

EuroValve

October 28- 29, 2021

Atrial fibrillation at the time of valve surgery

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Disclosure Statement of Financial Interest

I currently have, or have had over the last two years, an affiliation or financial interests or interests of any order with a company or I receive compensation or fees or research grants with a commercial company :

No personal relationship to disclose

The cardiology department in which I'm working receive grand from several pharmaceutical companies

- How to anticoagulate a valvular heart disease patient with atrial fibrillation ?
- AF a risk factor for valve surgery?
- Presence of AF could influence surgical plan:
 - AF ablation during surgery
 - LAA closure during surgery
 - Choice of prosthesis



Atrial fibrillation and valve surgery

How to anticoagulated a VHD patient with AF ?

Apixaban in Comparison With Warfarin in Patients With Atrial Fibrillation and Valvular Heart Disease

Findings From the Apixaban for Reduction in Stroke and Other Thromboembolic Events in Atrial Fibrillation (ARISTOTLE) Trial
Circulation. 2015;132:624-632.

Clinical characteristics and outcomes with rivaroxaban vs. warfarin in patients with non-valvular atrial fibrillation but underlying native mitral and aortic valve disease participating in the ROCKET AF trial

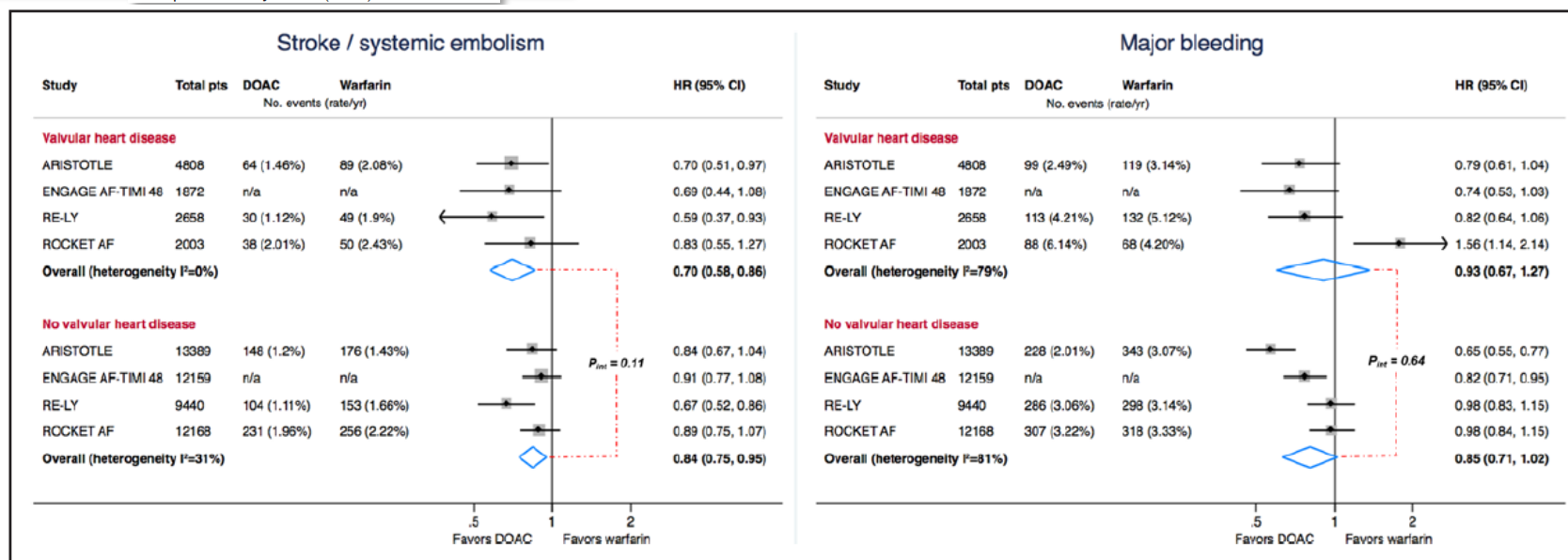
European Heart Journal (2014) 35, 3377–3385

Valvular Heart Disease Patients on Edoxaban or Warfarin in the ENGAGE AF-TIMI 48 Trial

J Am Coll Cardiol 2017;69:1372–82

Comparison of Dabigatran and Warfarin in Patients With Atrial Fibrillation and Valvular Heart Disease

The RE-LY Trial (Randomized Evaluation of Long-Term Anticoagulant Therapy)
Circulation. 2016;134:589–598.



Atrial fibrillation and valve surgery

How to anticoagulated a VHD patient with AF ?

Recommendations on management of atrial fibrillation in patients with native VHD

Recommendations	Class ^a	Level ^b
Anticoagulation		
For stroke prevention in AF patients who are eligible for OAC, NOACs are recommended in preference to VKAs in patients with aortic stenosis, aortic and mitral regurgitation. ^{75–78,83,84}	I	A
The use of NOACs is not recommended in patients with AF and moderate to severe mitral stenosis.	III	C

Recommendations for patients with valvular heart disease and AF

Recommendations	Class ^a	Level ^b
NOACs are contraindicated in patients with a prosthetic mechanical valve. ¹¹⁶⁵	III	B
Use of NOACs is not recommended in patients with AF and moderate-to-severe mitral stenosis.	III	C

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Atrial fibrillation and valve surgery

AF a risk factor for valve procedures?

Mitral valve repair

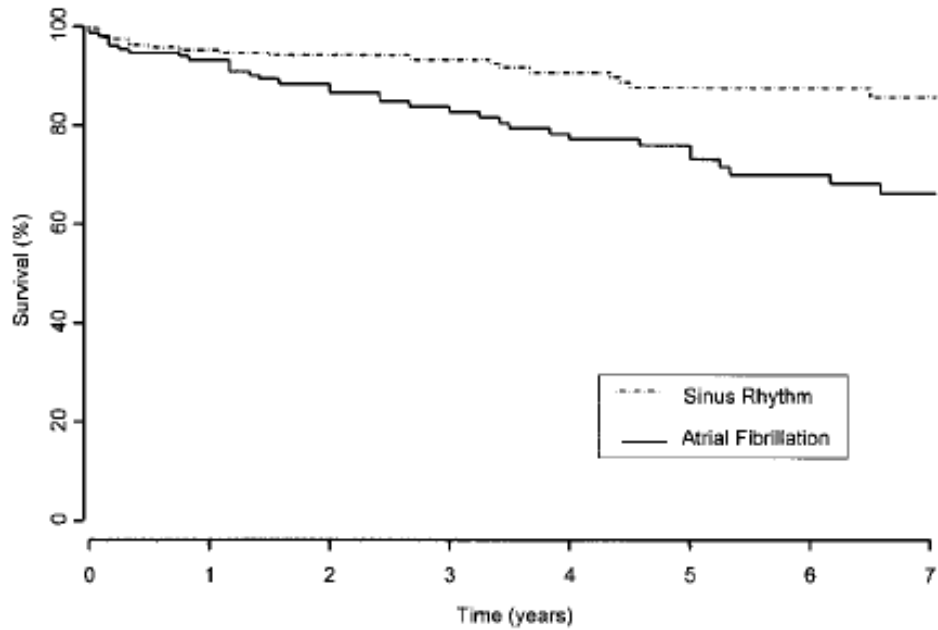


Figure 1. Survival by preoperative rhythm.

Atrial fibrillation and valve surgery

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Mitral valve repair

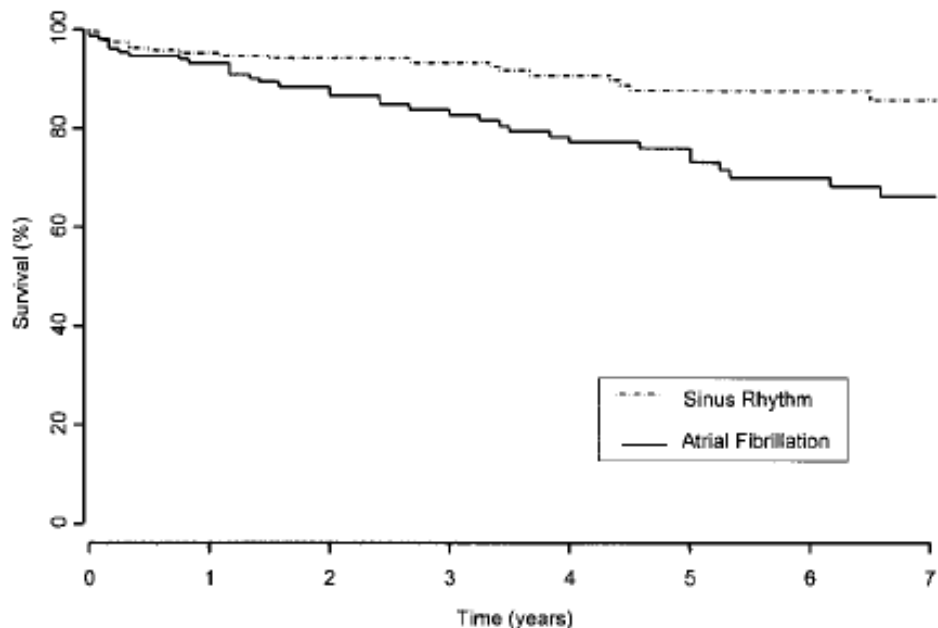
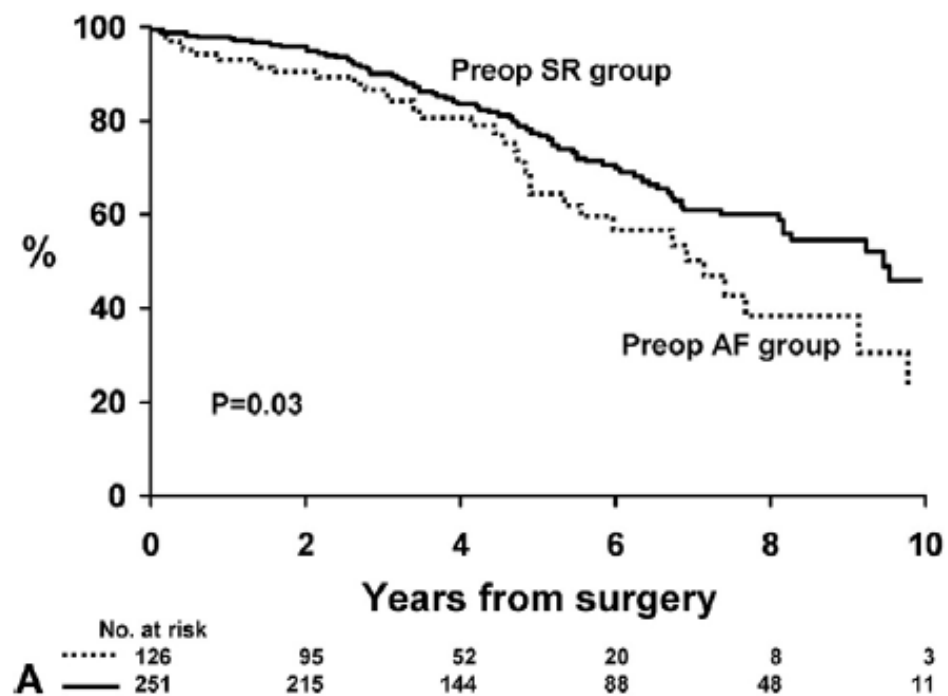


Figure 1. Survival by preoperative rhythm.

Aortic valve replacement



AF ablation during surgery ?

Associations Between Surgical Ablation and Operative Mortality After Mitral Valve Procedures

J. Scott Rankin, MD, Maria V. Grau-Sepulveda, MD, MPH, Niv Ad, MD, Ralph J. Damiano, Jr, MD, A. Marc Gillinov, MD, J. Matthew Brennan, MD, Patrick M. McCarthy, MD, Vinod H. Thourani, MD, Jeffrey P. Jacobs, MD, David M. Shahian, MD, and Vinay Badhwar, MD

Table 2. Unadjusted Outcomes for Patients in Each Multivariable Study Group

Variable	Overall All Patients (n = 80,651)	Group 1 No-AF + No-SA (n = 53,519)	Group 3 AF + No-SA (n = 10,780)	Group 4 AF + SA (n = 16,352)	p Value
Operative mortality	4.1	3.7	6.7	3.6	<0.0001
Reoperation for bleeding	3.5	3.2	4.6	3.9	<0.0001
Sternal infection	0.2	0.2	0.2	0.2	0.4877
Permanent stroke	1.9	2.0	2.5	1.5	<0.0001
Prolonged ventilation	17.5	16.4	25.3	15.9	<0.0001
New renal failure	4.2	3.9	5.8	3.9	<0.0001
Permanent pacemaker	6.3	5.0	7.6	9.5	<0.0001
Discharged with					
Antiarrhythmic agents	38.3	33.1	42.3	54.5	<0.0001
Aspirin	84.7	86.3	80.7	82.1	<0.0001
Warfarin	55.6	47.4	72.0	72.2	<0.0001
Thrombin inhibitors	2.6	1.6	3.7	5.0	<0.0001



AF ablation during surgery ?

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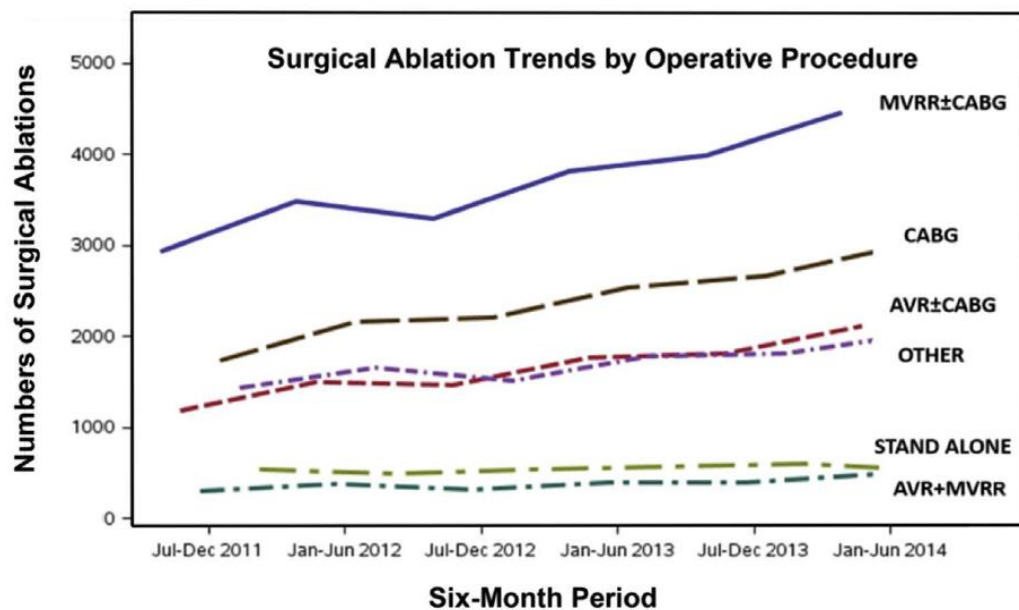


Surgical Ablation of Atrial Fibrillation in the United States: Trends and Propensity Matched Outcomes



Vinay Badhwar, MD, J. Scott Rankin, MD, Niv Ad, MD, Maria Grau-Sepulveda, MD, MPH, Ralph J. Damiano, MD, A. Marc Gillinov, MD, Patrick M. McCarthy, MD, Vinod H. Thourani, MD, Rakesh M. Suri, MD, DPhil, Jeffrey P. Jacobs, MD, and James L. Cox, MD

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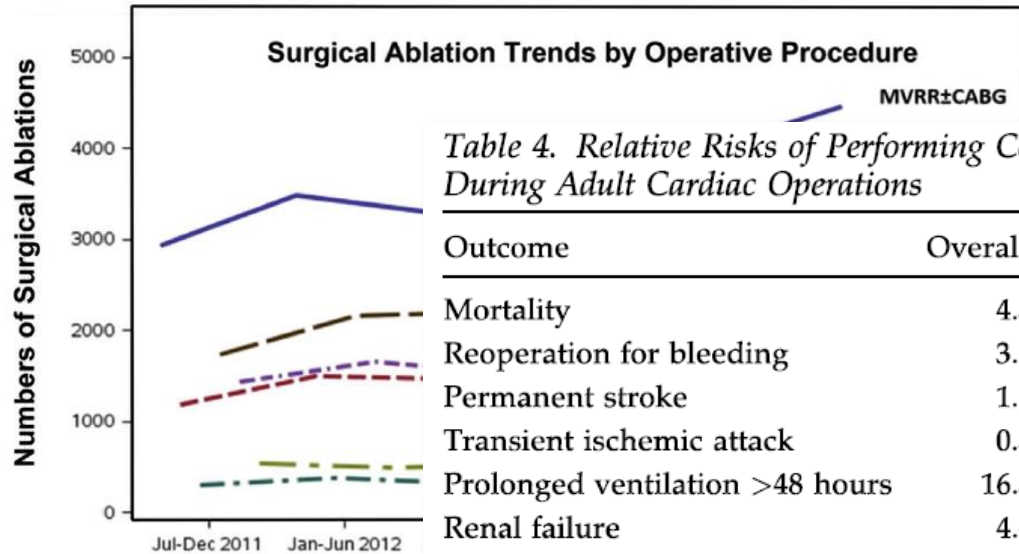
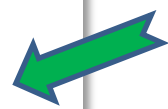


Table 4. Relative Risks of Performing Concomitant Surgical Ablation in Propensity Matched Patients With Atrial Fibrillation During Adult Cardiac Operations

Outcome	Overall (n = 57,478)	No Ablation (n = 28,739)	Ablation (n = 28,739)	RR (95% CI)	p Value
Mortality	4.31 (2,480)	4.50 (1,292)	4.13 (1,118)	0.92 (0.85–0.99)	0.0422
Reoperation for bleeding	3.61 (2,075)	3.73 (1,073)	3.49 (1,002)	0.93 (0.86–1.02)	0.1195
Permanent stroke	1.96 (1,124)	2.13 (612)	1.78 (512)	0.84 (0.74–0.94)	0.0028
Transient ischemic attack	0.38 (218)	0.42 (121)	0.34 (97)	0.80 (0.61–1.05)	0.1064
Prolonged ventilation >48 hours	16.31 (9,373)	16.75 (4,813)	15.87 (4,560)	0.95 (0.90–0.99)	0.0224
Renal failure	4.62 (2,585)	4.35 (1,219)	4.88 (1,366)	1.12 (1.03–1.22)	0.0107
Pacemaker	6.87 (3,946)	5.89 (1,693)	7.84 (2,253)	1.33 (1.24–1.43)	<0.0001
Phrenic nerve injury	0.06 (33)	0.06 (16)	0.06 (17)	1.06 (0.53–2.14)	0.8655
Readmission 30 days	13.36 (7,347)	12.79 (3,511)	13.92 (3,836)	1.09 (1.03–1.15)	0.0011

Values are percent (n).



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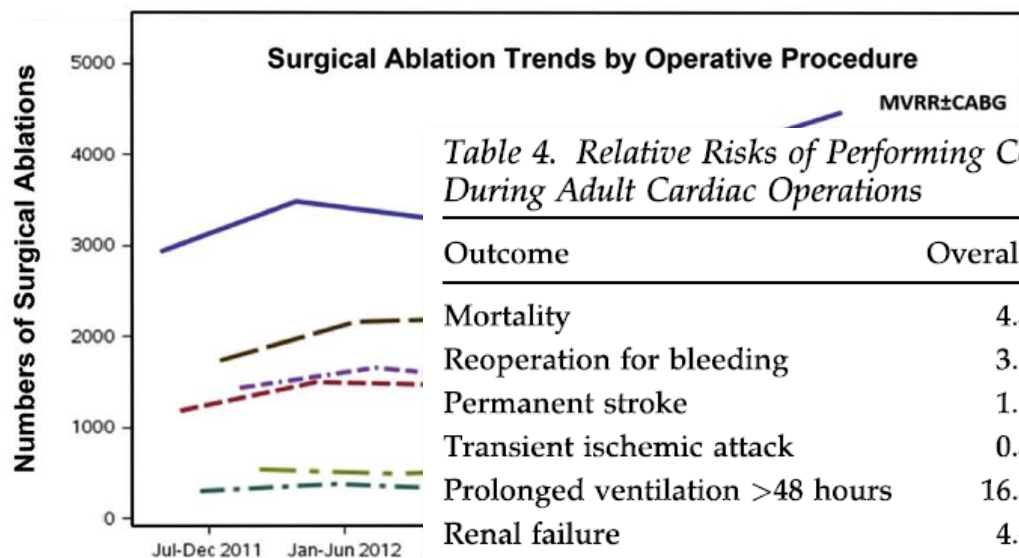


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AF ablation during surgery ?

- Concomitant AF ablation should be considered in patients undergoing cardiac surgery, balancing the benefits of freedom from atrial arrhythmias with the risk factors for recurrence, such as age, LA dilatation, years in AF, renal dysfunction, and other cardiovascular risk factors.

Recommendations	Class ^a	Level ^b
Surgical interventions		
Concomitant AF ablation should be considered in patients undergoing valve surgery, balancing the benefits of freedom from atrial arrhythmias and the risk factors for recurrence (LA dilatation, years in AF, age, renal dysfunction, and other cardiovascular risk factors). ^{79,85–90}	IIa	A



LAA closure during surgery ?



LAA closure during surgery ?

Table 1. Demographic and Clinical Characteristics of the Participants at Baseline, Antithrombotic Therapy, and Surgical Treatments.*

Variable	Occlusion (N=2379)	No Occlusion (N=2391)
Participants		
Age — yr	71.3±8.4	71.1±8.3
Male sex — no. (%)	1617 (68.0)	1601 (67.0)
Type of atrial fibrillation — no. (%)		
Permanent	692 (29.1)	707 (29.6)
Persistent	577 (24.3)	508 (21.3)
Paroxysmal	1110 (46.7)	1176 (49.2)
Medical history — no. (%)		
Previous myocardial infarction	567 (23.8)	583 (24.4)
Previous stroke	214 (9.0)	219 (9.2)
Rheumatic heart disease	165 (6.9)	162 (6.8)
Peripheral arterial disease	236 (9.9)	256 (10.7)
History of heart failure	1348 (56.7)	1372 (57.4)
Diabetes mellitus	770 (32.4)	765 (32.0)
Aortic plaque	240 (10.1)	231 (9.7)
Smoking, former or current	1127 (47.4)	1173 (49.1)
Hypertension	1960 (82.4)	1941 (81.2)
CHA ₂ DS ₂ -VASc score†		
Mean	4.2±1.5	4.2±1.5
Median (interquartile range)	4 (3–5)	4 (3–5)
Atrial fibrillation on baseline ECG — no. (%)	1392 (58.5)	1338 (56.0)
Left ventricular ejection fraction <50% — no./total no. (%)	671/2179 (30.8)	669/2188 (30.6)
Anticoagulant therapy within 7 days before surgery		
Vitamin K antagonist — no. (%)	541 (22.7)	542 (22.7)
Direct oral anticoagulant — no. (%)	674 (28.3)	705 (29.5)
Neither direct oral anticoagulant nor vitamin K antagonist — no. (%)	1164 (48.9)	1144 (47.8)
Cardiac surgery		
Surgical procedure performed — no. (%)		
Isolated CABG	482 (20.3)	522 (21.8)
Isolated valve replacement	552 (23.2)	572 (23.9)
Other	1344 (56.5)	1296 (54.2)
Any valve procedure		
Mitral	856 (36.0)	880 (36.8)
Aortic	837 (35.2)	858 (35.9)
Tricuspid	397 (16.7)	427 (17.9)
Pulmonic	2 (0.1)	4 (0.2)
Any aortic procedure	146 (6.1)	134 (5.6)
Concomitant surgical ablation of atrial fibrillation — no. (%)	809 (34.0)	753 (31.5)
Received assigned procedure — no. (%)	2131 (89.6)	2262 (94.6)

Left Atrial Appendage Occlusion during Cardiac Surgery to Prevent Stroke

R.P. Whitlock, E.P. Belley-Cote, D. Paparella, J.S. Healey, K. Brady, M. Sharma, W. Reents, P. Budera, A.J. Baddour, P. Fila, P.J. Devereaux, A. Bogachev-Prokophiev, A. Boening, K.H.T. Teoh, G.I. Tagarakis, M.S. Slaughter, A.G. Royse, S. McGuinness, M. Alings, P.P. Punjabi, C.D. Mazer, R.J. Folkerling, A. Colli, Á. Avezum, J. Nakamya, K. Balasubramanian, J. Vincent, P. Voisine, A. Lamy, S. Yusuf, and S.J. Connolly, for the LAAOS III Investigators*

Table 1. (Continued.)

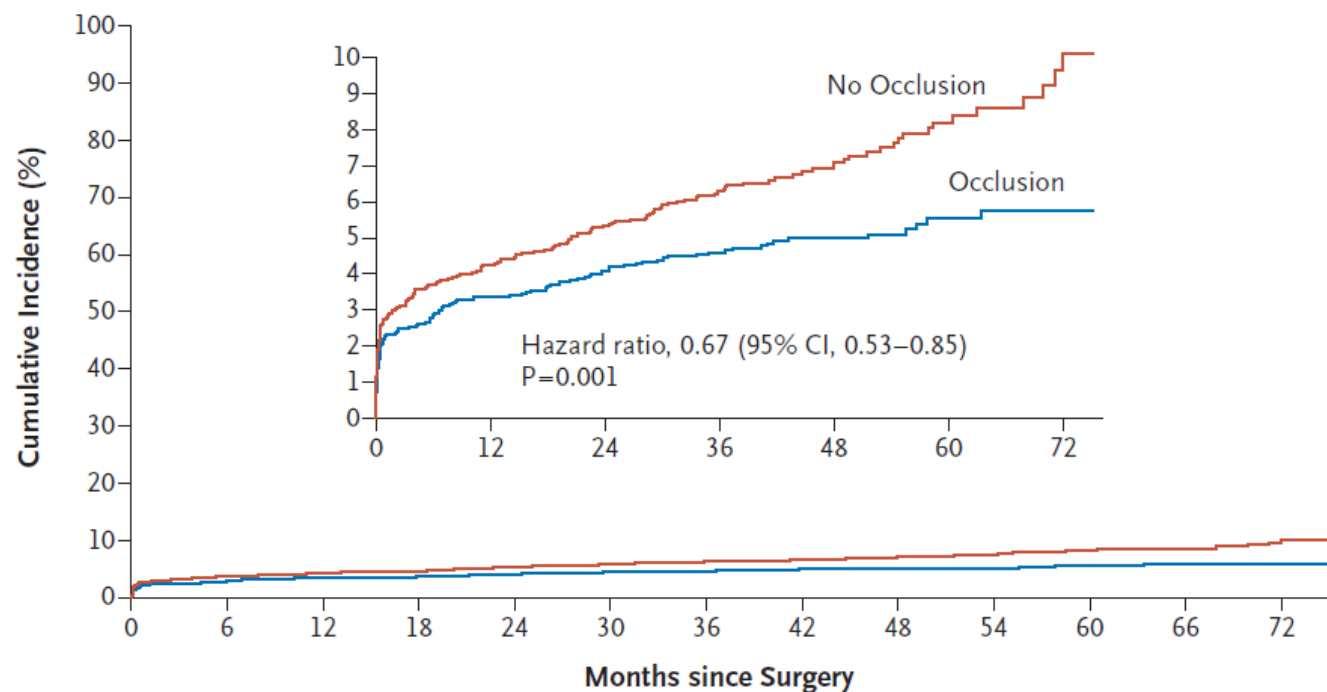
Variable	Occlusion (N=2379)	No Occlusion (N=2391)
Left atrial appendage occlusion‡		
Occlusion attempted — no. (%)	2131 (89.6)	NA
Occlusion method — no./total no. (%)§		
Cut and sew	939/1685 (55.7)	NA
Stapler	189/1685 (11.2)	NA
Closure device	255/1685 (15.1)	NA
Closure from within	233/1685 (13.8)	NA
Other approved techniques	69/1685 (4.1)	NA



LAA closure during surgery ?

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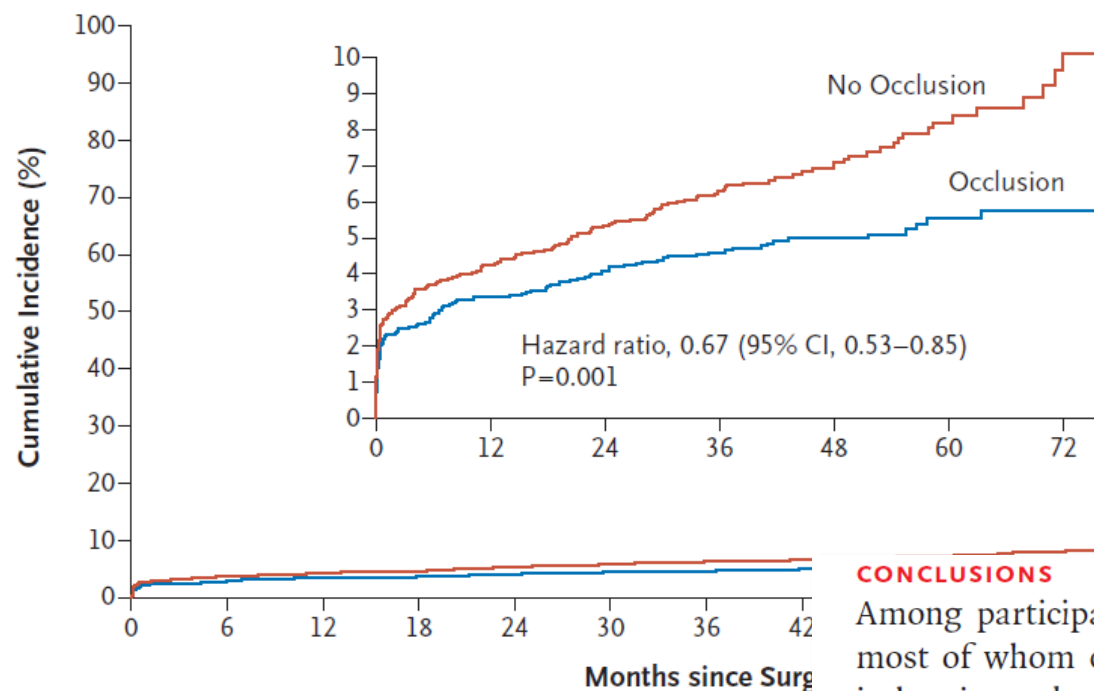
No. at Risk

No Occlusion	2391	2134	2081	2030	1981	1897	1607	1291	1016	751	540	348	205
Occlusion	2379	2163	2105	2059	2020	1948	1642	1322	1046	781	550	349	199

LAA closure during surgery ?

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No. at Risk

No Occlusion	2391	2134	2081	2030	1981	1897	1607	129
Occlusion	2379	2163	2105	2059	2020	1948	1642	132

CONCLUSIONS

Among participants with atrial fibrillation who had undergone cardiac surgery, most of whom continued to receive ongoing antithrombotic therapy, the risk of ischemic stroke or systemic embolism was lower with concomitant left atrial appendage occlusion performed during the surgery than without it. (Funded by the Canadian Institutes of Health Research and others; LAAOS III ClinicalTrials.gov number, NCT01561651.)

LAA closure during surgery ?

- Left atrial appendage (LAA) occlusion **should be considered** in combination with valve surgery in patients with AF and a CHA₂DS₂VASc score ≥ 2 to reduce the thromboembolic risk.
- The selected surgical technique should ensure complete occlusion of the LAA. For patients with AF and risk factors for stroke, **long-term oral anticoagulation** (OAC) is currently **recommended, irrespective** of the use of surgical ablation of AF and/or surgical LAA occlusion.

Recommendations	Class ^a	Level ^b
Surgical interventions		
LAA occlusion should be considered to reduce the thromboembolic risk in patients, with AF and a CHA ₂ DS ₂ VASc score ≥ 2 undergoing valve surgery. ⁸²	IIa	B



Atrial fibrillation and valve surgery

Choice of prosthesis...

Mechanical prosthesis



NOACS



AVK

Bioprosthesis



NOACS

A bioprosthesis may be considered in patients already on long-term NOACs due to the high risk for thromboembolism.^{466–469 f}

IIb

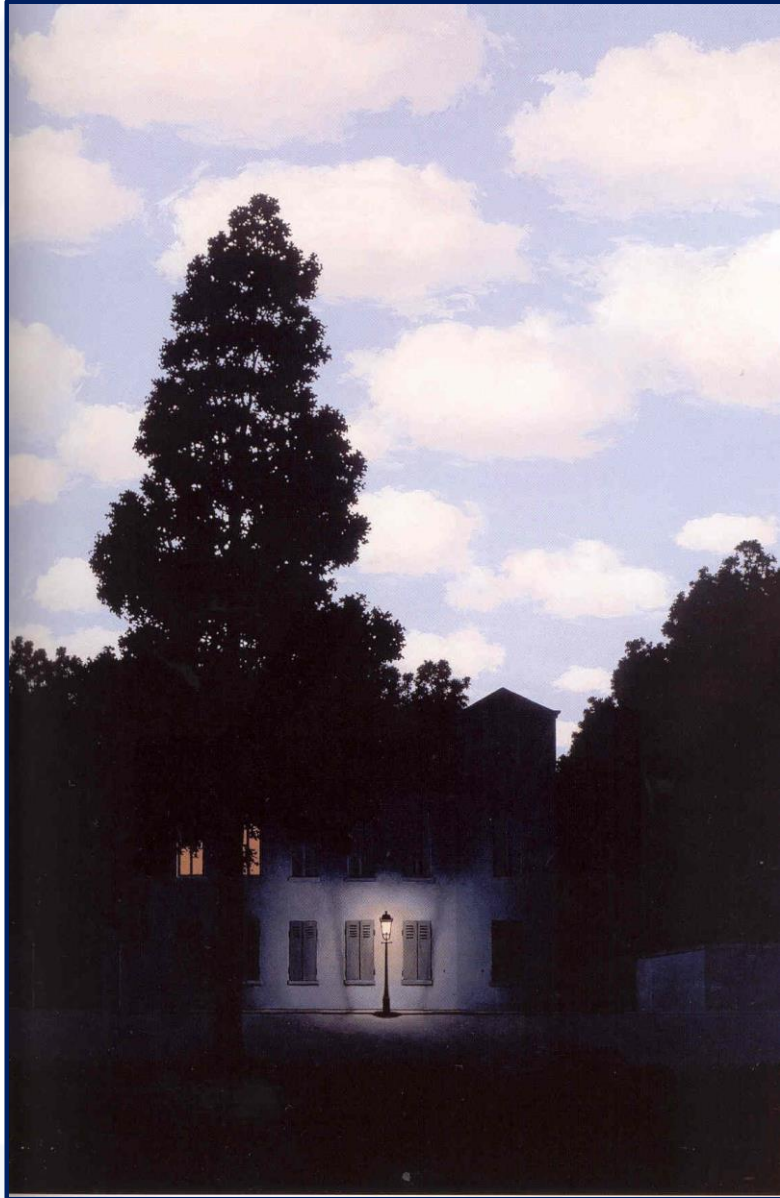
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Conclusion

- Atrial fibrillation at the time of the surgery, increases the risk of poor outcome after surgery
- In patients with atrial fibrillation undergoing valve surgery, surgical ablation and LAA occlusion should be considered and discussed in the pre surgical planning





Thank you for your attention.



Atrial fibrillation and valve surgery

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