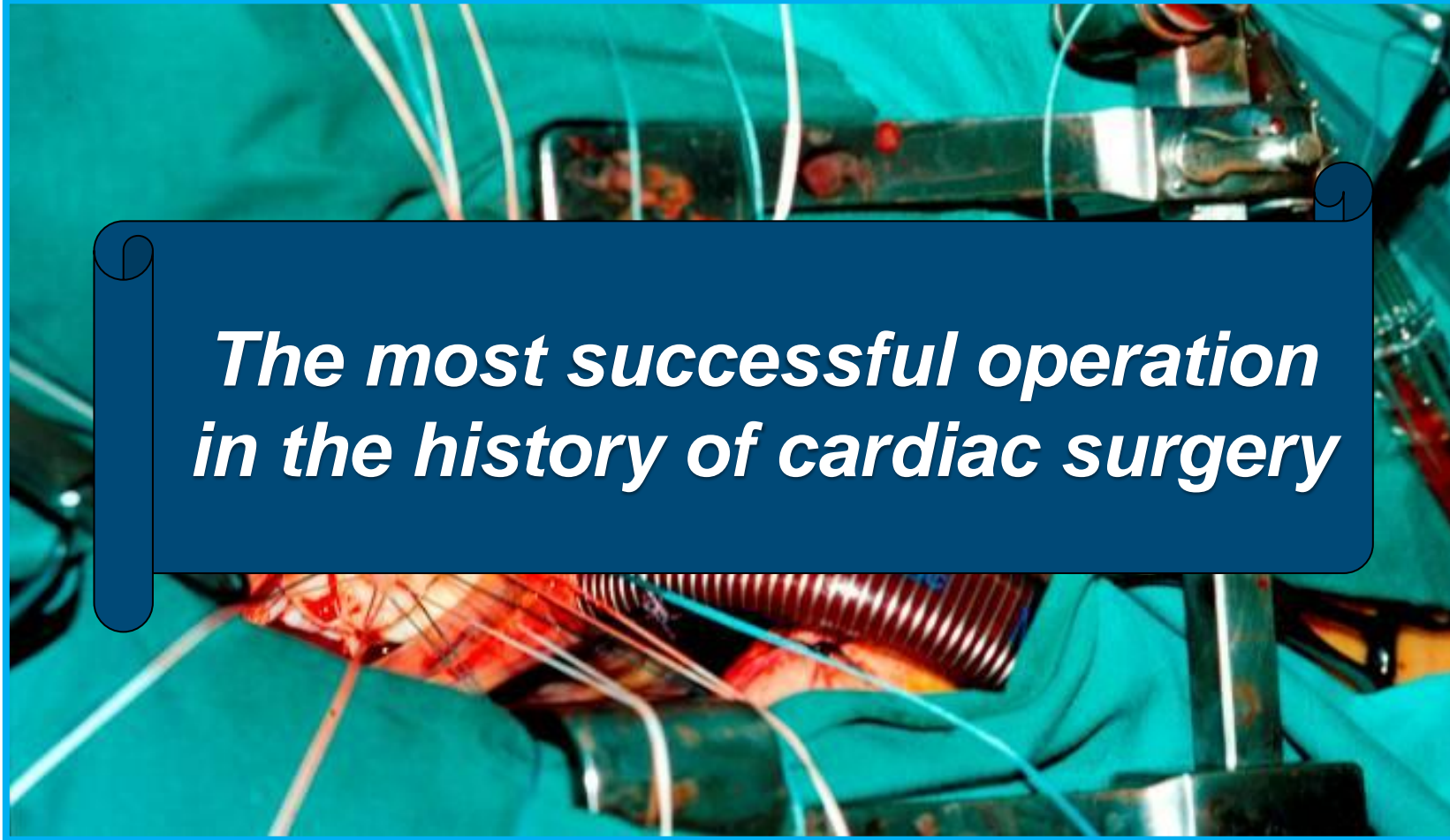


TCT AP 2023
Seoul, May 7-9, 2023



Conventional Aortic Valve Surgery



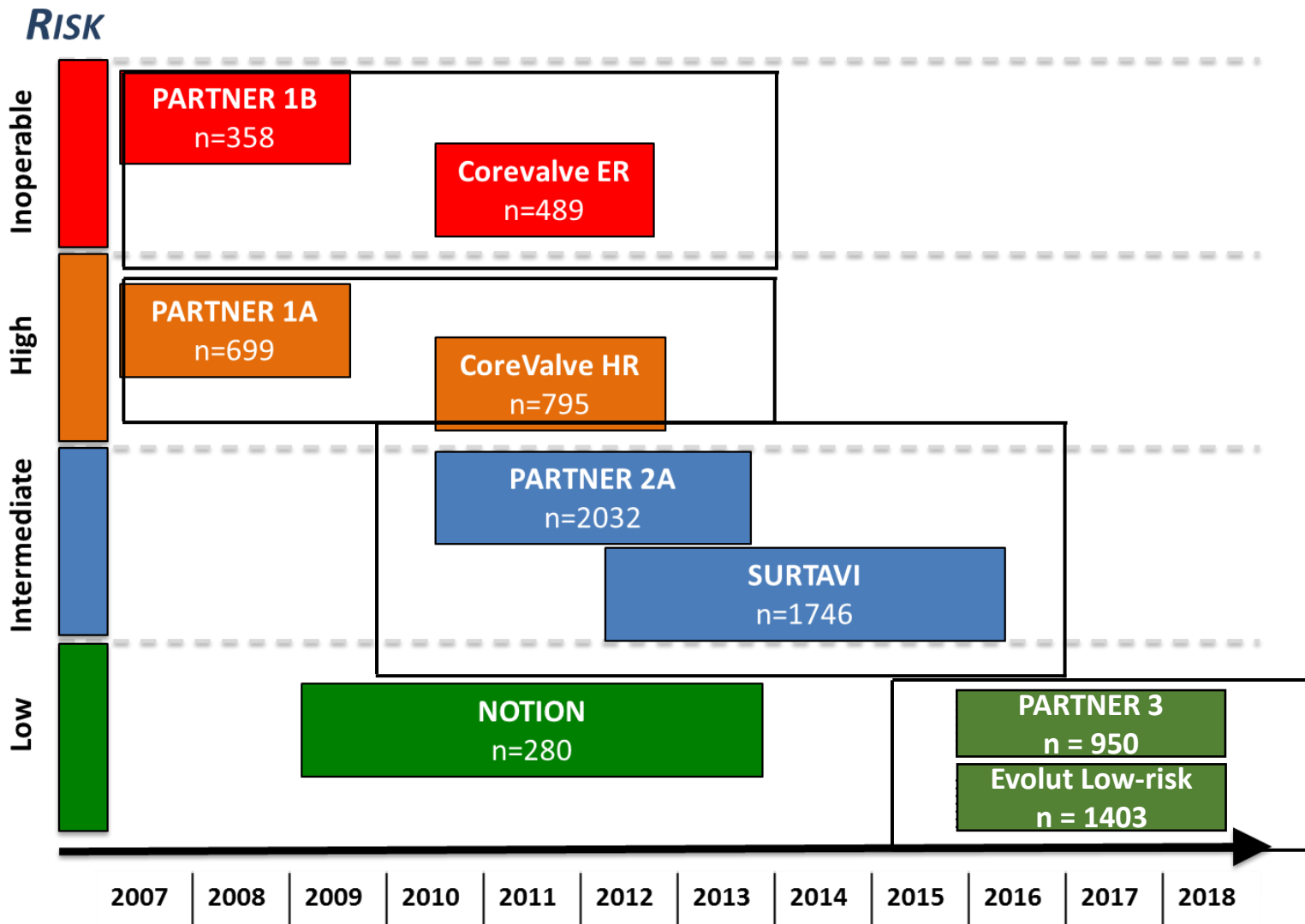
*The most successful operation
in the history of cardiac surgery*

Is there a better way?

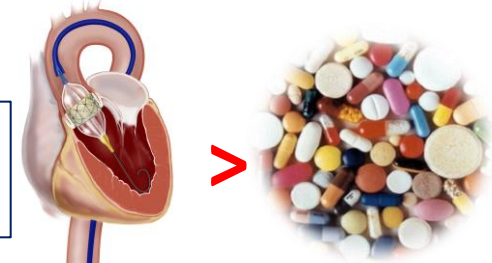
Can we we challenge the good Results of conventional Aortic Valve Surgery?



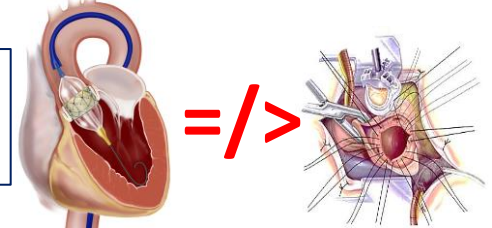
The Evolution of Clinical Evidence (TAVR vs SAVR)



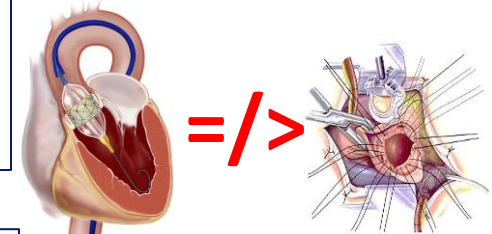
TAVI superior to medical Rx



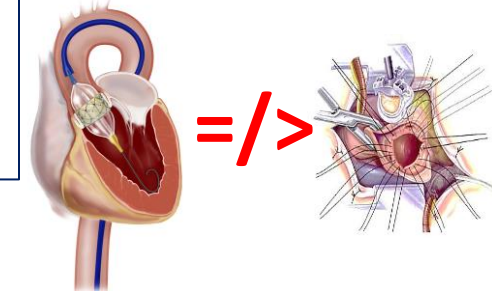
TAVI noninferior or superior to SAVR



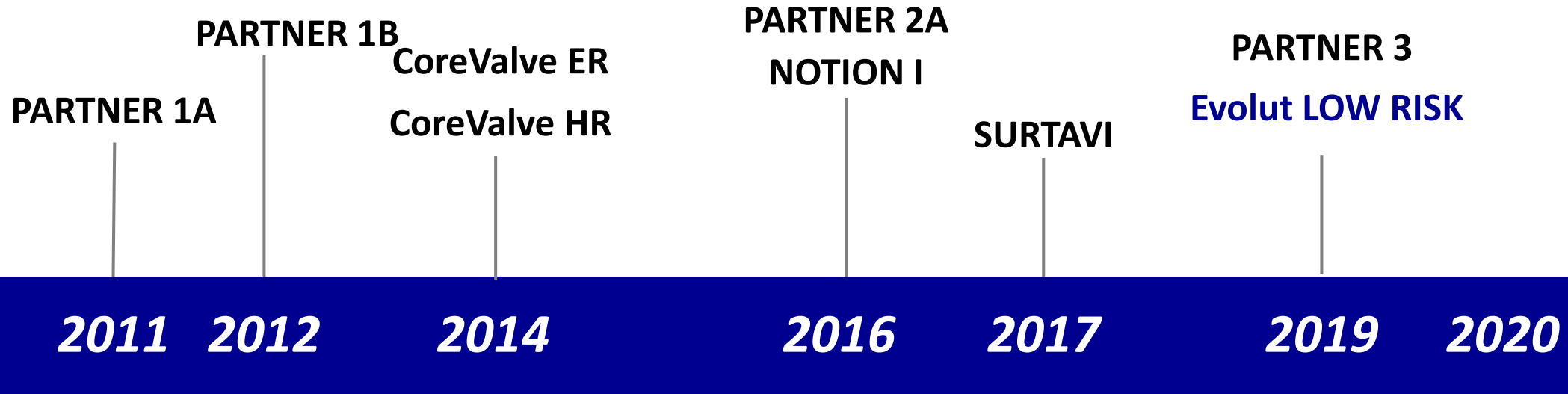
TAVI noninferior or superior (TF access) to SAVR



Transfemoral TAVI noninferior or superior to SAVR



EVIDENCE AND GUIDELINES



Extreme risk	I	B
High-risk	IIa	B

Extreme risk	I	B
Increased risk	I	B

Age >75 years	I	A
High/prohibitive risk	I	A

**No longer Operative Risk
Heart Team shared Decision
Age**



Prohibitive risk	I	B
High-risk	IIa	B

Prohibitive risk	I	A
High-risk	I	A
Intermediate risk	IIa	B-R

Age >80 years	I	A
High/prohibitive risk	I	A

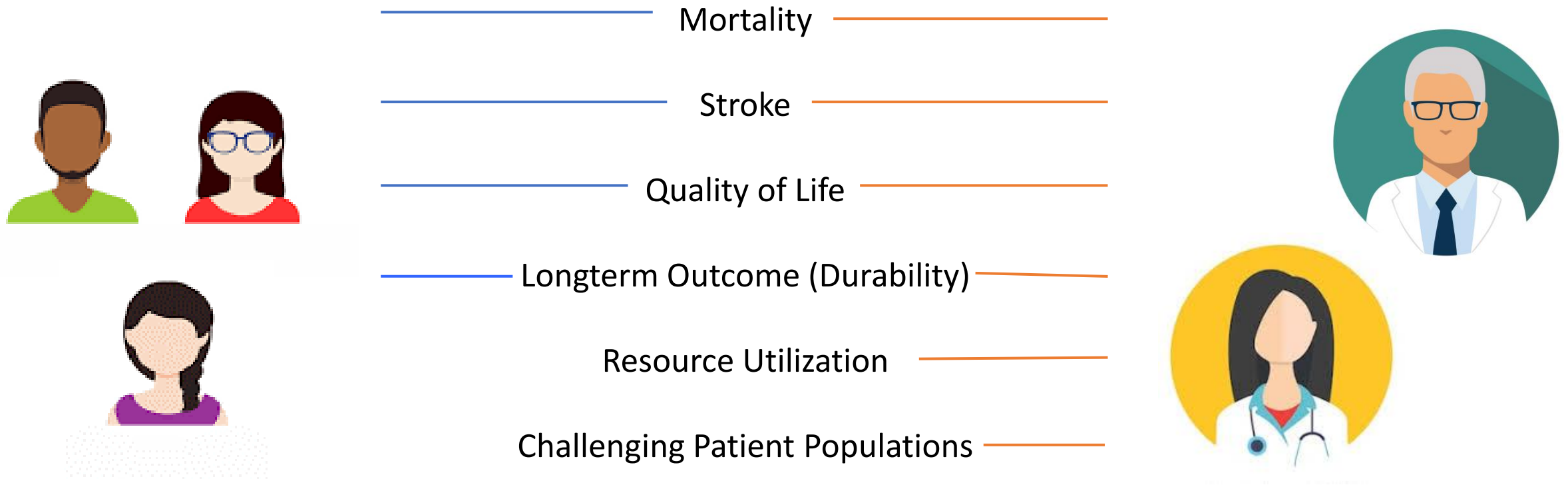


Key Patient and Physician Endpoints

The incredible success of TAVR across the risk spectrum has proven it is the therapy for almost all patients with severe, symptomatic aortic stenosis.

TAVR has demonstrated it is as good or even better than the previous gold standard, SAVR.

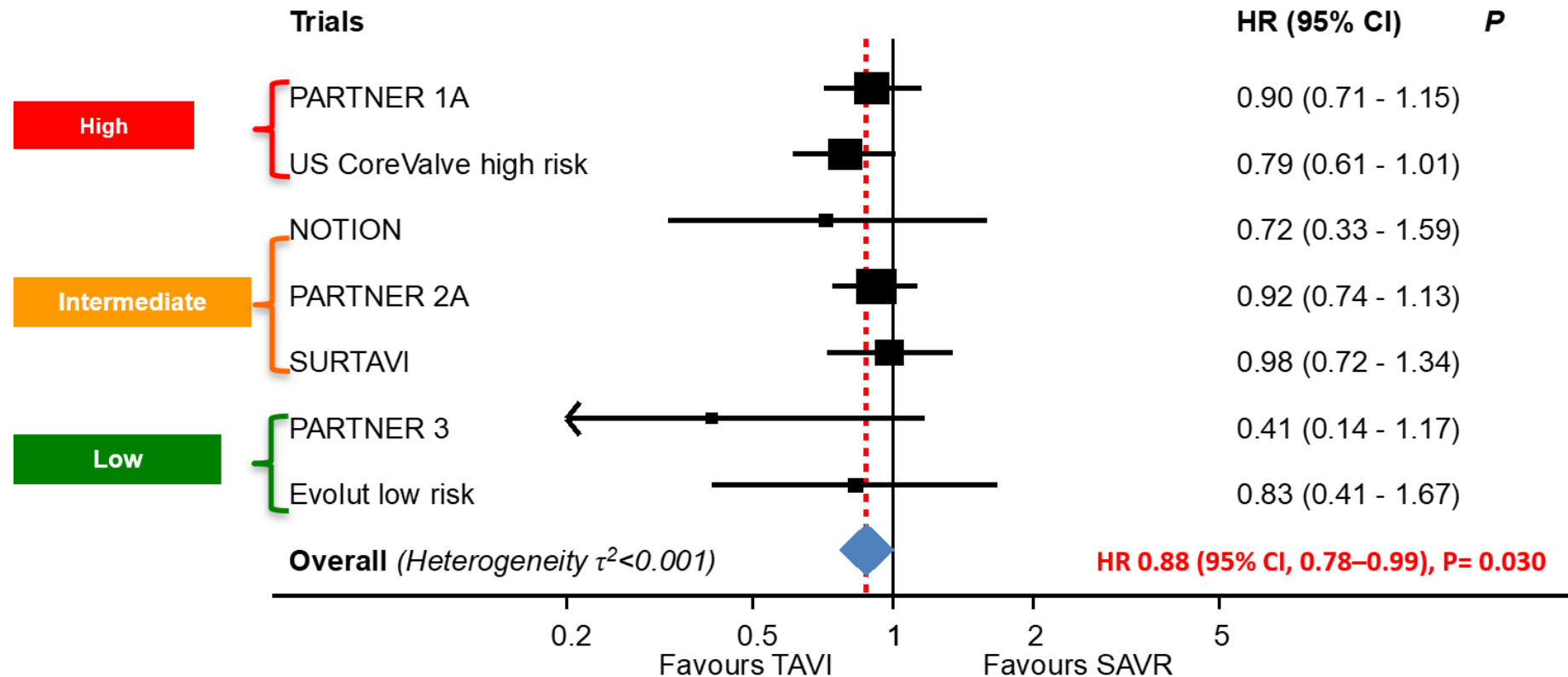
What Matters to the Patients and Physicians



TAVR has a *Mortality Advantage* over SAVR

A meta-analysis of 7 randomized control trials showed a 12% relative mortality risk reduction up to 2 years for TAVR compared to SAVR across the risk spectrum.

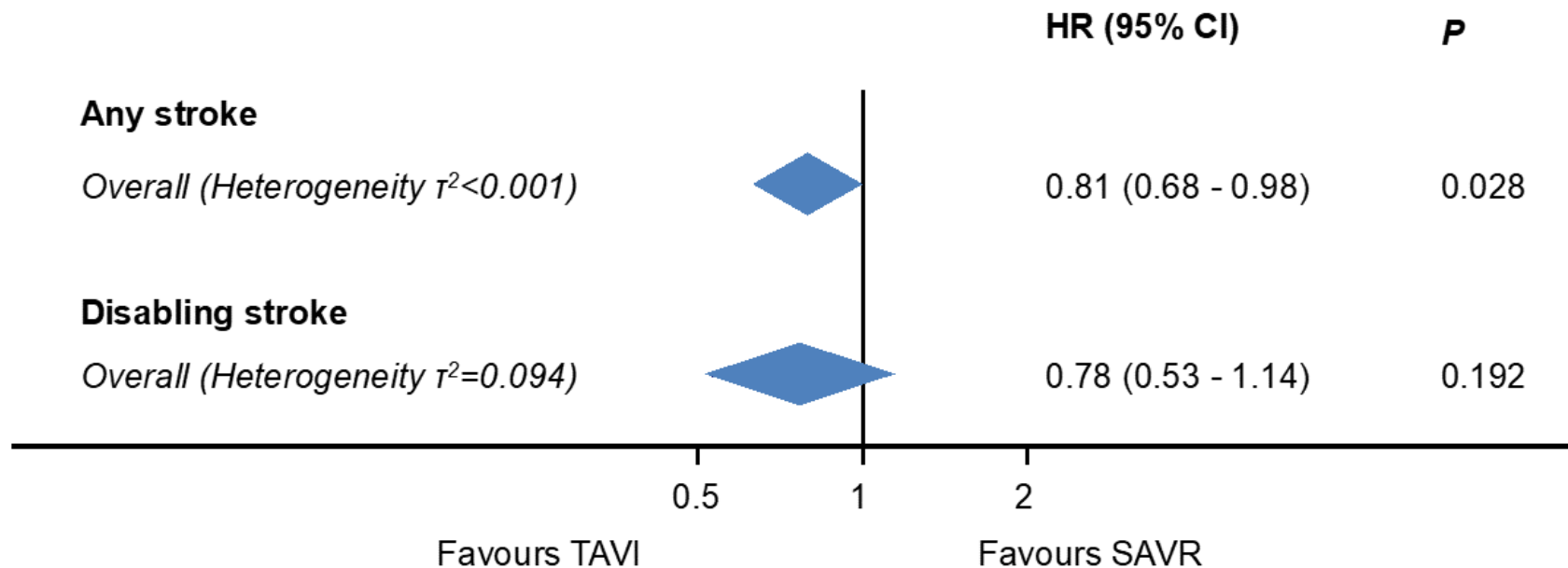
TAVI has a mortality advantage and is the preferred treatment option.



TAVR has a *Stroke Advantage* over SAVR

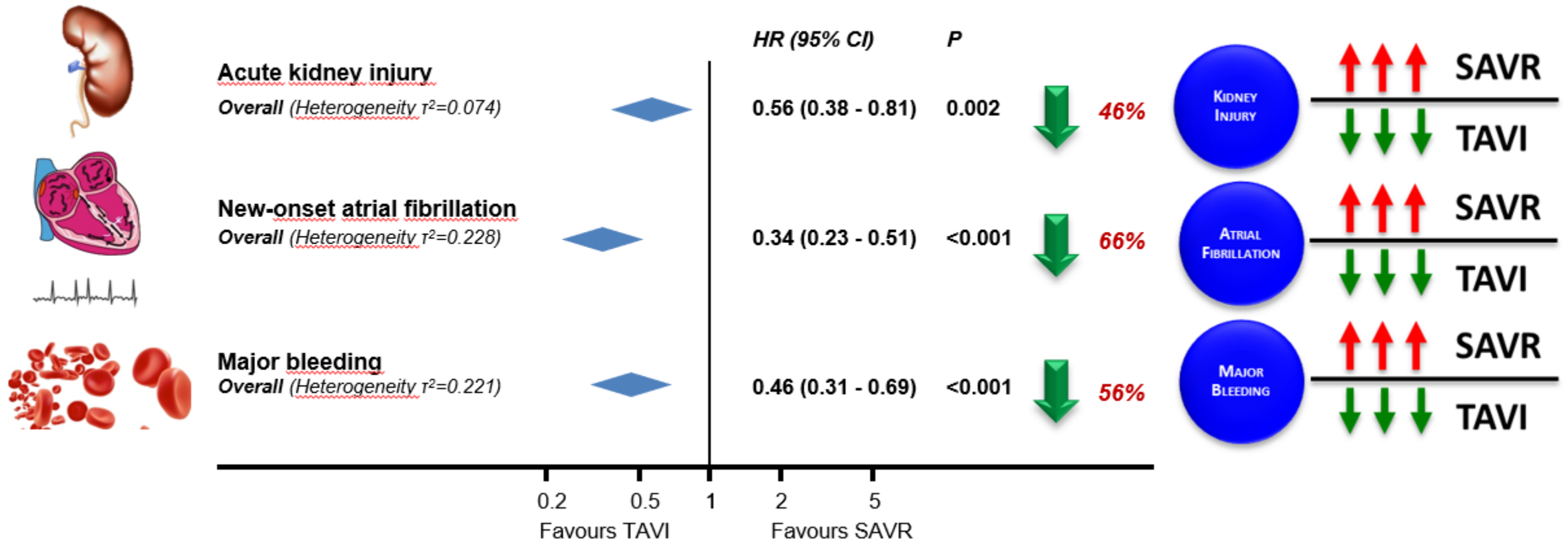
A meta-analysis of 7 randomized control trials showed a 19% relative stroke risk reduction up to 2 years for TAVI compared to SAVR.

Stroke rates are better than SAVR with contemporary devices in clinical trials making TAVR the preferred therapy.



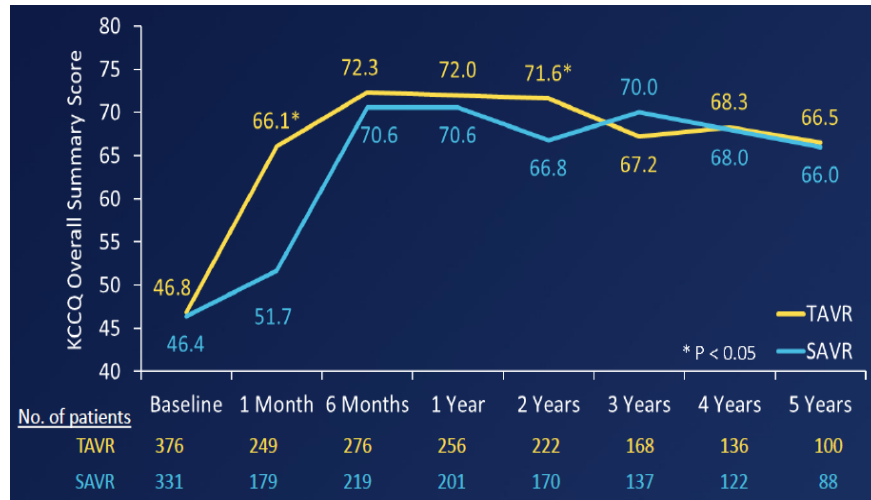
TAVR has a *QoL Advantage* over SAVR *Less Adverse Events*

Additionally, TAVR provides reduced rates of acute kidney injury, AF, and bleeding

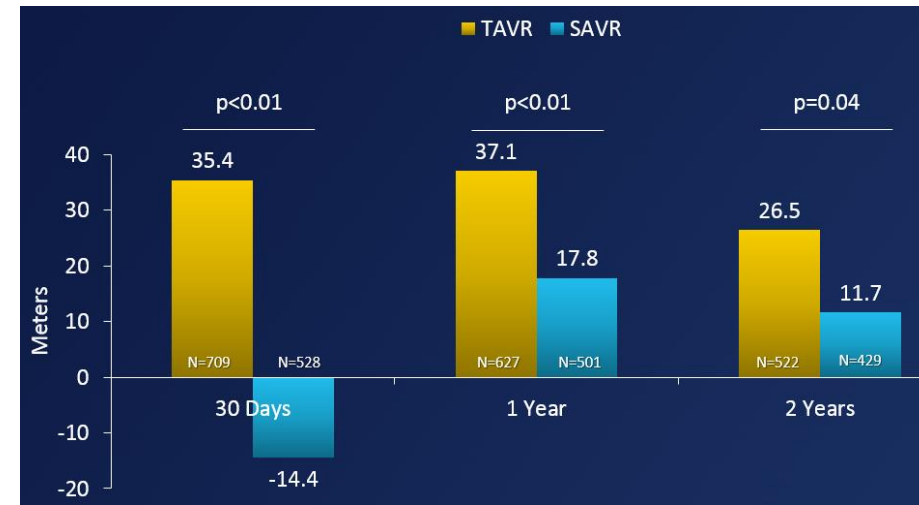


TAVI has a *QoL Advantage* over SAVR

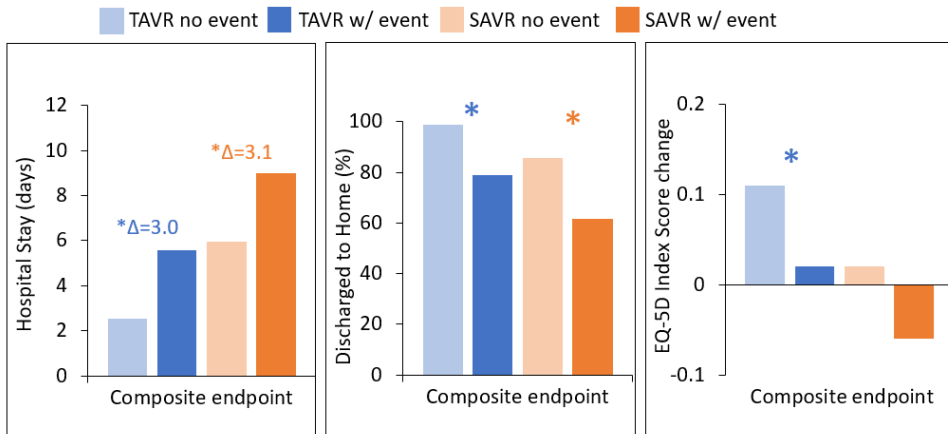
Faster Recovery



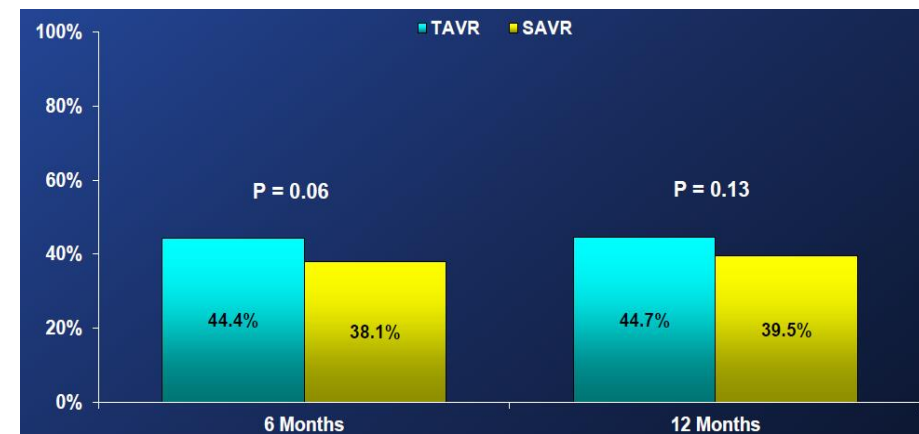
SURTAVI 6 Minutes Walk Test >2 yrs



Evolut Low Risk: Faster return to active lives



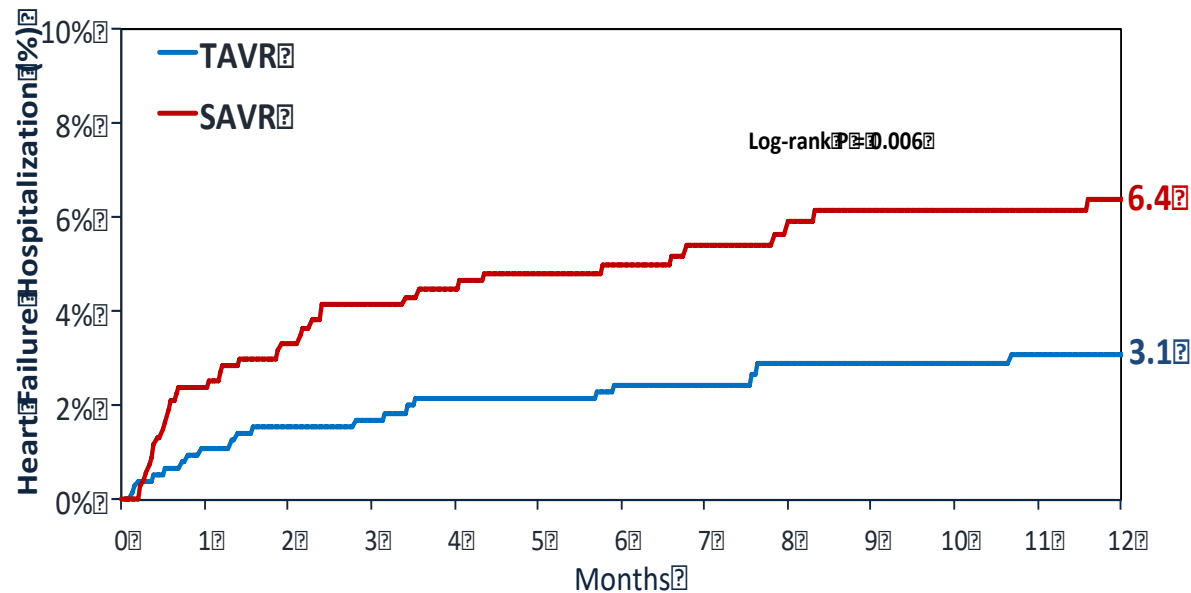
PARTNER 3 20 Point Improvement in KCCQ-OS



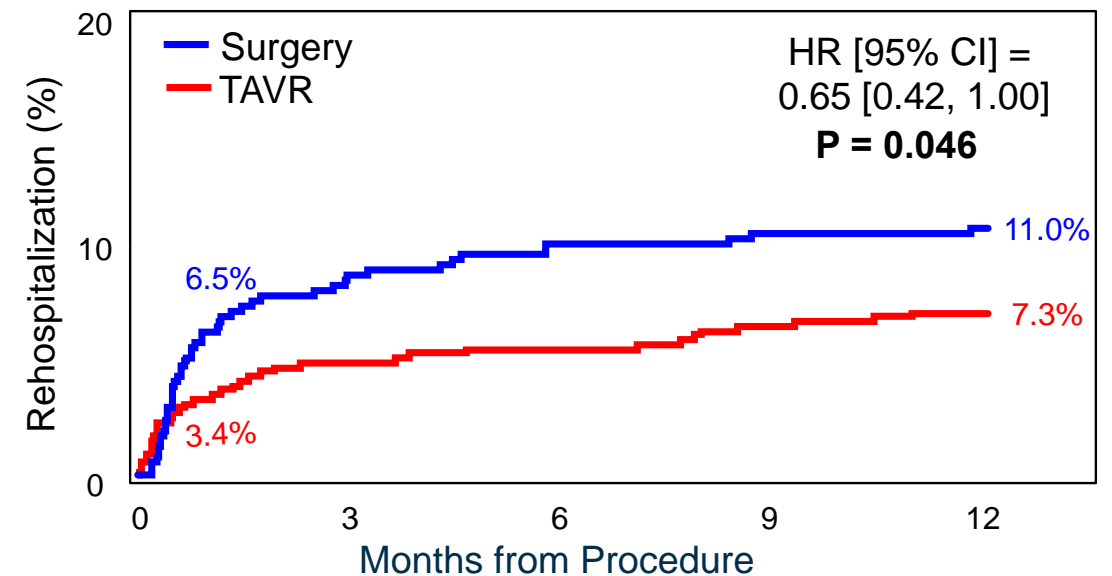
TAVR has *Less Re-Hospitalisations* than SAVR

Rehospitalizations occurred significantly more often in SAVR patients compared to TAVR at one year in low risk patients

Evolut Low Risk Trial



PARTNER 3



TAVR has *Improved Resource Utilization*

TAVR has reduced procedure times, ICU stay, and total hospital stays allowing hospitals to treat more patients and work more efficiently

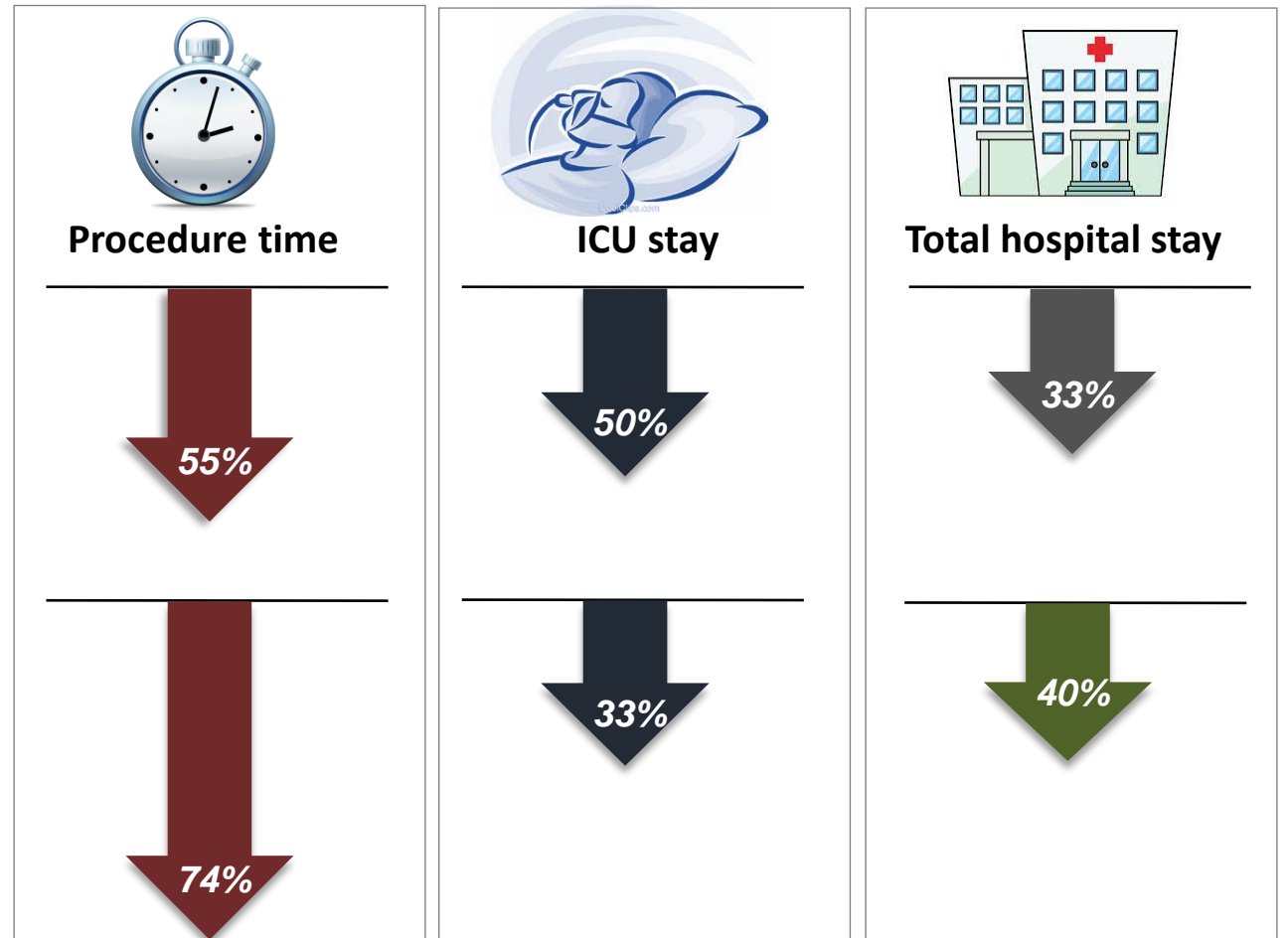
PARTNER 2A

N Engl J Med
2016;374:1609-20

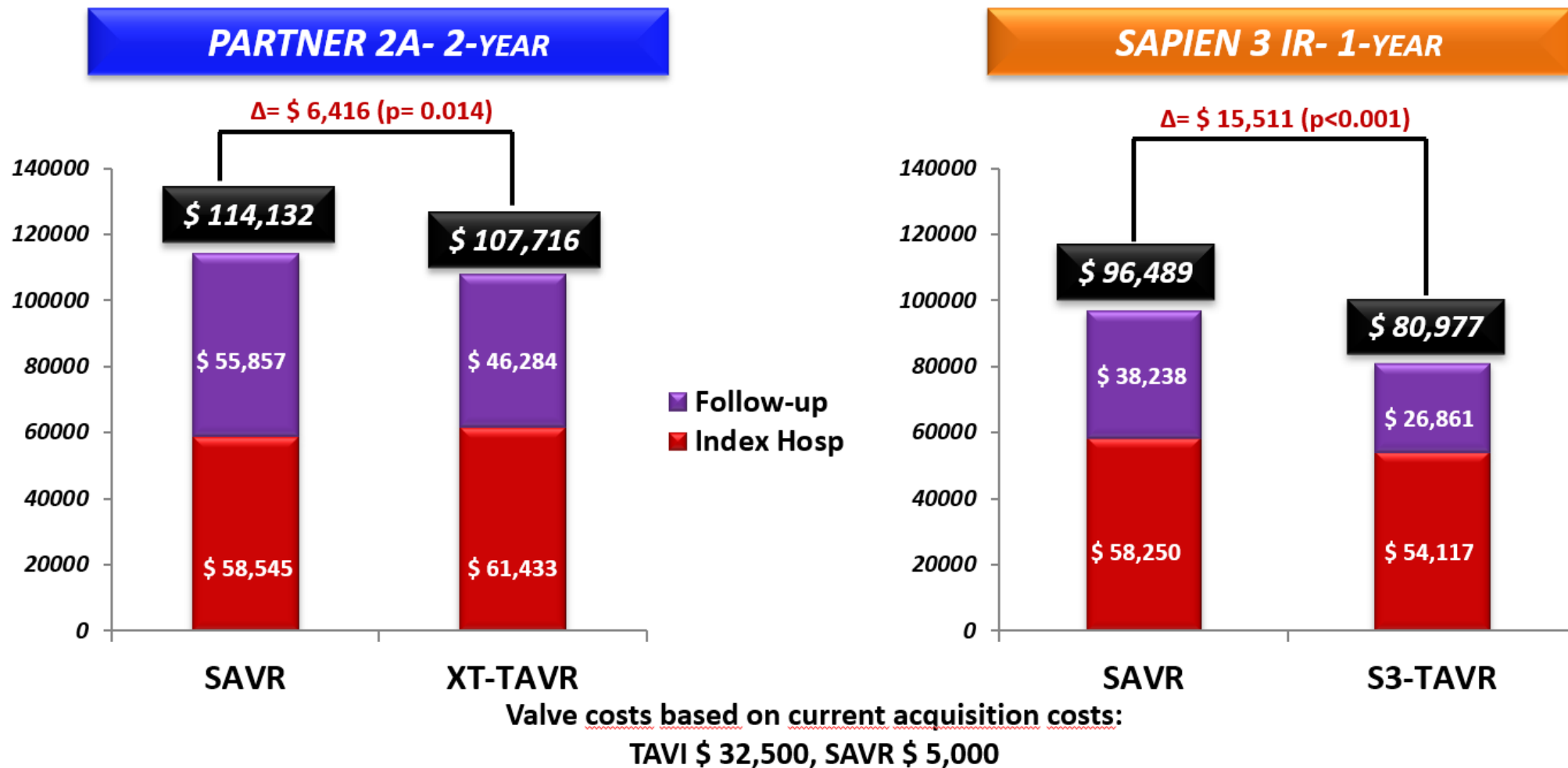
SURTAVI

N Engl J Med. 2017 Apr
6;376:1321-1331

TAVI - IMPROVED RESOURCE UTILIZATION



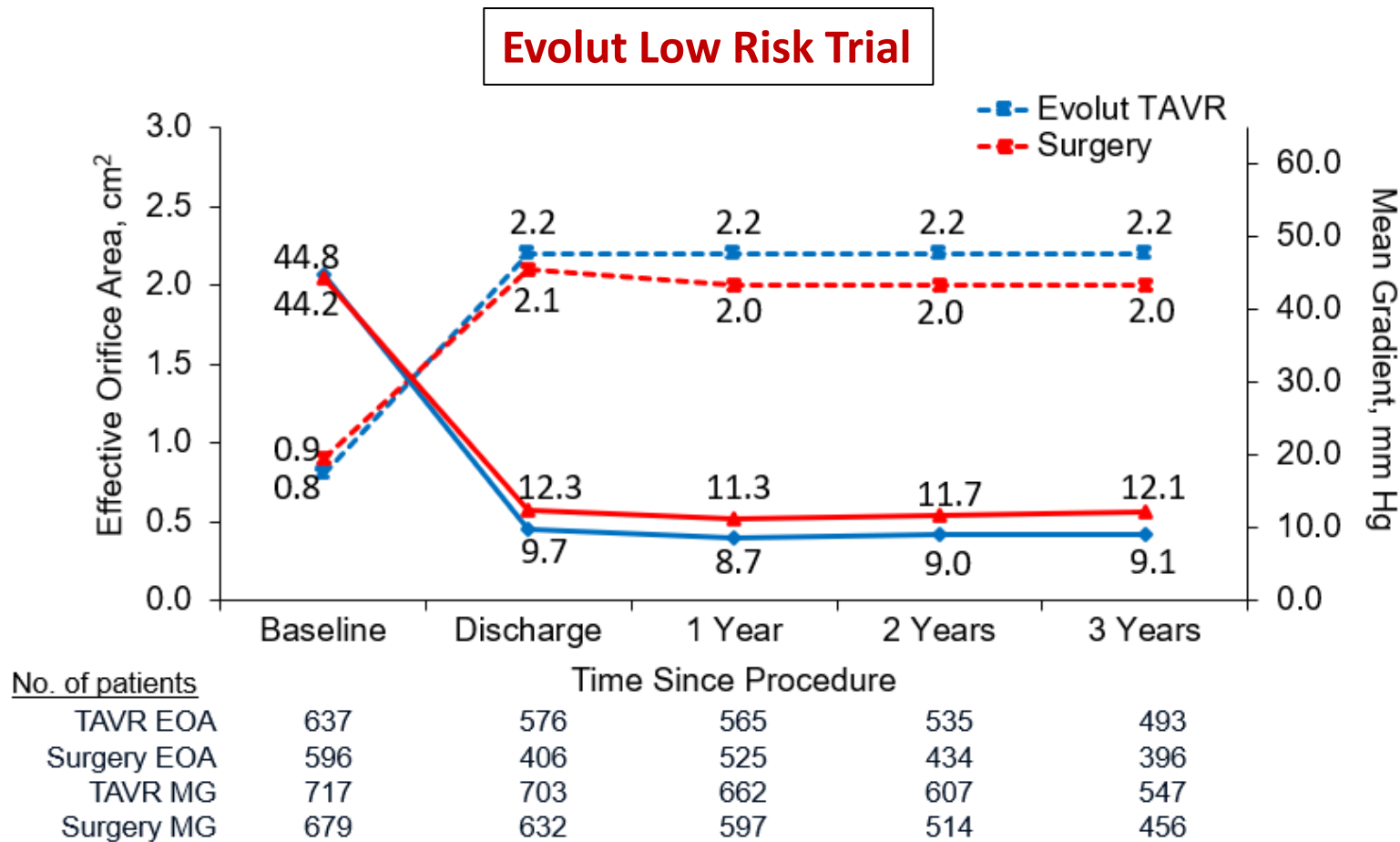
TAVR is *More Cost Effective Over Time*



TAVR has a *Hemodynamic Advantage* over SAVR



TAVR hemodynamic outcomes are significantly better than SAVR, which maximizes physical capacity post-implant leading to improved quality of life.



BIOPROSTHETIC DURABILITY CONTROVERSY



*This is an ongoing discussion but...
THVs have collected more rigorous durability
data than any surgical valve !*

Hemodynamic
Deterioration

Degeneration

Failure

TAVR VERSUS SURGERY

NEW INFORMATION OVER PAST 12-24 MONTHS

Longer Term Outcomes From Randomized Clinical Trials

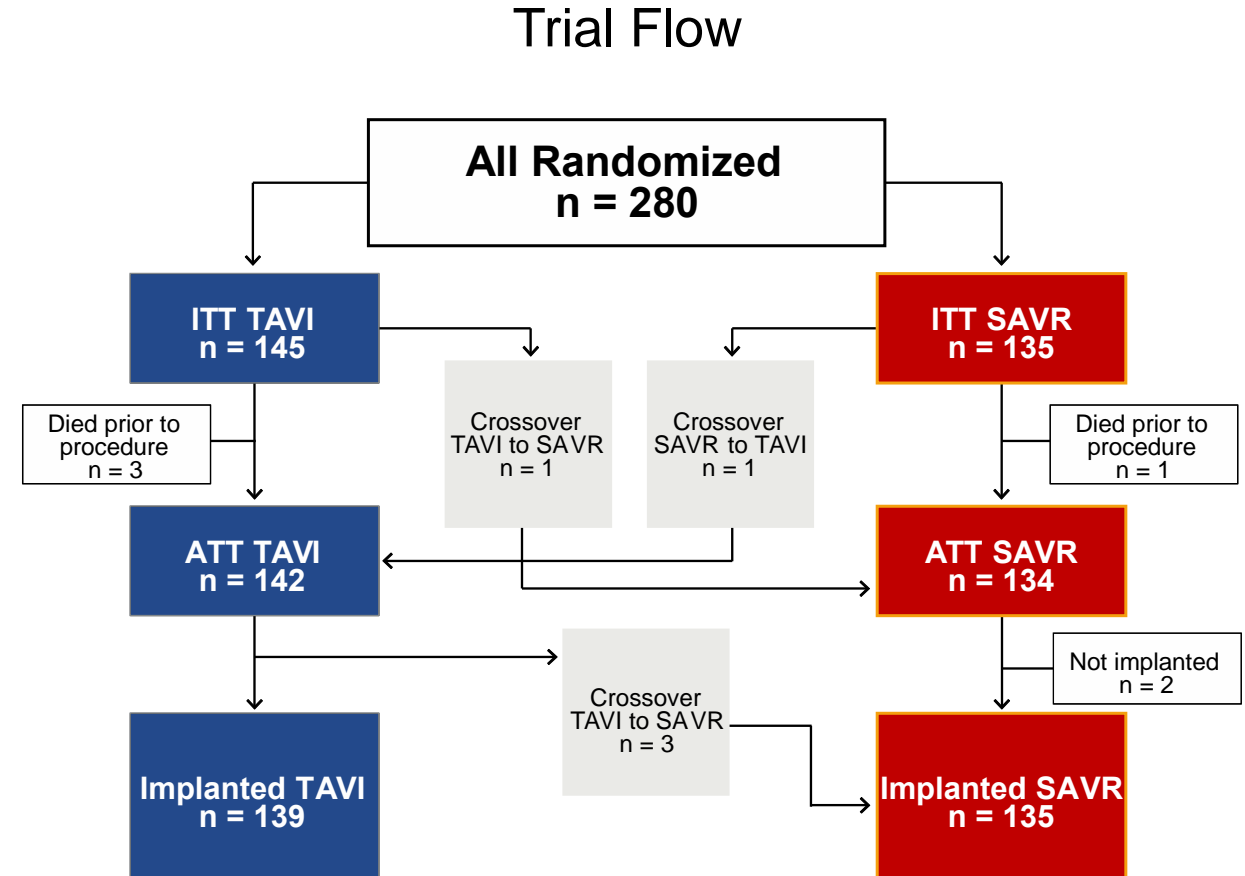
- Notion - 8 Year
- PARTNER IIA – 5 years
- CoreValve High-Intermediate Risk – 5 years
 - Structural Valve Deterioration
 - Bioprosthetic Valve Performance
- Evolut Low Risk – 3 Years

NOTION 8-YEAR ALL COMERS

RANDOMIZED TRIAL IN LOWER RISK PATIENTS

Nordic Aortic Valve Intervention CoreValve NOTION Trial

Objective:	To compare TAVI vs. SAVR in lower risk patients ≥ 70 years eligible for surgery (all-comers population)
Primary Outcome:	Composite rate of all-cause mortality, stroke, or myocardial infarction at 1 year (VARC II-defined)
Secondary Outcomes:	Safety and efficacy (NYHA), echocardiographic outcomes (VARC II-defined)
Design:	Prospective, multicenter, non-blinded, randomized trial
Enrollment Period:	December 2009–April 2013

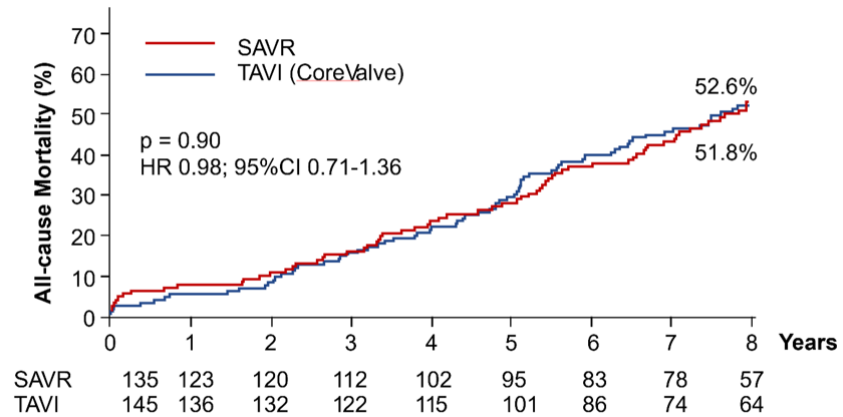


Source: Søndergaard L, et al. Presented at PCR Valves Conference 2020.

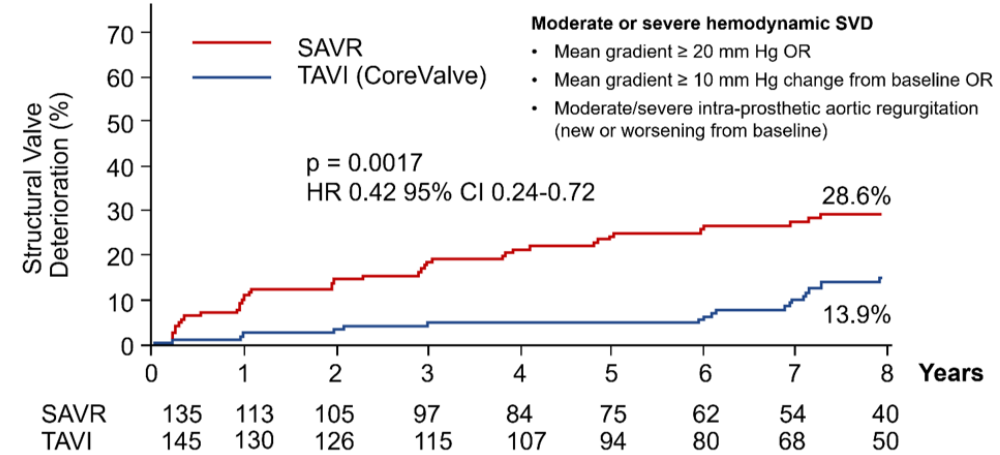
NOTION – 8 YEAR

ALL COMERS TAVR VERSUS SURGERY

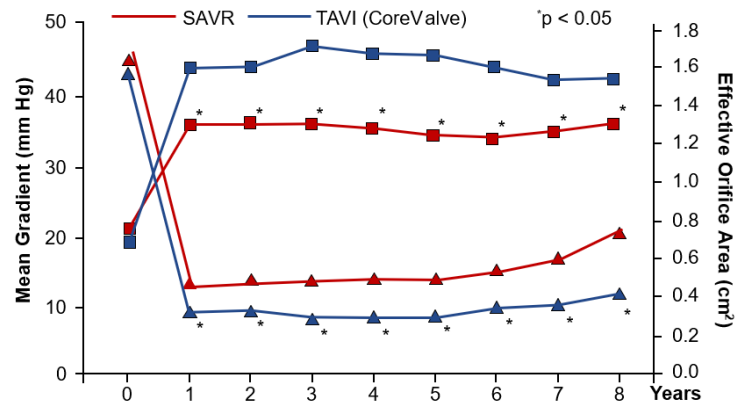
All Cause Mortality



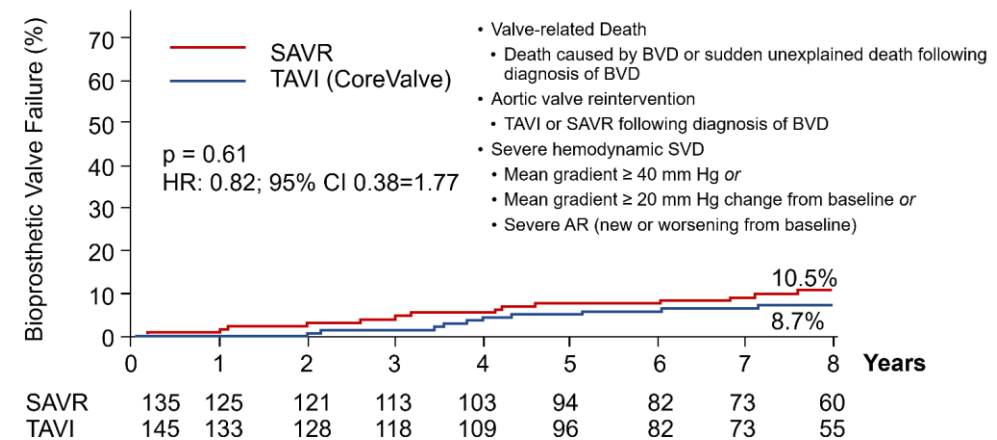
Structural Valve Deterioration



Transthoracic Hemodynamics

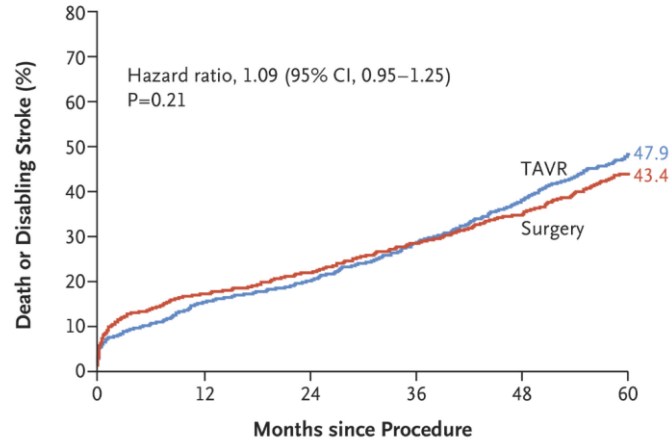


Bioprosthetic Valve Failure

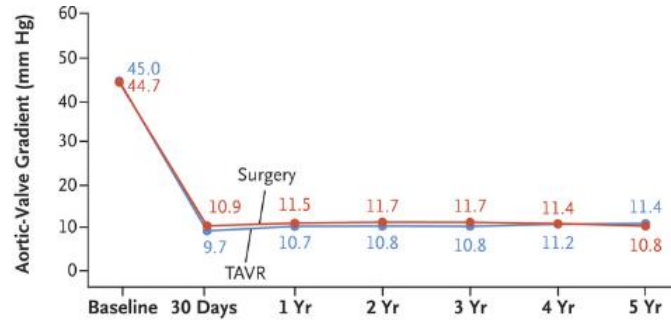


PARTNER II INTERMEDIATE RISK 5 YEARS

5 YEAR CLINICAL AND ECHOCARDIOGRAPHIC OUTCOMES

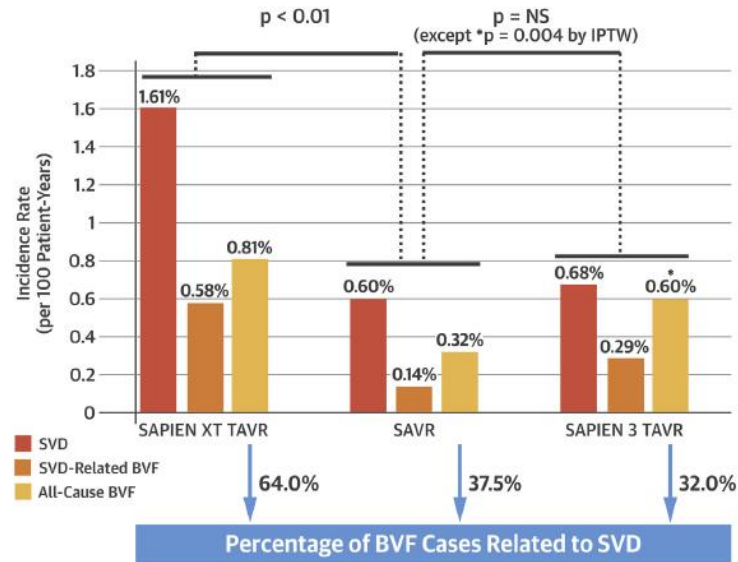
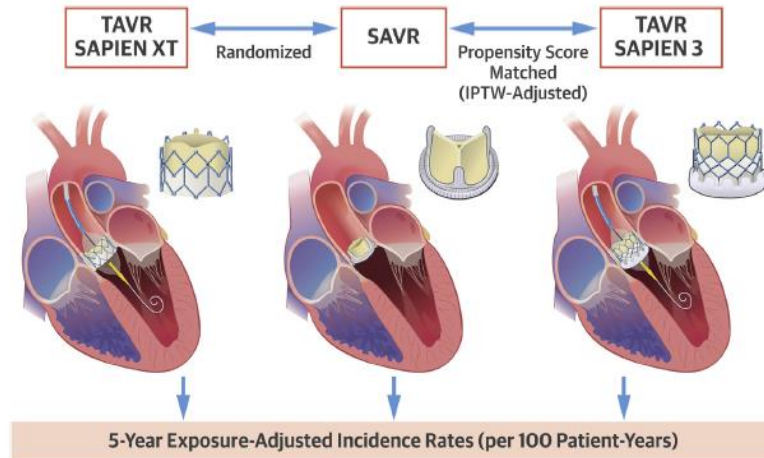


No. at Risk	0	12	24	36	48	60
TAVR	1011	843	785	687	581	474
Surgery	1021	771	704	625	547	440



No. of Patients with Echo Findings and Patients Alive

	0	12	24	36	48	60
TAVR						
Echo findings	959	890	751	633	522	405
Alive	974	945	854	800	697	475
Surgery						
Echo findings	916	788	633	538	453	377
Alive	936	896	796	727	649	459



Pibarot, P. et al. J Am Coll Cardiol. 2020;76(16):1830-43.

COREVALVE - EVOLUT POOLED ANALYSIS OBJECTIVE

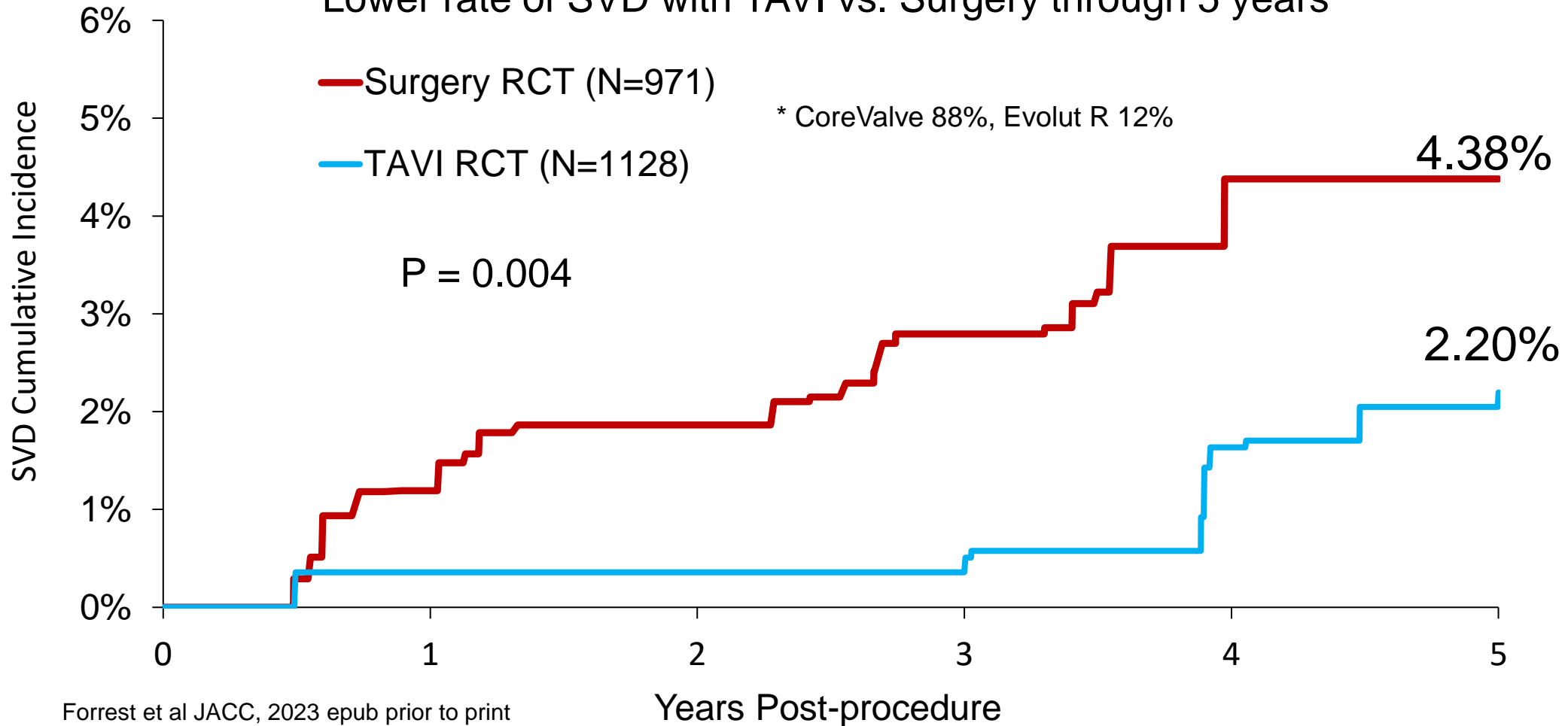
(Corevalve/Evolut vs Surgery)

Evaluation of the 5-year incidence, outcomes, and predictors of hemodynamic structural valve deterioration (SVD) and late valve performance (BVD) from the *CoreValve US Pivotal and SURTAVI trials*

COREVALVE EVOLUT POOLED ANALYSIS

5-YEAR SVD ADJUSTED FOR COMPETING RISK OF MORTALITY

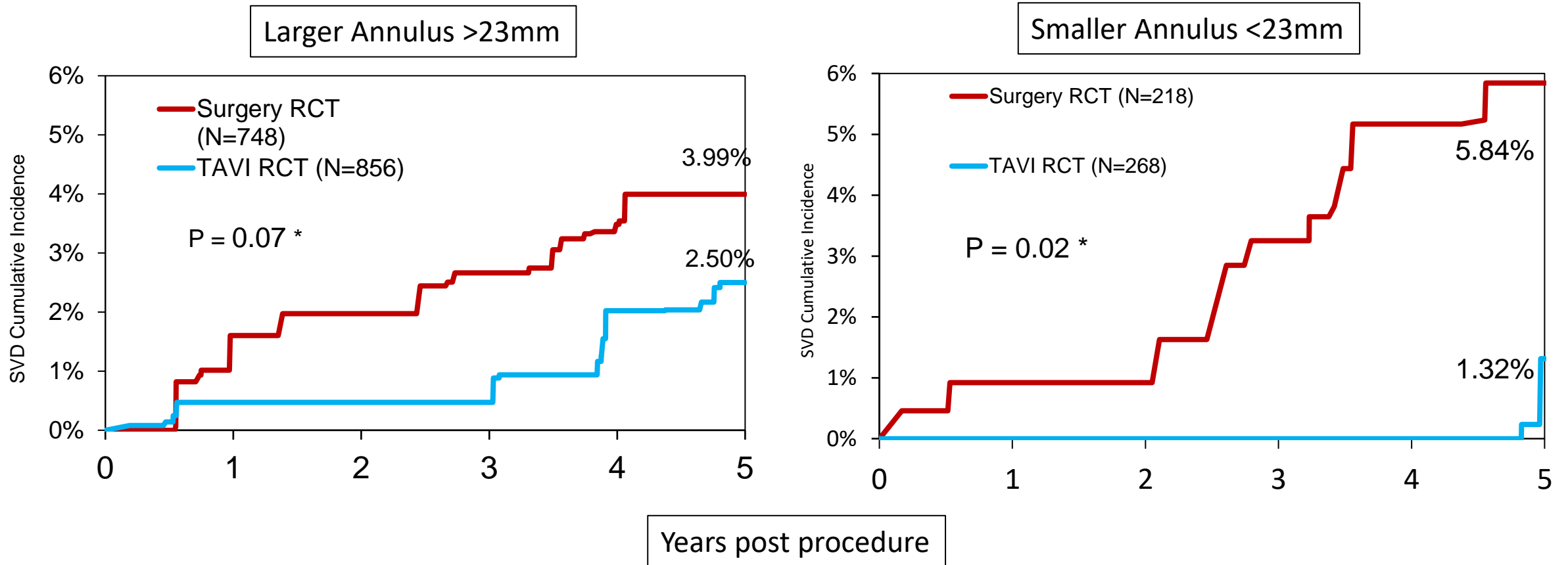
Lower rate of SVD with TAVI vs. Surgery through 5 years



Forrest et al JACC, 2023 epub prior to print

COREVALVE EVOLUT POOLED ANALYSIS

5-YEAR SVD IN LARGER AND SMALLER ANNULAR DIAMETERS



COREVALVE EVOLUT POOLED ANALYSIS

WORSENERD CLINICAL OUTCOMES IN PATIENTS WHO DEVELOP SVD

		HR (95% CI)	P value
Pooled Surgery RCT and All TAVI* (N=4762)			
All-cause mortality		1.98 (1.42, 2.76)	<0.001
Cardiovascular mortality		1.82 (1.17, 2.84)	0.008
Hospitalization for AV disease/worsening HF		2.11 (1.19, 3.74)	0.010
Composite †		1.96 (1.38, 2.80)	<0.001
Surgery RCT (N=971)			
All-cause mortality		2.45 (1.40, 4.30)	0.002
Cardiovascular mortality		2.37 (1.10, 5.08)	0.027
Hospitalization for AV disease/worsening HF		2.20 (0.81, 5.98)	0.121
Composite †		2.73 (1.53, 4.88)	<0.001
All TAVI* (N=3791)			
All-cause mortality		2.24 (1.48, 3.38)	<0.001
Cardiovascular mortality		2.07 (1.20, 3.59)	0.009
Hospitalization for AV disease/worsening HF		2.34 (1.16, 4.71)	0.017
Composite †		1.93 (1.23, 3.03)	0.005

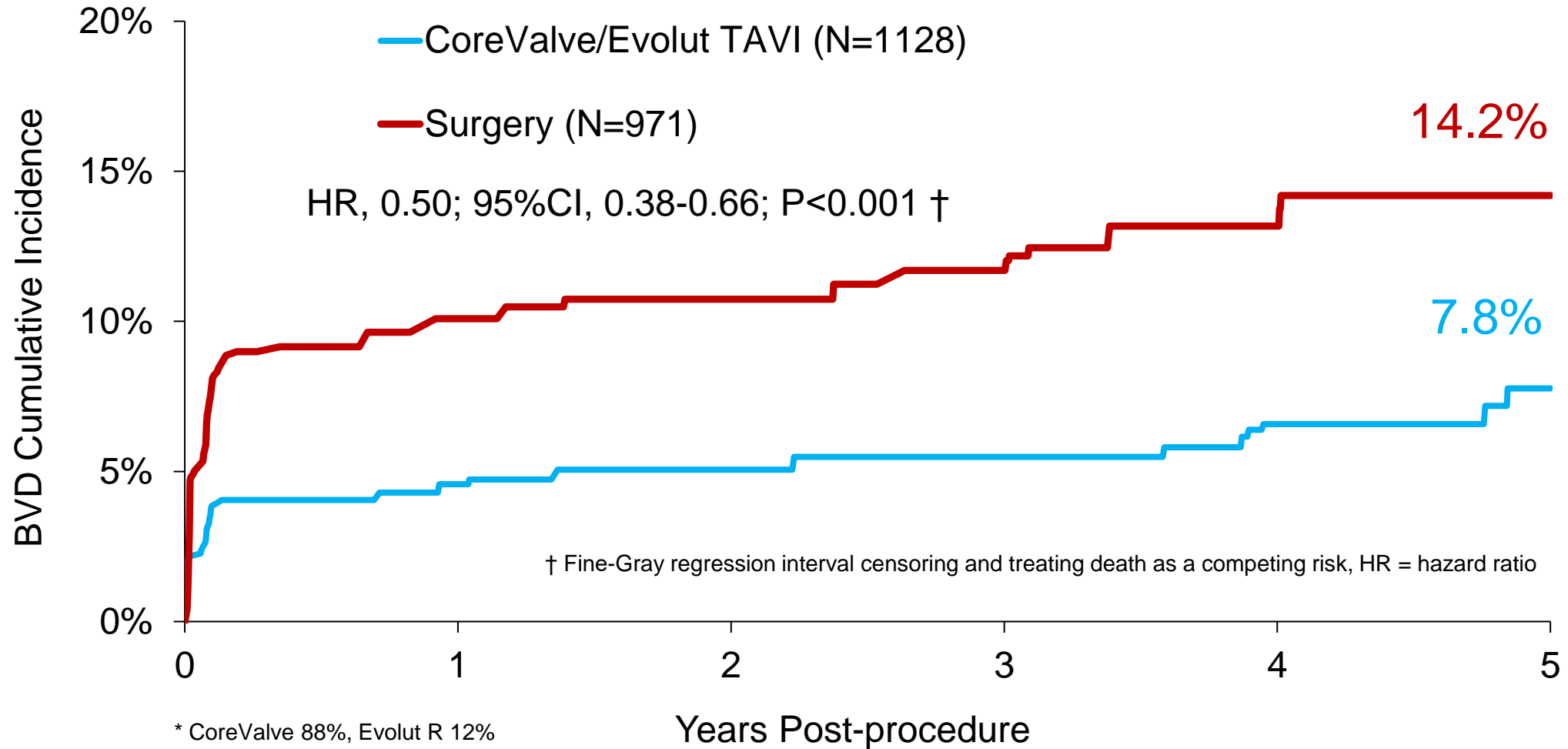
0.10 1.00 10.00

Lower risk with SVD ← → Higher risk with SVD

*RCT and Non-RCT cohorts; CoreValve 97%, Evolut R 3% † All-cause mortality or hospitalization for AV disease or worsening HF

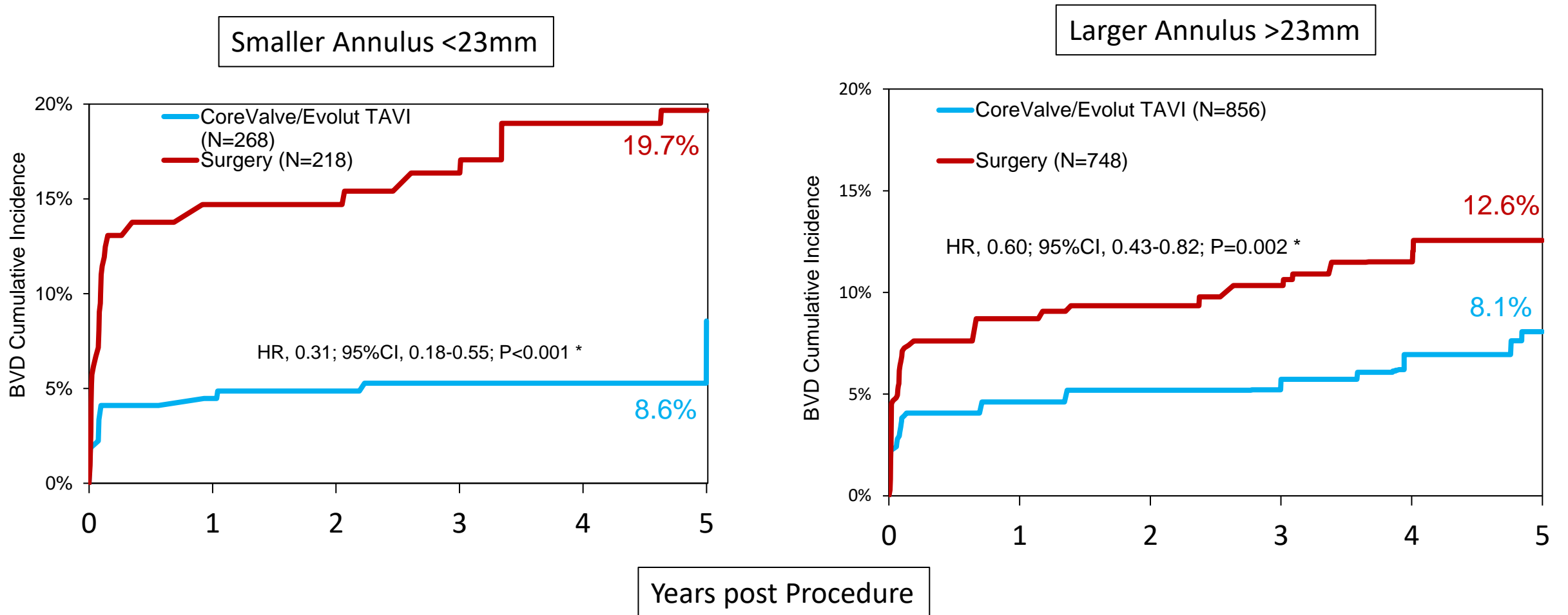
COREVALVE-EVOLUT POOLED ANALYSIS

5 YEAR VALVE PERFORMANCE (BVD CUMULATIVE INCIDENCE)



COREVALVE-EVOLUT POOLED ANALYSIS

5-YR VALVE PERFORMANCE (BVD) IN PATIENTS WITH SMALL AND LARGE ANNULI



COREVALVE-EVOLUT POOLED ANALYSIS

IMPACT OF BVD ON LATE CLINICAL OUTCOMES

		HR (95% CI)	P value
Pooled Surgery and TAVI (N=2099)			
All-cause mortality		1.46 (1.13, 1.88)	0.004
Cardiovascular mortality		1.84 (1.34, 2.51)	<0.001
Hospitalization for valve disease/worsening HF		1.67 (1.23, 2.26)	0.001
Composite †		1.46 (1.16, 1.83)	0.001
Surgery (N=971)			
All-cause mortality		1.58 (1.15, 2.19)	0.005
Cardiovascular mortality		2.14 (1.44, 3.18)	<0.001
Hospitalization for valve disease/worsening HF		1.67 (1.11, 2.51)	0.01
Composite †		1.51 (1.12, 2.02)	0.007
TAVI (N=1128)			
All-cause mortality		1.34 (0.88, 2.04)	0.18
Cardiovascular mortality		1.51 (0.87, 2.60)	0.14
Hospitalization for valve disease/worsening HF		1.82 (1.14, 2.91)	0.01
Composite †		1.49 (1.04, 2.15)	0.03

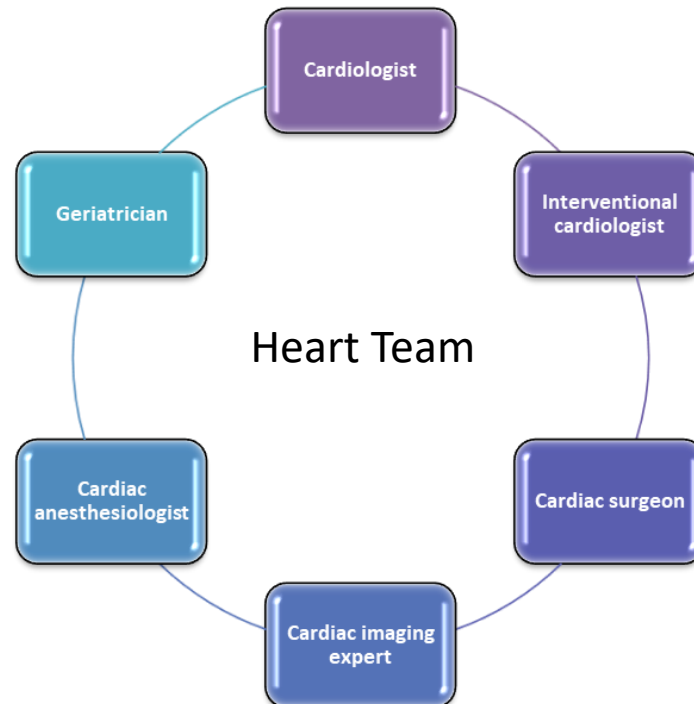
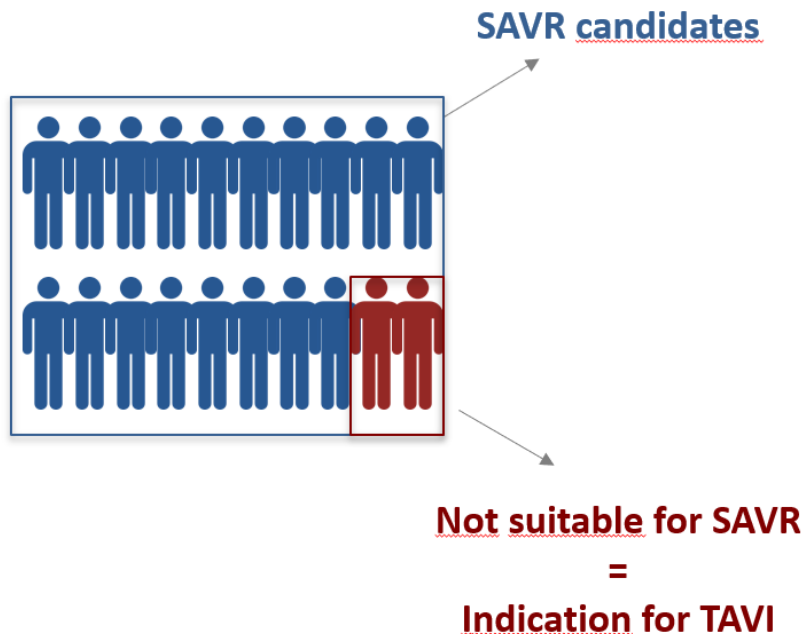
0.10 1.00 10.00
 Decreased risk to patients with BVD ← → Higher risk to patients with BVD

† All-cause mortality or hospitalization for valve disease or worsening heart failure (HF)

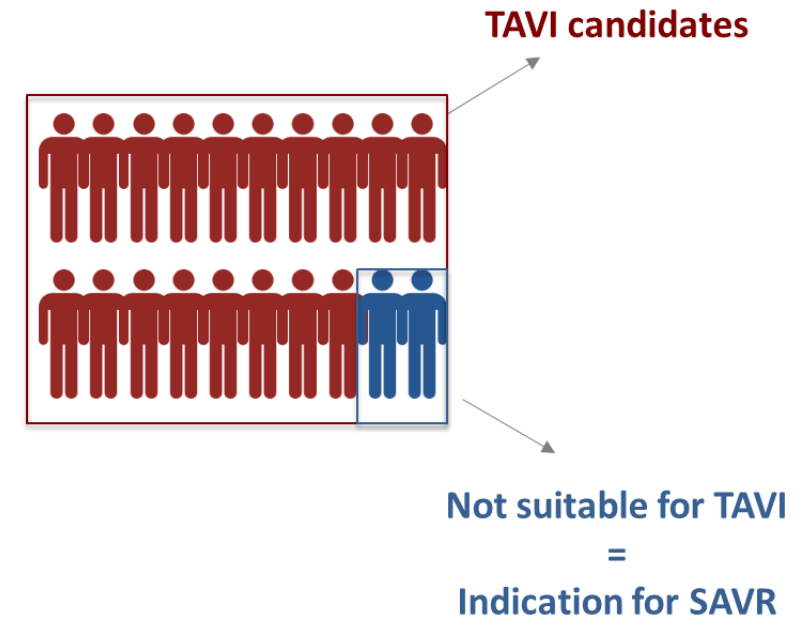
TAVR is the Preferred Treatment for Almost All!

In the past, surgical risk would drive the choice between TAVR and SAVR. With TAVR now approved across the risk spectrum, TAVR is the preferred therapy in patients with symptomatic, severe AS with SAVR reserved for those who are not ideal TAVR candidates.

Past



Future



Surgical or Transcatheter Valve Selection for AVR

Life Expectancy (and Durability) are the Key Metrics



VS



- ***TAVR will be the treatment of choice for:***
 - *All isolated trileaflet AS patients age > 65 years*
- ***Reasonable treatment option for (awaiting trial results):***
 - *Small annuli*
 - *Asymptomatic/moderate AS*
 - *Aortic regurgitation*
 - *Bicuspid AS*
 - *Concomitant CV diseases (multi-valve disease, CAD, AF etc)*