Update on Anticoagulation for Hospitalists

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I disclose the following relevant financial relationships with eligible companies:

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- Astra Zeneca
- Gilead
- Phase Bio
- Boston Scientific
- Inari

Research funding (to institution)
- Janssen
- BMS
- Osmosis research
- NIH
- Bayer

Board membership (non-profit)
- AC Forum
- National Blood Clot Alliance Medical and Scientific Advisory Board
- PERT Consortium

I intend to reference unlabeled/unapproved uses of drugs or products in my presentation

I will be presenting a topic or topics that are not, or not yet, adequately based on current science, evidence, and/or clinical reasoning and fall outside the standard of care.

Updates in Anticoagulation: Year in Review

AC Forum Rapid Recaps used to guide selection of papers

Thanks to this team for providing such a useful and timely resource

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Year in Review

- Antiphospholipid syndrome systematic review
- DOAC or VKA after TAVR (trans aortic valve replacement)
- Management of chronic coronary disease
- Apixaban in hemodialysis
- Early vs. Later anticoagulation after atrial fibrillation related stroke
- Bridging anticoagulation in mechanical heart valve patients with stroke

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Case 1

38-year-old female with acute DVT

No transient or persistent risk factors

No arterial thrombosis, livedo racemosa, pulmonary hemorrhage, nephropathy, myocardial disease, or adrenal hemorrhage

1 miscarriage at 9 weeks and no preeclampsia or intrauterine fetal growth restriction

Which anticoagulant?

A. Low molecular weight heparin
B. DOAC
C. Warfarin

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Rapid Recap

Anticoagulation FORUM

ANTICOAGULATION Centers of Excellence

December 2022

Direct Oral Anticoagulants vs Vitamin-K Antagonist in Thrombotic Antiphospholipid Syndrome: Meta-analysis of Randomized Controlled Trials & Warfarin is the Preferred Therapy for Patients with Thrombotic APS

Background: Data related to the optimal treatment strategy, direct acting oral anticoagulants (DOACs) or vitamin K antagonist (VKA), for patients with thrombotic antiphospholipid syndrome (APS) have raised concern of excessive thrombotic events, specifically arterial, with DOACs. However, these randomized controlled trials were relatively small and may not have been adequately powered to assess individual thrombotic outcomes. The authors conducted a systematic review and meta-analysis of four randomized-controlled trials to compare the efficacy and safety of DOACs versus VKA in thrombotic APS (defined as a reported history of arterial or venous thrombosis with documented positivity of at least one antiphospholipid antibody and verified at least 12 weeks apart).

Results: Overall, DOAC use was associated with increased odds of subsequent arterial thrombotic events when compared to warfarin (10.3% vs. 1.3%, OR 5.43, 95% CI 1.87-15.75, p <0.001), especially stroke. Furthermore, there was an increase in combined arterial thrombotic events or VTE in DOAC use vs VKA (11.5% vs 2.5%, OR 4.46, 95% CI 1.12-17.84, p=0.03). There was no significant difference in subsequent venous thromboembolism or major bleeding. These results were consistent in the different subgroups (single, double, and triple positivity; prior history of arterial thrombosis vs no prior history of arterial thrombosis; men vs women).

Rapid Takeaway: At this time, this meta-analysis provides the largest dataset looking at the question related to the use of DOAC versus VKA in thrombotic APS. Based on this data, it is clear there is an increase in arterial thrombosis when DOACs are used. Both the authors and authors of the associated commentary suggest this may be due to warfarin's ability to target multiple pathways in the clotting cascade. At this time, VKAs are to remain the primary choice of agent for single, double and triple positive APS; however, DOACs may be considered in select situations. More details on this topic can be found in our Antiphospholipid Syndrome Rapid Resource. Continued research is needed in this domain. *J Am Coll Cardiol. 2022;* doi:10.1016/j.jacc.2022.10.008 & *J Am Coll Cardiol. 2022;* doi: 10.1016/j.jacc.2022.10.015

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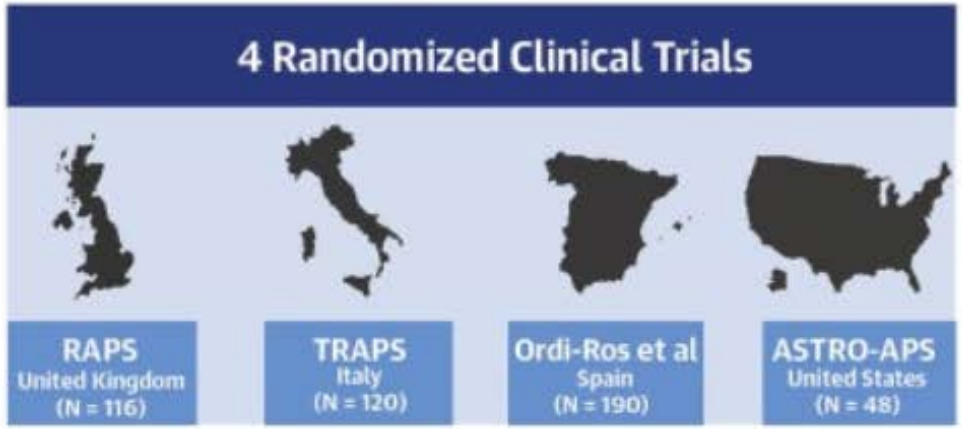
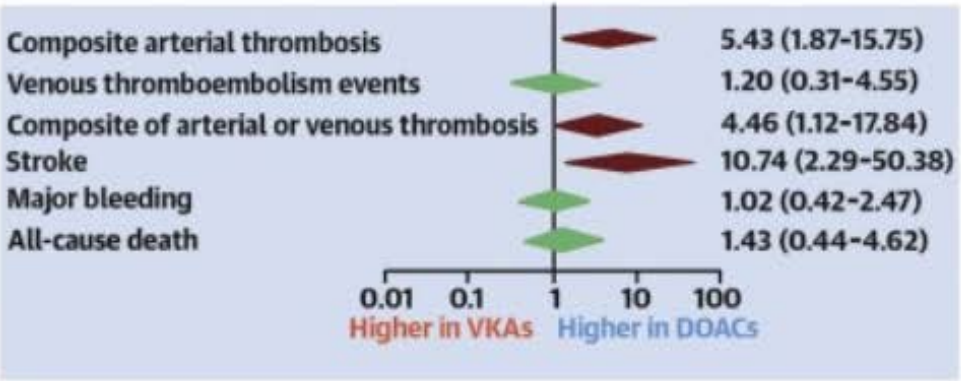
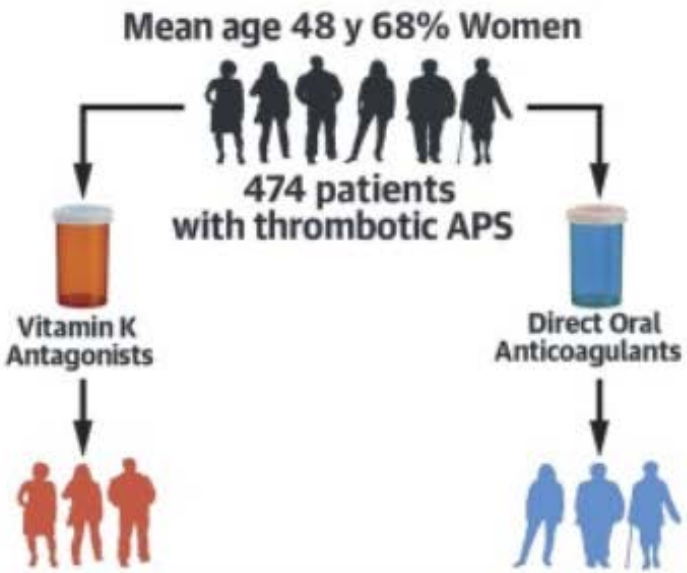
-2022-12-14-141155.pdf (acforum-excellence.org)

CENTRAL ILLUSTRATION: Use of Direct Oral Anticoagulants vs Vitamin K Antagonists in Thrombotic Antiphospholipid Syndrome







Use of DOACs Compared With VKAs Was Associated With:

- Increased odds of arterial thrombotic events, especially stroke
- No change in the odds of VTE or major bleeding

Results were consistent within subgroups

Khairani CD, et al. J Am Coll Cardiol. 2023;81(1):16-30.

EDITORIAL COMMENT

Warfarin Is the Preferred Therapy for Patients With Thrombotic APS

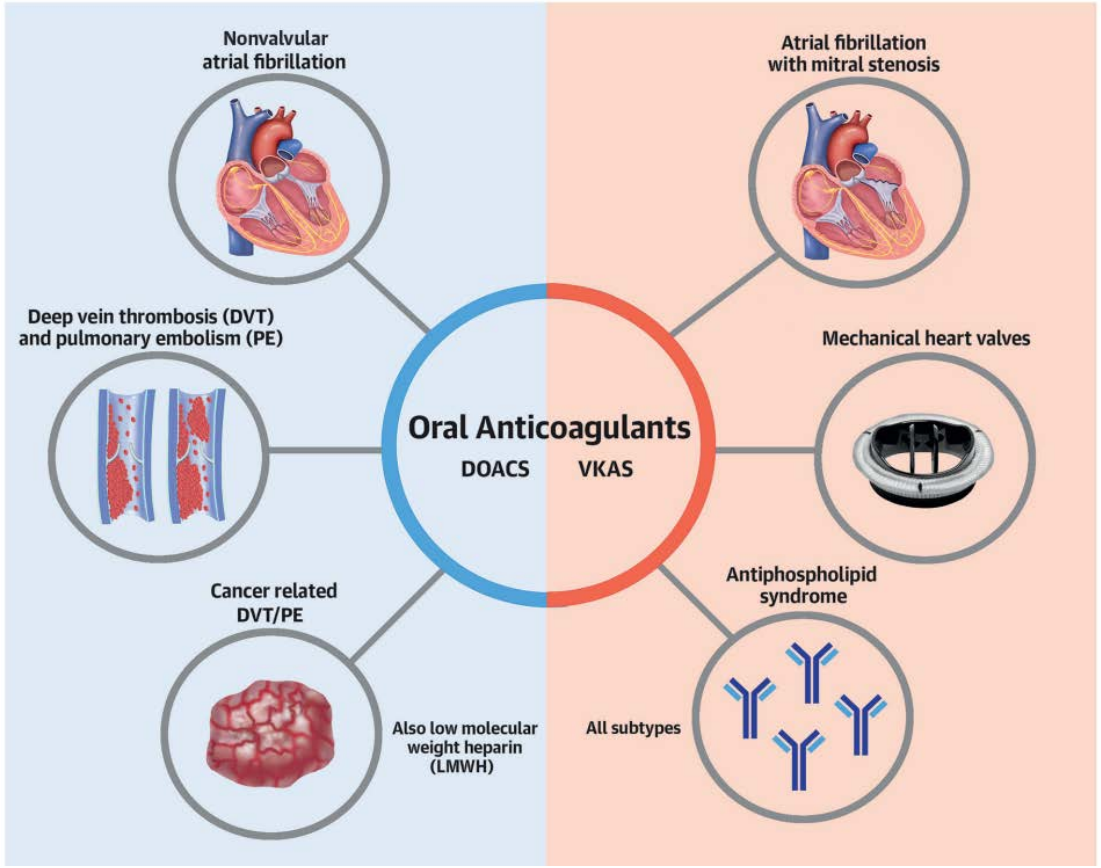
Back to the Future*

Mark A. Crowther, MD,[a] Aubrey E. Jones, PharmD, MSCI,[b] Daniel M. Witt, PharmD, BCPS[b]

Editorial suggests not using DOAC for any antiphospholipid syndrome or serology

Triple, double or single positive

FIGURE 1 Current Evidence-Based Indications for Warfarin or Other Anticoagulant Medications



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Crowther MA. J Am Coll Cardiol. 2023 Jan 3;81(1):31-33. PMID: 36328156.

Year in Review

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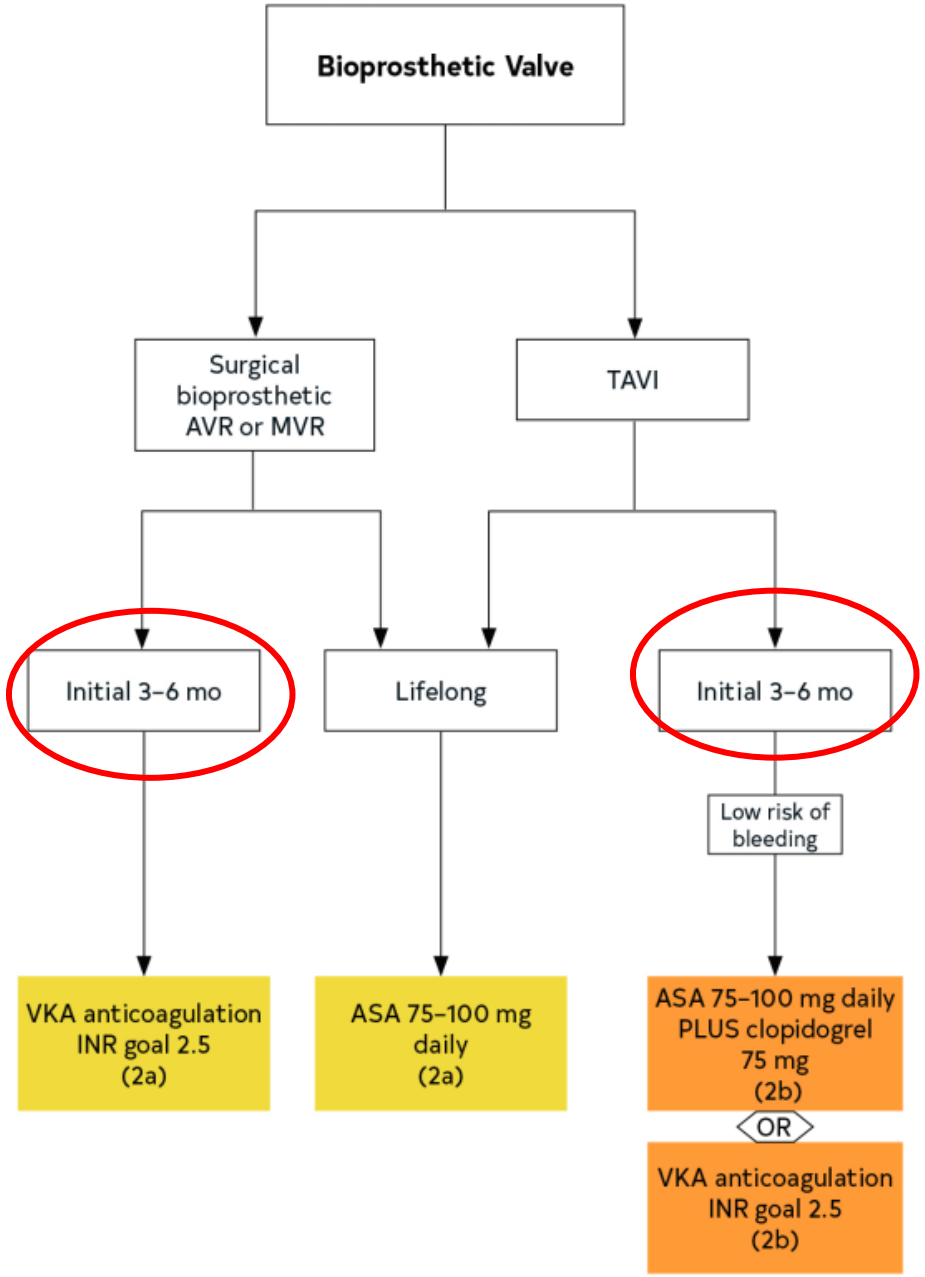
Case 2

68-year-old with Trans Aortic Valve Replacement (TAVR or TAVI)

Low bleeding risk

What would you prescribe for initial therapy?

A. Dual antiplatelet therapy
B. VKA
C. DOAC



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Otto CM. Circulation. 2021 Feb 2;143(5):e72-e227. PMID: 33332150.

DOACs vs. VKAs in the First 3 Months Following Bioprosthetic Valve Replacement

The risk of valve thrombosis is the highest in the first 90 days following bioprosthetic valve replacement. Many of these patients also have an indication for long term anticoagulation. Existing literature is limited surrounding the efficacy and bleeding risk associated with using DOACs during this initial 90 day time period. The authors conducted a systematic review & meta-analysis of four RTCs (two TAVR, two SAVR) comparing DOACs to VKAs in this population.

Rapid Takeaway: No difference was observed in rates of thrombosis, major bleeding or death between DOACs and VKAs over a median follow-up period of 12 months. However, there was a subgroup trend towards more bleeding with DOACs when initiated within 7 days of valve implantation. The interpretation of results is limited by the low numbers of trials included and the fact that most events were from a single trial (ENVISAGE-TAVI-AF).

Eur J Cardiothorac Surg. 2023 Apr 3;63(4):ezad110.

Direct oral anticoagulants versus vitamin K antagonists in the first 3 months after bioprosthetic valve replacement: a systematic review and meta-analysis

Key question

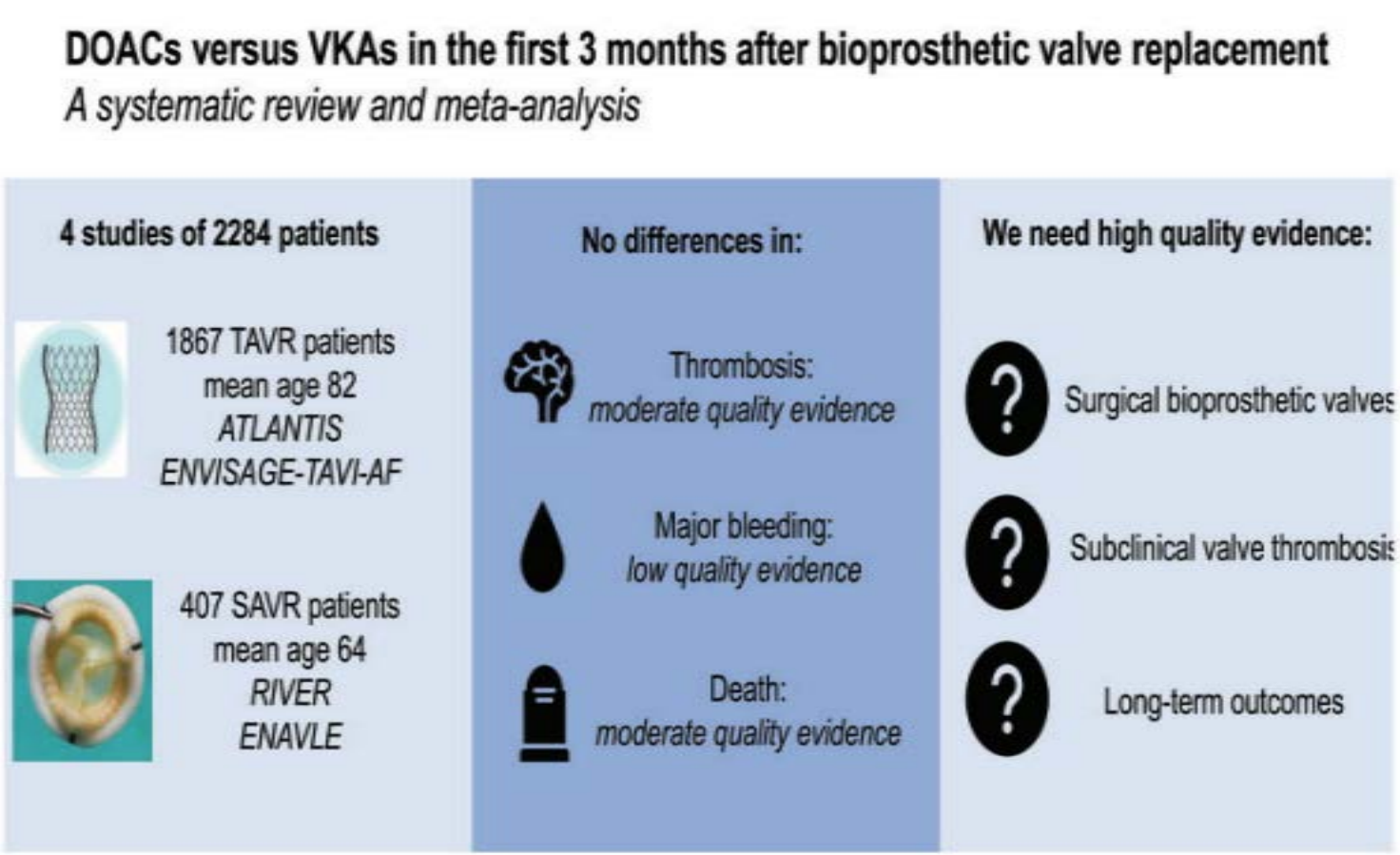
Are direct oral anticoagulants as safe and effective as vitamin K antagonists in the first 3 months after bioprosthetic valve replacement?

Key finding(s)

We found low to moderate quality evidence of no difference between DOACs and VKAs with respect to thrombosis, major bleeding, or death.

Take-home message

We need high-quality evidence regarding DOACs versus VKAs early after bioprosthetic valve replacement, especially in patients with surgical valves.



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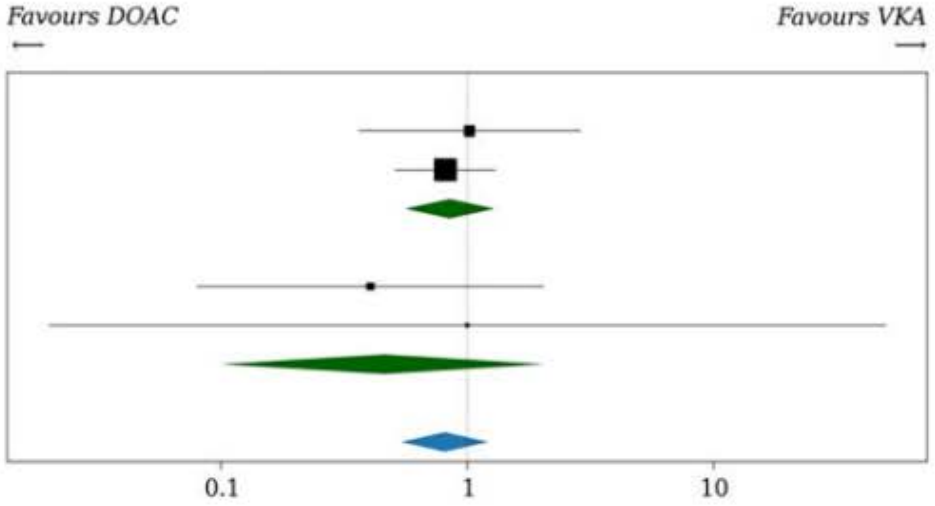
Eikelboom R. Eur J Cardiothorac Surg. 2023 Apr 3;63(4):ezad110 PMID: 36971601.

Direct oral anticoagulants versus vitamin K antagonists in the first 3 months after bioprosthetic valve replacement: a systematic review and meta-analysis

Thrombosis

Study	DOAC	(%)	VKA	(%)	Weight	RR [95% CI]
Transcatheter						
Collet 2021	7/223	(3%)	7/228	(3%)	15.5%	1.02 [0.36, 2.87]
Van Mieghem 2021	31/713	(4%)	38/713	(5%)	77.1%	0.82 [0.51, 1.3]
Subgroup Estimate	38/936	(4%)	45/941	(5%)	I^2: 0%	0.85 [0.56, 1.29]
Surgical						
Guimares 2021	2/94	(2%)	5/95	(5%)	6.3%	0.4 [0.08, 2.03]
Shim 2021	0/109	(0%)	0/109	(0%)	1.1%	1.0 [0.02, 49.95]
Subgroup Estimate	2/203	(1%)	5/204	(2%)	I^2: 0%	0.46 [0.1, 2.05]
Pooled Estimate					I^2: 0%	0.81 [0.54, 1.22]

Mantel-Haenszel, DerSimonian-Laird Random Effects Subgroup Effect
p=0.31, z=1.02
τ^2=0.00
χ^2=0.59, p=0.44, I^2=0.0%
RR: Risk Ratio
CI: Confidence Interval



Risk of bias domains

Study	D1	D2	D3	D4	D5	Overall
Van Mieghem 2021	+	+	+	+	+	+
Guimares 2021	+	+	+	+	+	+
Duraes 2016	-	+	+	+	+	+
Shim 2021	+	-	+	+	+	+

Eikelboom R.. Eur J Cardiothorac Surg. 2023 Apr 3;63(4):ezad110 PMID: 36971601.

Direct oral anticoagulants versus vitamin K antagonists in the first 3 months after bioprosthetic valve replacement: a systematic review and meta-analysis

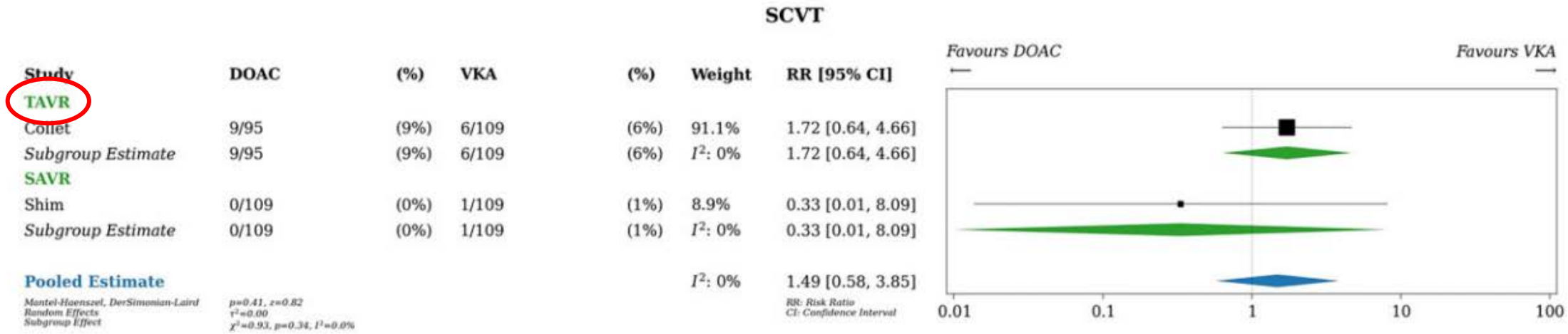


Figure 6: Subclinical valve thrombosis. DOAC: direct oral anticoagulant; RR: relative risk; VKA: vitamin K antagonist.

Meta analysis dominated by one trial

3 of 4 trials had indication for anticoagulation (mostly atrial fibrillation)

3 DOACs used in the 4 trials

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Eikelboom R.. Eur J Cardiothorac Surg. 2023 Apr 3;63(4):ezad110 PMID: 36971601.

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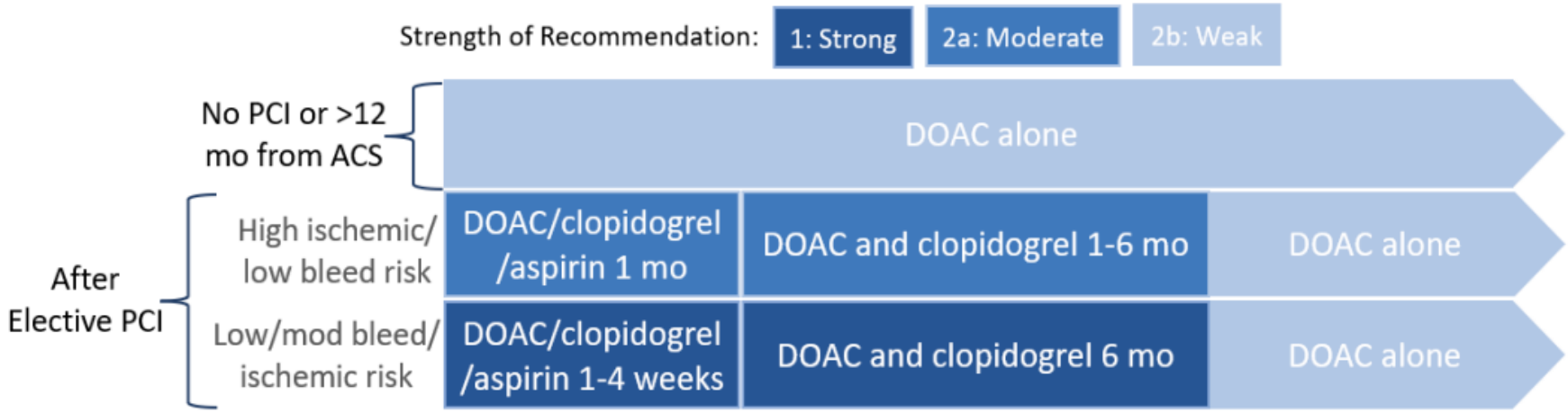
2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines

These recommendations update considerations from the 2020 ACC Expert Consensus Pathway for Anticoagulant and Antiplatelet Therapy with a focus on further limiting duration of combination antithrombotic therapy. There remains limited guidance and supporting evidence for patients with high bleeding risk after elective PCI. The following figure summarizes key points on anticoagulation and concomitant antiplatelet therapy. Recommendations listed are not all-inclusive. Circulation.2023 Jul 20. Online ahead of print.

Recommended Duration of Antiplatelet Therapy with Oral Anticoagulants



ACS: Acute Coronary Syndrome, DOAC: Direct Oral Anticoagulant, PCI: Percutaneous Coronary Intervention

Antiplatelet Therapy With Direct Oral Anticoagulant (DOAC)		
1	B-R	11. In patients with CCD who have undergone elective PCI and who require oral anticoagulant therapy, DAPT for 1 to 4 weeks followed by clopidogrel alone for 6 months should be administered in addition to DOAC.†[23]
2a	B-R	12. In patients with CCD who have undergone PCI and who require oral anticoagulant therapy, continuing aspirin in addition to clopidogrel for up to 1 month is reasonable if the patient has a high thrombotic risk and low bleeding risk.*[23–25]
2b	B-R	13. In patients with CCD who require oral anticoagulation and have a low atherothrombotic risk, discontinuation of aspirin therapy with continuation of DOAC alone may be considered 1 year after PCI to reduce bleeding risk.*[26]
2b	C-LD	14. In patients with CCD who require oral anticoagulation, DOAC monotherapy may be considered if there is no acute indication for concomitant antiplatelet therapy.[27–29]
Antiplatelet Therapy and Low-Dose DOAC		
2a	B-R	15. In patients with CCD without an indication for therapeutic DOAC or DAPT and who are at high risk of recurrent ischemic events but low-to-moderate bleeding risk, the addition of low-dose rivaroxaban 2.5 mg twice daily to aspirin 81 mg daily is reasonable for long-term reduction of risk for MACE.[30–32]
DAPT and Proton Pump Inhibitor (PPI)		
2a	B-R	16. In patients with CCD on DAPT, the use of a PPI can be effective in reducing gastrointestinal bleeding risk.*[33]

2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease

PCI

Triple therapy

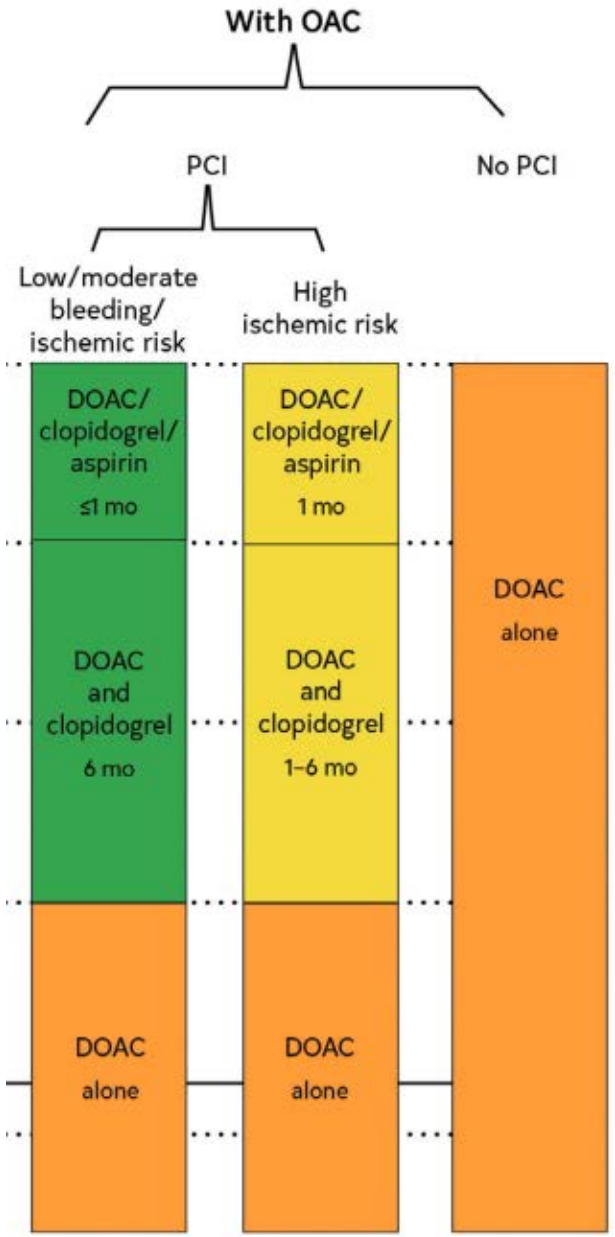
- 1-4 weeks
- 4 weeks in high thrombotic and low bleeding risk

Double antithrombotic

- DOAC and Clopidogrel for 6 months

No PCI

DOAC alone



Virani SS. Circulation. 2023 Aug 29;148(9):e1 e119. PMID: 37471501.

Update on Anticoagulation for Hospitalists

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No Financial Conflicts of Interest

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Case 3

75 year old woman with diabetes, atrial fibrillation on warfarin, and ESKD on hemodialysis. Hospitalized for pneumonia and now ready for discharge.

As you are prepping her for discharge, she asks whether she could take an alternative anticoagulant.

What do you tell her?

A. Stay on warfarin
B. OK to switch to apixaban

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Apixaban in Hemodialysis: AXADIA-AFNET 8 and RENAL-AF

Background: AXADIA-AFNET 8 (N=97) and RENAL-AF (N=154) are prospective, randomized, open-label trials comparing VKA to apixaban in patients with atrial fibrillation on chronic hemodialysis (HD). Whereas AXADIA-AFNET 8 dosed all participants with apixaban 2.5 mg BID, RENAL-AF dosed apixaban as per package insert. The primary outcome was a safety composite of major bleeding, clinically relevant non-major bleeding (CRB), and death in AXADIA-AFNET 8 and time to major or CRB in RENAL-AF. The primary efficacy outcome was a composite of ischemic stroke, all cause death, MI, and VTE in AXADIA-AFNET 8. Secondary outcomes in RENAL-AF were stroke, mortality, and apixaban pharmacokinetics.

Results: No difference in safety or efficacy between apixaban and VKA was observed in either study, however, both were underpowered to detect non-inferiority. Median TTR for VKA patients was 44% (RENAL-AF) and 51% (AXADIA-AFNET 8). PK studies showed apixaban 2.5 mg BID resulted in similar plasma levels (AUC0-12) to individuals with normal kidney function receiving 5 mg BID.

Rapid Takeaway: Additional interventions in this population are needed as event rates remain high (AXADIA-AFNET 8 = 22% death, 31% major or CRB; RENAL-AF = 22% death, 24% major or CRB). Both 2.5mg BID and 5mg BID appear to have some low quality evidence to support use in atrial fibrillation patients on HD, however until higher quality evidence is available, clinicians should engage in shared-decision making and dosing decisions should be individualized.

Circulation. 2022; 146(23):1735-1745 & Circulation. 2022 Nov 6. Online ahead of print.

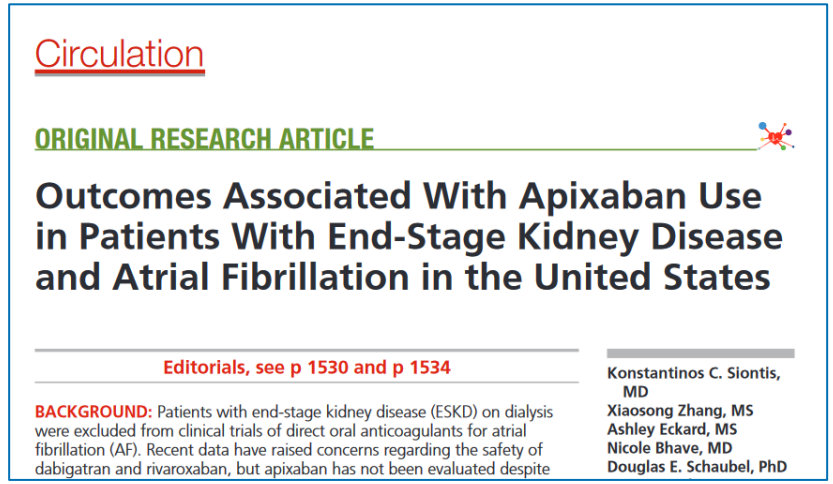
DOACs and End Stage Kidney Disease

Patients with ESKD excluded from pivotal clinical trials of DOACs

- Concern about bleeding risk

Nevertheless, DOAC use has been increasing over time

- 25,523 patients with AFib and on dialysis
- By 2015, 27% of new anticoagulant prescriptions were for apixaban



Circulation

ORIGINAL RESEARCH ARTICLE

Outcomes Associated With Apixaban Use in Patients With End-Stage Kidney Disease and Atrial Fibrillation in the United States

Editorials, see p 1530 and p 1534

Konstantinos C. Siontis, MD
Xiaosong Zhang, MS
Ashley Eckard, MS
Nicole Bhave, MD
Douglas E. Schaubel, PhD

BACKGROUND: Patients with end-stage kidney disease (ESKD) on dialysis were excluded from clinical trials of direct oral anticoagulants for atrial fibrillation (AF). Recent data have raised concerns regarding the safety of dabigatran and rivaroxaban, but apixaban has not been evaluated despite

Siontis KC et al., Circulation 2018

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Apixaban for ESRD in Atrial Fibrillation

Question: Can you use apixaban for Afib in ESRD?

Design: 2 multicenter, randomized non-inferiority trials: RENAL-AF and AXADIA-AFNET

	RENAL-AF	AXADIA-AFNET
Patients	Chronic HD, Afib, and CHA_2DS_2-VASC ≥2	
Apixaban	5 mg BID (or 2.5 mg if ≥80 yrs, ≤ 60kg)	2.5 mg BID
Control	Warfarin	Phenprocoumon
Outcomes	Bleeding	Death + bleeding

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Pokorney et al, Circulation 2022;146:1735-1745 and Reinecke et al, Circulation 2023;147:296-309

Baseline characteristics

	RENAL-AF		AXADIA-AFNET	
Target	*760*		*222*	
Actual	*154*		*97*	
	Apixaban N=82	**Warfarin N=72**	**Apixaban N=48**	**Phenprocoumon N=49**
Age, mean	69 yrs	68 yrs	75 yrs	75 yrs
Men	59%	69%	65%	76%
CHA_2DS_2-VASC, mean	4.0	4.0	4.5	4.5

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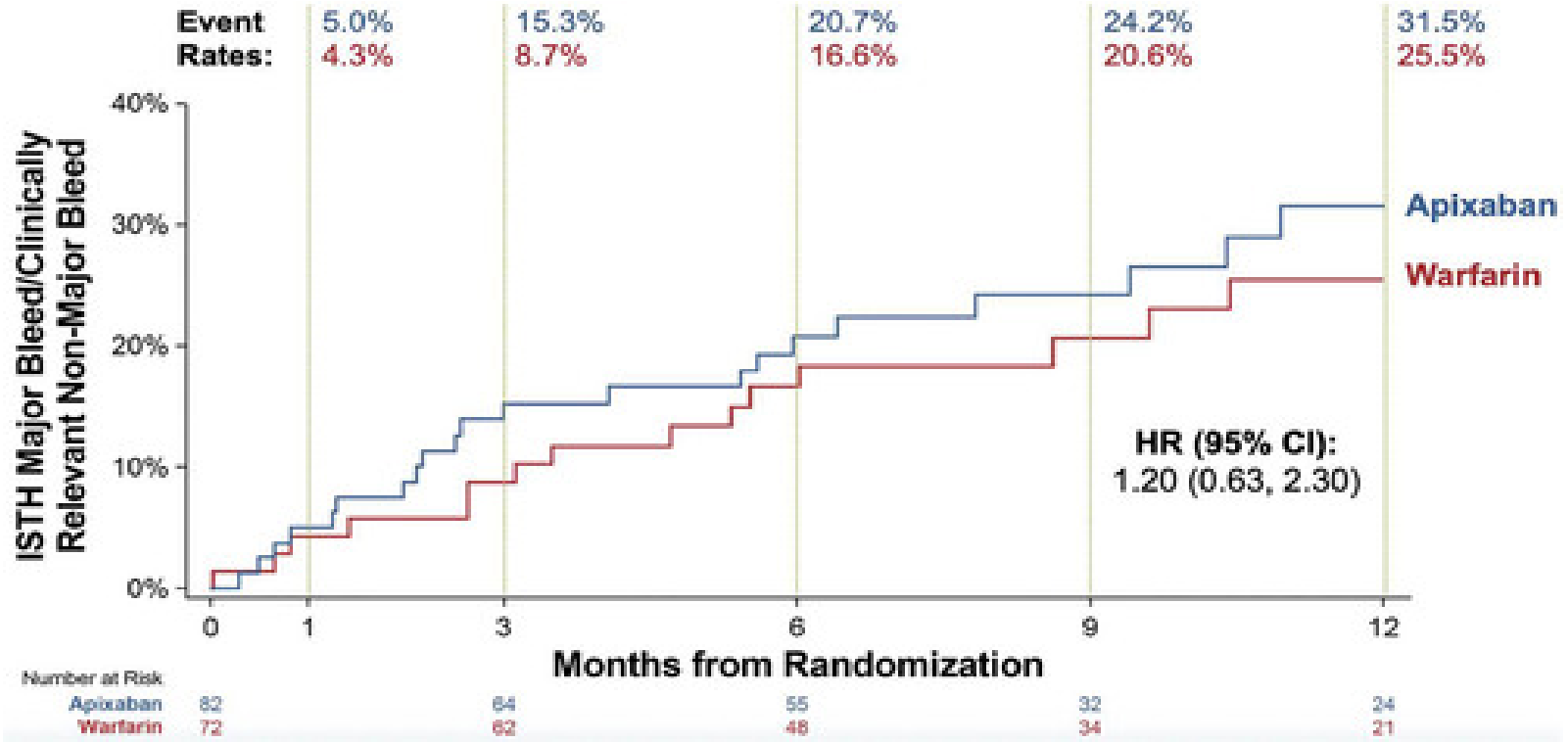
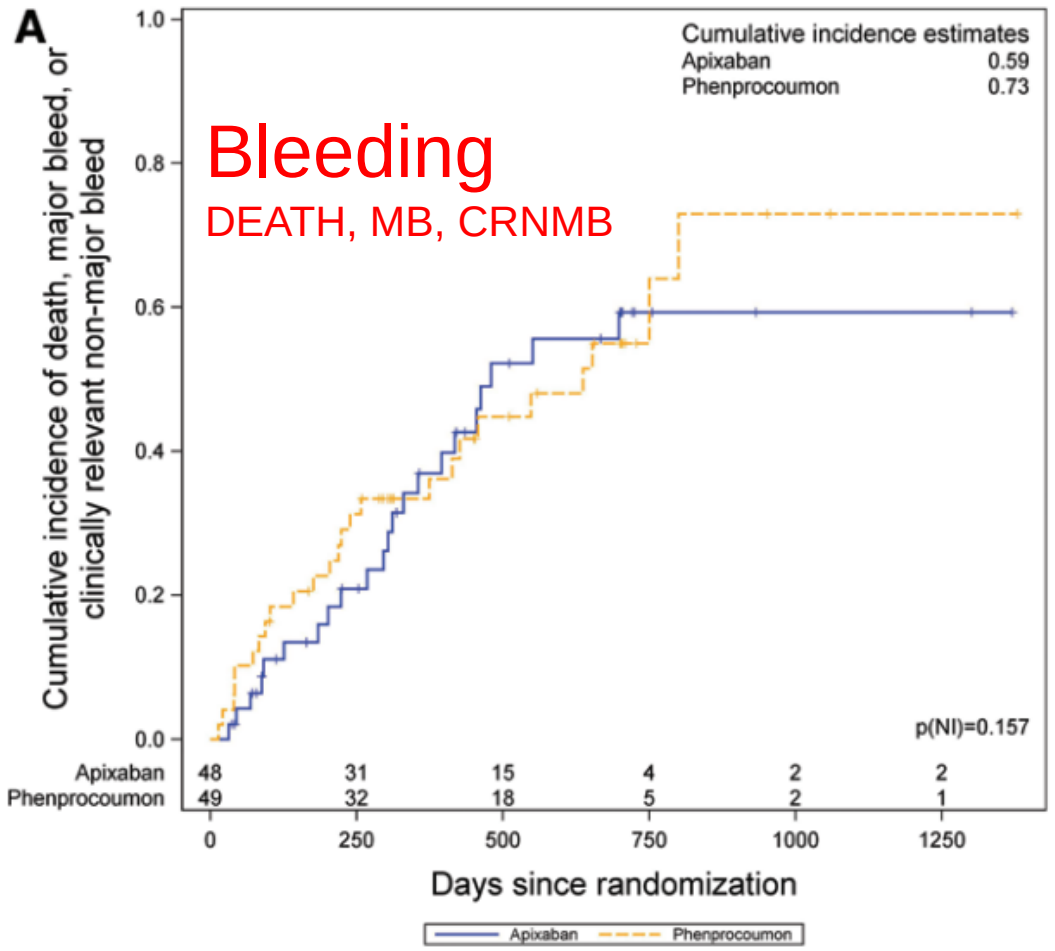
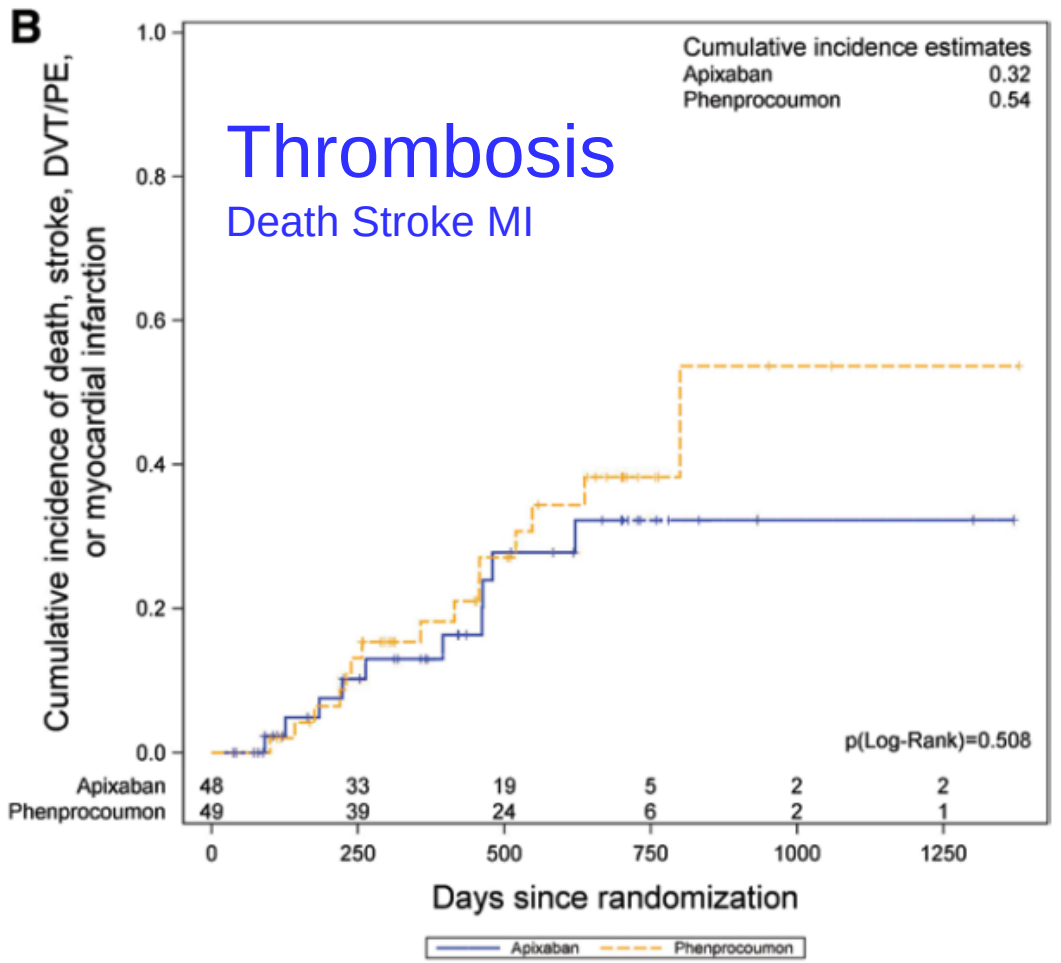
RENAL-AF



Pokorney SD et al. Circulation. 2022;146:1735–1745. PMID: 36335914

AXADIA-AFNET 8





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Reinecke H. Circulation. 2023 Jan 24;147(4):296-309. PMID: 36335915

Conclusions

No signal of excess harm with apixaban in ESRD for atrial fibrillation based on (underpowered) trials

Still unknown: should patients on dialysis be on anticoagulation for atrial fibrillation in the first place?

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That was Afib…
What about Venous Thrombosis?

Acute VTE – "loading phase" recommended; different dosing than atrial fibrillation

Observational study of 11,565 patients on dialysis with VTE

- 20% on apixaban, 80% on warfarin

Outcomes: bleeding, recurrent VTE within 6 months

Statistical methods used to control for differences between groups

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Ellenbogen et al. J Hosp Med. 2022; 17: 809-18

Apixaban vs. Warfarin for VTE

	Apixaban N=2302	Warfarin N=9263	HR [95% CI]
Bleeding			
Major bleeding	10.3%	13.7%	0.81 [0.7-0.9]
Intracranial bleeding	1.8%	2.5%	0.69 [0.5-0.98]
Clinically relevant non-major bleeding	15.3%	18.1%	0.84 [0.7-0.9]

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Ellenbogen et al. J Hosp Med. 2022; 17: 809-18

Apixaban vs. Warfarin for VTE

	Apixaban N=2302	Warfarin N=9263	HR [95% CI]
Bleeding			
Major bleeding	10.3%	13.7%	0.81 [0.7-0.9]
Intracranial bleeding	1.8%	2.5%	0.69 [0.5-0.98]
Clinically relevant non-major bleeding	15.3%	18.1%	0.84 [0.7-0.9]
Recurrent VTE	6.6%	6.3%	0.8 [0.7-1.0]
Death	10%	10%	1.1 [0.9-1.2]

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Ellenbogen et al. J Hosp Med. 2022; 17: 809-18

Words of Caution

Apixaban for VTE

- Not sure what the right dose is in acute VTE, especially loading phase
- Standard VTE dosing – higher bleeding risk?
- Lower apixaban dosing – higher thrombosis risk?

Situations where heparin/warfarin still appropriate

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Case 4

78-year-old with atrial fibrillation not on anticoagulation presents with acute ischemic stroke.

NIHSS score of 5

On MRI imaging, the stroke is 1.5 cm (moderate in size).

You want to start DOAC anticoagulation but are worried about hemorrhagic transformation.

What is the earliest you could start anticoagulation?

A. Within 2 days
B. At 6-7 days
C. After 14 days

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Early Versus Later Anticoagulation for Secondary Stroke Prevention in Patients with Atrial Fibrillation

In patients with an acute ischemic stroke and comorbid AF, DOACs can be used for secondary stroke prevention. The ELAN study was conducted to address the question of when to initiate a DOAC in this scenario as early initiation may increase the risk of ICH and late initiation may increase risk of stroke.

Design: In this international, open-label, randomized trial, 2032 patients presenting with acute ischemic stroke and comorbid AF were randomized to either early or late, guideline-recommended initiation of a DOAC. Early treatment group was initiated within 48 hours of a minor or moderate stroke and on day 6 or 7 after a major stroke. Later treatment initiation occurred on day 3 or 4 after a minor stroke, day 6 or 7 after a moderate stroke, and day 12, 13, or 14 after a major stroke.

Results: No statistically significant difference in the primary outcome, or composite of the incidence of recurrent ischemic stroke, systemic embolism, major extracranial bleeding, symptomatic intracranial hemorrhage, or vascular death at 30 days, was observed between the early (2.9%) versus later (4.1%) anticoagulation groups. There were no significant differences in serious adverse events, and assessment at 90 days also found no significant difference between groups.

Rapid Takeaway: ELAN provides further data that may support earlier initiation of DOAC therapy (≤ 48 hours for a minor or moderate stroke, 6-7 days after a major stroke) for nonvalvular AF after acute ischemic stroke.

N Engl J Med. 2023 May;388(26):2411-2421.

Initiating Anticoagulation after Acute Ischemic Stroke

Fear of intracranial hemorrhage / hemorrhagic transformation

Current guidelines recommend delaying anticoagulation

- European guidelines: start anticoagulation at 6 days for moderate stroke, 12 days after severe stroke
- AHA/ASA guidelines: wait to start anticoagulation after 14 days if high risk of hemorrhagic transformation

Is the worry about early anticoagulation justified?

ELAN Trial

Question: Is it okay to start DOACs earlier after afib-related stroke?

Design: multicenter randomized controlled trial

	Early DOAC	Later DOAC
Stroke size	After Onset of Stroke Symptoms	
Minor	Within 48 hours	Day 3 or 4
Moderate	Within 48 hours	Day 6 or 7
Major	Day 6 or 7	Day 12, 13, or 14

Outcome: 30- day composite of recurrent stroke, embolism, major bleeding, ICH, vascular death

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Fischer U. N Engl J Med. 2023 Jun 29;388(26):2411-2421. PMID: 37222476

Early vs. Later Anticoagulation for Stroke

	Early Treatment N=1006	Later Treatment N=1007
Age, median	77 years	78 years
Stroke size on imaging		
Minor	38%	37%
Moderate	40%	39%
Major	23%	23%
NIHSS Score at admission, median	5	5
Received thrombolysis	40%	38%

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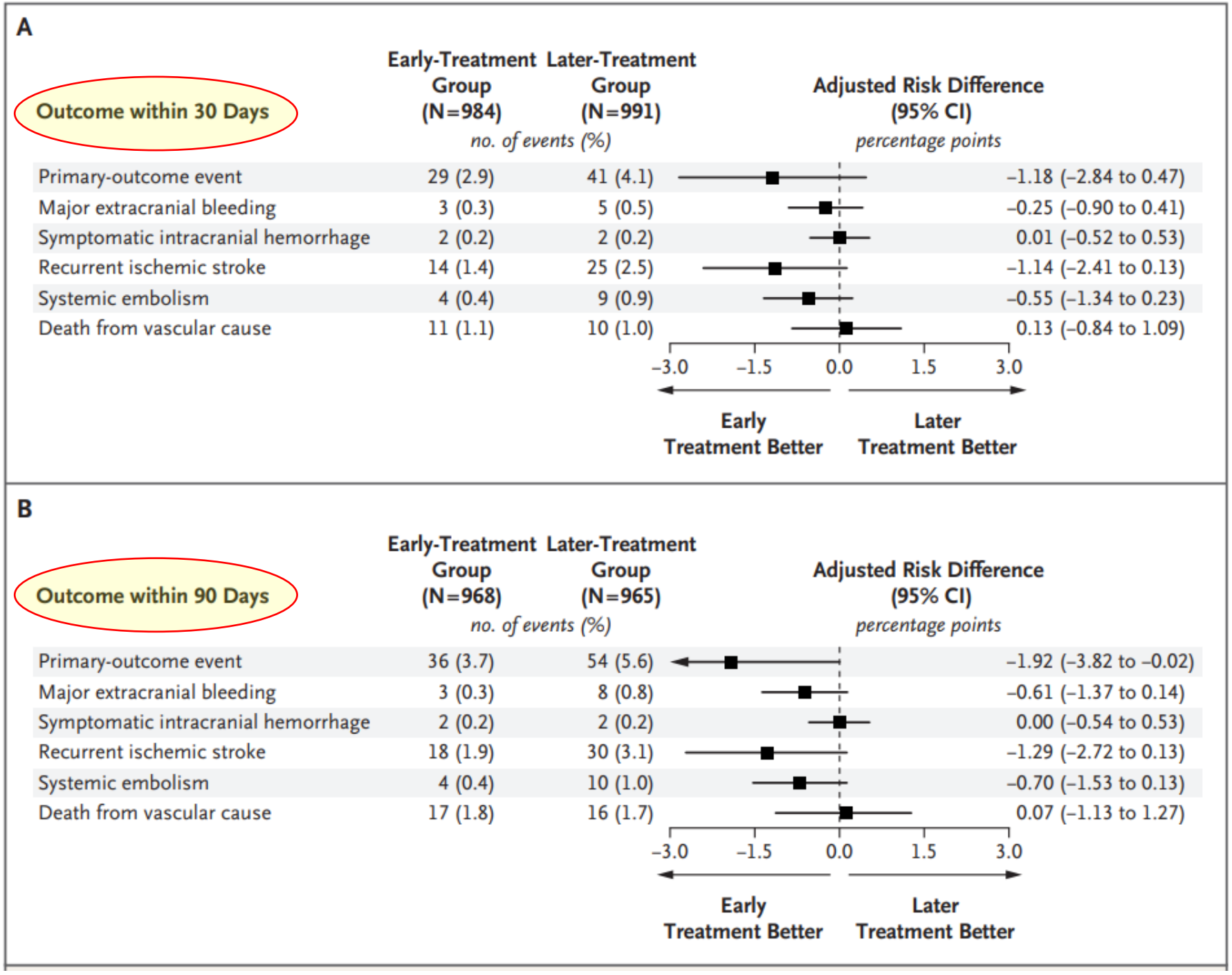
ELAN Trial

Early initiation of DOAC

2.8% less to 0.5% more at 30 days

3.8% less to 0.02% more at 90 days



- Fischer U. N Engl J Med. 2023 Jun 29;388(26):2411-2421. PMID: 37222476

Conclusions

For minor-moderate strokes: OK to start DOAC within 2 days

For large strokes: OK to start DOAC on day 6 or 7

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Year in Review

- Antiphospholipid syndrome systematic review
- DOAC or VKA after TAVR (trans aortic valve replacement)
- Management of chronic coronary disease
- Apixaban in hemodialysis
- Early vs. Later anticoagulation after atrial fibrillation related stroke
- **Bridging anticoagulation in mechanical heart valve patients with stroke**

Case 5

47 year old with mechanical mitral valve on warfarin, goal INR 2.5-3.5

Presents with moderate-size acute ischemic stroke, did not receive thrombolysis

On admission: INR subtherapeutic at 1.9, normal kidney function

Would you use bridging anticoagulation?

A. Yes

B. No

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Anticoagulation in acute ischemic stroke patients with mechanical heart valves: To bridge or not with heparin. The ESTREM study

In patients with a mechanical heart valve (MHV) who experience an acute ischemic stroke, the optimal strategy for reinitiating anticoagulation is unknown.

Design: A multicenter retrospective observational cohort study evaluating 603 patients who had a MHV and experienced an ischemic stroke for ischemic and hemorrhagic outcomes based on use of "bridging" therapy or not.

Results: Bridging therapy was associated with higher risk of combined ischemic and hemorrhagic events, primarily driven by hemorrhagic events. However, after propensity matching, there was no difference in ischemic or hemorrhagic events.

Rapid Takeaway: Bridging MHV patients following acute ischemic stroke may be associated with increased risk of bleeding, especially if initiated within 3 days of a severe stroke. However, caution should be used in interpretation of this study due to various confounders, including uneven distribution of stroke severity between groups.

Eur Stroke J.2023 Jul 15. Online ahead of print.

Background

Patients with mechanical heart values need indefinite anticoagulation with VKAs

“Bridging” anticoagulation often administered when anticoagulation is interrupted or subtherapeutic

Risk of hemorrhagic transformation of ischemic strokes

Question: should you bridge patients with mechanical heart valves after acute ischemic stroke?

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ESTREM Observational Study

Design: observational prospective registry from 43 stroke units in Europe and Asia

Patients: 603 patients with mechanical heart valves who presented with ischemic stroke

Comparison: bridged vs. not bridged when resuming VKA

Outcome: 90 day composite stroke, systemic embolism, symptomatic cerebral bleeding, major extracerebral bleeding

Paciaroni M. Eur Stroke J. 2023 Jul 15:23969873231186863. PMID: 37452632.

	42% Bridged N=255	58% Not Bridged N=348
Age, mean	69 years	70 years
Valve		
Mitral	45%	41%
Aortic	45%	49%
NIHSS score	10.1	7.2
Stroke size: large	27%	19%
tPA or thrombectomy	38%	17%
INR <2.5 on admit	82%	70%
Anticoagulation	239 with LMWH 16 with heparin	271 interrupted VKA 77 continued VKA
Re-initiation timing	3.3 days	3.5 days

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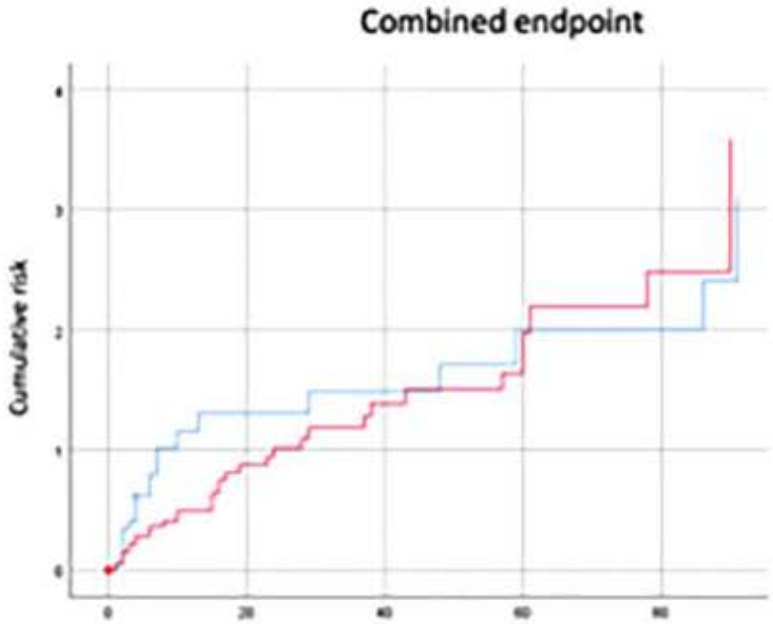
Outcomes

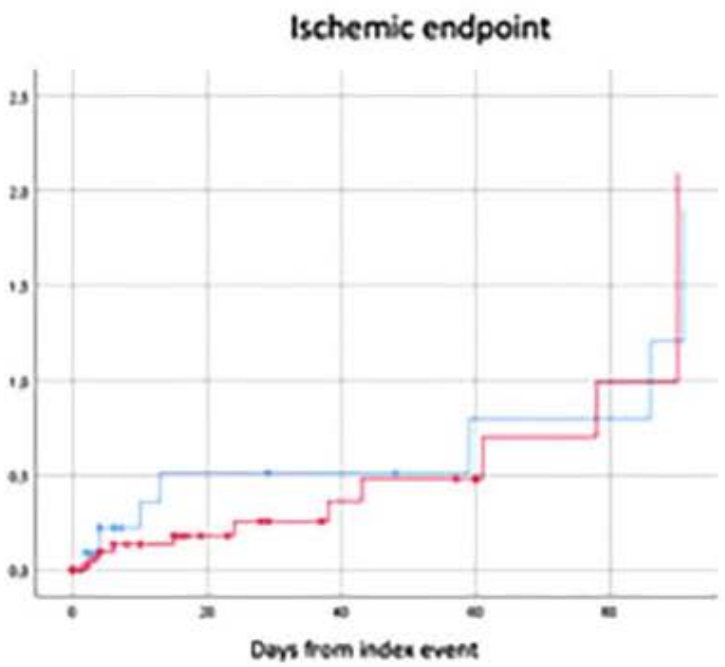
	Bridged N=255	Not Bridged N=348	Adjusted OR [95% CI]
Combined outcomes	14%	8%	1.97 [1.1-3.5]
Ischemic outcomes	5%	3%	1.68 [0.7-4.1]
Hemorrhage outcomes	9%	5%	2.05 [1.02-4.1]
Mortality	9%	7%	1.34 [0.7-2.6]

Bridging vs. No Bridging, Propensity Matched

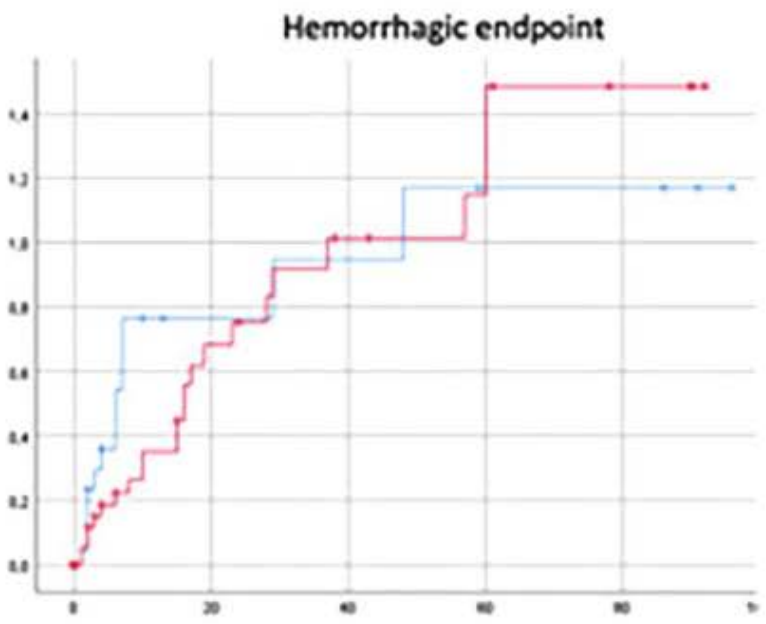
14% vs 9.1%,
p=0.07



5.1% vs 4.0%
p=0.5



9.1% vs 5.1%,
p=0.08



No bridging therapy
Bridging therapy

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Paciaroni M. Eur Stroke J. 2023 Jul 15:23969873231186863. PMID: 37452632.

Conclusions

Bridging anticoagulation in patients with mechanical heart valves and acute stroke was not beneficial

May cause harm (increased bleeding) particularly when bridging started in first 3 days

RECAP

Apixaban can be used for atrial fibrillation and VTE in patients with ESRD on dialysis

Earlier initiation of DOACs is ok in patients with atrial fibrillation and acute stroke (48 hours for mild to moderate stroke, 6-7 days for major stroke)

Bridging anticoagulation in patients with mechanical heart valves presenting with acute stroke might not be beneficial, and may increase bleeding risk

Thank you

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Transforming patient care.

Discussion