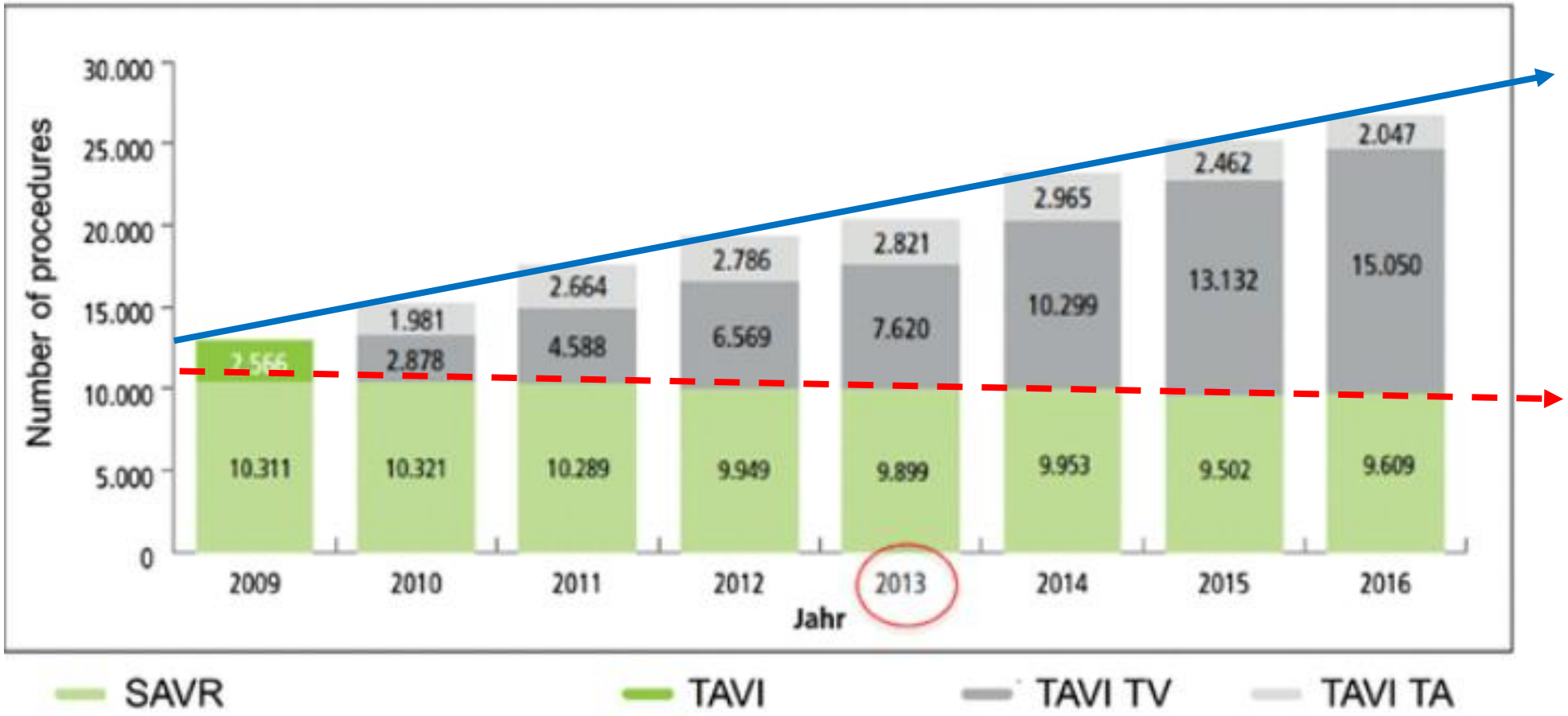
TAVI u low-risk pacientů

Petr Kala, FN Brno a LF MU

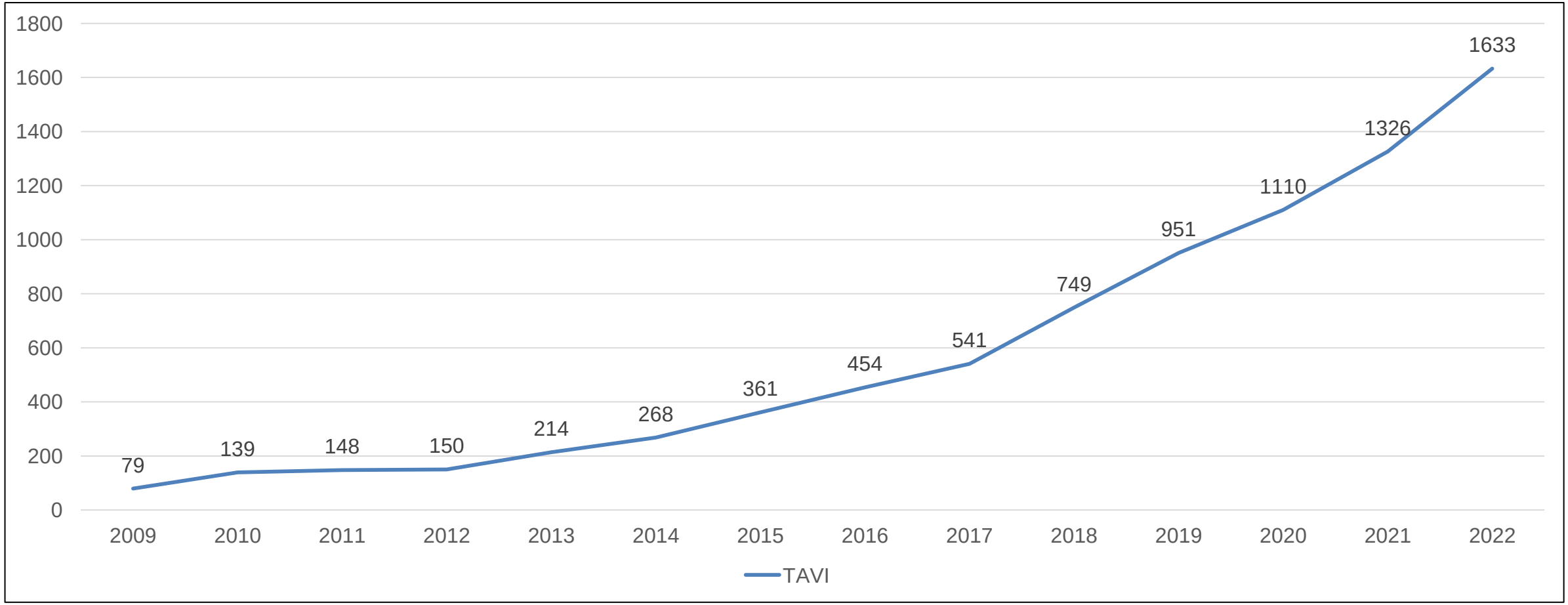
Trendy počtů výkonů TAVI/ SAVR

Trendy počtu TAVI a AVR v Německu

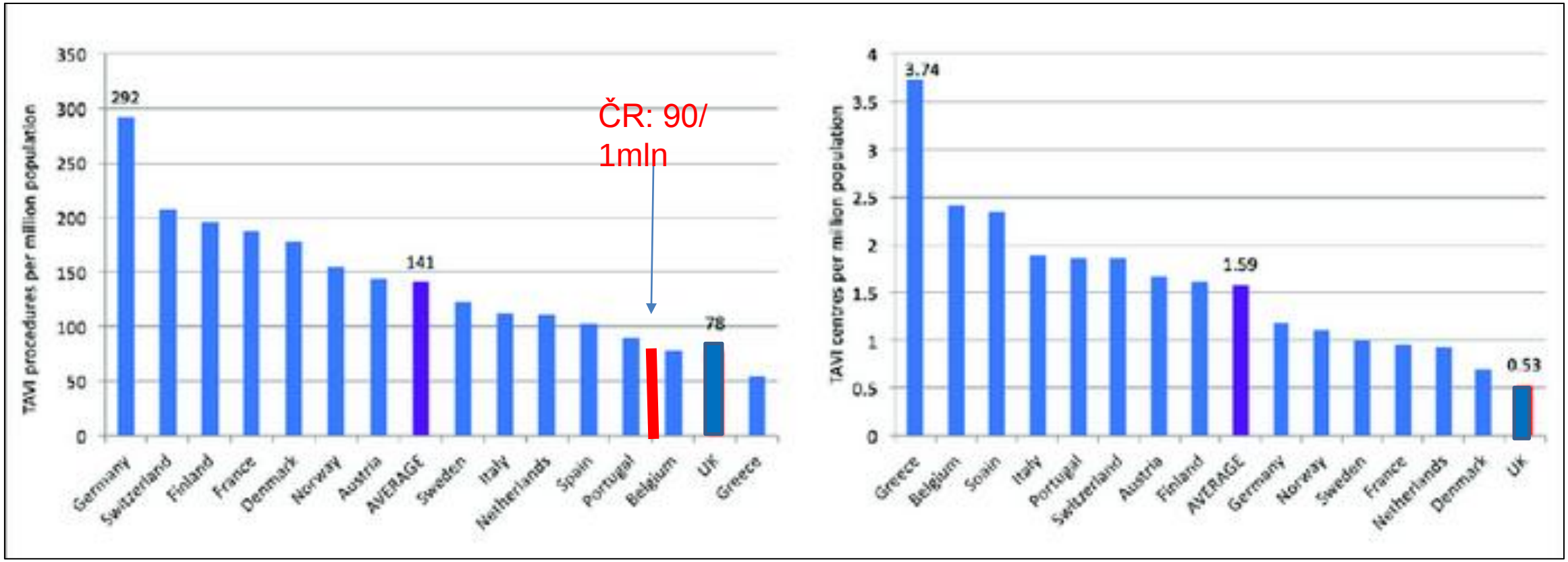


Czech TAVI Registry

Počet TAVI 2008-2022



Počet TAVI/center na 1mln obyvatel v r. 2019



ČR: 90,5/ 1mln obyvatel

ČR: 0,75mln/ 1 TAVI centrum

MUNI MED

PARTNER 3 Trial

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Transcatheter Aortic-Valve Replacement with a Balloon-Expandable Valve in Low-Risk Patients

M.J. Mack, M.B. Leon, V.H. Thourani, R. Makkar, S.K. Kodali, M. Russo, S.R. Kapadia, S.C. Malaisrie, D.J. Cohen, P. Pibarot, J. Leipsic, R.T. Hahn, P. Blanke, M.R. Williams, J.M. McCabe, D.L. Brown, V. Babaliaros, S. Goldman, W.Y. Szeto, P. Genereux, A. Pershad, S.J. Pocock, M.C. Alu, J.G. Webb, and C.R. Smith, for the PARTNER 3 Investigators*

EVOLUT Low Risk Trial

FAKULTNÍ NEMOCNICE BRNO

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Transcatheter Aortic-Valve Replacement with a Self-Expanding Valve in Low-Risk Patients

Jeffrey J. Popma, M.D., G. Michael Deeb, M.D., Steven J. Yakubov, M.D., Mubashir Mum , Tanvir Bajwa, M.D., John C. Heiser, Judah Askew, M.D., Paul S tcuti, M.D., David H. A Zorn III, M.D., John K. Forrest ıtony Walton, M.D., Nicolo Piaz obinson, M.D., George P K. Oh, M.D., Michael J. Bo . Mugglin, Ph.D., and Micha l Investigators*

Comparing Low-Risk TAVR Trials

Patient populations

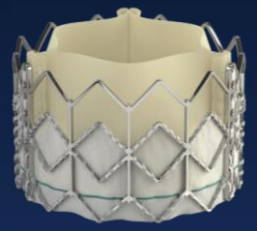
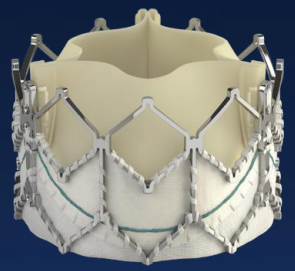
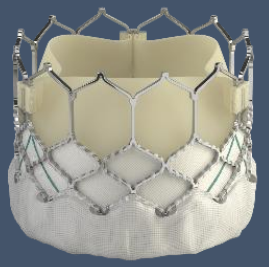
PARTNER 3

- 71 sites from US, CA, Japan, Australia, and NZ
- Patients … randomized = 1,000; as-treated = 950; available for 1-yr FU = 950
- Low-risk criteria: STS < 4% + HT evaluation; case screening committee
- Exclusions: bicuspid valves, complex CAD, unsuitable anatomy for THV, non-TF access required

MDT Low-Risk

- 86 sites from US, CA, EU, Japan, Australia, and NZ
- Patients … randomized = 1,468; as-treated = 1,403; available for 1-yr FU = 784
- Low-risk criteria: STS <3% + HT evaluation; case screening committee
- Exclusions: bicuspid valves, complex CAD, unsuitable anatomy for THV

SAPIEN Valve Evolution

	SAPIEN	SAPIEN XT	SAPIEN 3
Valve Technology			
Sheath Compatibility			
Available Valve Sizes			
FDA Approval of Valve:	PARTNER 1 2011	PARTNER 2 2014	PARTNER 3 2015

Study Timeline and Valves Studied

Evolut™ Low Risk Trial

2016	2017	2018

First Patient Randomized
Mar. 28, 2016

*Last Patient Randomized
Nov. 27, 2018

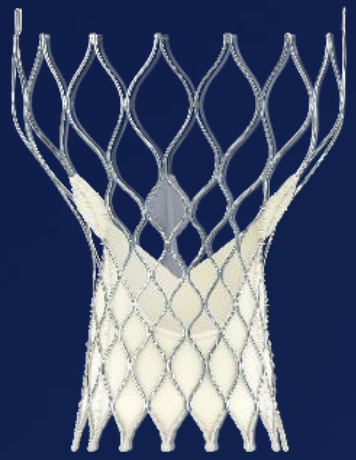
CoreValve 31 mm

Evolut R: 23, 26, 29

Added Evolut R 34 mm

Evolut PRO: 23, 26, 29 mm

Primary Endpoint Assessment
Dec. 27, 2018



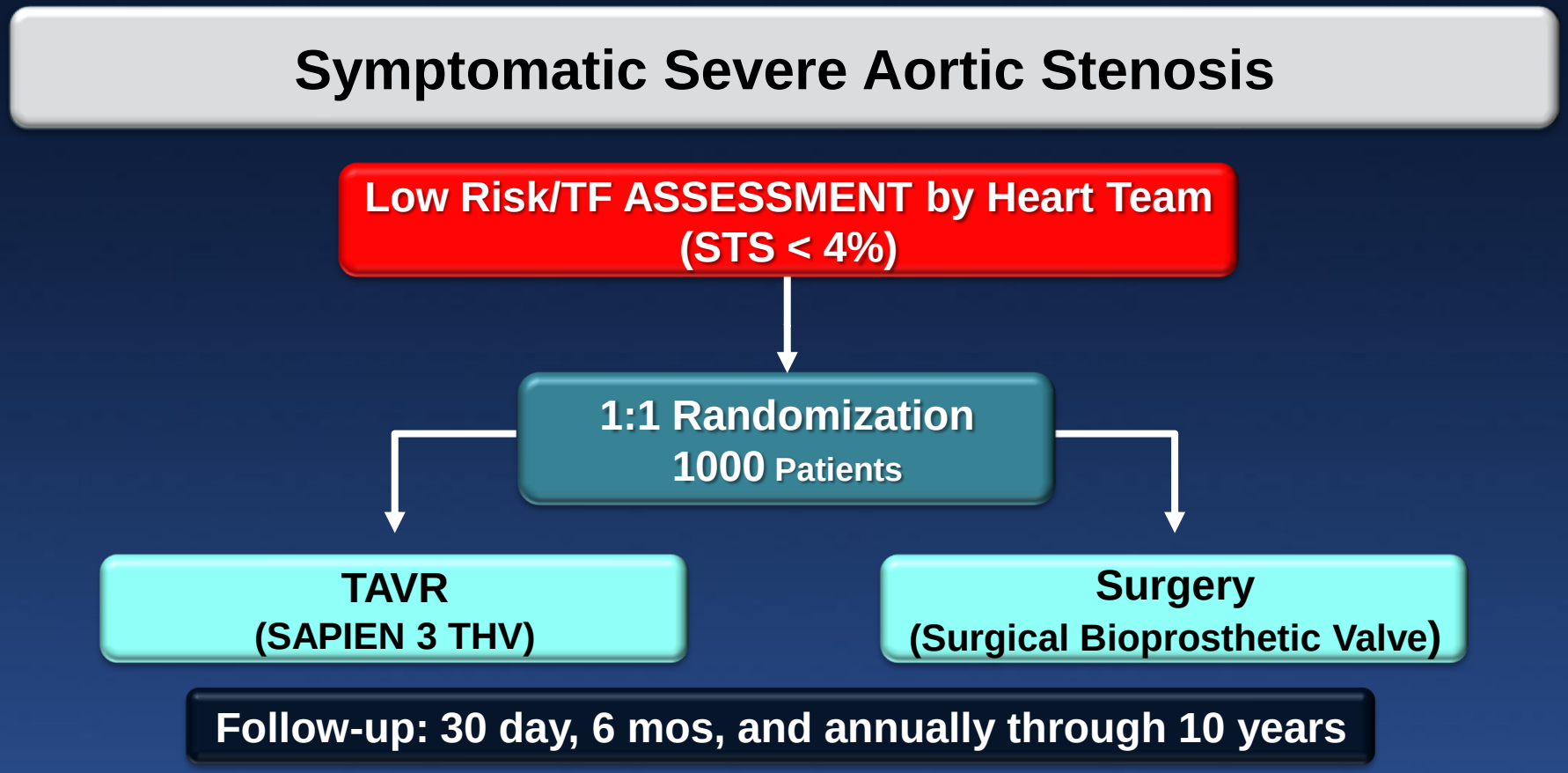
CoreValve 31 = 3.6%	Evolut R = 74.1%	Evolut PRO = 22.3%

Vascular access
- 99% transfemoral
- 0.6% subclavian
- 0.4% direct aortic

*For this analysis

THE PARTNER 3 TRIAL

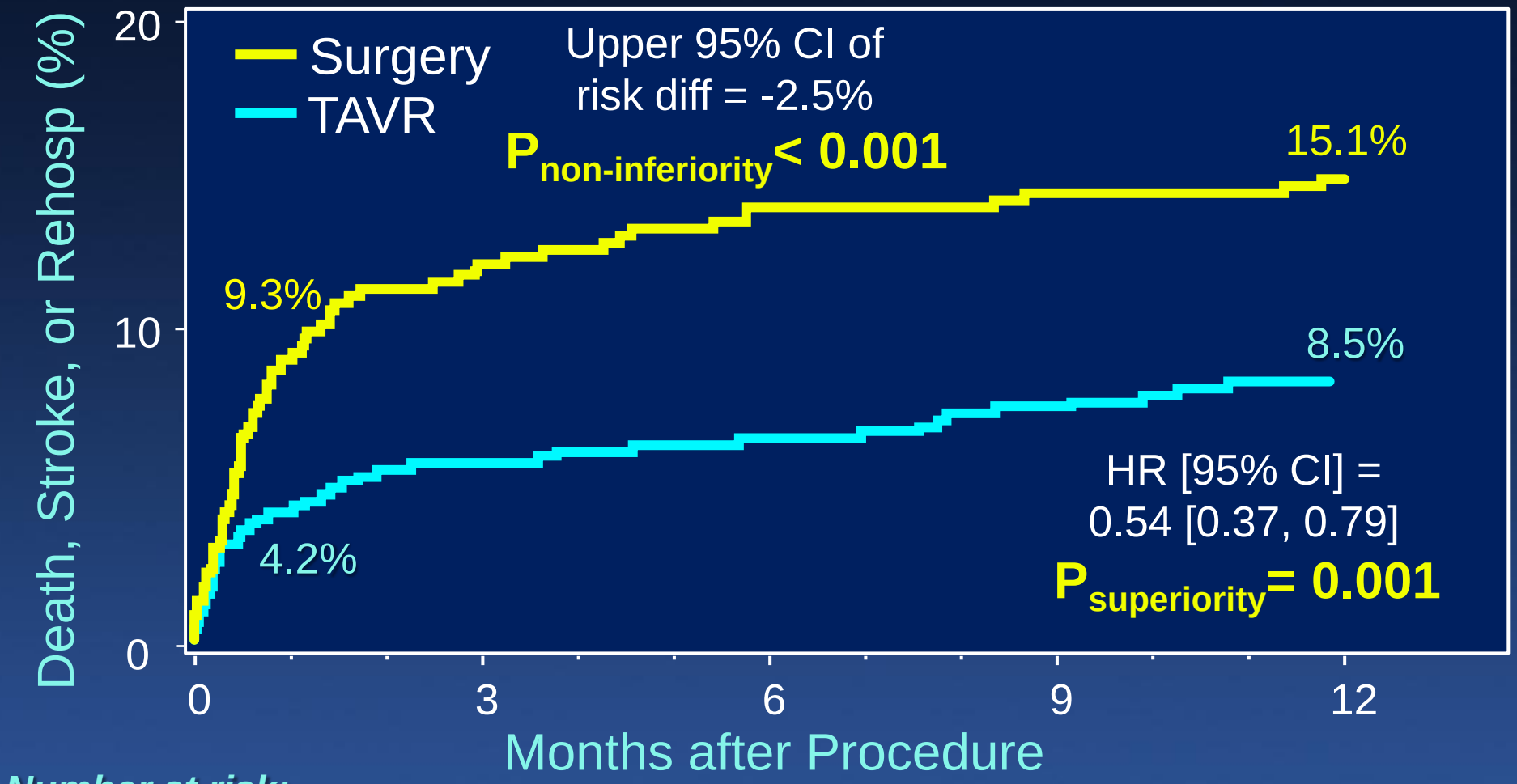
PARTNER 3 Study Design



PRIMARY ENDPOINT:
Composite of all-cause mortality, stroke, or CV re-hospitalization at 1 year post-procedure

THE PARTNER 3 TRIAL

Primary Endpoint

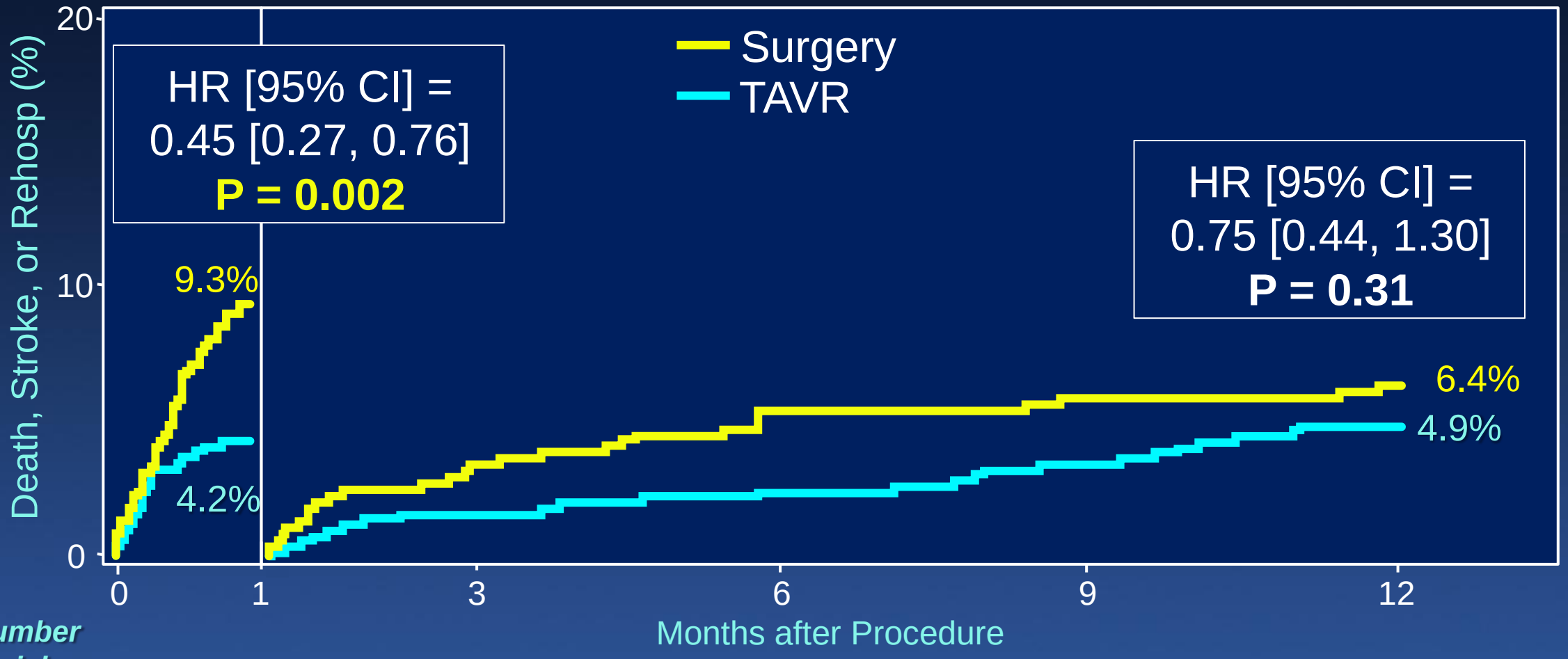


Number at risk:

Surgery	**454**	**408**	**390**	**381**	**377**	**374**
TAVR	**496**	**475**	**467**	**462**	**456**	**451**

THE PARTNER 3 TRIAL

Primary Endpoint - Landmark Analysis

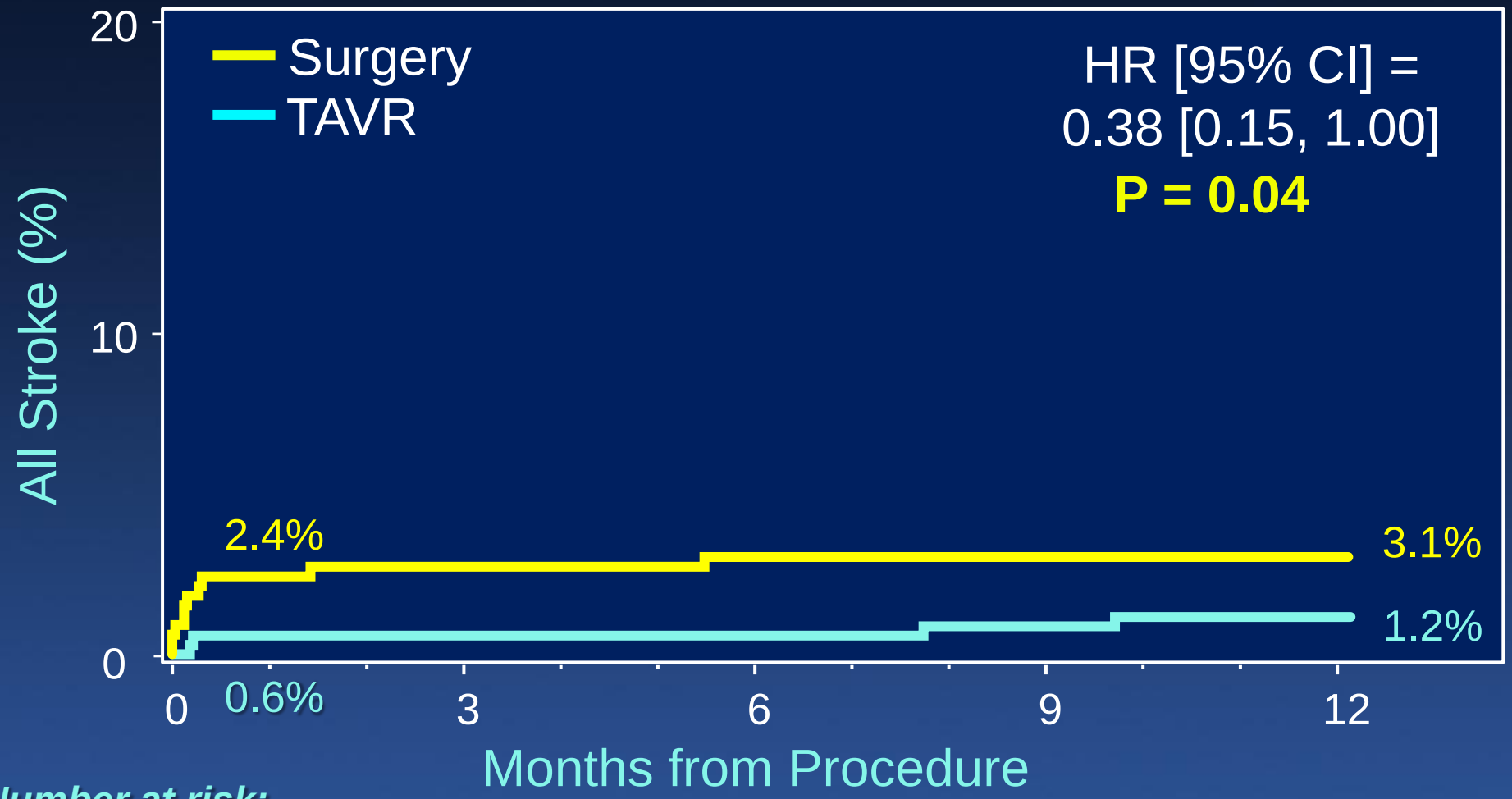


Number at risk:

Surgery	**454**	**445**	**415**	**411**	**408**
TAVR	**496**	**494**	**481**	**475**	**467**

THE PARTNER 3 TRIAL

All Stroke

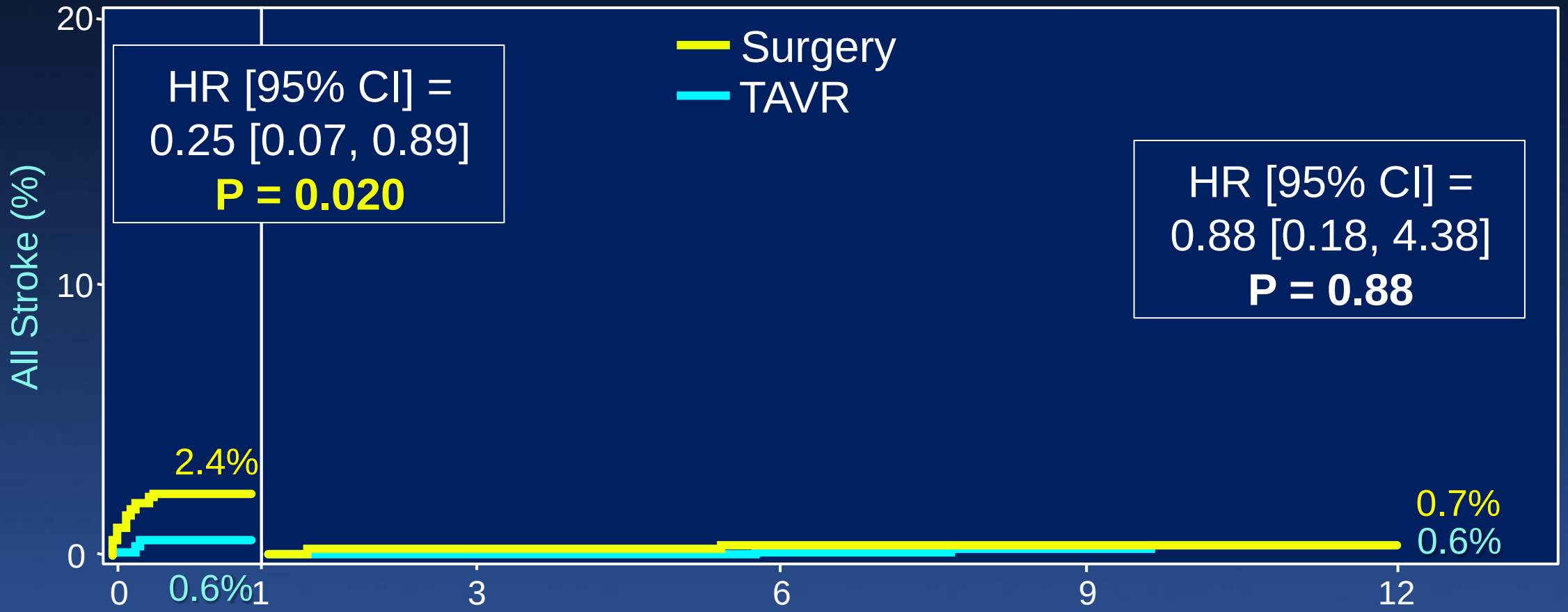


Number at risk:

Surgery	**454**	**435**	**427**	**423**	**421**	**417**
TAVR	**496**	**491**	**491**	**489**	**487**	**484**

THE PARTNER 3 TRIAL

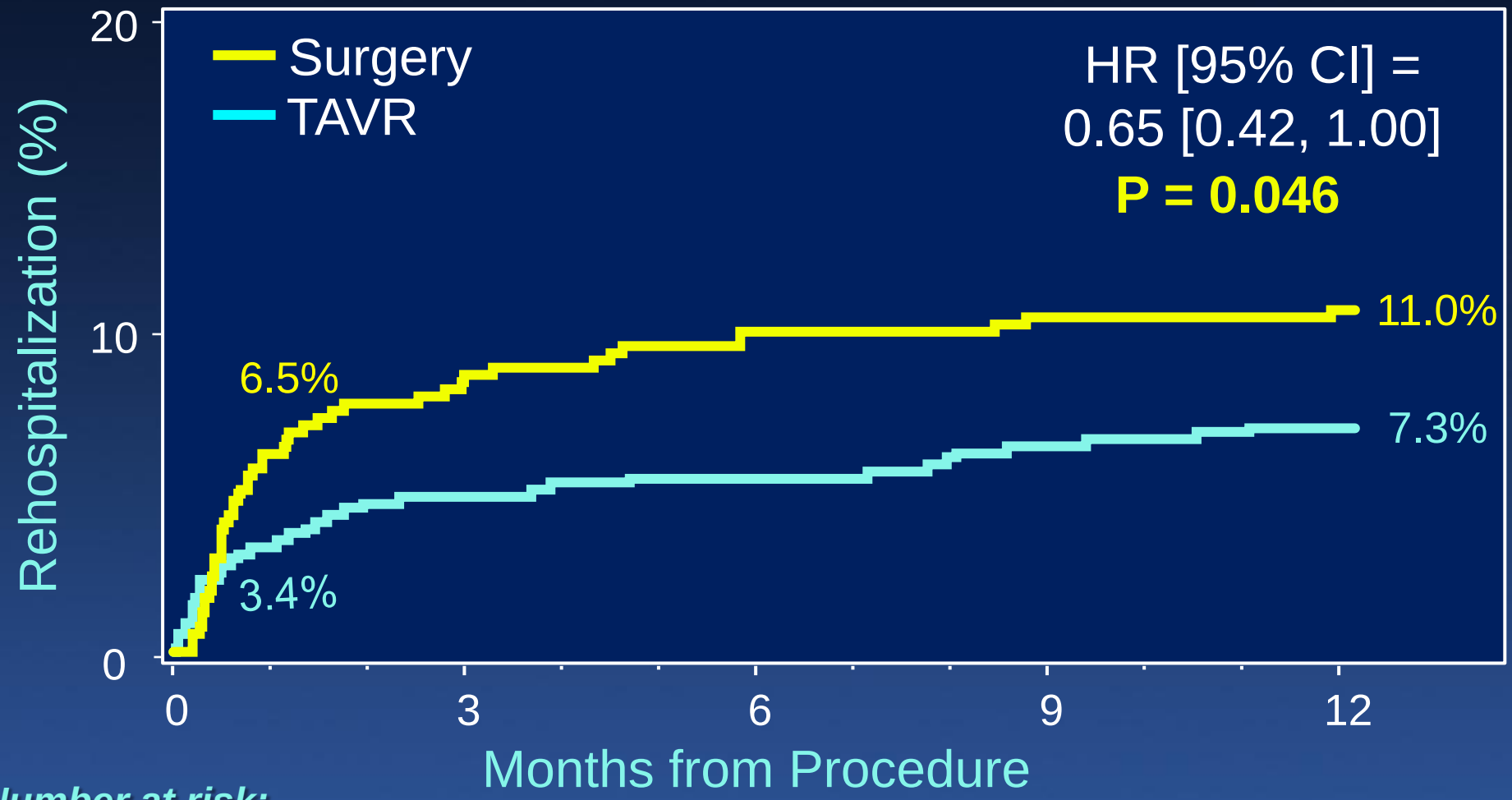
All Stroke - Landmark Analysis



Number at risk:					
Surgery	454	445	433	431	427
TAVR	496	494	492	490	486

THE PARTNER 3 TRIAL

Rehospitalization



Number at risk:

Surgery	**454**	**416**	**399**	**389**	**385**	**382**
TAVR	**496**	**477**	**469**	**465**	**459**	**453**

THE PARTNER 3 TRIAL

Atrial Fibrillation

Outcomes % (# pts)	Index Hospitalization			30 Days		
	TAVR (N=417)	Surgery (N=369)	p-value	TAVR (N=417)	Surgery (N=369)	p-value
New Onset Atrial Fibrillation*	4.1% (17)	35.5% (131)	< 0.001	5.0% (21)	***39.3% (145)***	< 0.001
Present on 30 day ECG	5.9% (1)	6.1% (8)		5.9% (1)	6.1% (8)	
Not present on 30 day ECG	94.1% (16)	91.6% (120)		94.1% (16)	***91.6% (120)***	
Duration						
≤ 24 hrs	4.1% (11)	35.5% (41)		5.0% (11)	31.7% (46)	
> 24 hrs	64.7% (5)	31.3% (51)		52.4% (6)	***37.2% (54)***	
Treatment						
Electrical cardioversion	41.2% (7)	8.4% (11)		33.3% (7)	***9.0% (13)***	
Electrical cautery/ablation	5.9% (1)	0% (0)		4.8% (1)	0% (0)	
Medical cardioversion	5.9% (1)	6.1% (8)		4.8% (1)	5.5% (8)	
New medication	23.5% (4)	76.3% (100)		33.3% (7)	***75.9% (110)***	
Other	5.9% (1)	0% (0)		4.8% (1)	0.7% (1)	
No action	17.6% (3)	9.2% (12)		19.0% (4)	9.0% (13)	

Data are binary counts

*Denominator excludes patients with history or atrial fibrillation at baseline.

THE PARTNER 3 TRIAL

Bleeding Complications

VARC-2 and BARC at 30 Days

KM rates at 30 days - % (n)	TAVR (N=496)	Surgery (N=454)	HR [95% CI]	p-value
VARC-2 Definitions				
Life-threatening/Disabling or Major	***3.6% (18)***	***24.5% (111)***	***0.12 [0.07, 0.21]***	<0.001
Life-threatening/Disabling	1.2% (6)	11.9% (54)	0.09 [0.04, 0.22]	<0.001
Major	2.6% (13)	13.5% (61)	0.18 [0.10, 0.33]	<0.001
Minor	4.8% (24)	7.5% (34)	0.63 [0.37, 1.07]	0.09
BARC Definitions				
Type 1	0.8% (4)	2.6% (12)	0.30 [0.10, 0.93]	0.03
Type 2	4.0% (20)	2.9% (13)	1.42 [0.71, 2.86]	0.32
Type 3A	***2.0% (10)***	***9.9% (45)***	***0.19 [0.10, 0.38]***	<0.001
Type 3B	***1.4% (7)***	***13.9% (63)***	***0.09 [0.04, 0.20]***	<0.001
Type 3C	0.0% (0)	0.2% (1)	NA	0.30
Type 4	***0.4% (2)***	***4.2% (19)***	***0.09 [0.02, 0.40]***	<0.001
Type 5	0.4% (2)	0.0% (0)	NA	0.18

*HR and 95% CI are from the log-rank test

THE PARTNER 3 TRIAL

Bleeding Complications

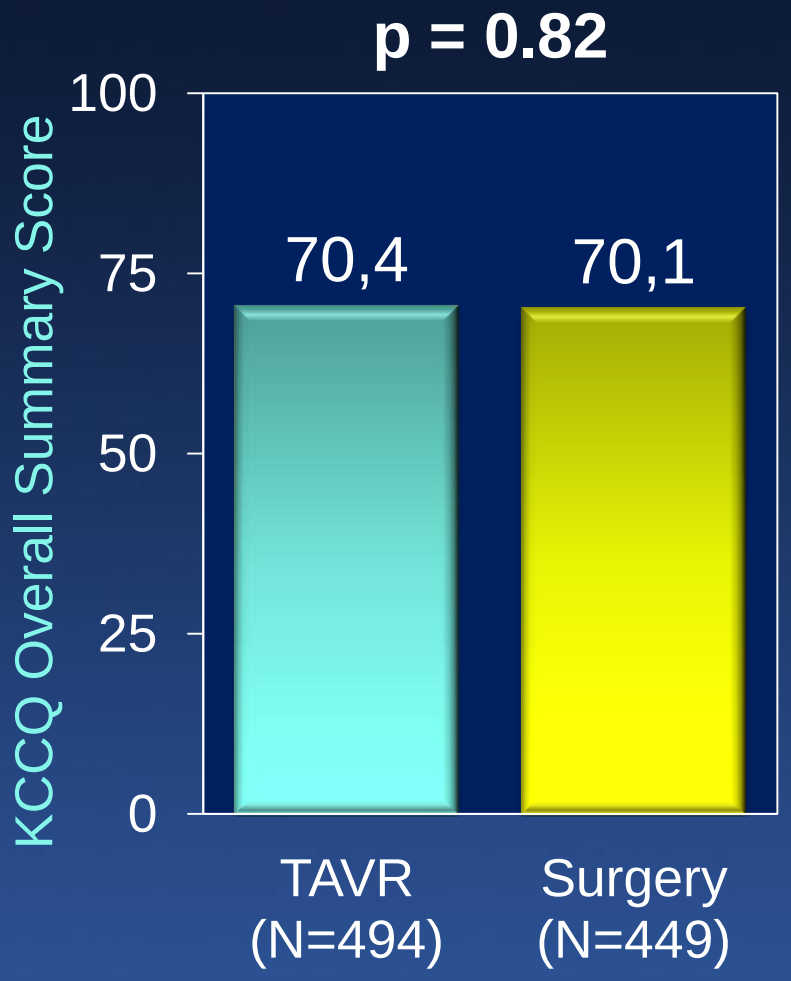
Transfusions

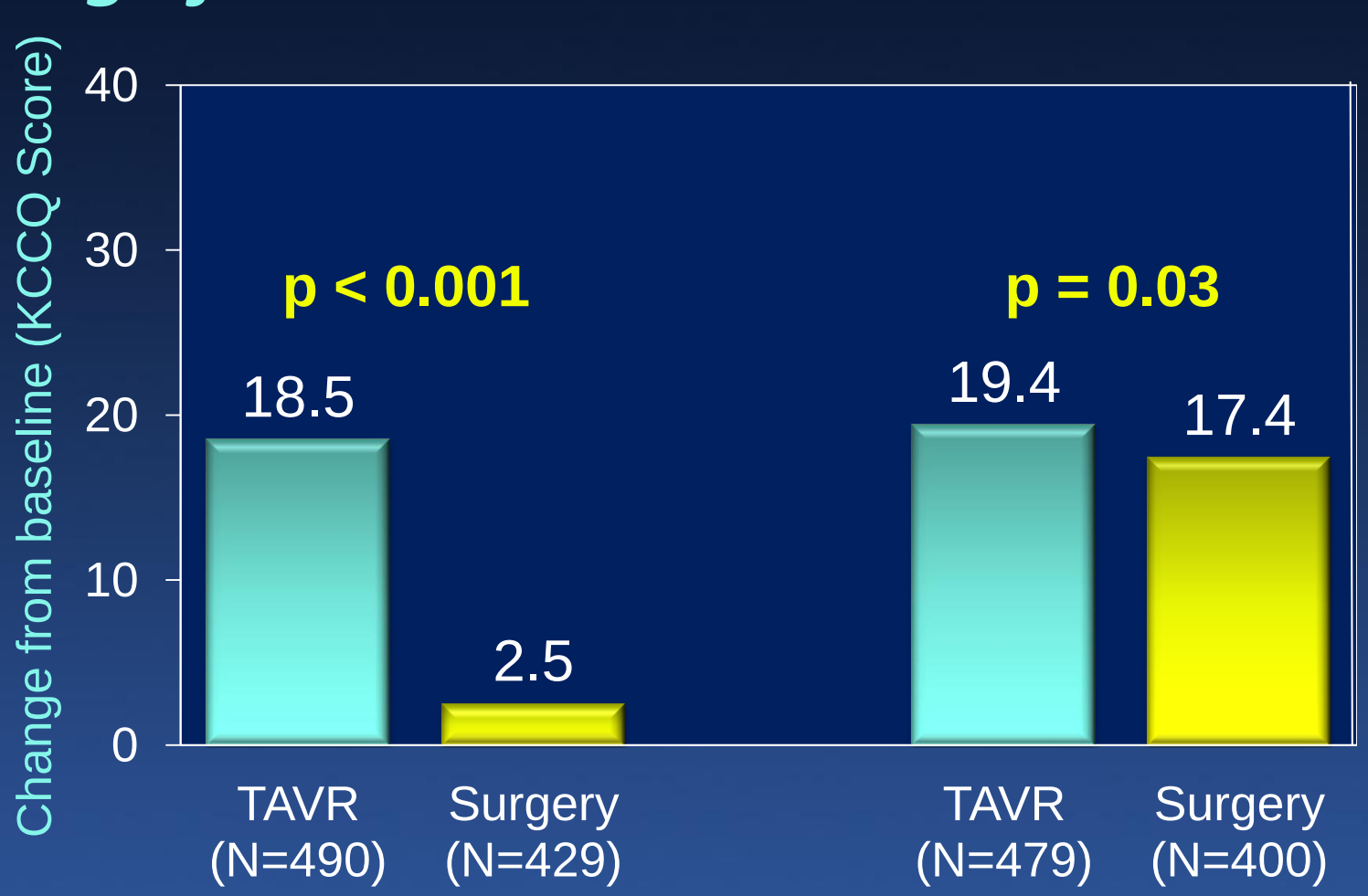
	3 Days				In Hospital			
	TAVR (N=496)	Surgery (N=454)	Difference [95% CI]	p-value	TAVR (N=496)	Surgery (N=454)	Difference [95% CI]	p-value
Patients requiring transfusion ≥ 1 unit	2.0% (10)	26.7% (121)	-24.6% [-28.9%, -20.4%]	<0.001	2.0% (10)	27.8% (126)	-25.7% [-30.0%, -21.4%]	<0.001
Patients requiring transfusion ≥ 4 units	***0.8% (4)***	***7.3% (33)***	***-6.5% [-9.0%, -4.0%]***	<0.001	0.8% (4)	7.3% (33)	-6.5% [-9.0%, -4.0%]	<0.001

THE PARTNER 3 TRIAL

KCCQ Overall Summary Score

Change from Baseline



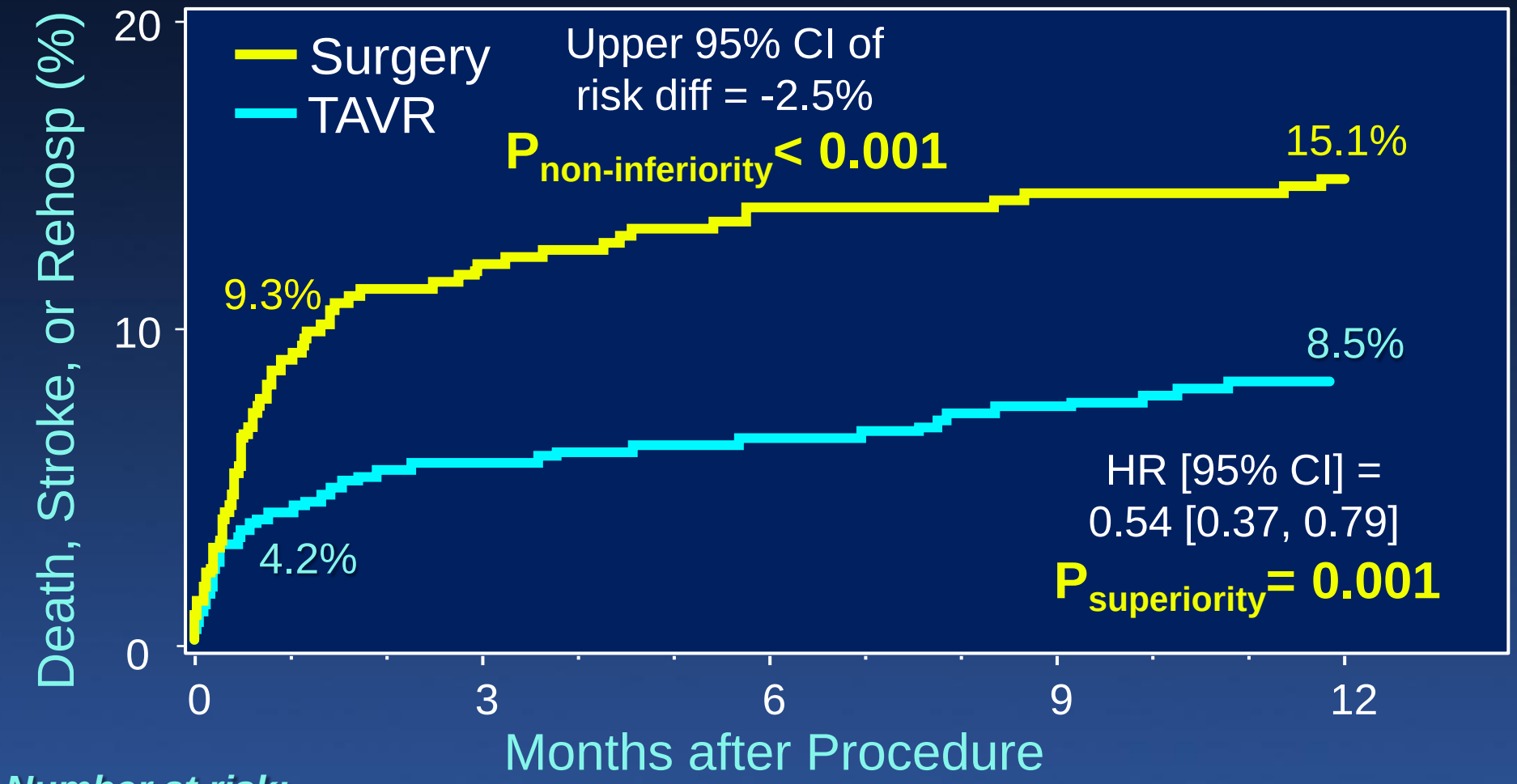


P-value is based on the t-test.

P-values are based on the ANCOVA for TAVR vs Surgery adjusted by baseline.

THE PARTNER 3 TRIAL

Primary Endpoint

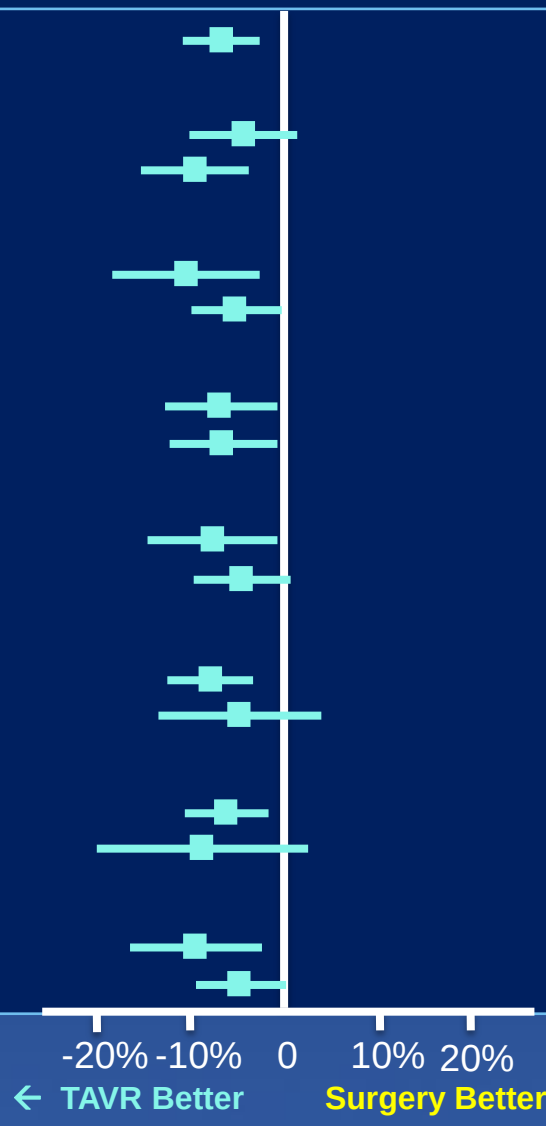


Number at risk:

Surgery	**454**	**408**	**390**	**381**	**377**	**374**
TAVR	**496**	**475**	**467**	**462**	**456**	**451**

Primary Endpoint - Subgroup Analysis

Subgroup	TAVR	Surgery	Diff [95% CI]	P-value*
Overall	**8.5**	**15.1**	**-6.6 [-10.8, -2.5]**	
Age				
≤ 74 (n=516)	10.6	14.9	-4.3 [-10.1, 1.5]	**0.21**
> 74 (n=434)	5.8	15.3	-9.5 [-15.3, -3.7]	
Sex				
Female (n=292)	8.1	18.5	-10.4 [-18.3, -2.5]	**0.27**
Male (n=658)	8.7	13.8	-5.1 [-9.9, -0.3]	
STS Score				
≤ 1.8 (n=464)	9.1	15.7	-6.7 [-12.6, -0.7]	**0.98**
> 1.8 (n=486)	8.0	14.5	-6.5 [-12.2, -0.8]	
LV Ejection Fraction				
≤ 65 (n=384)	9.6	17.2	-7.6 [-14.5, -0.7]	**0.48**
> 65 (n=524)	8.0	12.4	-4.4 [-9.6, 0.7]	
NYHA Class				
I/II (n=687)	6.8	14.5	-7.8 [-12.4, -3.2]	**0.54**
III/IV (n=263)	12.3	16.9	-4.7 [-13.5, 4.1]	
Atrial Fibrillation				
No (n=786)	7.9	14.0	-6.1 [-10.5, -1.7]	**0.67**
Yes (n=163)	11.6	20.3	-8.7 [-19.9, 2.5]	
KCCQ Overall Summary Score				
≤ 70 (n=407)	10.5	19.9	-9.4 [-16.5, -2.4]	**0.27**
> 70 (n=536)	6.5	11.2	-4.6 [-9.4, 0.2]	



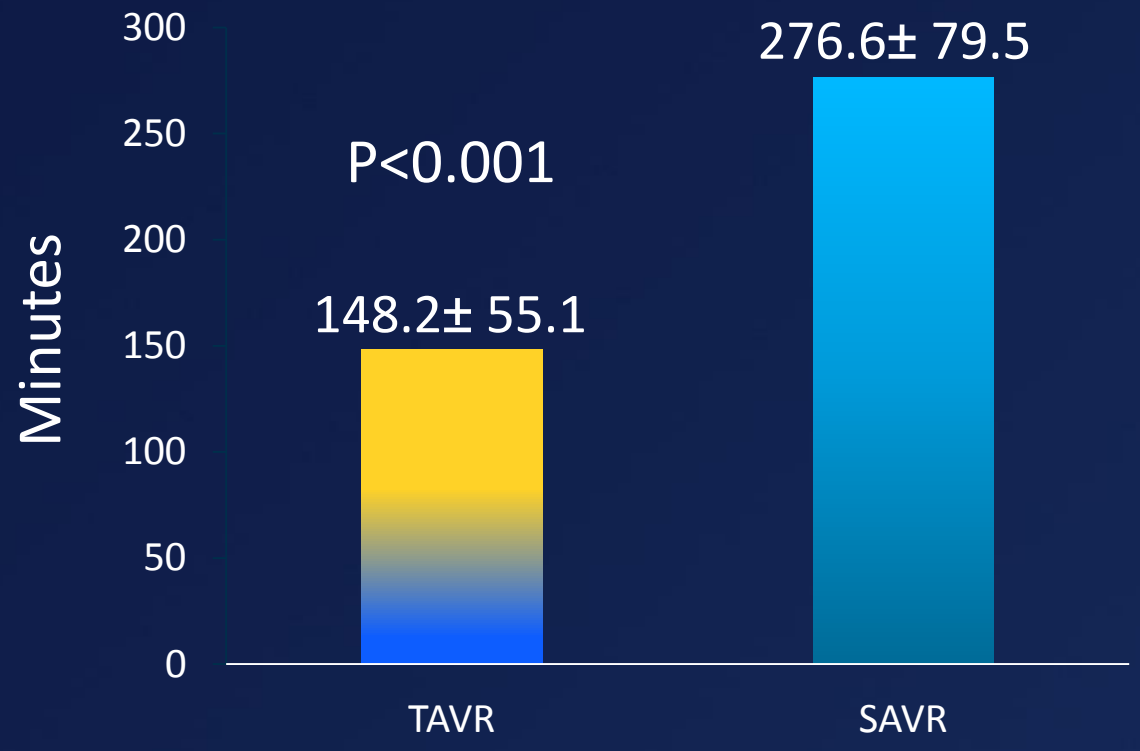
Event rates are KM estimates (%)

* P-value is for interaction

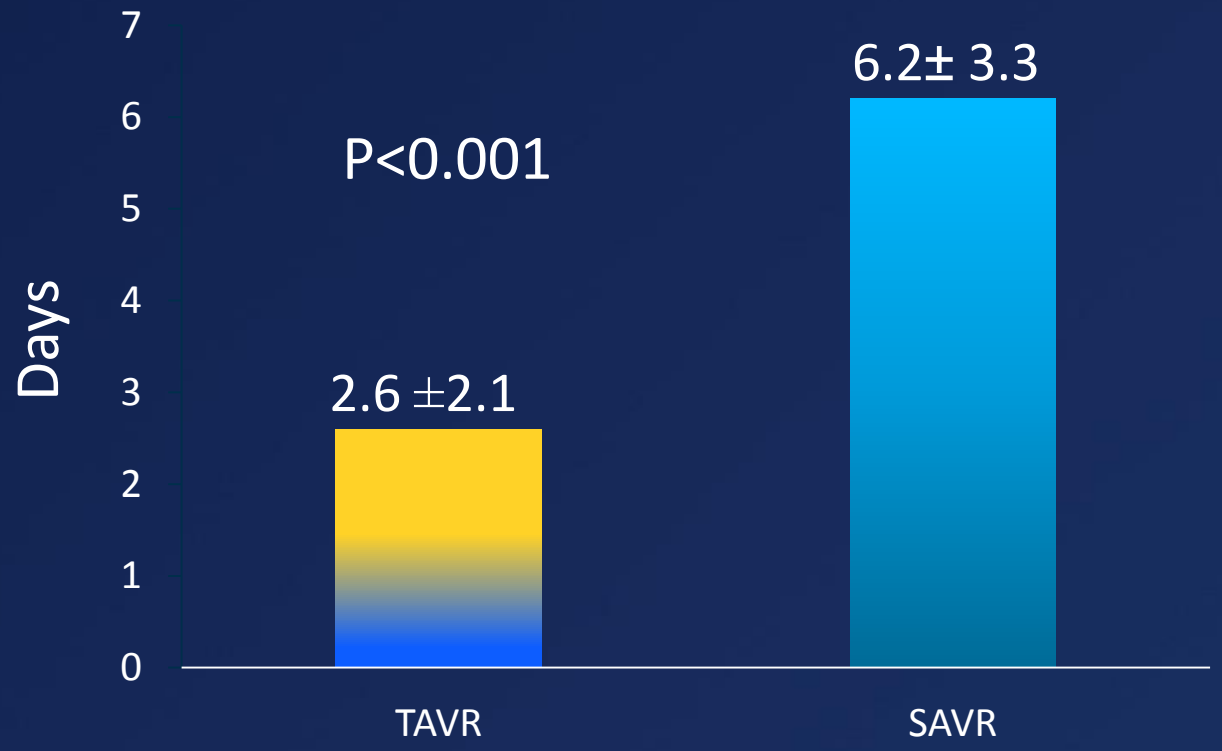
Procedural Time and Length of Stay

Evolut™ Low Risk Trial

Time in Cath Lab or OR



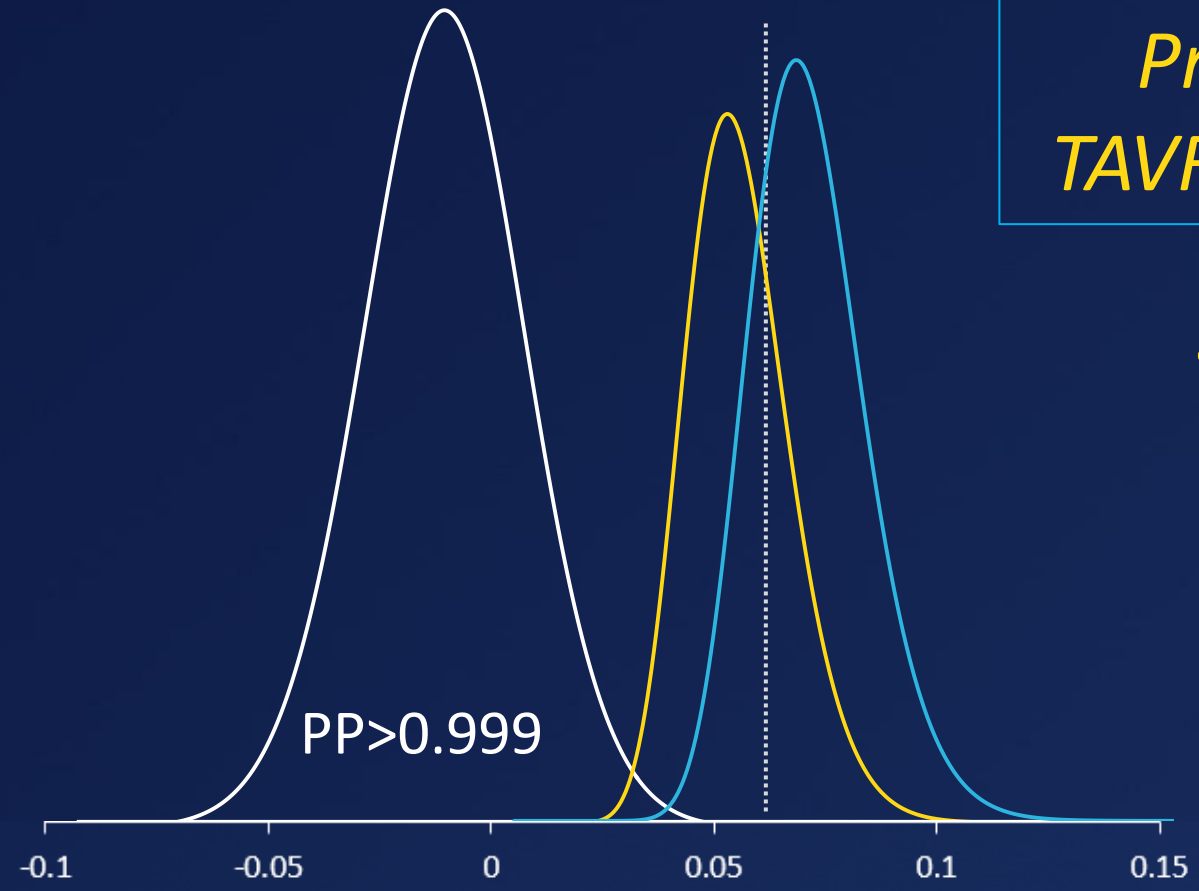
Hospital Length of Stay



Primary Endpoint

All-Cause Mortality or Disabling Stroke at 2 Years

Evolut™ Low Risk Trial



Primary Endpoint Met
TAVR is noninferior to SAVR

TAVR 5.3% **SAVR 6.7%**

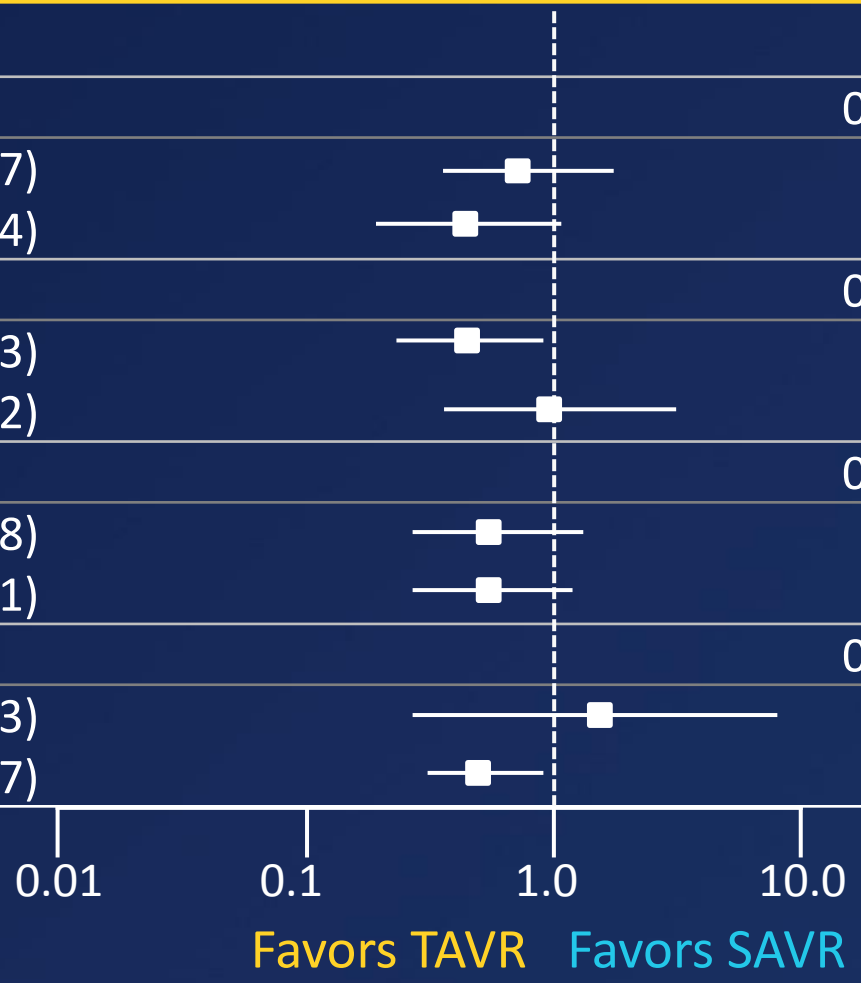
Posterior probability of noninferiority > 0.999

TAVR –SAVR difference = -1.4% (95% BCI; -4.9, 2.1)

Subgroup Analysis for Death or Disabling Stroke at 1 Year

Evolut™ Low Risk Trial

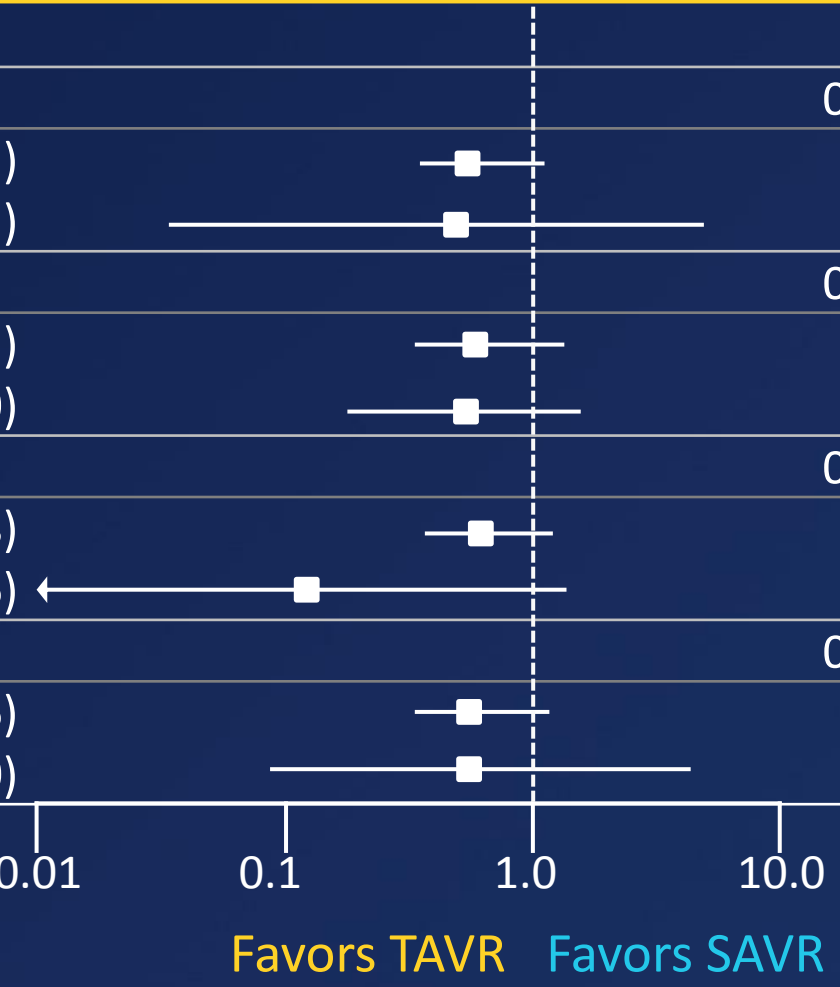
Subgroup	TAVR	SAVR	Hazard Ratio (95% BCI)	P for Interaction
	n/N (% KM rate at 1 Year)			
Age, years				0.50
< 75	10/351 (3.3)	14/350 (4.3)	0.70 (0.31-1.57)	
≥ 75	7/374 (2.2)	13/328 (4.9)	0.45 (0.18-1.14)	
Sex				0.22
Male	10/464 (2.5)	21/449 (5.4)	0.44 (0.21-0.93)	
Female	7/261 (3.0)	6/229 (2.9)	1.01 (0.34-3.02)	
BMI, kg/m^2				0.98
≤ 30	8/366 (2.5)	13/345 (4.4)	0.57 (0.24-1.38)	
> 30	9/359 (2.9)	14/333 (4.7)	0.56 (0.24-1.31)	
LVEF, %				0.28
≤ 50	3/56 (7.4)	2/56 (3.6)	1.44 (0.24-8.63)	
> 50	14/669 (2.3)	25/621 (4.6)	0.50 (0.26-0.97)	



Subgroup Analysis for Death or Disabling Stroke at 1 Year

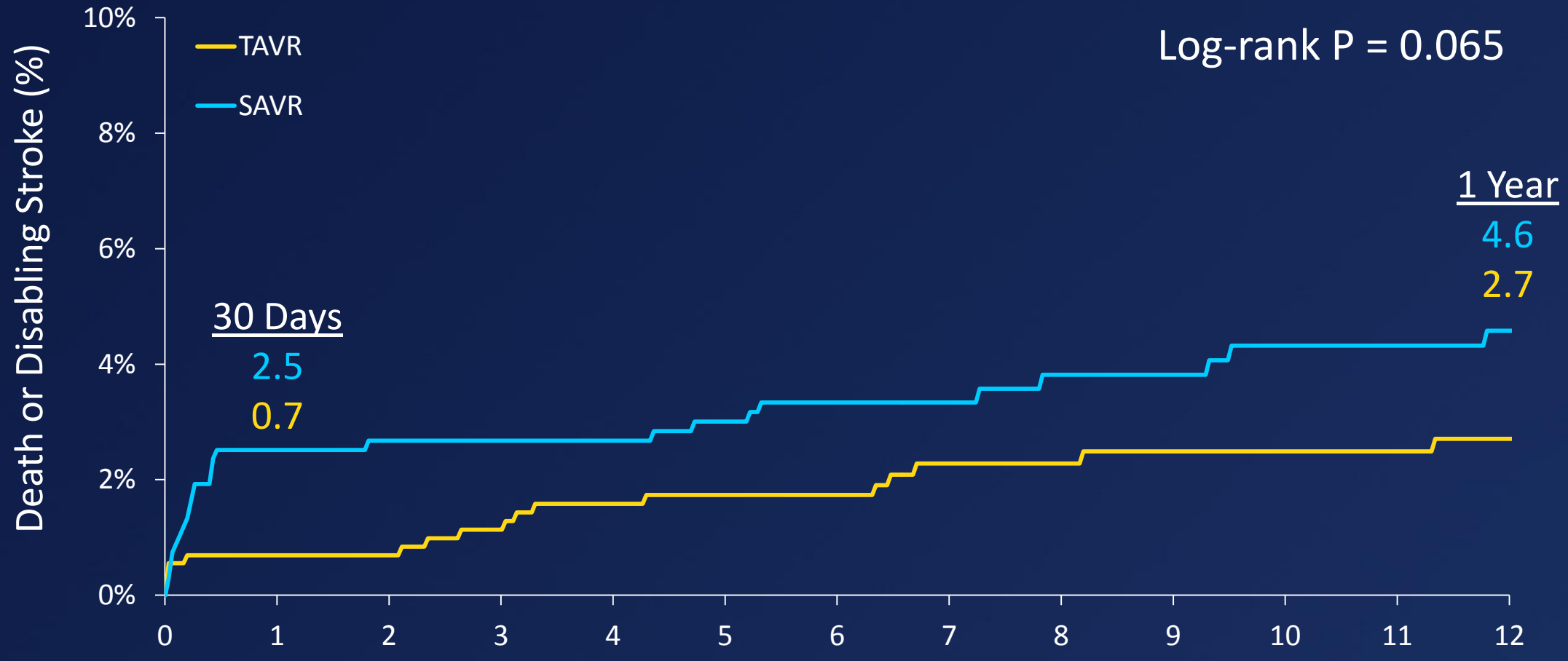
Evolut™ Low Risk Trial

Subgroup	TAVR	SAVR	Hazard Ratio (95% BCI)	P for Interaction
	n/N (% KM rate at 1 Year)			
Peripheral Artery Disease				0.92
No	15/664 (2.7)	25/621 (4.6)	0.54 (0.29-1.03)	
Yes	1/54 (1.9)	2/56 (4.9)	0.46 (0.04-5.15)	
Diabetes Mellitus				0.81
No	12/497 (2.8)	18/471 (4.7)	0.59 (0.28-1.23)	
Yes	5/228 (2.3)	9/207 (4.4)	0.50 (0.17-1.50)	
Need for Revascularization				0.31
No	17/640 (3.1)	24/599 (4.7)	0.64 (0.34-1.18)	
Yes	0/85 (0.0)	3/79 (3.9)	0.13 (0.00-1.36)	
STS PROM, %				0.99
< 3	15/678 (2.5)	25/650 (4.4)	0.56 (0.29-1.06)	
≥ 3	2/47 (5.3)	2/28 (7.6)	0.55 (0.08-3.90)	



K-M All-Cause Mortality or Disabling Stroke at 1 Year

Evolut™ Low Risk Trial

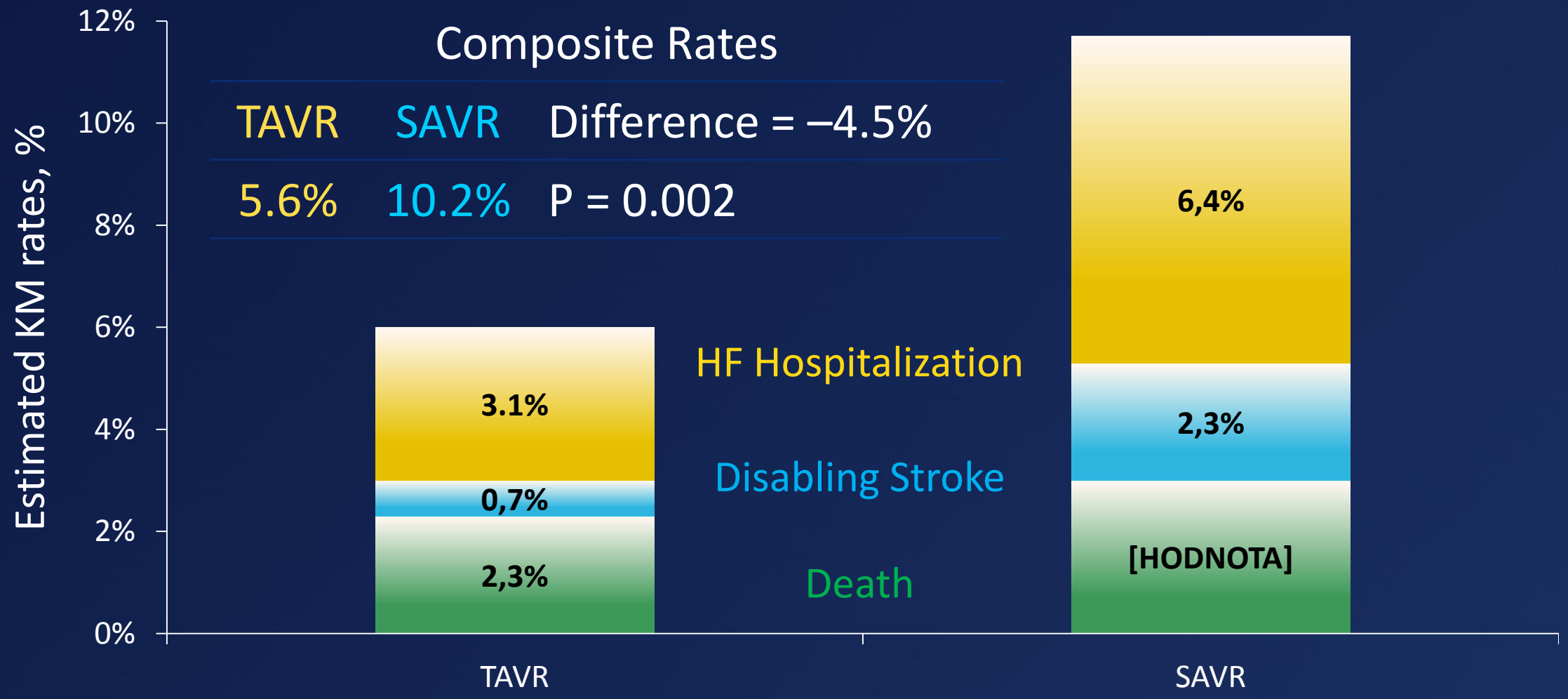


No. at risk					
TAVR	725	718	648		435
SAVR	678	656	576		366

Clinical Implications

Death, Disabling Stroke and Heart Failure Hospitalizations to 1 Year

Evolut™ Low Risk Trial



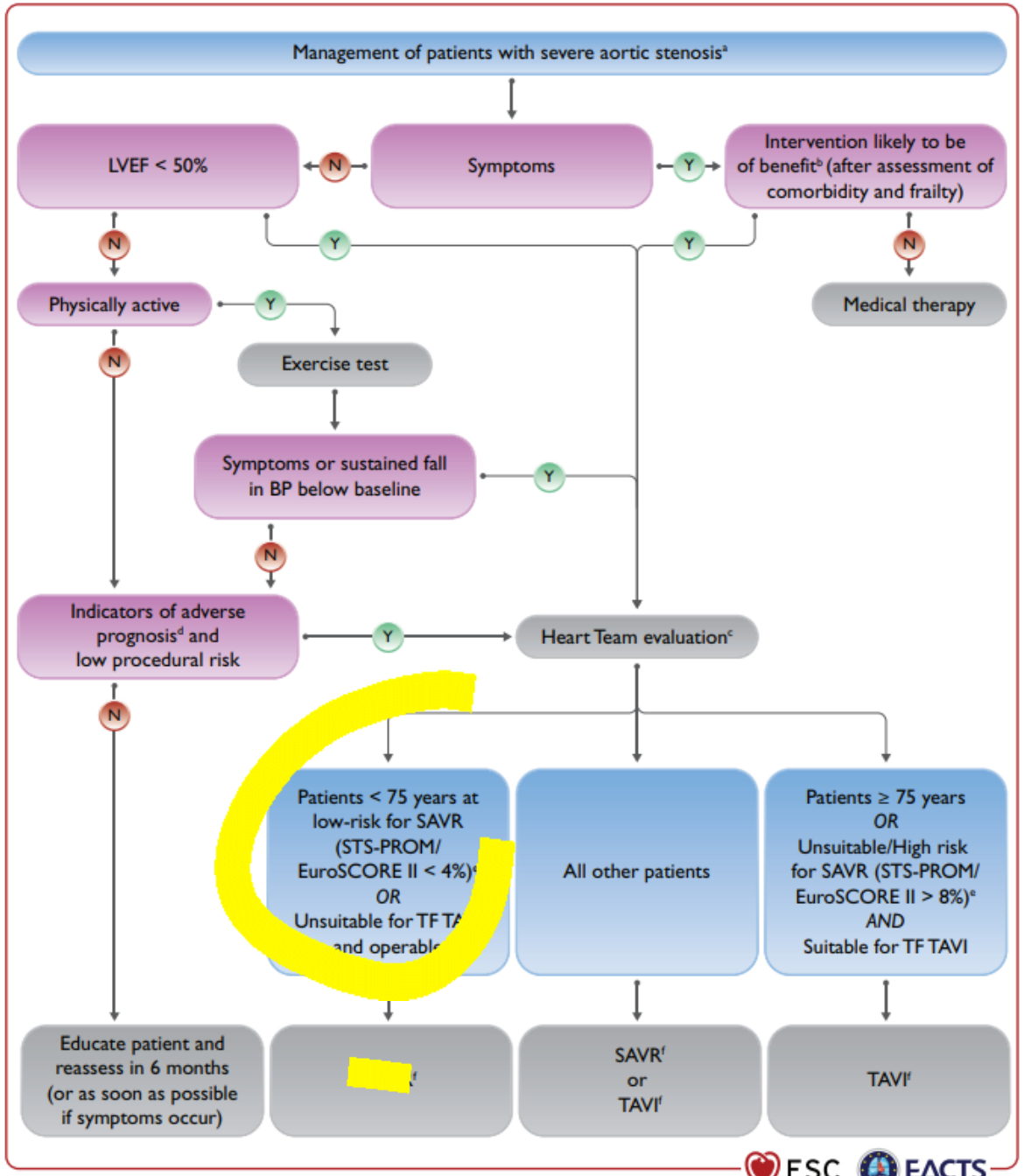
ESC GL 2021

Table 6 Clinical, anatomical and procedural factors that influence the choice of treatment modality for an individual patient

	Favours TAVI	Favours SAVR
Clinical characteristics		
Lower surgical risk	–	+
[redacted]		–
Younger age[a]	–	+
[redacted]		–
[redacted] onary artery bypass grafts at risk of injury during repeat sternotomy)	+	–
[redacted]		–
Active or suspected endocarditis	–	+

Anatomical and procedural factors		
[redacted]	+	–
Transfemoral access challenging or impossible and SAVR feasible	–	+
[redacted]	+[c]	–
[redacted]	+	–
[redacted]	+	–
[redacted]	+	–
[redacted]	+	–
Aortic annular dimensions unsuitable for available TAVI devices	–	+
Bicuspid aortic valve	–	+
Valve morphology unfavourable for TAVI (e.g. high risk of coronary obstruction due to low coronary ostia or heavy leaflet/LVOT calcification)	–	+
Thrombus in aorta or LV	–	+

Concomitant cardiac conditions requiring intervention		
Significant multi-vessel CAD requiring surgical revascularization[d]	–	+
Severe primary mitral valve disease	–	+
Severe tricuspid valve disease	–	+
Significant dilatation/aneurysm of the aortic root and/or ascending aorta	–	+
Septal hypertrophy requiring myectomy	–	+



TAVI u low-risk pacientů
SHRNUTÍ

- Dvě velké randomizované studie u pacientů s nízkým operačním rizikem prokázaly minimálně stejně dobré 1roční výsledky TAVI a SAVR.
- U pacientů s dlouhou životní prognózou je nutné vnímat potřebu dalších zákroků na bioprotéze – SAVR-TAVI-SAVR-TAVI-TAVI…
- SAVR by měla být provedena pouze s bioprotézami umožňujícími bezpečné provedení následné intervence.

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Děkuji za pozornost