5-Year Outcomes After Transcatheter or Surgical Aortic Valve Replacement in Low-Risk Patients With Aortic Stenosis

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On behalf of the Evolut Low Risk Trial Investigators

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Evolut Low Risk Trial

Disclosure of Relevant Financial Relationships

- Within the prior 24 months, I have had a relevant financial relationship with a company producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients:

Nature of Financial Relationship	**Ineligible Company**
Grant/Research Support	Abbott, Boston Scientific, WL Gore Medical, and Medtronic

All relevant financial relationships have been mitigated.
Faculty disclosure information can be found on the app

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Evolut™ Low Risk Trial

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Background

Evolut™ Low Risk Trial

- Transcatheter aortic valve replacement (TAVR) has emerged as the leading procedure for treating symptomatic severe aortic stenosis in the United States, irrespective of the patient's surgical risk
- The Evolut Low Risk Trial (NCT02701283) is a multinational, prospective, randomized, interventional study comparing the safety and efficacy of TAVR with Evolut to surgery in low-risk patients with severe aortic stenosis with a 10-year follow-up
  - We recruited patients at a predicted surgical mortality of 3% or less, with anatomy suitable for both TAVR and surgery
  - Since these are low risk patients, we have committed to reporting our data frequently
- The availability of intermediate- and long-term data assessing TAVR against surgery in low surgical risk aortic stenosis patients is limited

Objective

Evolut™ Low Risk Trial

To evaluate 5-year outcomes with Evolut vs surgery in patients from the Evolut Low Risk trial

US Study Sites (N = 61)

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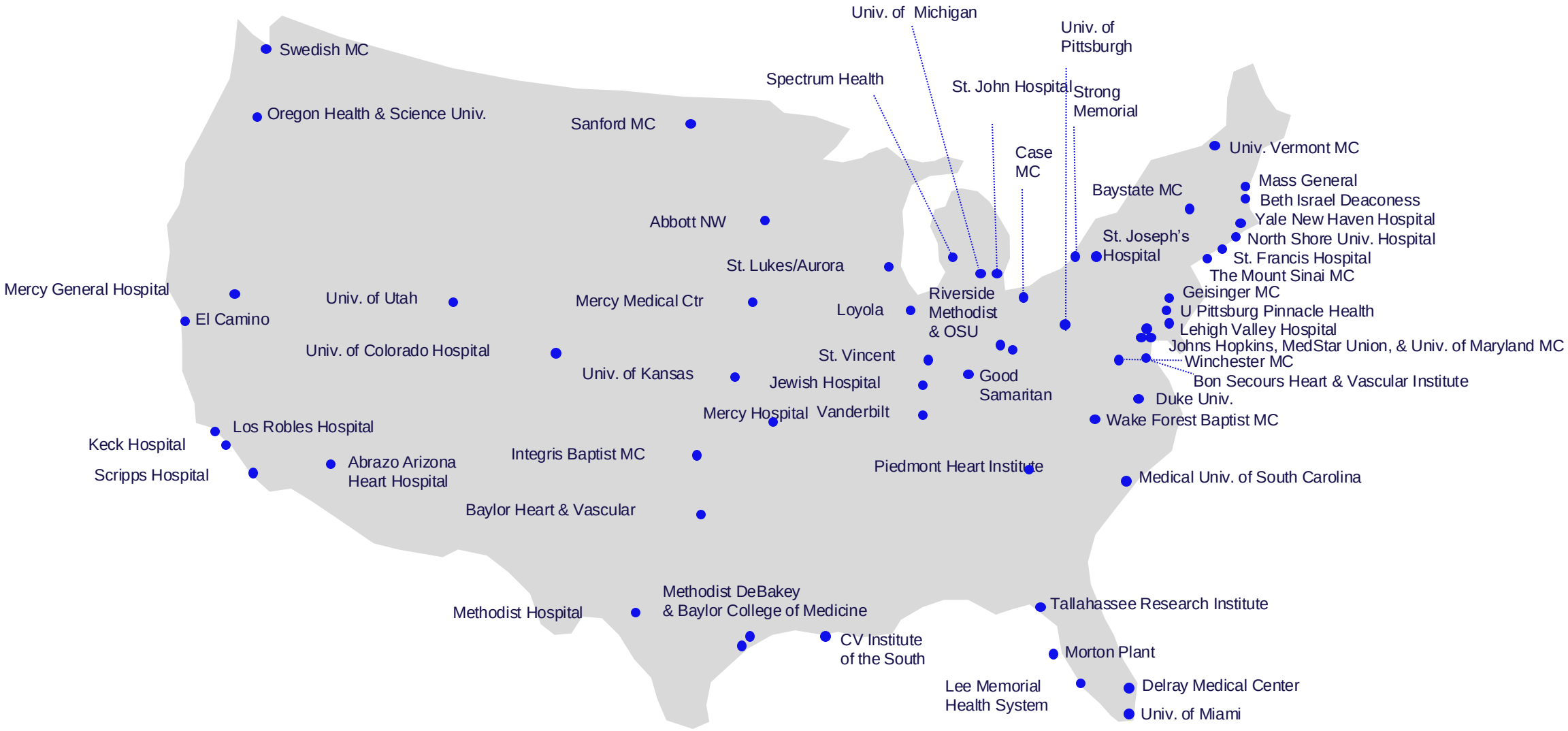
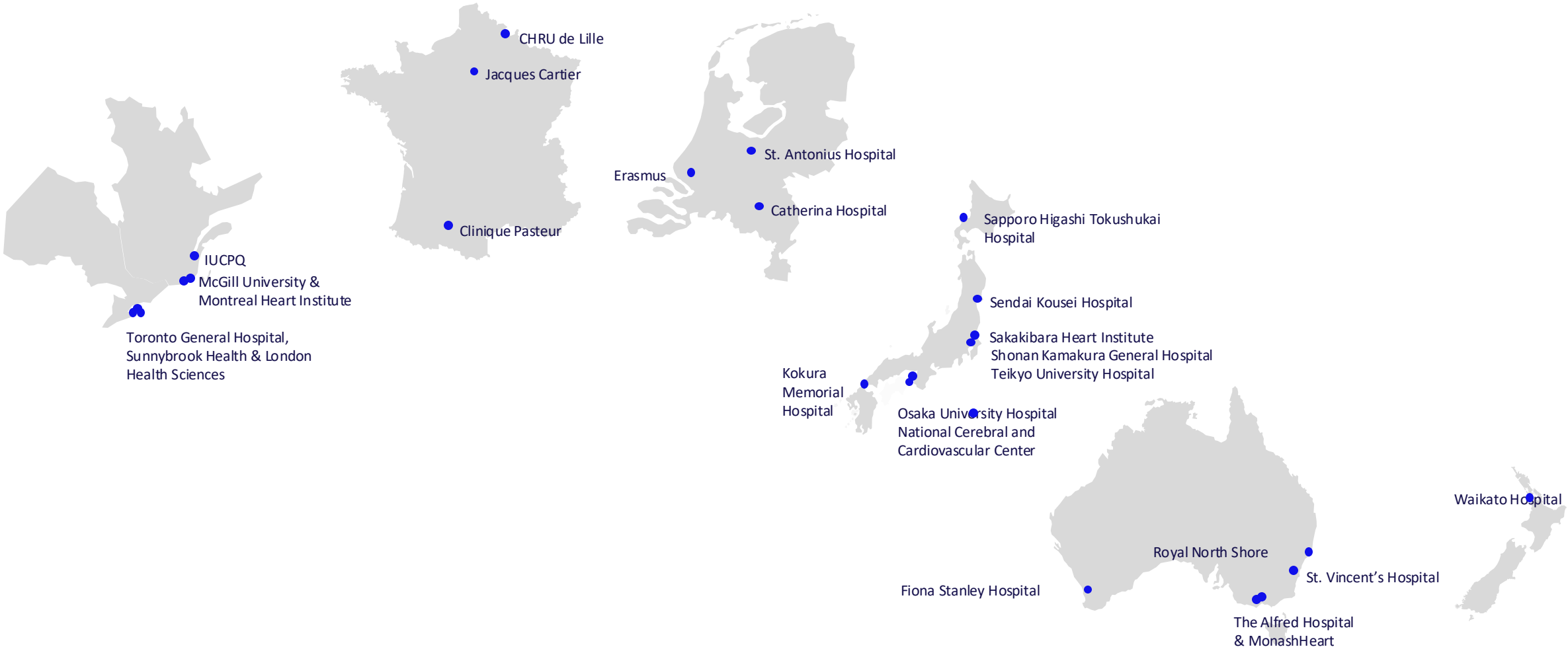


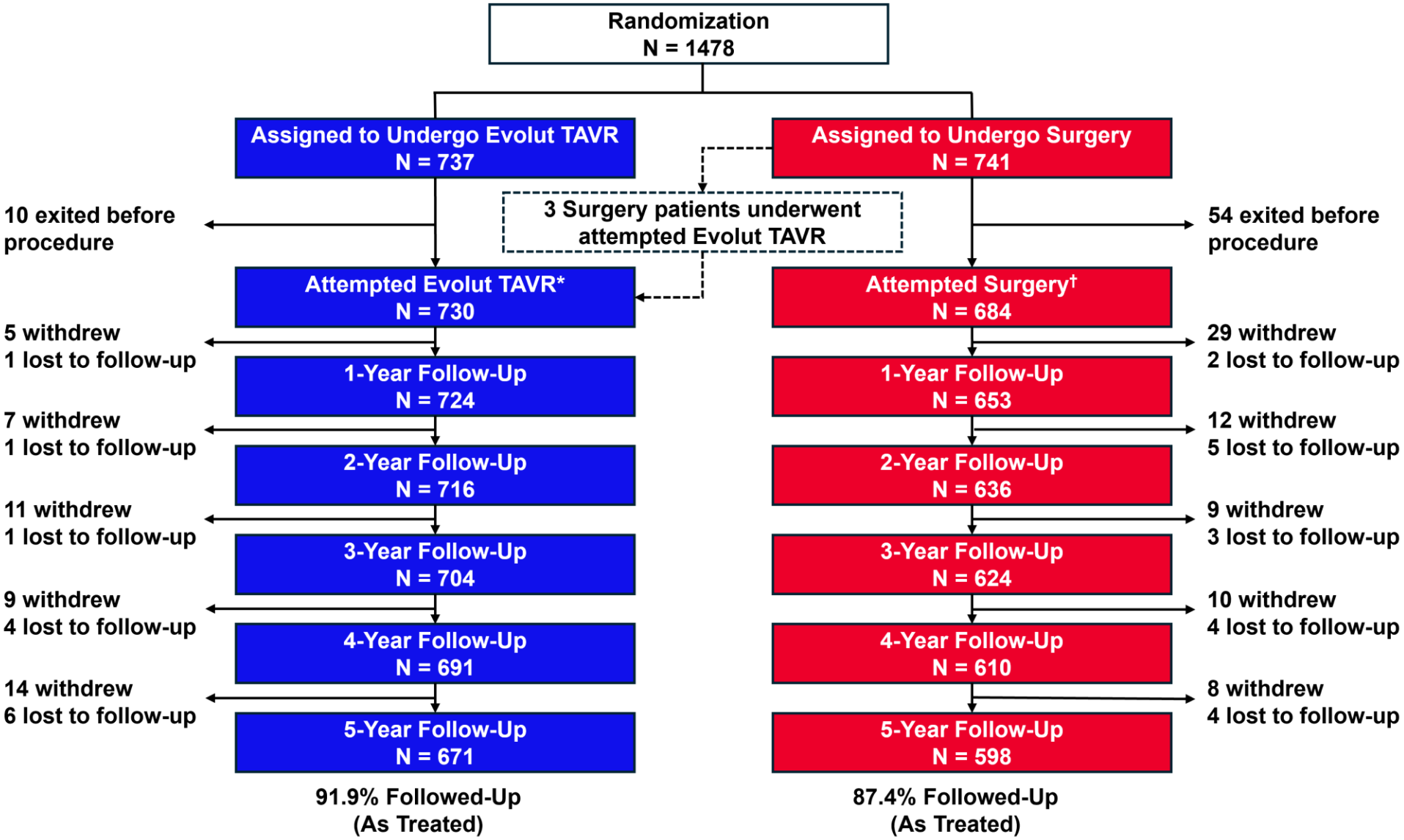
International: Canada, Europe, Japan, Australia, New Zealand (N = 25)

Evolut™ Low Risk Trial



Patient Flow

Evolut™ Low Risk Trial



*Evolut R: 73%; Evolut Pro: 23.4%; CoreValve: 3.6%. †Edwards: 56.9%; Abbott: 18.7%; %; LivaNova: 13.7% ; Medtronic: 10.8%.

Baseline Characteristics

Evolut™ Low Risk Trial

	Evolut (N=730)	Surgery (N=684)
Age – yr	74.1 ± 5.8	73.7 ± 5.9
Age <70 yr	21.4%	24.0%
Age <65 yr	5.8%	7.0%
Female sex	36.4%	34.1%
STS-PROM score	2.0% ± 0.7	1.9% ± 0.7
NYHA functional class		
III	24.8%	27.8%
IV	0.1%	0.4%
Hypertension	84.8%	82.6%
Chronic lung disease, COPD	15.1%	18.0%
Previous coronary artery bypass graft	2.5%	2.0%
Previous percutaneous coronary intervention	14.1%	12.9%
Previous myocardial infarction	6.7%	4.8%
Atrial fibrillation/atrial flutter	15.4%	14.4%
Pre-existing permanent pacemaker or defibrillator	3.3%	4.0%
Left ventricular ejection fraction	61.7% ± 7.9	61.9% ± 7.7

Continuous variables reported as mean ± standard deviation and categorical variables were presented as percentages. There were no significant differences ($P<0.05$) in baseline characteristics between trial groups.

Primary Endpoint: All-cause Mortality Or Disabling Stroke

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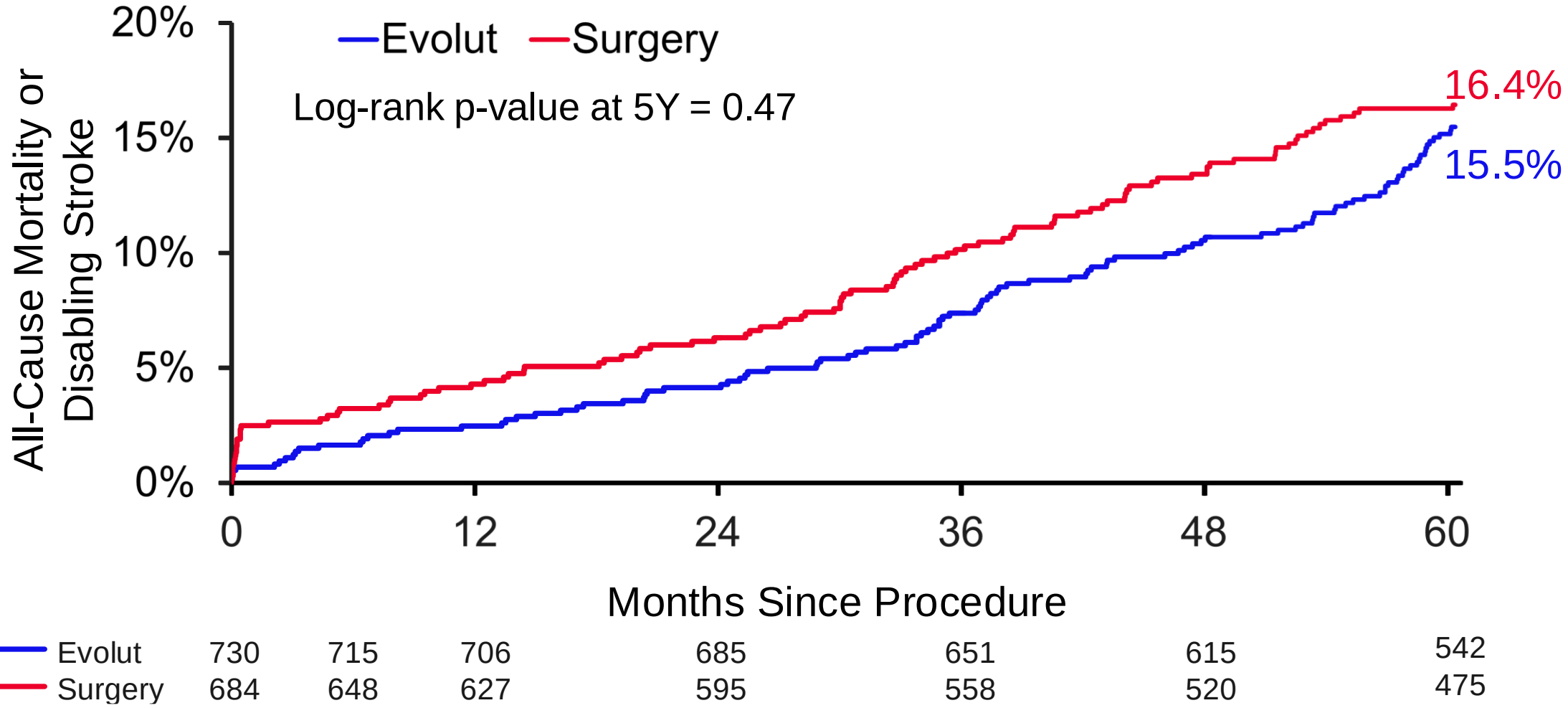

All-cause Mortality And Disabling Stroke

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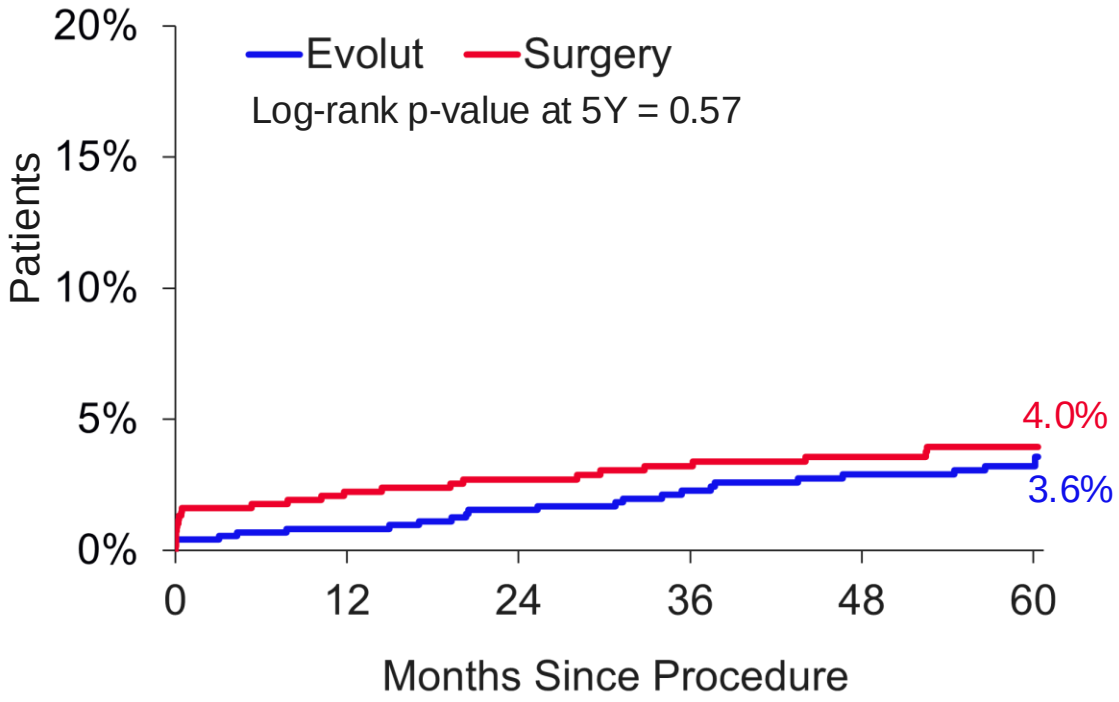
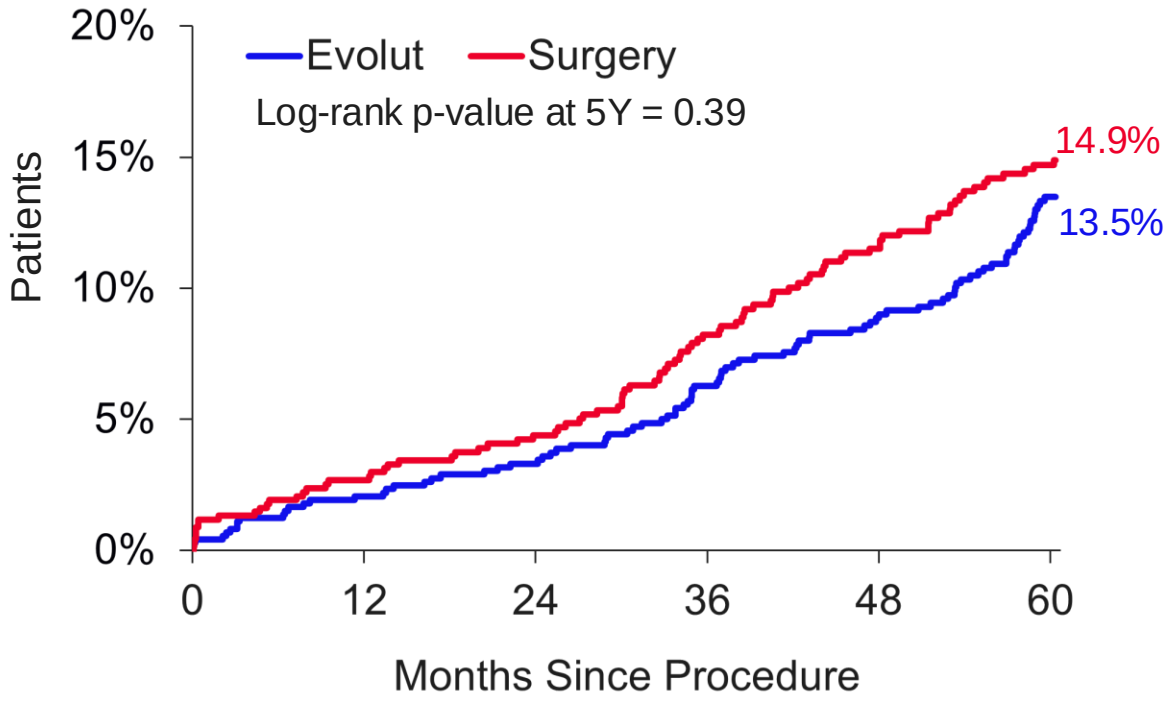
Disabling Stroke



Evolut	730	715	706	685	651	615	542
Surgery	684	648	627	595	558	520	475

All-Cause Mortality

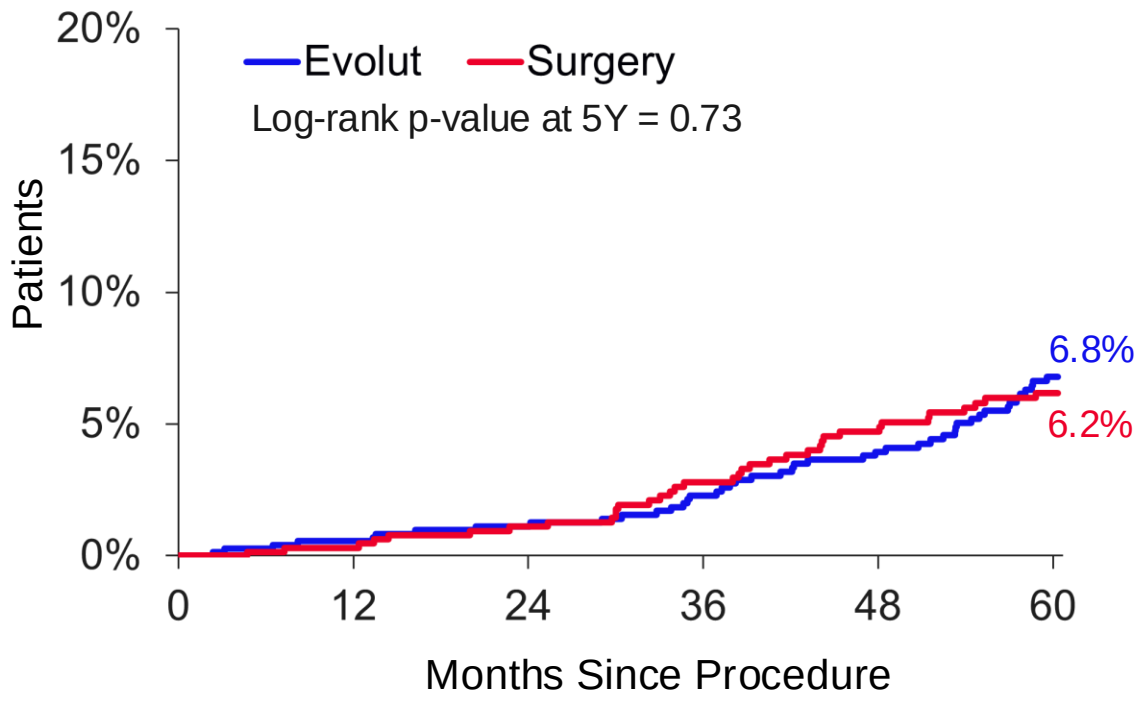


Evolut	730	718	709	691	659	626	555
Surgery	684	656	636	605	569	530	482

Non-cardiovascular And Cardiovascular Mortality

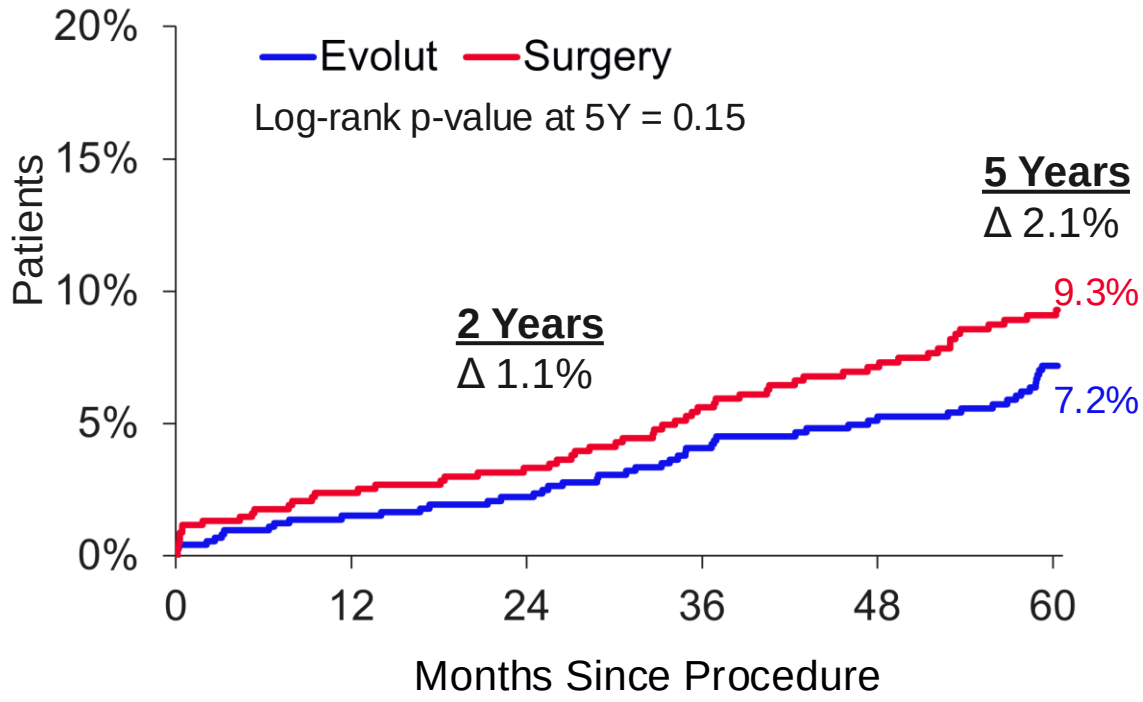
Evolut™ Low Risk Trial

Non-Cardiovascular Mortality



Evolut	730	718	709	691	659	626	555
Surgery	684	656	636	605	569	530	482

Cardiovascular Mortality



Evolut	730	718	709	691	659	626	555
Surgery	684	656	636	605	569	530	482

5-Year Clinical Outcomes

Evolut™ Low Risk Trial

	Evolut	Surgery	HR (95% CI)	P Value (log-rank)
All-cause mortality or disabling stroke	15.5%	16.4%	0.90 (0.69, 1.18)	0.47
All-cause mortality	13.5%	14.9%	0.88 (0.66, 1.17)	0.39
Cardiovascular death	7.2%	9.3%	0.75 (0.51, 1.11)	0.15
Non-cardiovascular death	6.8%	6.2%	1.08 (0.70, 1.67)	0.73
Disabling stroke	3.6%	4.0%	0.85 (0.49, 1.49)	0.57
Aortic valve hospitalization	13.9%	15.1%	0.89 (0.67, 1.19)	0.44
Myocardial infarction	6.0%	3.6%	1.63 (0.97, 2.75)	0.06
Total valve thrombosis	0.9%	0.6%	1.36 (0.38, 4.82)	0.63
New pacemaker implant[a]	27.0%	11.3%	2.70 (2.04, 3.55)	**<0.001**
Total pacemaker implant[b]	26.3%	11.0%	2.68 (2.04, 3.53)	**<0.001**
Atrial fibrillation	16.3%	41.2%	0.32 (0.25, 0.39)	**<0.001**
Reintervention[c]	3.3%	2.5%	1.30 (0.66, 2.56)	0.44

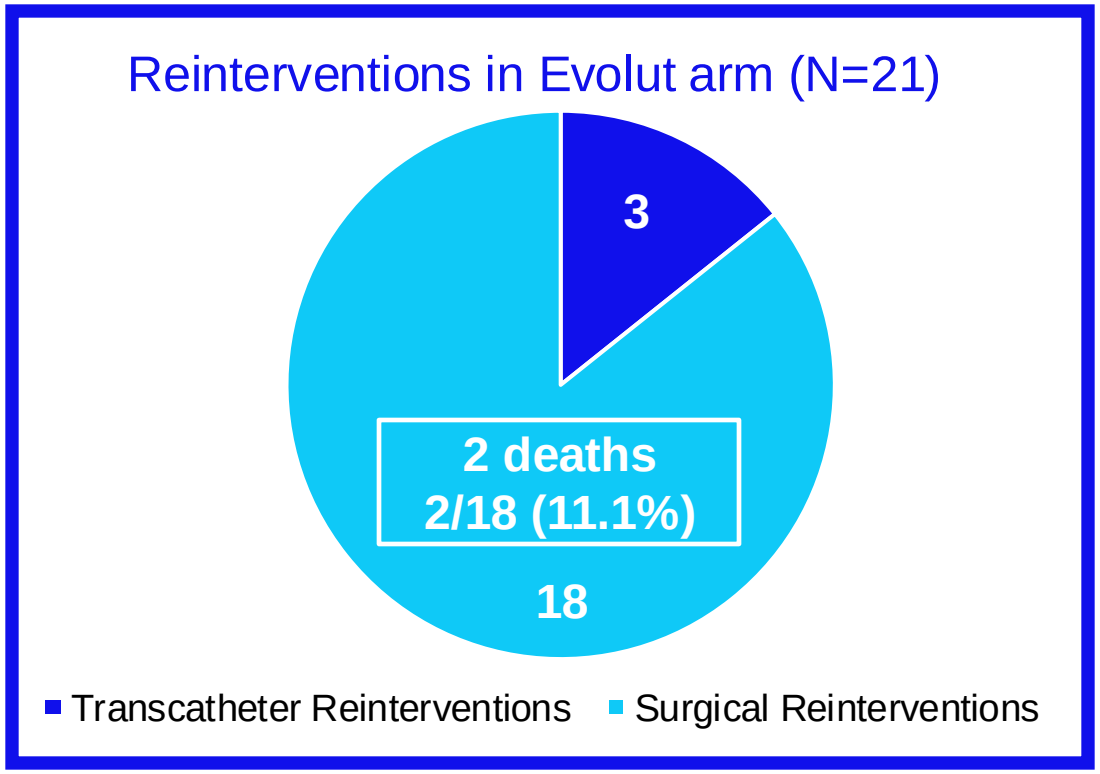
Clinical outcomes are presented as Kaplan-Meier % with HR (95% CI). [a]Patients with pacemaker or ICD at baseline are not included. Not adjudicated by CEC. [b]Patients with pacemaker or ICD at baseline are included. Not adjudicated by CEC. [c]One crossover patient (randomized to TAVR but received a surgical intervention) included in surgery group.

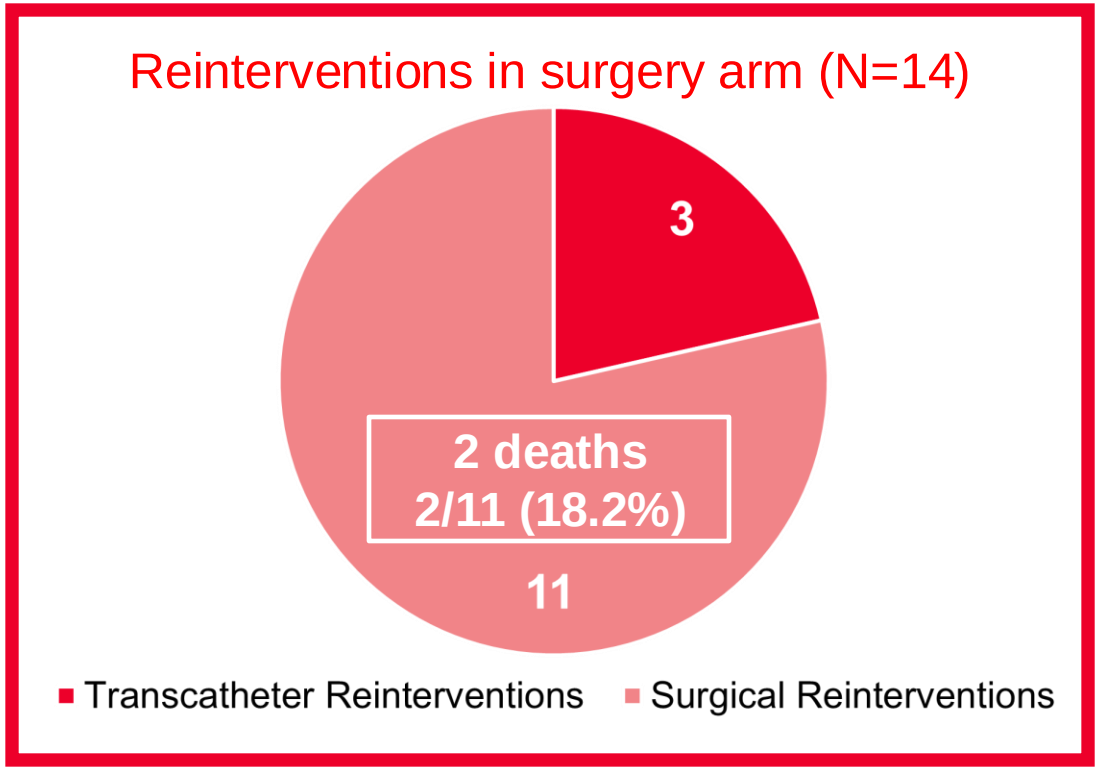
Reinterventions

Evolut™ Low Risk Trial

No difference in reinterventions between Evolut and surgery

	Evolut	Surgery	P Value (log-rank)
Reintervention	21 (3.3%)	14 (2.5%)	0.44
Surgical	18 (2.8%)	11 (2.0%)	0.34
Transcatheter	3 (0.5%)	3 (0.5%)	0.84

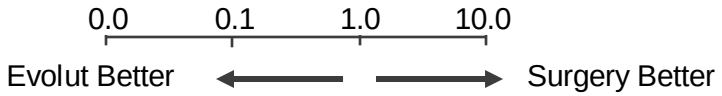




All-cause Mortality Or Disabling Stroke Subgroup Analysis

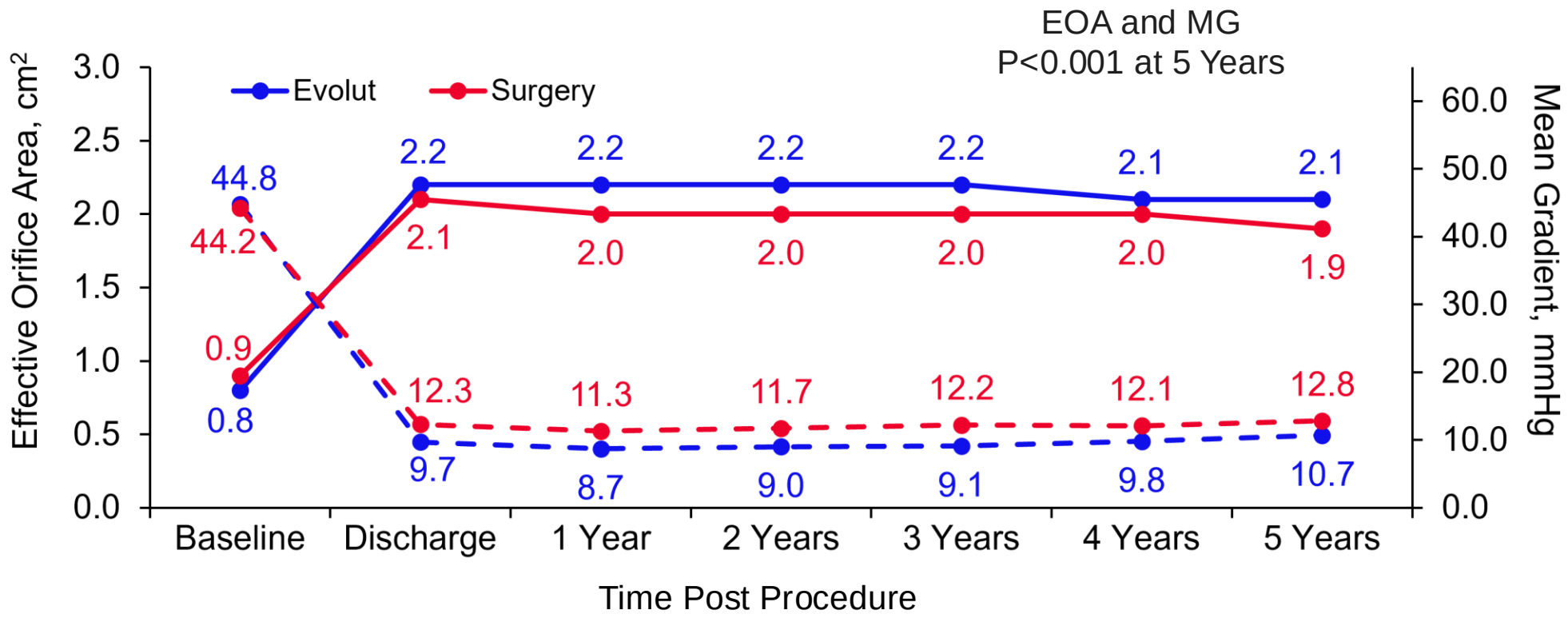
Evolut™ Low Risk Trial

Variable	Evolut	Surgery	HR (95% CI)	P Value
	KM rate, 5 years			
Age, years				0.8451
<75	11.9%	13.4%	0.87 (0.57-1.33)	
≥75	18.9%	19.8%	0.91 (0.64-1.29)	
Sex				0.5366
Female	12.9%	12.1%	1.05 (0.63-1.76)	
Male	17.0%	18.6%	0.86 (0.63-1.18)	
STS-PROM, %				0.8263
<2.0	12.3%	12.6%	0.94 (0.63-1.41)	
≥2.0	19.5%	21.4%	0.88 (0.61-1.26)	
NYHA				0.5851
I/II	13.4%	15.0%	0.87 (0.62-1.22)	
III/IV	22.1%	20.2%	1.02 (0.64-1.61)	
Baseline KCCQ Overall Score				0.6475
≤72	16.1%	17.7%	0.85 (0.59-1.24)	
>72	14.7%	15.0%	0.96 (0.65-1.43)	
COPD				0.5460
Yes	20.9%	18.8%	1.10 (0.60-2.02)	
No	15.1%	16.0%	0.90 (0.67-1.23)	
Baseline Atrial fibrillation/flutter				0.5177
Yes	26.4%	24.5%	1.05 (0.60-1.84)	
No	13.4%	15.0%	0.86 (0.63-1.17)	
BMI, kg/m^2				0.7226
≤30	15.6%	17.4%	0.86 (0.59-1.25)	
>30	15.4%	15.5%	0.95 (0.64-1.41)	



Hemodynamic Valve Performance

Evolut™ Low Risk Trial



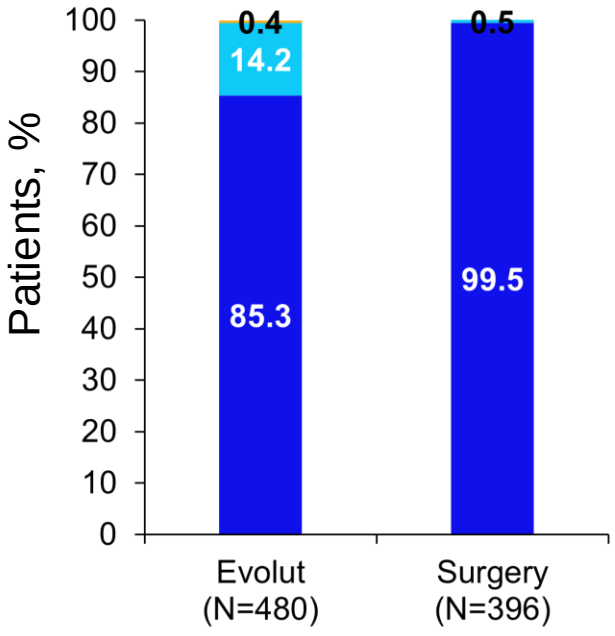
Evolut EOA	637	577	565	535	495	439	399
Surgery EOA	596	406	525	435	397	370	313
Evolut MG	717	704	662	607	549	498	467
Surgery MG	679	632	597	515	457	436	387

Paravalvular Regurgitation

Evolut™ Low Risk Trial

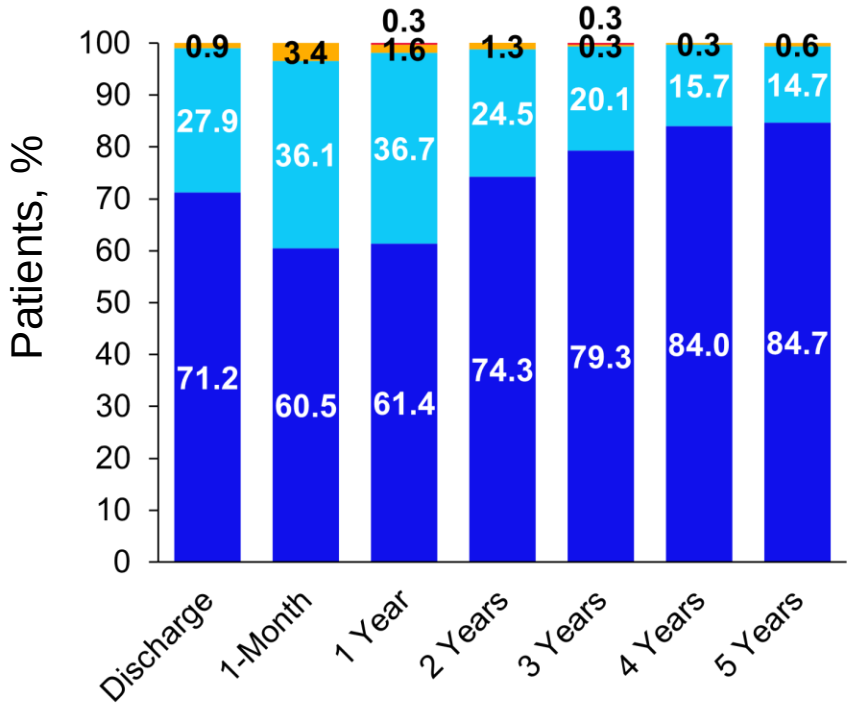
Patients with PVR data at 5Y

Overall, p < 0.0001
≥ Moderate, p = 0.50

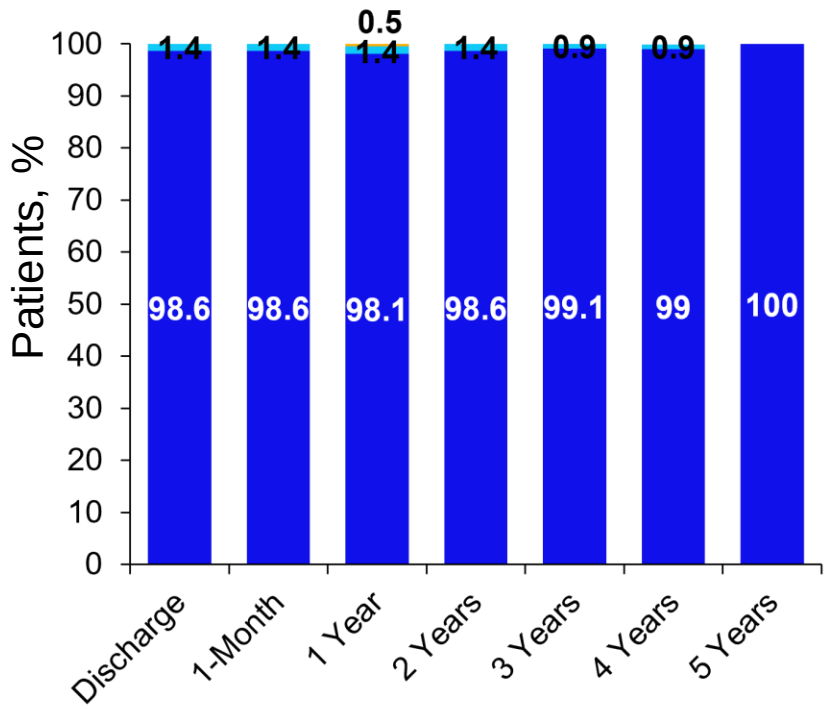


Patients with PVR data at all visits (paired data)

Evolut (N=319)



Surgery (N=211)

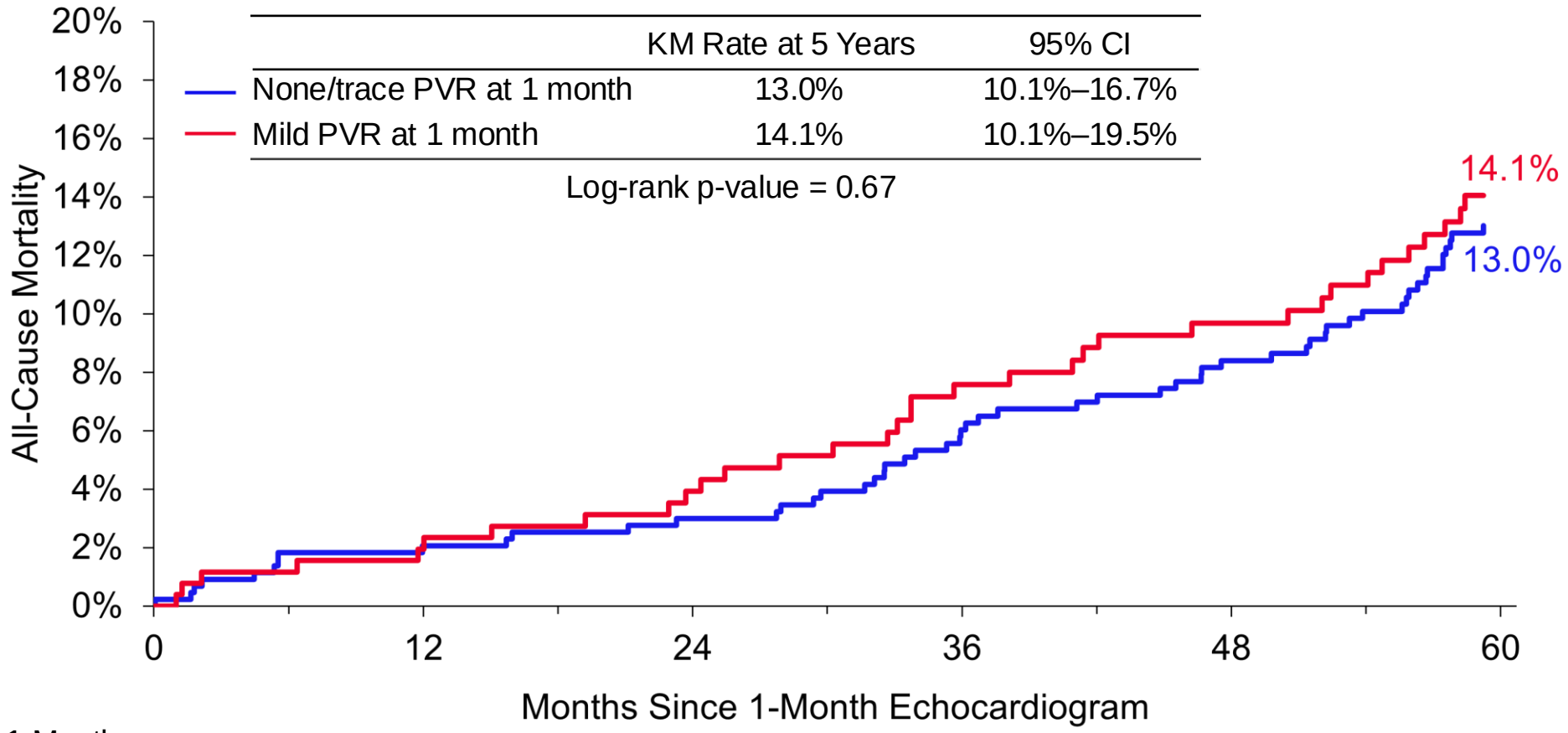


None/trace Mild Moderate Severe

Effect of 1-Month Paravalvular Regurgitation on Mortality in Evolut

Evolut™ Low Risk Trial

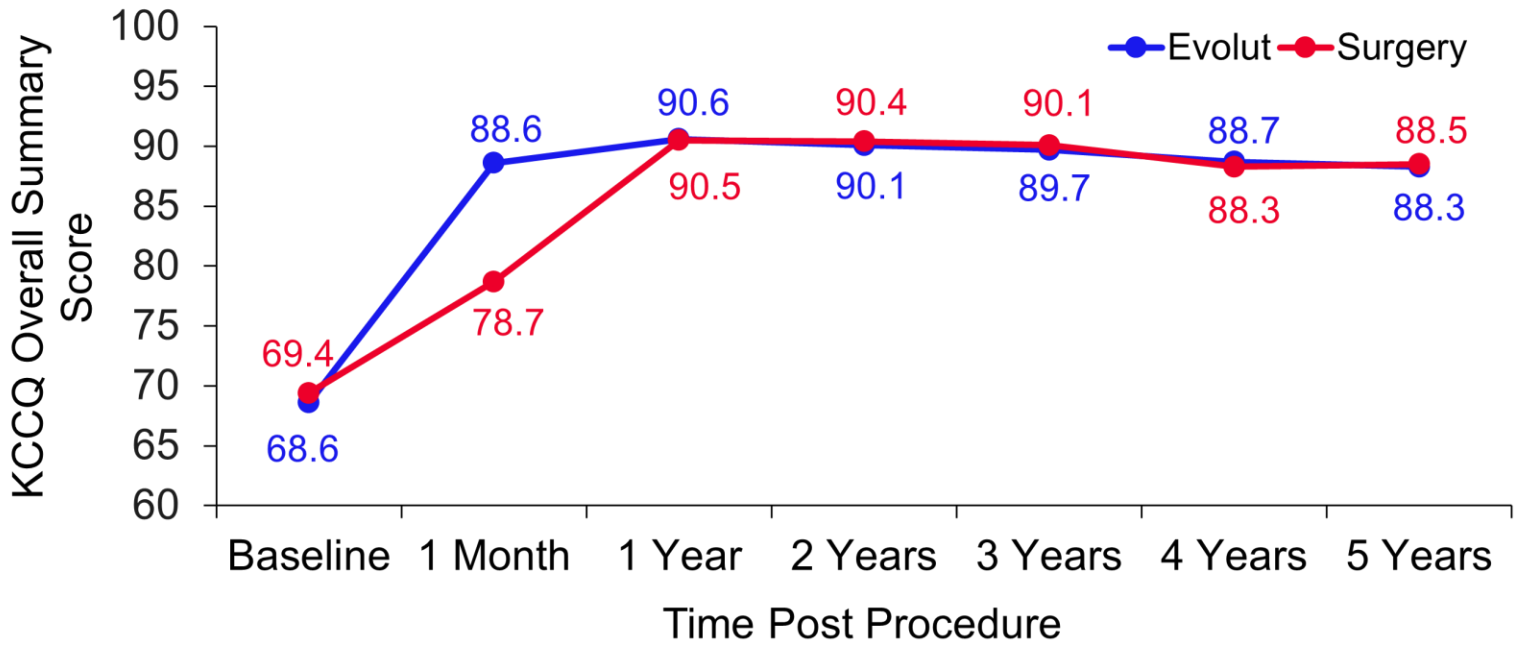
Early mild paravalvular regurgitation had no impact on 5-year mortality



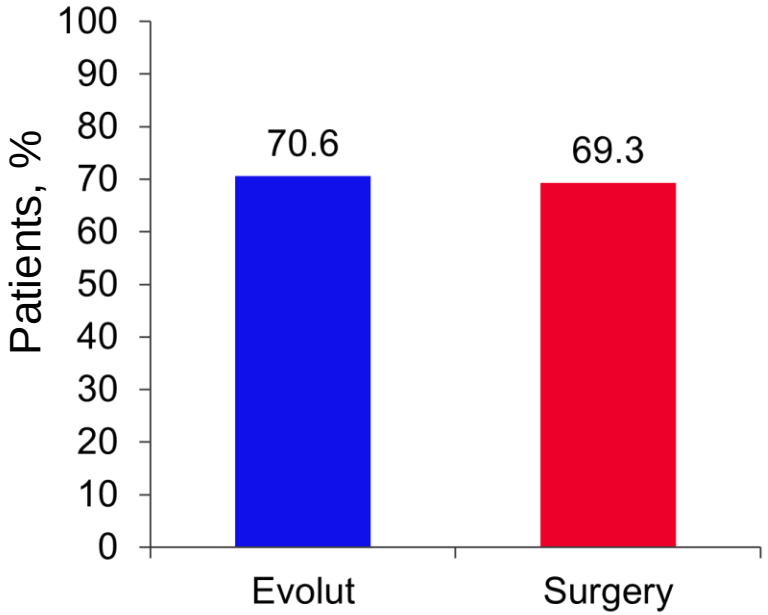
PVR at 1 Month							
None/trace	438	427	424	416	398	384	344
Mild	257	254	249	240	221	213	185

KCCQ Overall Summary Score

Evolut™ Low Risk Trial



Alive and well at 5 Years
(alive and KCCQ summary score >75)

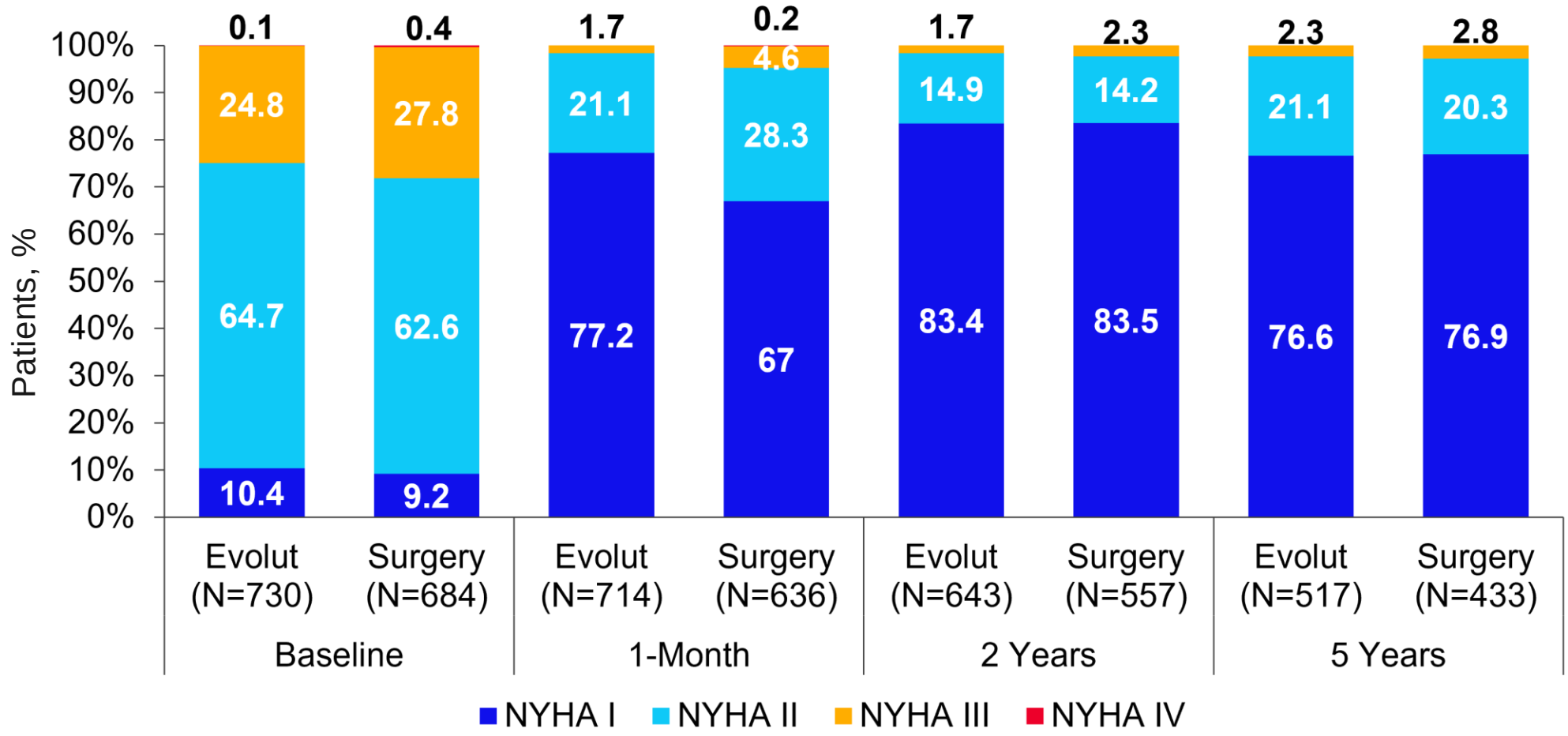


Change from Baseline							
Evolut	n	720	689	661	617	561	520
	Mean ± SD	20.0 ± 21.1	21.6 ± 20.6	20.9 ± 20.8	20.1 ± 20.6	19.3 ± 20.7	18.9 ± 21.9
Surgery	n	645	607	565	522	483	445
	Mean ± SD	9.2 ± 22.3	20.7 ± 20.3	20.0 ± 20.0	19.3 ± 21.1	17.3 ± 20.9	17.8 ± 21.7
	p-value	<0.001	0.42	0.44	0.53	0.13	0.45

NYHA Classification By Visit

Evolut™ Low Risk Trial

Both Evolut and surgery gave patients good relief from symptoms



Summary

Evolut™ Low Risk Trial

Low surgical risk patients with severe aortic stenosis who were treated with either Evolut or surgery showed comparable rates of all-cause mortality or disabling stroke at 5 years (15.5% Evolut and 16.4% surgery, p=0.47)

- Importantly, cardiovascular mortality remains similar for Evolut and surgery at 5 years (Δ at 5 years favoring Evolut: 2.1%)
- Significantly lower mean gradients and larger EOAs ($p<0.001$ for both) with Evolut vs surgery
- No difference in valve reintervention rates, moderate or greater PVR, or alive and well status at 5 years

The results of the Evolut Low Risk Trial at five years support Evolut as a safe, effective, and durable alternative to surgery for patients with severe aortic stenosis and low surgical risk

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5-Year Outcomes After Transcatheter or Surgical Aortic Valve Replacement in Low-Risk Patients With Aortic Stenosis

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ABSTRACT

BACKGROUND The Evolut Low Risk trial demonstrated that transcatheter aortic valve replacement (TAVR) was noninferior to surgery for the primary endpoint of all-cause mortality or disabling stroke at 2 years. Outcomes at 5 years have not been reported.

OBJECTIVES This study sought to evaluate 5-year clinical and hemodynamic outcomes with TAVR vs surgery in patients from the Evolut Low Risk trial.

METHODS We randomly assigned low-risk patients with severe aortic stenosis to TAVR or surgery. The primary endpoint was a composite of all-cause mortality or disabling stroke. Secondary endpoints included clinical, echocardiographic, and quality-of-life outcomes through 5 years.

RESULTS A total of 1,414 patients underwent an attempted implant (n = 730 TAVR, n = 684 surgery). The mean age was 74 years (range 51-88 years), and women accounted for 35% of patients. At 5 years the Kaplan-Meier estimate for the primary endpoint of all-cause mortality or disabling stroke was 15.5% for the TAVR group and 16.4% for the surgery group ($P = 0.47$). The Kaplan-Meier estimates in the TAVR and surgery groups for all-cause mortality were 13.5% and 14.9% ($P = 0.39$) and for disabling stroke were 3.6% and 4.0% ($P = 0.57$). Cardiovascular mortality was 7.2% in the TAVR group and 9.3% in the surgery group ($P = 0.15$). Noncardiovascular mortality in the TAVR group was 6.8% and 6.2% in the surgery group ($P = 0.73$). A site-level vital status sweep was performed for patients who were lost to follow-up or withdrew from the study. With the addition of these patients, the all-cause mortality rate at 5 years for patients undergoing TAVR was 14.7% and for surgery was 15.2% ($P = 0.74$). Over 5 years, valve reintervention rate was 3.3% for TAVR and 2.5% for surgery ($P = 0.44$). A sustained improvement in quality of life was observed in both treatment arms with mean Kansas City Cardiomyopathy Questionnaire summary score of 88.3 ± 15.8 in TAVR and 88.5 ± 15.8 in surgery.

CONCLUSIONS At 5 years, patients with severe aortic stenosis who were treated with either TAVR or surgery had comparable rates of all-cause mortality or disabling stroke. Valve durability and performance were excellent in both arms. This midterm evaluation reinforces the position of TAVR as noninferior to surgery in patients with severe aortic stenosis at low surgical risk (Medtronic Evolut Transcatheter Aortic Valve Replacement in Low Risk Patients; NCT02701283) (JACC. 2025;■:■-■) © 2025 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

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