Anticoaguláns kezelés

Dr. Rábai Miklós
egyetemi adjunktus
PTE KK I. sz. Belgyógyászati Klinika
Kardiológiai Tanszék

A vér alvadása

Véralvadás - a rög feloldódása

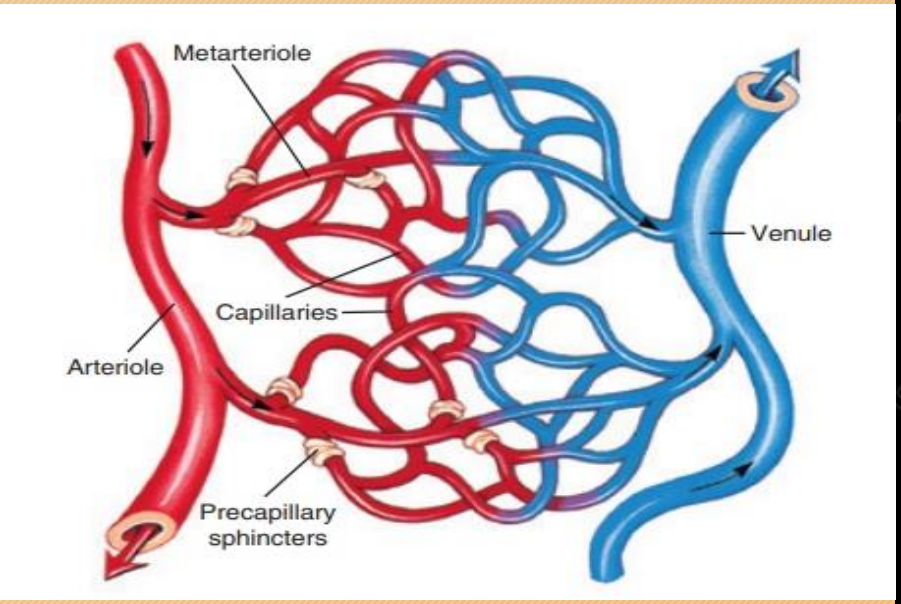
Virchow triász

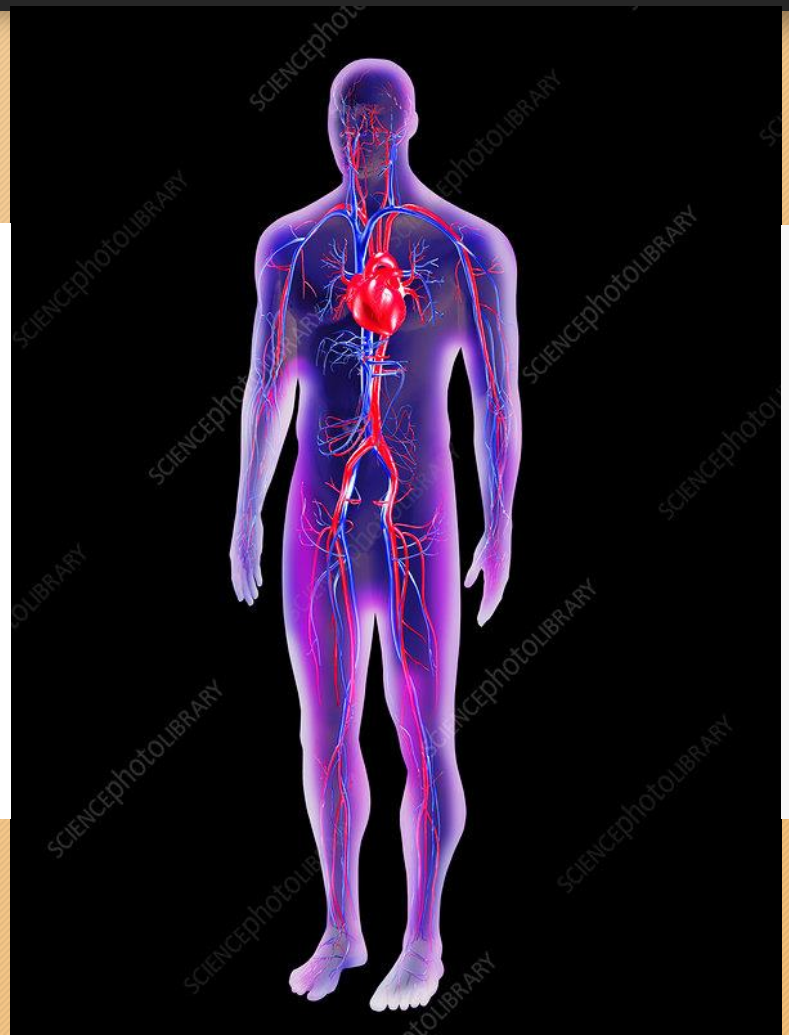
- endothel sérülés (toxinok, gyulladás)
- véráramlás megváltozása (pangás, turbulencia)
- hypercoagulabilitás (genetika, tumor)

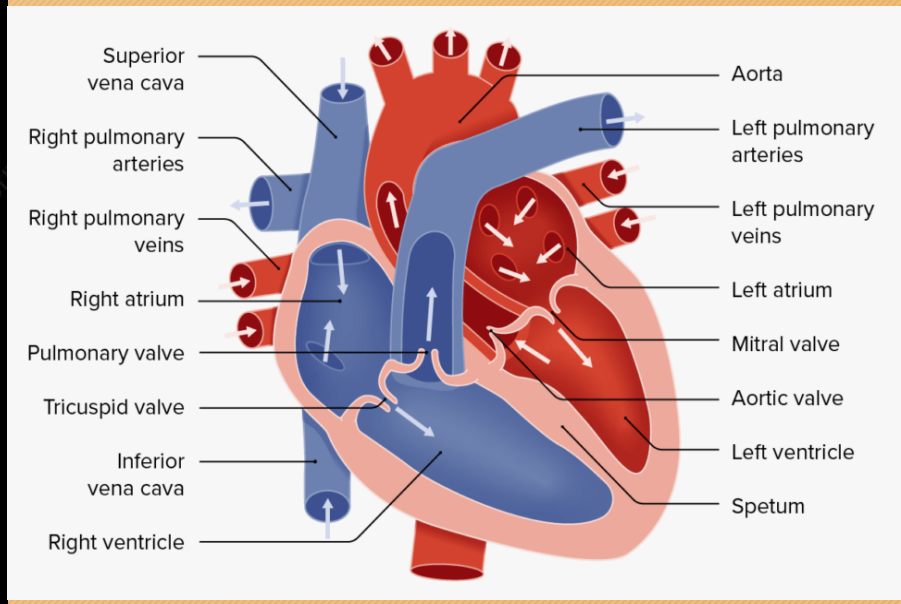
Antithrombitikus terápia

- thrombocyta aggregáció gátlás
- anticoaguláns terápia
- fibrinolízis

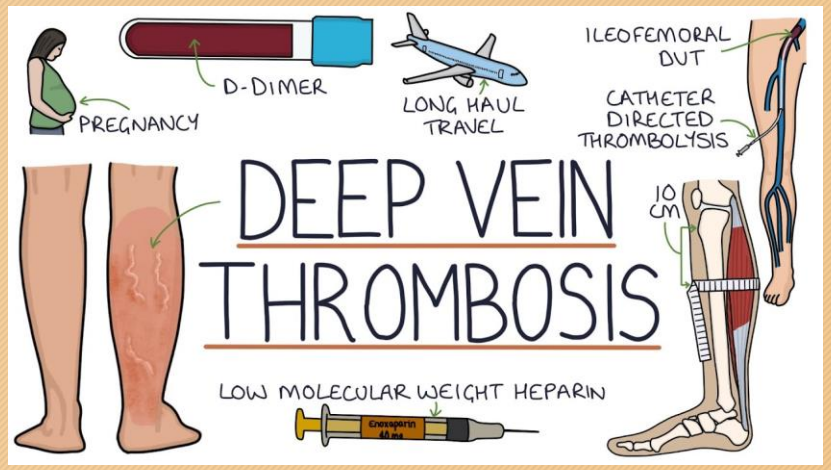
Artériás – vénás rendszer

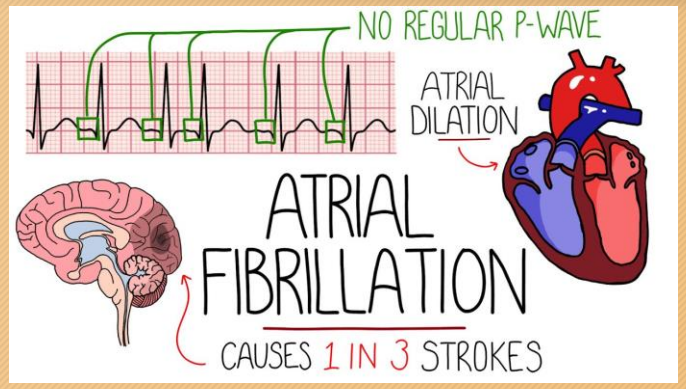


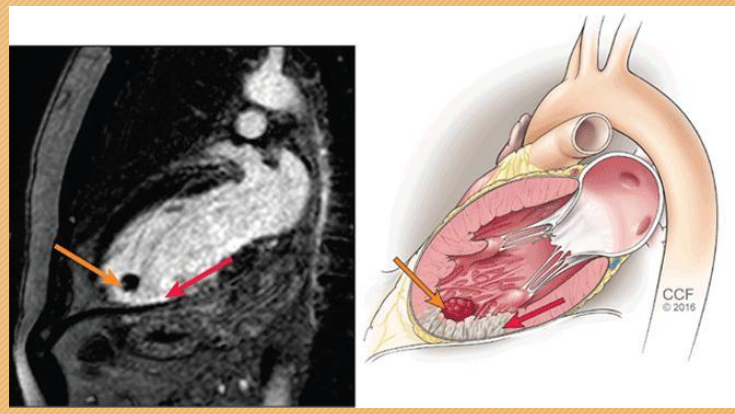


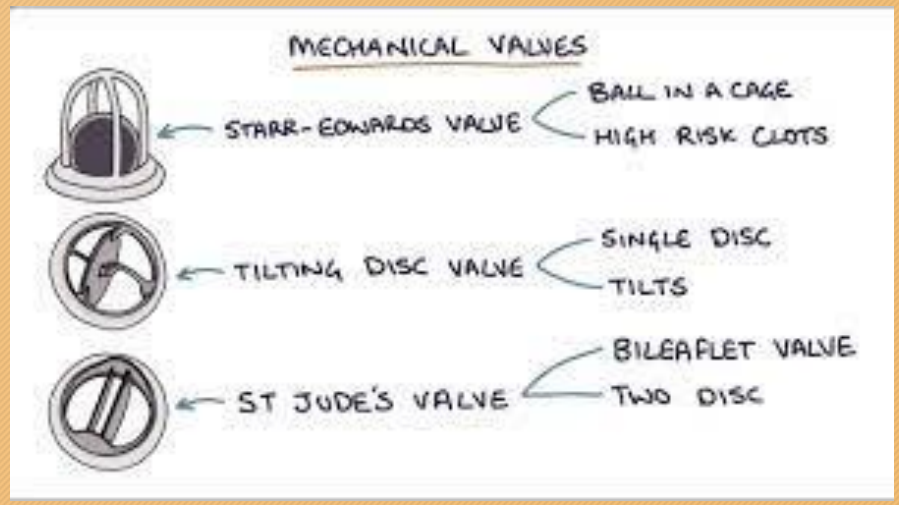


Anticoaguláns terápia - indikációk

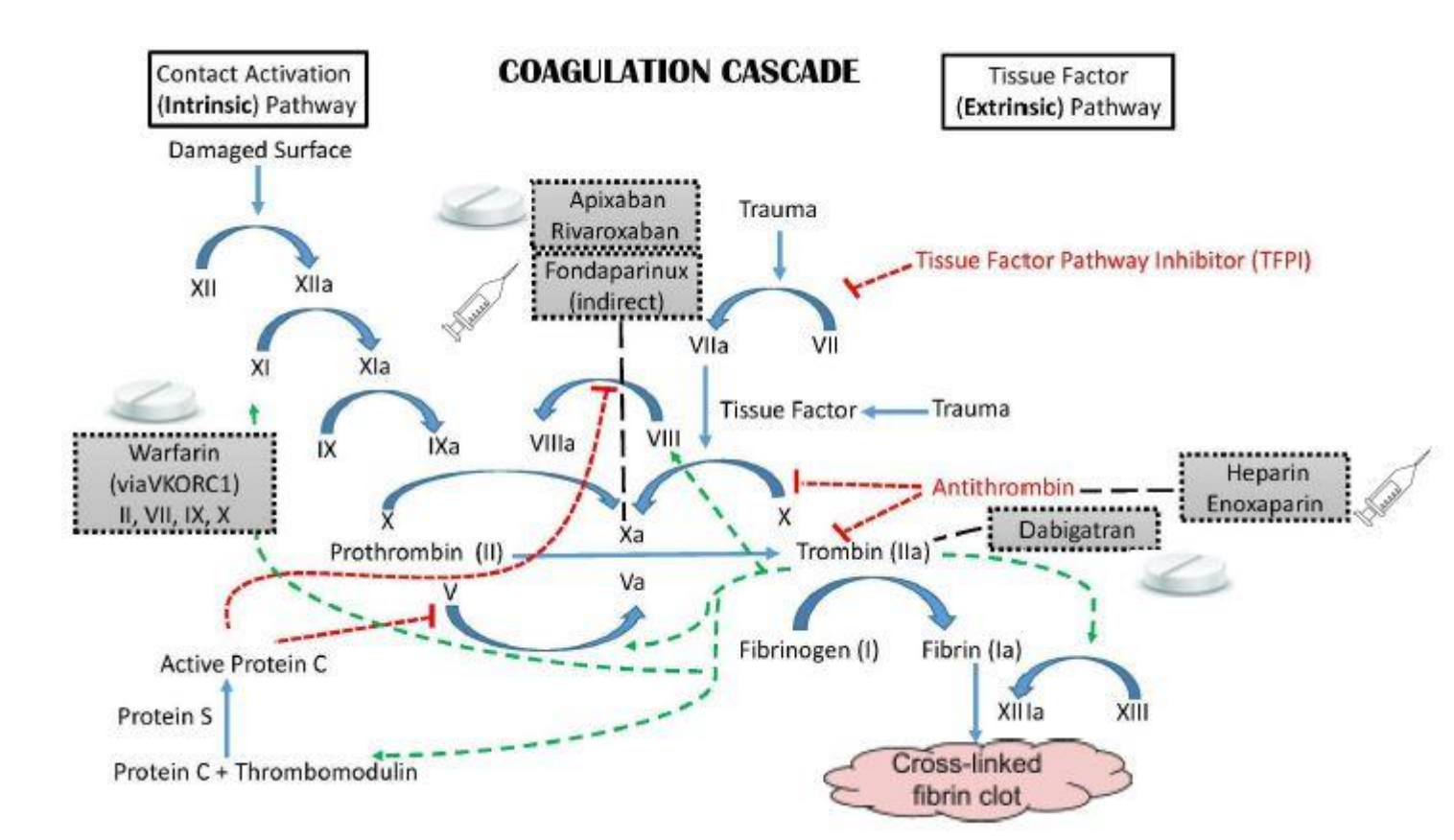








Anticoaguláns terápia



Új anticoagulánsok

Új támadáspont - XIa gátlás

- asundexian - PACIFIC-AF, OCEANIC-AF, OCEANIC-STROKE
- milvexian

Safety of the oral factor XIa inhibitor asundexian compared with apixaban in patients with atrial fibrillation (PACIFIC-AF): a multicentre, randomised, double-blind, double-dummy, dose-finding phase 2 study

*Jonathan P Piccini, Valeria Caso, Stuart J Connolly, Keith A A Fox, Jonas Oldgren, W Schuyler Jones, Diana A Gorog, Václav Durdil, Thomas Viethen, Christoph Neumann, Hardi Mundl, Manesh R Patel, on behalf of the PACIFIC-AF Investigators**

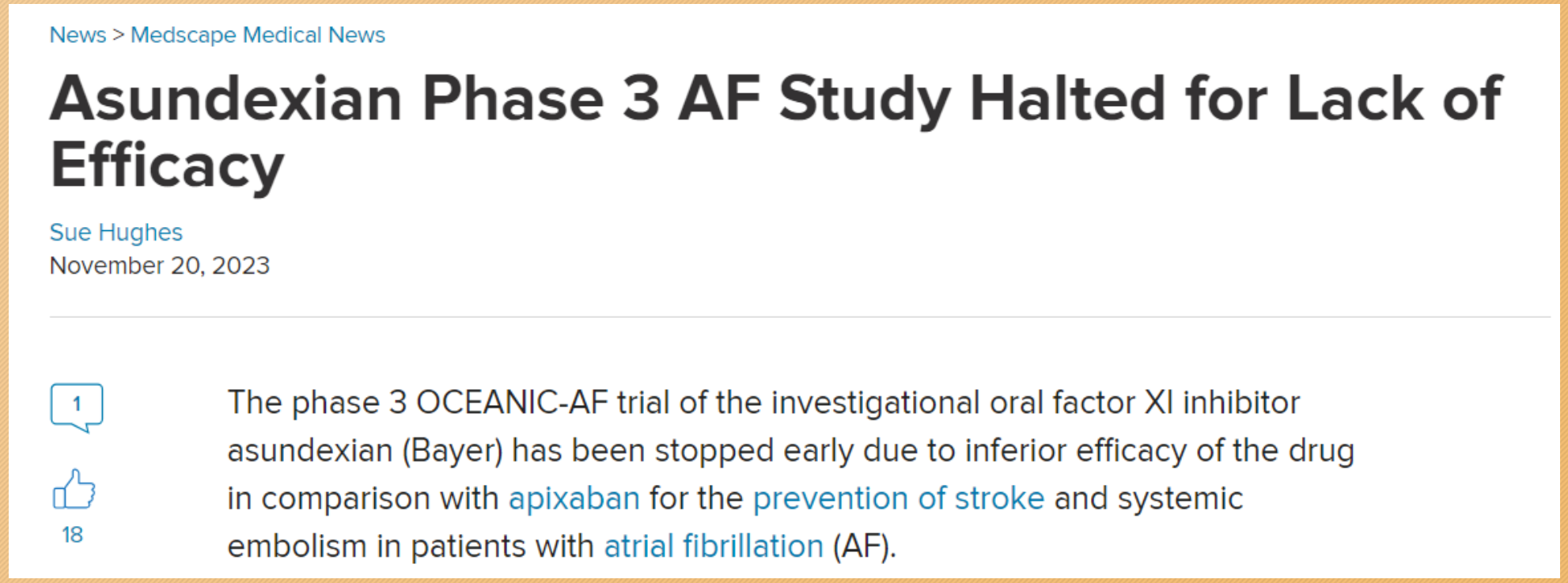
Summary

Background Direct-acting oral anticoagulant use for stroke prevention in atrial fibrillation is limited by bleeding concerns. Asundexian, a novel, oral small molecule activated coagulation factor XIa (FXIa) inhibitor, might reduce thrombosis with minimal effect on haemostasis. We aimed to determine the optimal dose of asundexian and to compare the incidence of bleeding with that of apixaban in patients with atrial fibrillation.

Új anticoagulánsok

Új támadáspont - XIa gátlás

- asundexian - PACIFIC-AF, OCEANIC-AF, OCEANIC-STROKE
- milvexian



News > Medscape Medical News

Asundexian Phase 3 AF Study Halted for Lack of Efficacy

Sue Hughes
November 20, 2023

1

18

The phase 3 OCEANIC-AF trial of the investigational oral factor XI inhibitor asundexian (Bayer) has been stopped early due to inferior efficacy of the drug in comparison with apixaban for the prevention of stroke and systemic embolism in patients with atrial fibrillation (AF).

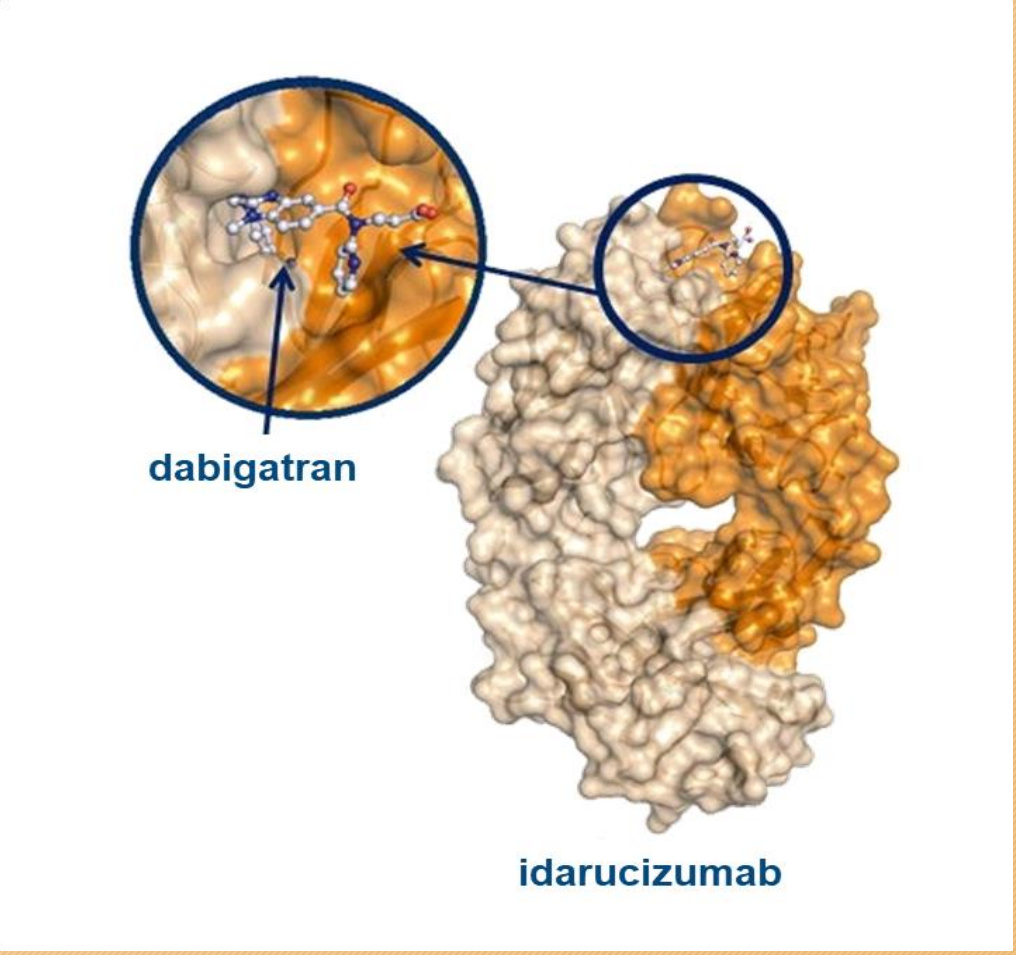
VKA - DOAC

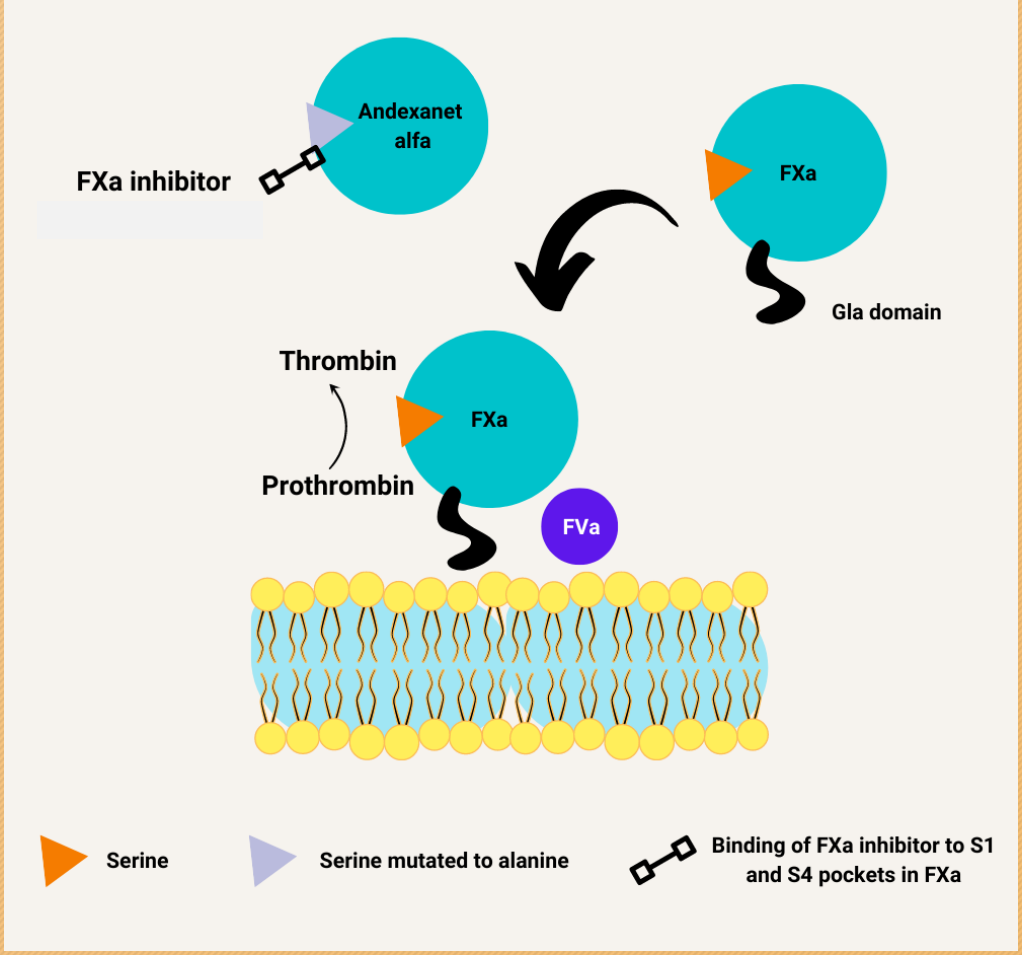
Feature	Warfarin	New OAC
Onset	Slow	Rapid
Dosing	Variable	Fixed
Food effect (Vitamin K)	Yes	No
Drug interactions	Many	Few
Monitoring	Yes	No?
Offset	Long	Shorter

Assay test	Dabigatran	Rivaroxaban	Apixaban	Edoxaban
APTT	++	+	Little to no effect	+
PT/INR	+	++	++	++
TT	+++	No effect	No effect	No effect
Anti-Xa	No effect	Overestimation	Overestimation	Overestimation
Anti-IIa	overestimation	No effect	No effect	No effect

+, Slight increase in clotting time; ++, Moderate increase in clotting time; +++, Marked increase in clotting time.

DOAC antidótum



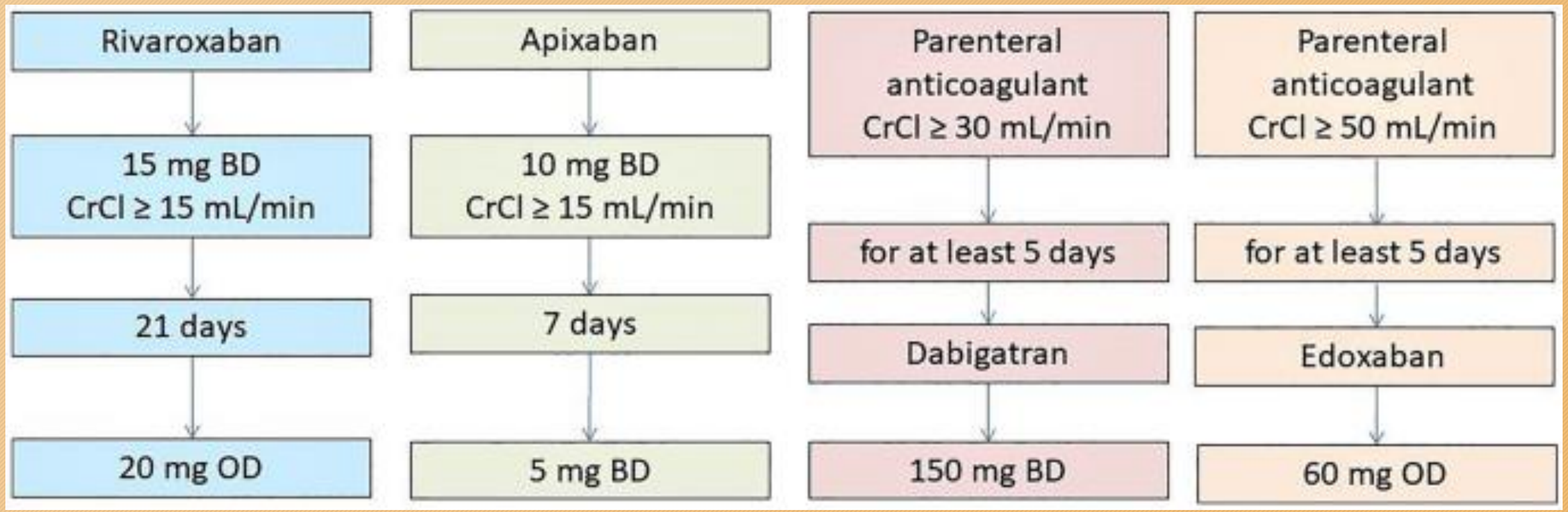


Anticoaguláns terápia - MVT és PE

RECOVER I+II (n = 5107)	LMWH/dabigatran	LMWH/warfarin	2.7 vs. 2.4% (n.s.)	1.4 vs. 2.0% (n.s.)	
EINSTEIN DVT and PE (n = 8282)	Rivaroxaban	LMWH/warfarin	2.1 vs. 2.3% (n.s.)	1.0 vs. 1.7% ($P = 0.002$)	Safety benefit much more pronounced in fragile patients (>75 years, impaired renal function, body weight <50 kg); major bleeding 1.3% vs. 4.5% ($P < 0.05$) Rivaroxaban resulted in significantly lower rates of major bleeding in patients with impaired renal function compared to warfarin. Rivaroxaban resulted in an improved treatment satisfaction compared with enoxaparin/VKA, particularly by reducing patient-reported anticoagulation burden.
AMPLIFY (n = 5395)	Apixaban	LMWH/warfarin	2.1 vs. 2.7% (n.s.)	0.6 vs. 1.8% ($P < 0.001$)	Apixaban resulted in a significant reduction in hospitalizations over time.
HOKUSAI (n = 8292)	LMWH/edoxaban	LMWH/warfarin	3.2 vs. 3.5% (n.s.)	1.4 vs. 1.6% (n.s.)	Edoxaban significantly reduced recurrent VTE in PE patients with NT-proBNP ≥ 500 pg/mL.
RESONATE (n = 1343)	Dabigatran	Placebo	0.4 vs. 5.6% ($P = 0.08$)	0.3 vs. 0.0% (n.s.)	
EINSTEIN EXT (n = 1196)	Rivaroxaban	Placebo	1.3 vs. 7.1% ($P < 0.001$)	0.7 vs. 0.0% (n.s.)	
AMPLIFY EXT (n = 2486)	Apixaban	Placebo	1.7 vs. 8.8% ($P < 0.001$)	0.2 vs. 0.5% (n.s.)	Apixaban resulted in a significant reduction in hospitalizations over time

Abbreviations: LMWH, low molecular weight heparin; ns, not significant.

DOAC terápia különbözőségei

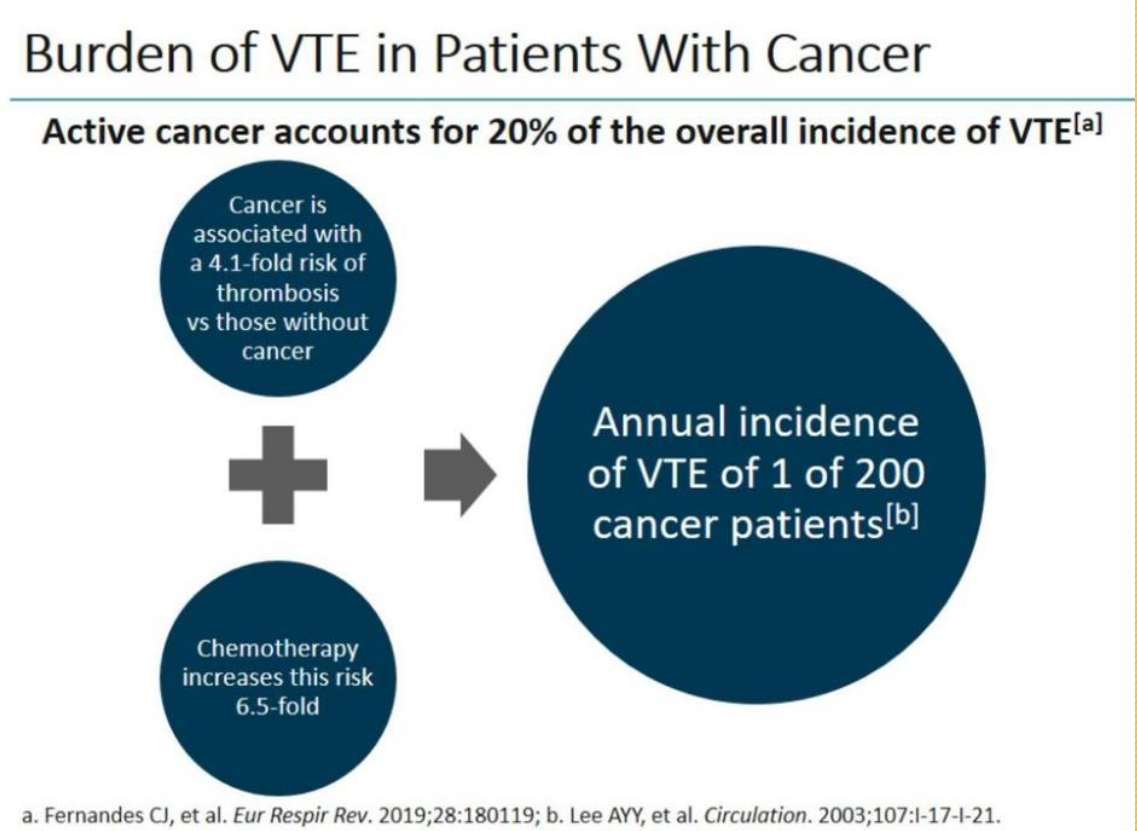


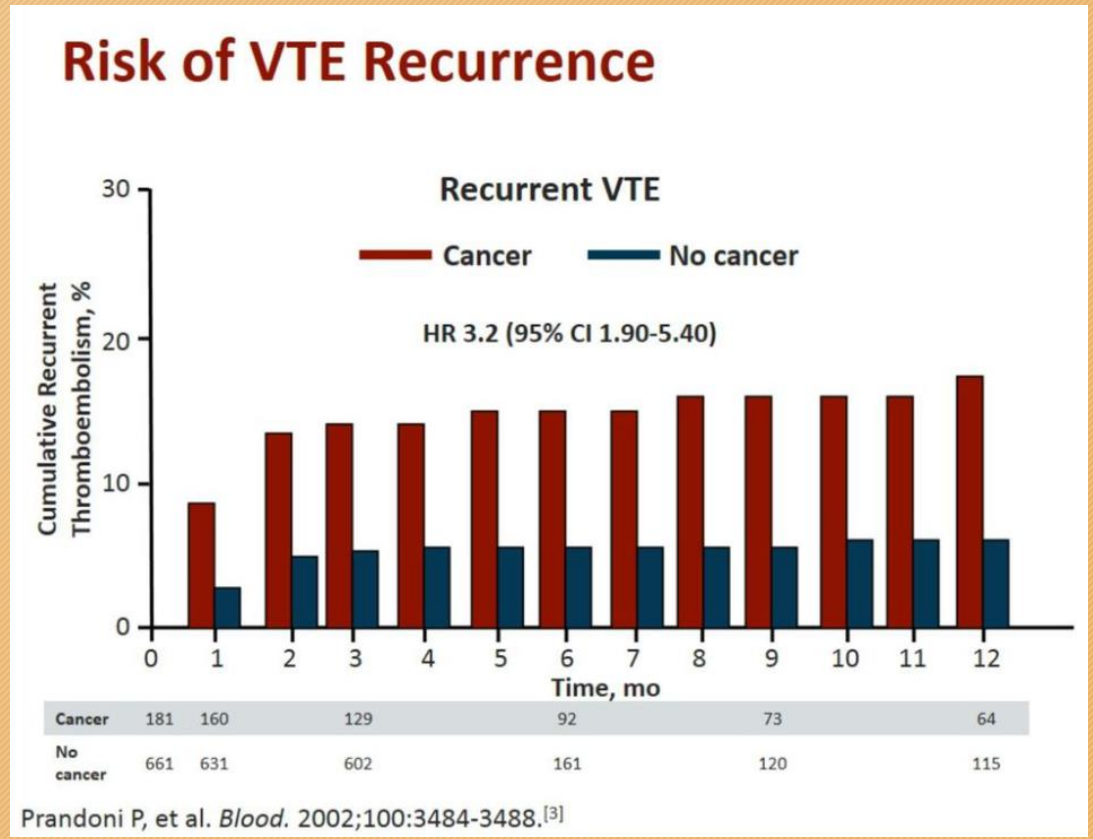
A recidíva esélye és a terápia leállítása

Estimated risk for long-term recurrence[a]	Risk factor category for index PE[b]	Examples[b]
Low (<3% per year)	Major transient or reversible factors associated with >10-fold increased risk for the index VTE event (compared to patients without the risk factor)	• Surgery with general anaesthesia for >30 min • **Confined** to bed in hospital (only "bathroom privileges") for ≥3 days due to an acute illness, or acute exacerbation of a chronic illness • Trauma with fractures
Intermediate (3–8% per year)	Transient or reversible factors associated with ≤10-fold increased risk for **first** (index) VTE	• Minor surgery (general anaesthesia for <30 min) • Admission to hospital for <3 days with an acute illness • Oestrogen therapy/contraception • Pregnancy or puerperium • **Confined** to bed out of hospital for ≥3 days with an acute illness • Leg injury (without fracture) associated with reduced mobility for ≥3 days • Long-haul **flight**
	Non-malignant persistent risk factors	• **Inflammatory** bowel disease • Active autoimmune disease
	No **identifiable** risk factor	
High (>8% per year)		• Active cancer • One or more previous episodes of VTE in the absence of a major transient or reversible factor • Antiphospholipid antibody syndrome

Recommendations	Class[a]	Level[b]
Therapeutic anticoagulation for ≥ 3 months is recommended for all patients with PE.[347]	I	A
Patients in whom discontinuation of anticoagulation after 3 months is recommended		
For patients with first PE/VTE secondary to a major transient/reversible risk factor, discontinuation of therapeutic oral anticoagulation is recommended after 3 months.[331,340,341]	I	B
Patients in whom extension of anticoagulation beyond 3 months is recommended		
Oral anticoagulant treatment of indefinite duration is recommended for patients presenting with recurrent VTE (that is, with at least one previous episode of PE or DVT) not related to a major transient or reversible risk factor.[358]	I	B
Oral anticoagulant treatment with a VKA for an indefinite period is recommended for patients with antiphospholipid antibody syndrome.[359]	I	B
Patients in whom extension of anticoagulation beyond 3 months should be considered[c,d]		
Extended oral anticoagulation of indefinite duration should be considered for patients with a first episode of PE and no identifiable risk factor.[330,331,347,351–353]	IIa	A
Extended oral anticoagulation of indefinite duration should be considered for patients with a first episode of PE associated with a persistent risk factor other than antiphospholipid antibody syndrome.[330,352,353]	IIa	C
Extended oral anticoagulation of indefinite duration should be considered for patients with a first episode of PE associated with a minor transient or reversible risk factor.[330,331,352]	IIa	C
NOAC dose in extended anticoagulation[e]		
If extended oral anticoagulation is decided after PE in a patient without cancer, a reduced dose of the NOACs apixaban (2.5 mg b.i.d.) or rivaroxaban (10 mg o.d.) should be considered after 6 months of therapeutic anticoagulation.[352,353]	IIa	A
Extended treatment with alternative antithrombotic agents		
In patients who refuse to take or are unable to tolerate any form of oral anticoagulants, aspirin or sulodexide may be considered for extended VTE prophylaxis.[355–357]	IIb	B
Follow-up of the patient under anticoagulation		
In patients who receive extended anticoagulation, it is recommended that their drug tolerance and adherence, hepatic and renal[f] function, and bleeding risk be reassessed at regular intervals.[259]	I	C

Anticoaguláns terápia - CAT





Anticoaguláns terápia - CAT

CAT
- az életminőséget rontja
- a morbitás és mortalitás faktora
- terápia felfüggesztését okozza

Rutinszerűen nem ajánlott
- nagyszámú beteg
- magas költségek
- vérzéstől való félelem
  - major vérzés
  - klinikailag releváns, nem major vérzés

Khorana Risk Score

Predictive Model for Chemotherapy-Associated VTE

Characteristic	Score
Site of cancer	
Very high risk (stomach, pancreas)	2
High risk (lung, lymphoma, gynecologic, GU excluding prostate)	1
Platelet count ≥ 350,000/mm³	1
Hb < 10 g/dL or use of ESAs	1
Leukocyte count > 11,000/mm³	1
BMI ≥ 35 kg/m²	1

Risk score:
- ≥ 3: high risk for VTE
- 1-2: intermediate risk
- 0: low risk

Khorana AA, et al. *Blood*. 2008;111:4902-4907.

Anticoaguláns terápia - major vérzés

Major vérzés - ISTH (International Society of Thrombosis and Haemosthasis)

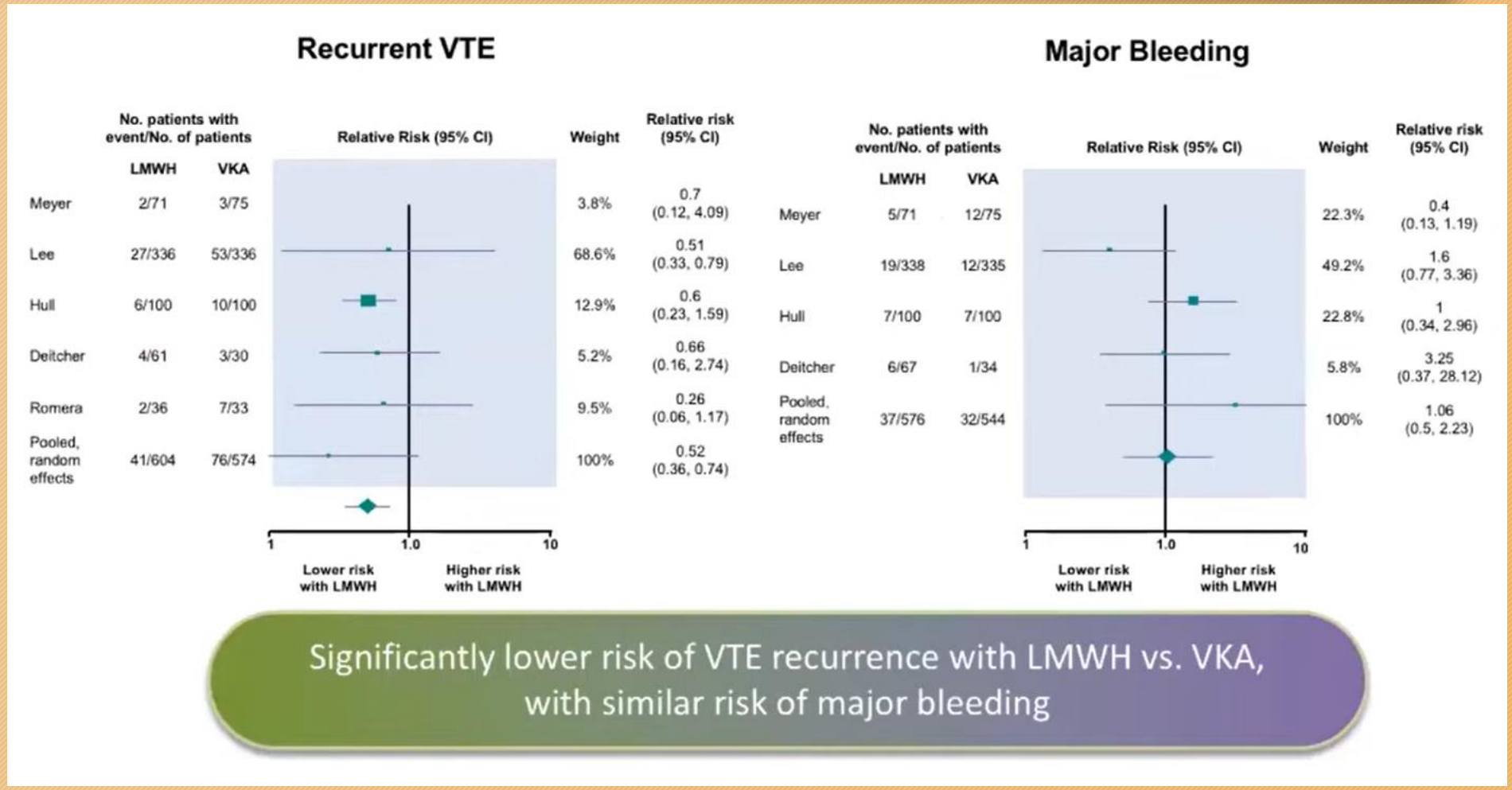
klinikailag releváns vérzés

L halálos

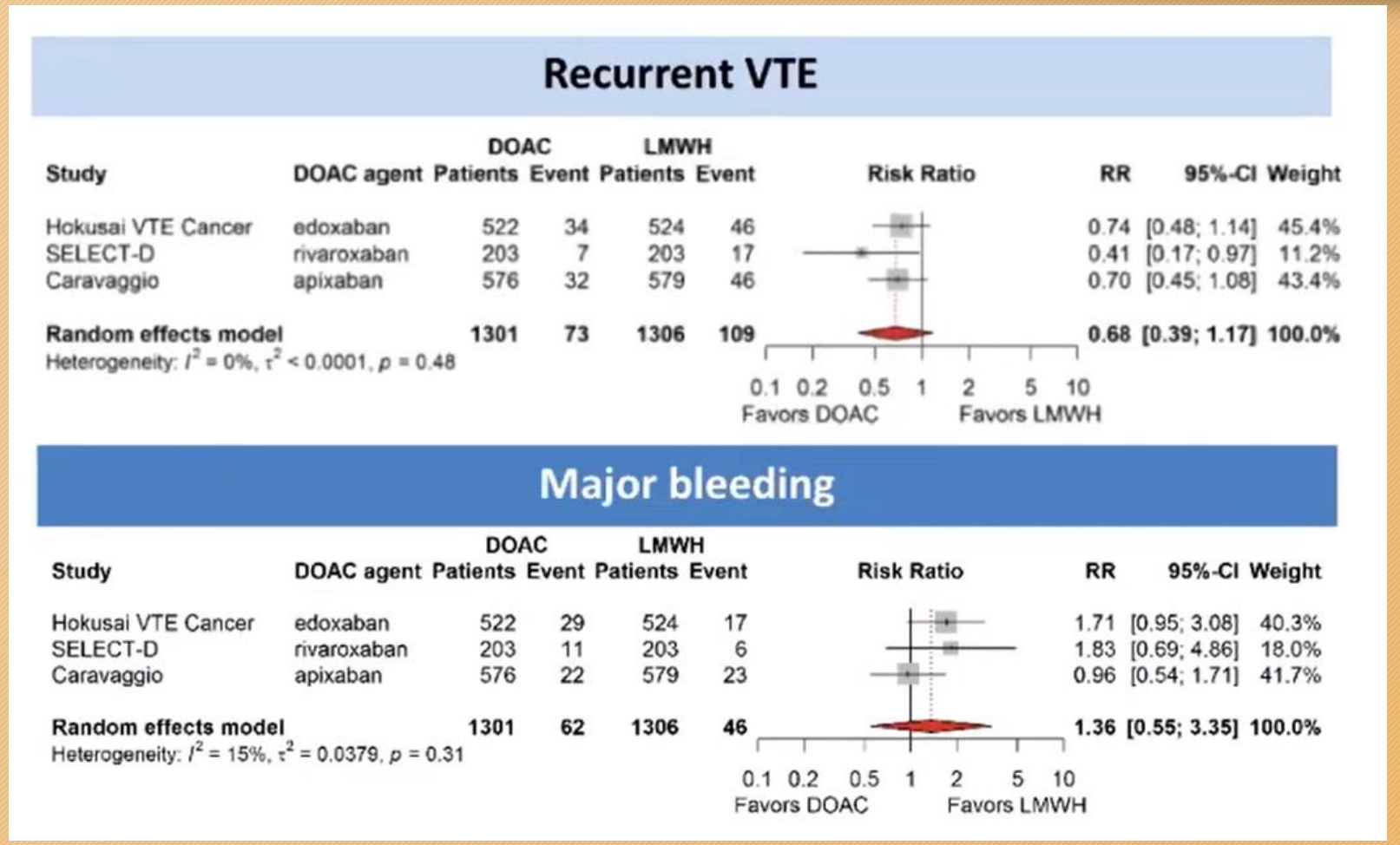
L az alábbi kritériumokat teljesíti

- a haemoglobin szint 20 g/l-t csökken, vagy 2 ≤ VVT massza kerül beadásra
- kritikus anatómia struktúrában történik a vérzés
  - intracraniális
  - spinális
  - occuláris
  - pericardiális
  - intraarticuláris
  - intramusculáris
  - retroperitoneális
  - gasztrointesztinális

Anticoaguláns terápia - CAT



Anticoaguláns terápia - CAT



Anticoaguláns terápia - CAT

Recommendations	Class[a]	Level[b]
For patients with PE and cancer, weight-adjusted subcutaneous LMWH should be considered for the first 6 months over VKAs.[360–363]	IIa	A
Edoxaban should be considered as an alternative to weight-adjusted subcutaneous LMWH in patients without gastrointestinal cancer.[366]	IIa	B
Rivaroxaban should be considered as an alternative to weight-adjusted subcutaneous LMWH in patients without gastrointestinal cancer.[367]	IIa	C
For patients with PE and cancer, extended anticoagulation (beyond the first 6 months)[c] should be considered for an indefinite period or until the cancer is cured.[378]	IIa	B
In patients with cancer, management of incidental PE in the same manner as symptomatic PE should be considered, if it involves segmental or more proximal branches, multiple subsegmental vessels, or a single subsegmental vessel in association with proven DVT.[376,377]	IIa	B

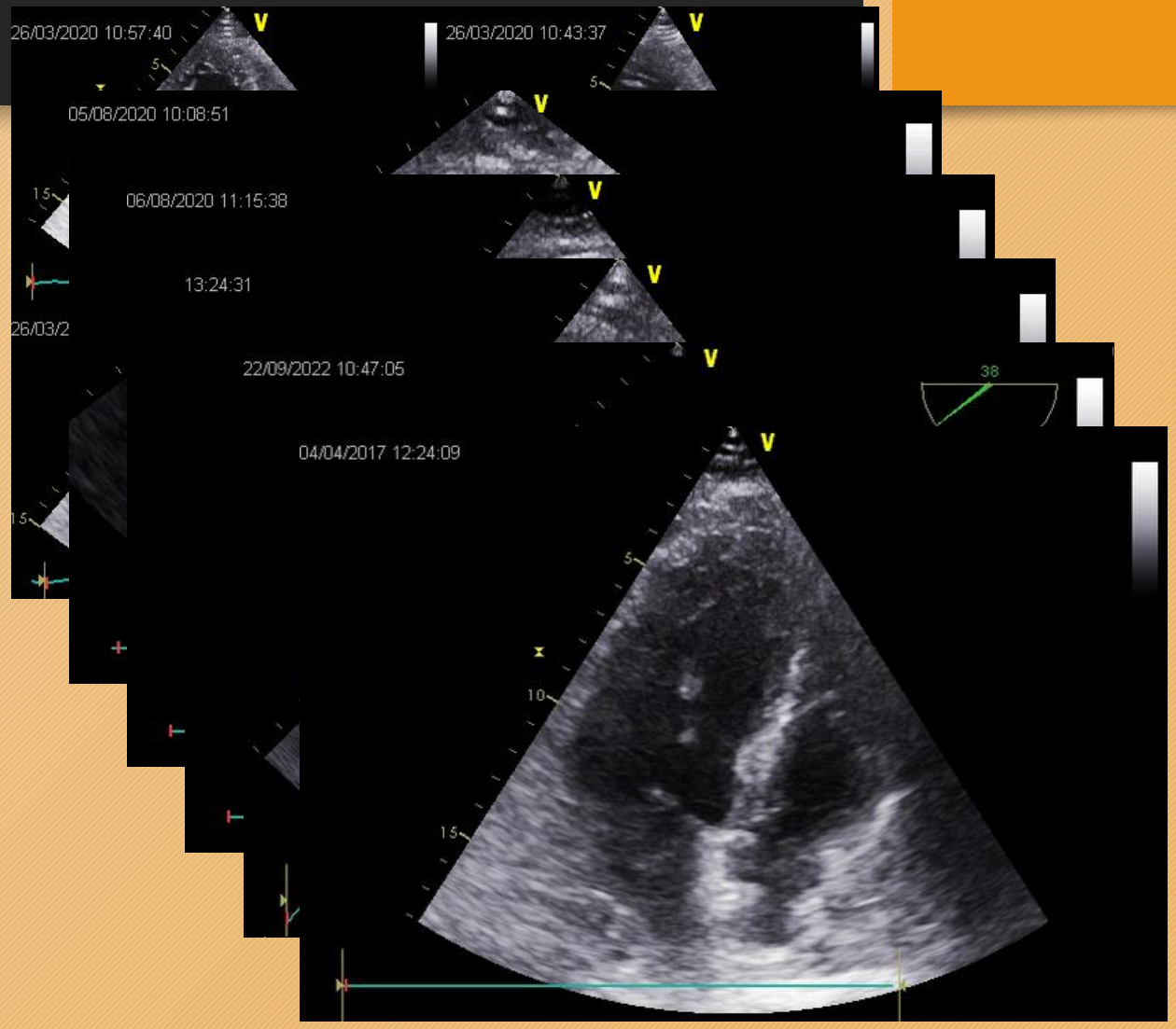
Anticoaguláció - MVT, PE és terhesség

Treatment		
A therapeutic, fixed dose of LMWH based on early pregnancy body weight is the recommended therapy for PE in the majority of pregnant women without haemodynamic instability.[408,410]	I	B
Thrombolysis or surgical embolectomy should be considered for pregnant women with high-risk PE.[421]	IIa	C
Insertion of a spinal or epidural needle is not recommended, unless ≥24 h have passed since the last therapeutic dose of LMWH.	III	C
Administration of LMWH is not recommended within 4 h of removal of an epidural catheter.	III	C
NOACs are not recommended during pregnancy or lactation.	III	C

Kardiogén embolizáció

Kardiogén embóliaforrás legfőbb okai:

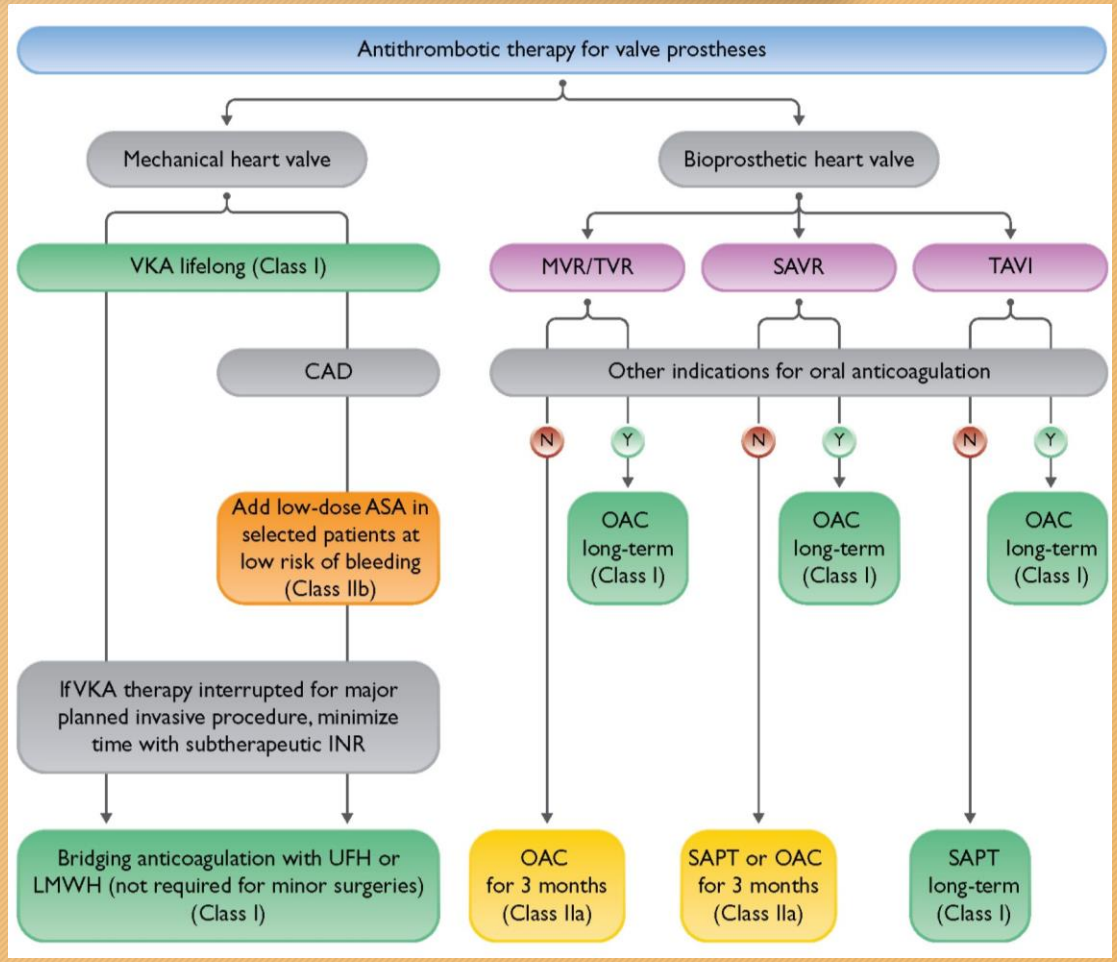
- pitvarfibrilláció,
- kiterjedt anteroszeptális, csúcsi akinezis,
- kamrai aneurizma,
- mechanikus műbillentyű
- billentyű meszesedés,
- infektív endokarditisz,
- kardiomiopátiák,
- intrakardiális tumorok,
- (foramen ovale - paradox embolizáció),
- (pacemaker),



Műbillentyű

Billentyű sebészet
- plasztika
- műbillentyű implantáció
    - L mechanikus műbillentyű
    - L biológiai műbillentyű
    - L TAVI

K vitamin antagonista - DOAC

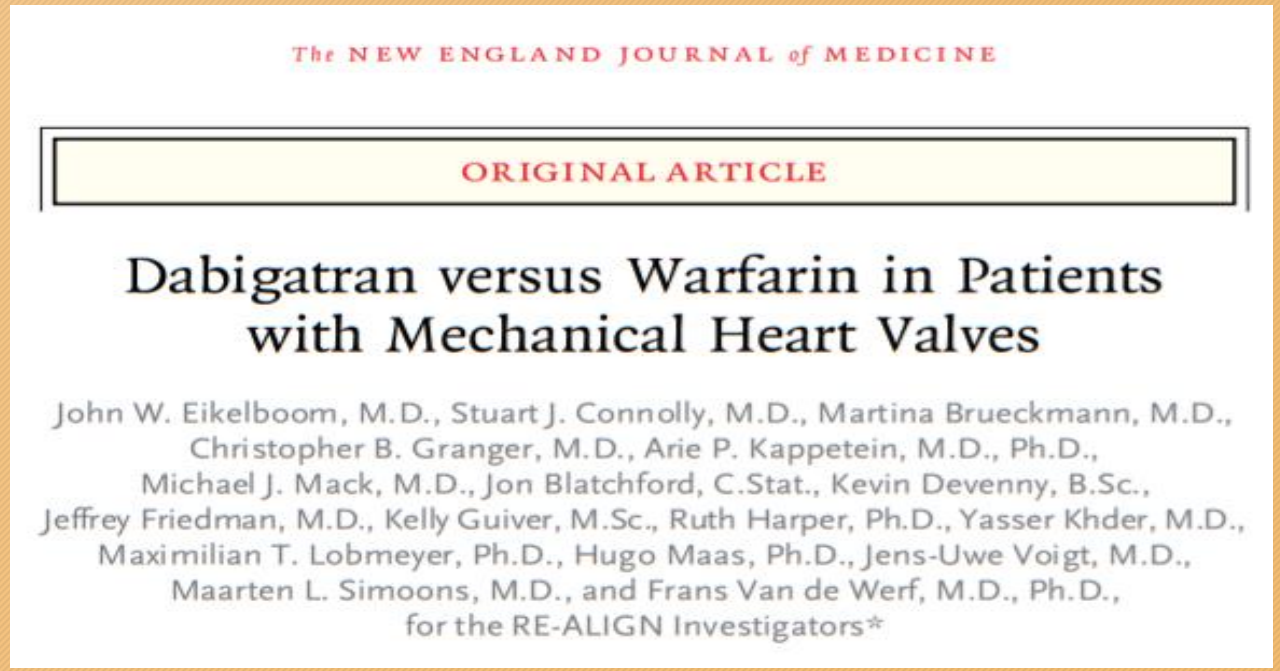


Mechanikus műbillentyű - DOAC

RE-ALIGN vizsgálat

- fázis II-es, biztonságossági és farmakokinetikai vizsgálat
- 252 mechanikus műbillentyű implantált beteg
- dabigatran vs. Warfarin

a dabigatran a warfarinhoz képest fokozta
a tromboembóliás és vérzéses események előfordulását



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Dabigatran versus Warfarin in Patients with Mechanical Heart Valves

John W. Eikelboom, M.D., Stuart J. Connolly, M.D., Martina Brueckmann, M.D., Christopher B. Granger, M.D., Arie P. Kappetein, M.D., Ph.D., Michael J. Mack, M.D., Jon Blatchford, C.Stat., Kevin Devenny, B.Sc., Jeffrey Friedman, M.D., Kelly Guiver, M.Sc., Ruth Harper, Ph.D., Yasser Khder, M.D., Maximilian T. Lobmeyer, Ph.D., Hugo Maas, Ph.D., Jens-Uwe Voigt, M.D., Maarten L. Simoons, M.D., and Frans Van de Werf, M.D., Ph.D., for the RE-ALIGN Investigators*

Mechanikus műbillentyű - VKA

Target international normalized ratio for mechanical prostheses

Prosthesis thrombogenicity	Patient-related risk factors[a]	
	None	≥1 risk factor
Low[b]	2.5	3.0
Medium[c]	3.0	3.5
High[d]	3.5	4.0

AF = atrial fibrillation; LVEF = left ventricular ejection fraction.

a Mitral or tricuspid valve replacement; previous thromboembolism; AF; mitral stenosis of any degree; LVEF <35%.

b Carbomedics, Medtronic Hall, ATS, Medtronic Open-Pivot, St Jude Medical, Sorin Bicarbon.

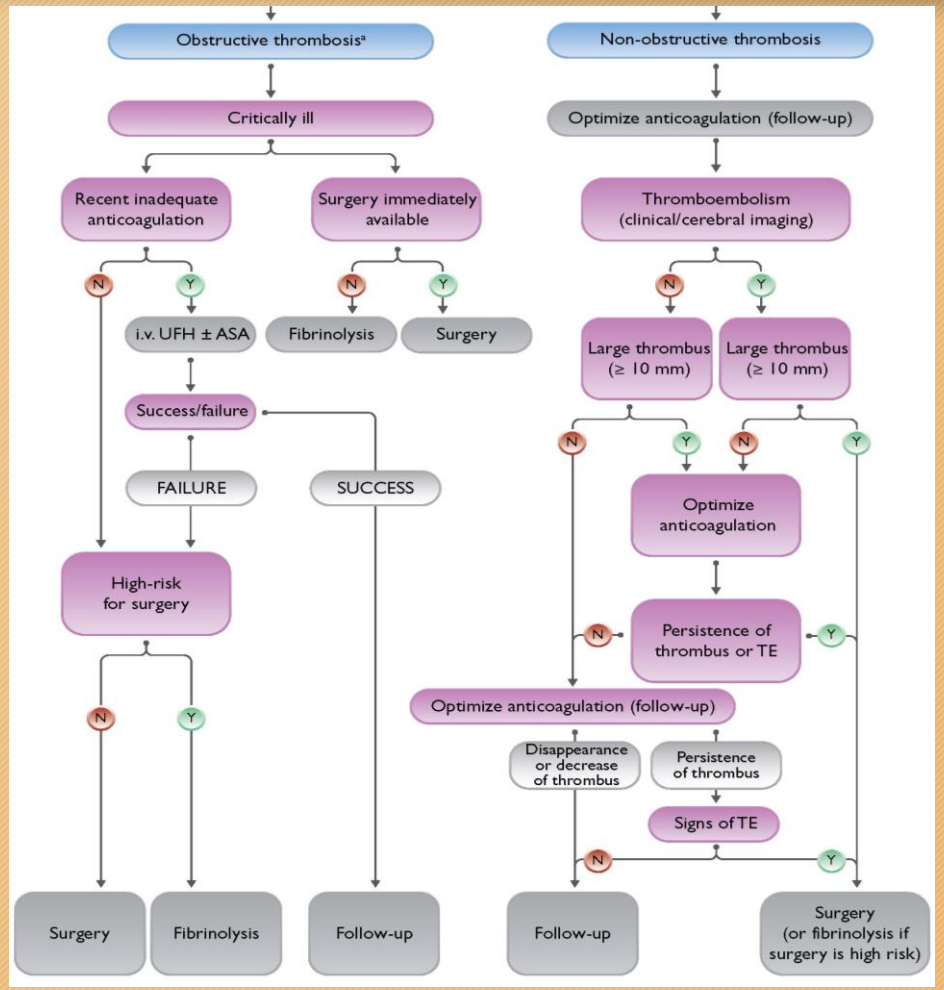
c Other bileaflet valves with insufficient data.

d Lillehei-Kaster, Omniscience, Starr-Edwards (ball-cage), Bjork-Shiley and other tilting-disc valves.

Surgical valve replacement		
OAC using a VKA is recommended lifelong for all patients with an MHV prosthesis.[472,473]	I	B
For patients with a VKA, INR self-management is recommended provided appropriate training and quality control are performed.[482]	I	B
OAC is recommended for patients undergoing implantation of a surgical BHV who have other indications for anticoagulation.[f]	I	C
NOACs should be considered over VKA after 3 months following surgical implantation of a BHV in patients with AF.[74,499,500,515–518]	IIa	B
In patients with no baseline indications for OAC, low-dose aspirin (75–100 mg/day) or OAC using a VKA should be considered for the first 3 months after surgical implantation of an aortic BHV.[491,494]	IIa	B
In patients with no baseline indications for OAC, OAC using a VKA should be considered for the first 3 months after surgical implantation of a bioprosthesis in the mitral or tricuspid position.[519,520]	IIa	B
The addition of low-dose aspirin (75–100 mg/day) to VKA may be considered in selected patients with MHVs in case of concomitant atherosclerotic disease and low risk of bleeding.	IIb	C
The addition of low-dose aspirin (75–100 mg/day) to VKA should be considered after thromboembolism despite an adequate INR.	IIa	C
NOACs may be considered over VKA within 3 months following surgical implantation of a BHV in mitral position in patients with AF.[499]	IIb	C
NOACs are not recommended in patients with a mechanical valve prosthesis.[474]	III	B

Surgical valve repair		
OAC with VKA should be considered during the first 3 months after mitral and tricuspid repair.	IIa	C
SAPT with low-dose ASA (75–100 mg/day) should be considered for the first 3 months after valve-sparing aortic surgery when there are no other baseline indications to OAC.	IIa	C
Transcatheter aortic valve implantation		
OAC is recommended lifelong for TAVI patients who have other indications for OAC.[501 f]	I	B
Lifelong SAPT is recommended after TAVI in patients with no baseline indication for OAC.[495,496,521]	I	A
Routine use OAC is not recommended after TAVI in patients with no baseline indication for OAC.[497]	III	B

Mechanikus műbillentyű thrombózis



Műbillentyű és terhesség

Fogamzóképes nő + műbillentyű implantáció

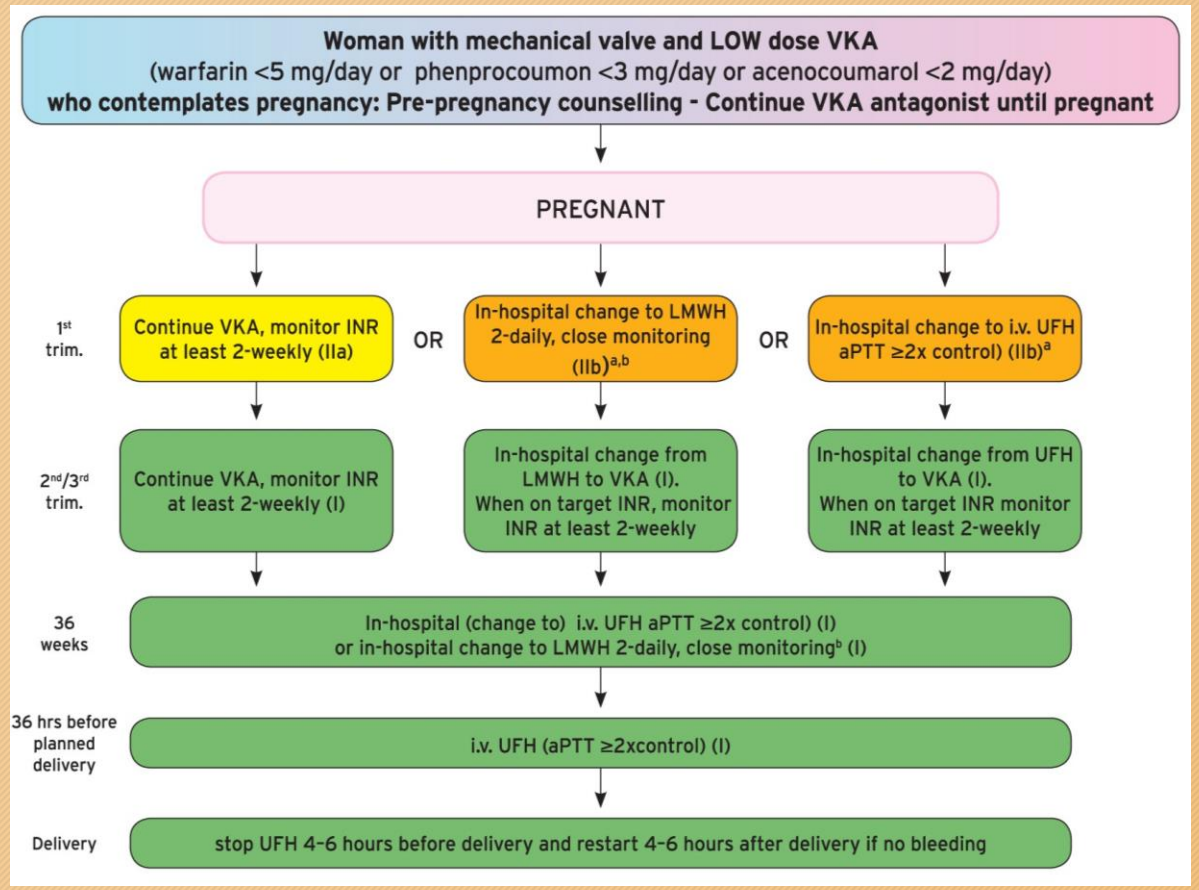
- mechanikus
- biológiai

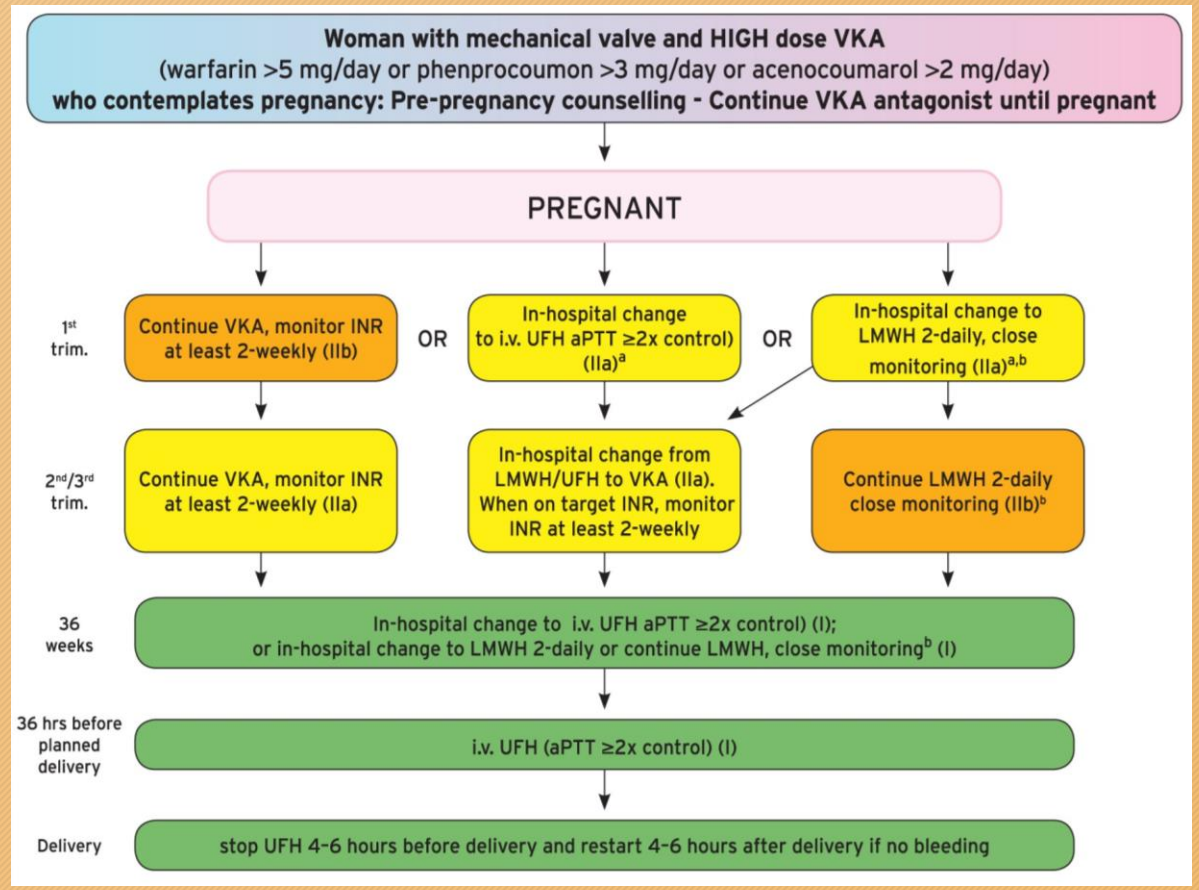
Az anticoagulálás növeli az anyai és magzati morbiditást, mortalitást és a major cardiális események elfordulásának valószínűségét.
Eseménymentes terhesség 58%-ban fordul elő mechanikus műbillentyű esetén, míg biológiai műbillentyű esetén 79%-ban.

Mechanikus műbillentyű

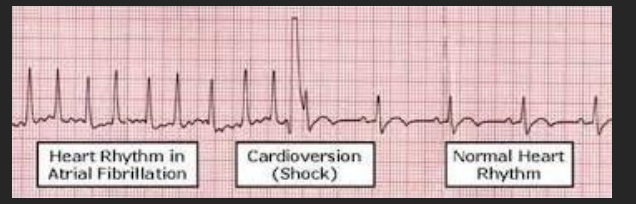
- A VKA adja a legjobb thrombózis elleni védelmet, ugyanakkor a foetoapathia, embriopathia, a vetélés és a magzati haemorrhagia veszélye fokozott
- LMWH használata kisebb thrombózis elleni védelemmel és kisebb magzati rizikóval jár.

Mechanikus műbillentyű és terhesség





Pitvarfibrilláció

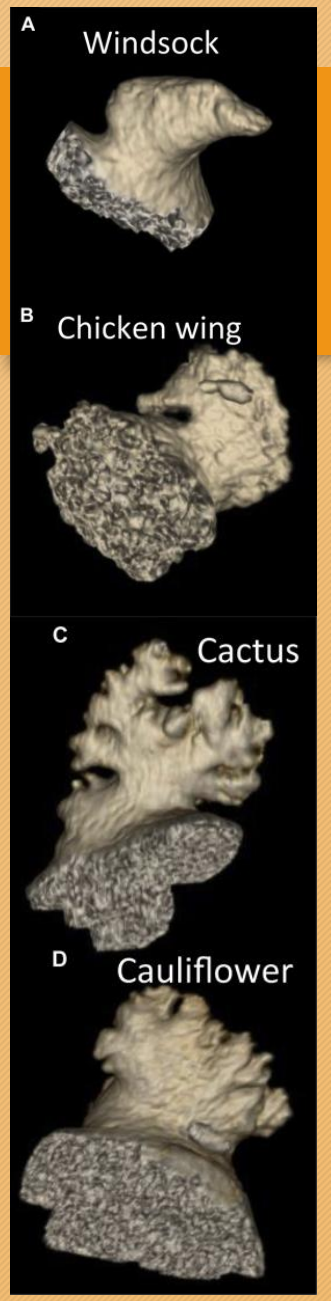


80 éves életkor felett a stroke-ok 25%-ában oki tényező

- a stroke súlyosabb
- a mortalitás magasabb

Valvuláris - non-valvuláis pitvarfibrilláció

Thrombotikus rizikó - vérzéses rizikó

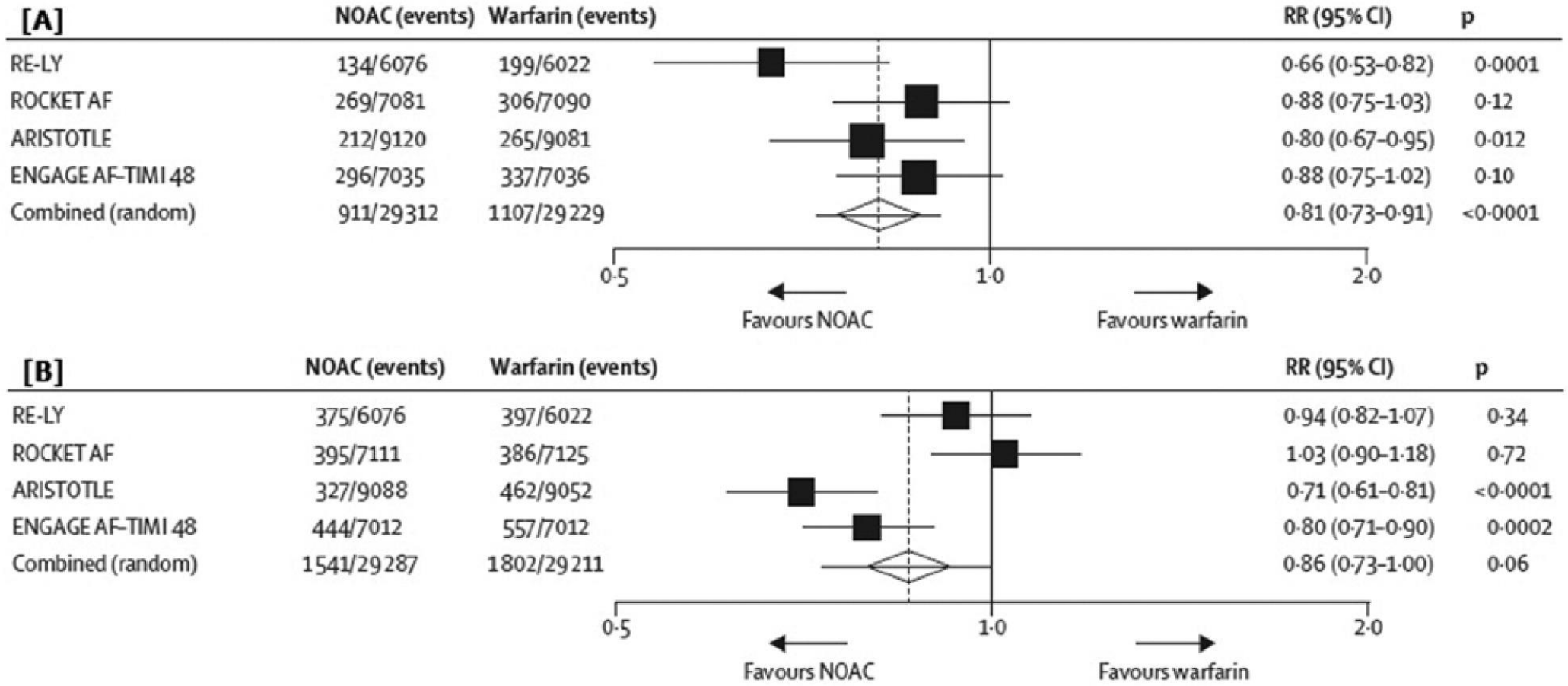


CHA_2DS_2-VASc és HAS-BLED score

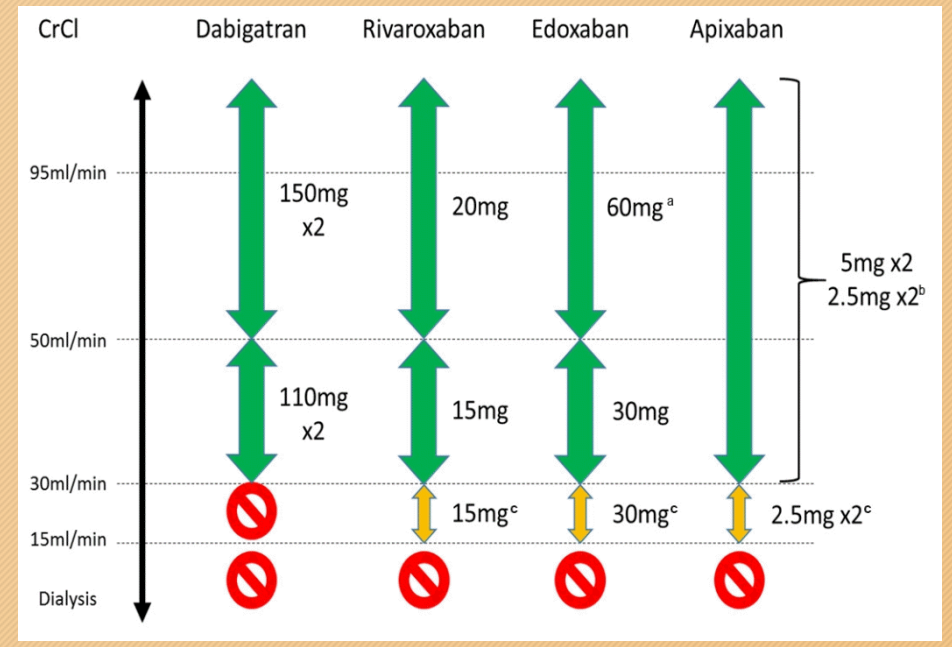
	rizikófaktorok	pont	CHA_2DS_2-VASc score	Stroke rizikó (%/év)
C	pangásos szívelégtelenség/bal kamra diszfunkció	1	0	0%
H	hipertónia	1	1	1,3%
A_2	életkor: >75 év	2	2	2,2%
D	diabétesz mellitusz	1	3	3,2%
S_2	stroke/TIA/tromboembóliás események	2	4	4%
V	vaszkuláris megbetegedés	1	5	6,7%
A	életkor: 65-74 év	1	6-7	9,6-9,8%
Sc	női nem	1	8	6,7%
	maximum érték		9 8	15,2%

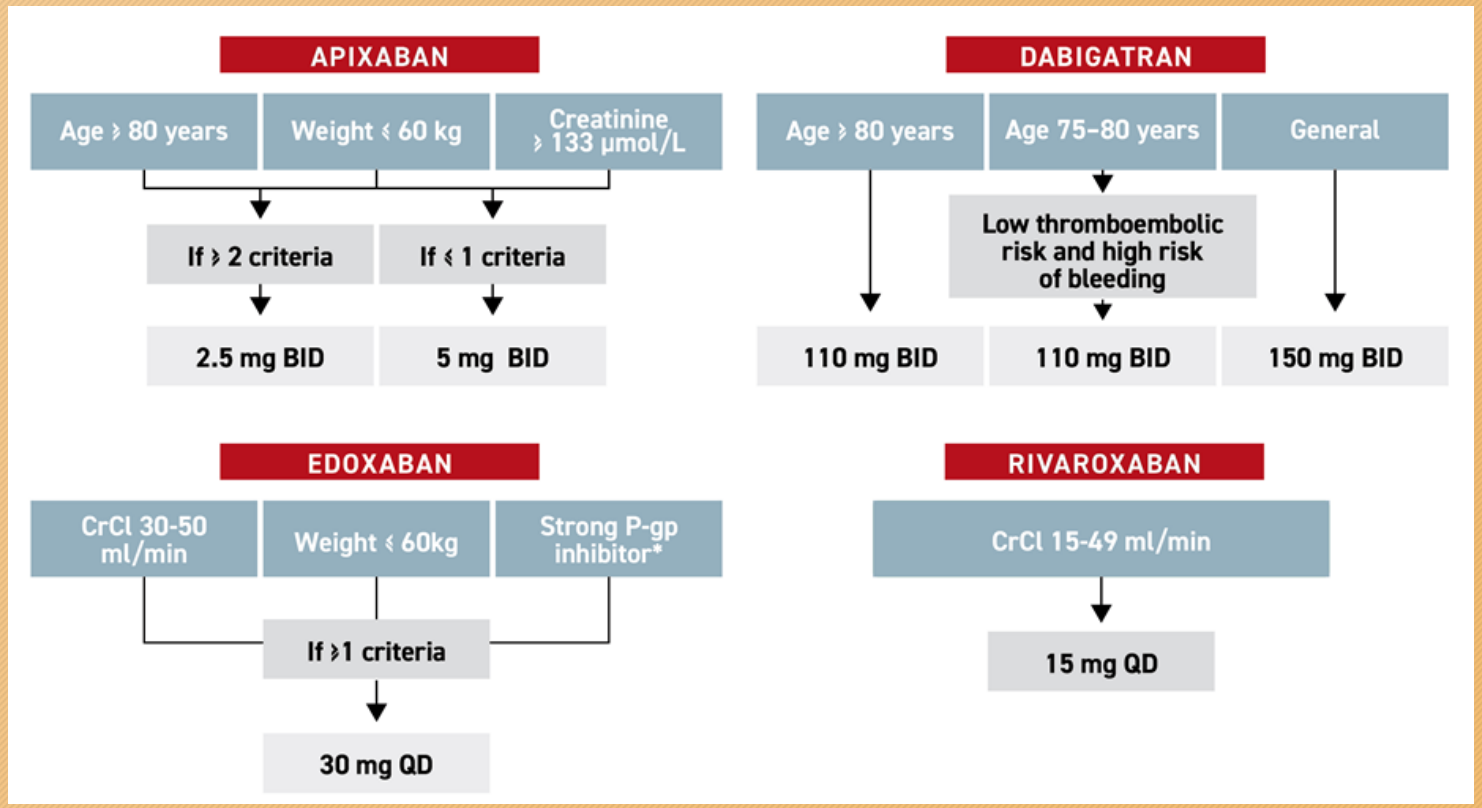
	rizikófaktorok	HAS-BLED score
H	hipertónia	1
A	kóros vese vagy májfunkció (1-1- pont)	1 vagy 2
S	stroke	1
B	vérzés	1
L	labilis INR	1
E	életkor: > 65 év	1
D	gyógyszerszedés vagy alkoholfogyasztás (1-1 pont)	1 vagy 2
	maximum érték	9

Anticoaguláns terápia - PF



Pitvarfibrilláció - DOAC dózis

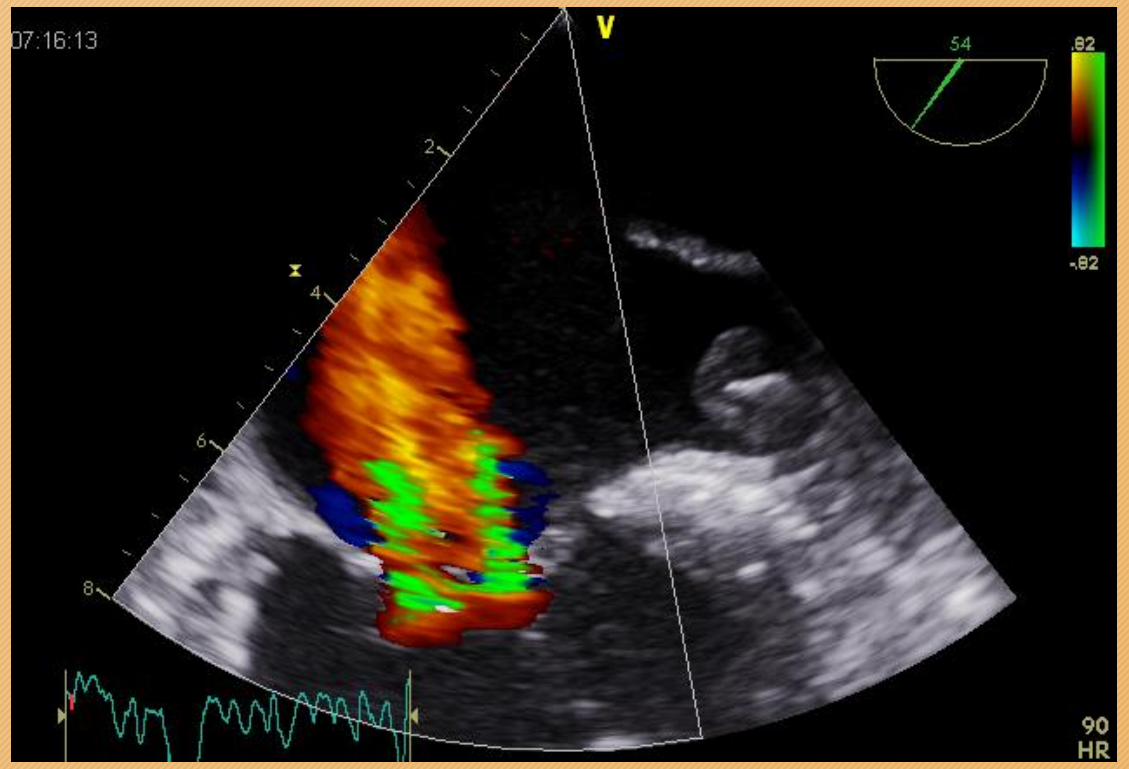




DOAC dózis

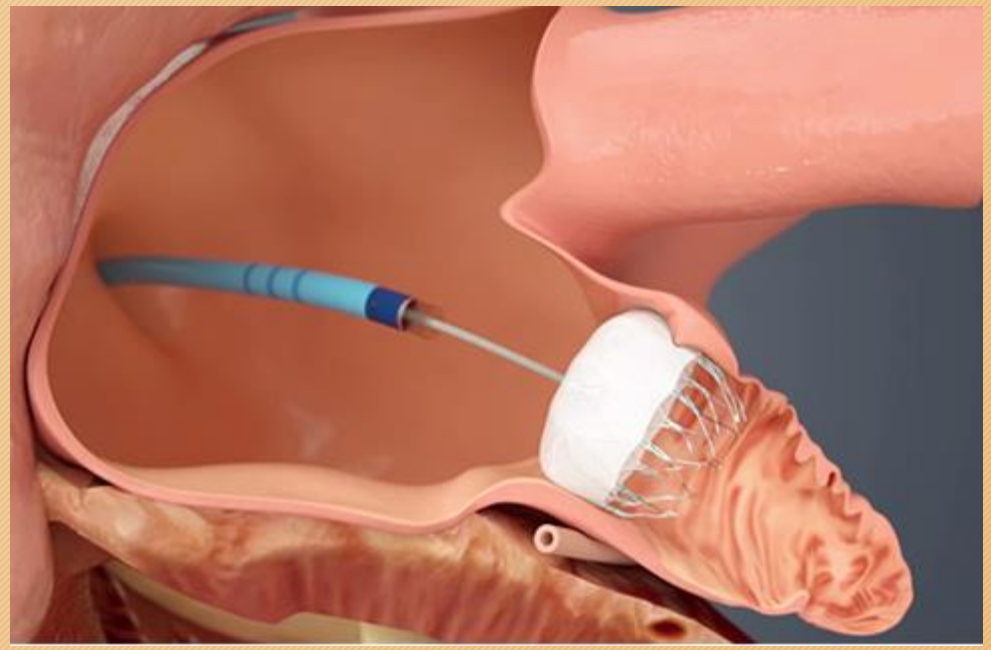
Miért van különbség a DOAC dózisban MVT-PE és PF között?

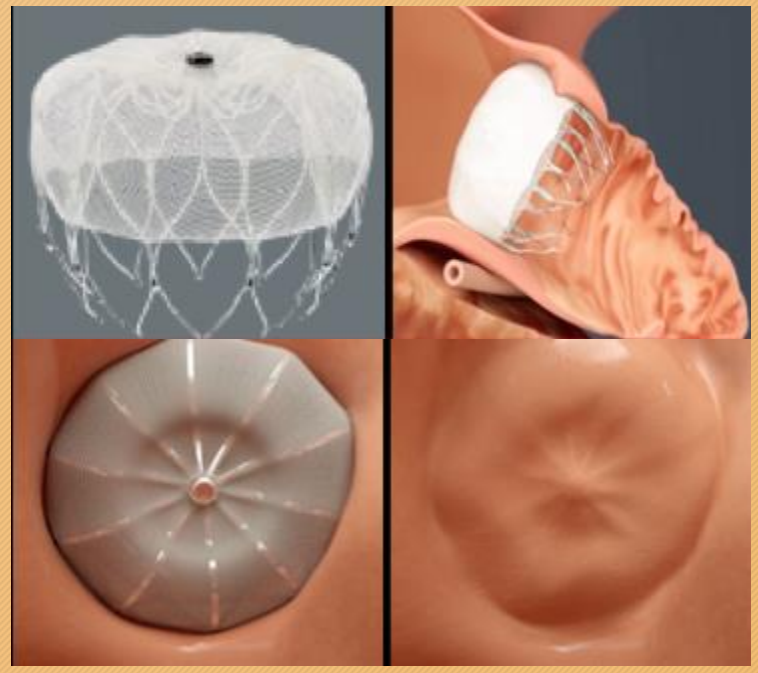
És mi a helyzet, ha a fülcsében thrombus van?



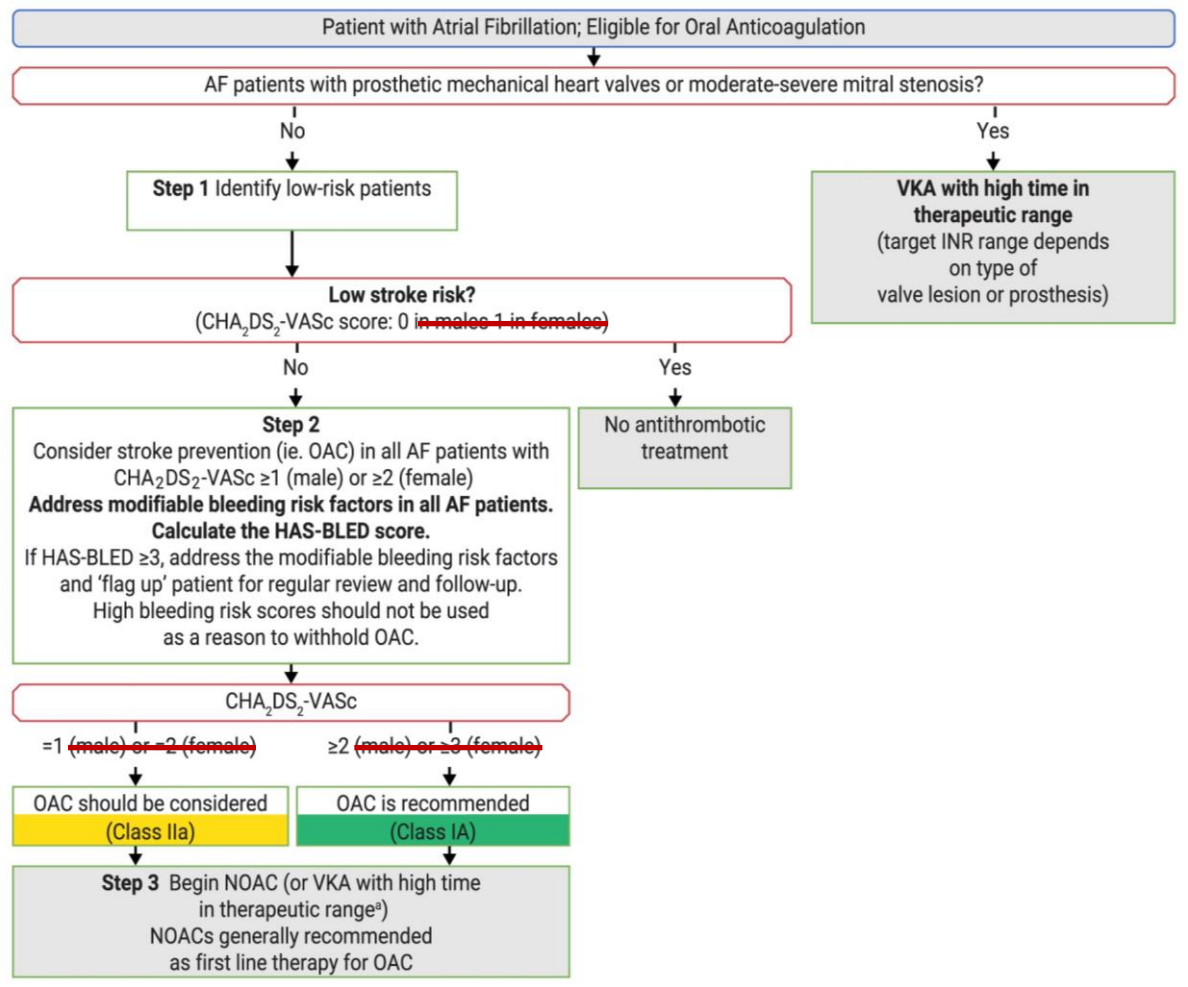
Ha nem lehet anticoagulálni

Sebészi vagy eszközös fülcsezárás





Anticoaguláns terápia - PF



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

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

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

Abláció

Recommendations	Class[a]	Level[b]
Initiation of oral anticoagulation is recommended at least 3 weeks prior to catheter-based ablation in AF patients at elevated thromboembolic risk, to prevent peri-procedural ischaemic stroke and thromboembolism.[554,647]	I	C
Uninterrupted oral anticoagulation is recommended in patients undergoing AF catheter ablation to prevent peri-procedural ischaemic stroke and thromboembolism.[664,665]	I	A
Continuation of oral anticoagulation is recommended for at least 2 months after AF ablation in all patients, irrespective of rhythm outcome or CHA_2DS_2-VA score, to reduce the risk of peri-procedural ischaemic stroke and thromboembolism.[554,663]	I	C
Continuation of oral anticoagulation is recommended after AF ablation according to the patient's CHA_2DS_2-VA score, and not the perceived success of the ablation procedure, to prevent ischaemic stroke and thromboembolism.[554]	I	C
Cardiac imaging should be considered prior to catheter ablation of AF in patients at high risk of ischaemic stroke and thromboembolism despite taking oral anticoagulation to exclude thrombus.[649,650]	IIa	B

Kamrai thrombus

RIVAWAR: Rivaroxaban As Effective as Warfarin For Post MI LV Thrombus

Mar 29, 2025

ACC News Story

Print Font Size A A A

On this page: Resources

Rivaroxaban was found to be as effective and safe as warfarin in resolving post myocardial infarction (MI) left ventricular (LV) thrombus at three months, according to a Late-Breaking Clinical Trial presented at ACC.25 in Chicago.

The open-label trial, conducted at a single site in Pakistan, randomized 261 patients (54.5 years old on average, 79.3% men) with acute LV thrombus to either rivaroxaban (n=171) or warfarin (n=90) for three months. Of the patients, 90.4% had a STEMI and 9.6% NSTEMI, and 85.1% had undergone PCI. The LVEF was ≤35% in 93.9% of the patients. Patients were treated with dual antiplatelet therapy for one month and then a single antiplatelet therapy for the remaining eight weeks along with an oral anticoagulant.

Results showed that at one month more patients in the rivaroxaban arm had LV thrombus resolution (33 patients [20.1%] vs. seven patients (8.3%) in the warfarin arm (risk difference [RD], 11.8%; odds ratio [OR], 2.41; p=0.017). At three months, LV thrombus resolution occurred in 95.8% of patients in the rivaroxaban arm and 96.6% of patients in the warfarin arm (RD, –0.8%; OR, 0.98; p=0.88).

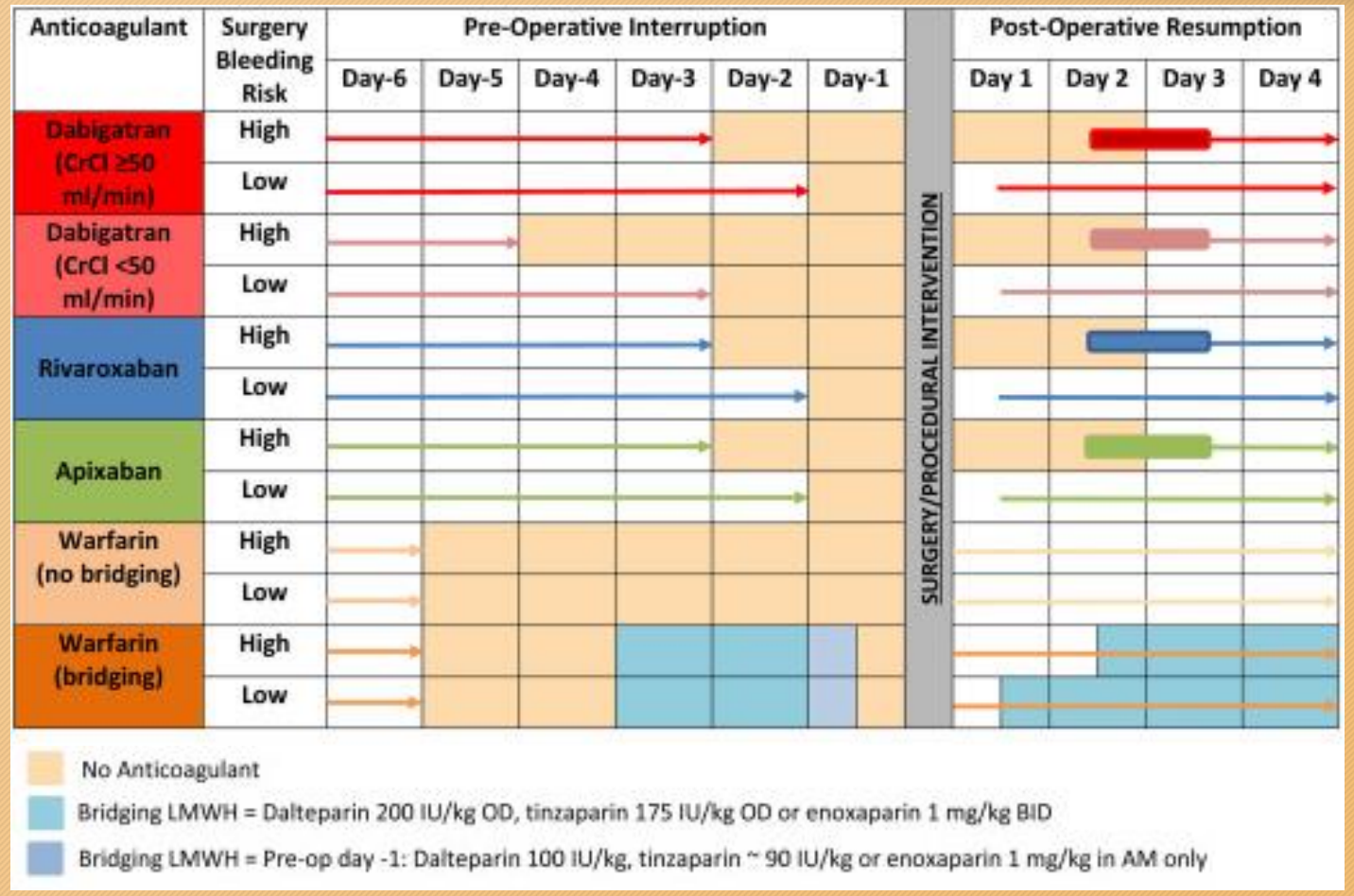
Secondary endpoints were comparable between the rivaroxaban and warfarin arms, respectively, including all-cause mortality (3.5% vs. 3.3%), ischemic stroke (3.5% vs. 1.1%) and major bleeding (2.3% vs. 1.1%). Follow-up ended at three months when the study was discontinued due to lack of funding.

Perioperatív anticoagulálás - vérzési rizikó

Perioperatív vérzési rizikó az orvosi beavatkozások függvényében

alacsony	közepes	magas
fogászati	RF abláció	ér-, mellkas- és szívsebészet
kisebb bőrgyógyászati	ICD implantáció	hasi és kismedencei sebészet
szemészeti	endoszkópia biopsziával	orthopédiai sebészet
endoszkópia biopszia nélkül	prosztata biopszia	idegsebészet
	coronarographia - a. radialis	coronarographia - a. femoralis

Perioperatív anticoagulálás



Köszönöm a figyelmet!