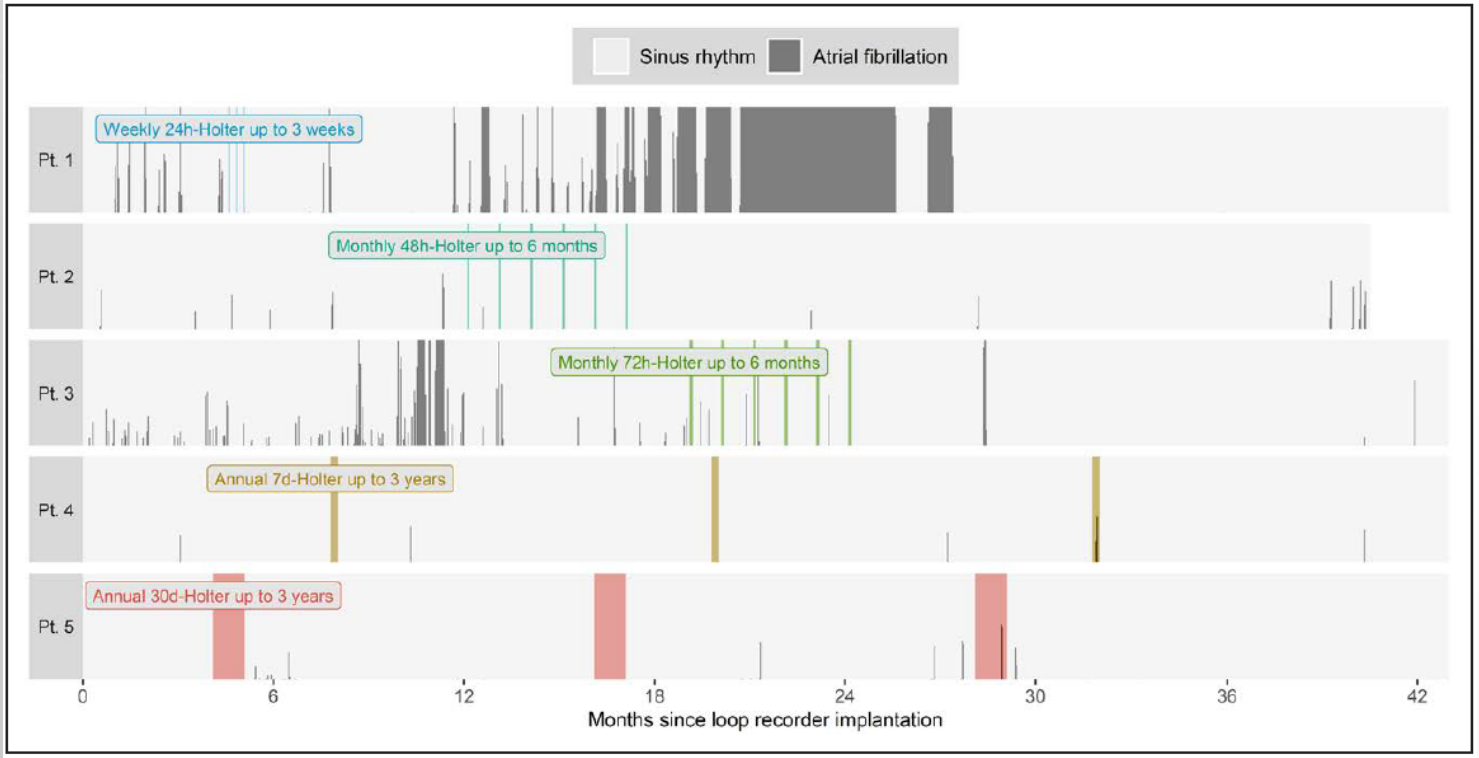
Figure 1 Overview of digital heart rhythm devices for the clinic. Suggest reading the figure from the inner circle—devices have been divided into devices that provide photoplethysmography (PPG) or electrocardiogram (ECG), followed by the mode of handheld or wearable, and then placement on the body, number of leads, and device type. */**Please see *Table 2* for further details. ECG, electrocardiogram; L, lead; mApp, mobile App; PPG, photoplethysmography.

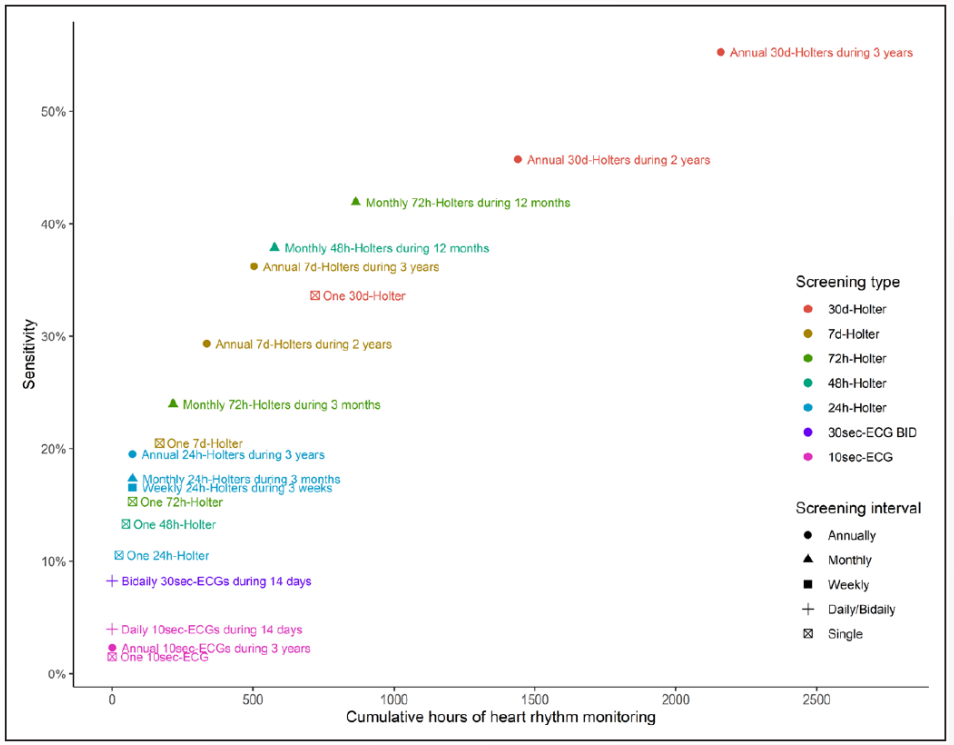




ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Afib diagnosztika





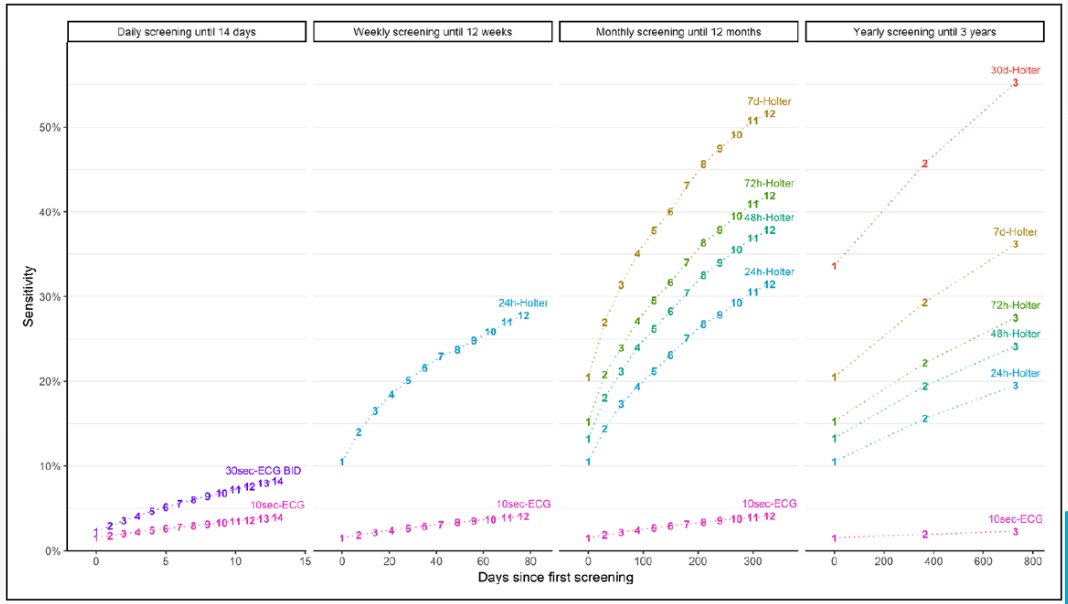
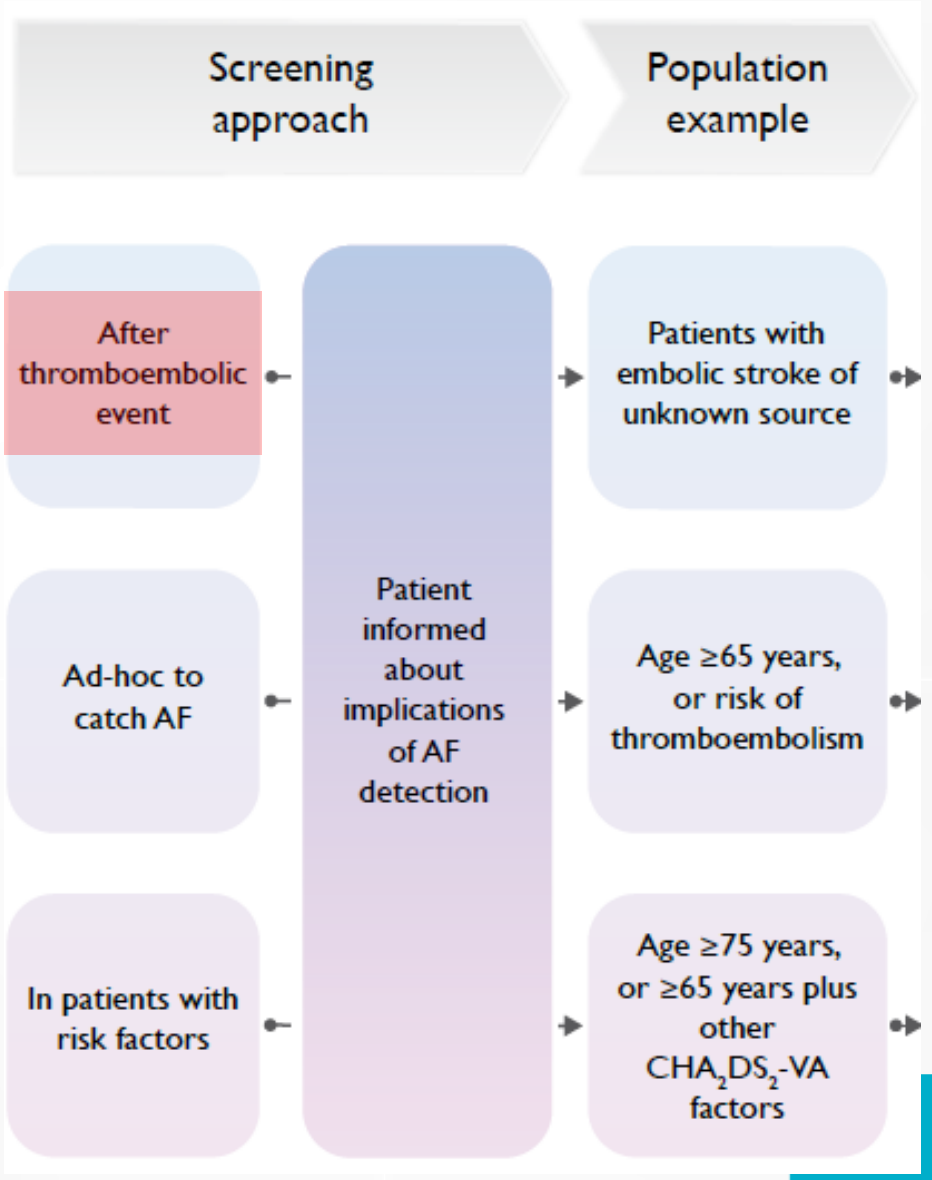


Figure 2. Sensitivity for detection of atrial fibrillation according to type and number of screenings.

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Afib diagnosztika / screening

Recommendations	Class[a]	Level[b]
Review of an ECG (12-lead, single, or multiple leads) by a physician is recommended to provide a definite diagnosis of AF and commence appropriate management.[1091,1121–1123,1125]	I	B
Routine heart rhythm assessment during healthcare contact is recommended in all individuals aged ≥65 years for earlier detection of AF.	I	C
Population-based screening for AF using a prolonged non-invasive ECG-based approach should be considered in individuals aged ≥75 years, or ≥65 years with additional CHA_2DS_2-VA risk factors to ensure earlier detection of AF.[6,1135–1137]	IIa	B

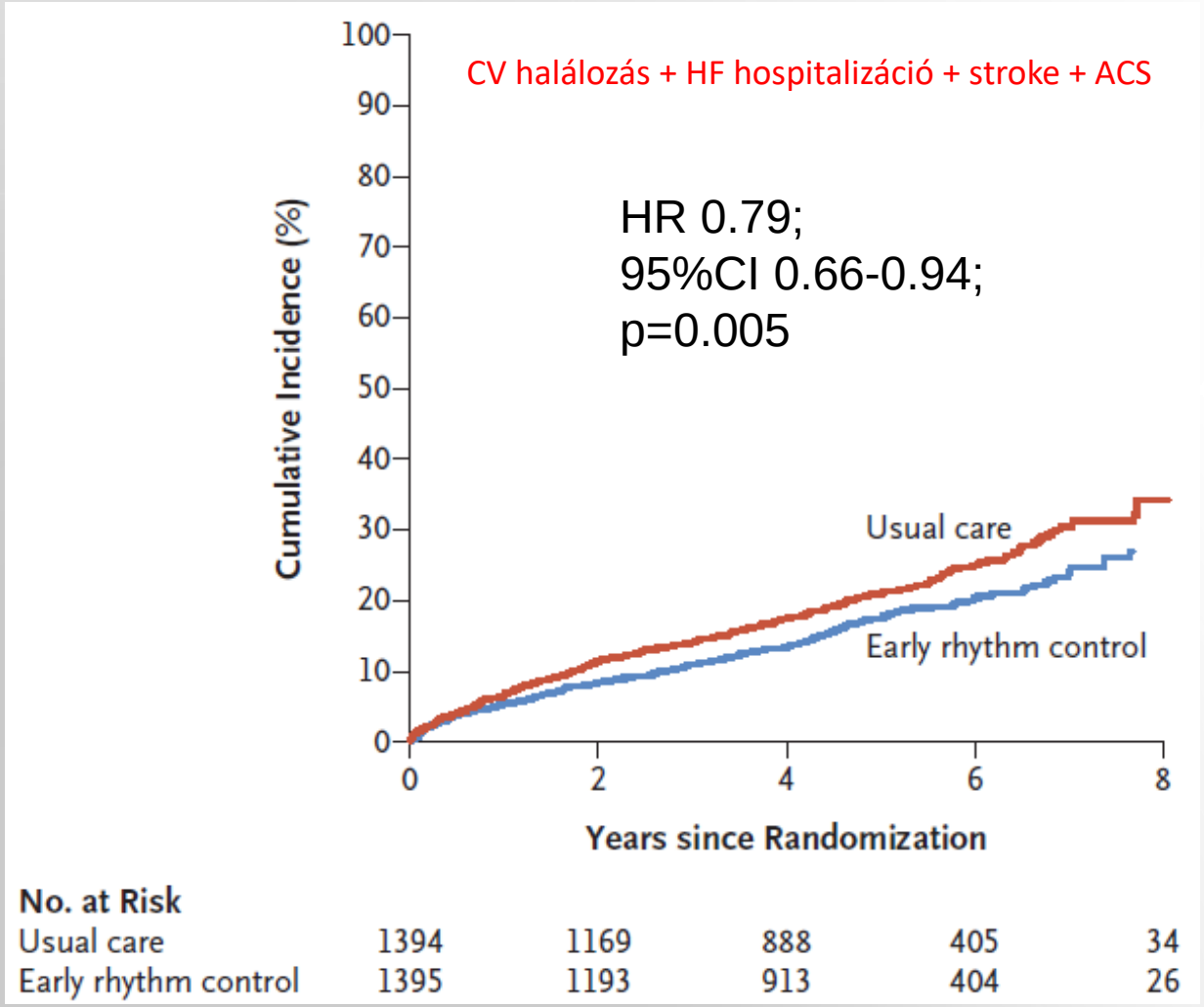


A thromboembolia megelőzés lehetőségei

- (Ritmus kontroll)
- OAC ter.
- Sebészi LAA zárás
- Eszközös LAA zárás

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Korai ritmus kontroll vs. frekvencia kontroll



The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 OCTOBER 1, 2020 VOL. 383 NO. 14

Early Rhythm-Control Therapy in Patients with Atrial Fibrillation

P. Kirchhof, A.J. Camm, A. Goette, A. Brandes, L. Eckardt, A. Elvan, T. Fetsch, I.C. van Gelder, D. Haase, L.M. Haegeli, F. Hamann, H. Heidbüchel, G. Hindricks, J. Kautzner, K.-H. Kuck, L. Mont, G.A. Ng, J. Rekosz, N. Schoen, U. Schotten, A. Suling, J. Taggeselle, S. Themistoclakis, E. Vettorazzi, P. Vardas, K. Wegscheider, S. Willems, H.J.G.M. Crijns, and G. Breithardt, for the EAST-AFNET 4 Trial Investigators*

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Ritmus kontroll: abláció vs. gyógyszer

Study	Reference	Patients (n)	Age, years	Type of AF	Previous use of AAD	Ablation technique	Repeat ablation in the ablation group	Crossed to ablation in the AAD group	AF free at 1 year	
									Ablation	AAD
Krittayaphong *et al.* 2003	Online	30	55 ± 10 (ablation) 47 ± 15 (AAD)	Paroxysmal, persistent	≥1[a]	PVI + LA lines + CTI ablation + RA lines	Not stated	Not stated	79%	40%
Wazni *et al.* 2005 (RAAFT)	134	70	53 ± 8 (ablation) 54 ± 8 (AAD)	Mainly paroxysmal	No	PVI	12%[b]	49%[c]	87%	37%
Stabile *et al.* 2005 (CACAF)[d]	Online	245	62 ± 9 (ablation) 62 ± 10 (AAD)	Paroxysmal, persistent	≥2	PVI + LA lines ± CTI ablation	No exact data	57%	56%	9%
Oral *et al.* 2006[e]	Online	245	57 ± 9	Persistent	≥1 (mean 2.1 ± 1.2)	CPVA	26% for AF; 6% for LA flutter	77%	74%	4%
Pappone *et al.* 2006 (APAF)	135	198	55 ± 10 (ablation) 57 ± 10 (AAD)	Paroxysmal	≥2 (mean 2 ± 1)	CPVA + CTI ablation	6% for AF; 3% for atrial tachycardia	42%	86%	22%
Jais *et al.* 2008 (A4 study)	133	112	51 ± 11	Paroxysmal	≥1	PVI ± LA lines ± CTI ablation	Mean 1.8 ± 0.8, median 2 per patient	63%	89%	23%
Forleo *et al.* 2008[f]	Online	70	63 ± 9 (ablation) 65 ± 6 (AAD)	Paroxysmal, persistent	≥1	PVI ± LA lines ± CTI ablation	Not stated	Not stated	80%	43%
Wilber *et al.* 2010 (Thermocool)[g]	96	167	55.5 (ablation) 56.1 (AAD)	Paroxysmal	≥1 (mean 1.3)[h]	PVI ± LA lines ± CFAEs ± CTI ablation ± RA lines	12.6% within 80 days after 1st procedure[i]	59%[c]	66%	16%
Packer *et al.* 2010 (STOP-AF)[j]	Online	245	56.7 (ablation) 56.4 (AAD)	Paroxysmal	≥1[b]	Cryo-PVI ± LA lines	19% within 90 days after 1st procedure	79%	69.9%	7.3%

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Abláció vs. stroke rizikó

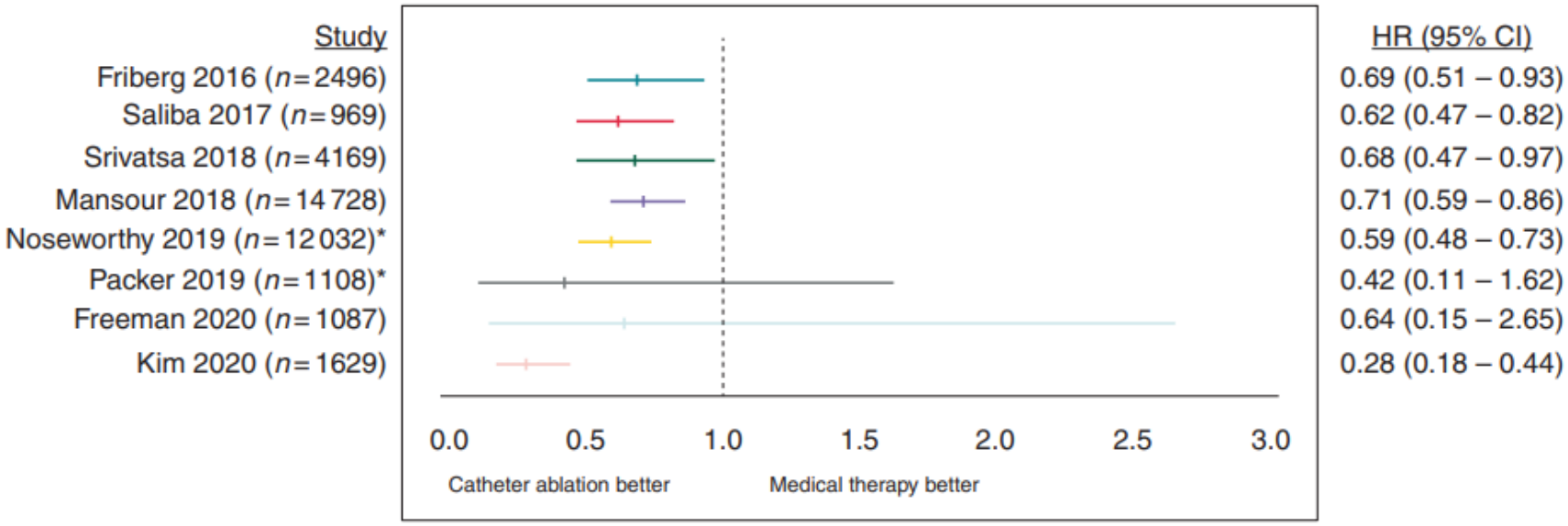


Figure 1 Graphical representation of the risk of stroke in patients with atrial fibrillation who underwent catheter ablation vs. medical therapy from various studies, with the number of patients who underwent catheter ablation in each.[5–7] *Unadjusted hazard ratio.

ESC European Society of Cardiology
Europace (2021) **23**, 489–490
doi:10.1093/europace/euaa299
EDITORIAL

Catheter ablation: the 'Pym Particles' of atrial fibrillation?

Wern Yew Ding and Dhiraj Gupta*
Department of Cardiac Electrophysiology, Liverpool Centre for Cardiovascular Science, University of Liverpool and Liverpool Heart & Chest Hospital, Liverpool L14 3PE, UK

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Thromboembolia megelőzés: OAC

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
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 anticoagulants are recommended in preference to VKAs to prevent ischaemic stroke and thromboembolism, except in patients with mechanical heart valves or moderate-to-severe mitral stenosis.[25–28,292–294]	I	A
A target INR of 2.0–3.0 is recommended for patients with AF prescribed a VKA for stroke prevention to ensure safety and effectiveness.[295–298]	I	B
Switching to a DOAC is recommended for eligible patients that have failed to maintain an adequate time in therapeutic range on a VKA (TTR <70%) to prevent thromboembolism and intracranial haemorrhage.[299–303]	I	B
Assessment and management of modifiable bleeding risk factors is recommended in all patients eligible for oral anticoagulation, as part of shared decision-making to ensure safety and prevent bleeding.[439–444]	I	B

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

Thromboembolia vs. vérzés rizikó

Table 8 CHA_2DS_2VASc score and stroke rate

(a) Risk factors for stroke and thrombo-embolism in non-valvular AF	
'Major' risk factors	**'Clinically relevant non-major' risk factors**
Previous stroke, TIA, or systemic embolism Age ≥75 years	Heart failure or moderate to severe LV systolic dysfunction (e.g. LV EF ≤40%) Hypertension - Diabetes mellitus Female sex - Age 65–74 years Vascular disease[a]

(b) Risk factor-based approach expressed as a point based scoring system, with the acronym CHA_2DS_2-VASc (Note: maximum score is 9 since age may contribute 0, 1, or 2 points)	
Risk factor	**Score**
Congestive heart failure/LV dysfunction	1
Hypertension	1
Age ≥75	2
Diabetes mellitus	1
Stroke/TIA/thrombo-embolism	2
Vascular disease[a]	1
Age 65–74	1
Sex category (i.e. female sex)	1
Maximum score	**9**

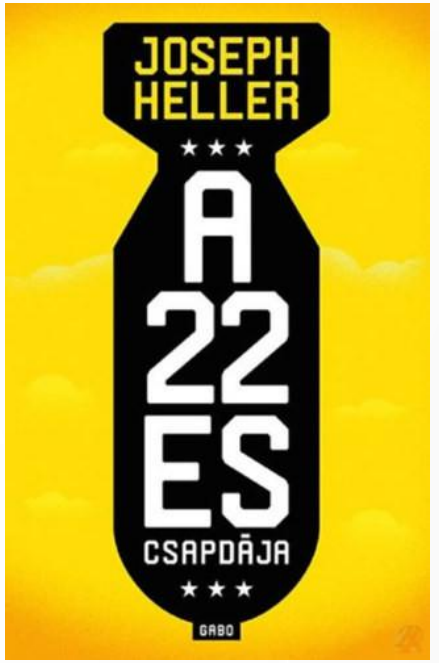
(c) Adjusted stroke rate according to CHA_2DS_2-VASc score

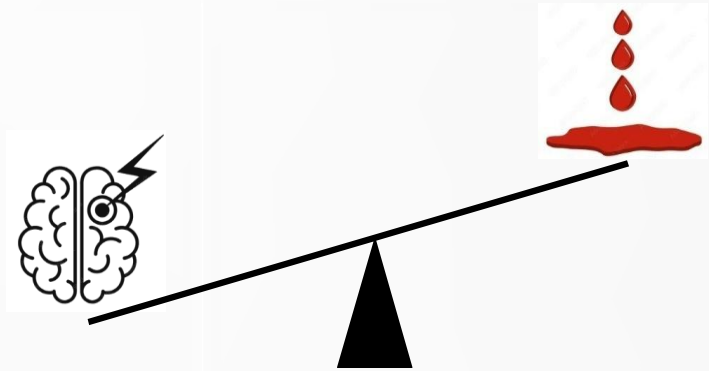
CHA_2DS_2-VASc score	Patients (n=7329)	Adjusted stroke rate (%/year)[b]
0	1	0%
1	422	1.3%
2	1230	2.2%
3	1730	3.2%
4	1718	4.0%
5	1159	6.7%
6	679	9.8%
7	294	9.6%
8	82	6.7%
9	14	15.2%

Table 10 Clinical characteristics comprising the HAS-BLED bleeding risk score

Letter	Clinical characteristic[a]	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age >65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

[a]Hypertension' is defined as systolic blood pressure >160 mmHg. 'Abnormal kidney function' is defined as the presence of chronic dialysis or renal transplantation or serum creatinine ≥200 μmol/L. 'Abnormal liver function' is defined as chronic hepatic disease (e.g. cirrhosis) or biochemical evidence of significant hepatic derangement (e.g. bilirubin >2 x upper limit of normal, in association with aspartate aminotransferase/alanine aminotransferase/alkaline phosphatase >3 x upper limit normal, etc.). 'Bleeding' refers to previous bleeding history and/or predisposition to bleeding, e.g. bleeding diathesis, anaemia, etc. 'Labile INRs' refers to unstable/high INRs or poor time in therapeutic range (e.g. <60%). Drugs/alcohol use refers to concomitant use of drugs, such as antiplatelet agents, non-steroidal anti-inflammatory drugs, or alcohol abuse, etc. INR = international normalized ratio. Adapted from Pisters *et al.*[60]

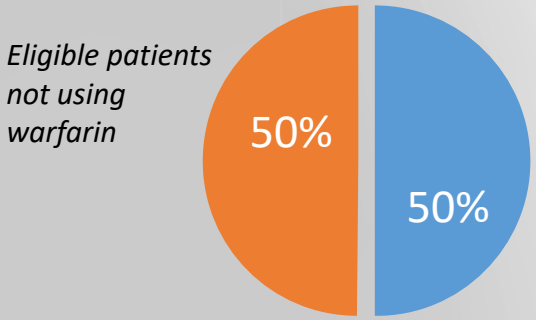




VKA problémák

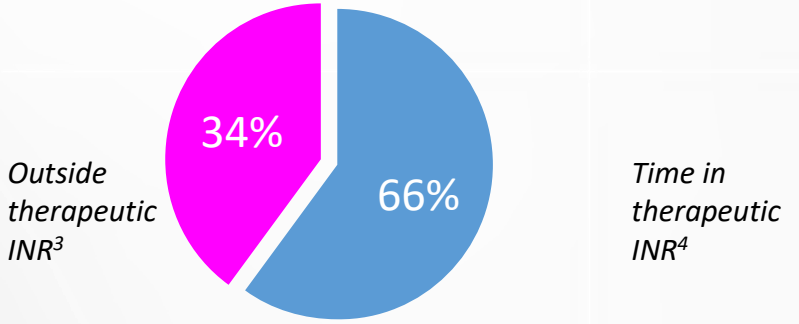
Warfarin is not always well-tolerated

- Narrow therapeutic range (INR 2–3)
- Genetic variability
- Negative interactions with food and drugs
- High risk of bleeding[1]
- Requires frequent monitoring and dose adjustments
- TTR



Major Complications

- Major bleeding with warfarin use is estimated to occur at a frequency as high as 16%[3]
- Warfarin associated bleeding experience a rate of mortality, hospitalization, life threatening disability or intervention as high as 90%[3]



35-50% AFib patients are NOT taking warfarin due to tolerance or non-compliance issues

Arch Int Med 1999; 131
Circulation 2007;116
Arch Intern Med, 2007;167(13)
NEJM 2009;361(12)

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

DOAC-ok

	Rivaroxaban	Apixaban	Edoxaban	Dabigatran
Target	Factor Xa	Factor Xa	Factor Xa	Thrombin
T_{max}	2–4 hours	3 hours	1–3 hours	2 hours
Half-life	9–13 hours	9–14 hours	5–11 hours	14–17 hours
Frequency	Once daily	Twice daily	Once daily	Once or twice daily
Renal excretion	66% (half inactive)	25%	36–45%	80%
Antidote	Andexanet[a]	Andexanet[a]	Andexanet[a]	Idarucizumab
Discontinuation	48 hours[b]	48 hours	48 hours	48–96 hours[b]

[a]Not yet approved by EMA.
[b]Discontinue >48 h if creatinine clearance is >80 ml/min/1.73 m^2; discontinue >72 h if creatinine clearance is 50–79 ml/min/1.73 m^2; and discontinue >96 h if creatinine clearance is <50 ml/min/1.73 m^2.
EMA: European Medicines Agency; DOACs: direct oral anticoagulants.

- napi fix dózis
- egyszerűbb használat
- kevesebb vérvétel (vesefunkció)
- kevesebb étel / gyógyszer interakció

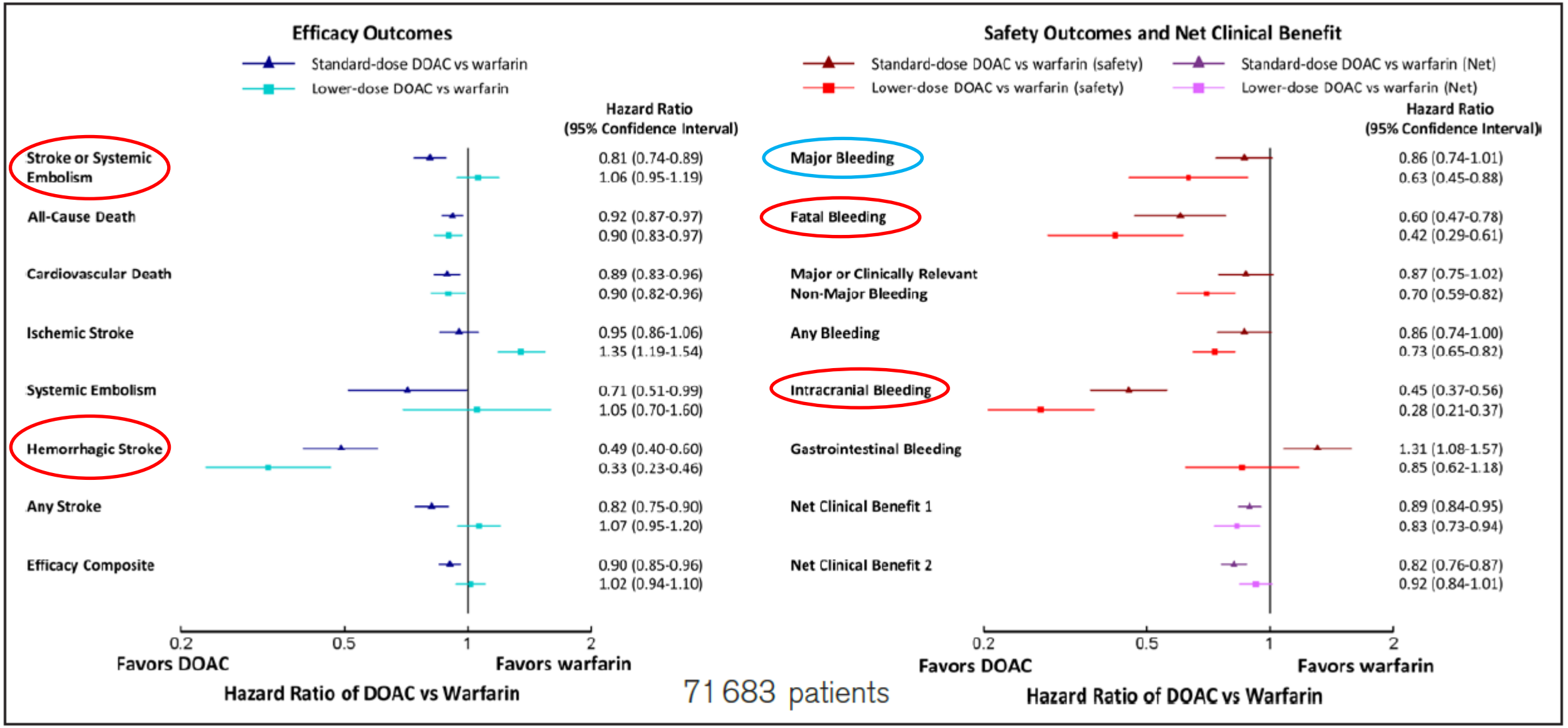
ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

DOAC-ok

Direct Oral Anticoagulants Versus Warfarin in Patients With Atrial Fibrillation: Patient-Level Network Meta-Analyses of Randomized Clinical Trials With Interaction Testing by Age and Sex

Anthony P. Carnicelli, MD; Hwanhee Hong, PhD; Stuart J. Connolly, MD; John Eikelboom, MBBS, MSc; Robert P. Giugliano, MD, ScM; David A. Morrow, MD, MPH; Manesh R. Patel, MD; Lars Wallentin, MD, PhD; John H. Alexander, MD, MHS; M. Cecilia Bahit, MD; Alexander P. Benz, MD, MSc; Erin A. Bohula, MD, Dphil; Tze-Fan Chao, MD, PhD; Leanne Dyal, MSc; Michael Ezekowitz, MB, ChB, Dphil; Keith A.A. Fox, MB, ChB; Baris Gencer, MD, MPH; Jonathan L. Halperin, MD; Ziad Hijazi, MD, PhD; Stefan H. Hohnloser, MD; Kaiyuan Hua, MB; Elaine Hylek, MD, MPH; Eri Toda Kato, MD, PhD; Julia Kuder, MA; Renato D. Lopes, MD, PhD; Kenneth W. Mahaffey, MD; Jonas Oldgren, MD, PhD; Jonathan P. Piccini, MD, MHS; Christian T. Ruff, MD, MPH; Jan Steffel, MD; Daniel Wojdyla, MSc; Christopher B. Granger, MD; on behalf of the COMBINE AF (A Collaboration Between Multiple Institutions to Better Investigate Non-Vitamin K Antagonist Oral Anticoagulant Use in Atrial Fibrillation) Investigators*

Circulation. 2022;145:242–255. DOI: 10.1161/CIRCULATIONAHA.121.056355



ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

DOAC problémák

- súlyos fokú veseelégtelenség CrCl <15-30 ml/min
- vérzés rizikó VKA-hoz képest ↓, de még jelentős
- HAS-BLED score >3
- antidótum elérhetőség / hatástartam
- gyógyszer interakciók
- gyakori indokolatlan aluldozírozás!

Apixaban	Dabigatran	Edoxaban	Rivaroxaban
Avoid where possible Carbamazepine Phenytoin Phenobarbital Rifampicin Ritonavir Itraconazole Ketoconazole	**Avoid where possible** Dronedarone Carbamazepine Phenytoin Rifampicin Ritonavir Itraconazole Ketoconazole Cyclosporin Glecaprevir/pibrentasvir Tacrolimus	**Avoid where possible** Carbamazepine Phenytoin Phenobarbital Rifampicin Ritonavir	**Avoid where possible** Dronedarone Carbamazepine Phenytoin Phenobarbital Itraconazole Ketoconazole Posaconazole Voriconazole Rifampicin Ritonavir
Avoid or reduce apixaban dose if another interacting drug therapy Posaconazole Voriconazole Protease inhibitors Apalutamide Enzalutamide Tyrosine kinase inhibitors	**Delay timing of drugs and/or adjust dose** Amiodarone Ticagrelor Verapamil Quinidine Clarithromycin Posaconazole	**Avoid or reduce edoxaban dose** Dronedarone **Avoid or reduce edoxaban dose if another interacting drug therapy** Cyclosporin Itraconazole Ketoconazole Erythromycin	**Avoid if another interacting drug therapy** Protease inhibitors Tyrosine kinase inhibitors **Caution if renal function impaired** Verapamil Cyclosporin Clarithromycin Erythromycin Fluconazole
Limit consumption Grapefruit juice St John's wort	**Limit consumption** Grapefruit juice St John's wort	**Limit consumption** Grapefruit juice St John's wort	**Limit consumption** Grapefruit juice St John's wort

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

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

DOAC problémák

- adherencia
- perzisztencia

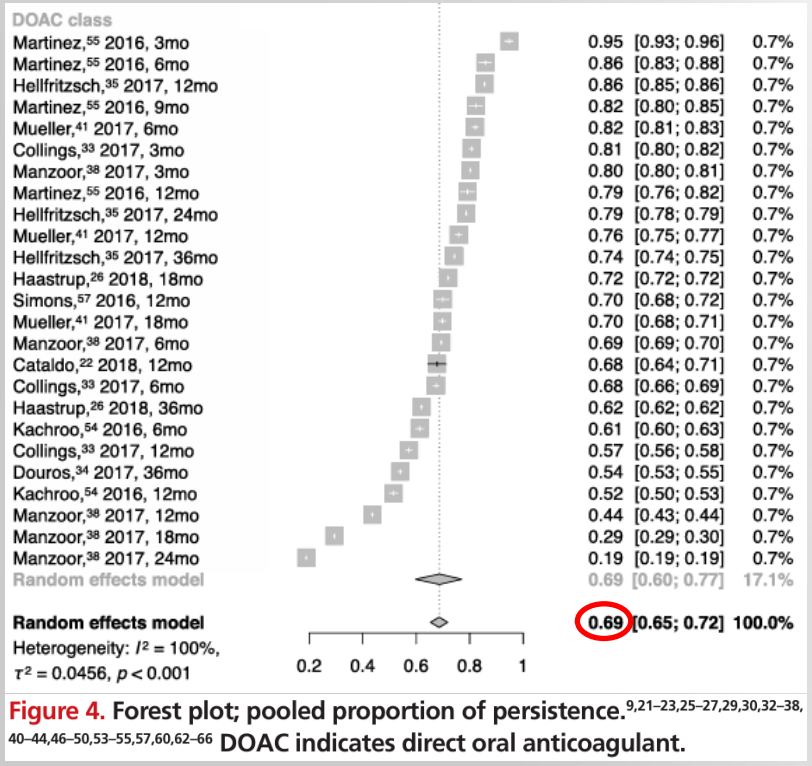


Figure 4. Forest plot; pooled proportion of persistence.[9,21–23,25–27,29,30,32–38,40–44,46–50,53–55,57,60,62–66] DOAC indicates direct oral anticoagulant.

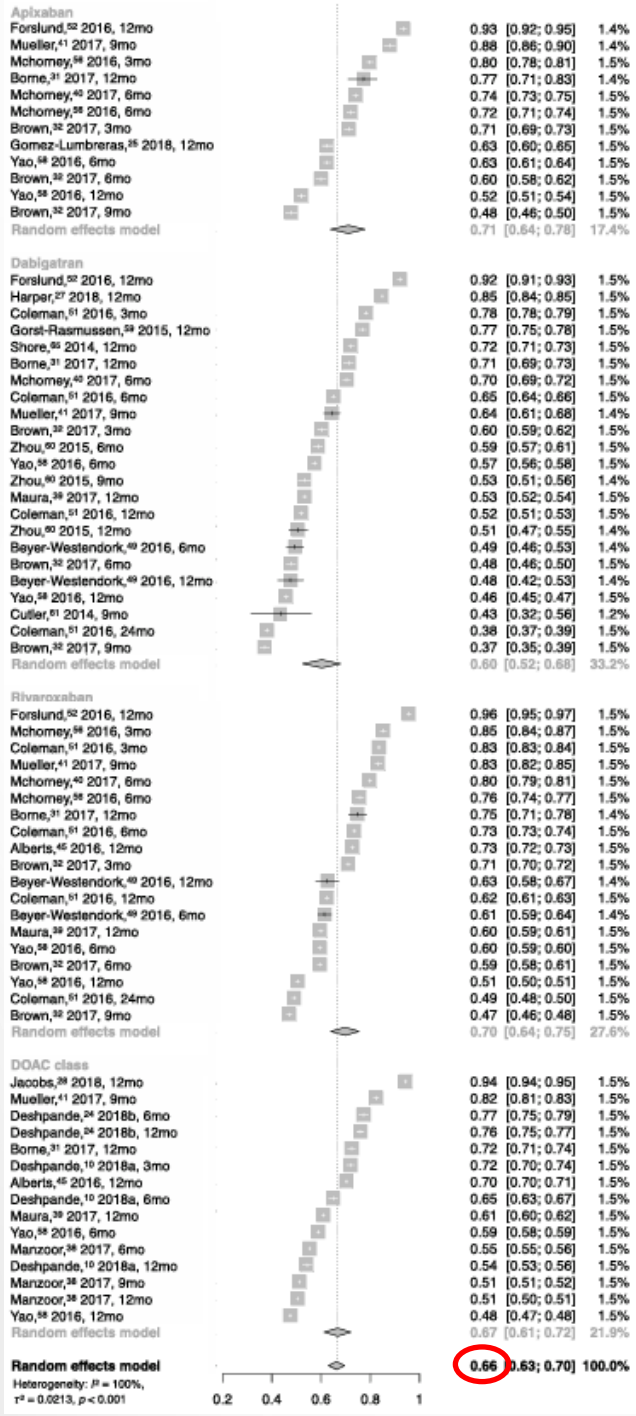


Figure 3. Forest plot; pooled proportion of good adherence (proportion of days covered/medication possession ratio ≥80%).[10,24,25,27,28,31,32,38–41,45,49,51,52,56,58–61,65] DOAC indicates direct oral anticoagulant.

Real-World Adherence and Persistence to Direct Oral Anticoagulants in Patients With Atrial Fibrillation

A Systematic Review and Meta-Analysis

Circ Cardiovasc Qual Outcomes. 2020;13:e005969. DOI: 10.1161/CIRCOUTCOMES.119.005969

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ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Új gyógyszerek: XIa inhibíció

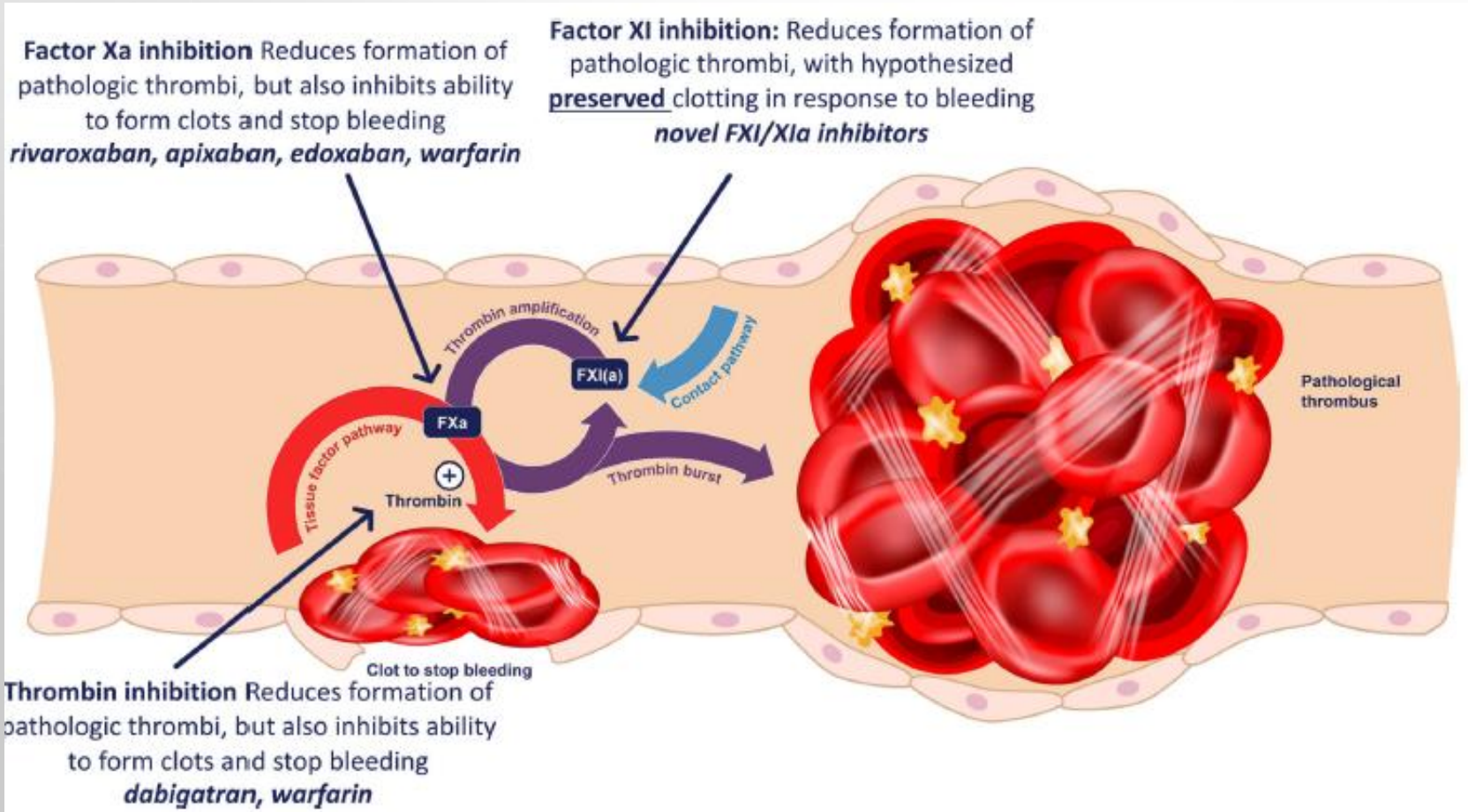


Figure 1: The Coagulation Cascade and Mechanisms of Different Anticoagulants.
Direct oral anticoagulants and warfarin all act on the common pathway, inhibiting both hemostasis and pathologic thrombus formation. By inhibiting FXI, it may be possible to reduce the risk of thrombi while preserving the functionality of the clotting cascade in response to bleeding.

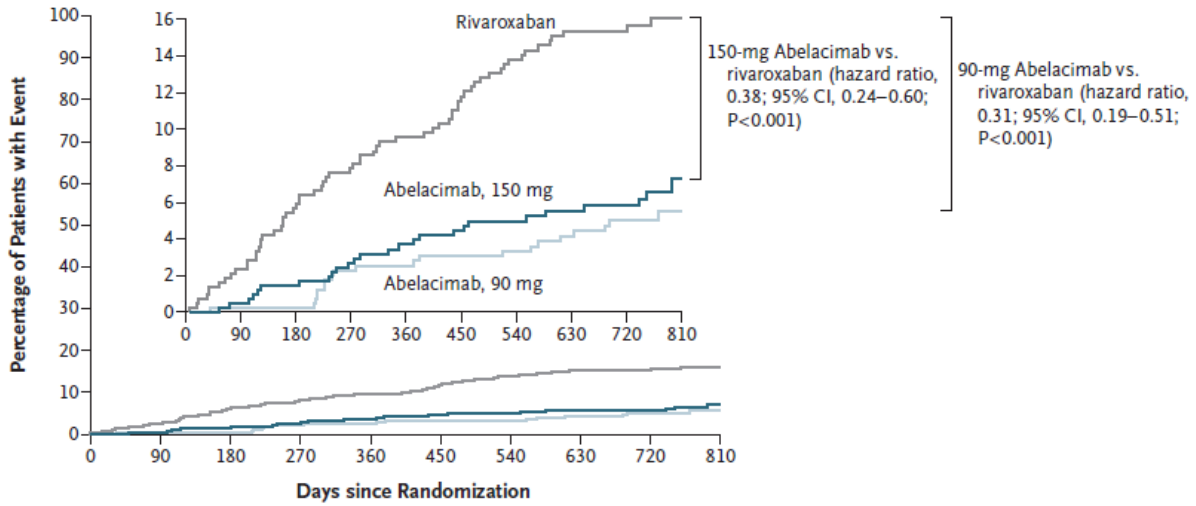
ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Új gyógyszerek: XIa inhibíció

Abelacimab versus Rivaroxaban in Patients with Atrial Fibrillation

Christian T. Ruff, M.D., M.P.H., Siddharth M. Patel, M.D., M.P.H., Robert P. Giugliano, M.D., David A. Morrow, M.D., M.P.H., Bruce Hug, M.D., Ph.D., Julia F. Kuder, M.A., Erica L. Goodrich, M.S., Shih-Ann Chen, M.D., Shaun G. Goodman, M.D., Boyoung Joung, M.D., Robert G. Kiss, M.D., Jindrich Spinar, M.D., Ph.D., Wojciech Wojakowski, M.D., Ph.D., Jeffrey I. Weitz, M.D., Sabina A. Murphy, M.P.H., Stephen D. Wiviott, M.D., Sanobar Parkar, M.D., Daniel Bloomfield, M.D., and Marc S. Sabatine, M.D., M.P.H., for the AZALEA–TIMI 71 Investigators*

N Engl J Med 2025;392:361-71.
DOI: 10.1056/NEJMoa2406674



No. at Risk

Rivaroxaban	428	415	392	375	365	352	339	328	310	121
Abelacimab, 150 mg	427	419	404	386	375	363	353	343	324	117
Abelacimab, 90 mg	425	413	398	378	372	357	349	338	308	117

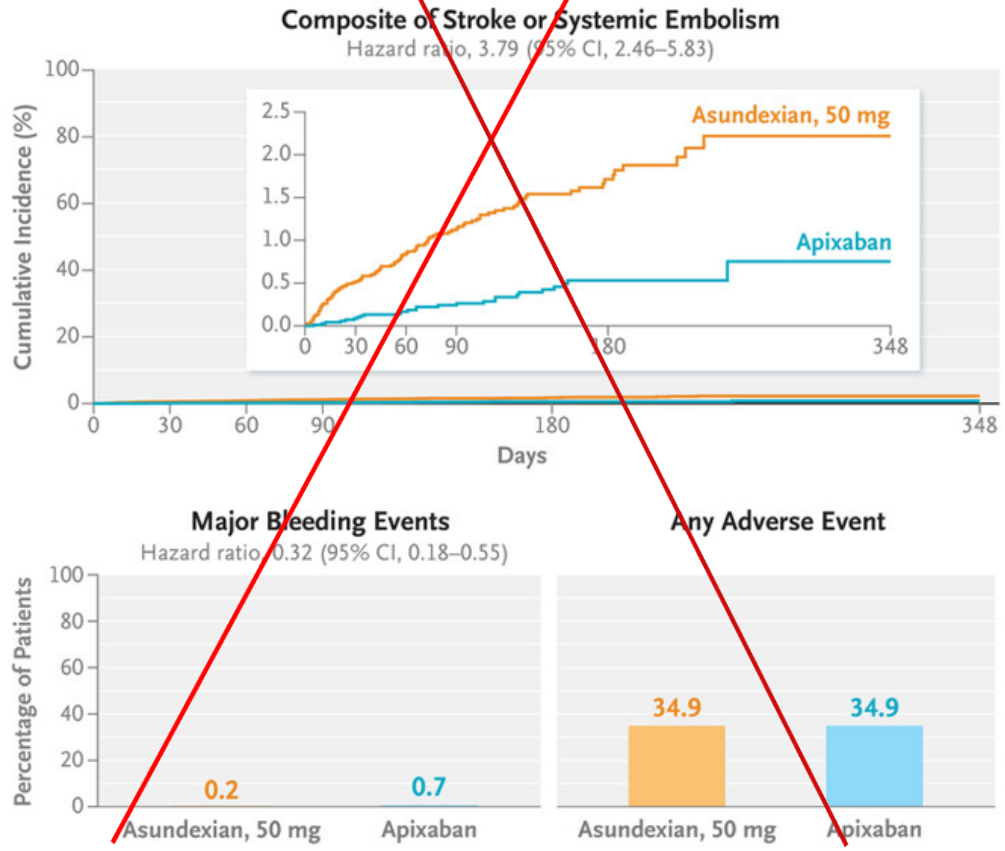
Figure 2. Major or Clinically Relevant Nonmajor Bleeding.
Shown is the cumulative incidence of the primary end point event of major or clinically relevant nonmajor bleeding. The inset shows the same data on an expanded y axis.

Asundexian versus Apixaban in Patients with Atrial Fibrillation

Jonathan P Piccini [1], Manesh R Patel [1], Jan Steffel [1], Keith Ferdinand [1], Isabelle C Van Gelder [1], Andrea M Russo [1], Chang-Sheng Ma [1], Shaun G Goodman [1], Jonas Oldgren [1], Christopher Hammett [1], Renato D Lopes [1], Masaharu Akao [1], Raffaele De Caterina [1], Paulus Kirchhof [1], Diana A Gorog [1], Martin Hemels [1], Michiel Rienstra [1], W Schuyler Jones [1], Josephine Harrington [1], Gregory Y H Lip [1], Stephen J Ellis [1], Frank W Rockhold [1], Christoph Neumann [1], John H Alexander [1], Thomas Viethen [1], James Hung [1], Rosa Coppolecchia Hardi Mundl [1], Valeria Caso [1]; OCEANIC-AF Steering Committee and Investigators

N Engl J Med. 2025 Jan 2;392(1):23-32. doi: 10.1056/NEJMoa2407105.

The rate of stroke or systemic embolism was significantly higher in the asundexian group than in the apixaban group.



ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Thromboembolia megelőzés: sebészi zárás

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

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

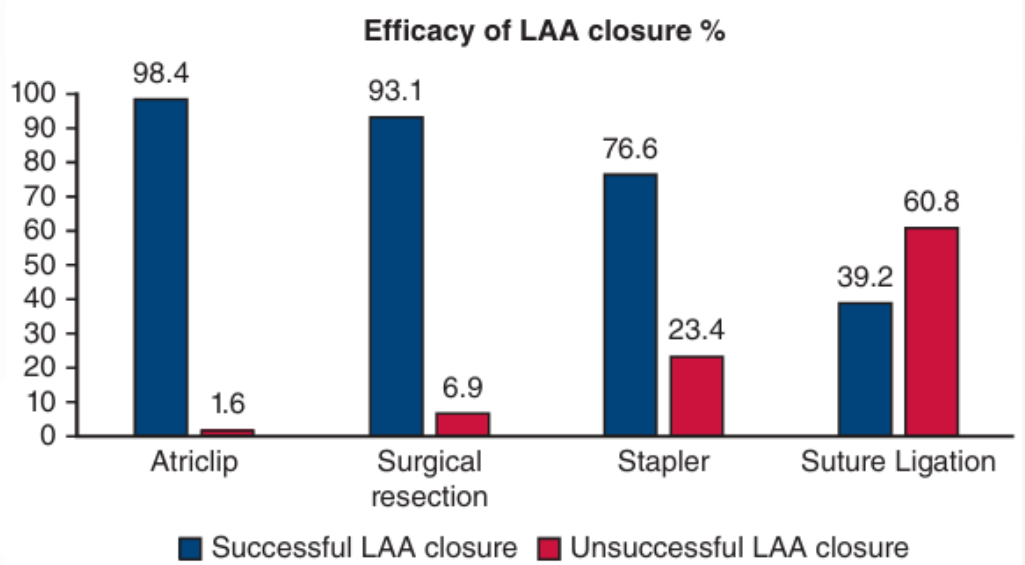


FIGURE 2. Efficacy of different LAA closure methods. *LAA*, Left atrial appendage.

Results: The mean patients age was 68.7 ± 9.4 years; 61.7% were male. No complications related to LAA closure were observed. Mean follow-up was 36.5 ± 8 months. Transesophageal echocardiography follow-up showed the following LAA closure success rates: LAA clip 98.4%, surgical excision 93.1%, stapler resection 76.6%, and suture ligation 39.2%. Suture ligation resulted in a high rate of recanalization (50%) and residual stumps (10.8%), whereas stapler resection resulted in a high rate of residual stumps (23.4%). Overall, 4 patients (2.7%) had a stroke during follow-up. In detail, 2 of 27 (7.4%) patients with unsuccessful LAA closure had a stroke, whereas 2 of the 122 (1.6%) patients with successful LAA closure had a stroke.

Efficacy of four different left atrial appendage closure techniques during cardiac surgery—A transesophageal echocardiography follow-up study

Johannes Petersen, MD,[a,b] Henrike Böning, MD,[a] Sevenai Yildirim, MD,[c] Yousuf Alassar, MD,[a] Yalin Yildirim, MD,[a] Ilia Bazhanov, MD,[a] Christoph Sinning, MD,[b] Hermann Reichenspurner, MD, PhD,[a,b] and Simon Pecha, MD[a,b]

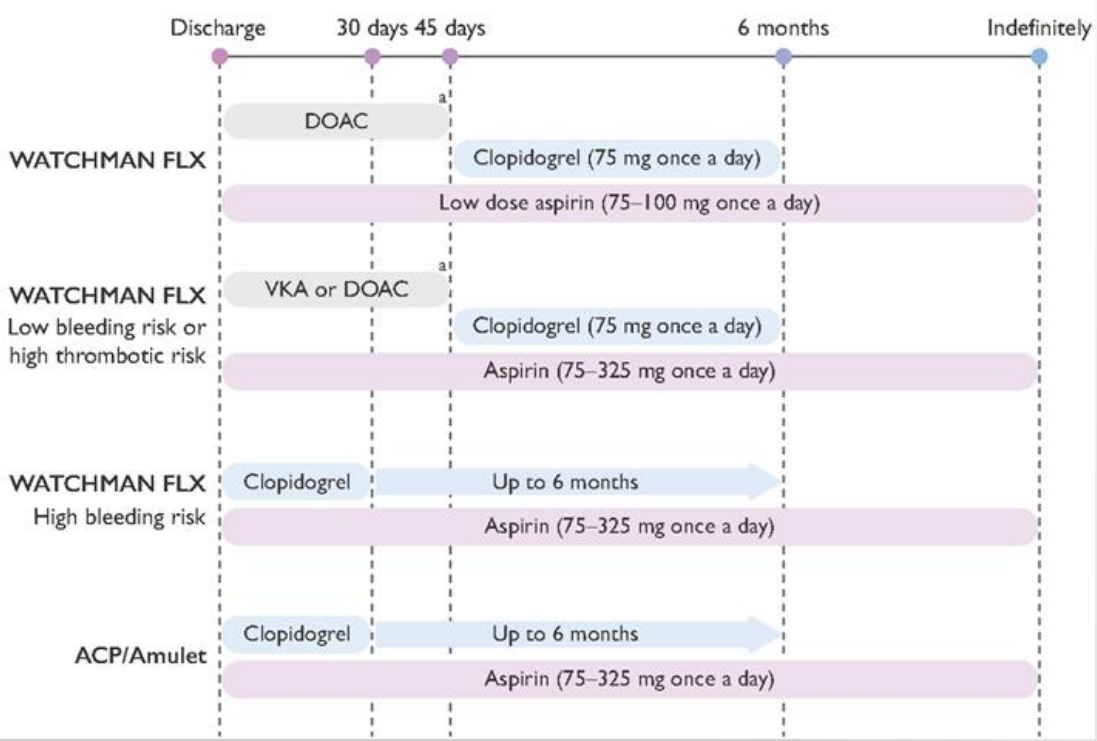
JTCVS Techniques • August 2024

Thromboembolia megelőzés: LAA occlusio

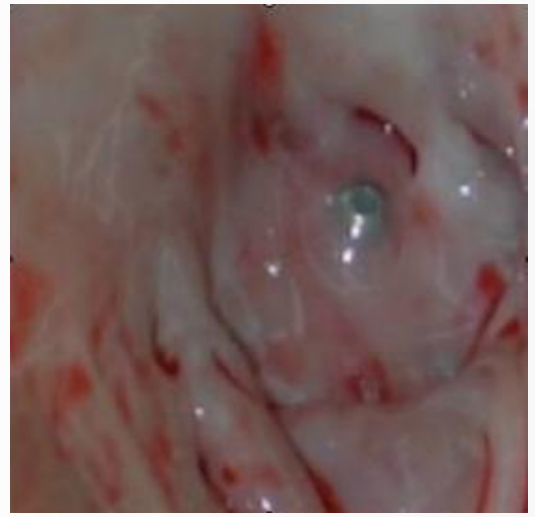
Percutaneous LAA occlusion may be considered in patients with AF and contraindications for long-term anticoagulant treatment to prevent ischaemic stroke and thromboembolism.[372,376,386,387]

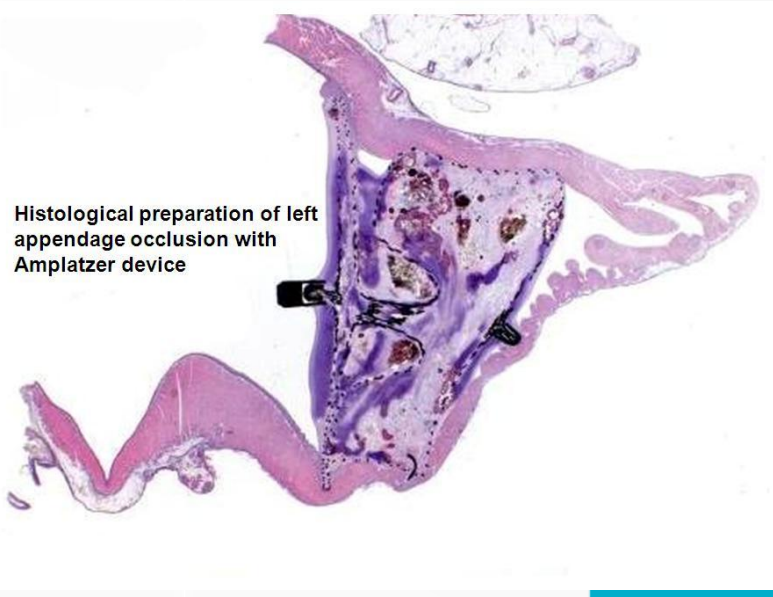
IIb	C

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



Watchman - postimplant 9 hó (humán)





Histological preparation of left appendage occlusion with Amplatzer device

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Hosszú távú OAC ter. kontraindikációja

Table 4 Conditions in which percutaneous LAA occlusion may be considered

Condition	Details
Recurrent ischaemic stroke despite well-controlled therapeutic OAC	Percutaneous LAA occlusion may be considered after exclusion of other sources of embolism
Previous ICH	Percutaneous LAA occlusion may be considered as an alternative to the use of novel anticoagulants, acknowledging individual patient factors, and bleeding aetiology
Recurrent GI bleeding	Bleeding from unknown origin or intestinal angiodysplasia despite endoscopic therapy. Lesions that are not accessible for endoscopic therapy
Co-morbidities	Uncontrolled hypertension, cerebral microbleeds, cerebral amyloid angiopathy
Coagulopathies	Low platelet counts, myelodysplastic syndrome
Intolerance to new OAC drugs	GI intolerance, severe liver and kidney dysfunction. Vitamin K antagonists are the first option to consider, percutaneous LAA occlusion may be considered as a secondary alternative

ÉPCHK indikációk (2012-2023): 68 beteg

1. **major vérzés**es szövődmény **anticoagulatio mellett** – elsősorban gastrointestinalis vérzés (**70,6%**)
2. **neurológiai indikáció** (**14,7%**) – CAA, cavernoma vérzésveszély, isch. stroke után vérzéses transzformáció
3. rekurráló **thromboemboliás esemény NOAC mellett** (**8.8%**)
4. **labilis INR** - elsősorban a “NOAC éra” elején (**5.9%**)
5. **szemészeti indikáció** (**4.4%**)

ÉPCHK indikációk (2012-2025.03.): 89 beteg

1. magas **stroke / thromboembolia kockázat (10,1%)**
2. magas **vérzéses kockázat(89,9%)**

Risk stratification	
CHA_2DS_2-VASc Score	5 (4-6)
CHA_2DS_2-VA Score	4 (3-5)

ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

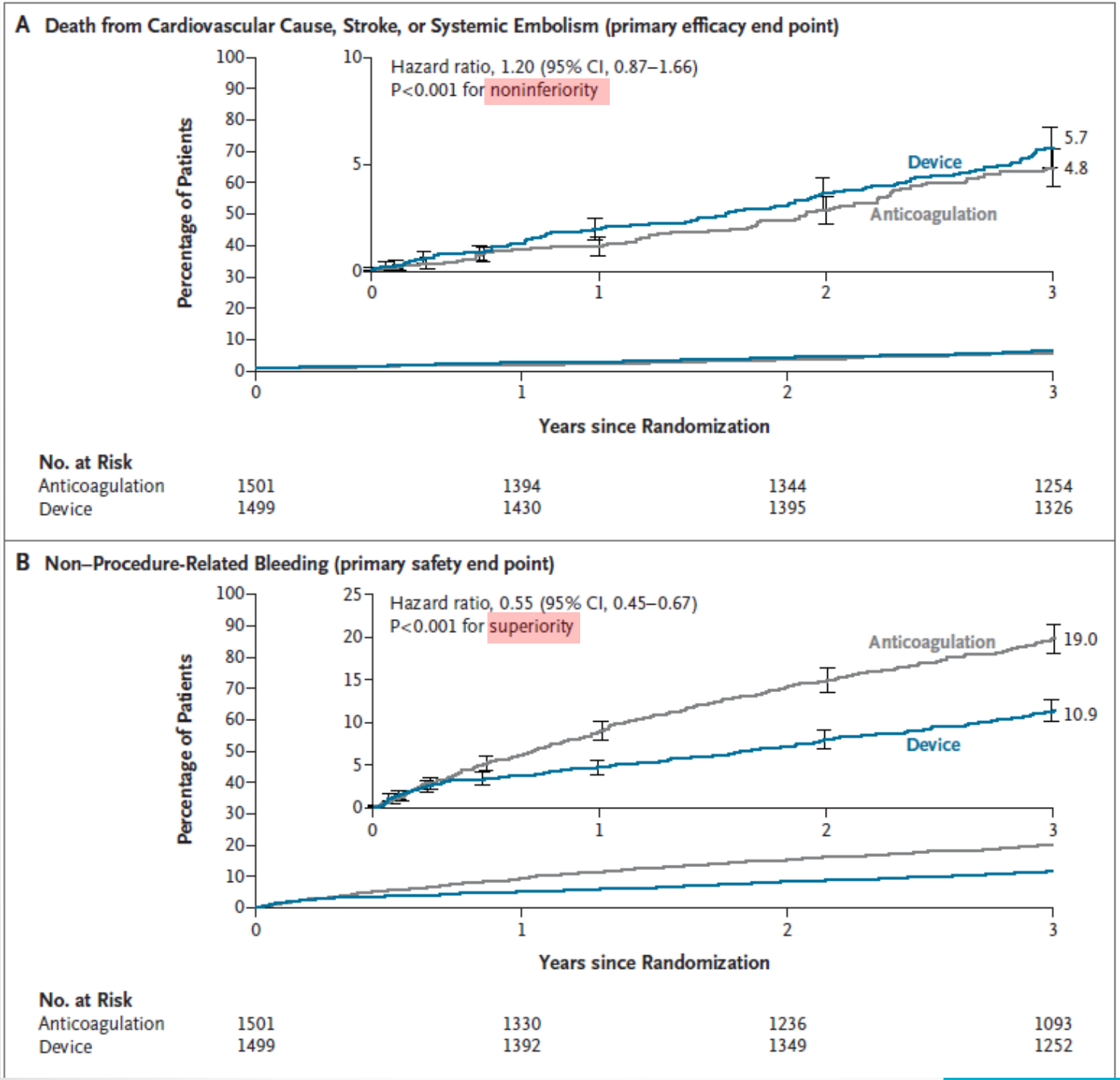
DOACs vs. LAAO

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Left Atrial Appendage Closure or Anticoagulation for Atrial Fibrillation

S.K. Doshi,[1,2] S. Kar,[3] D.G. Nair,[4] T. Waggoner,[5] H. Agarwal,[6] M. Moussavian,[7] A. Kashani,[8] S. Oza,[9] L. Feldman,[10] A. Sadhu,[11] D. DeLurgio,[12] O. Alli,[13] J.E. Nielsen-Kudsk,[14] M. Yamamoto,[15] M. Alkhouli,[16] A.J. Camm,[17] M. Coylewright,[18] C.M. Gibson,[19] C.B. Granger,[20] M.E. Gurol,[21] K.C. Huber,[22] M. Mansour,[21] A. Natale,[23,24] S.J. Pocock,[25] V.Y. Reddy,[26] W.I. Saliba,[27] F.M. Asch,[28] S. Wehrenberg,[29] K. Frost,[29] T. Christen,[29] B.S. Sutton,[29] K.M. Stein,[29] M.B. Leon,[30] and K.A. Ellenbogen,[31] for the CHAMPION-AF Investigators*



ÉSZAK-PESTI CENTRUMKÓRHÁZ HONVÉDKÓRHÁZ

Összefoglalás

- Pitvarfibrilláció ‚pandémia'
- Silent PF a betegek 27%-a
- Aktív screening jelentősége:
  - >75 év, 65 év + emelkedett CHA2DS2-VA score
  - thromboembolia után
- Diagnosztikus eszközök eltérő érzékenysége
- Magas klinikai rizikó -> thromboembolia profilaxis
- Az OAC ter. -megfelelő adherencia, perzisztencia és TTR (VKA) esetén- a thromboembolia profilaxis hatékony módszere, de számos nehézséggel jár együtt
- DOAC ter. egyértelmű előnyei VKA-val szemben
  - egyszerűbb szedni, kevesebb labor kontroll
  - kevesebb stroke/SE (IC vérzés!)
  - változatlan major vérzés rizikó
- XIa inhibíció ígéretesnek tűnik (biztonságosság!), DE további vizsgálatok szükségesek (hatékonyság?)
- A PF betegek egy csoportja számára az OAC ter. hosszú távon magas rizikójú / kontraindikált (vérzés!)
- A percutan eszközös LAA zárás ezen betegek számára biztonságos és hatékony alternatívát kínál

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Köszönöm a figyelmet!

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