Aortic stenosis: TAVI vs. SAVR

Univ.-Prof. Dr. med. Daniel Sedding

Dept. of Cardiology and Angiology

Hannover Medical School

AORTIC STENOSIS: TAVI vs. SAVR

Evidence for treatment decisions

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)

FIGURE 3 Overview of TAVR Systems

Currently, 8 transcatheter aortic valve replacement (TAVR) systems are commercially available in Europe **(A–H)**, whereas 2 TAVR systems are approved by the U.S. Food and Drug Administration in the United States **(A, B)**. **(A)** Edwards Lifesciences Sapien 3 Valve (Edwards Lifesciences, Irvine, California); **(B)** Medtronic CoreValve Evolut R (Medtronic, Minneapolis, Minnesota); **(C)** Symetis Acurate *neo* Valve (Symetis, Ecublens VD, Switzerland); **(D)** JenaValve (JVT Research & Development Corporation, Irvine, California); **(E)** St. Jude Medical Portico Valve (St. Jude Medical, St. Paul, Minnesota); **(F)** Direct Flow Medical Valve (Direct Flow Medical, Inc., Santa Rosa, California); **(G)** Medtronic Engager Valve (Medtronic, Minneapolis, Minnesota); and **(H)** Boston Scientific Lotus Valve (Boston Scientific, Marlborough, Massachusetts).

Vahl Tet al JAm Coll Cardiol 2016;67:1472-87

Which patients should we treat:

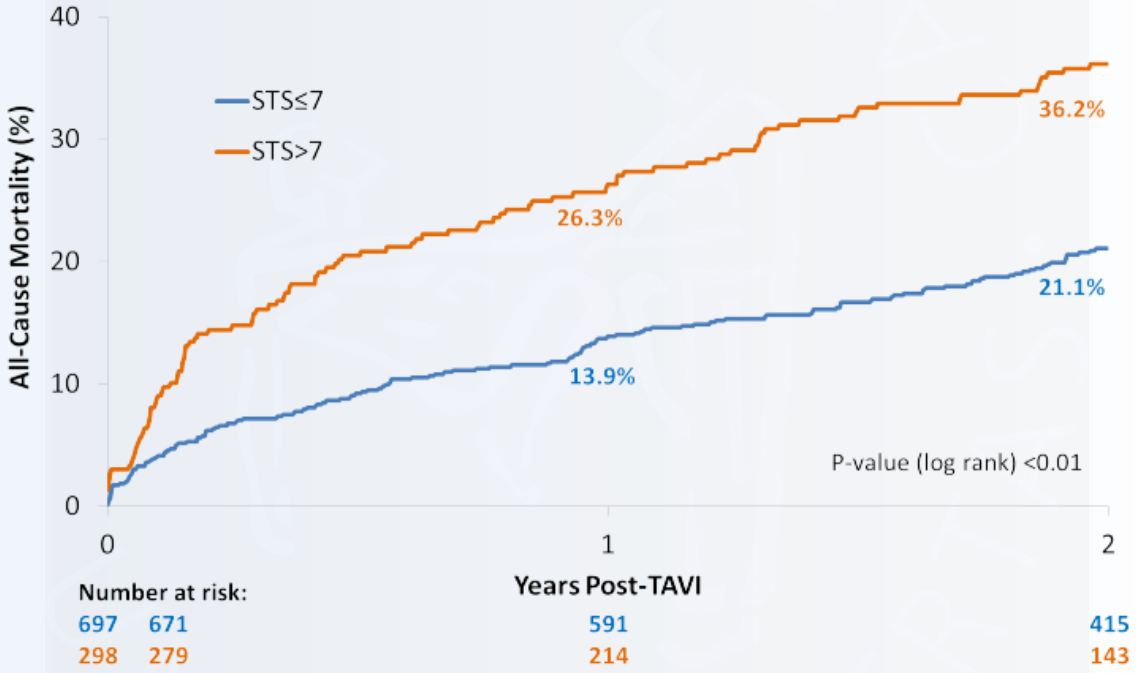
- High risk
- Intermediate risk
- Low risk

5 randomized trials
1 meta-analysis
Large registries

Key Message 1

Intermediate risk patients have a good outcome post TAVI (better than high risk patients)

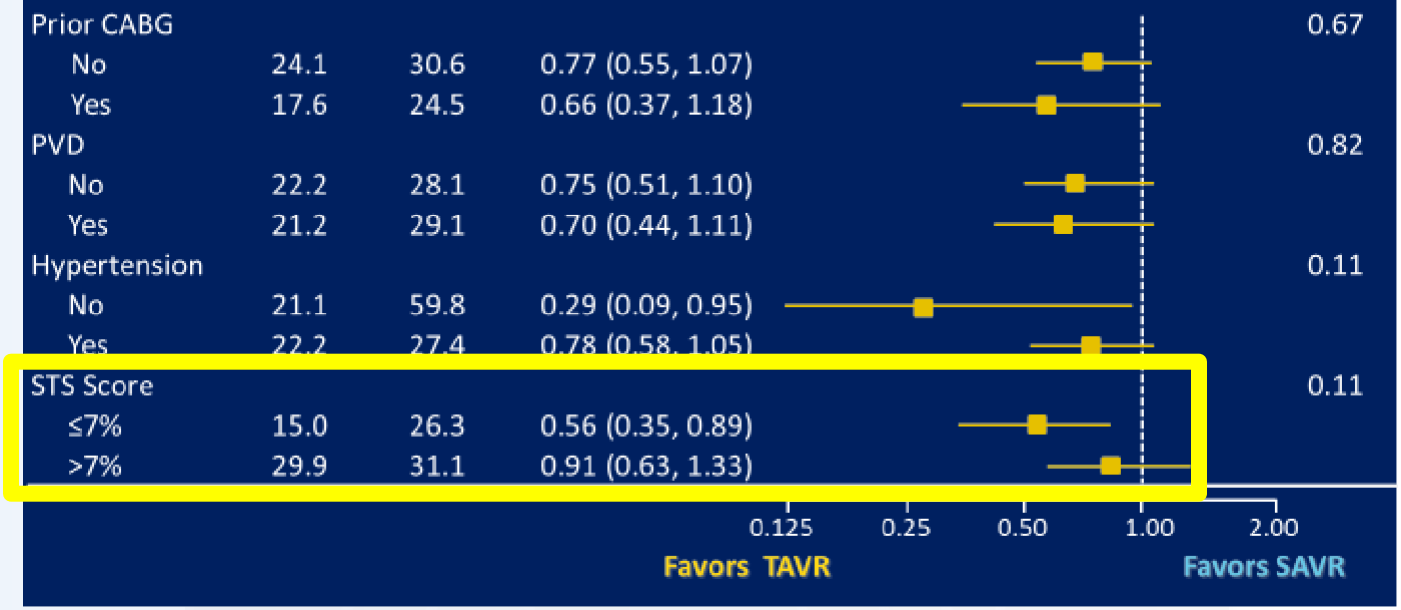
2-Year all-cause mortality in the CoreValve ADVANCE Registry



CoreValve ADVANCE Study

Outcome in the PARTNER 1A Trial

Subgroup	All-Cause Death at 2 Years KM Rates TAVR	SAVR	Hazard Ratios (95% CI)	*P* Value*
Prior CABG				0.67
No	24.1	30.6	0.77 (0.55, 1.07)	
Yes	17.6	24.5	0.66 (0.37, 1.18)	
PVD				0.82
No	22.2	28.1	0.75 (0.51, 1.10)	
Yes	21.2	29.1	0.70 (0.44, 1.11)	
Hypertension				0.11
No	21.1	59.8	0.29 (0.09, 0.95)	
Yes	22.2	27.4	0.78 (0.58, 1.05)	
STS Score				0.11
≤7%	15.0	26.3	0.56 (0.35, 0.89)	
>7%	29.9	31.1	0.91 (0.63, 1.33)	



Medizinische Hochschule Hannover

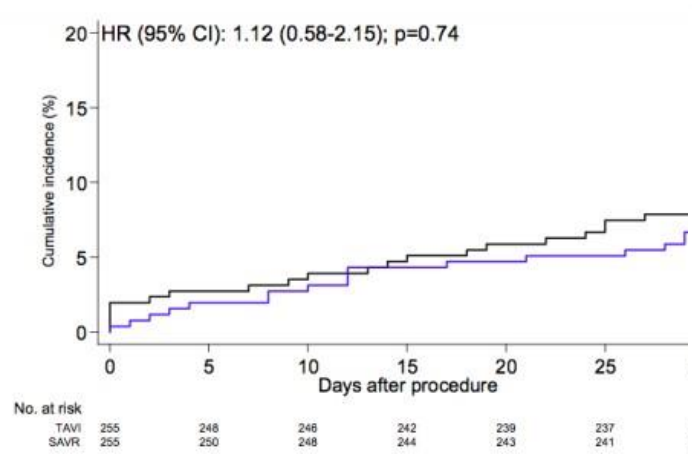
CLINIQUE Pasteur

Key Message 2

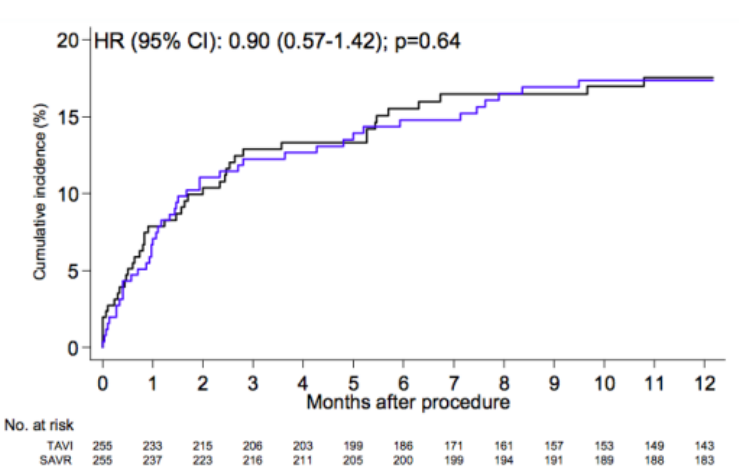
In Intermediate risk patients,
the outcome after TAVI is comparable to surgery

BERn – **MU**nich – rotter**DA**m study

30-day All-cause mortality

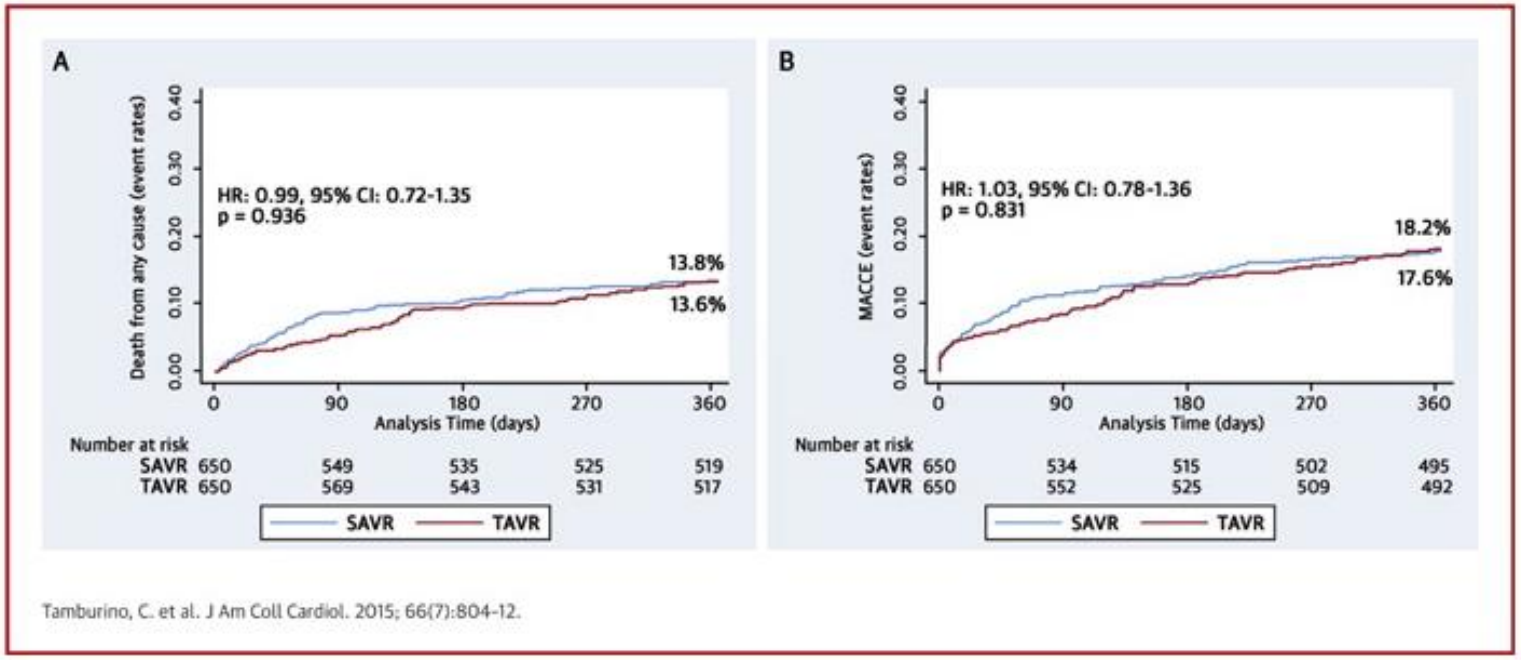


1-year All-cause mortality



TAVI SAVR

The Italian OBSERVANT registry



Tamburino, C. et al. J Am Coll Cardiol. 2015; 66(7):804-12.

PARTNER II Trial

The NEW ENGLAND JOURNAL of MEDICINE

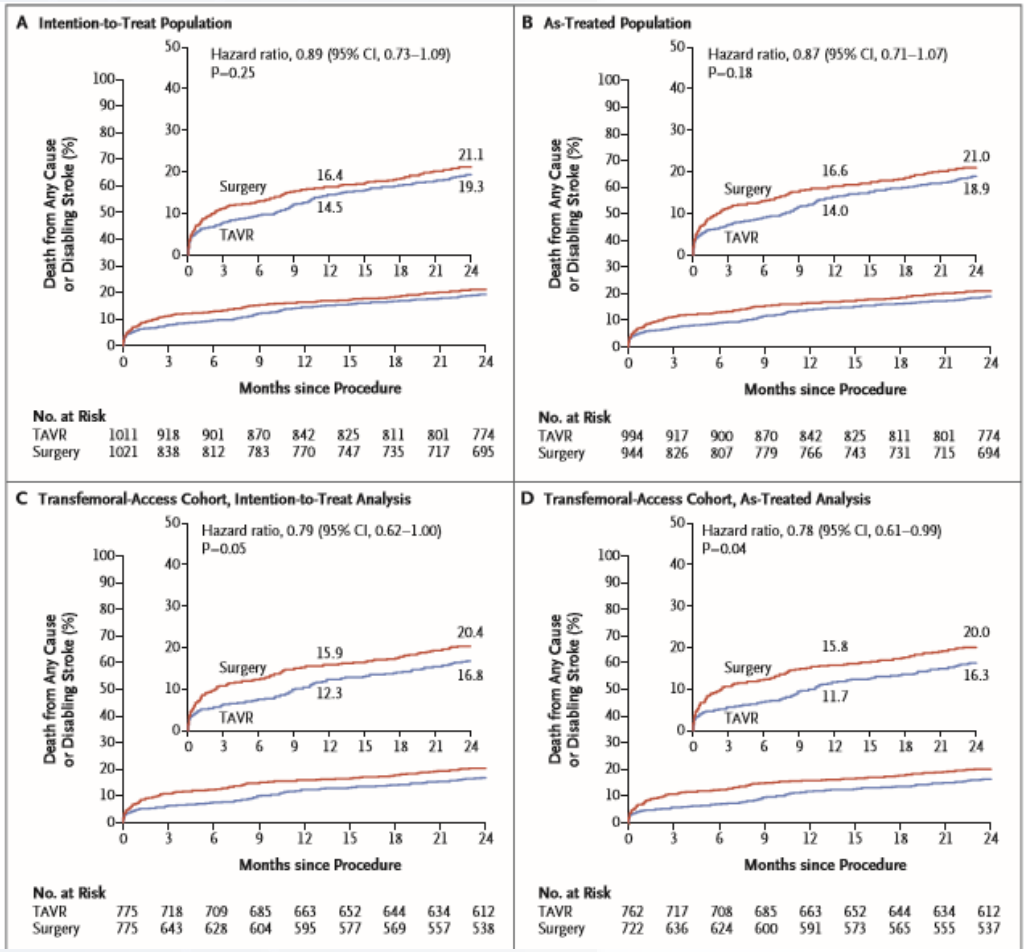
ORIGINAL ARTICLE

Transcatheter or Surgical Aortic-Valve Replacement in Intermediate-Risk Patients

Martin B. Leon, M.D., Craig R. Smith, M.D., Michael J. Mack, M.D.,

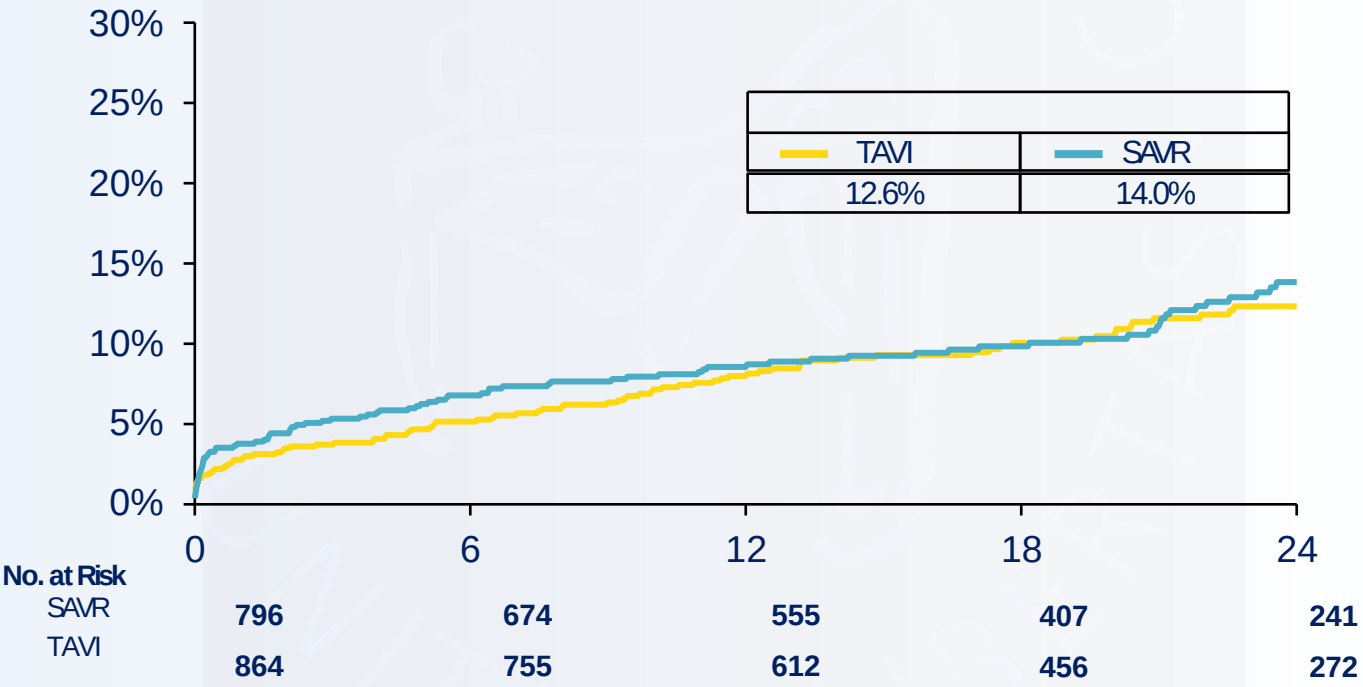
Table 1. Characteristics of the Patients at Baseline.*

Characteristic	TAVR (N=1011)	Surgery (N=1021)
Age — yr	81.5±6.7	81.7±6.7
Male sex — no. (%)	548 (54.2)	560 (54.8)
Body-mass index†	28.6±6.2	28.3±6.2
STS risk score‡	5.8±2.1	5.8±1.9



SURTAVI trial: Non inferiority of TAVI against SAVR at 2 years

All-Cause Mortality or Disabling Stroke



Main findings of SURTAVI

- TAVI had significantly less 30 day stroke, AKI, atrial fibrillation and transfusion use and a superior quality of life at 30 days.
- TAVI resulted in significantly improved AV hemodynamics with lower mean gradients and larger aortic valve areas than SAVR through 24 months.
- SAVR had less residual aortic regurgitation, major vascular complications and fewer new pacemakers.
- Need for a new pacemaker after TAVI was not associated with increased mortality.

Key Message 3

TAVI is promising in low risk patients

The **NOTION trial** was the first to randomize TAVI (CoreValve) with SAVR in Low and intermediate risk patients:

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY VOL. 65, NO. 20, 2015

PUBLISHED BY ELSEVIER INC. ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2015.03.014

Transcatheter Versus Surgical Aortic Valve Replacement in Patients With Severe Aortic Valve Stenosis

1-Year Results From the All-Comers NOTION Randomized Clinical Trial

Hans Gustav Hørsted Thyregod, MD,* Daniel Andreas Steinbrüchel, MD, DMSc,* Nikolaj Ihlemann, MD, PhD,† Henrik Nissen, MD, PhD,‡ Bo Juel Kjeldsen, MD, PhD,§ Petur Petursson, MD,‖ Yanping Chang, MS,¶ Olaf Walter Franzen, MD,† Thomas Engstrøm, MD, DMSc,† Peter Clemmensen, MD, DMSc,† Peter Bo Hansen, MD,# Lars Willy Andersen, MD, DMSc,# Peter Skov Olsen, MD, DMSc,* Lars Søndergaard, MD, DMSc†

Thyregod et al., JACC 2015

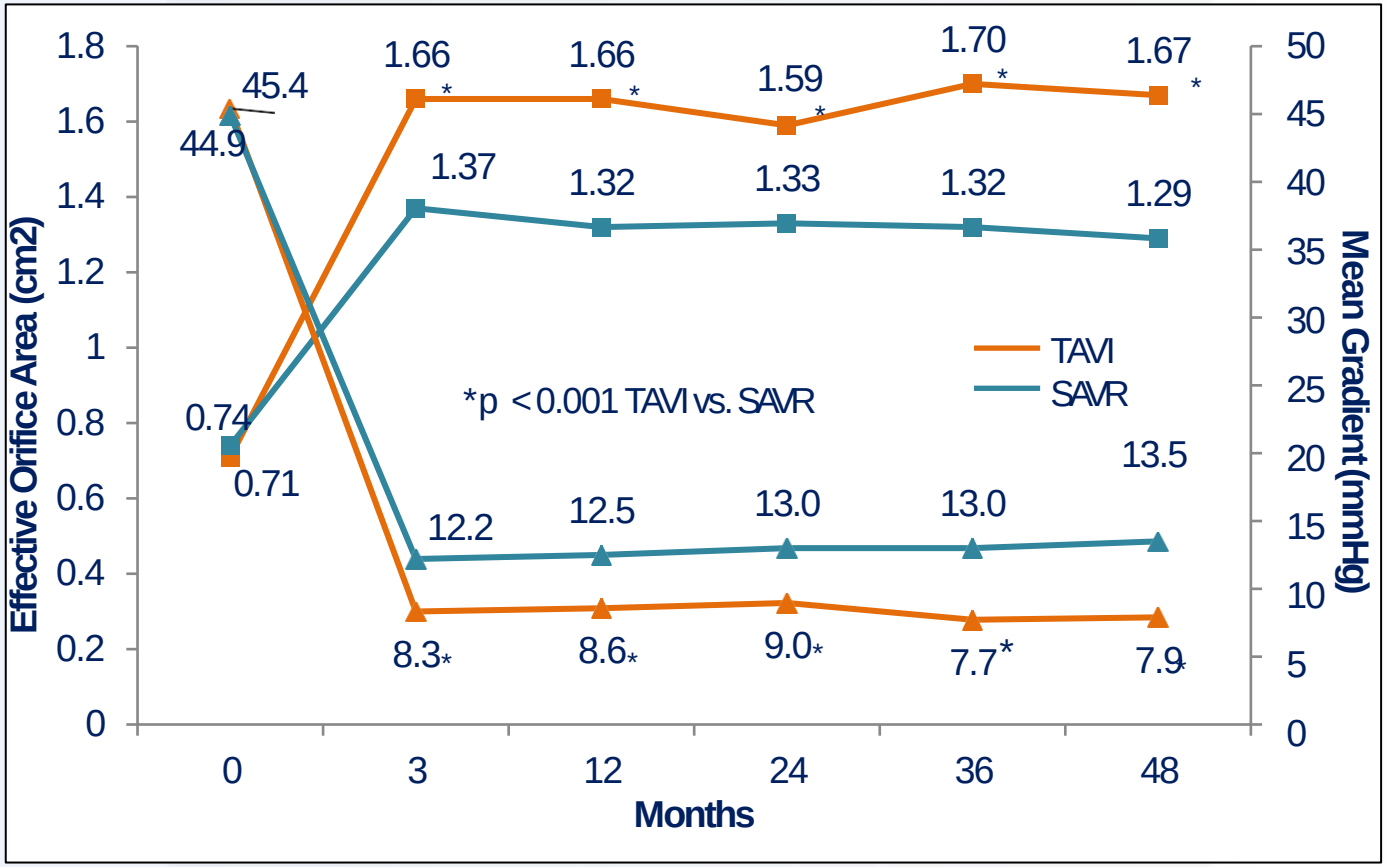
The NOTION Trial

Randomized Low-Risk Patients

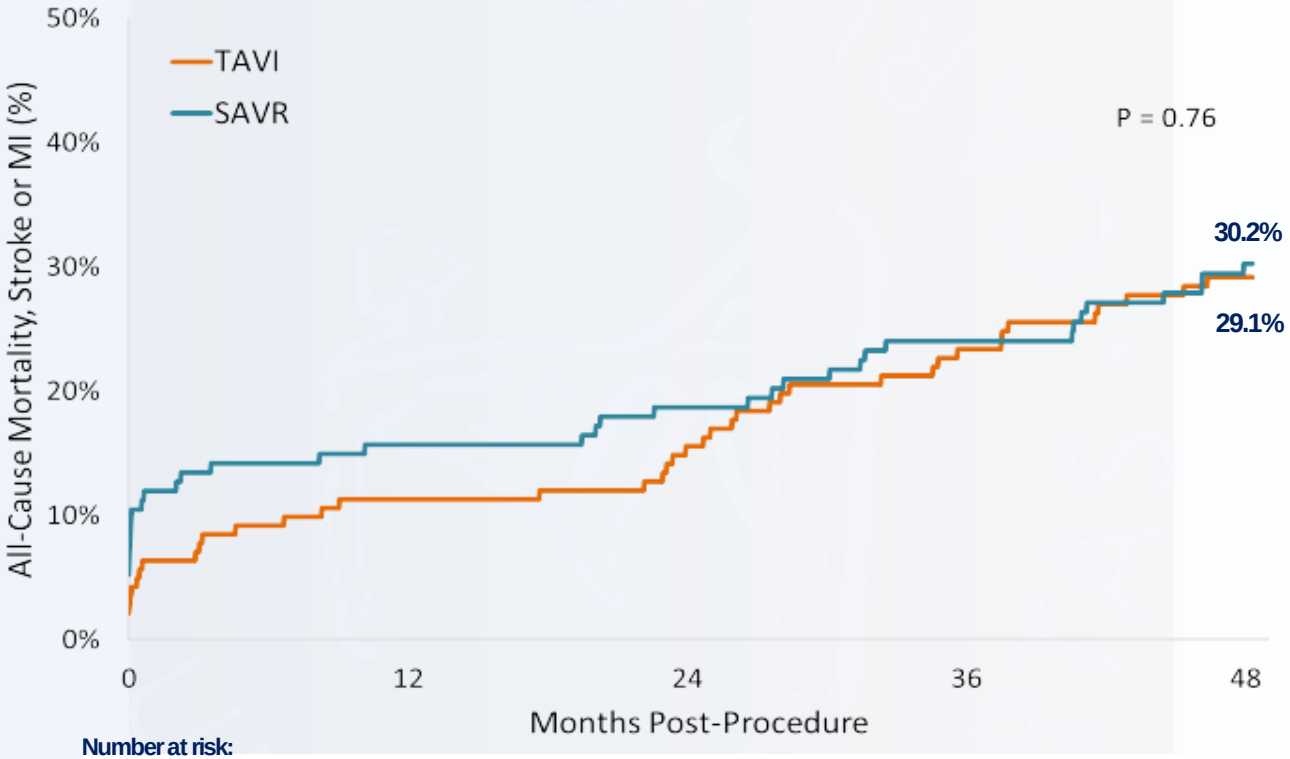
NOTION Trial | Select Baseline Characteristics

Characteristic, %or mean ± SD	TAVI n=145	SAVR n=135	p-value
Age (yrs)	79.2 ± 4.9	79.0 ± 4.7	0.71
Male	53.8	52.6	0.84
STS Score	2.9 ± 1.6	3.1 ± 1.7	0.30
STS Score < 4%	83.4	80.0	0.46
NYHA class III or IV	48.6	45.5	0.61

The NOTION Trial aortic valve performance



The NOTION Trial all-cause mortality, stroke or MI



AORTIC STENOSIS: TAVI vs. SAVR

	Favours TAVI	Favours SAVR
Clinical characteristics		
STS/EuroSCORE II <4% (logistic EuroSCORE I <10%)[a]		+
STS/EuroSCORE II ≥4% (logistic EuroSCORE I ≥10%)[a]	+	
Presence of severe comorbidity (not adequately reflected by scores)	+	
Age <75 years		+
Age ≥75 years	+	
Previous cardiac surgery	+	
Frailty[b]	+	
Restricted mobility and conditions that may affect the rehabilitation process after the procedure	+	
Suspicion of endocarditis		+

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)

AORTIC STENOSIS: TAVI vs. SAVR

	Favours TAVI	Favours SAVR
Anatomical and technical aspects		
Favourable access for transfemoral TAVI	+	
Unfavourable access (any) for TAVI		+
Sequelae of chest radiation	+	
Porcelain aorta	+	
Presence of intact coronary bypass grafts at risk when sternotomy is performed	+	
Expected patient–prosthesis mismatch	+	
Severe chest deformation or scoliosis	+	
Short distance between coronary ostia and aortic valve annulus		+
Size of aortic valve annulus out of range for TAVI		+
Aortic root morphology unfavourable for TAVI		+
Valve morphology (bicuspid, degree of calcification, calcification pattern) unfavourable for TAVI		+
Presence of thrombi in aorta or LV		+

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)

AORTIC STENOSIS: TAVI vs. SAVR

	Favours TAVI	Favours SAVR
Cardiac conditions in addition to aortic stenosis that require consideration for concomitant intervention		
Severe CAD requiring revascularization by CABG		+
Severe primary mitral valve disease, which could be treated surgically		+
Severe tricuspid valve disease		+
Aneurysm of the ascending aorta		+
Septal hypertrophy requiring myectomy		+

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)

AORTIC STENOSIS: TAVI vs. SAVR

Choice of intervention:

2012

Recommendations	Class	Level
TAVI is indicated in patients with severe symptomatic AS who are not suitable for AVR as assessed by a 'heart team' and who are likely to gain improvement in their quality of life and to have a life expectancy of more than 1 year after consideration of their comorbidities	I	B
TAVI should be considered in high-risk patients with severe symptomatic AS who may still be suitable for surgery, but in whom TAVI is favoured by a 'heart team' based on the individual risk profile and anatomic suitability	IIa	B

Not suitable for SAVR

High Risk only

Increased Risk

Low Risk

2017

In patients who are at increased surgical risk (STS or EuroSCORE II ≥4% or logistic EuroSCORE I ≥10% ,or other risk factors not included in these scores such as frailty , porcelain aorta , sequelae of chest radiation), the decision between SAVR and TAVI should be made by the Heart Team according to the individual patient characteristics with TAVI being favoured in elderly patients suitable for transfemoral access	I	B
SAVR is recommended in patients at low surgical risk (STS or EuroSCORE II <4% or logistic EuroSCORE I <10% and no other risk factors not included in these scores, such as frailty, porcelain aorta, sequelae of chest radiation)	I	B

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease
(European Heart Journal 2017 - doi:10.1093/eurheartj/ehx391)

Conclusion

Key learnings from emerging evidences :

- TAVI is equal to surgery and guideline indicated in intermediate risk patients.
- TAVI prostheses are proven to be durable up to five years and probably beyond.
- (Many examples of patients with functioning prosthesis up to 12 years)
- TAVI seems safe even in low-risk patients (5-year follow up)
- Remaining issues to solve before expanding indications to low risk patients (durability, pace maker rate)

Yes we can ⟹ Yes we should!

	Favours TAVI	Favours SAVR
Clinical characteristics		
STS/EuroSCORE II <4% (logistic EuroSCORE I <10%)[a]		+
STS/EuroSCORE II ≥4% (logistic EuroSCORE I ≥10%)[a]	+	
Presence of severe comorbidity (not adequately reflected by scores)	+	
Age <75 years		+
Age ≥75 years	+	
Previous cardiac surgery	+	
Frailty[b]	+	
Restricted mobility and conditions that may affect the rehabilitation process after the procedure	+	
Suspicion of endocarditis		+

	Favours TAVI	Favours SAVR
Anatomical and technical aspects		
Favourable access for transfemoral TAVI	+	
Unfavourable access (any) for TAVI		+
Sequelae of chest radiation	+	
Porcelain aorta	+	
Presence of intact coronary bypass grafts at risk when sternotomy is performed	+	
Expected patient–prosthesis mismatch	+	
Severe chest deformation or scoliosis	+	
Short distance between coronary ostia and aortic valve annulus		+
Size of aortic valve annulus out of range for TAVI		+
Aortic root morphology unfavourable for TAVI		+
Valve morphology (bicuspid, degree of calcification, calcification pattern) unfavourable for TAVI		+
Presence of thrombi in aorta or LV		+

	Favours TAVI	Favours SAVR
Cardiac conditions in addition to aortic stenosis that require consideration for concomitant intervention		
Severe CAD requiring revascularization by CABG		+
Severe primary mitral valve disease, which could be treated surgically		+
Severe tricuspid valve disease		+
Aneurysm of the ascending aorta		+
Septal hypertrophy requiring myectomy		+

Conclusion

Choice of intervention:

2012

Recommendations	Class	Level
TAVI is indicated in patients with severe symptomatic AS who are not suitable for AVR as assessed by a 'heart team' and who are likely to gain improvement in their quality of life and to have a life expectancy of more than 1 year after consideration of their comorbidities	I	B
TAVI should be considered in high-risk patients with severe symptomatic AS who may still be suitable for surgery, but in whom TAVI is favoured by a 'heart team' based on the individual risk profile and anatomic suitability	IIa	B

Not suiteble for SAVR

High Risk only

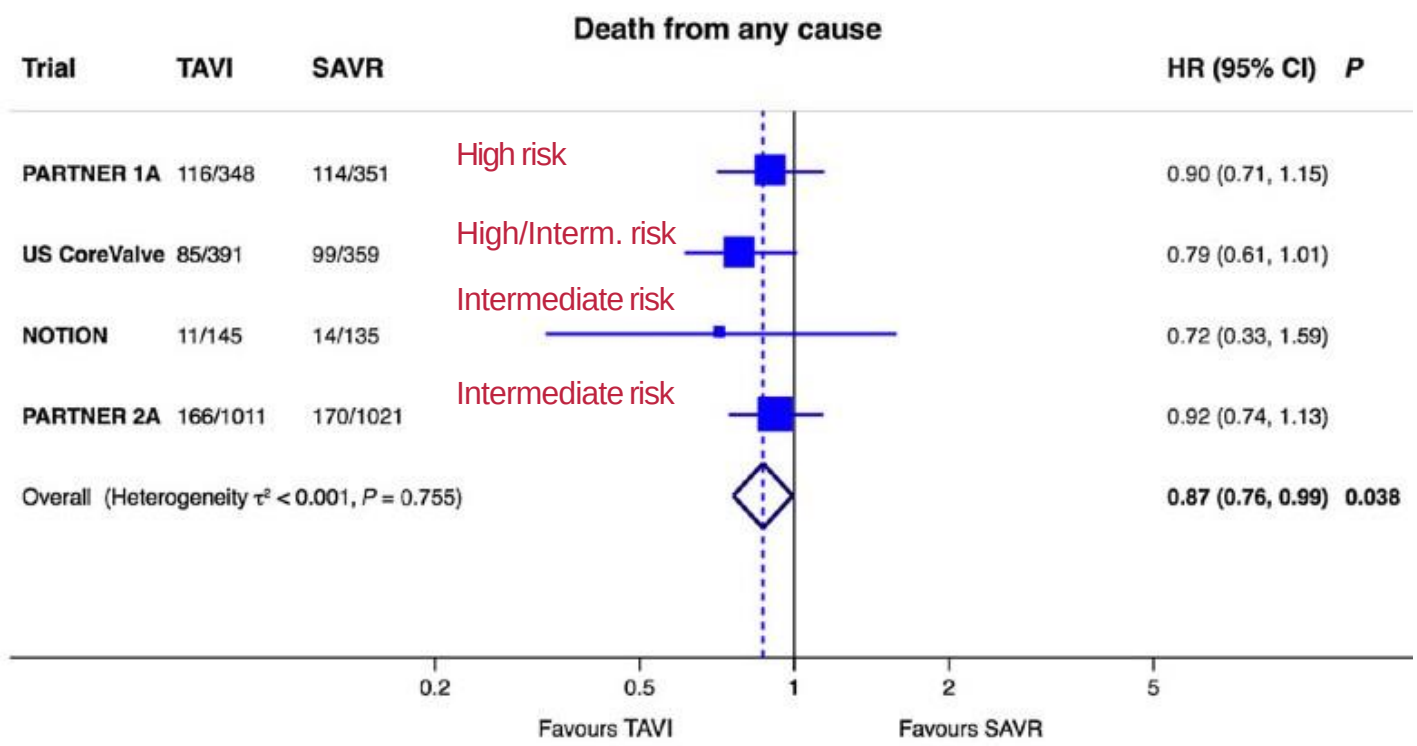
Increased Risk

Low Risk

2017

In patients who are at increased surgical risk (STS or EuroSCORE II ≥4% or logistic EuroSCORE I ≥10% ,or other risk factors not included in these scores such as frailty , porcelain aorta , sequelae of chest radiation), the decision between SAVR and TAVI should be made by the Heart Team according to the individual patient characteristics with TAVI being favoured in elderly patients suitable for transfemoral access	I	B
SAVR is recommended in patients at low surgical risk (STS or EuroSCORE II <4% or logistic EuroSCORE I <10% and no other risk factors not included in these scores, such as frailty, porcelain aorta, sequelae of chest radiation)	I	B

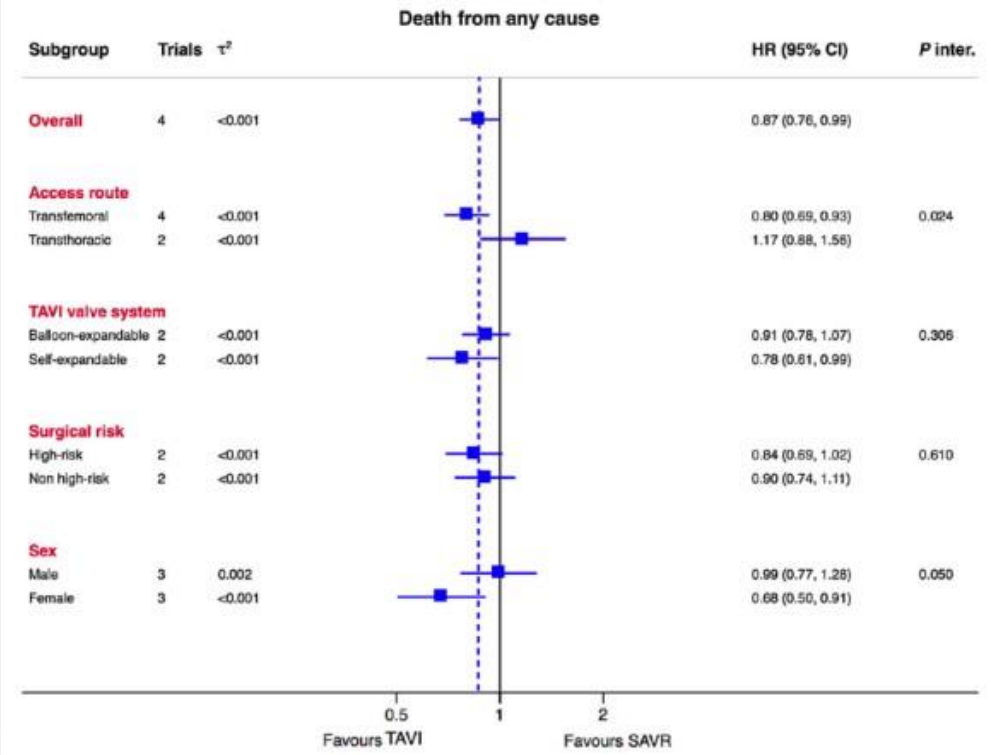
AORTIC STENOSIS: TAVI vs. SAVR



Siontis GCM et al Eur Heart J 2016;37:3503-3512

2017 ESC/EACTS Valvular Heart Disease GL

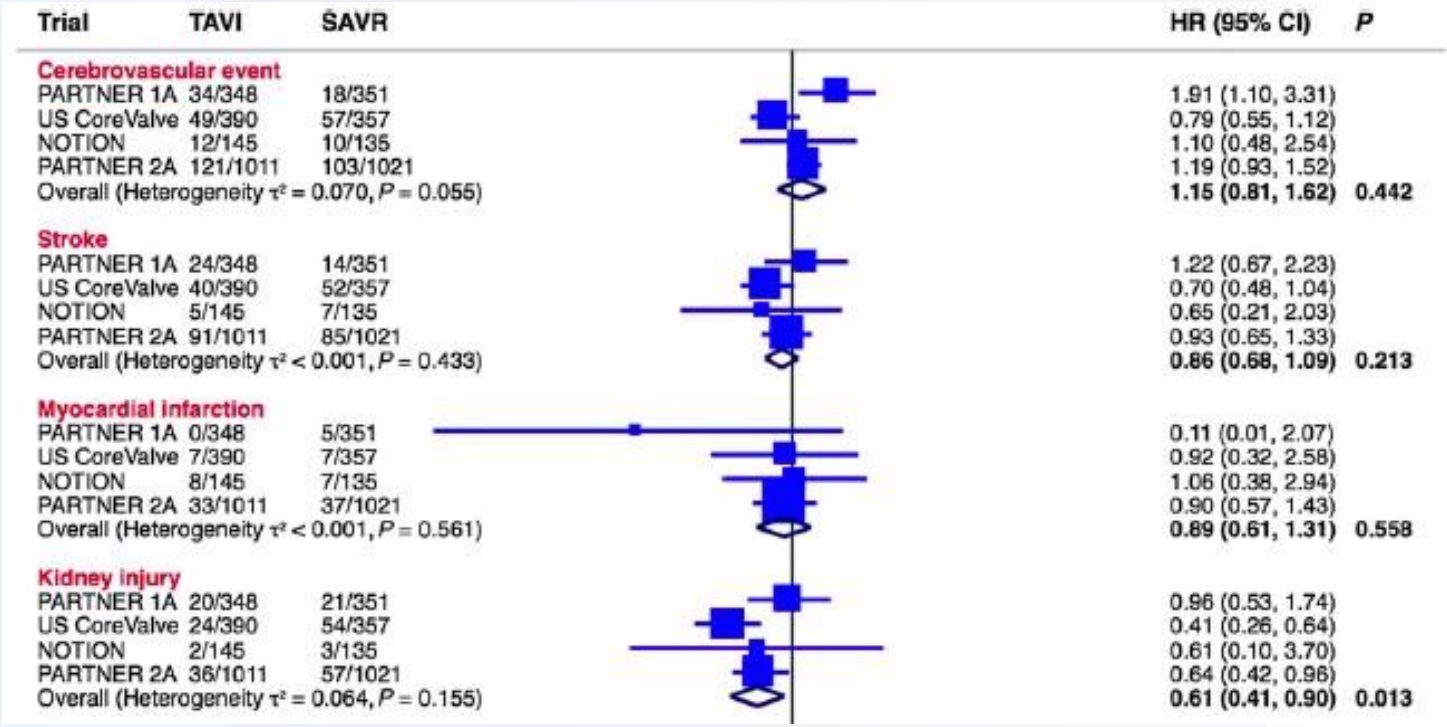
AORTIC STENOSIS: TAVI vs. SAVR



Siontis GCM et al Eur Heart J 2016;37:3503-3512

2017 ESC/EACTS Valvular Heart Disease GL

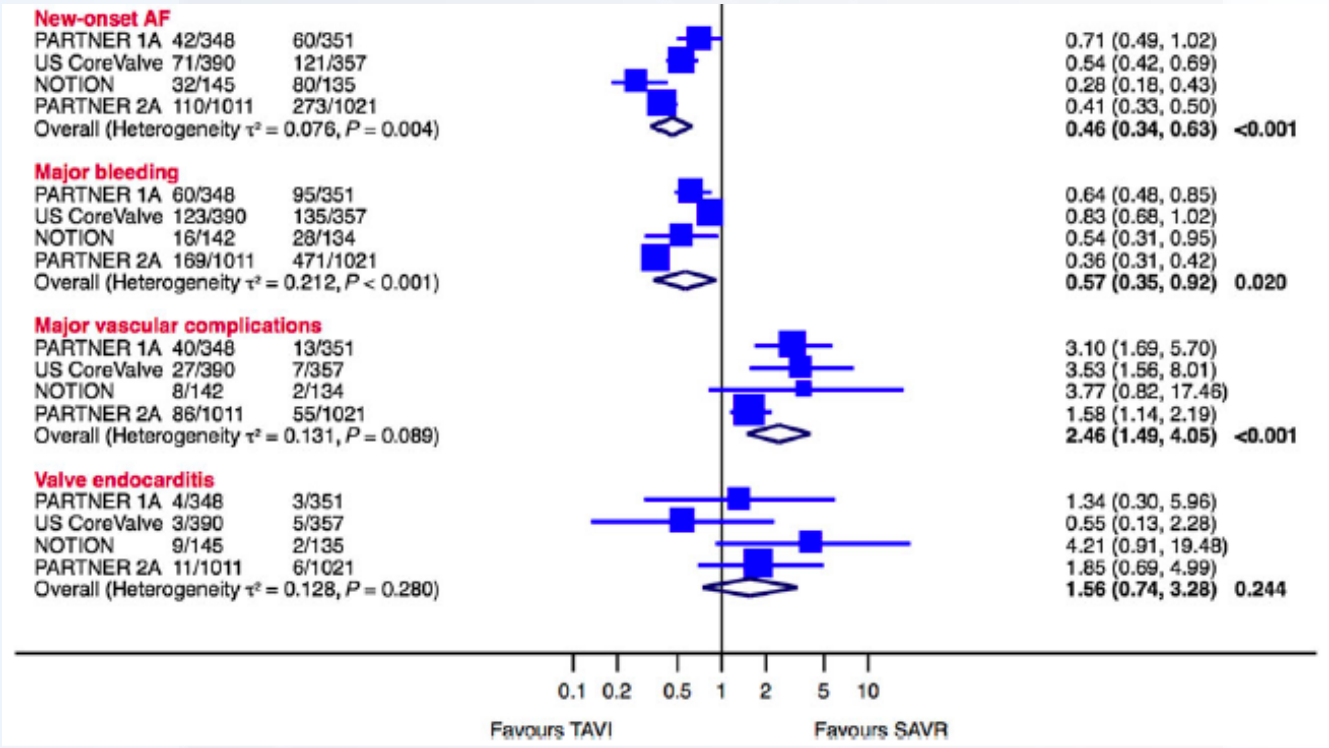
AORTIC STENOSIS: TAVI vs. SAVR



Siontis GCM et al Eur Heart J 2016;37:3503-3512

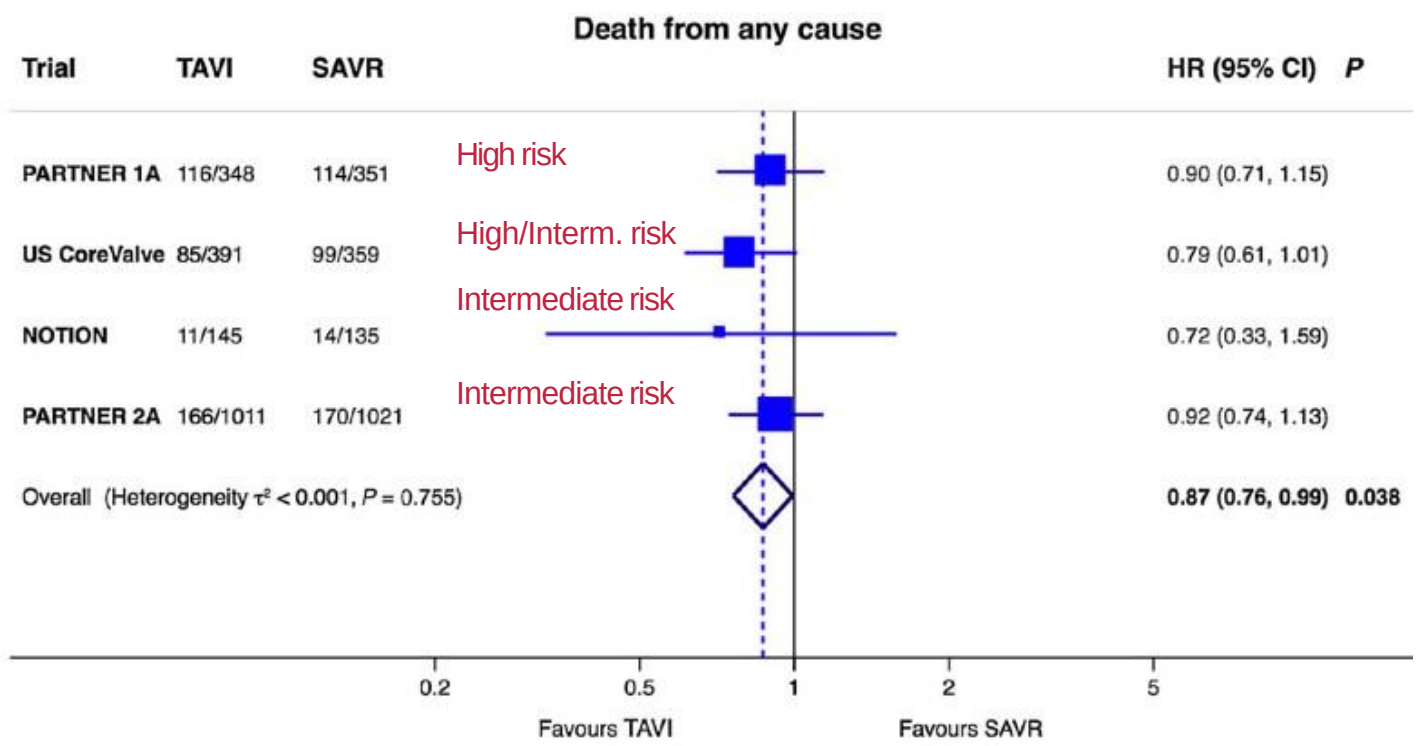
2017 ESC/EACTS Valvular Heart Disease GL

AORTIC STENOSIS: TAVI vs. SAVR



Siontis GCM et al Eur Heart J 2016;37:3503-3512

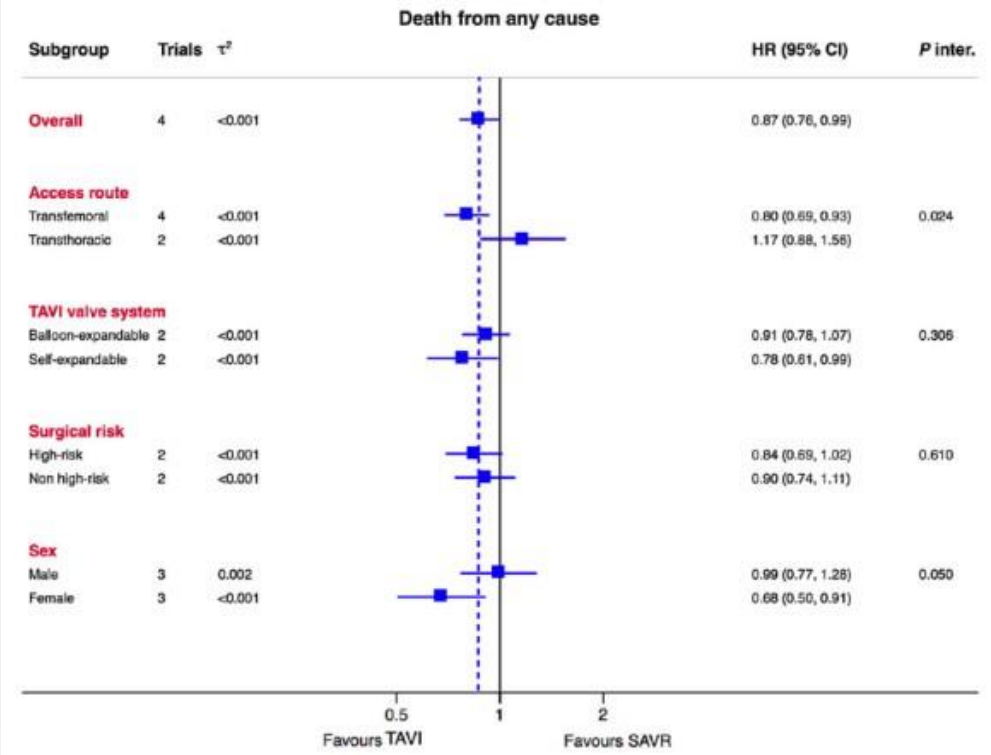
AORTIC STENOSIS: TAVI vs. SAVR



Siontis GCM et al Eur Heart J 2016;37:3503-3512

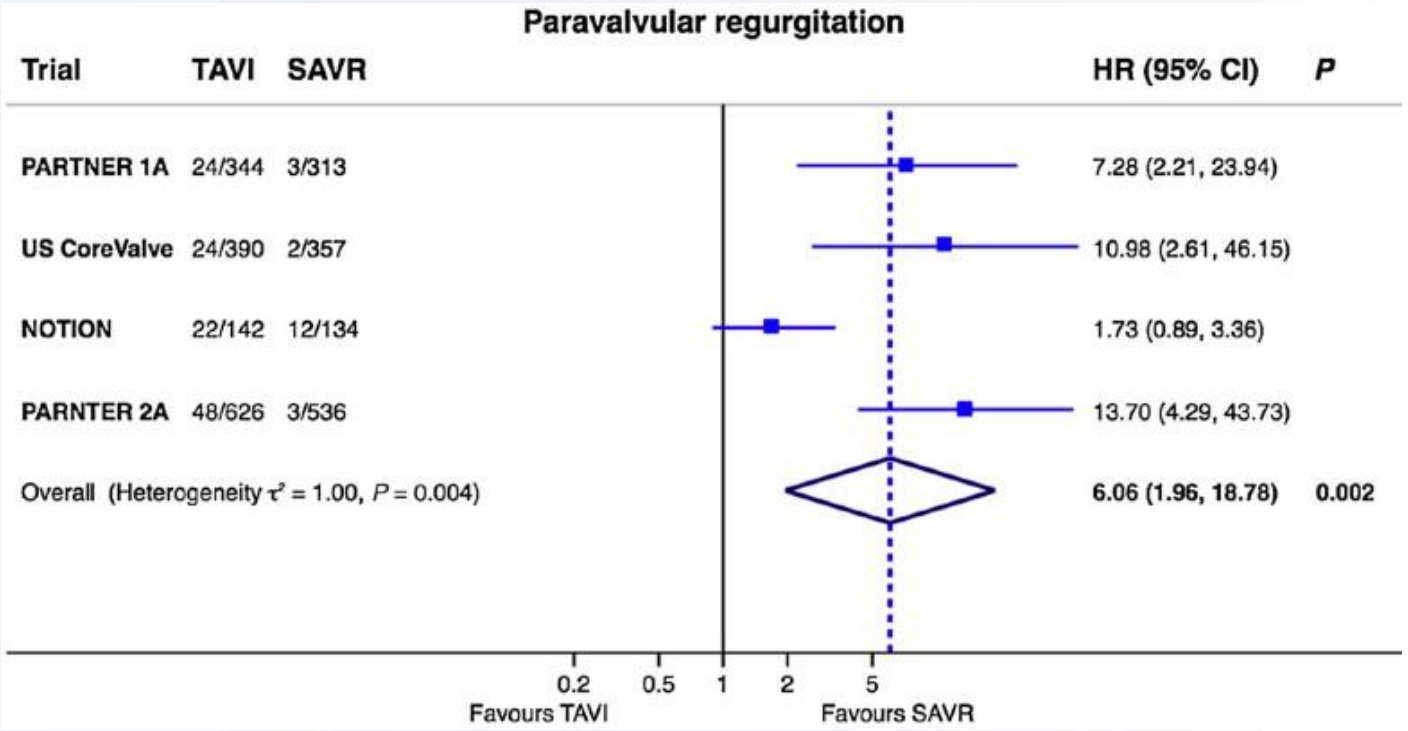
2017 ESC/EACTS Valvular Heart Disease GL

AORTIC STENOSIS: TAVI vs. SAVR



Siontis GCM et al Eur Heart J 2016;37:3503-3512

AORTIC STENOSIS: TAVI vs. SAVR

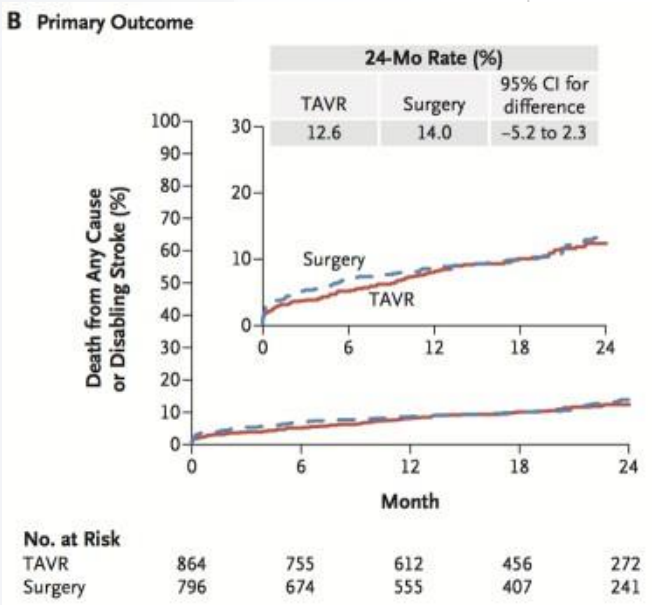


Siontis GCM et al Eur Heart J 2016;37:3503-3512

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease" (European Heart Journal 2017)
doi:10.1093/eurheartj/ehx391

AORTIC STENOSIS: TAVI vs. SAVR

	PARTNER 2A		SURTAVI	
Age (years)	81.6 ± 6.7		79.8 ± 6.2	
STS Score	5.8 ± 2.0		4.5 ± 1.6	
Frail (%)	44.4		52.3	
	PARTNER Surgery	PARTNER TAVI	SURTAVI Surgery	SURTAVI TAVI
30-day mortality (%)	4.1	3.9	1.7	2.2
2-year mortality (%)	18.0	16.7	11.6	11.4
Stroke 30-day (%)	6.1	5.5	5.6	3.4
Moderate/severe AR (%)		3.7	0.6	5.3
New PM (%)	6.9	8.5	6.6	25.9



Reardon MJ et al New Engl J Med 2017 (epub March 17)

www.escardio.org/guidelines

2017 ESC/EACTS Valvular Heart Disease GL
AORTIC STENOSIS: TAVI vs. SAVR

- Consideration of TAVI as an alternative to SAVR in a wide range of patients with increased surgical risk („intermediate“ or „high risk“)
- Risk scores alone are insufficient to guide decision between TAVI and SAVR
- Avaliable data for TAVI mostly in population > 75 years !
  - Bicuspid valves more frequent in younger patients (few experience, worse results?)
  - Missing longterm durability data
  - Higher PM and PVL rates become more relevant in younger patients
- When patients are theoretically eligible for both, TAVI and surgery, a number of patient characteristics affect the individual risk / benefit ratio for both modalities (complex decision process)
- Local outcome data for both modalities require consideration

www.escardio.org/guidelines

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal, 2017, doi:10.1093/eurheartj/ehx391)

Aspects to be considered by the Heart Team for the decision between SAVR and TAVI in patients at increased surgical risk

	Favours TAVI	Favours SAVR
Clinical characteristics		
STS/EuroSCORE II <4% (logistic EuroSCORE I<10%)		+
STS/EuroSCORE II ≥4% (logistic EuroSCORE I ≥10%)	+	
Presence of severe comorbidity (not adequately reflected by scores)	+	
Age <75 years		+
Age ≥75 years	+	
Previous cardiac surgery	+	

www.escardio.org/guidelines

Aspects to be considered by the Heart Team for the decision between SAVR and TAVI in patients at increased surgical risk *(continued)*

	Favours TAVI	Favours SAVR
Clinical characteristics *(continued)*		
Frailty	+	
Restricted mobility and conditions that may affect the rehabilitation process after the procedure	+	
Suspicion of endocarditis		+
Anatomical and technical aspects		
Favourable access for transfemoral TAVI	+	
Unfavourable access (any) for TAVI		+

www.escardio.org/guidelines

Aspects to be considered by the Heart Team for the decision between SAVR and TAVI in patients at increased surgical risk *(continued)*

	Favours TAVI	Favours SAVR
Anatomical and technical aspects *(continued)*		
Sequelae of chest radiation	+	
Presence of intact coronary bypass grafts at risk when sternotomy is performed	+	
Severe chest deformation or scoliosis	+	

www.escardio.org/guidelines

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal, 2017, doi:10.1093/eurheartj/ehx391)

Aspects to be considered by the Heart Team for the decision between SAVR and TAVI in patients at increased surgical risk *(continued)*

	Favours TAVI	Favours SAVR
Anatomical and technical aspects *(continued)*		
Size of aortic valve annulus out of range for TAVI		+
Valve morphology (bicuspid, degree of calcification, calcification pattern) unfavourable for TAVI		+
Cardiac conditions in addition to aortic stenosis that require consideration for concomitant intervention		

www.escardio.org/guidelines

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal, 2017, doi:10.1093/eurheartj/ehx391)

Aspects to be considered by the Heart Team for the decision between SAVR and TAVI in patients at increased surgical risk *(continued)*

	Favours TAVI	Favours SAVR
Cardiac conditions in addition to aortic stenosis that require consideration for concomitant intervention *(continued)*		
Severe primary mitral valve disease, which could be treated surgically		+
Severe tricuspid valve disease		+
Aneurysm of the ascending aorta		+
Septal hypertrophy requiring myectomy		+

www.escardio.org/guidelines

Indications for intervention in aortic stenosis and recommendations for the choice of intervention mode *(continued)*

Recommendations	Class	Level
b) Choice of intervention in symptomatic aortic stenosis		
Aortic valve interventions should only be performed in centres with both departments of cardiology and cardiac surgery on-site, and with structured collaboration between the two, including a Heart Team (heart valve centres).	I	C

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal, 2017)
doi:10.1093/eurheartj/ehx391

Indications for intervention in aortic stenosis and recommendations for the choice of intervention mode *(continued)*

Recommendations	Class	Level
The choice for intervention must be based on careful individual evaluation of technical suitability and weighing of risks and benefits of each modality (aspects to be considered are listed in the according table). In addition, the local expertise and outcomes data for the given intervention must be taken into account.	I	C
SAVR is recommended in patients at low surgical risk (STS or EuroSCORE II <4% or logistic EuroSCORE I <10% and no other risk factors not included in these scores, such as frailty, porcelain aorta, sequelae of chest radiation).	I	B
TAVI is recommended in patients who are not suitable for SAVR as assessed by the Heart Team.	I	B

www.escardio.org/guidelines

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal 2017; doi:10.1093/eurheartj/ehx391)

Indications for intervention in aortic stenosis and recommendations for the choice of intervention mode *(continued)*

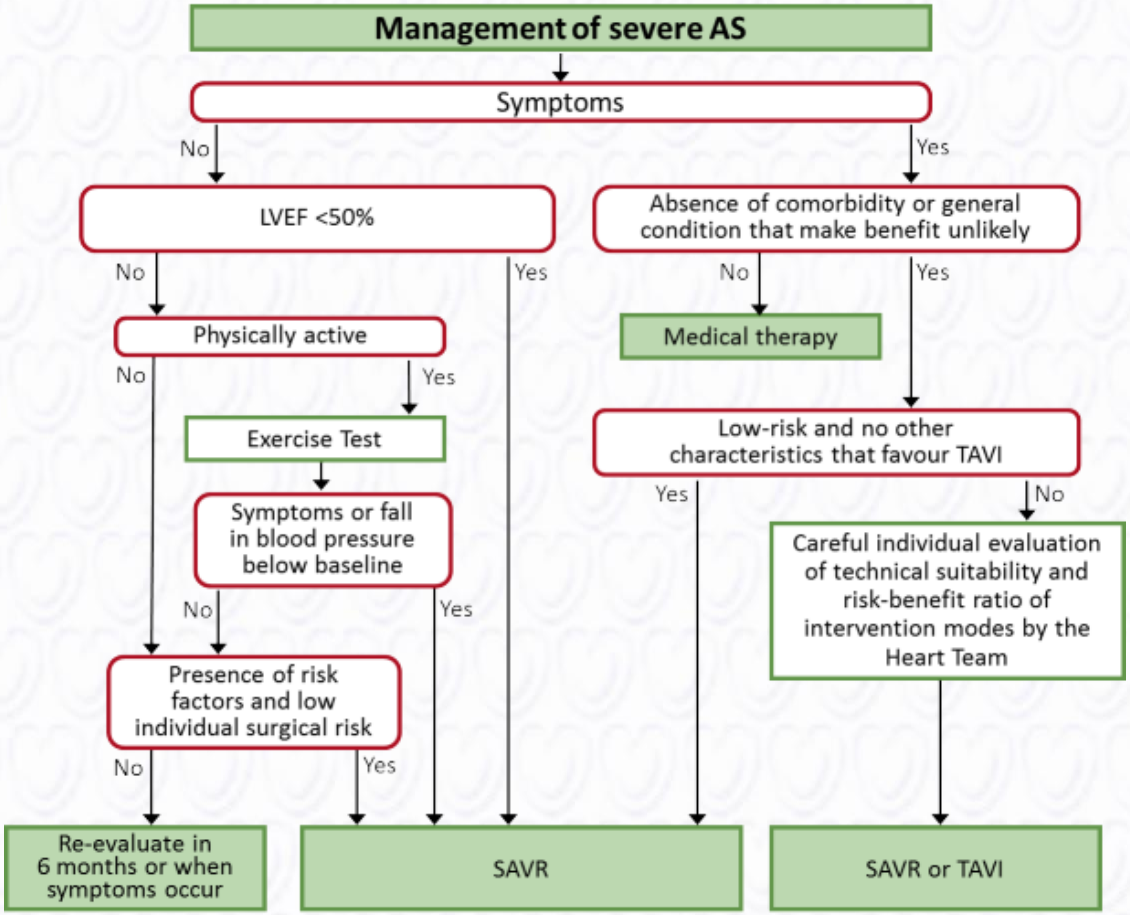
Recommendations	Class	Level
In patients who are at increased surgical risk (STS or EuroSCORE II ≥4% or logistic EuroSCORE I ≥10% or other risk factors not included in these scores such as frailty, porcelain aorta, sequelae of chest radiation), the decision between SAVR and TAVI should be made by the Heart Team according to the individual patient characteristics (see according table), with TAVI being favoured in elderly patients suitable for transfemoral access.	I	B
Balloon aortic valvotomy may be considered as a bridge to SAVR or TAVI in haemodynamically unstable patients or in patients with symptomatic severe aortic stenosis who require urgent major non-cardiac surgery.	IIb	C

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal 2017; doi:10.1093/eurheartj/ehx...)

Indications for intervention in aortic stenosis and recommendations for the choice of intervention mode *(continued)*

Recommendations	Class	Level
Balloon aortic valvotomy may be considered as a diagnostic means in patients with severe aortic stenosis and other potential cause for symptoms (i.e. lung disease) and in patients with severe myocardial dysfunction, pre-renal insufficiency or other organ dysfunction that maybe reversible with balloon aortic valvotomy when performed in centres that can escalate to TAVI.	IIb	C

2017 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (European Heart Journal, 2017)
doi:10.1093/eurheartj/ehx391

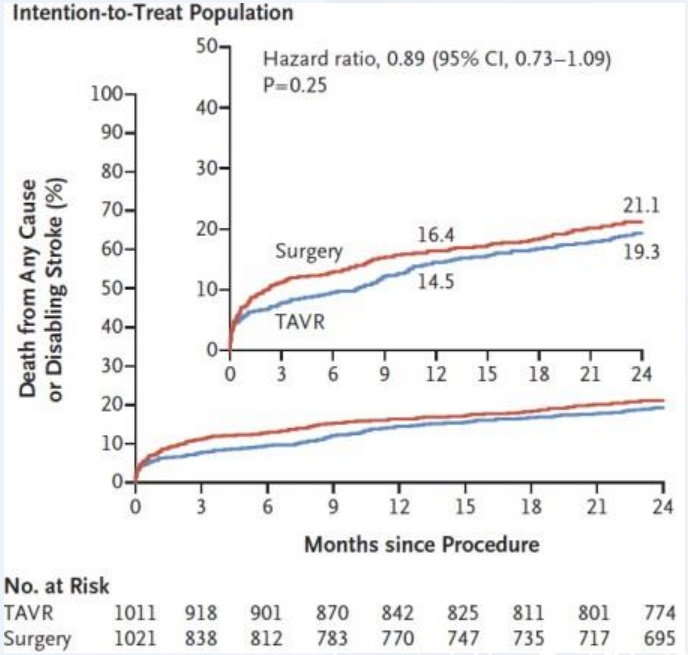


www.escardio.org/guidelines

TAVI Similar to SAVR if STSscore>3

PARTNER II trial – Sapien XT vs. SAVR

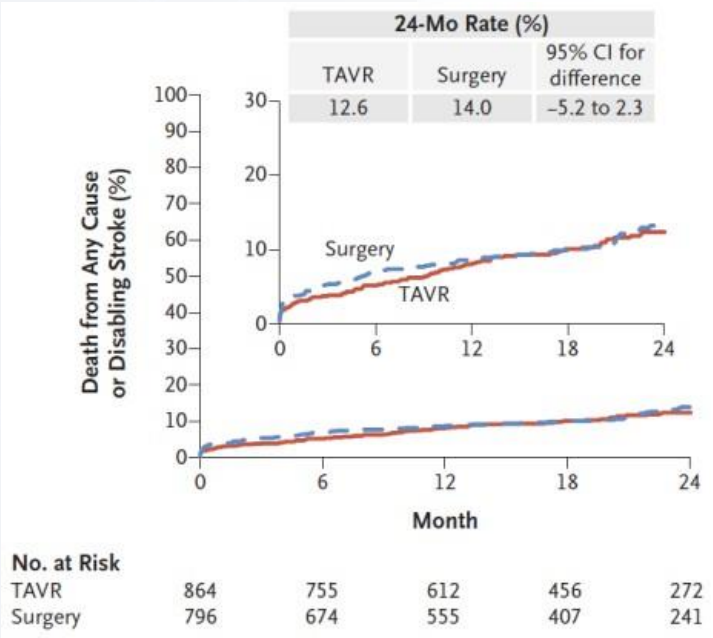
N= 2032, age 81.7, STSscore 5.8%



Leon et al. New Engl JMed 2016

SURTAVI trial – Corevalve

N= 1746, age 79.8



Reardon et al. New Engl JMed 2017

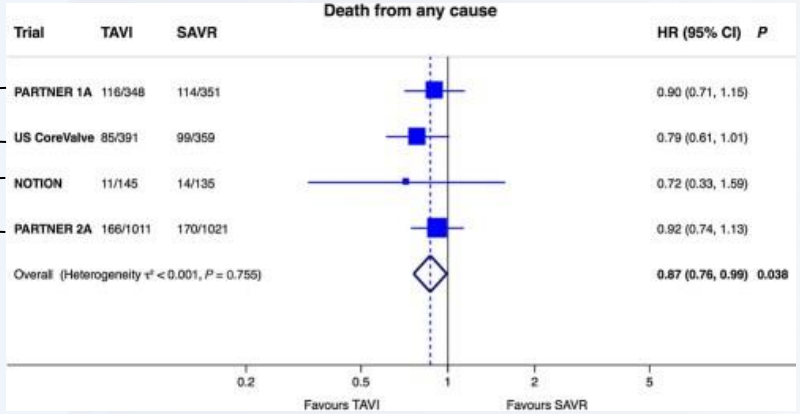
TAVI Lower Mortality than SAVR if STSscore >3

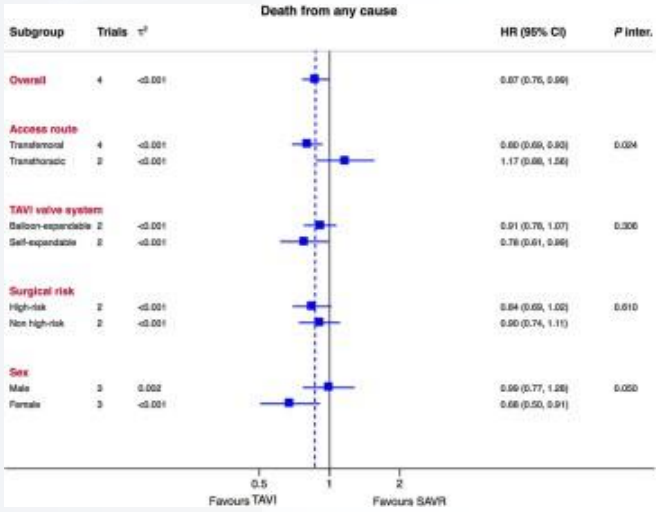
Meta-analysis of RCT
n= 3806

mean age 82 yrs

mean STSscore 8

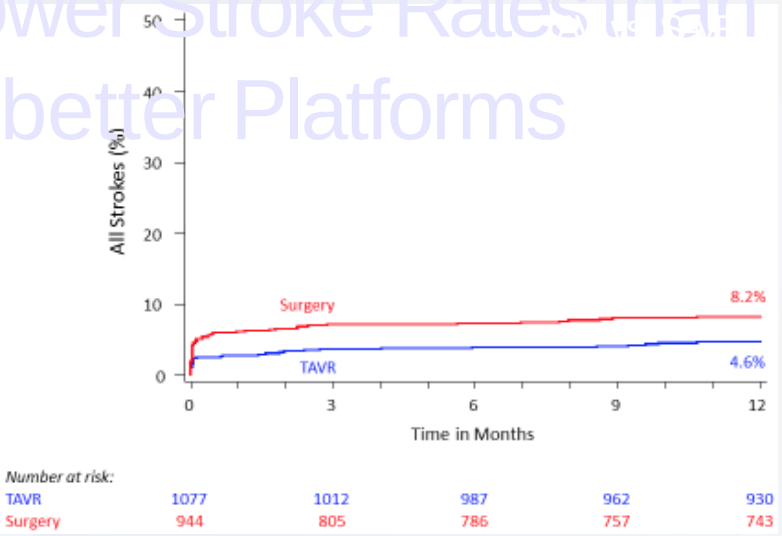
mean STSscore 4

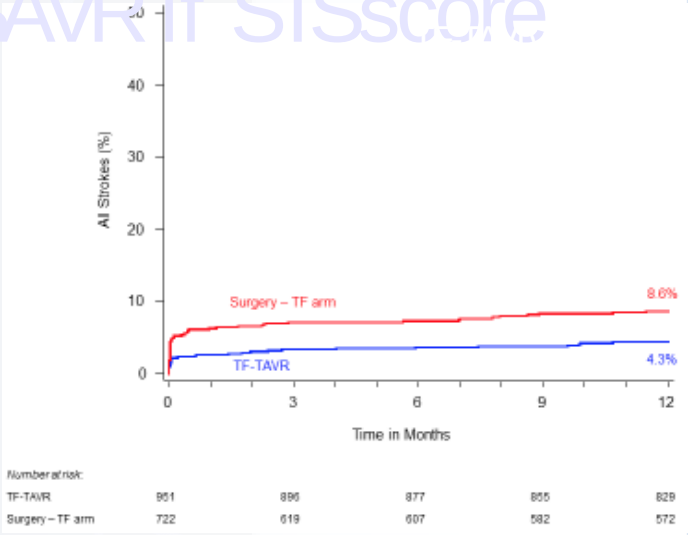




Sionitis et al., Eur Heart J2016

TAVI Lower Stroke Rates than SAVR if STSscore >3 and better Platforms

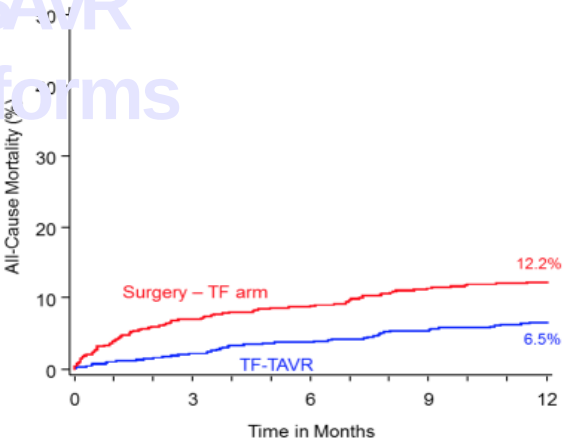




Thourani et al., Lancet 2016

TAVI Lower Mortality than SAVR if STS score >3 and better Platforms

Number at risk:					
TAVR	1077	1043	1017	991	963
Surgery	944	859	836	808	795

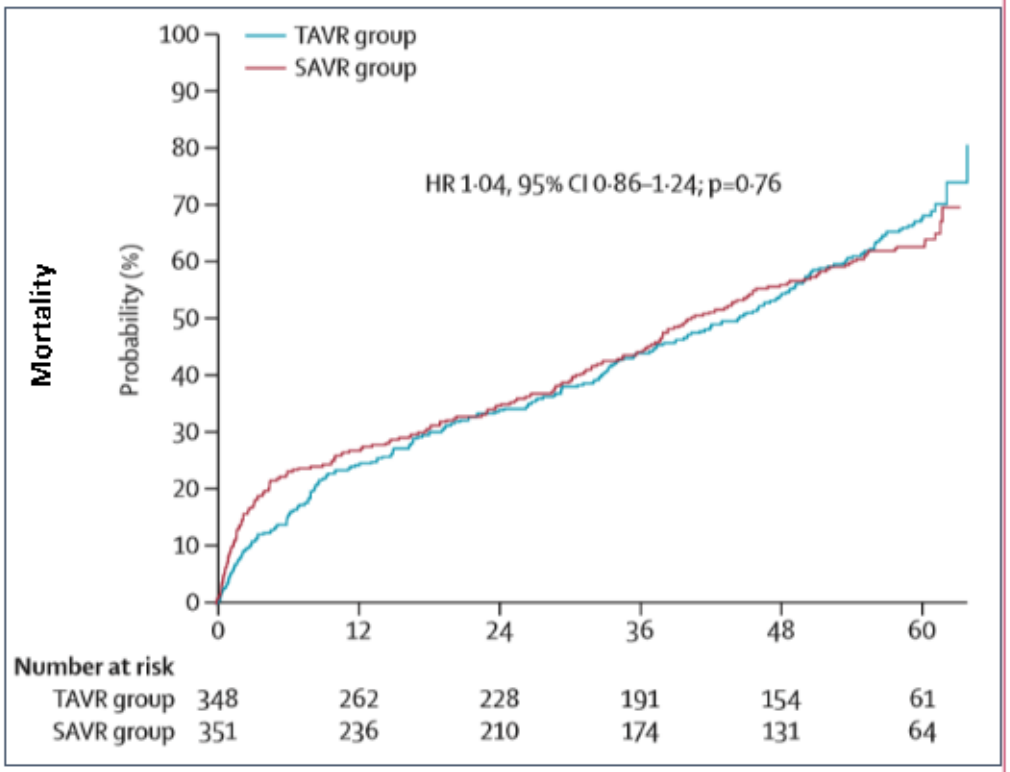


Number at risk:					
TF TAVR	951	921	903	882	858
TF arm Surgery	722	661	647	623	614

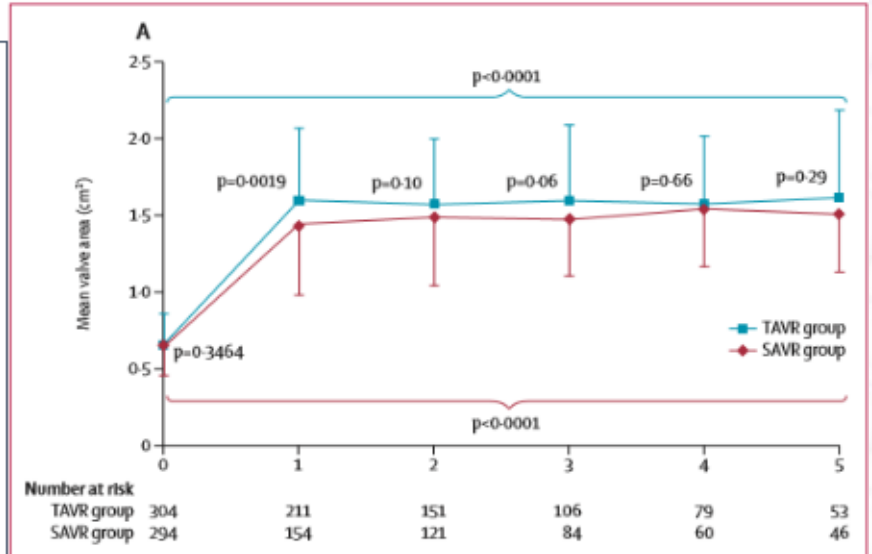
Thourani et al., Lancet 2016

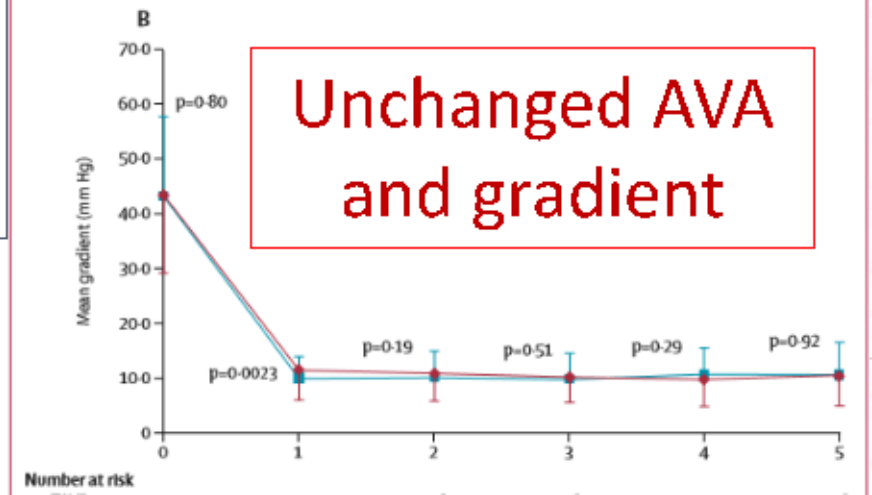
Only one randomized Trial with Follow-up at 5 yrs: PARTNER 1

Excellents Hemodynamic Results of both TAVI and SAVR



No Pt with SVD





Unchanged AVA and gradient

M Mack et al. The Lancet 2016

5-Years Durability in Registries

5-Year Outcome After Transcatheter Aortic Valve Implantation

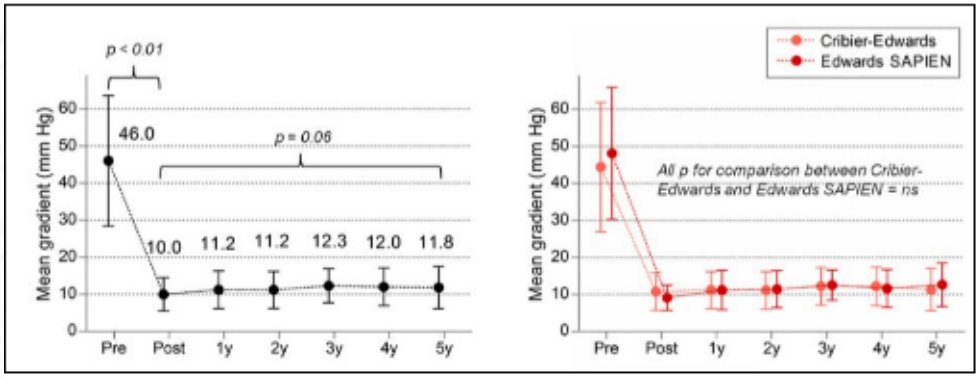
Stefan Toggweiler, MD, Karin H. Humphries, DSc, May Lee, MSc, Ronald K. Binder, MD, Robert R. Moss, MD, Melanie Freeman, MBBS, Jian Ye, MD, Anson Ch... David A. Wood, MD, John G. Webb, MD

Vancouver, British Columbia, Canada

Vancouver

JACC 2013;61:413-9

88 Pts
2005-2007



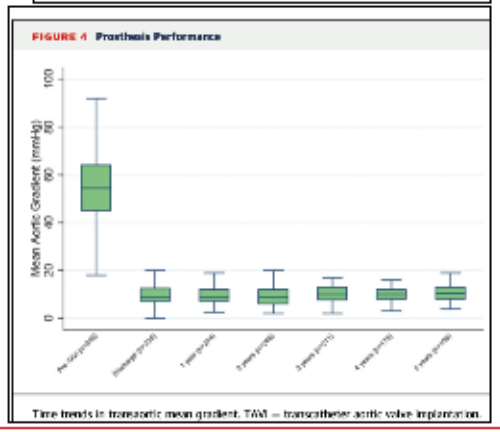
3 patients (3,4% of the total cohort) showed signs of SVD

5-Year Outcomes After Transcatheter Aortic Valve Implantation With CoreValve Prosthesis

The Italian registry

JACC Intv 2015;8:1084-91

353 Pts
2007-2009



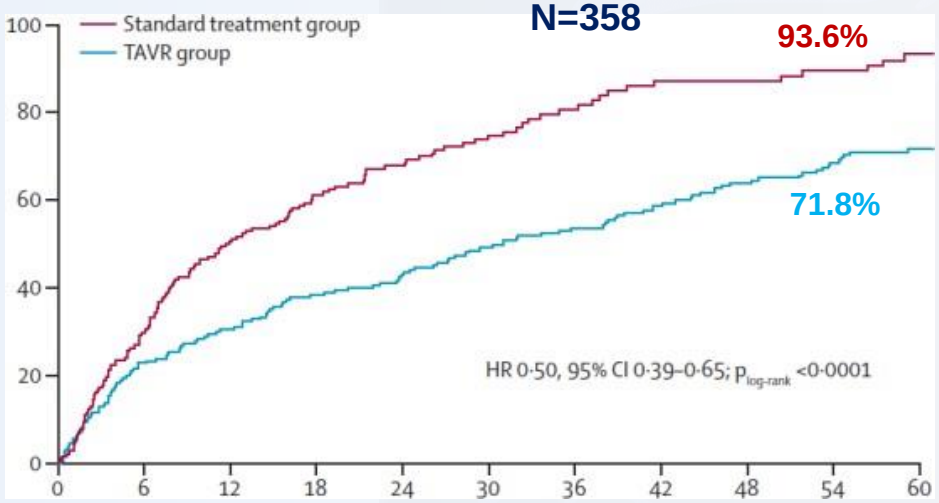
5 definite SVD cases (1.4%) requiring Redo-TAVI in 2
+ 10 (2.8%) with mild stenosis (20-40 mm Hg)

Long-Term Outcomes in Extreme Risk Patients

PARTNER 1B: 5-Year Follow-up

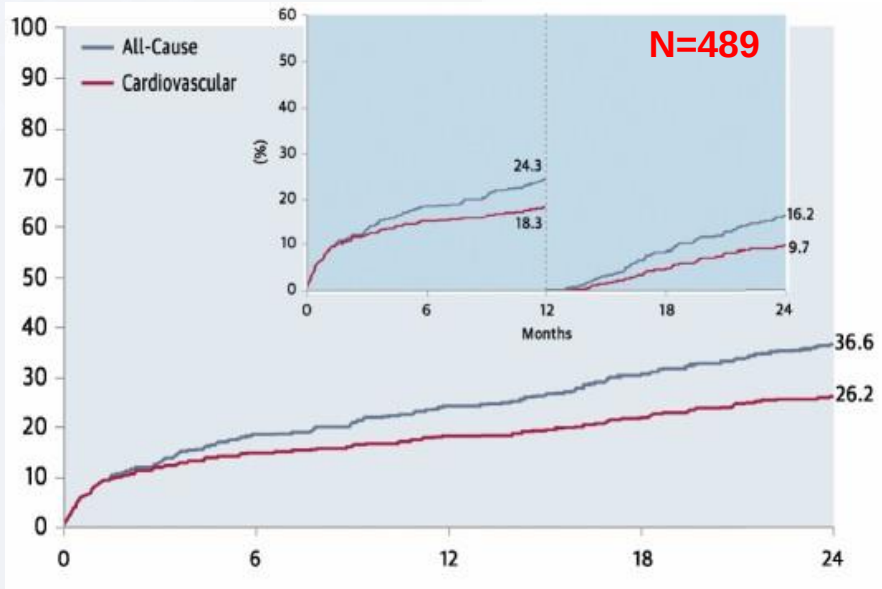
Kapadia SR et al. Lancet 2015

All-Cause Mortality



CoreValve Exteme-Risk: 3-Year Follow-up

Yakubov SJ et al. J Am Coll Cardiol 2015

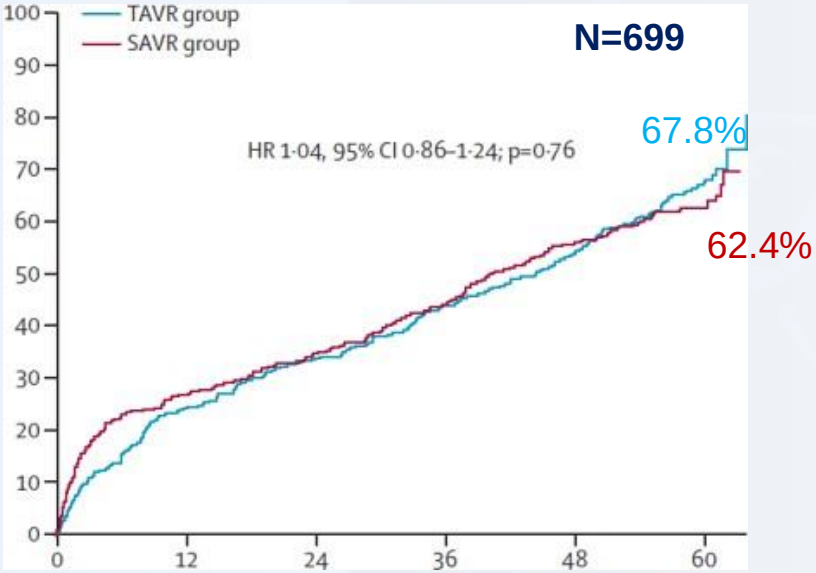


Long-Term Outcomes in High Risk Patients

PARTNER 1A: 5-Year Follow-up

Mack MJ et al. Lancet 2015

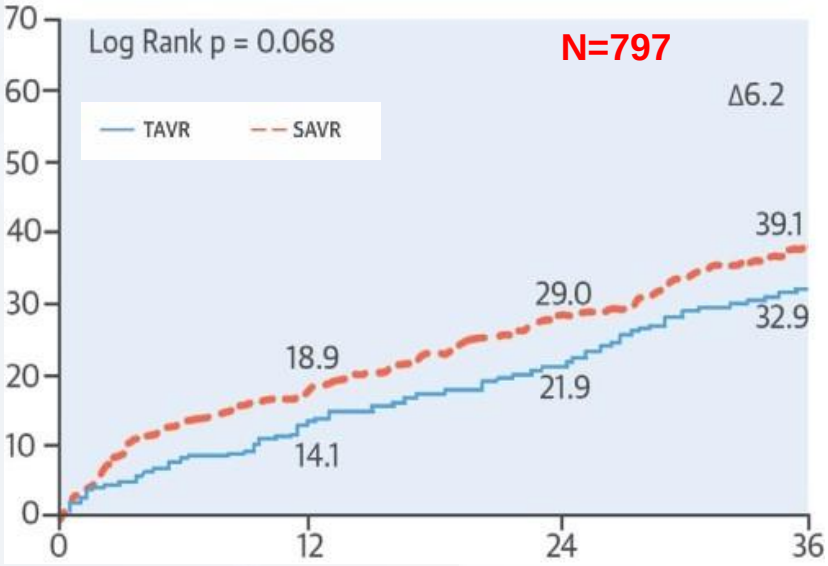
All-cause Mortality



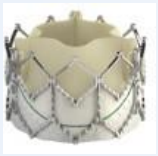
CoreValve High-Risk: 3-Year Follow-up

Deeb M et al. J Am Coll Cardiol 2016

All-cause Mortality



OUTCOMES IN INTERMEDIATE RISK PATIENTS



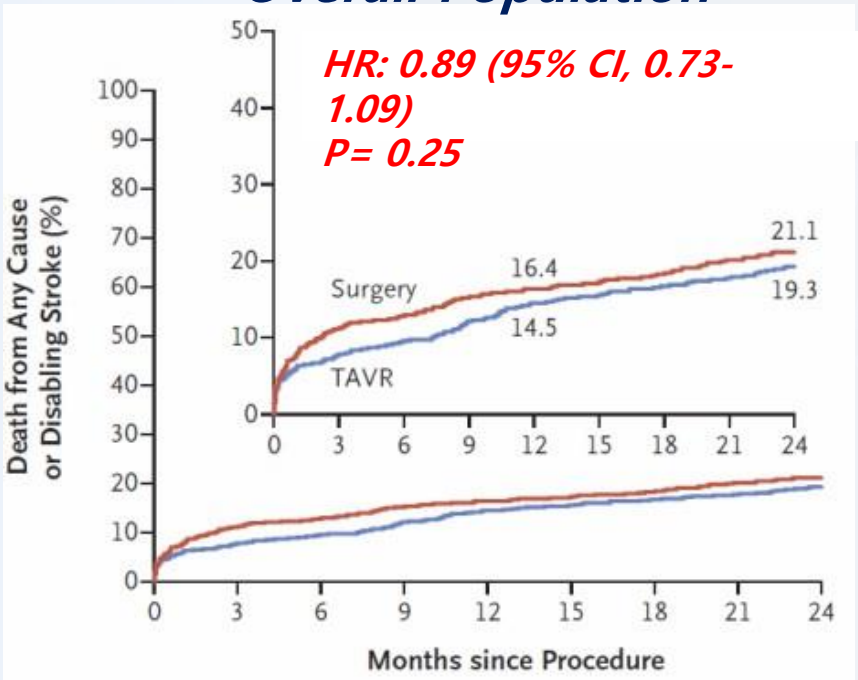
PARTNER 2A TRIAL

Leon M et al. *N Engl J Med. 2016 Apr 28;374:1609-20*

2,032 patients, mean STS score 5.8%, mean age 82 years

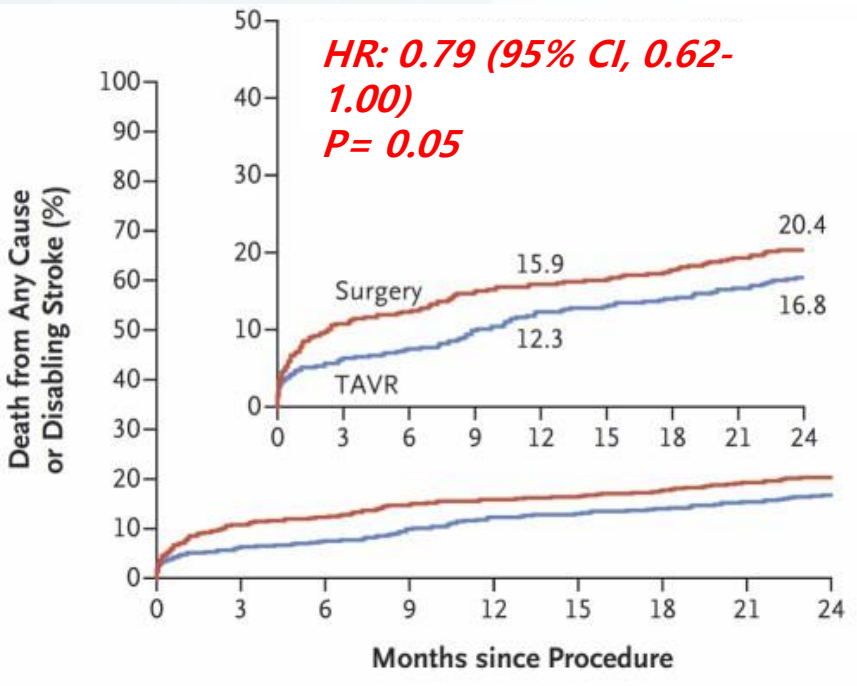
Overall Population

HR: 0.89 (95% CI, 0.73-1.09)
P= 0.25



Transfemoral Cohort

HR: 0.79 (95% CI, 0.62-1.00)
P= 0.05

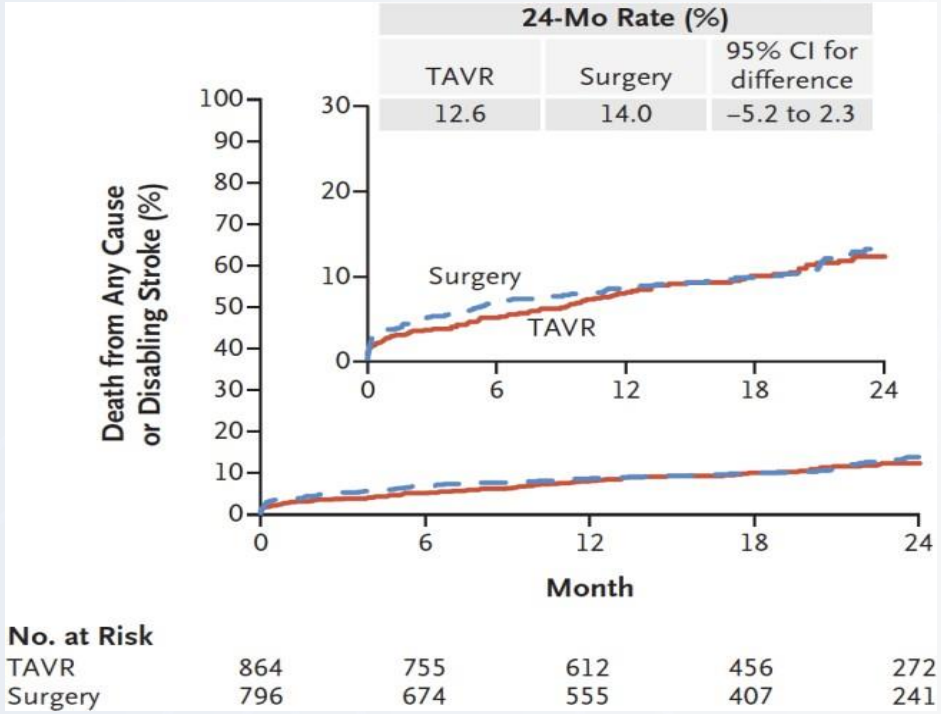


OUTCOMES IN INTERMEDIATE RISK PATIENTS

SURTAVI TRIAL

Reardon MJ et al *N Engl J Med*. 2017 Apr 6;376:1321-1331

1,746 patients, mean STS score 4.5%, mean age 80 years



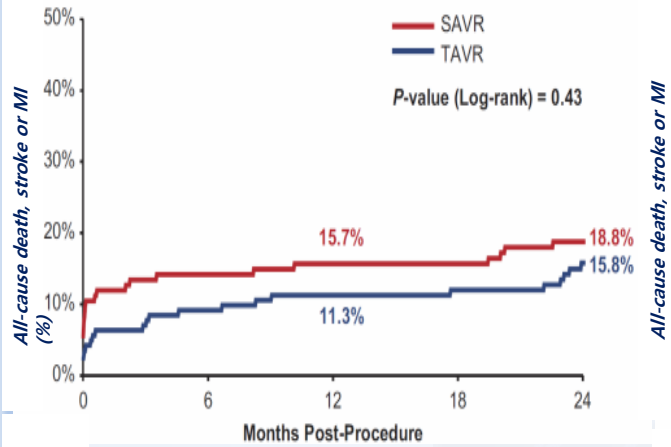
ALL-COMER PATIENTS

NOTION I TRIAL

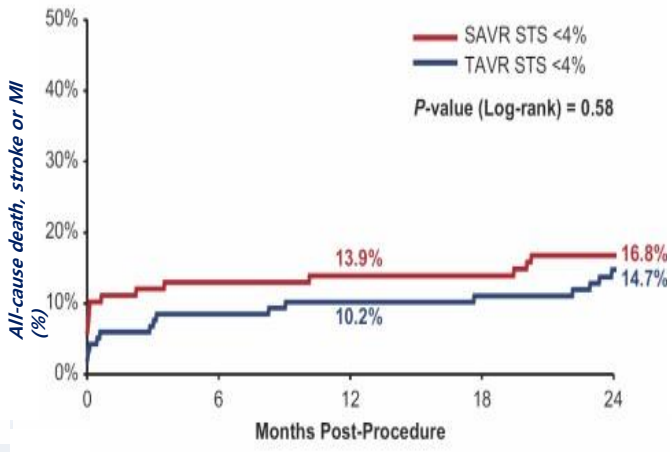
Søndergaard L et al *Circ Cardiovasc Interv.* 2016;9:e003665

280 patients, mean age 79 years, 81.8% low-risk (STS-PROM <4)

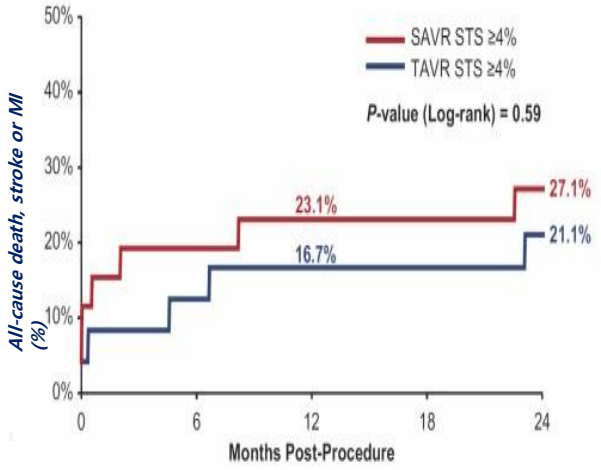
Overall Population



STS < 4%

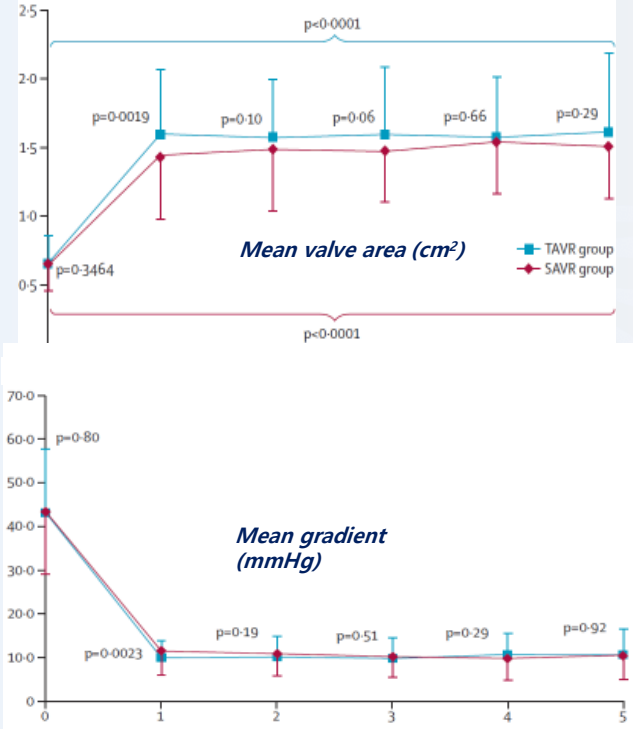


STS ≥ 4%

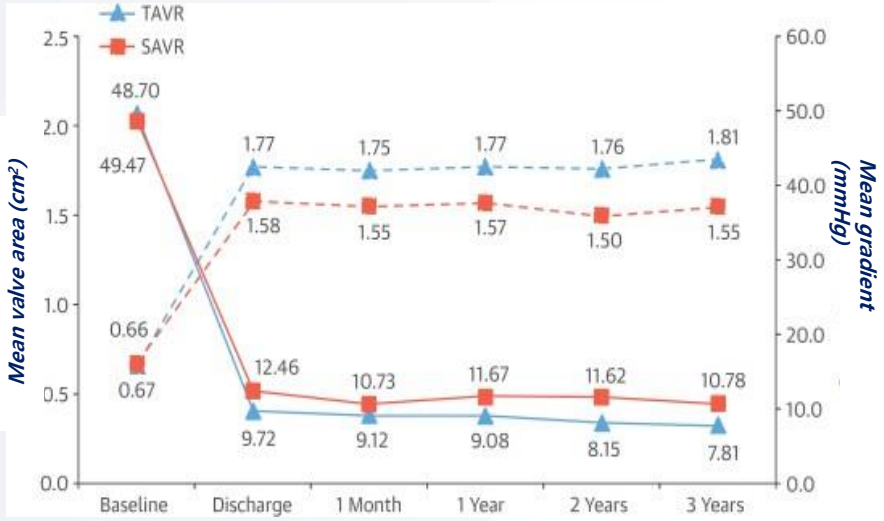


TAVI vs. SAVR: Long-Term Hemodynamic Data

PARTNER 1A: 5-Year Follow-up



CoreValve High-Risk: 3-Year Follow-up



Vielen Dank!

PURE	Ernährung
CANTOS	Antiinflammatorische Therapie der Atherosklerose
STEMI Guidelines	
PAD Guidelines	
CASTLE AF	Vorhofflimmerablation bei Herzinsuffizienz
AFFIRM	Blutdruckvariabilität bestimmt Risiko bei VHF