Percutaneous Treatment of Valvular Heart Disease: a Paradigm Shift?

TAVI: up-to-date

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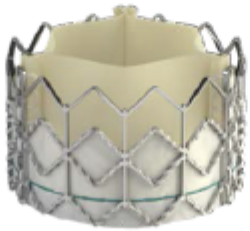
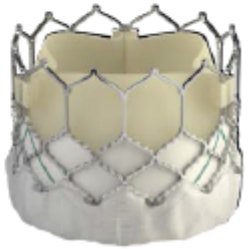
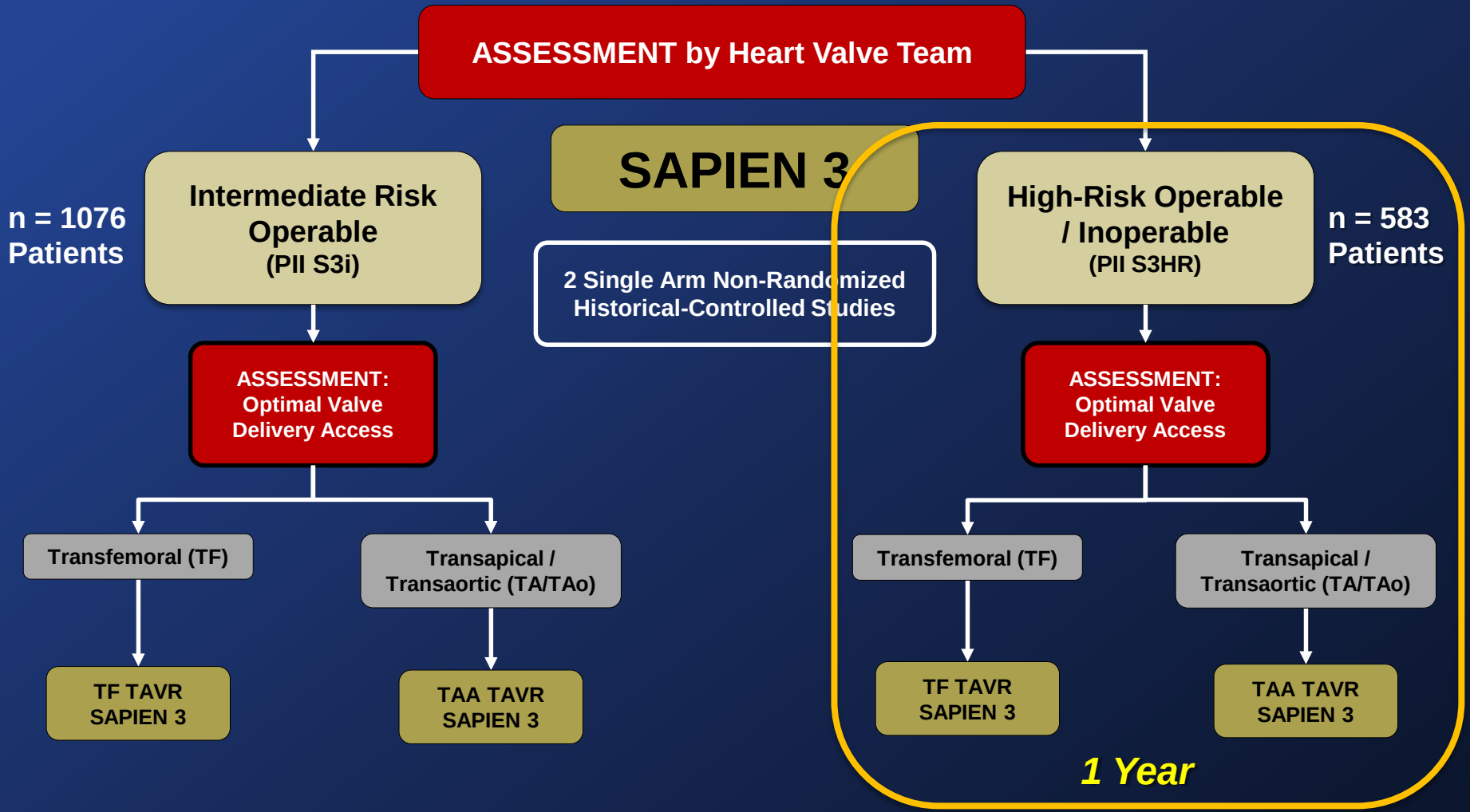
PCR 2014
london valves

From Yesterday to Today

	2002	→ 2005	→ 2009	→ 2014
Edwards	**Cribier PVT**	**Edwards SAPIEN**	**SAPIEN XT**	**SAPIEN 3**
				
Sheath size	**24F**	**22/24F**	**16/18/20F**	**14/16F**
Valve size	23 mm	23, 26mm	23, 26, 29mm	20, 23, 26, 29mm
		Bovine Retrograde And 26	16-20 F And 29 Prostar	14-16 F Skirt And 20

Eltchaninoff H. London Valve 2014

The PARTNER II S3 Trial
Study Design



Baseline & Procedural Characteristics

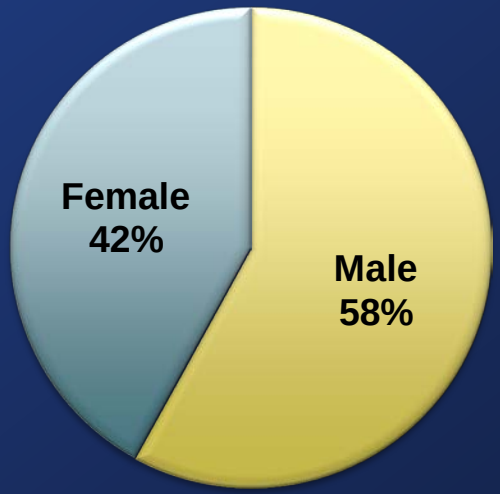
THE PARTNER II TRIAL

Median STS =

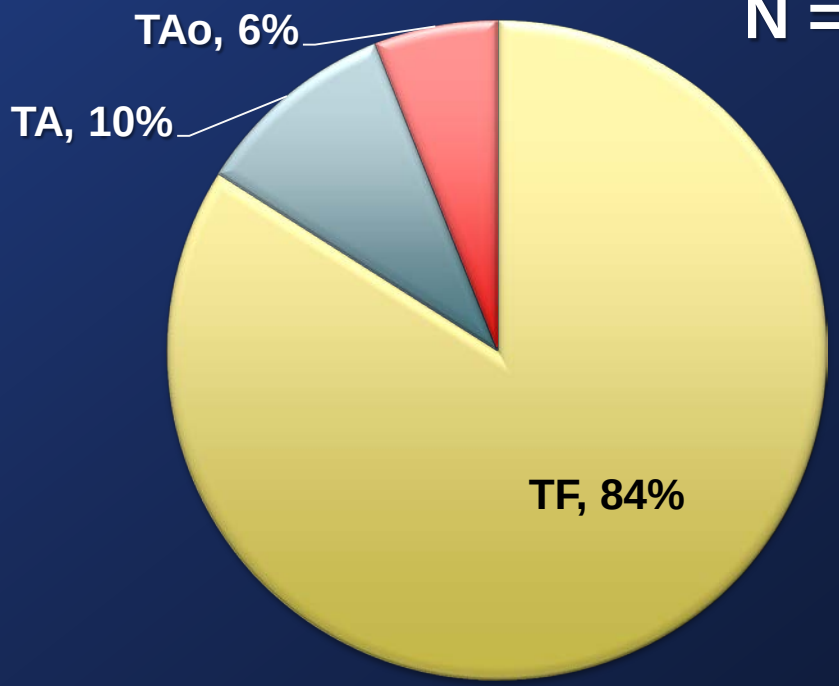
8.4%

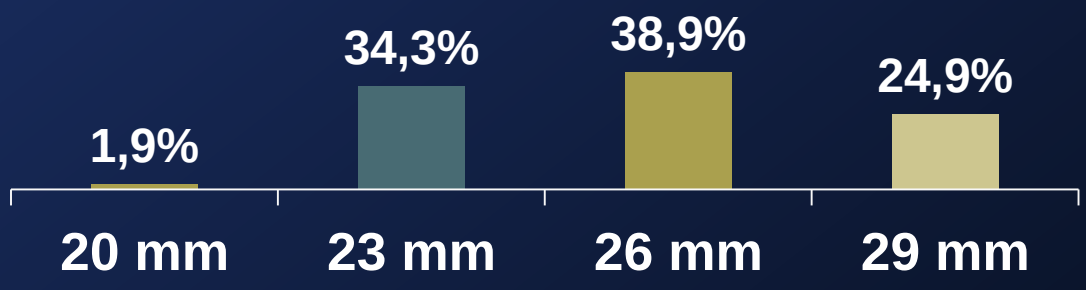
Average Age =

82yrs



N = 583





Other Clinical Outcomes

S3 HR / INOP – 30 Days and 1 Year

THE PARTNER II TRIAL

Clinical Outcomes (%)	30 Days	1 Year
All-Cause Mortality	2.2	14.4
Cardiac Mortality	1.4	8.1
All Stroke	1.4	4.3
Disabling Stroke	0.9	2.4
Rehospitalization	8.0	17.1
New Permanent Pacemaker	13.3	16.9
Surgical AVR	0.2	0.6
Structural Valve Deterioration	0	0
Valve Thrombosis	0	0

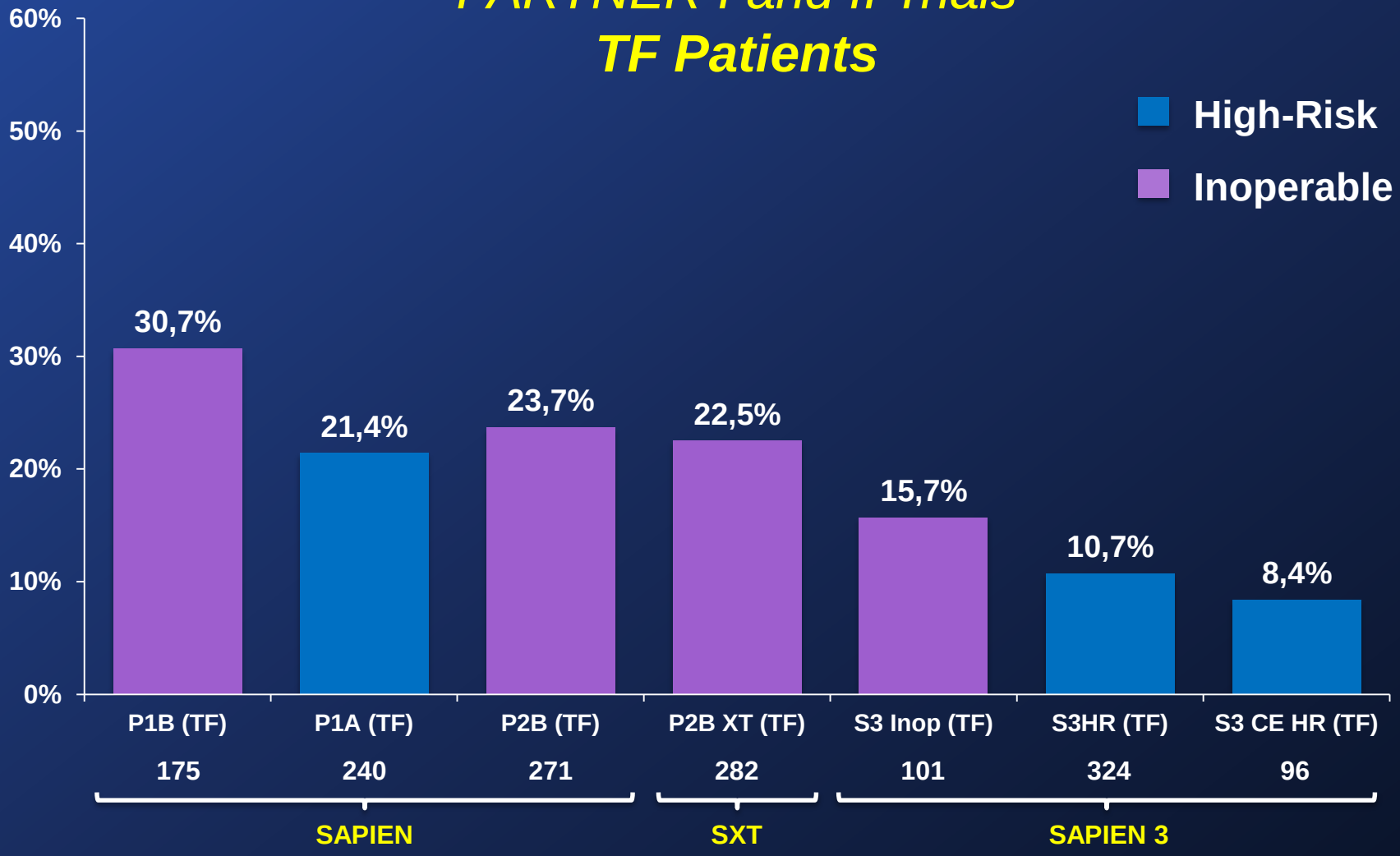
All-Cause Mortality at 1 Year

Edwards SAPIEN Valves (As Treated Patients)

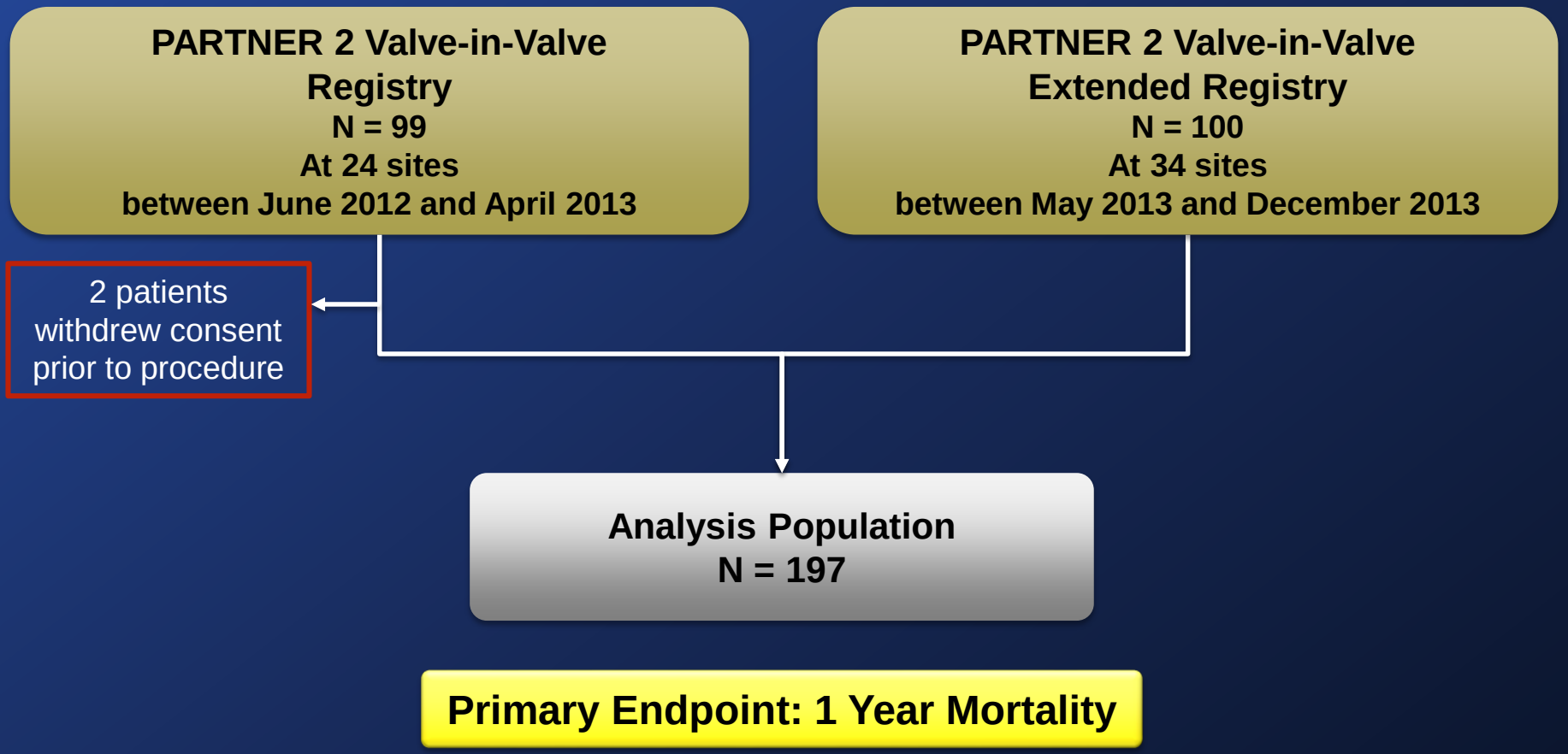
THE PARTNER II TRIAL

PARTNER I and II Trials

TF Patients



Study Population



Valve and Procedure Characteristics

THE PARTNER II TRIAL

Surgical Bioprosthesis Age	%
< 5 years	8.1
5-10 years	32.4
> 10 years	59.5
Mode of Degeneration	
Stenosis	54.2
Regurgitation	22.4
Mixed	23.4
Surgical Valve Type	
Bioprosthetic Stented	94.4
Stentless/Homograft	4.6
Unknown	1.0

Labeled Surgical Valve Size	%
21mm	28.3
23-25mm	59.7
>25mm	12.0
Implanted THV Size	
23mm	72
26mm	28
Access	
Transfemoral	67
Transapical	33

Clinical Outcomes
30 Days and 1 Year

THE PARTNER II TRIAL

Complication	30 Days	1 Year
All-Cause Mortality	8 (4.1%)	26 (13.4%)
Cardiac Mortality	7 (3.6%)	17 (8.9%)
Stroke (All)	5 (2.5%)	7 (3.7%)
Rehospitalization	14 (7.3%)	22 (11.8%)

All values are expressed as n (%) and percentages are Kaplan-Meier estimates at 30 days or 1 year.

Study Device

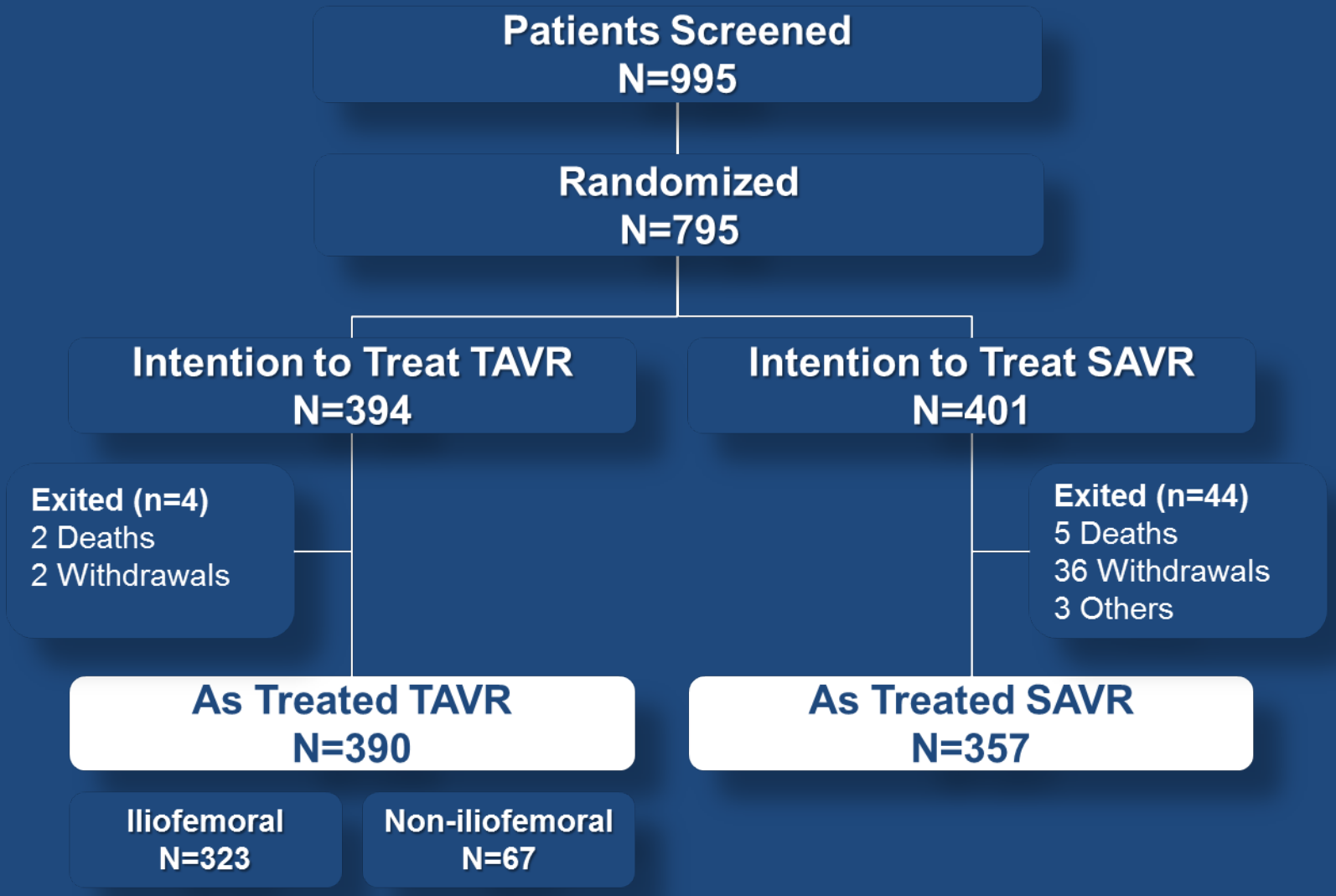
4 Valve Sizes
(18–29 mm annular diameter)

18F Delivery System

Pivotal Trial Design

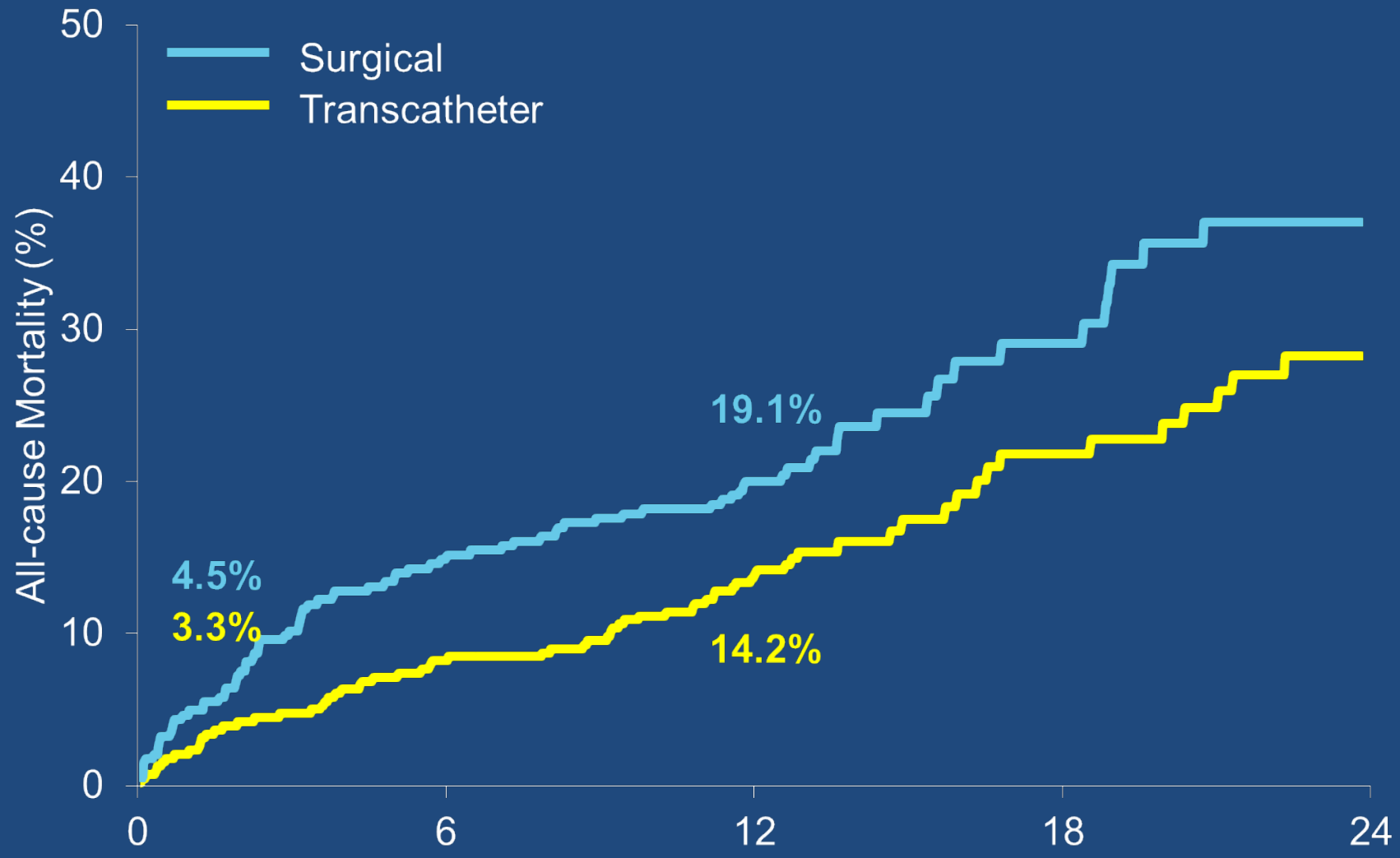
* Randomization stratified by intended access site

Study Disposition



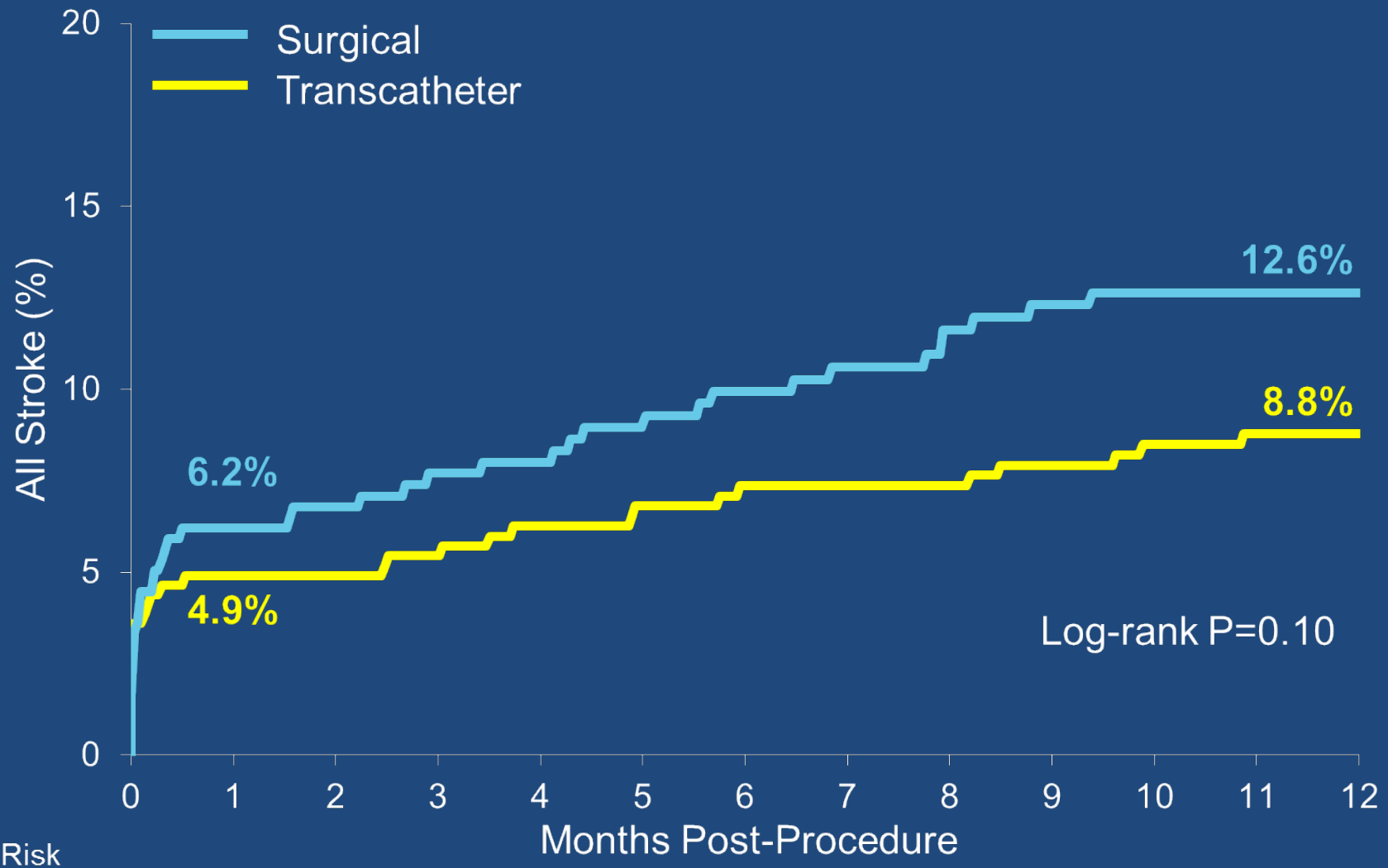
2-Year All-cause Mortality

ACC 2014



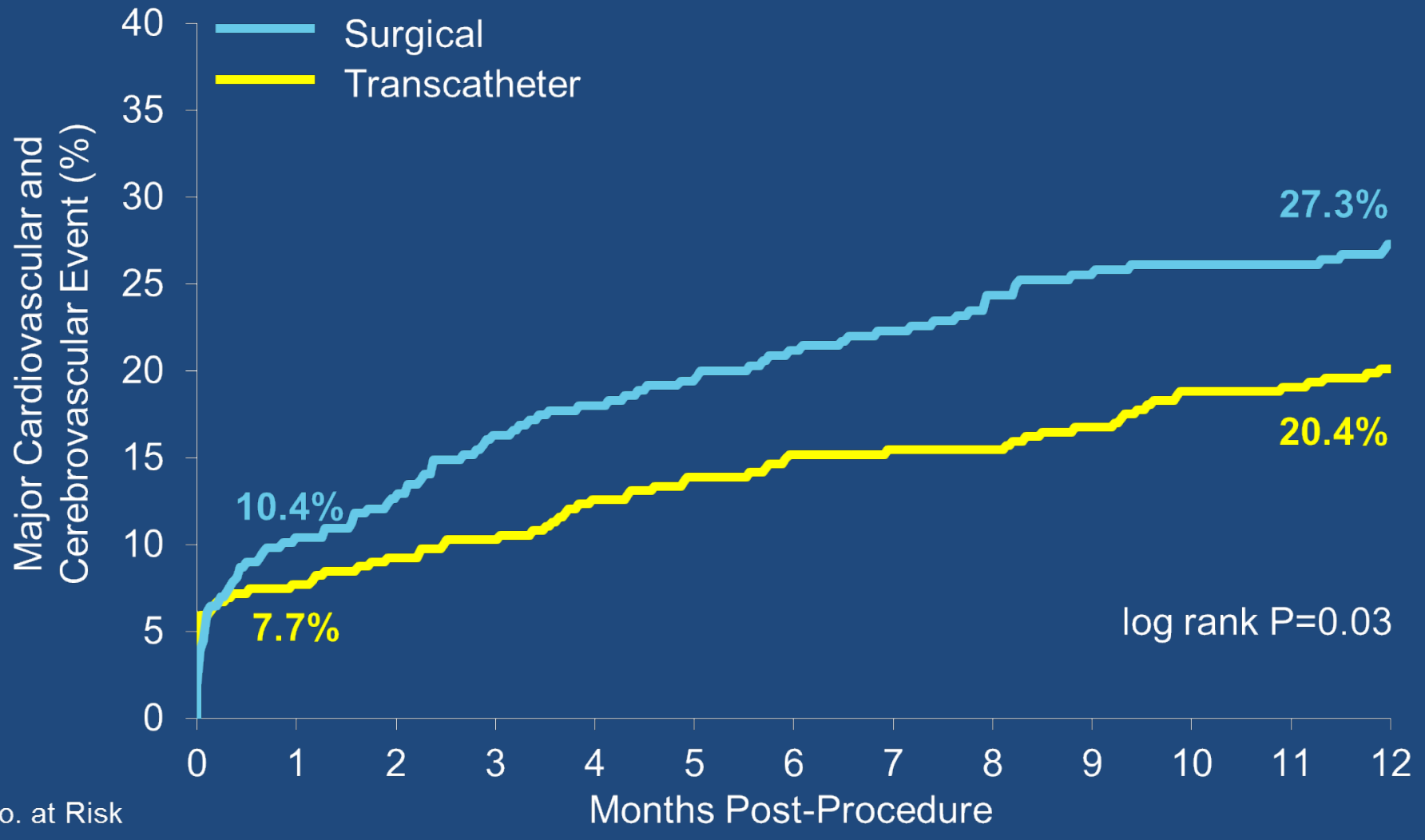
No. at Risk				
Surgical	357	341	274	28
Transcatheter	390	377	329	38

All Stroke



No. at Risk					
Surgical	357	322	274		249
Transcatheter	390	363	334		314

1 Year MACCE



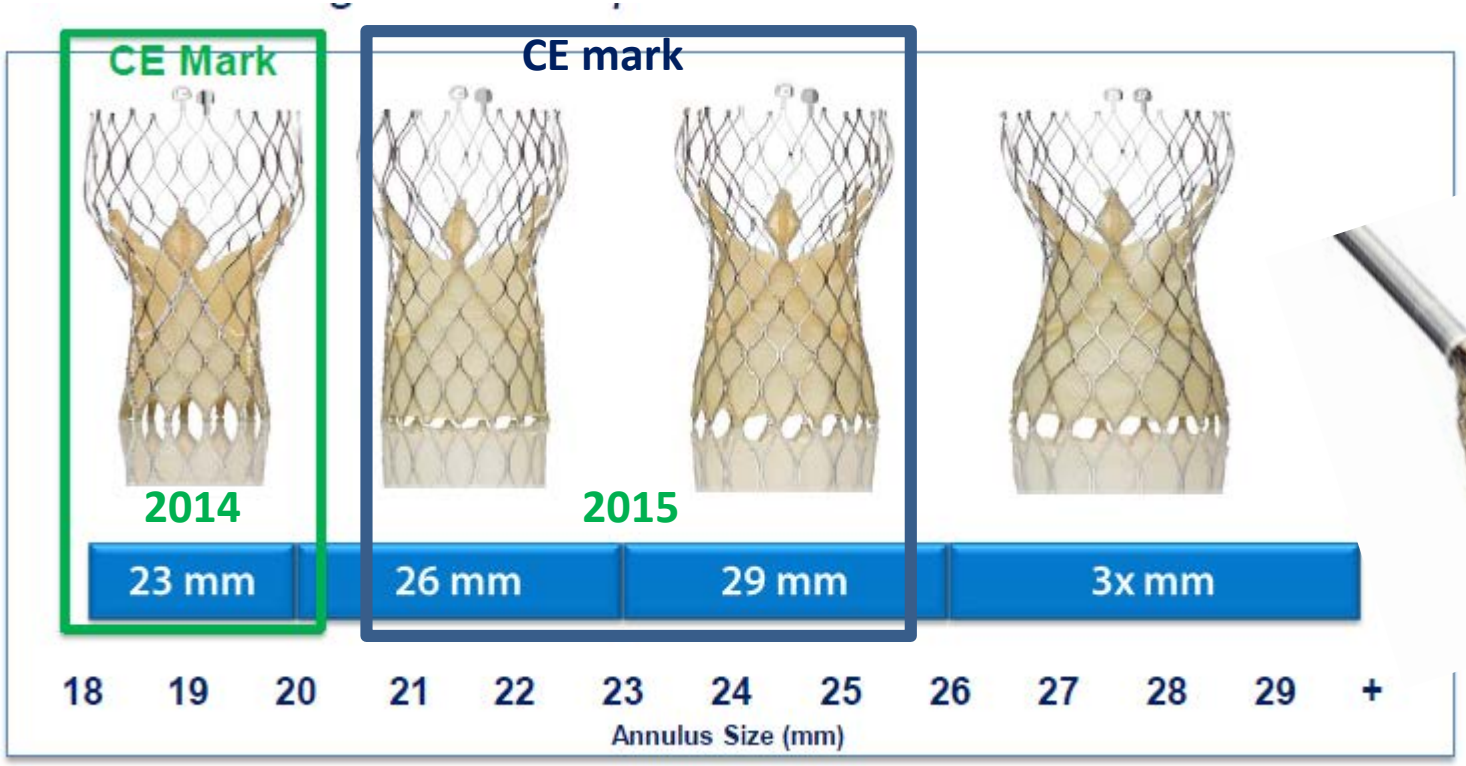
No. at Risk					
Surgical	357	320	273	247	
Transcatheter	390	360	329	306	

Other Endpoints

Events*	1 Month			1 Year		
	TAVR	SAVR	P Value	TAVR	SAVR	P Value
Vascular complications (major), %	5.9	1.7	0.003	6.2	2.0	0.004
Pacemaker implant, %	19.8	7.1	<0.001	22.3	11.3	<0.001
Bleeding (life threatening or disabling),%	13.6	35.0	<0.001	16.6	38.4	<0.001
New onset or worsening atrial fibrillation, %	11.7	30.5	<0.001	15.9	32.7	<0.001
Acute kidney injury, %	6.0	15.1	<0.001	6.0	15.1	<0.001

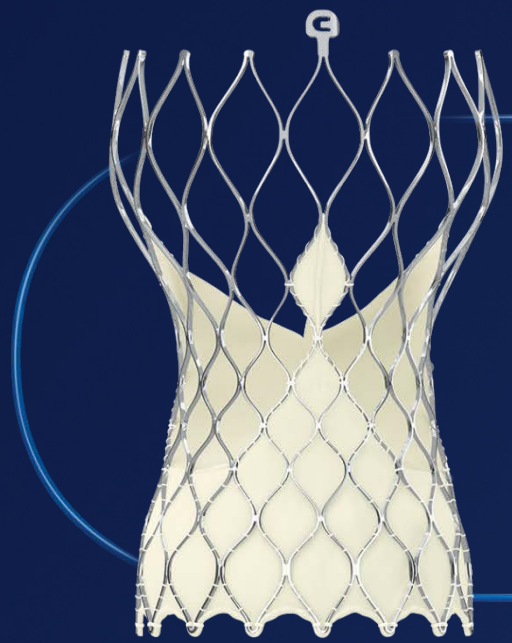
* Percentages reported are Kaplan-Meier estimates and log-rank P values

CoreValve Evolute family
Medtronic 2nd gen.



- Full annulus range 18-30mm
- Enhanced annular sealing
- Less traumatic inflow edge
- Optimized frame design and new Nitinol materials

CoreValve Evolut R System



Transcatheter Valve

Supra-annular design, optimized sealing

Catheter Delivery System

14Fr-equivalent profile

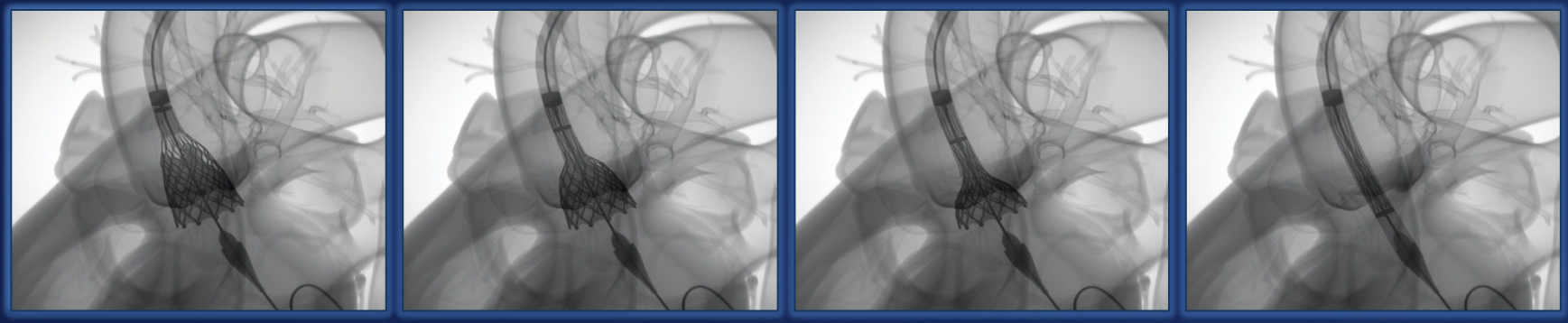
Loading System

Resheath/Recapture Experience

Used 22 times among 15 patients (25%); all for repositioning:

- 12 full recaptures among 10 patients
- 10 resheaths among 7 patients

All uses were successful



Valve too deep | Recapture begins | Partially recaptured | Valve fully captured

Source: Meredith IT, et al. Early Results from the CoreValve Evolut R CE Study [2101-295]. Presented at the Annual Meeting of the American College of Cardiology. March 14, 2015.

Methods

- All implanters experienced first use of the valve during the study.
- Multislice CT of the peripheral vascular and aortic annulus was preformed
- All source data were monitored.
- All echocardiographic results are based on independent, central core laboratory assessment. Mayo Clinic (Jae Oh, MD)
- Clinical endpoints reported according to Valve Academic Research Consortium (VARC-2)

Clinical Performance

Event, %	N=60
Absence of procedural mortality	100.0 (60/60)
Correct positioning of 1 valve in proper location	98.3 (59/60)
Mean gradient < 20 mm Hg or peak velocity < 3m/sec	98.3 (59/60)
Absence of moderate or severe regurgitation	93.3 (56/60)
Absence of patient prosthesis mismatch*	83.6 (46/55)
VARC-2 device success†	78.6 (44/56)

*Effective orifice area could not be determined in 5 patients to calculate patient prosthesis mismatch.

†First time reporting of device success according to VARC-2 criteria

Source: Meredith IT, et al. Early Results from the CoreValve Evolut R CE Study [2101-295]. Presented at the Annual Meeting of the American College of Cardiology. March 14, 2015.

30-Day Safety Endpoints

Events*	N=60	KM Rate (%)
Annular rupture†	0	0.0%
Coronary artery obstruction requiring intervention†	0	0.0%
Valve dysfunction requiring reintervention	0	0.0%
Device embolization	0	0.0%

* Percentages obtained from Kaplan Meier estimates

† Medtronic data on file.

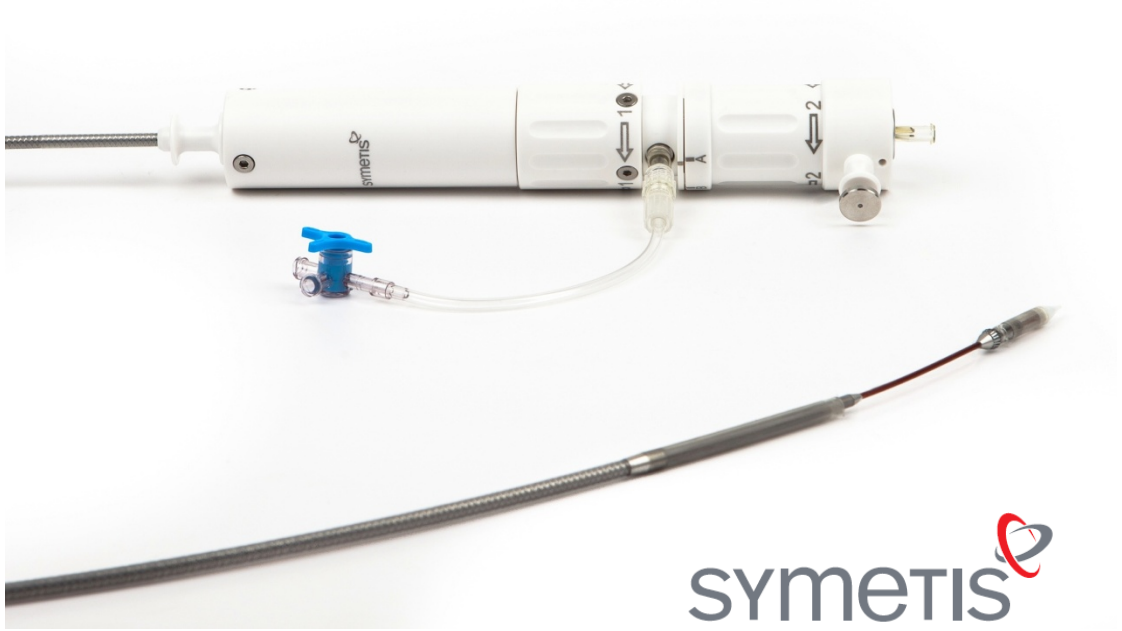
30-Day Outcomes

Event, % *	KM Rate (%)
All-cause mortality	0.0
All stroke	0.0
Absence of moderate or severe PVL	96.6
Permanent pacemaker implantation	11.7

* Percentages obtained from Kaplan Meier estimates

Source: Meredith IT, et al. Early Results from the CoreValve Evolut R CE Study [2101-295]. Presented at the Annual Meeting of the American College of Cardiology. March 14, 2015.

ACURATE *neo*™ & ACURATE TF™ Delivery System



Post-Market Registry

- EC approval of post-market registry in SEP 2014
- **S**ymetis **A**CURATE *neo*™ **V**alve **I**mplantation using **T**rans**F**emoral Access (**SAVI TF**) Registry
  - 1st 250 consented patients enrolled at 19 centers in EU
  - 1st patient treated in OCT 2014
  - Enrollment closed in MAR 2015
  - Amendment to add another 750 patients (actively recruiting)
- 30D endpoint results here for the first time

Procedure Success

PROCEDURE OUTCOMES	7D/DC
Population [n]	250
Procedure success [n/%]	245 / 98
VinV	4 / 1.6
Conversion to surgery	1 / 0.4
Procedure time [mins, mean± SD]	7±8
Deployed with rapid pacing [n/%]	198 / 79.2

VinV: Persistent PVL, bail-out procedure with S3

VinV: Embolization of ACURATE *neo* into AAo, bail-out with S3

VinV: Persistent PVL, bail-out with S3

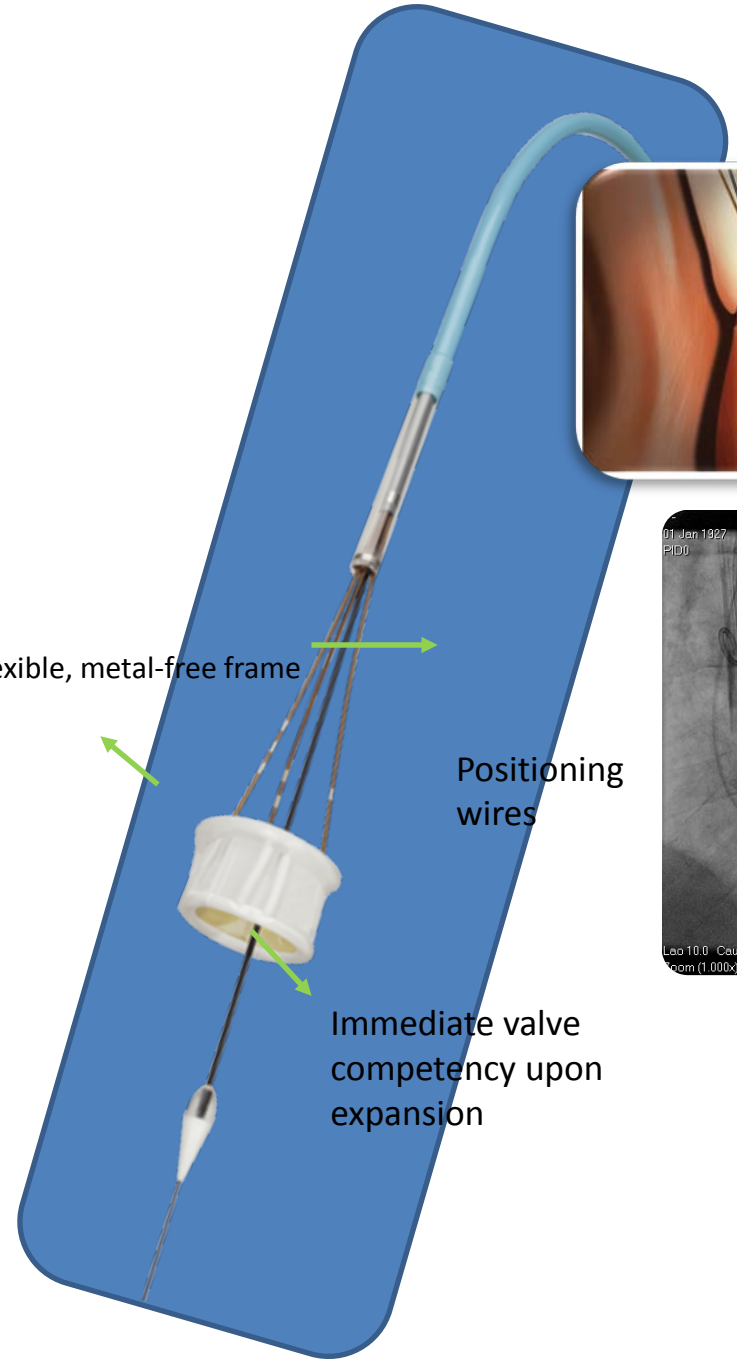
VinV: Incomplete expansion, bail-out with S3

SAVR: Conversion due to embolization of ACURATE *neo* into AAo

Safety

MACCE (n/%)	30D
Population [n]	250
All-cause mortality	4 / 1.6
Stroke	6 / 2.4
MI	2 / 0.8
Re-intervention post-DC	0 / 0.0
Freedom from MACCE	238 / 95.2
New pacemaker implantation	20 / 8.0

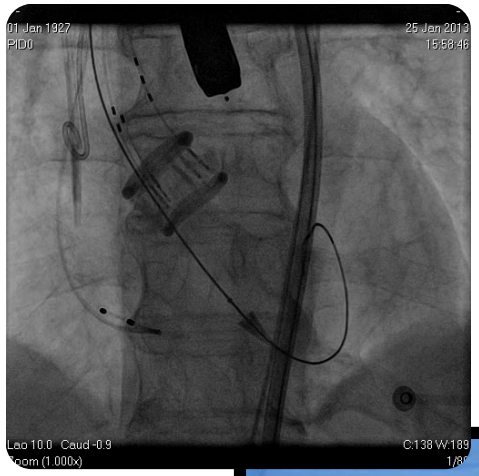
Direct Flow

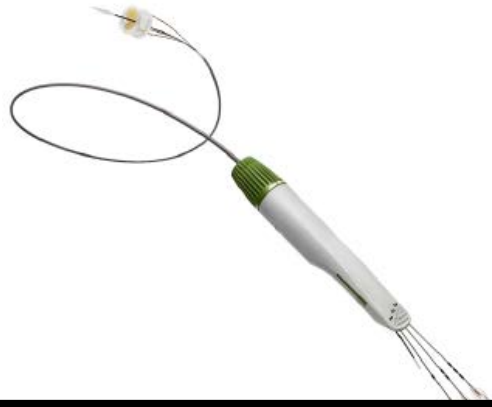


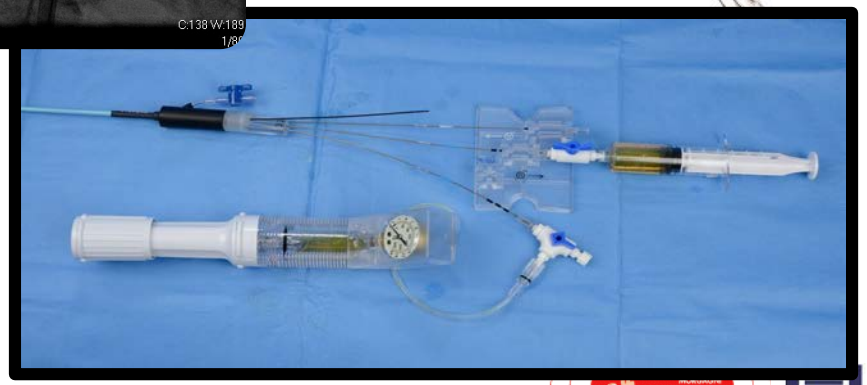
Flexible, metal-free frame

Positioning wires

Immediate valve competency upon expansion

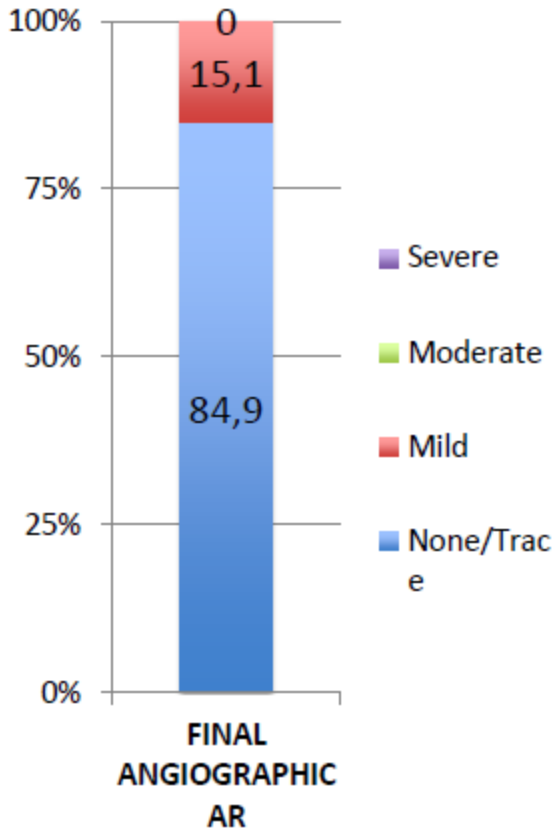






THE ITALIAN DFM REGISTRY

Procedural Results N = 139	
Device Success (VARC-2)	97.1 %
Device Size 23/25/27/29	6 / 51 / 36 / 7 %
Baseline peak to peak catheter gradient (mmHg)	60 ± 24
Post TAVI peak to peak catheter gradient (mmHg)	8 ± 7
Baseline echo Mean transvalvular gradient (mmHg)	49 ± 15
Post TAVI echo Mean transvalvular gradient (mmHg)	14 ± 7



euro PCR 2015

THE ITALIAN DFM REGISTRY

Clinical outcome

N = 142

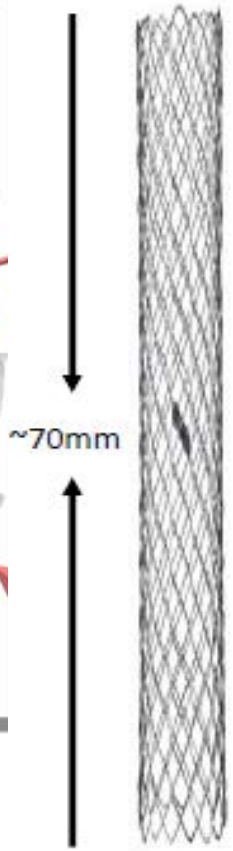
(Non hierarchical ranking, the same patient might have had multiple complications)

	30 DAY N = 136	LAST FOLLOW UP Med 11 months (IQR 3-19)
All cause mortality	3.5 %	9.2 %
Cardiac mortality		4.7 %
Stroke (major)	0.7 %	2.1 %
PPM rate	12.7 %	

The Lotus™ Valve System
Preloaded Delivery System

Locking Mechanism

Valve elongated in catheter for delivery



Step 1: Unsheathing

Valve unsheathed into intermediate configuration

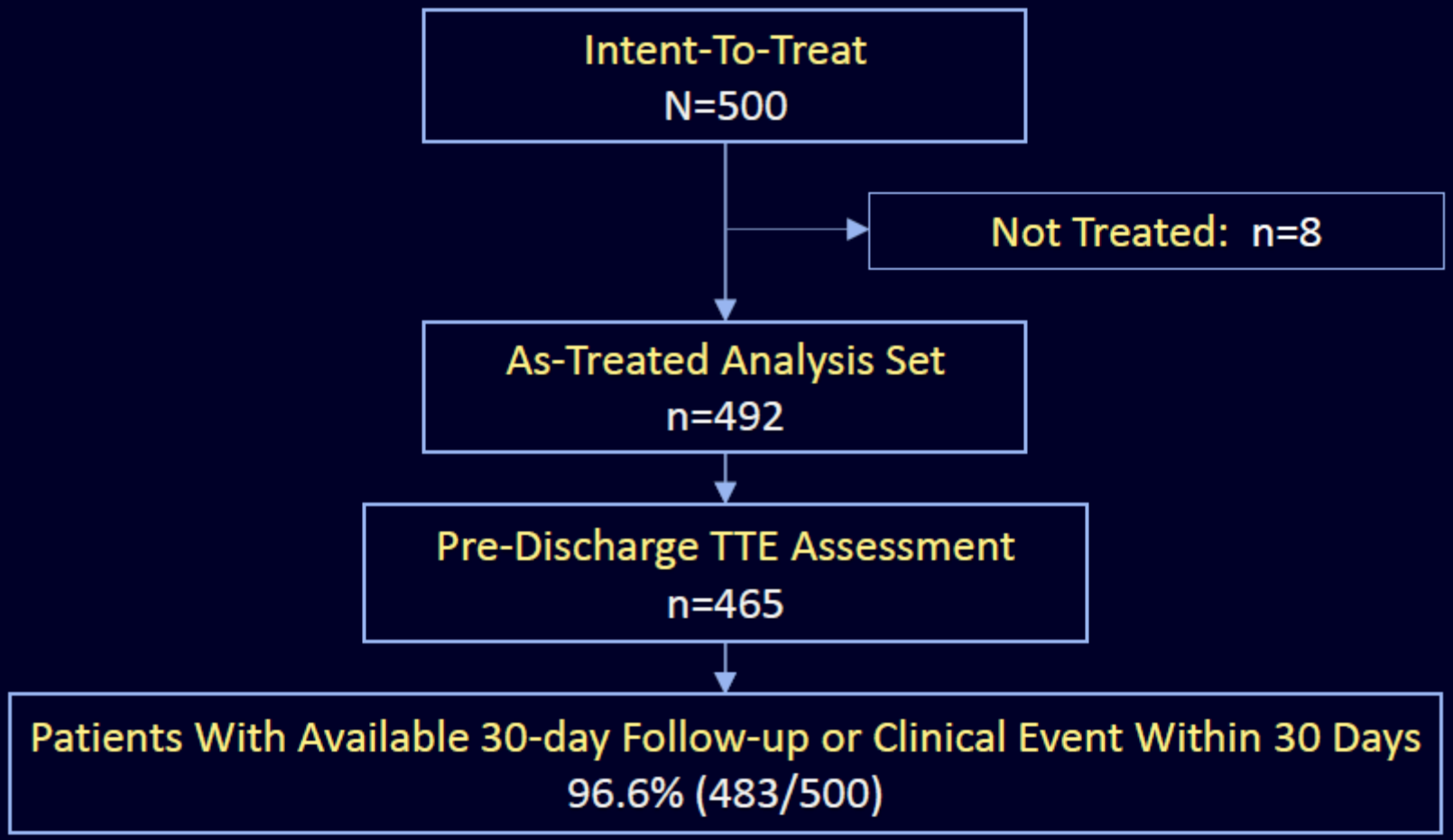
Step 2 : Locking

Valve expands radially as it shortens and locks into final configuration

Study Flow

500-Patient Interim Analysis

RESPOND



Device Success – VARC 2 Metrics

500-Patient Interim Analysis

RESPOND

	As-Treated (N=492)
No procedural mortality	100% (492/492)
Correct positioning of one valve in proper location	99.6% (490/492)
Mean aortic valve gradient <20 mmHg	97.2% (446/459)
Peak velocity <3 m/s	96.9% (445/459)
No moderate/severe prosthetic valve regurgitation	99.6% (463/465)

Safety Endpoints at 30 Days

500-Patient Interim Analysis

RESPOND

All-cause mortality	1.9% (9/483)
Cardiovascular mortality	1.7% (8/483)
All stroke	3.9% (19/483)
Disabling stroke	2.7% (13/483)
Life-threatening or disabling bleeding	1.7% (8/483)
Myocardial infarction (>72h post-procedure)	0.2% (1/483)
Acute kidney injury (Stage 2 or 3)	1.7% (8/483)
Repeat procedure for valve-related dysfunction	0% (0/483)
Valve- or CHF-related repeat hospitalisation	0.8% (4/483)
Newly implanted permanent pacemaker	30.6% (148/483)
Pacemaker dependent at 30 days (site-reported)	36.5% (54/148)

Portico™ Valve Design Features

- Intuitive System: Fully repositionable* and retrievable* *in situ*
  - Bovine pericardium leaflets
  - Porcine pericardium sealing cuff
  - Both leaflets and cuff are treated with Linx™ AC treatment**
- Large cell geometry and non-flared design
- Slow controlled deployment – no rapid pacing or loss in hemodynamic pressure

Portico Valve

*Until fully deployed.
**There is no clinical data currently available that evaluates the long-term impact of anticalcification tissue treatment in humans.

PORTICO
CLINICAL PROGRAM

Clinical Safety Results

All events adjudicated by an independent Clinical Events Committee

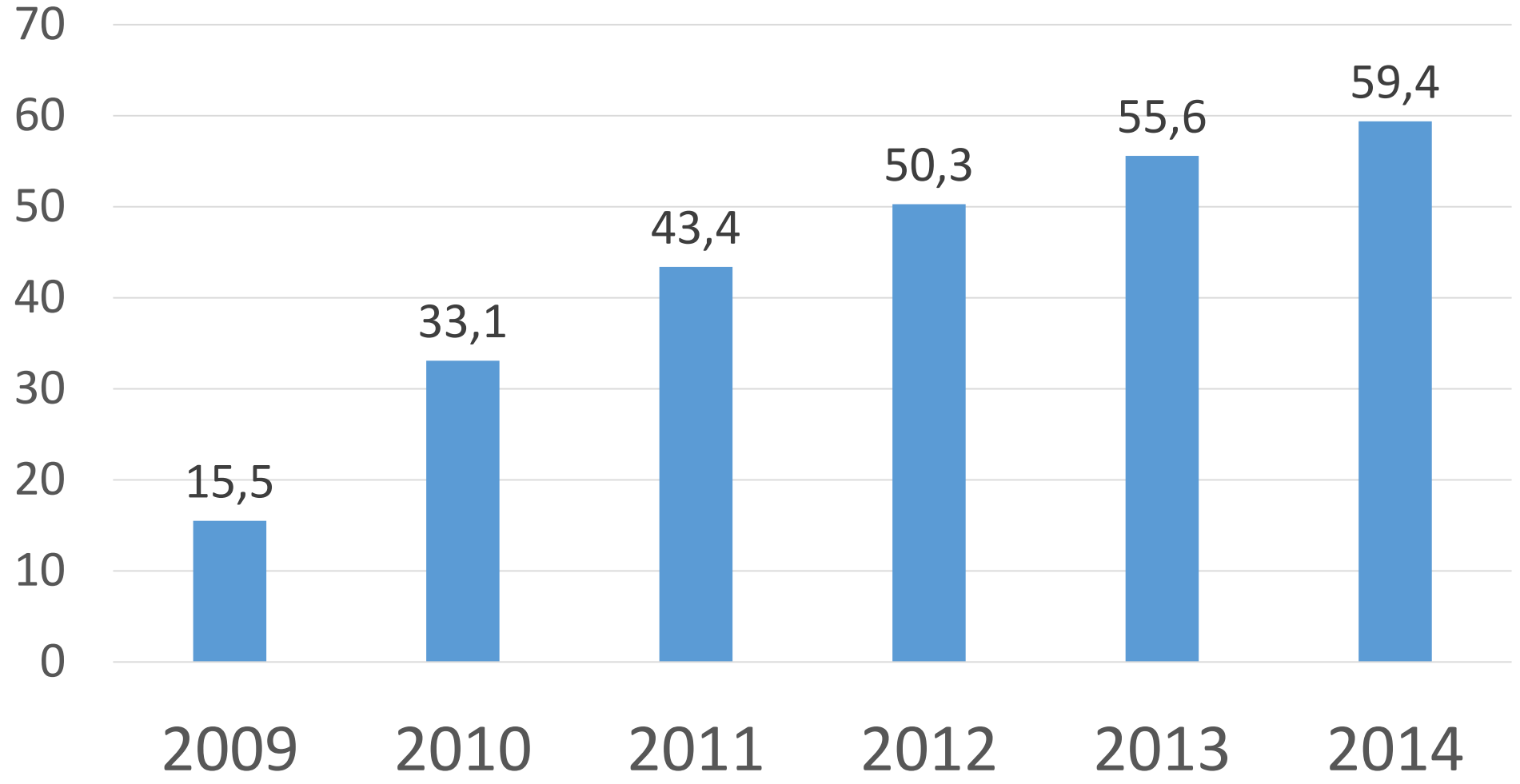
Event	30 Day Rate (%) n = 102	1 Year Overall Rate (%) n = 102
Mortality ▪ Cardiovascular mortality	2.9 2.9	11.8 7.8
Disabling (Major) stroke Non-disabling (Minor) stroke	2.9 1.0	4.9 2.0
New pacemaker implantation	9.8	10.8
Myocardial infarction	2.0	2.0
Acute kidney injury ▪ Stage 3 AKI	2.0	3.9
Major vascular complication Minor vascular complication	5.9 3.9	6.9 3.9
Life-threatening or disabling bleeding	3.9	3.9
Coronary obstruction	0.0	0.0

PORTICO
CLINICAL PROGRAM

Considerazioni

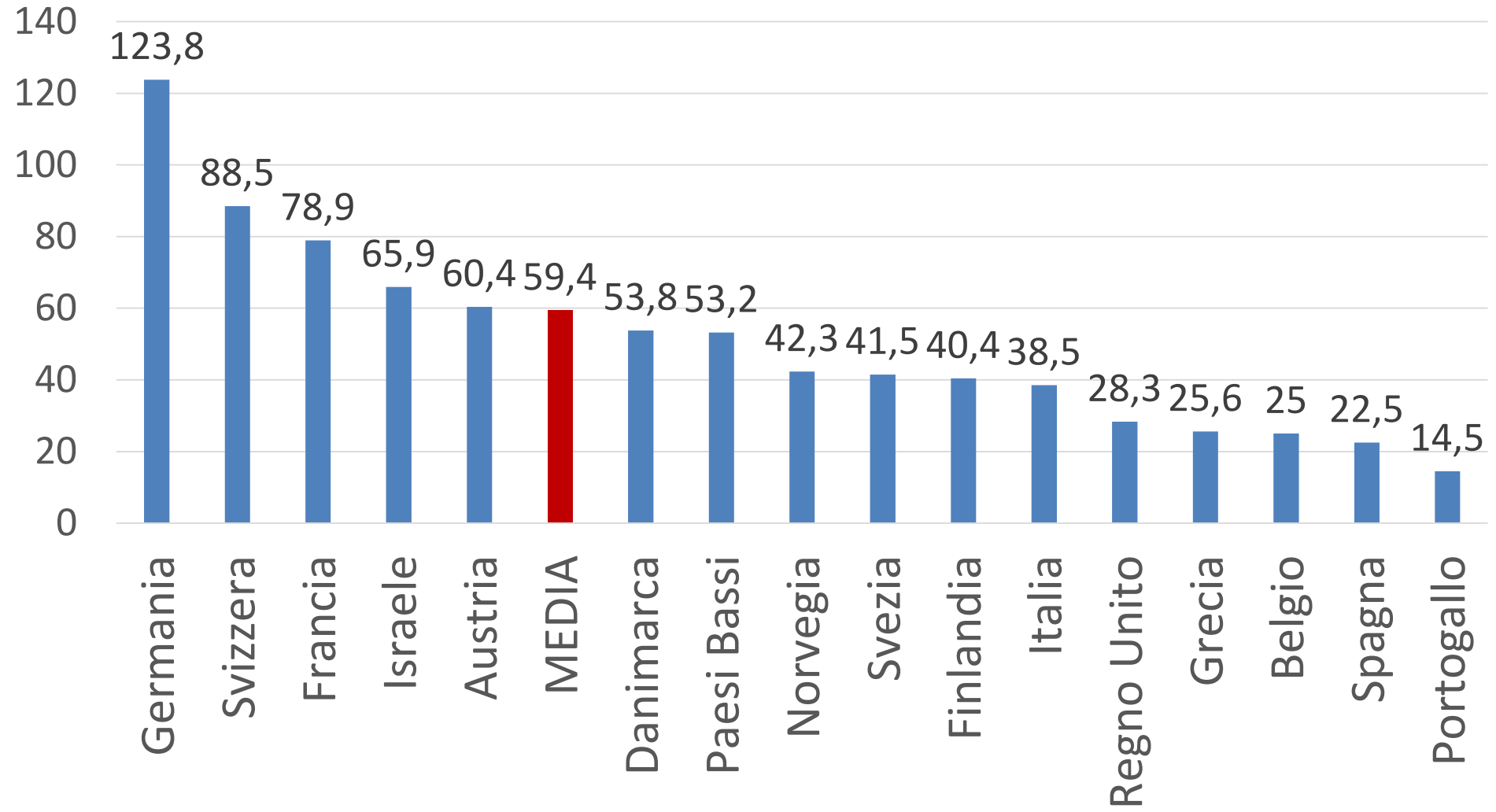
- I risultati procedurali e clinici sono molto buoni con tutte le protesi transcatetere disponibili ed in alcuni casi eccellenti con le valvole di terza generazione
- La disponibilità di valvole transcatetere con caratteristiche tecniche peculiari ci permette di scegliere la protesi piu ADATTA per l'anatomia della valvola di ogni singolo paziente e ridurre le complicanze

TAVI Implant rate per millions inhabitants 2009-2014 (16 countries)



TAVI Therapy adoption – 2014 DATA

Implants per millions inhabitants



OneValveOneLife è un'iniziativa promossa da SIC

GRAZIE