Late Follow-Up from the PARTNER Aortic Valve-in-Valve Registry

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on behalf of The PARTNER II Trial Investigators

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THE PARTNER II TRIAL

Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

Affiliation/Financial Relationship	Company
• Grant/Research Support	Edwards Lifesciences
• Steering Committee	Edwards Lifesciences
• SAB (Equity)	
• Honoraria	Edwards Lifesciences

Background

- Valve-in-Valve TAVR is a viable alternative for patients with failing surgical bioprosthetic valves
- Although early outcomes have been favorable, limited data is available on *longer-term* clinical outcomes, valve function, and durability

Methods
Study Design

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- **Prospective, multicenter registry**
- **Inclusion Criteria:**
  - Symptomatic severe stenosis or regurgitation of a surgical aortic bioprosthetic valve
  - High-risk for re-operation (estimated surgical mortality or major morbidity ≥ 50%)
  - Suitable for 23mm or 26mm SAPIEN XT THV
- **Key Exclusion criteria:**
  - Surgical valve labeled size < 21mm
  - Prosthetic valve in another position
- **Angiogram, CT, Echo images and clinical data were screened on a weekly web conference call**

The PARTNER II Trial: Aortic Valve-in-Valve Registry

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Transca
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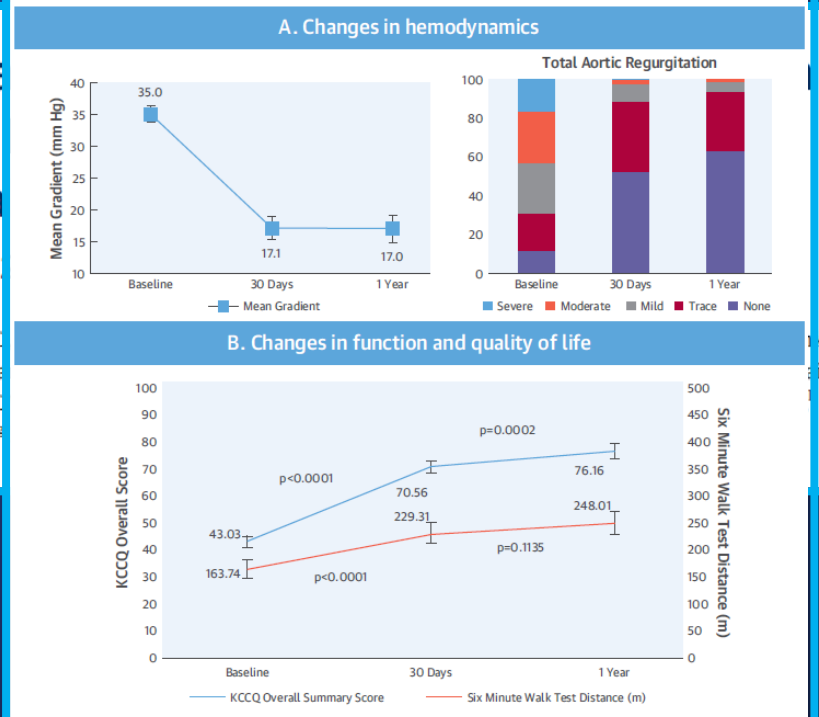
CENTRAL ILLUSTRATION Transcatheter VIV Implantation



Webb, J.G. et al. J Am Coll Cardiol. 2017;69(18):2253-62.

Webb JG et al. JACC 2017;69:2253-62

Methods
Statistical Analysis

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- **Analysis Population**
  - Nested Registry (NR3, N=96) and Continued Access Registry (CANR, N=269)
  - Valve implant population (patients in whom valve implant was completed)
- **Clinical Outcomes**
  - Cumulative incidence reported as Kaplan-Meier event rates
  - Associations assessed by Cox proportional hazards regression models
  - Comparisons performed by the log-rank test
- **Longitudinal Outcomes (echo and functional characteristics)**
  - Within-subject comparisons modeled over time by linear mixed effects model to adjust for patient variability (missing data and survival bias)

Baseline Characteristics

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Characteristic (%)	All Patients N=365	Initial Registry (NR3) N=96	Continued Access (CANR) N=269	p-value
Age, years	78.9 ± 10.2	80.1 ± 9.3	78.5 ± 10.5	0.18
Male	64.1	55.2	67.3	0.03
STS Score, %	9.1 ± 4.7	9.9 ± 5.1	8.8 ± 4.6	0.06
NYHA Class 3/4	90.4	95.8	88.5	0.04
Atrial Fibrillation	46.8	50.0	45.7	0.47
CAD	75.6	76.0	75.5	0.91
COPD	30.4	29.2	30.9	0.76
Renal Insufficiency (SCr ≥2 mg/dL)	12.3	14.6	11.5	0.43

Data presented as % or mean ± SD; CAD = coronary artery disease, COPD = chronic obstructive pulmonary disease, NYHA = New York Heart Association, SCr = serum creatinine, STS = Society of Thoracic Surgeons

Valve and Procedural Characteristics

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Surgical Bioprosthesis Age	%
< 5 years	6.8
5-10 years	27.2
> 10 years	66.0
Mode of Degeneration	
Stenosis	55.0
Regurgitation	23.7
Mixed	21.2
Surgical Valve Type	
Bioprosthetic Stented	93.1
Other	6.9

Labeled Surgical Valve Size	%
21mm	26.7
22-25mm	12.6
>25mm	59.2
Implanted THV Size	
23mm	69.0
26mm	31.0
Access	
Transfemoral	75.8
Transapical	24.2

Results

Clinical Outcomes at 3 Years

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	Events at 3 years* N=365
Composite Endpoint: All-Cause Death or Any Stroke	36.2 (127)
All-Cause Death	33.3 (116)
Cardiovascular	20.1 (68)
Non-cardiovascular	16.4 (48)
Any Neurological Event (Stroke or TIA)	7.8 (26)
Stroke	6.2 (21)
TIA	3.0 (9)
New Permanent Pacemaker	7.1 (23)
Repeat Valve Replacement	1.9 (5)

**All events CEC-adjudicated through 1 year and site-reported thereafter, presented as KM % (# events); TIA = transient ischemic attack*

Results

Primary Endpoint – Composite of Death or Stroke

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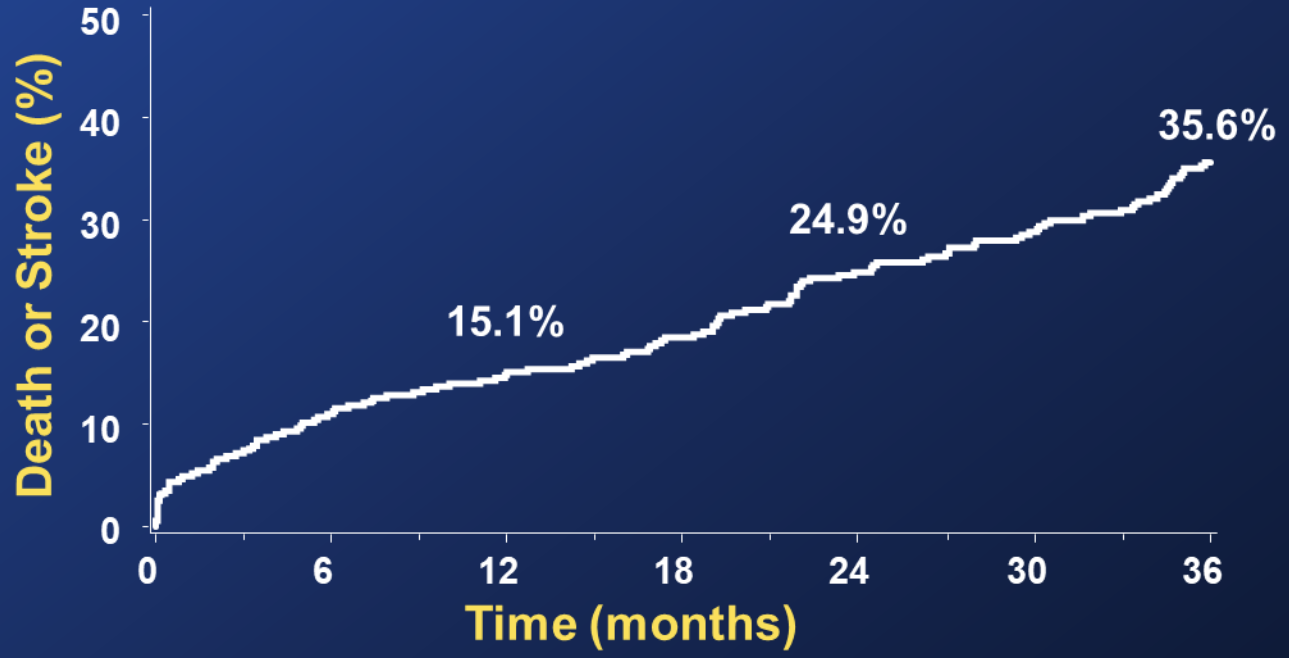

Number at risk:

NR3 + CANR	365	325	309	290	260	237	185

Results

Mortality and Stroke

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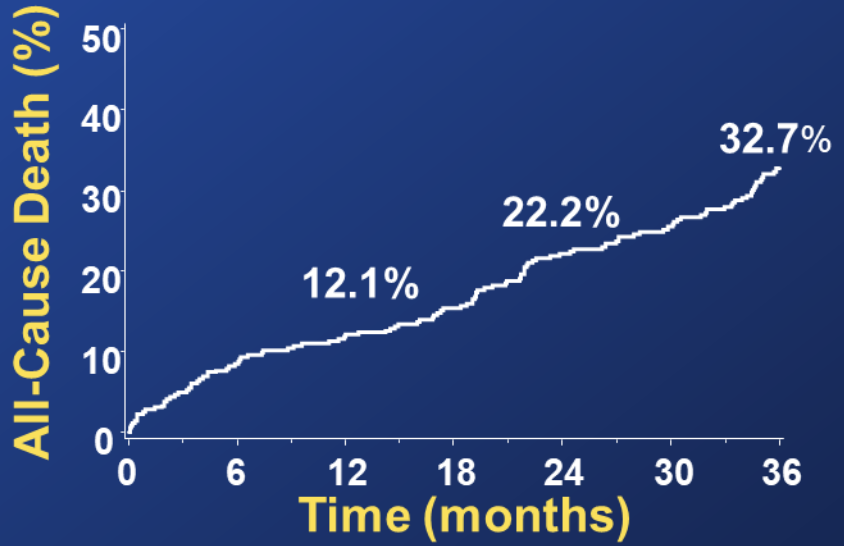
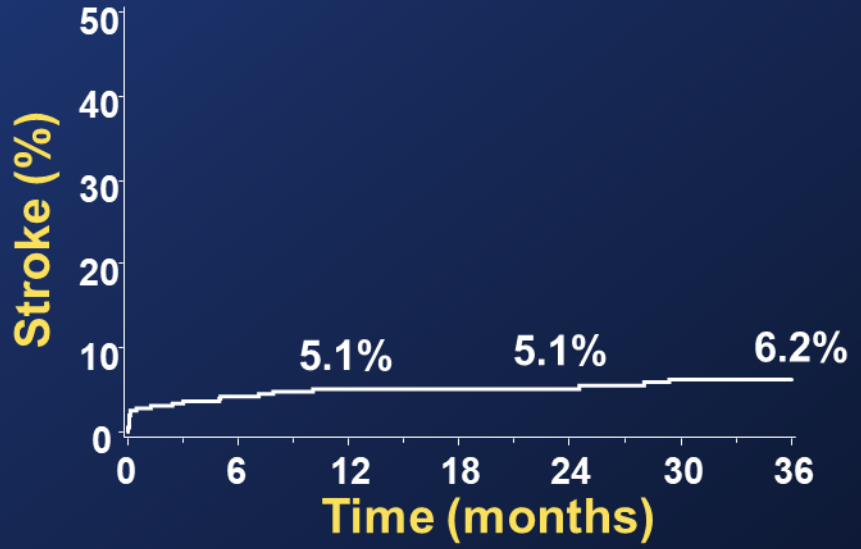


Number at risk:

365	334	320	301	268	246	192



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365	325	309	291	260	237	185

Results

Repeat Valve Replacement*

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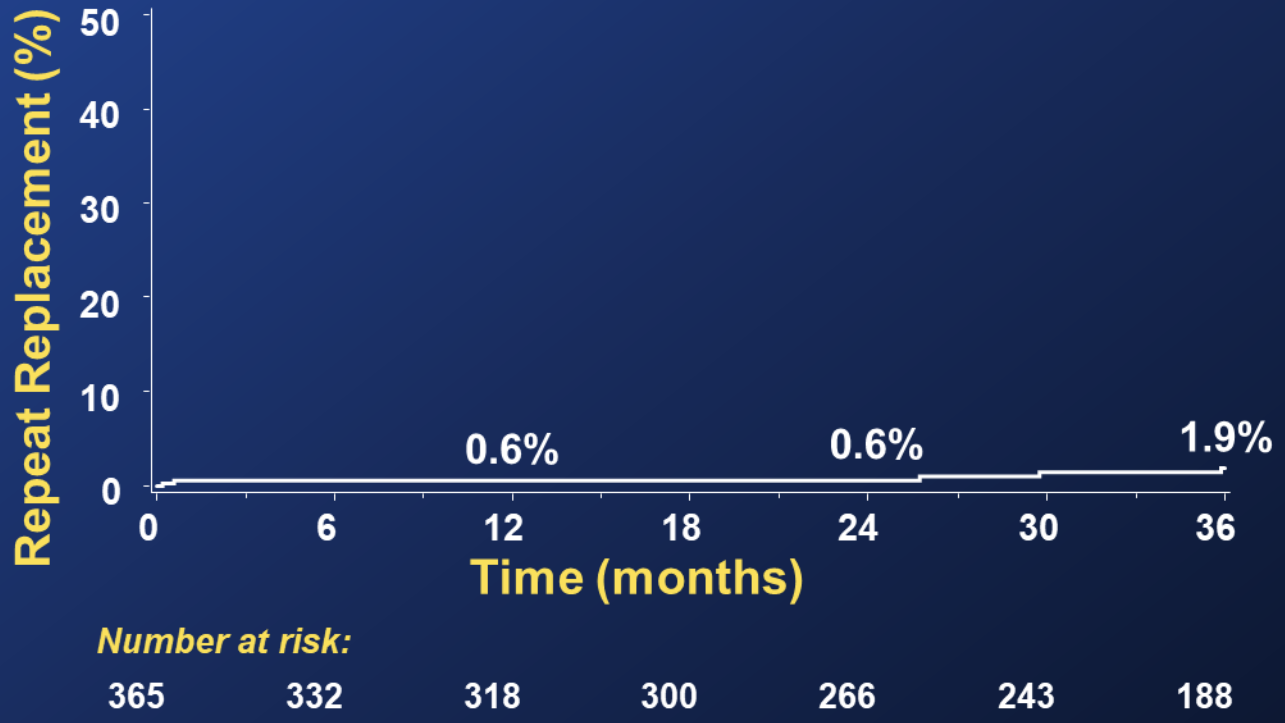
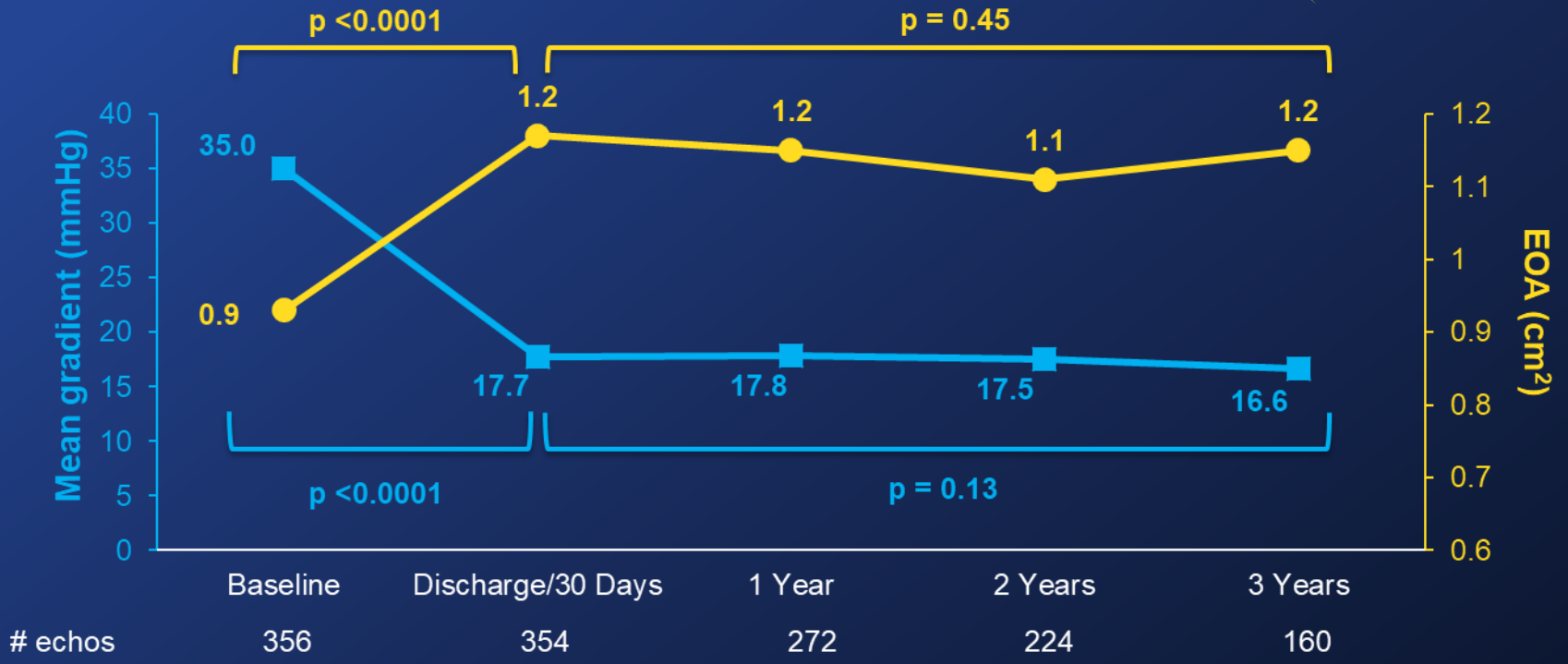


*SAVR or ViV TAVR

Results

EOA and Mean Gradient



Results

Mean Gradient by Failure Mode

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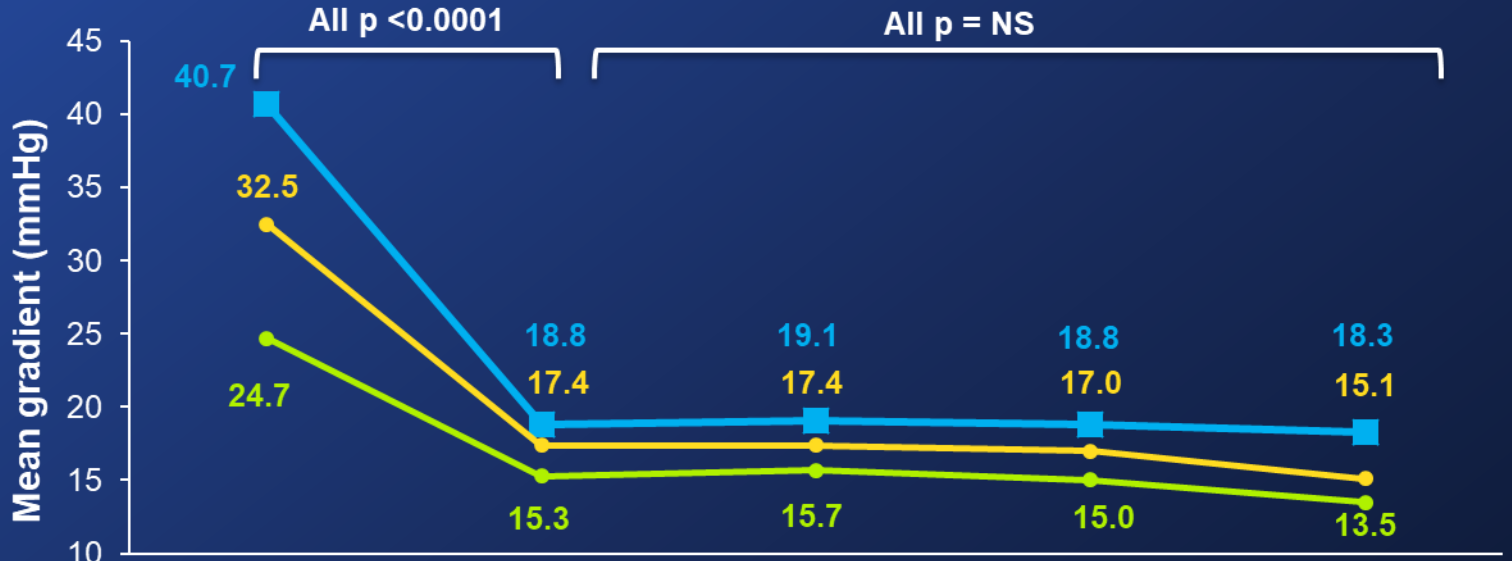

# echos					
Stenosis	191	192	141	121	88
Mixed	75	72	55	42	32
Regurgitation	83	83	71	57	37

Results

Aortic Regurgitation

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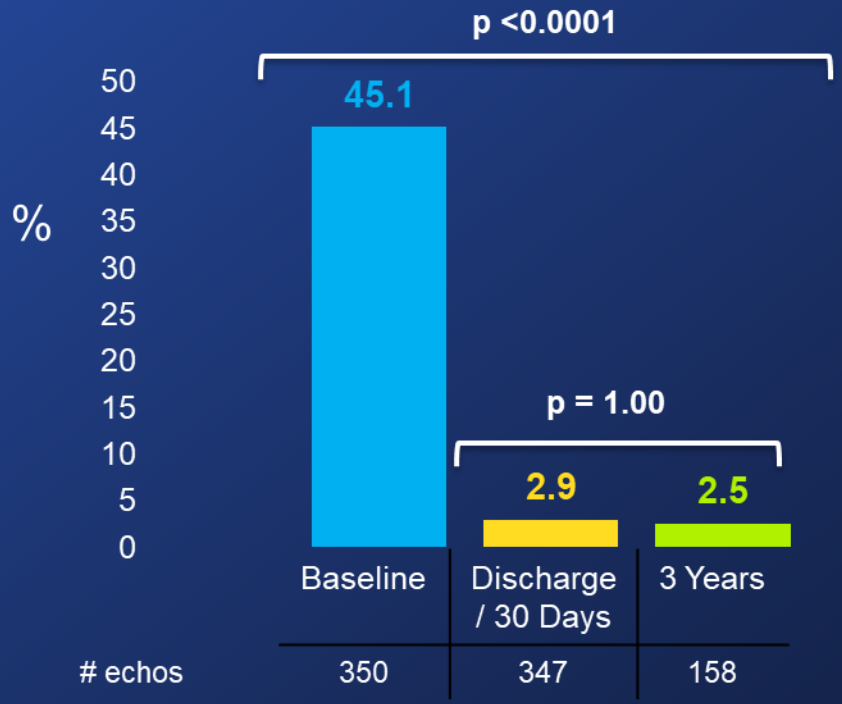
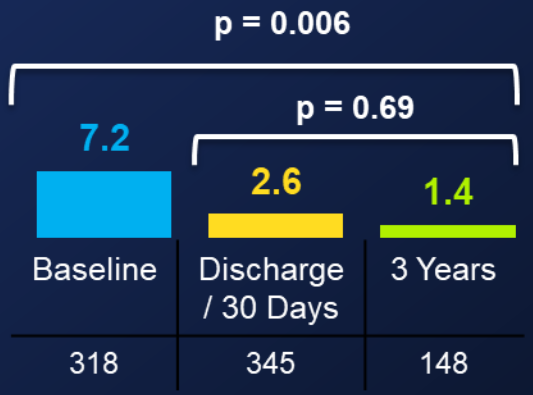
Total AR ≥ Moderate



Paravalvular AR ≥ Moderate



Results

Longitudinal Hemodynamics (LV Function)

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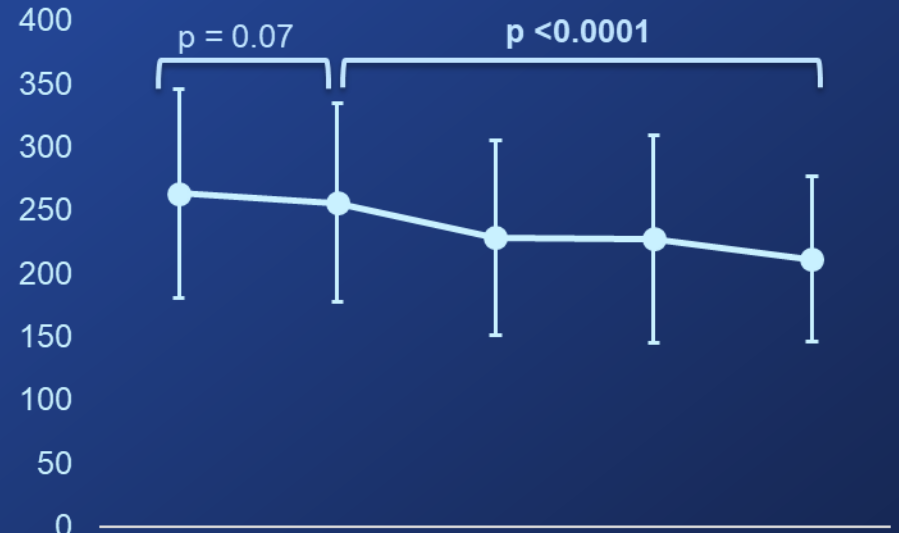
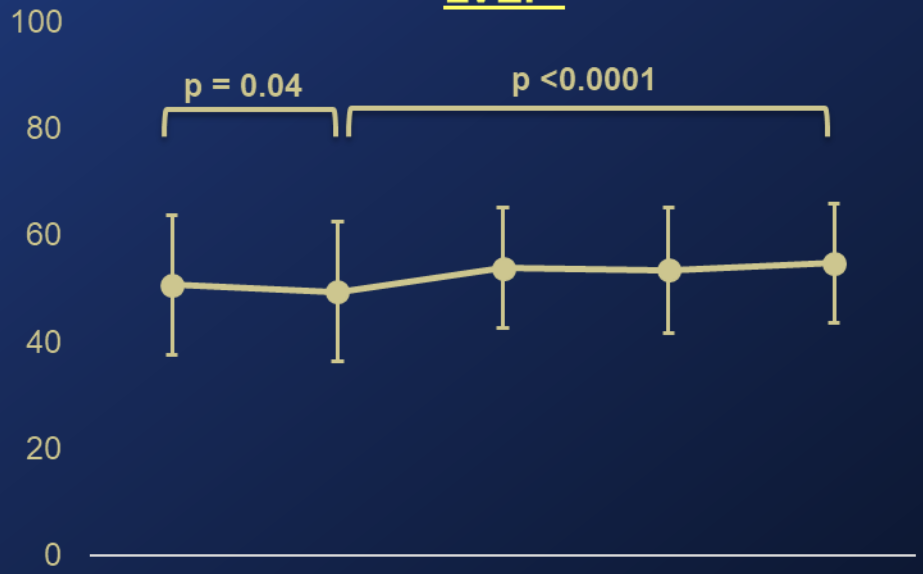
LV Mass



	Baseline	Discharge/ 30 Days	1 Year	2 Years	3 Years
# echos	321	344	250	201	147

LVEF*



	Baseline	Discharge/ 30 Days	1 Year	2 Years	3 Years
# echos	245	258	160	122	87

*LVEF by Simpson's

Results

Changes in Function and Quality of Life

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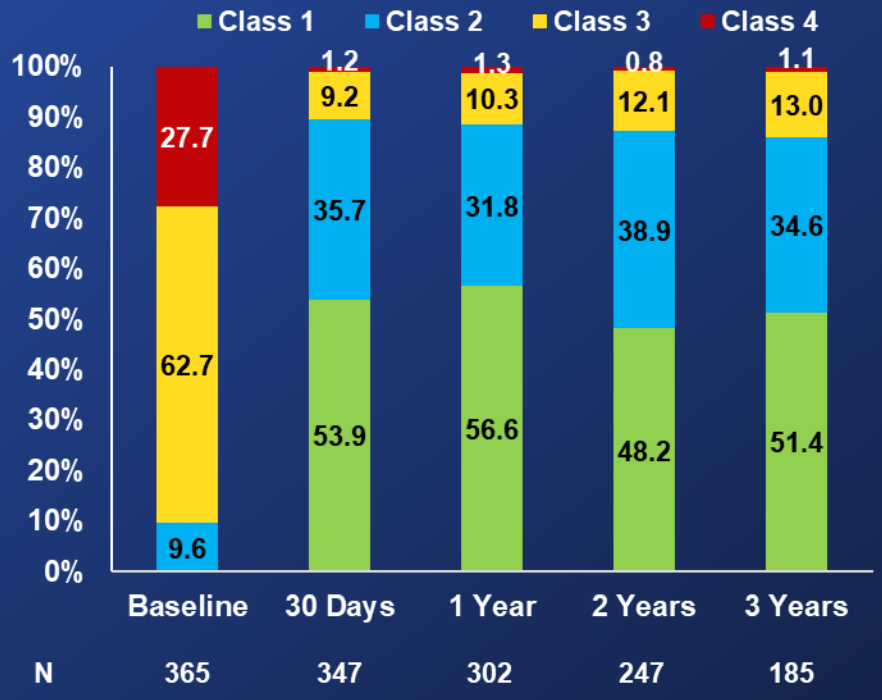
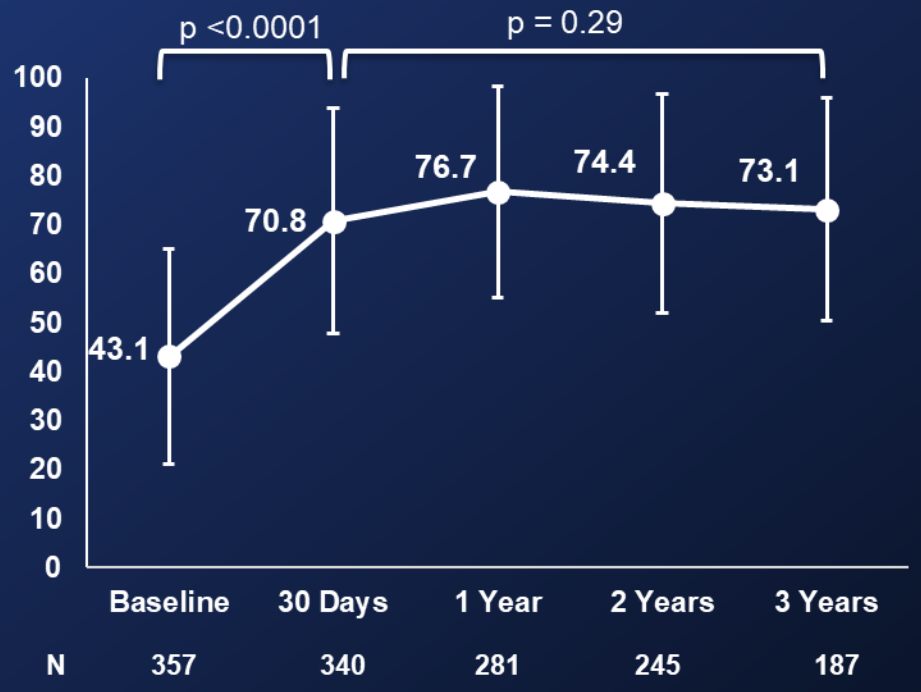
NYHA



KCCQ Overall Summary Score



Results

HR for Mortality

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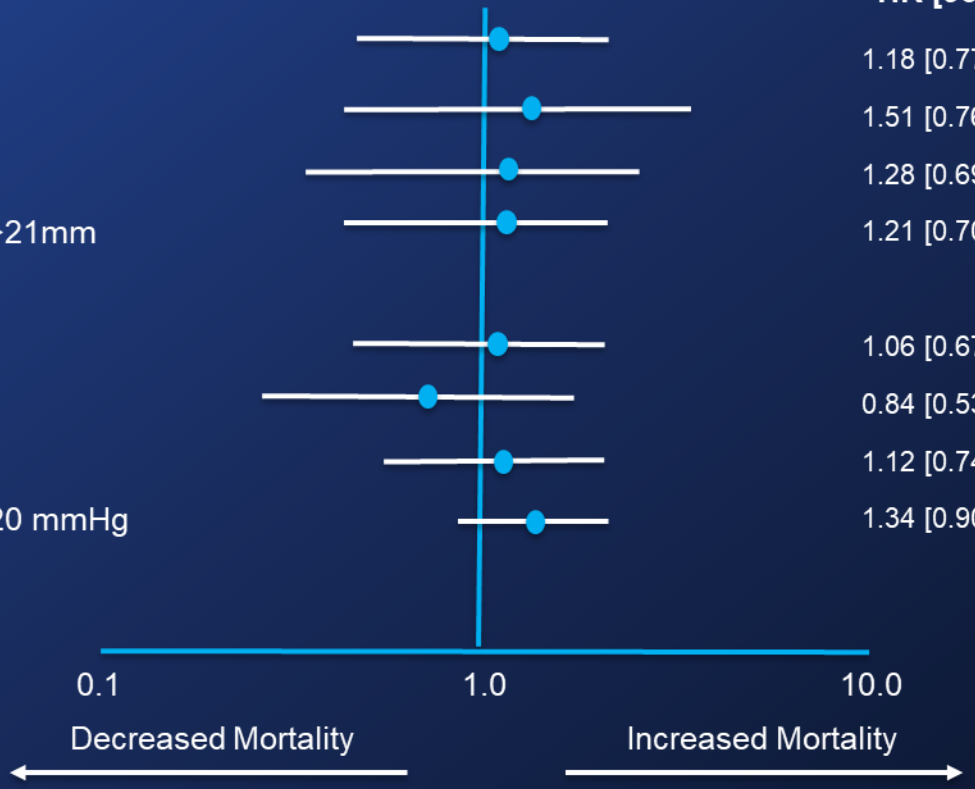
	HR [95% CI]; p-value
Surgical Valve Size (Labeled):	
21mm vs 22-25mm	1.18 [0.77, 1.78]; p=0.45
21mm vs >25mm	1.51 [0.76, 2.99]; p=0.24
22-25mm vs >25mm	1.28 [0.69, 2.43]; p=0.44
Surgical Valve True ID: ≤21mm vs >21mm	1.21 [0.70, 2.10]; p=0.49
Failure Mode:	
Stenosis vs Regurgitation	1.06 [0.67, 1.70]; p=0.80
Stenosis vs Mixed	0.84 [0.53, 1.32]; p=0.44
Approach: TT vs TF	1.12 [0.74, 1.70]; p=0.59
Residual gradient: ≥20 mmHg vs <20 mmHg	1.34 [0.90, 1.99]; p=0.15



Results

Mortality by surgical valve size (labeled)

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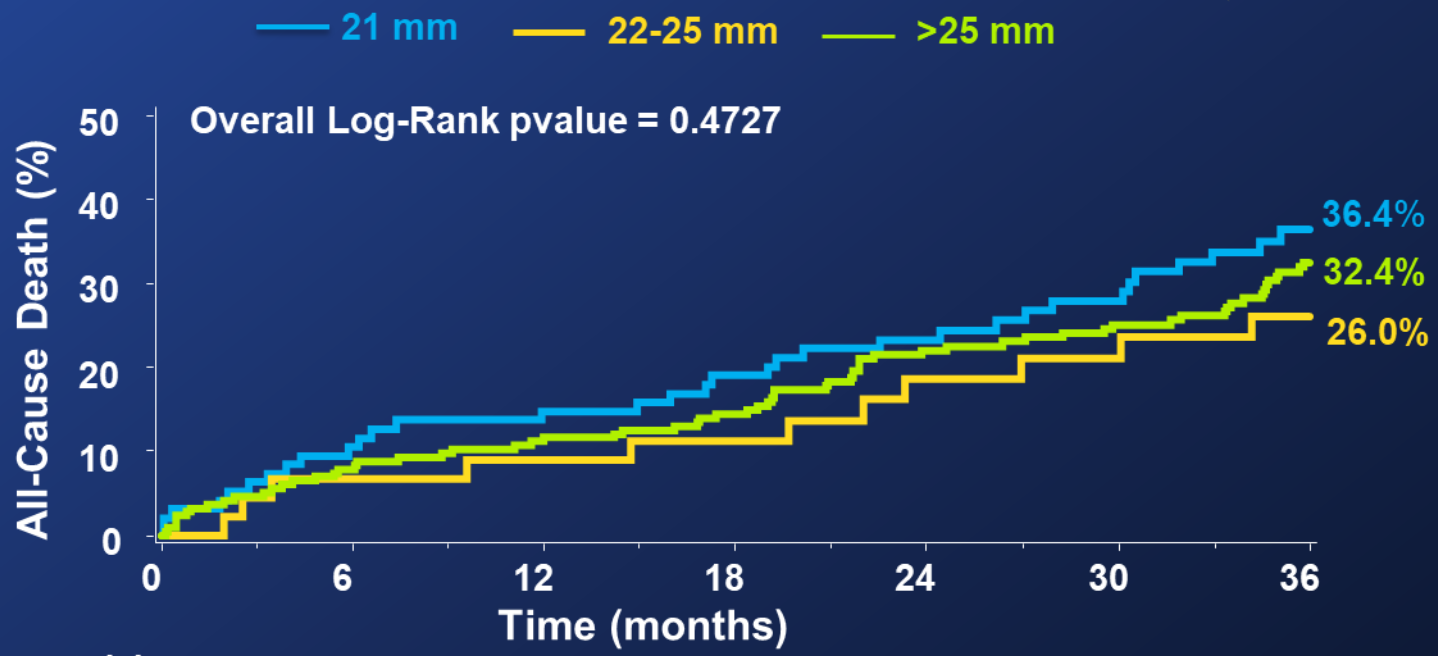

Number at risk:

21mm	95	85	81	76	68	62	43
22-25 mm	45	42	40	37	33	32	25
>25 mm	216	199	191	181	161	146	118

Results

Mortality by post-implant gradient

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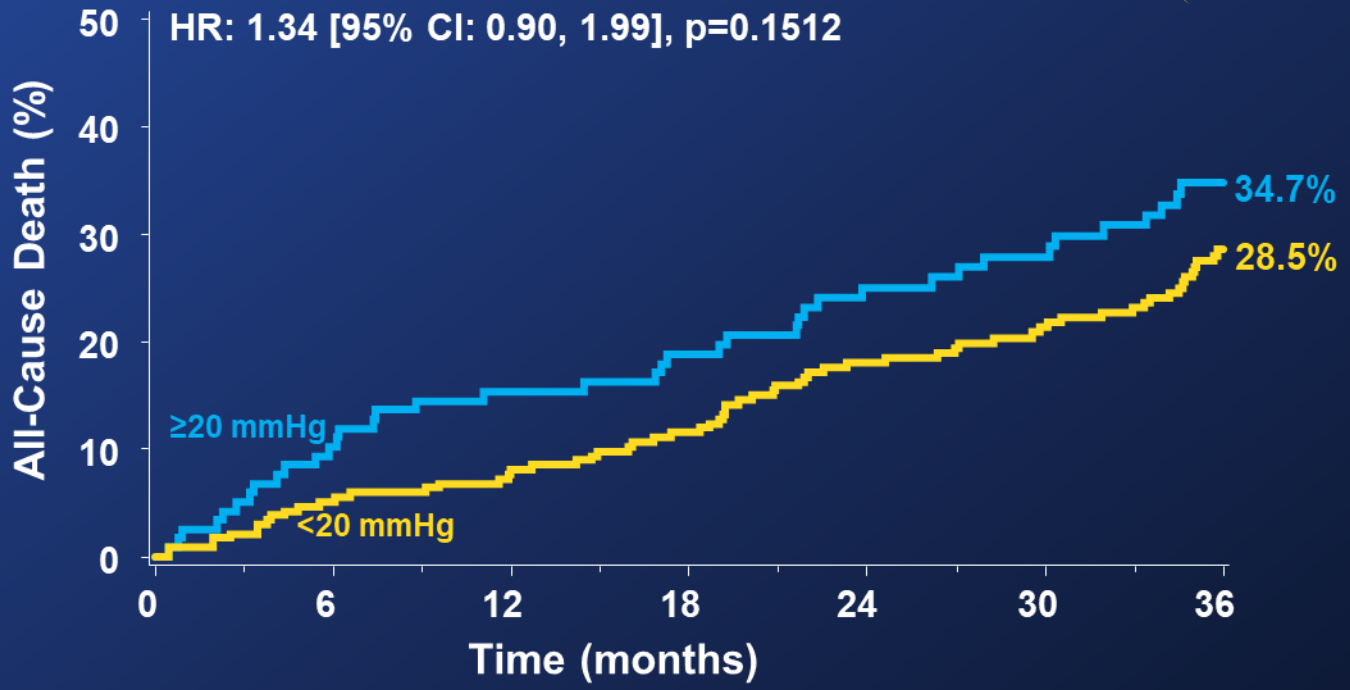

Number at risk:

≥20 mmHg	118	106	99	93	82	75	56
<20 mmHg	236	224	217	204	184	170	136

Conclusions

- The mortality of 33.3% at 3 years reflects multiple co-morbidities in this high-risk patient population (mean STS 9.1%).
- In survivors, early improvements in functional status and quality of life indices are maintained through 3-years.
- Valve performance is also sustained through 3 years with rare signs of structural valve deterioration requiring repeat procedures.

Conclusions

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- *The early improvements associated with ViV TAVR are maintained through 3 years, supporting the value of ViV TAVR as an important alternative therapy in appropriate patients with aortic bioprosthetic valve failure.*