Iranian Cardiovascular Course 2017
in association with

Sutureless AVR vs TAVI

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Rajaie Cardiovascular Medical & Research center
Tehran , November 2017

Aortic stenosis (AS) is a deadly disease, with an estimated survival of less than 5 years after symptoms develop.

33% of patients with severe symptomatic AS did not undergo surgery (EuroHeart survey in 2005)

24% of all AS patients are more than 80 years. (STS) database

Iranian Cardiovascular Course in association with EC 2017

SOLUTION

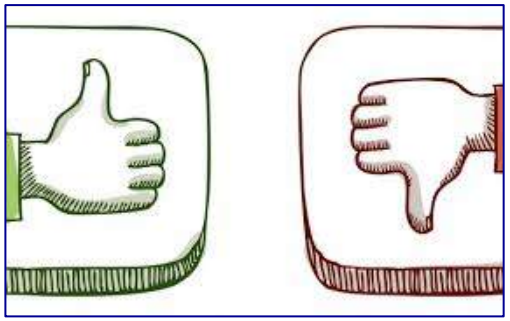
SU AVR

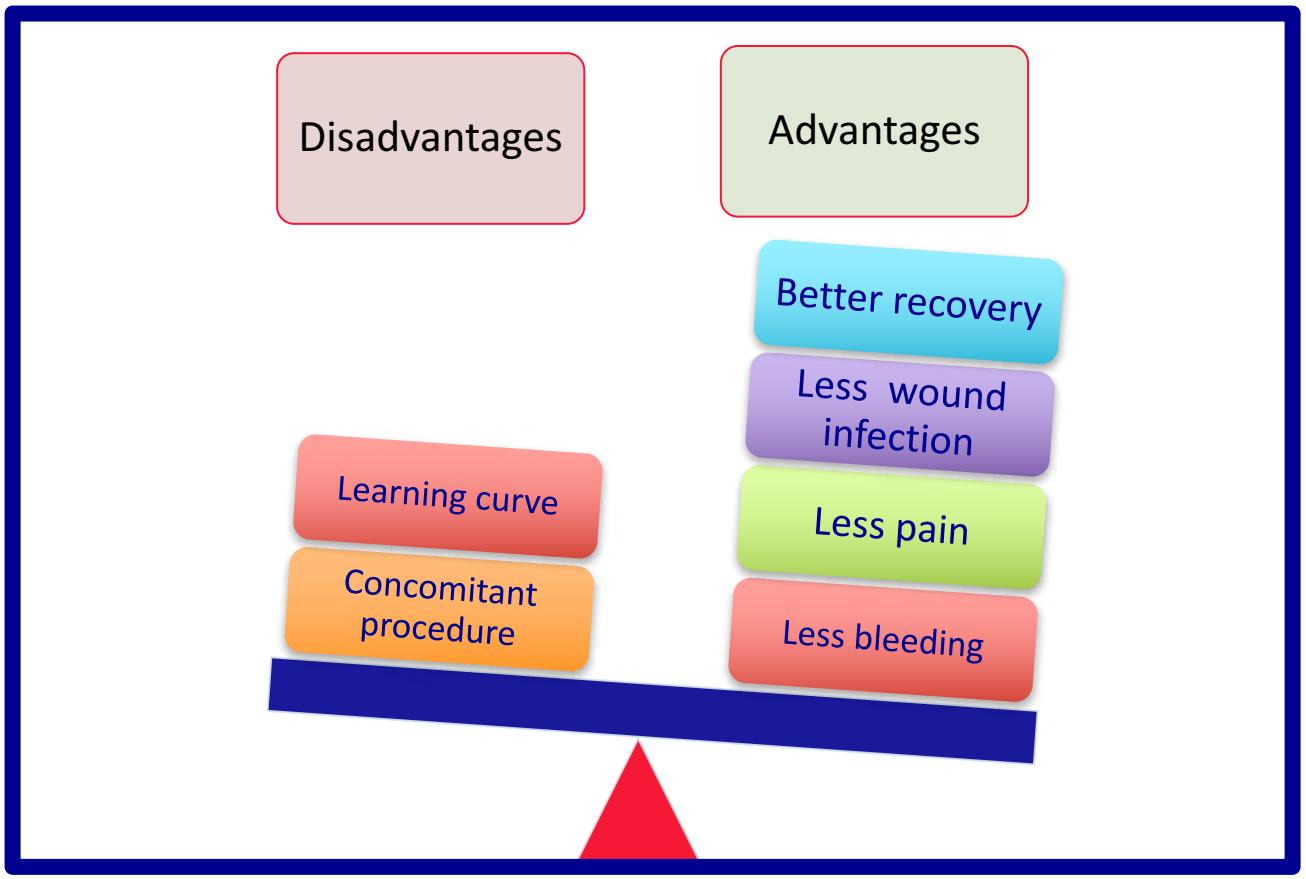
TAVI

SUAVR

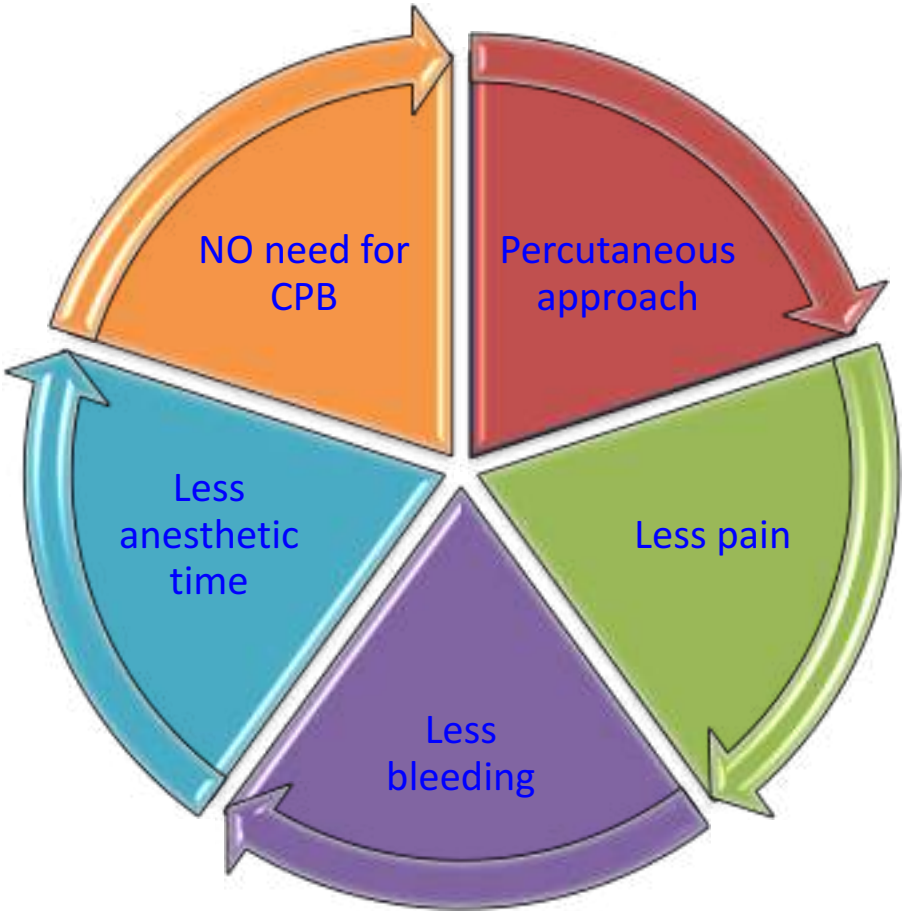
- Reduction of operation time
- Simplifies the procedure
- Replacement vs implantation
- Less CPB time and AOX
- Easier Mini-AVR
- Good EOA

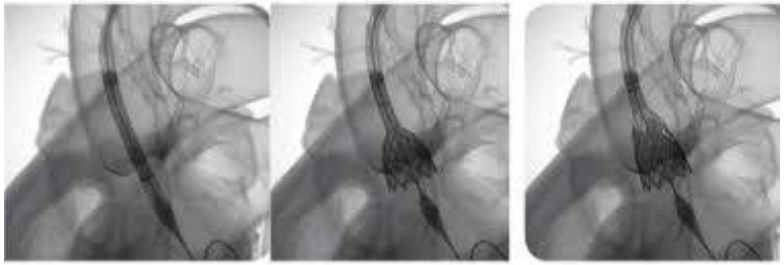
Mini AVR




Disadvantages
Advantages
Better recovery
Less wound infection
Learning curve
Less pain
Concomitant procedure
Less bleeding

TAVI


NO need for CPB
Percutaneous approach
Less pain
Less bleeding
Less anesthetic time

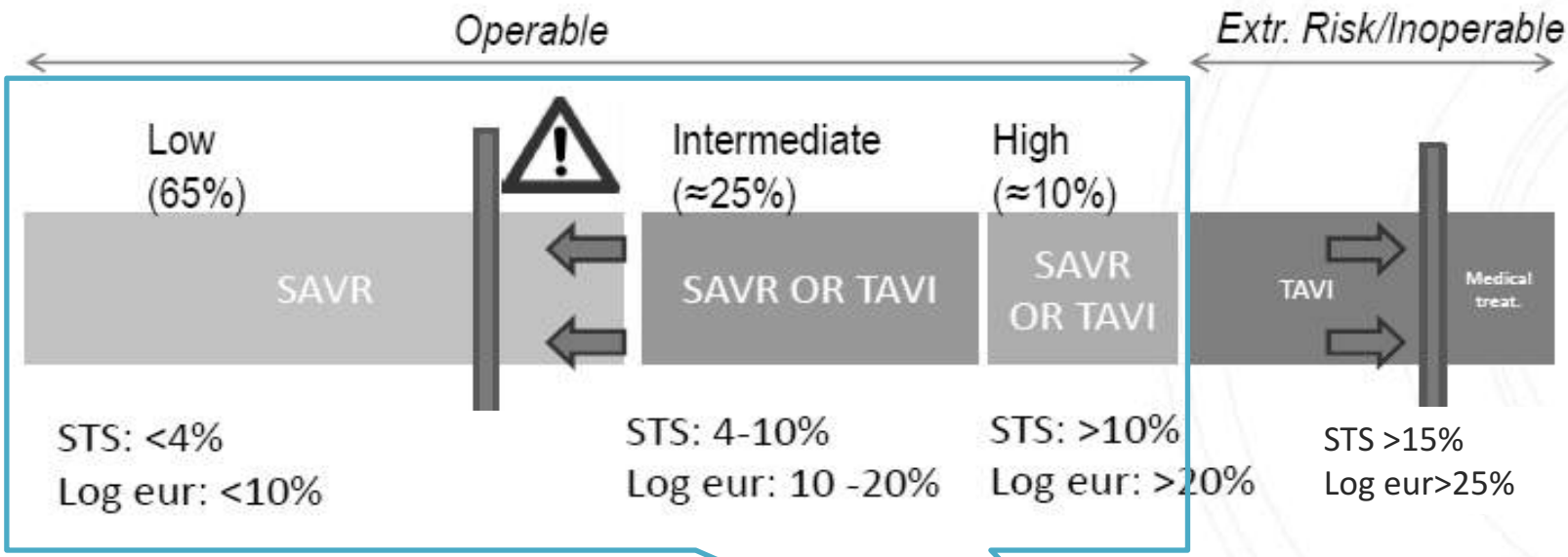


calcific native valve is not excised

AVB & PVL

Increased Mortality or Morbidity

Sutureless as alternative to conventional valves for all operable pts



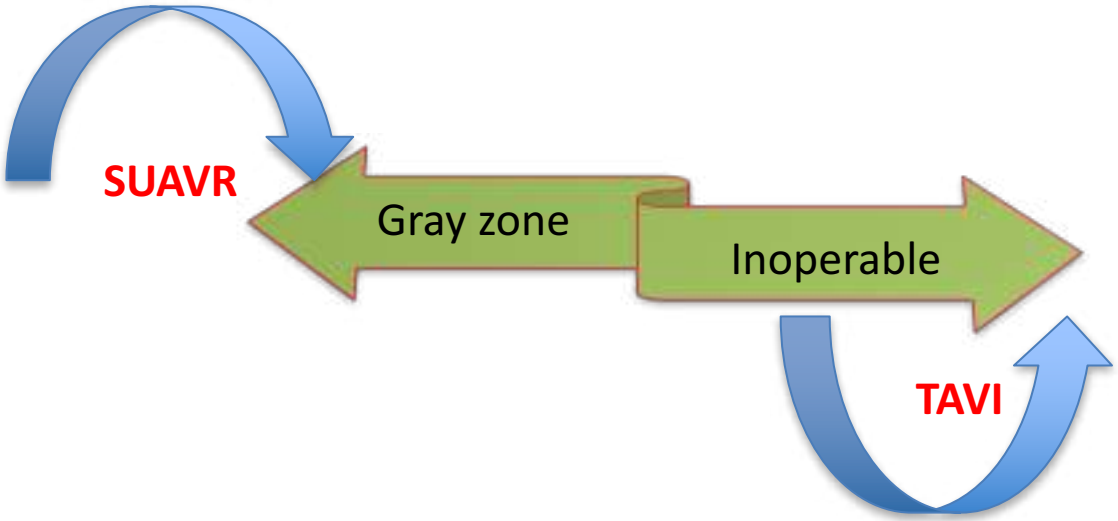
SU AVR

Sutureless aortic valve replacement as an alternative treatment for patients belonging to the "gray zone" between transcatheter aortic valve implantation and conventional surgery: A propensity-matched, multicenter analysis

Augusto D'Onofrio, MD,[a] Antonio Messina, MD,[b] Roberto Lorusso, MD,[c] Ottavio R. Alfieri, MD,[d] Melissa Fusari, MD,[c] Paolo Rubino, MD,[f] Mauro Rinaldi, MD,[g] Roberto Di Bartolomeo, MD,[h] Mattia Glauber, MD,[i] Giovanni Troise, MD,[b] and Gino Gerosa, MD[a]

The Journal of Thoracic and Cardiovascular Surgery • November 2012

No significant differences in hospital mortality, severe postoperative complications, and transprosthetic gradients between groups.



postprocedural paravalvular leak was identified as an independent predictor of late mortality after TAVI (hazard ratio, 3.79).22

TABLE 3. Postoperative outcomes after TA-TAVI and SU-AVR

Variable	TA-TAVI (n = 38)	SU-AVR (n = 38)	*P* Value
Hospital mortality, n (%)	2 (5.3)	0 (0)	.49
ARF requiring CVVH, n (%)	1 (2.6)	2 (5.3)	1.00
AMI, n (%)	0 (0)	0 (0)	1.00
Stroke, n (%)	0 (0)	0 (0)	1.00
Bleeding (life-threatening/disabling, major), n (%)	2 (5.3)	1 (2.6)	1.00
PPM implantation, n (%)	2 (5.3)	2 (5.3)	1.00
Mean transaortic gradient, mm Hg	10.25 ± 5.03	10.95 ± 3.72	.59
AR at discharge (at least mild), n (%)	17 (44.7)	6 (15.8)	.001
LVEF at discharge, % (IR)	60 (55-60)	60 (54-65)	.75
New-onset atrial fibrillation, n (%)	7 (18.4)	16 (42.1)	.04
Orotracheal intubation time, hours (IR)	4 (3-5)	5.5 (4-8)	.21

TA-TAVI, Transapical aortic valve implantation; *SU-AVR*, sutureless aortic valve replacement; *ARF*, acute renal failure; *CVVH*, continuous venovenous hemofiltration; *AMI*, acute myocardial infarction; *PPM*, permanent pacemaker; *AR*, aortic regurgitation; *LVEF*, left ventricular ejection fraction; *IR*, interquartile range.

Paravalvular leakage
New onset AFib

Sutureless replacement versus transcatheter valve implantation in aortic valve stenosis: A propensity-matched analysis of 2 strategies in high-risk patients

Giuseppe Santarpino, MD,[a] Steffen Pfeiffer, MD,[a] Jürgen Jessl, MD,[b] Angelo Maria Dell'Aquila, MD,[c] Francesco Pollari, MD,[a] Matthias Pauschinger, MD,[b] and Theodor Fischlein, MD[a]

The Journal of Thoracic and Cardiovascular Surgery c February 2014

Combining the advantage of standard diseased valve removal with shorter procedural times, minimally invasive sutureless aortic valve replacement may be the first-line treatment for high-risk patients considered in the ''gray zone'' between TAVI and conventional surgery.

Variable	AVR (n = 37)	(n = 37)	value
In-hospital mortality	0	3 (8.1%)	.24
ARF requiring CVVH	0	2 (5.4%)	.25
Stroke	2 (5.4%)	2 (5.4%)	>.999
Permanent PM implantation	4 (10.8%)	1 (2.7%)	.18
Mean transaortic gradient (mm Hg)	13.3 + 3.9	14.2 + 5.8	.564
AR at discharge (at least mild)	0	5 (13.5%)	.027

Worse survival after transcatheter aortic valve implantation than surgical aortic valve replacement: A meta-analysis of observational studies with a propensity-score analysis☆

Hisato Takagi *, Takuya Umemoto, for the ALICE (All-Literature Investigation of Cardiovascular Evidence) Group

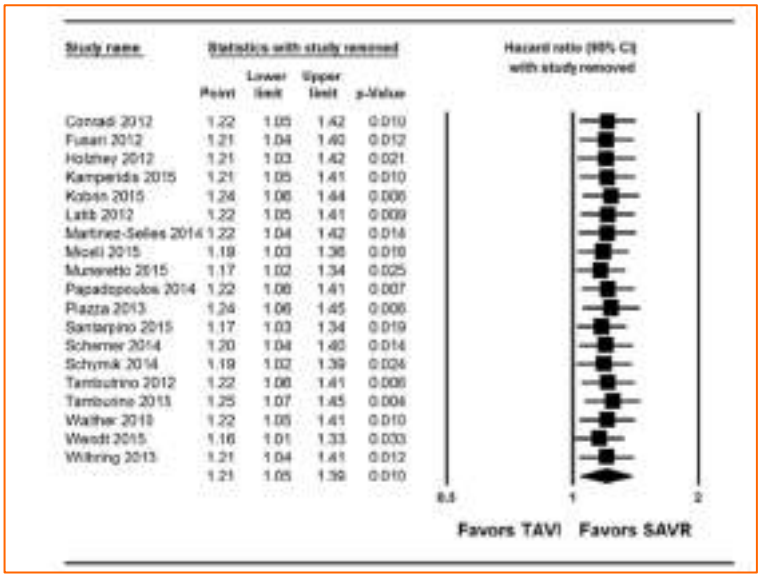
Department of Cardiovascular Surgery, Shizuoka Medical Center, Shizuoka, Japan

International Journal of Cardiology 220 (2016) 320–327

4 RCTs including a total of approximately 1800 patients

19 observational comparative studies, a total of more than 6000 patients,

All cause mortality



TAVI is likely to be associated with a

21% increase in the hazard

of follow-up all-cause mortality

relative to SAVR.

The mean of 3-year survival rates was 71.3% after TAVI and 77.9% after SAVR.

Contents lists available at ScienceDirect

Journal of Cardiology

journal homepage: www.elsevier.com/locate/jjcc

Original article

Sutureless aortic valve replacement may improve early mortality compared with transcatheter aortic valve implantation: A meta-analysis of comparative studies

Hisato Takagi (MD, PhD)*, Takuya Umemoto (MD, PhD) for the ALICE (All-Literature Investigation of Cardiovascular Evidence) Group

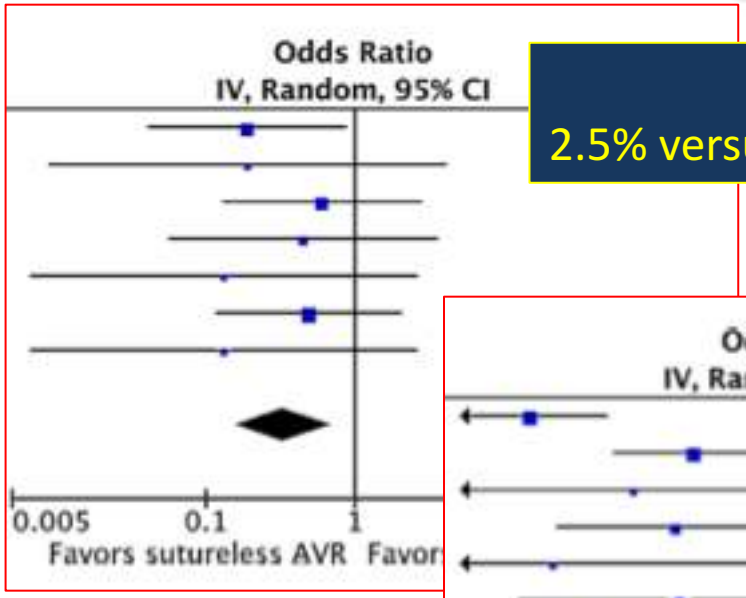
Journal of Cardiology 67 (2016) 504–512

7
Observational study, around 1000 patients

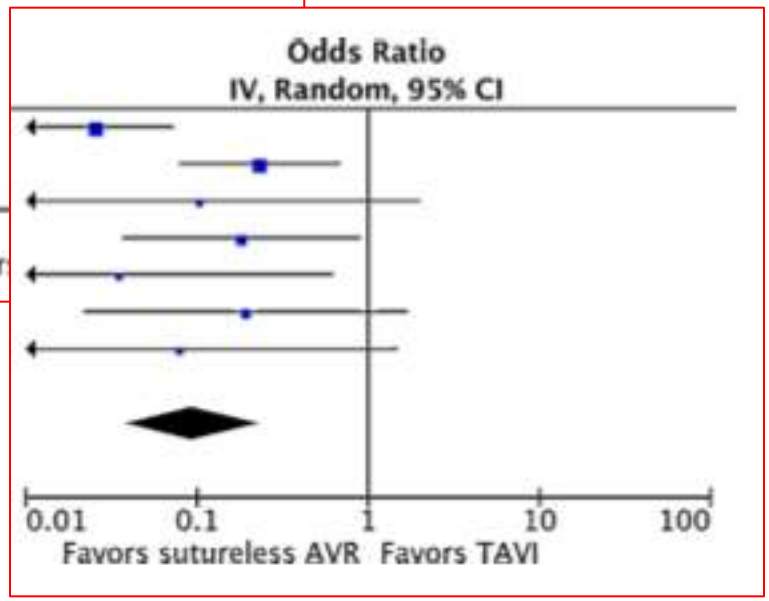
Primary End point: Early mortality

Secondary endpoints: CHB
PVL
AKI
Bleeding

Early Mortality



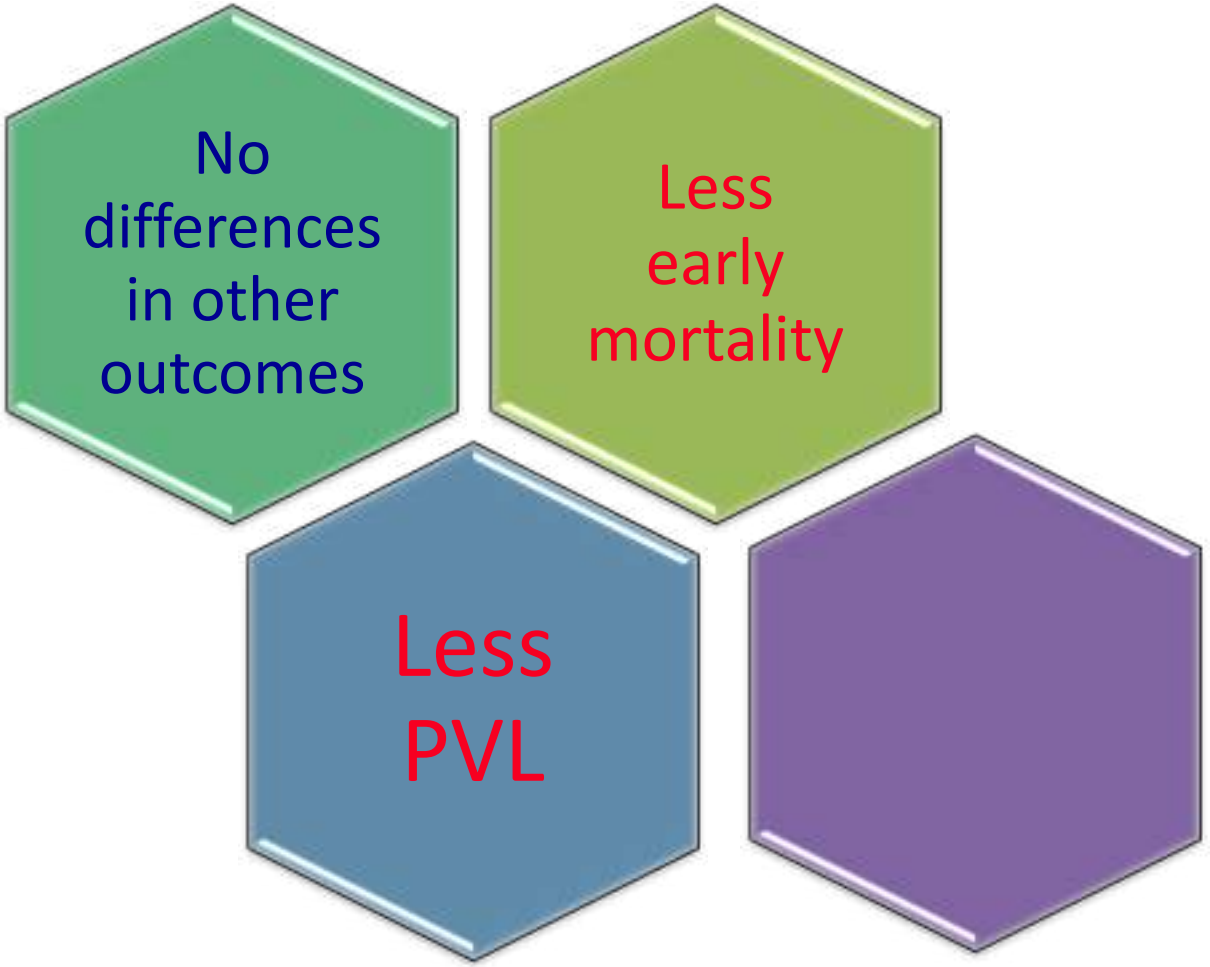
2.5% versus 7.3%; odds ratio (OR), 0.33; 95% CI p= 0.003



3.5% versus 33.2%; OR, 0.09; 95% CI,p<0.00001

P.V Leakage

SUAVR vs TAVI



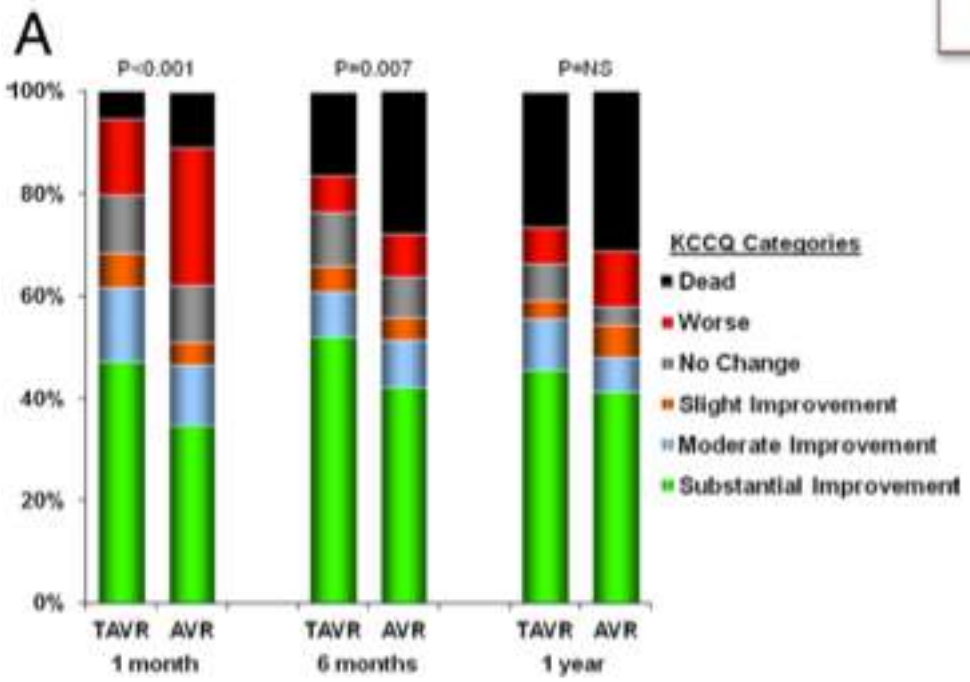
Health-Related Quality of Life After Transcatheter or Surgical Aortic Valve Replacement in High-Risk Patients With Severe Aortic Stenosis

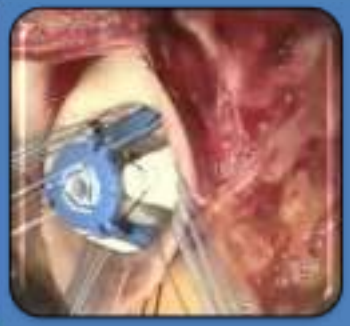
Results From the PARTNER (Placement of AoRTic TraNscathetER Valve) Trial (Cohort A)

Matthew R. Reynolds, MD, MSc,* Elizabeth A. Magnuson, ScD,† Kaijun Wang, PhD,† Vinod H. Thourani, MD,‡ Mathew Williams, MD,§ Alan Zajarias, MD,‖ Charanjit S. Rihal, MD,¶ David L. Brown, MD,# Craig R. Smith, MD,§ Martin B. Leon, MD,§ David J. Cohen, MD, MSc,† on behalf of the PARTNER Trial Investigators

Boston, Massachusetts; Kansas City and St. Louis, Missouri; Atlanta, Georgia; New York, New York; Rochester, Minnesota; and Dallas, Texas

JACC Vol. 60, No. 6, 2012
August 7, 2012:548–58





Correction of severe AS either by TAVR or AVR leads to very great improvement in patient-reported symptoms, functional status, and QOL over the first year of follow-up

The more rapid recovery from TAVR via the TF approach is associated with short-term benefits in health status, which may be important from the patient's perspective.

Tf approach had no evidence of health status benefits either in the short or medium term

Direct and adjusted indirect comparisons of perioperative mortality after sutureless or rapid-deployment aortic valve replacement versus transcatheter aortic valve implantation

Hisato Takagi [a,*,1], Tomo Ando [b,1], Takuya Umemoto [a],
for the ALICE (All-Literature Investigation of Cardiovascular Evidence) Group

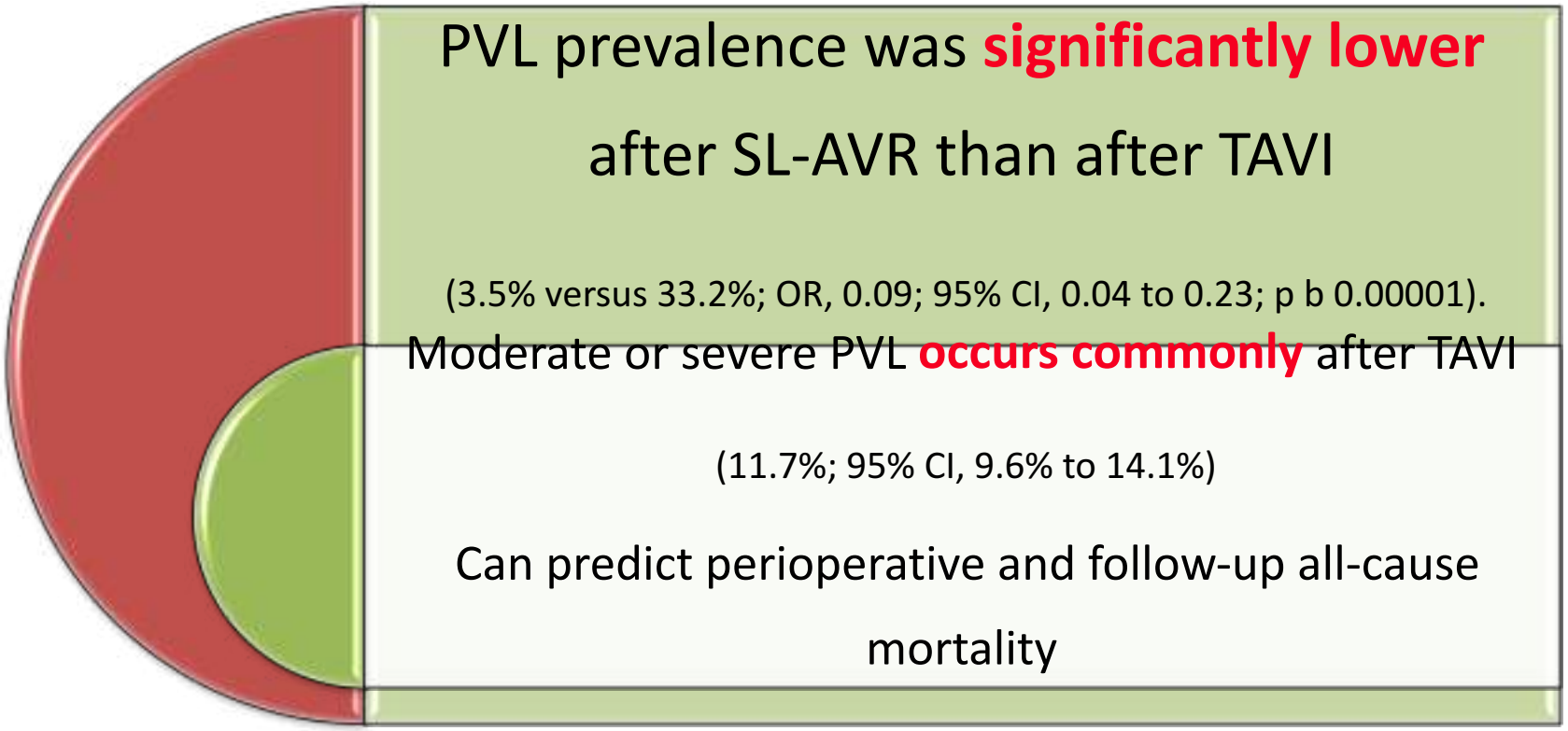
International Journal of Cardiology 228 (2017) 327–334

Tavi: Sapien XT,3 Corevalve
SL-AVR: Perceval, Intuity, Enable

6 RCT, 30 observational study
>15000 patients

Logistic euroSCORE:
SL AVR: 12
TAVI 18

Paravalvular leakage



PVL prevalence was **significantly lower**

after SL-AVR than after TAVI

(3.5% versus 33.2%; OR, 0.09; 95% CI, 0.04 to 0.23; p b 0.00001).

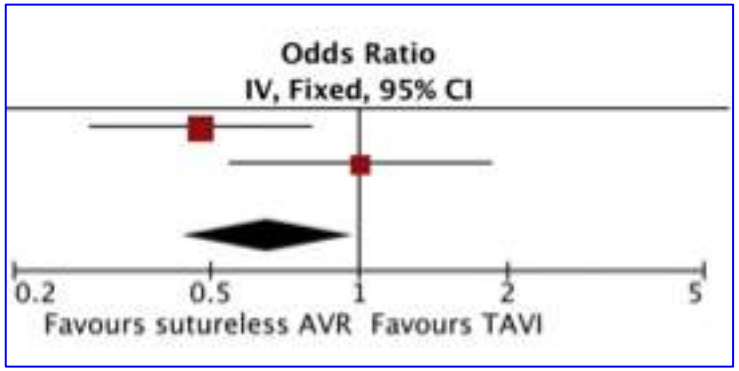
Moderate or severe PVL **occurs commonly** after TAVI

(11.7%; 95% CI, 9.6% to 14.1%)

Can predict perioperative and follow-up all-cause mortality

30 days Mortality

Significantly lower in SL-AVR than TAVI



No significant difference between C-AVR & TAVI

Transcatheter aortic valve implantation (TAVI) versus sutureless aortic valve replacement (SUAVR) for aortic stenosis: a systematic review and meta-analysis of matched studies

Nelson Wang[1], Yi-Chin Tsai[2], Natasha Niles[2], Vakhtang Tchantchaleishvili[3], Marco Di Eusanio[4], Tristan D. Yan[2], Kevin Phan[1,2]

J Thorac Dis 2016;8(11):3283-3293

Compared to TAVI, SUAVR had a lower incidence of paravalvular leak

(OR =0.06; 95% CI: 0.03–0.12, P<0.01).

There was no difference in perioperative mortality, however

SUAVR patients had significantly better survival rates at 1 (OR =2.40; 95% CI: 1.40–4.11, P<0.01) and 2 years (OR =4.62; 95% CI: 2.62–8.12, P<0.01).

Two-Year Outcomes in Patients With Severe Aortic Valve Stenosis Randomized to Transcatheter Versus Surgical Aortic Valve Replacement

The All-Comers Nordic Aortic Valve Intervention Randomized Clinical Trial

Lars Søndergaard, MD, DMSc; Daniel Andreas Steinbrüchel, MD, DMSc;

(*Circ Cardiovasc Interv*. 2016;9:e003665. DOI: 10.1161/CIRCINTERVENTIONS.115.

NOTION trial 2

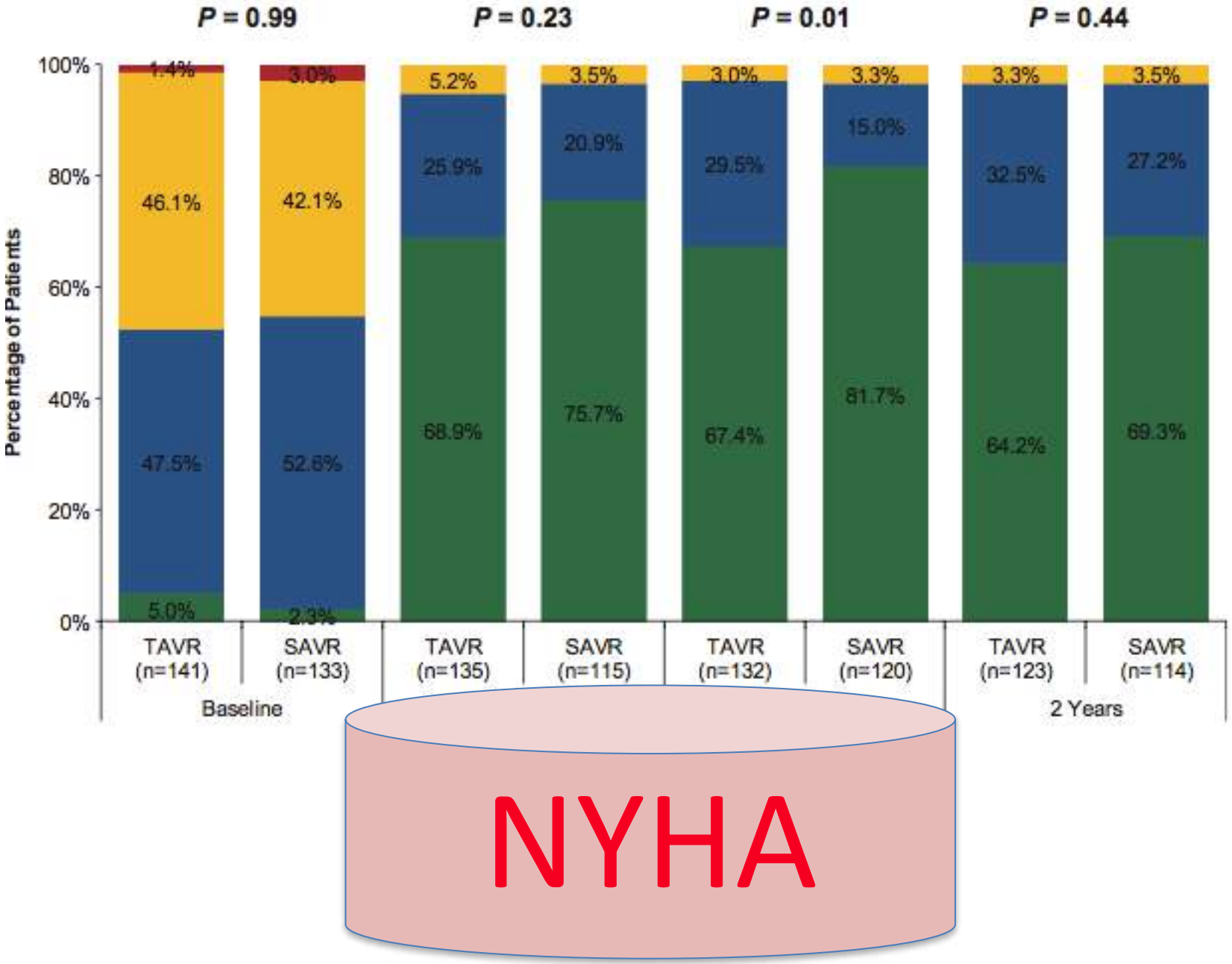
280 patients
Core valve vs
SAVR

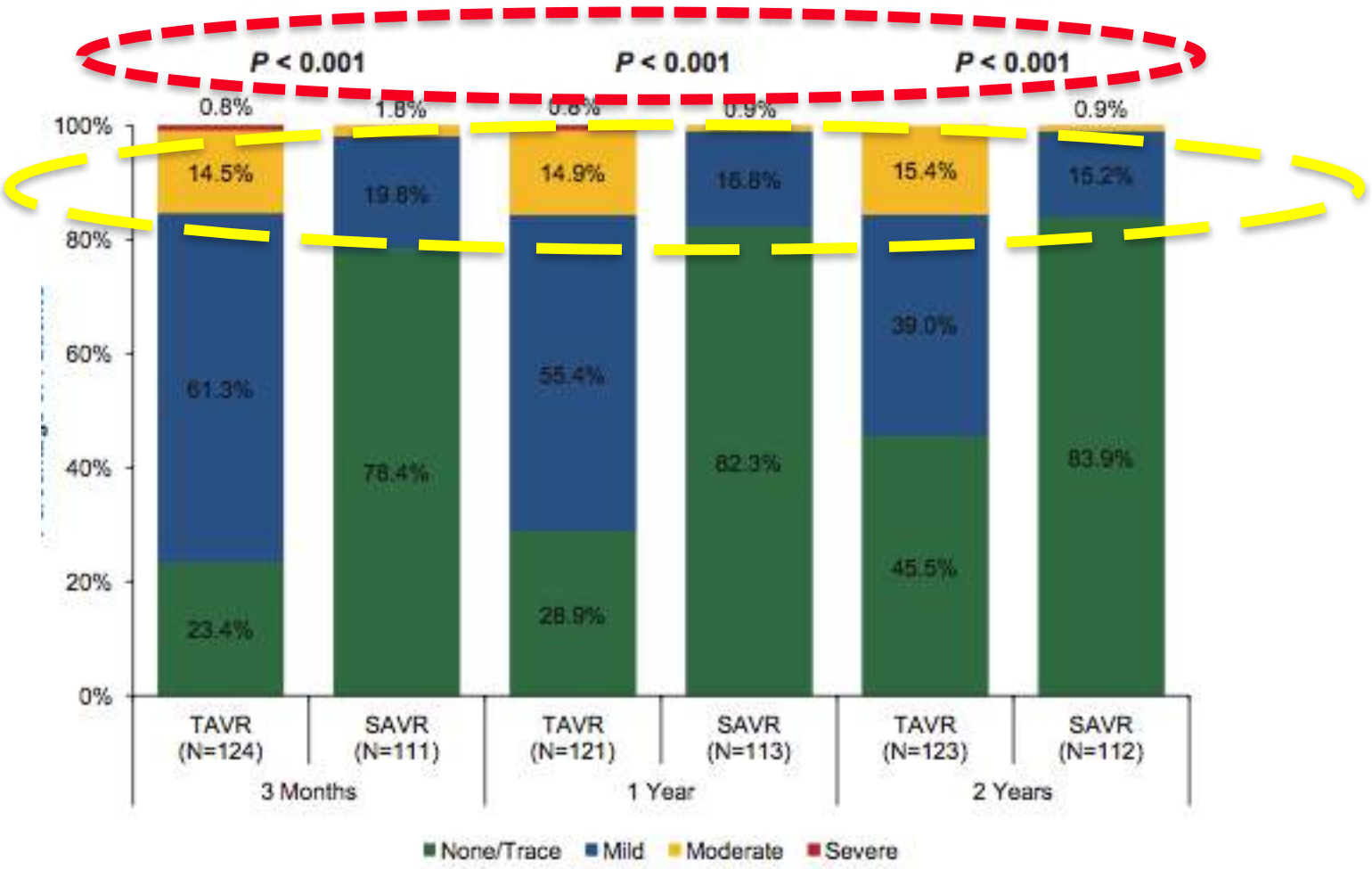
No difference in
All cause
mortality

Clinical Outcomes at 2 Years in the As-Treated Population

Characteristic	No. of Patients With Events (%)*		
	Transcatheter	Surgical	*P* Value
All-cause death	11 (8.0)	13 (9.8)	0.54
Cardiovascular death	9 (6.5)	12 (9.1)	0.40
Neurological events	13 (9.7)	10 (7.8)	0.67
Stroke	5 (3.6)	7 (5.4)	0.46
Transient ischemic attack	8 (6.0)	4 (3.3)	0.30
New-onset or worsening atrial fibrillation	32 (22.7)	80 (60.2)	<0.001
Permanent pacemaker implantation	55 (41.3)	5 (4.2)	<0.001

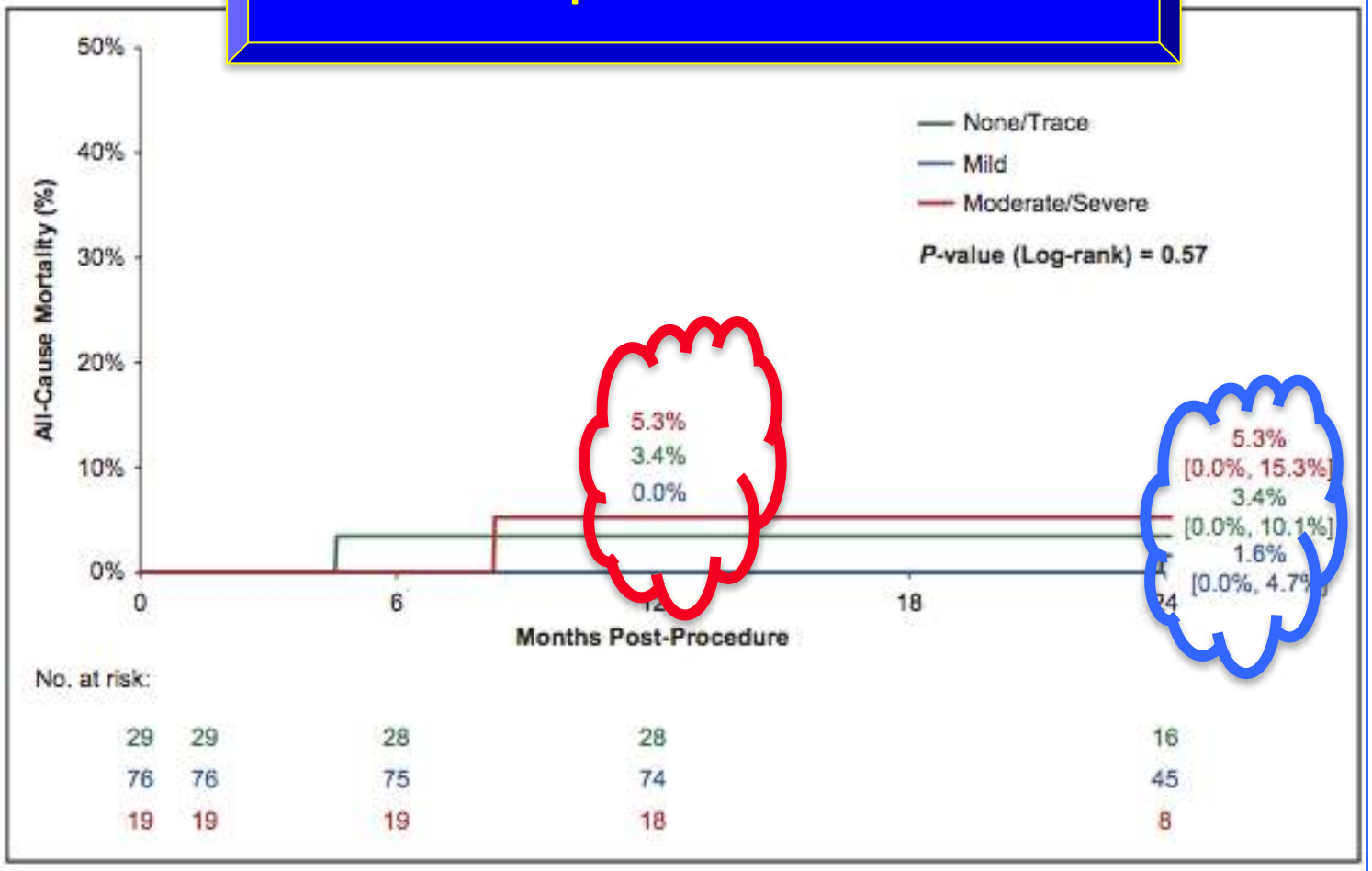
PPM A-fib


P = 0.99
P = 0.23
P = 0.01
P = 0.44
Percentage of Patients
100%
80%
60%
40%
20%
0%
1.4%
46.1%
47.5%
5.0%
3.0%
42.1%
52.6%
2.3%
5.2%
25.9%
68.9%
3.5%
20.9%
75.7%
3.0%
29.5%
67.4%
3.3%
15.0%
81.7%
3.3%
32.5%
64.2%
3.5%
27.2%
69.3%
TAVR (n=141)
SAVR (n=133)
TAVR (n=135)
SAVR (n=115)
TAVR (n=132)
SAVR (n=120)
TAVR (n=123)
SAVR (n=114)
Baseline
2 Years
NYHA



Paravalvular leakage

PVL as independent factor for death



Two-Year Outcomes in Patients With Severe Aortic Valve Stenosis Randomized to Transcatheter Versus Surgical Aortic Valve Replacement

The All-Comers Nordic Aortic Valve Intervention Randomized Clinical Trial

Lars Søndergaard, MD, DMSc; Daniel Andreas Steinbrüchel, MD, DMSc; Nikolaj Ihlemann, MD, PhD; Henrik Nissen, MD, PhD; Bo Juel Kjeldsen, MD, PhD; Petur Petursson, MD, PhD; Anh Thuc Ngo, MD, PhD; Niels Thue Olsen, MD, PhD; Yanping Chang, MS; Olaf Walter Franzen, MD; Thomas Engstrøm, MD, DMSc; Peter Clemmensen, MD, DMSc; Peter Skov Olsen, MD, DMSc; Hans Gustav Hørsted Thyregod, MD

Conclusions—Two-year results from the NOTION trial demonstrate the continuing safety and effectiveness of TAVR in lower-risk patients. Longer-term data are needed to verify the durability of this procedure in this patient population.

Surgeons Predicted [illegible] ROM) (<4% versus ≥4%), there was no statistically significant difference for TAVR and SAVR groups [illegible] composite outcome for low-risk (14.7%, 95% confidence interval, 8.3–21.2 versus 16.8%; 95% confidence interval, 9.7–23.8; P=0.58) or intermediate-risk patients (21.1% versus 27.1%; P=0.59).

Conclusions—Two-year results from the NOTION trial demonstrate the continuing safety and effectiveness of TAVR in lower-risk patients. Longer-term data are needed to verify the durability of this procedure in this patient population.

Clinical Trial Registration—URL: http://www.clinicaltrials.gov. Unique identifier: NCT01057173.

(***Circ Cardiovasc Interv***. **2016;9:e003665. DOI: 10.1161/CIRCINTERVENTIONS.115.003665.**)

INTERMEDIATE RISK PATIENTS

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 28, 2016 VOL. 374 NO. 17

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

Partner 2 trial

2032 intermediate-risk patients with severe aortic stenosis, at 57 centers,

The primary end point was death from any cause or disabling stroke at 2 years.

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
NYHA class III or IV — no./total no. (%)	782/1011 (77.3)	776/1020 (76.1)
Coronary artery disease — no. (%)	700 (69.2)	679 (66.5)
Previous myocardial infarction — no. (%)	185 (18.3)	179 (17.5)
Previous CABG — no. (%)	239 (23.6)	261 (25.6)
Previous PCI — no. (%)	274 (27.1)	282 (27.6)
Previous balloon aortic valvuloplasty — no. (%)	51 (5.0)	50 (4.9)
Cerebral vascular disease — no. (%)	325 (32.1)	317 (31.0)
Peripheral vascular disease — no. (%)	282 (27.9)	336 (32.9)
Diabetes mellitus — no. (%)	381 (37.7)	349 (34.2)
COPD — no. (%)		

Previous CABG — no. 239 (23.6) 261 (25.6)

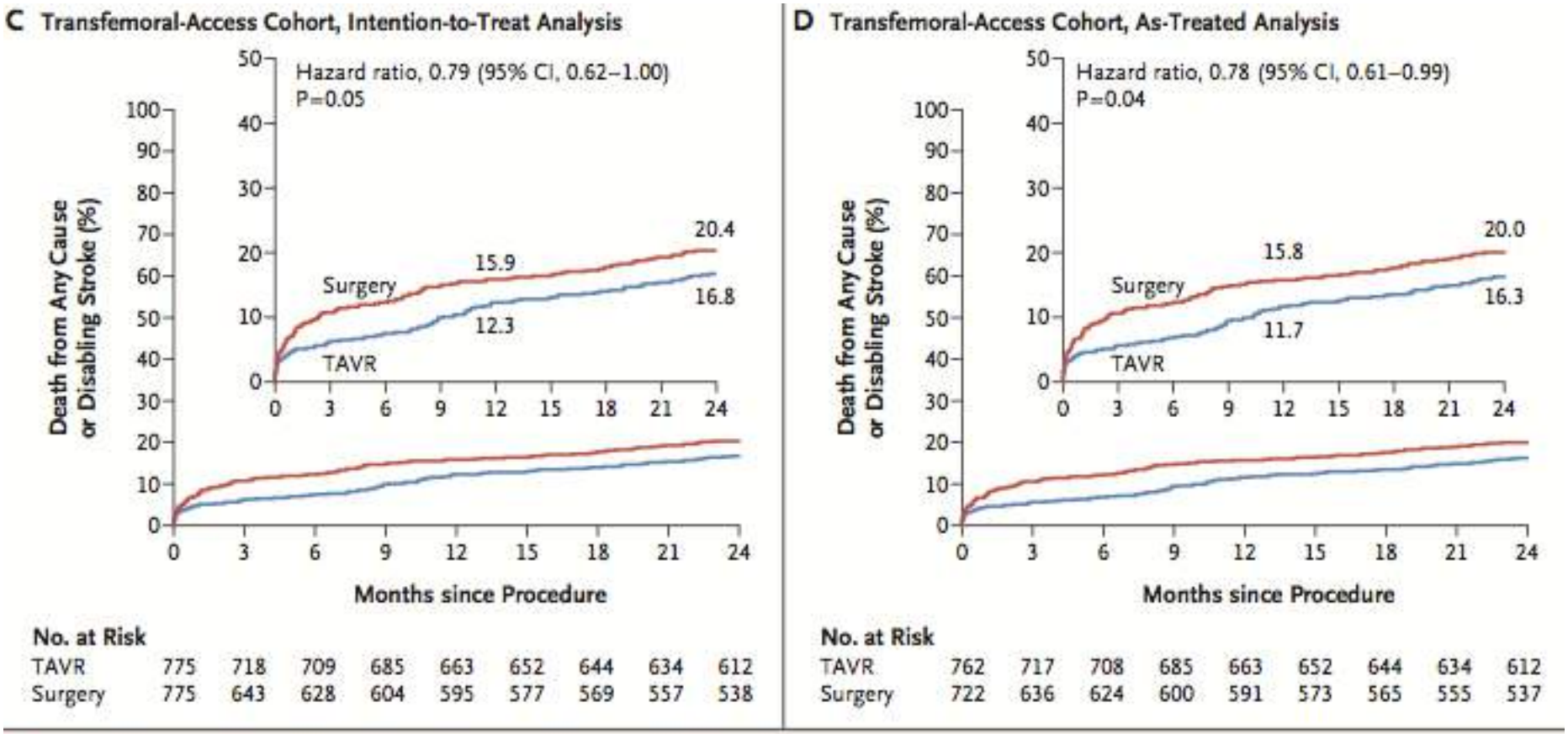
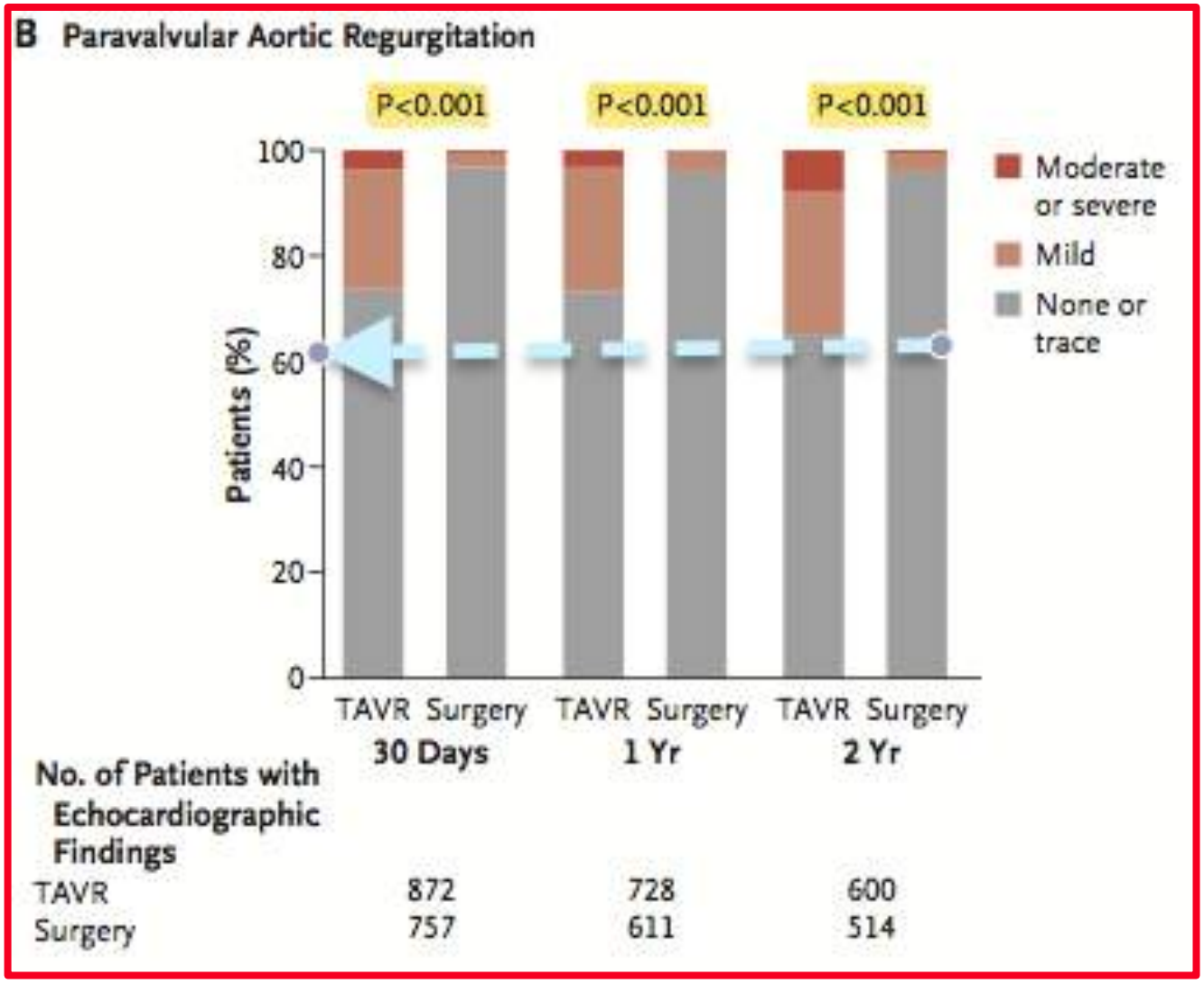
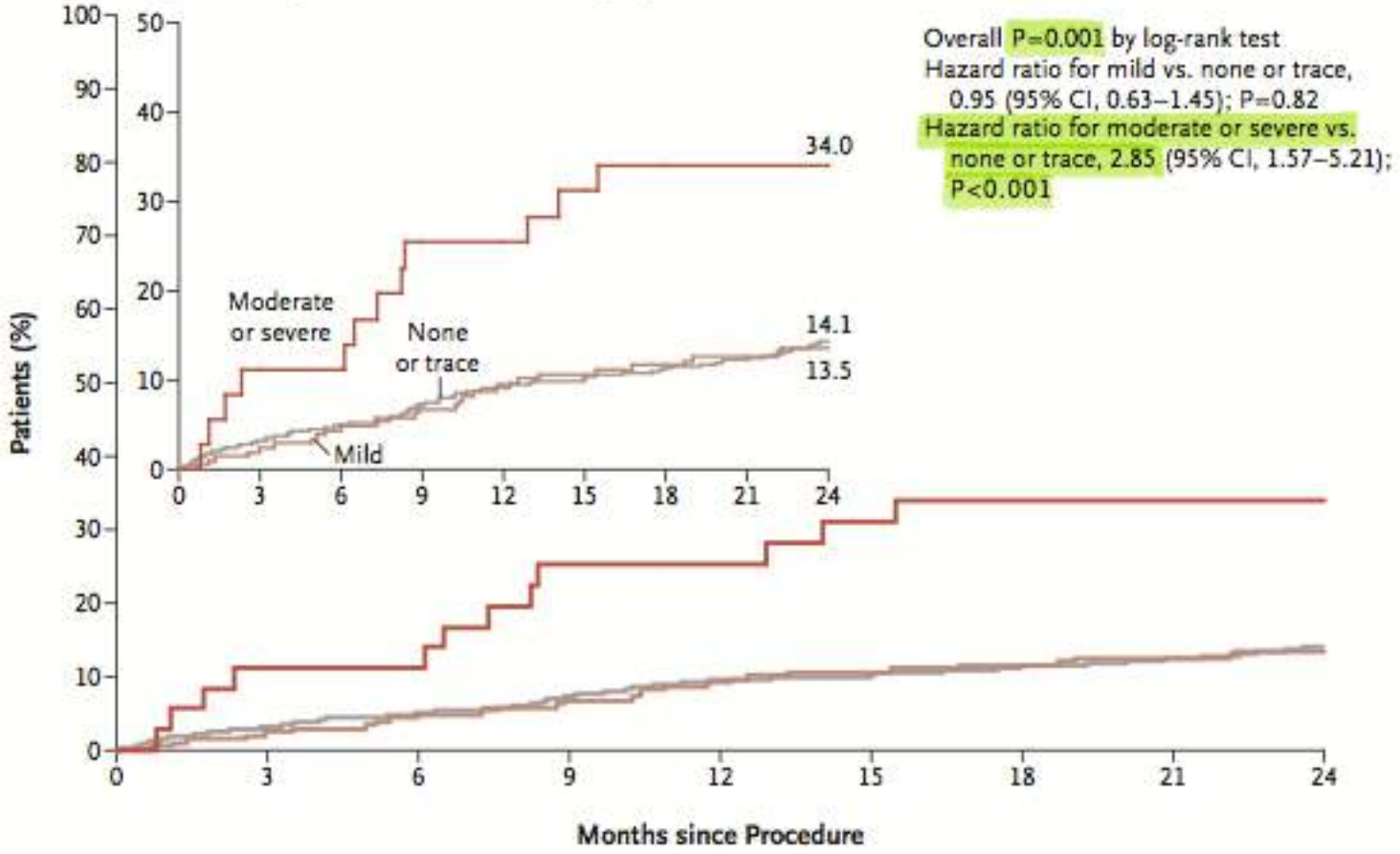


Figure 1. Time-to-Event Curves for the Primary Composite End Point.

The insets show the same data on an enlarged y axis. TAVR denotes transcatheter aortic-valve replacement.


B Paravalvular Aortic Regurgitation
P<0.001
P<0.001
P<0.001
100
80
60
40
20
0
Patients (%)
Moderate or severe
Mild
None or trace
TAVR Surgery
30 Days
TAVR Surgery
1 Yr
TAVR Surgery
2 Yr
No. of Patients with Echocardiographic Findings
TAVR 872 728 600
Surgery 757 611 514

C **Death from Any Cause, According to Severity of Paravalvular Aortic Regurgitation**



No. at Risk									
None or trace	701	678	664	647	628	621	612	605	585
Mild	210	204	199	194	188	184	182	180	175
Moderate or severe	36	32	32	26	26	24	22	22	21

Coronary revascularization was more commonly performed in the surgery group than TAVR (13.5% vs 3.9%)

The addition of either CABG or PCI to valve-replacement therapies had no deleterious effect on mortality or the rate of stroke.

Summary of Partner 2 trial

No difference in cardiac death and all cause mortality or CVA

AKI , post-op A-Fib, bl[illegible] a[illegible] c[illegible] in SAVR

26% redo in SAVR

Vs

24% protected TAVI

Paravalv[illegible] in TAVI

Moderate or sever PVL significantly increase the mortality

Re-intervention are more common in TAVI

MACCE no difference

Bleeding complication was higher in SU-AVR

773 patients

No Randomized trial included

TAVI (394 patients, mean age, 80.8 ± 5.5 years, mean EuroSCORE II 5.6 ± 4.9 %)

In-hospital mortality

2.6 % after SU-AVR and 5.3 % after TAVI ($p = 0.057$)

PPM need

(17.3 vs. 9.8 %, $p = 0.003$)

Mild (44.0 vs. 2.1 %) **paravalvular regurgitation** moderate–severe (14.1 vs. 0.3 %, $p < 0.0001$

Sutureless aortic valve replacement versus transcatheter aortic valve implantation: a meta-analysis of comparative matched studies using propensity score matching

Massimo Meco[a,†], Antonio Miceli[b,c,†], Andrea Montisci[b,*,†], Francesco Donatelli[b,d], Silvia Cirri[b], Matteo Ferrarini[b], Antonio Lio[b] and Mattia Glauber[b]

Interactive CardioVascular and Thoracic Surgery (2017) 1–8

Table 2: Patient preoperative characteristics

	Sutureless		OR (95% CI)/(WMD)	*P*-value
Female gender (%)	48.25		0.93 (0.75 to 1.15)	0.48
Preoperative renal insufficiency (%)			0.88 (0.69 to 1.129)	0.29
Hypertension (%)			(0.60 to 2.78)	0.51
Redo (%)			(0.54 to 1.09)	0.13
Diabetes			0.99 (0.75 to 1.30)	0.94
CAD (%)	9		0.86 (0.58 to 1.26)	0.43
Extracardiac arteriopathy (%)	19.4		1.07 (0.82 to 1.4)	0.63
NYHA Class III–IV (%)	68.6		1 (0.78 to 1.28)	1
LVEF (%), mean ± SD	55.2 ± 8.6	.7 ± 6.8	0.78 (-1.07 to 2.62)	0.41
Age (years), mean ± SD	78.96 ± 4.6	78.91 ± 6	-0.16 (-0.90 to 0.57)	0.66
EuroSCORE, mean ± SD	15.45 ± 9	15.58 ± 8.1	-0.36 (-1.11 to 0.40)	0.35

NO difference

CAD: coronary artery disease; CI: confidence interval; LVEF: left ventricular ejection fraction; NYHA: New York Heart Association; OR: odds ratio; TAVI: transcatheter aortic valve implantation; WMD: weighted mean difference.

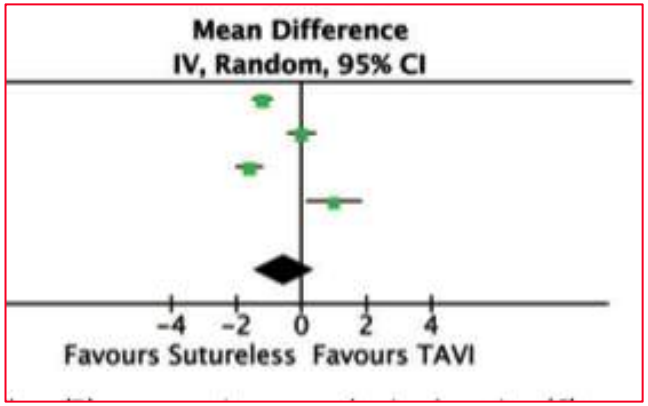
Stroke
PVL
PPM need
Vascular complication Higher rates in TAVI

Table 3: Postoperative data

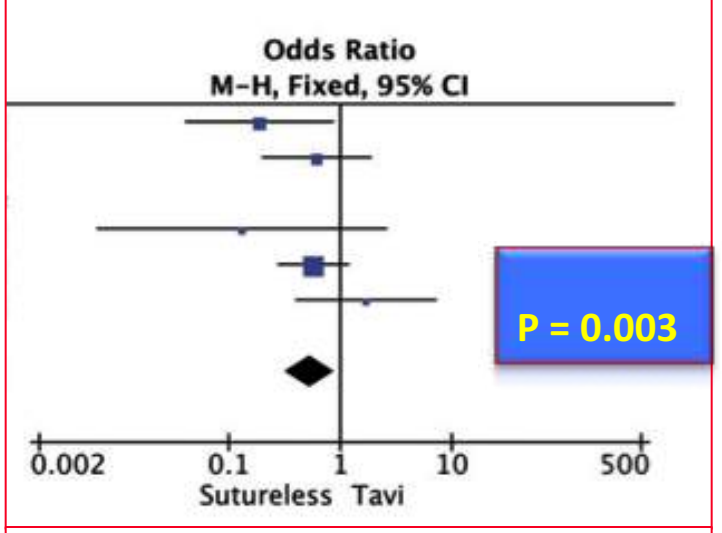
	SU-AVR	TAVI	*P*-value
30-days mortality (%)	24/741 (3.23)	44/741 (5.93)	0.01
Postoperative stroke (%)	12/741 (1.61)	27/741 (3.64)	0.01
Postoperative aortic regurgitation (%)	21/731 (2.8)	133/731 (18.19)	0.001
Postoperative AKI (%)	35/527 (6.51)	37/527 (6.89)	0.8
Pacemaker implantation (%)	69/741 (9.31)	70/741 (9.44)	0.9
Transfused patients (%)	88/426 (20.6)	26/424 (6.1)	0.001
Vascular complications (%)	0/490 (0)	41/490 (8.36)	0.001

AKI: acute kidney injury.

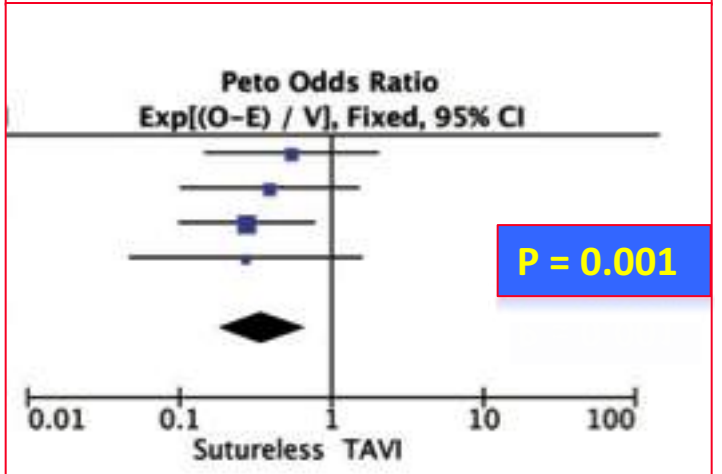
Similar ICU stay



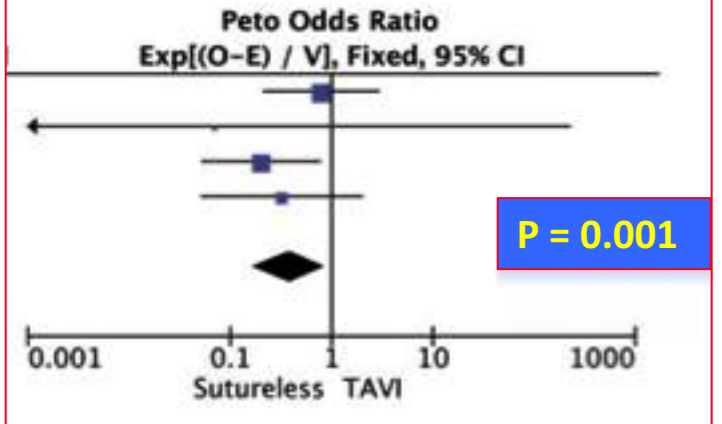
In hospital death



1 yr Survival



2 yr Survival



Sutureless Aortic Valve Replacement International Registry (SU-AVR-IR): design and rationale from the International Valvular Surgery Study Group (IVSSG)

Annals of cardiothoracic surgery, Vol 4, No 2 March 2015

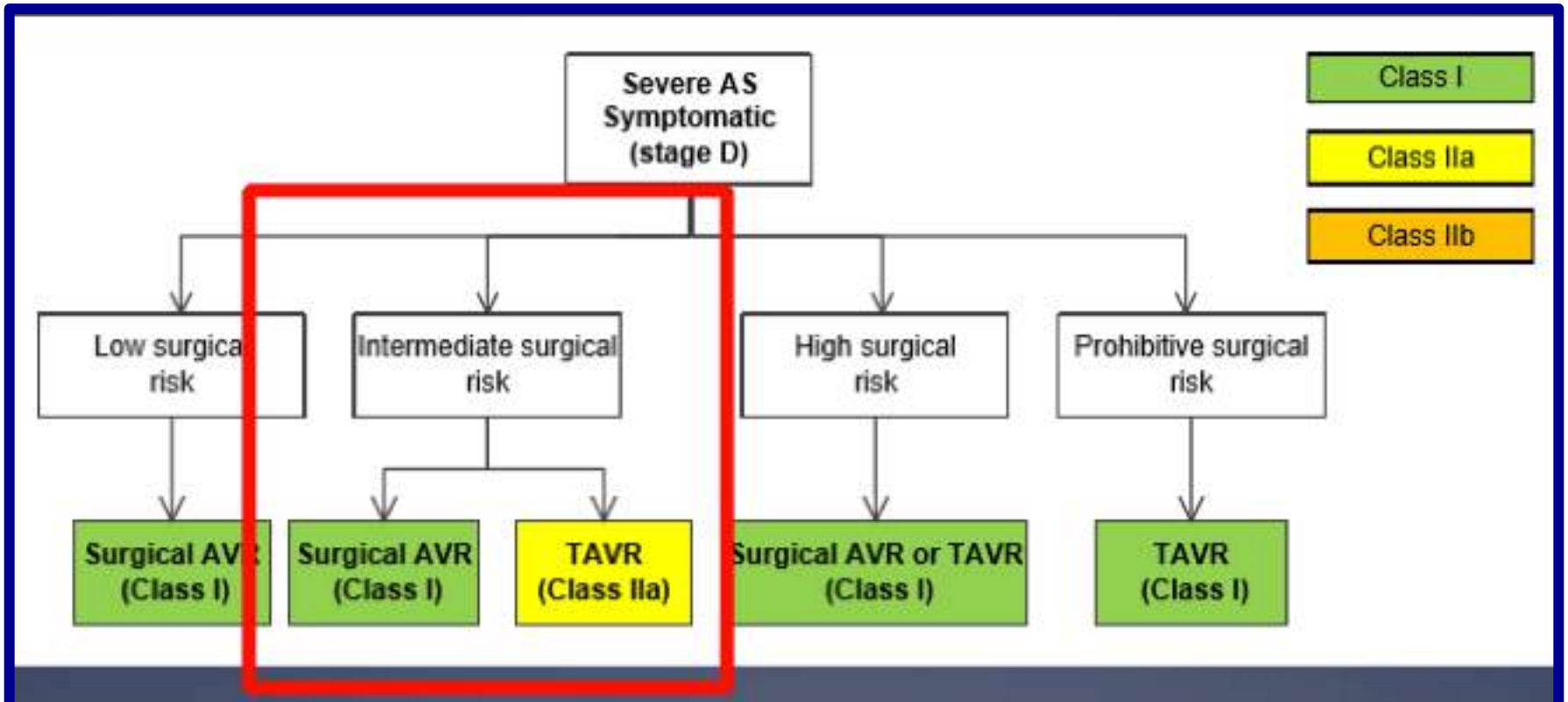
...ard[3], Thierry P. Carrel[4], Otto E. Dapunt[5], Roberto Di ... Fischlein[7], Thierry Folliguet[8], Borut Gersak[9], Mattia ...eter J. Oberwalder[5], Giuseppe Santarpino[7], Malakh Lal ...esco Alamanni[15], Alberto Albertini[16], Gopal Bhatnagar[17], ...llart[19], Utz Kappert[20], Alfred Kocher[21], Bart Meuris[22], ...etier[24], Parwis Baradaran Rahmanian[25], David Reineke[4], ...a[27], Thorsten Wahlers[25], Tristan D. Yan[2]

37 expert surgeon in Mini-AVR
26 high volume center

2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease

A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines

Developed in Collaboration With the American Association for Thoracic Surgery, American Society of Echocardiography, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Anesthesiologists, and Society of Thoracic Surgeons

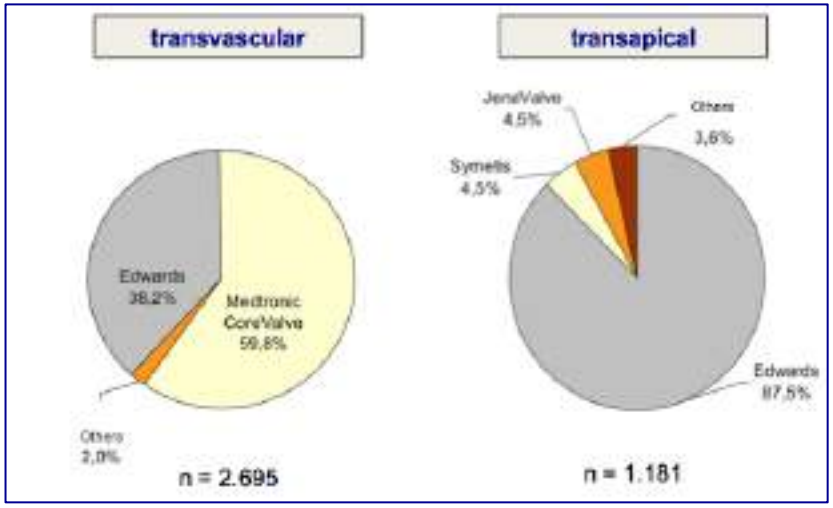


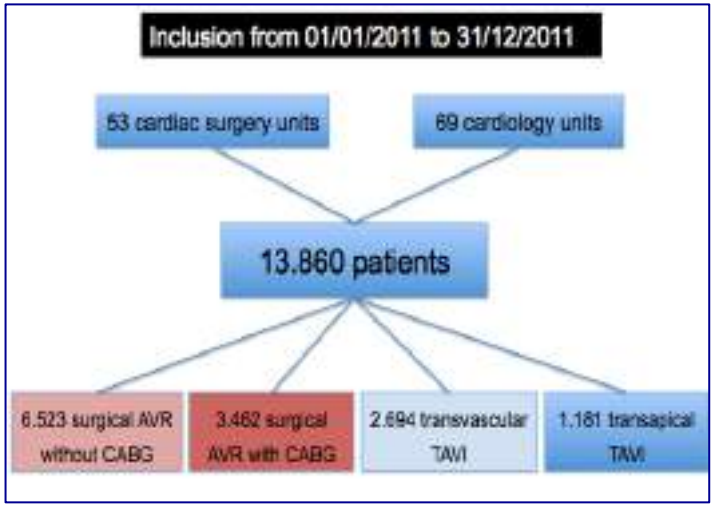
The German Aortic Valve Registry: 1-year results from 13 680 patients with aortic valve disease†

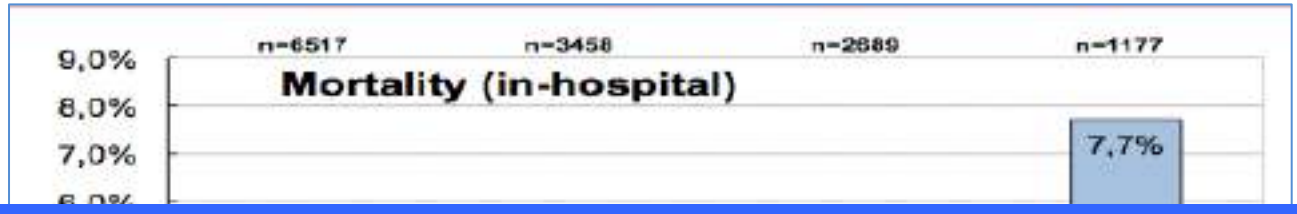
Friedrich W. Mohr[a,*], David Holzhey[a], Helge Möllmann[b], Andreas Beckmann[c], Christof Veit[d], Hans Reiner Figulla[e], Jochen Cremer[f], Karl-Heinz Kuck[g], Rüdiger Lange[h], Ralf Zahn[i], Stefan Sack[j], Gerhard Schuler[k], Thomas Walther[l], Friedhelm Beyersdorf[m], Michael Böhm[n], Gerd Heusch[o], Anne-Kathrin Funkat[a], Thomas Meinertz[p], Till Neumann[q], Konstantinos Papoutsis[q], Steffen Schneider[r], Armin Welz[s] and Christian W. Hamm[b], for the GARY Executive Board

European Journal of Cardio-Thoracic Surgery 46 (2014) 808–816

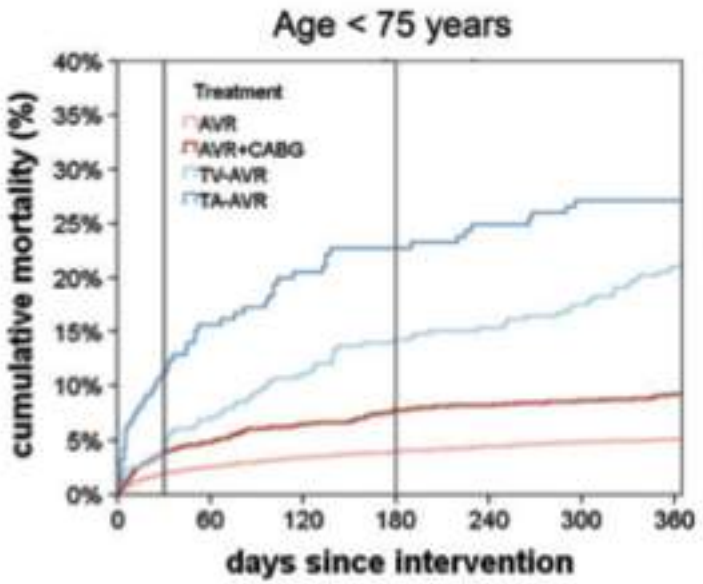
GARY Deutsches Aortenklappenregister
German Aortic Valve RegistrY

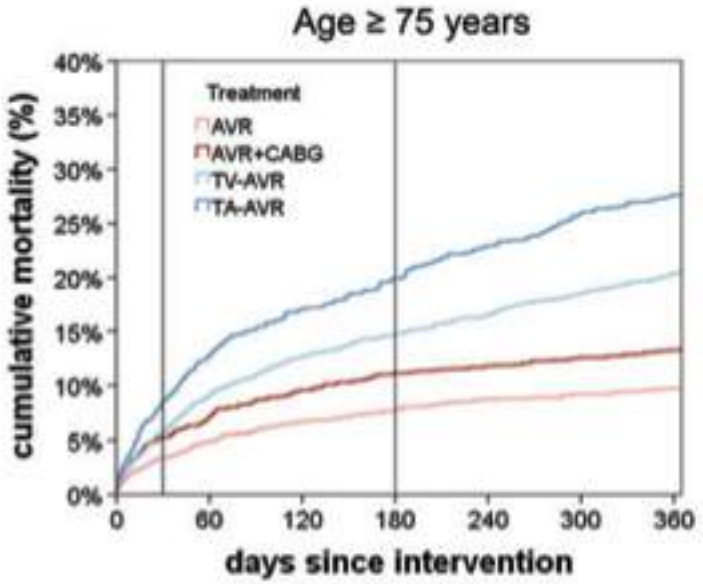


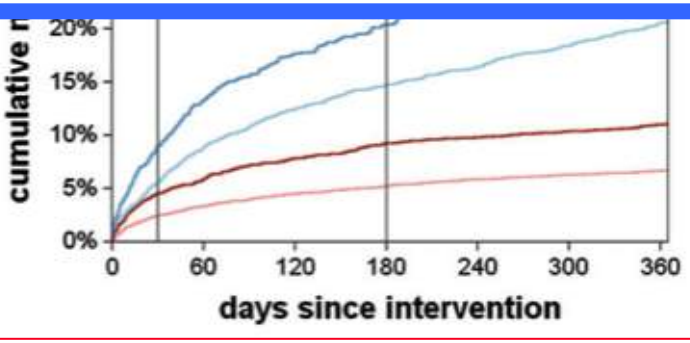




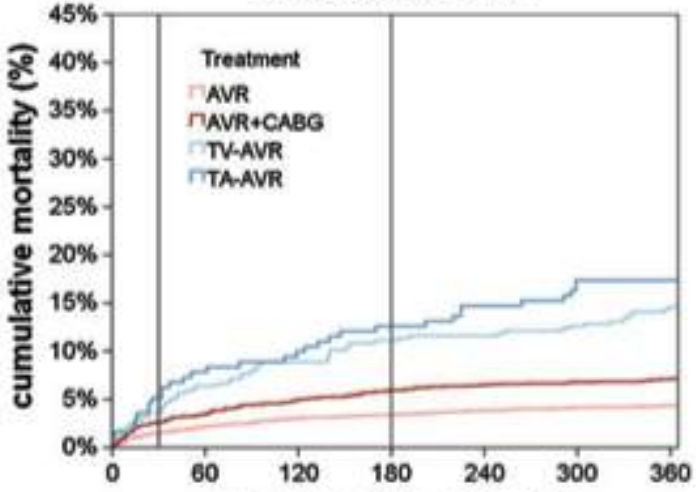
F.W. Mohr *et al.* / European Journal of Cardio-Thoracic Surgery





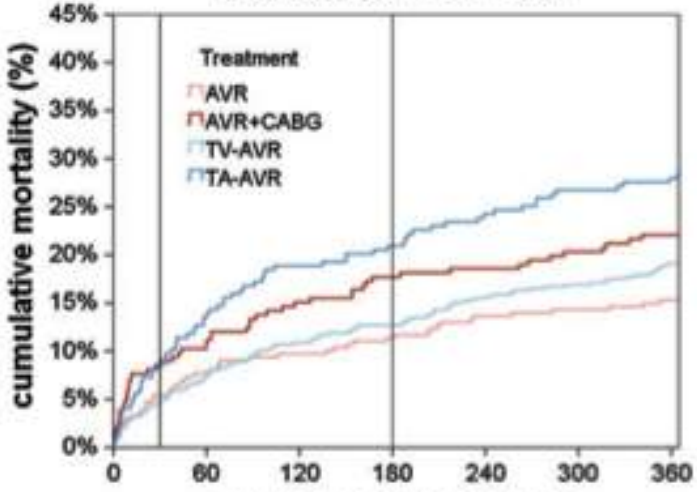


EuroSCORE < 10



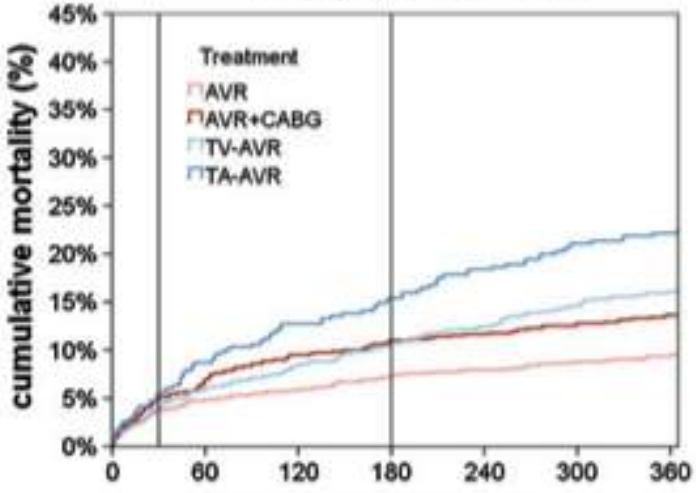
# at Risk – day	0	30	180	365
AVR	4731	4648	4505	4452
AVR+CABG	2138	2075	1977	1951
TV-AVR	409	394	358	344
TA-AVR	194	182	165	154

EuroSCORE 20 - < 30

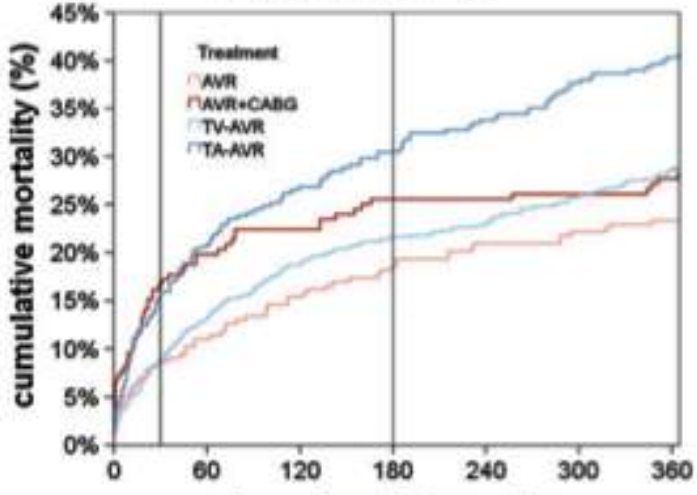


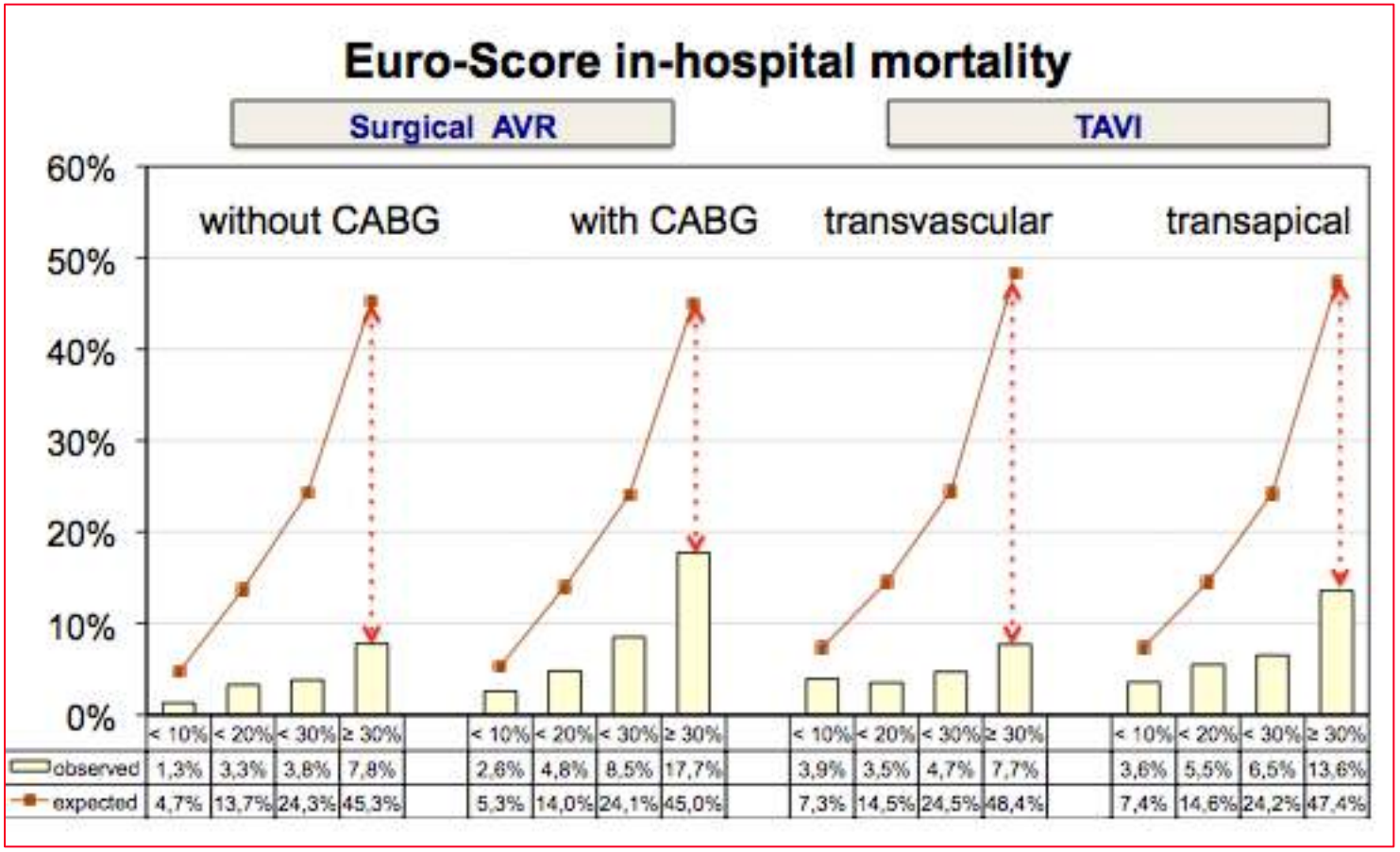
# at Risk – day	0	30	180	365
AVR	312	294	270	255
AVR+CABG	235	213	188	178
TV-AVR	514	488	435	402
TA-AVR	247	225	191	173

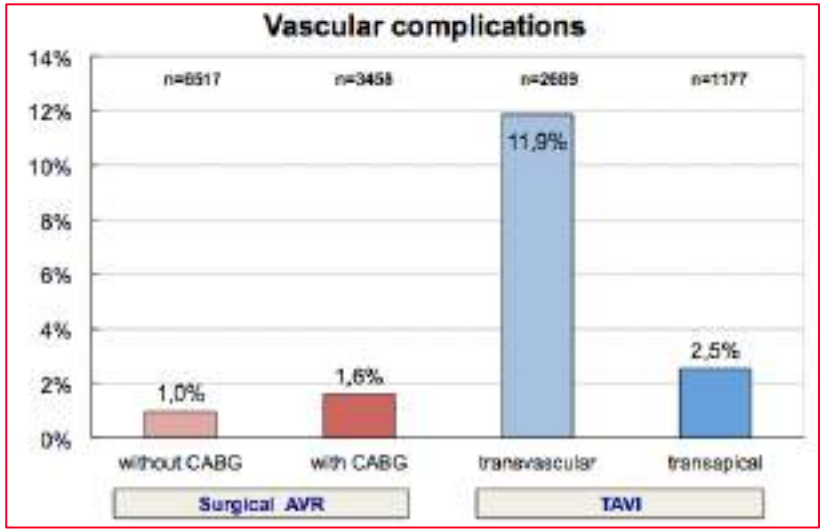
EuroSCORE 10 - < 20

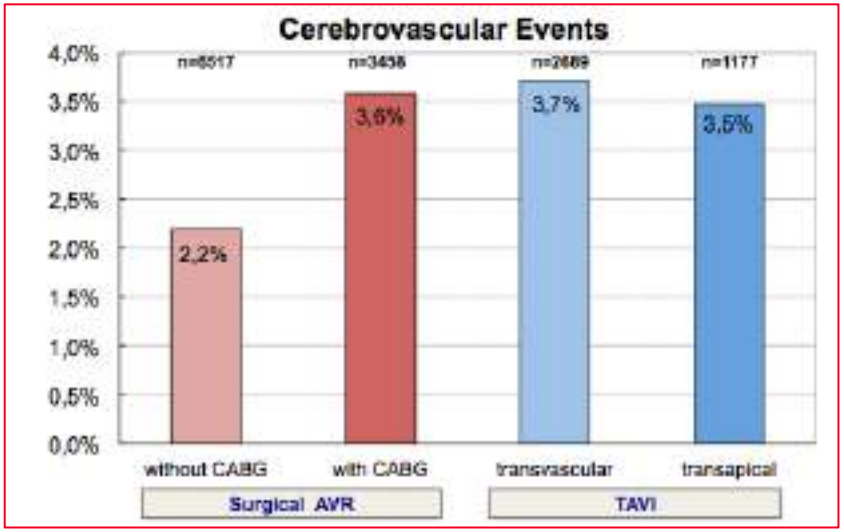


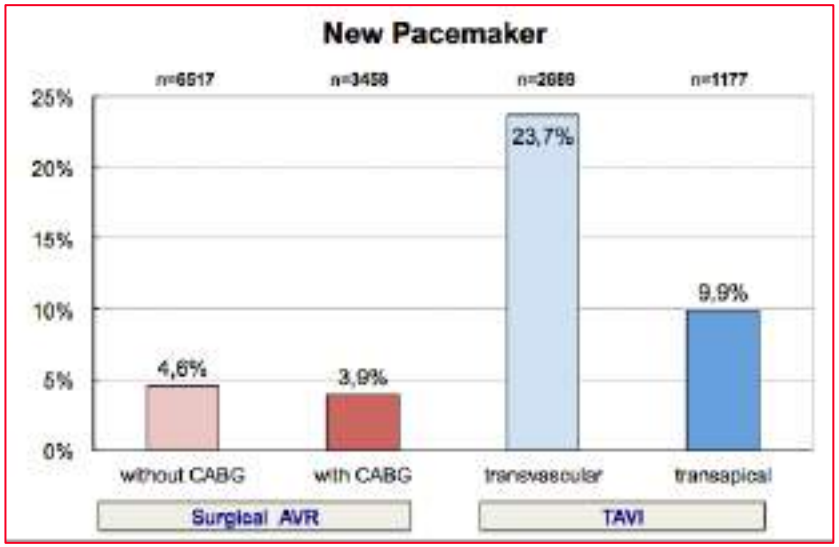
EuroSCORE ≥ 30

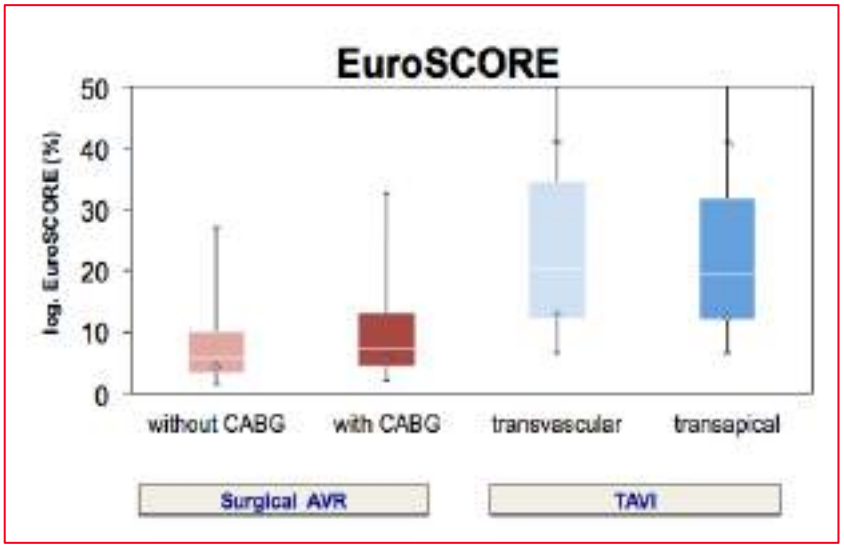



Euro-Score in-hospital mortality
Surgical AVR
TAVI
60%
50%
40%
30%
20%
10%
0%
without CABG
with CABG
transvascular
transapical
< 10% < 20% < 30% ≥ 30% < 10% < 20% < 30% ≥ 30% < 10% < 20% < 30% ≥ 30% < 10% < 20% < 30% ≥ 30%
observed 1,3% 3,3% 3,8% 7,8% 2,6% 4,8% 8,5% 17,7% 3,9% 3,5% 4,7% 7,7% 3,6% 5,5% 6,5% 13,6%
expected 4,7% 13,7% 24,3% 45,3% 5,3% 14,0% 24,1% 45,0% 7,3% 14,5% 24,5% 48,4% 7,4% 14,6% 24,2% 47,4%


Vascular complications
14%
12%
10%
8%
6%
4%
2%
0%
n=6517
n=3458
n=2689
n=1177
1,0%
1,6%
11,9%
2,5%
without CABG
with CABG
transvascular
transapical
Surgical AVR
TAVI


Cerebrovascular Events
4,0%
3,5%
3,0%
2,5%
2,0%
1,5%
1,0%
0,5%
0,0%
n=6517
n=3458
n=2689
n=1177
2,2%
3,6%
3,7%
3,5%
without CABG
with CABG
transvascular
transapical
Surgical AVR
TAVI


New Pacemaker
25%
20%
15%
10%
5%
0%
n=6517
n=3458
n=2689
n=1177
4,6%
3,9%
23,7%
9,9%
without CABG
with CABG
transvascular
transapical
Surgical AVR
TAVI

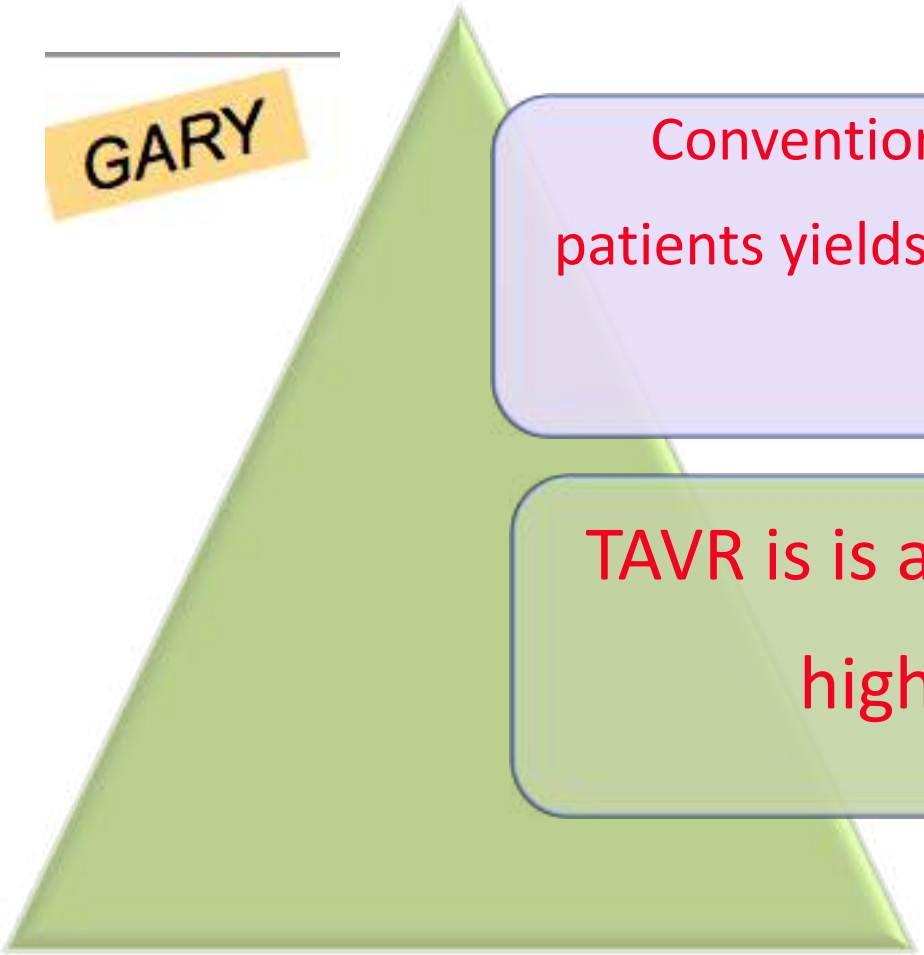

EuroSCORE
log. EuroSCORE (%)
50
40
30
20
10
0
without CABG
with CABG
transvascular
transapical
Surgical AVR
TAVI

GARY confirm in a large 'real-world', all- comer patient population that

Conventional surgery in operable patients yields excellent results in all risk groups.

TAVR is is a good alternative for high-risk patients.

GARY confirm in a large ‘real-world’, all- comer patient population that



Conventional surgery in operable patients yields excellent results in all risk groups.

TAVR is is a good alternative for high-risk patients.

TAVI	SUAVR
Expensive	Less expensive
Needs less anesthesia	Need for anesthesia
Need for X-ray (radiation)	Need for CPB & AOX
Indirect vision	Direct vision
Compressed valve tissue & Implantation	Valve resection and replacement
Higher incidence of paraleakage	Less Paravalvular leakage
Higher PPM needed	Less PPM needed
Less pain	
Rapid recovery	

In summary

SUAVR is superior in

- Early and 2 years mortality rates
- Paravalvular leakage

The Major Concern?

Durability

Long term outcomes

The concern with PVL is probably temporary, as TAVI will continue to improve in valve designs

Performance of SUAVR is promising and evolving

Minimally invasive approaches continue to improve the patients outcome

Cardiac Surgeons must be engaged and learn the endovascular surgery

Respect to the current guideline and heart team approach


BRIGHT
FUTURE

Sutureless and Rapid deployment valves implantation techniques