

# Transcatheter Aortic Valve Replacement: Will TAVR replace Surgical AVR?

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## Company/Relationship

**Eberhard Grube, MD**

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G - Grant and or Research Support    E - Equity Interests    S - Salary, AB - Advisory Board  
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# TAVI Patients Risk | Background

- TAVI is typically indicated for patients at high or extreme surgical risk, and the clinical evidence has consistently demonstrated good outcomes for these patients.
- TAVI outcomes, though, are driven by multiple factors. A change in any one may alter the course for an individual TAVI patient.

## Patient

- Comorbidities
- Anatomy

## Operator

- Experience / Learning Curve
- Clinical Judgment: Use of device and approach best suited to the patient

## Device Characteristics

- Size / profile
- Materials
- Deliverability

# Intermediate Surgical Risk | Background

- Contemporary clinical practice is evolving such that patients at lower surgical risk are being treated by TAVI.

## MINI-FOCUS ON TAVI

### CLINICAL RESEARCH

#### A 3-Center Comparison of 1-Year Mortality Outcomes Between Transcatheter Aortic Valve Implantation and Surgical Aortic Valve Replacement on the Basis of Propensity Score Matching Among Intermediate-Risk Surgical Patients

Nicolo Piazza, MD, PhD,\*† Bindu Kalesan, PhD,‡ Nicolas van Mieghem, MD,§ Stuart Head, MSc,|| Peter Wenaweser, MD,¶ Thierry P. Carrel, MD,‡ Sabine Bleiziffer, MD,\*† Peter P. de Jaegere, MD, PhD,§ Brigitta Gahl,‡ Robert H. Anderson, MD, PhD,\*\* Arie-Pieter Kappetein, MD, PhD,|| Ruediger Lange, MD, PhD,\*† Patrick W. Serruys, MD, PhD,§ Stephan Windecker, MD,¶ Peter Jüni, MD‡  
*Munich, Germany; Bern, Switzerland; Rotterdam, the Netherlands; Montreal, Canada; and Newcastle-Upon-Tyne, United Kingdom*

## STRUCTURAL HEART DISEASE

#### Acute and Late Outcomes of Transcatheter Aortic Valve Implantation (TAVI) for the Treatment of Severe Symptomatic Aortic Stenosis in Patients at High- and Low-Surgical Risk

GERHARD SCHYMIK, M.D.,<sup>1</sup> HOLGER SCHRÖFEL, M.D.,<sup>2</sup> JAN S. SCHYMIK,<sup>3</sup> RAINER WONDASCHKE,<sup>1</sup> TIM SÜSELBECK, M.D.,<sup>4</sup> RÜDIGER KIEFER,<sup>2</sup> VERONIKA BALTHASAR, M.D.,<sup>2</sup> ARMIN LUIK, M.D.,<sup>1</sup> HERBERT POSIVAL, M.D.,<sup>2</sup> and CLAUS SCHMITT, M.D.<sup>1</sup>

*From the <sup>1</sup>Medical Clinic IV, Municipal Hospital Karlsruhe, Germany; <sup>2</sup>Clinic for Cardiac Surgery Karlsruhe, Germany; <sup>3</sup>University of Munich, Germany; and <sup>4</sup>Department of Medicine, University Medical Centre Mannheim, Germany*

#### Improvements in Transcatheter Aortic Valve Implantation Outcomes in Lower Surgical Risk Patients

##### A Glimpse Into the Future

Ruediger Lange, MD, PhD, Sabine Bleiziffer, MD, Domenico Mazzitelli, MD, Yacine Elhmidi, MD, Anke Opitz, MD, Marcus Krane, MD, Marcus-Andre Deutsch, MD, Hendrik Ruge, MD, Gernot Brockmann, MD, Bernhard Voss, MD, Christian Schreiber, MD, Peter Tassani, MD, PhD, Nicolo Piazza, MD, PhD

*Munich, Germany*

#### Clinical outcomes of patients with estimated low or intermediate surgical risk undergoing transcatheter aortic valve implantation

Peter Wenaweser<sup>1†\*</sup>, Stefan Stortecky<sup>1†</sup>, Sarah Schwander<sup>1</sup>, Dik Heg<sup>2</sup>, Christoph Huber<sup>3</sup>, Thomas Pilgrim<sup>1</sup>, Steffen Gloekler<sup>1</sup>, Crochan J. O'Sullivan<sup>1</sup>, Bernhard Meier<sup>1</sup>, Peter Jüni<sup>2</sup>, Thierry Carrel<sup>3</sup>, and Stephan Windecker<sup>1,2</sup>

#### Transcatheter vs surgical aortic valve replacement in intermediate-surgical-risk patients with aortic stenosis: A propensity score-matched case-control study

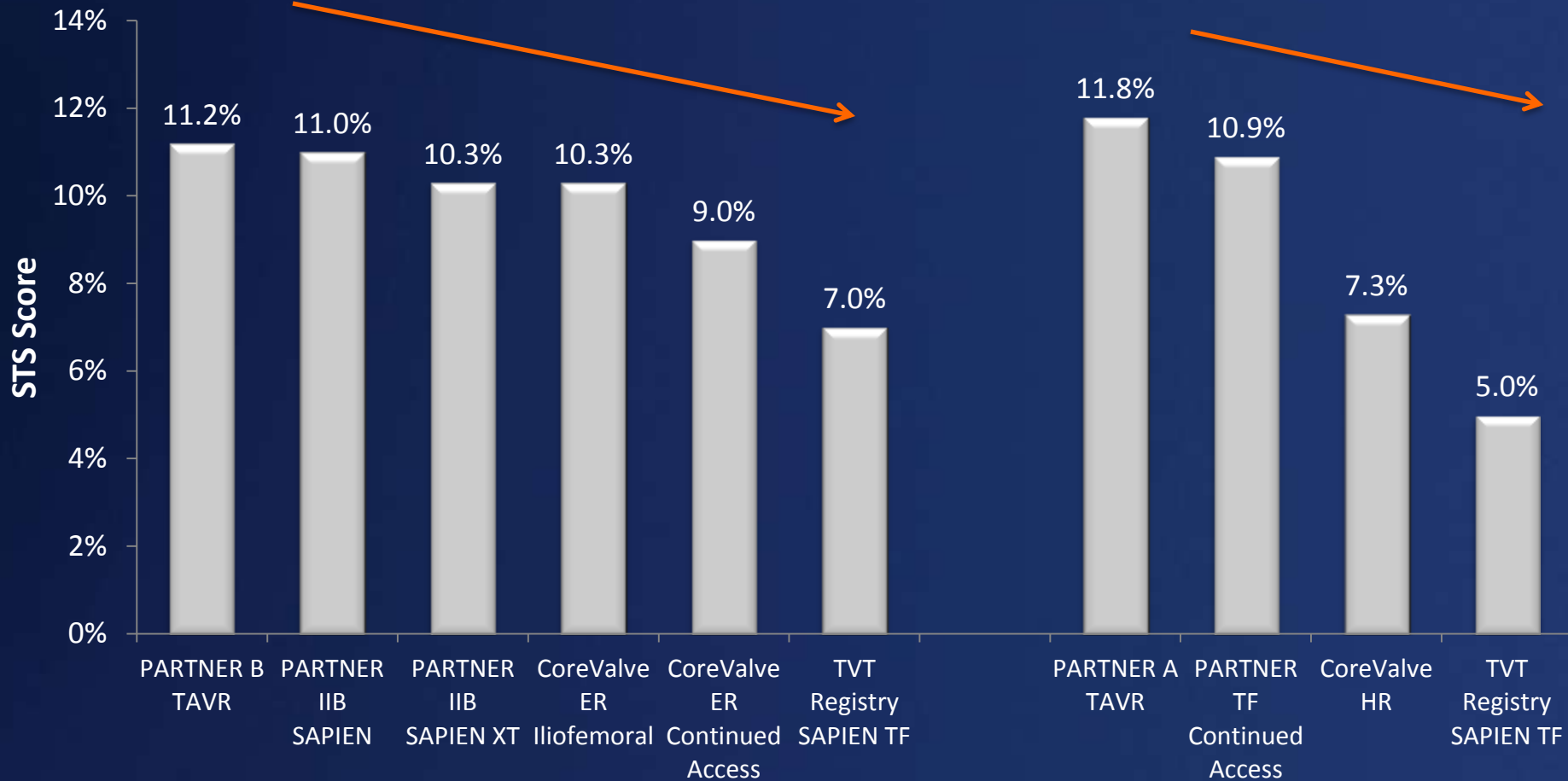
Azeem Latib, MB ChB,<sup>a,b,c</sup> Francesco Maisano, MD,<sup>c,f</sup> Letizia Bertoldi, MD,<sup>b</sup> Andrea Giacomini, MD,<sup>a</sup> Joanne Shannon, MD,<sup>a</sup> Micaela Cioni, MD,<sup>c</sup> Alfonso Ielasi, MD,<sup>b</sup> Filippo Figini, MD,<sup>a,b</sup> Kensuke Tagaki, MD,<sup>a</sup> Annalisa Franco, MD,<sup>d</sup> Remo Daniel Covello, MD,<sup>d</sup> Antonio Grimaldi, MD,<sup>d</sup> Pietro Spagnolo, MD,<sup>e</sup> Gill Louise Buchanan, MD,<sup>b</sup> Mauro Carlino, MD,<sup>b</sup> Alaide Chieffo, MD,<sup>b</sup> Matteo Montorfano, MD,<sup>b</sup> Ottavio Alfieri, MD,<sup>e</sup> and Antonio Colombo, MD<sup>a,b</sup> *Milan, Italy*

#### Transcatheter aortic valve implantation versus surgical aortic valve replacement for severe aortic stenosis: Results from an intermediate risk propensity-matched population of the Italian OBSERVANT study

Paola D'Errigo<sup>a</sup>, Marco Barbanti<sup>b,c,\*</sup>, Marco Ranucci<sup>d</sup>, Francesco Onorati<sup>e</sup>, Remo Daniel Covello<sup>f</sup>, Stefano Rosato<sup>a</sup>, Corrado Tamburino<sup>b,c</sup>, Francesco Santini<sup>e</sup>, Gennaro Santoro<sup>g</sup>, Fulvia Seccareccia<sup>h</sup> and on behalf of the OBSERVANT Research Group

<sup>1</sup>Wenaweser, et al., *Eur Heart J* 2013; 34: 1894-905; <sup>2</sup>Lange, et al., *J Am Coll Cardiol* 2012; 59: 280-7; <sup>3</sup>Piazza, et al., *J Am Coll Cardiol Intv* 2013; 6: 443-51; <sup>4</sup>D'Errigo, et al., *Int J Cardiol* 2013; 167: 1945-62; epub; <sup>5</sup>Latib, et al., *Am Heart J* 2012; 164: 910-7; Schymik, et al., *J Interv Cardiol* 2012; 25: 364-74

# Intermediate Surgical Risk | Evolution in Patient Selection



Inoperable / Extreme Risk Trials

High Risk Trials

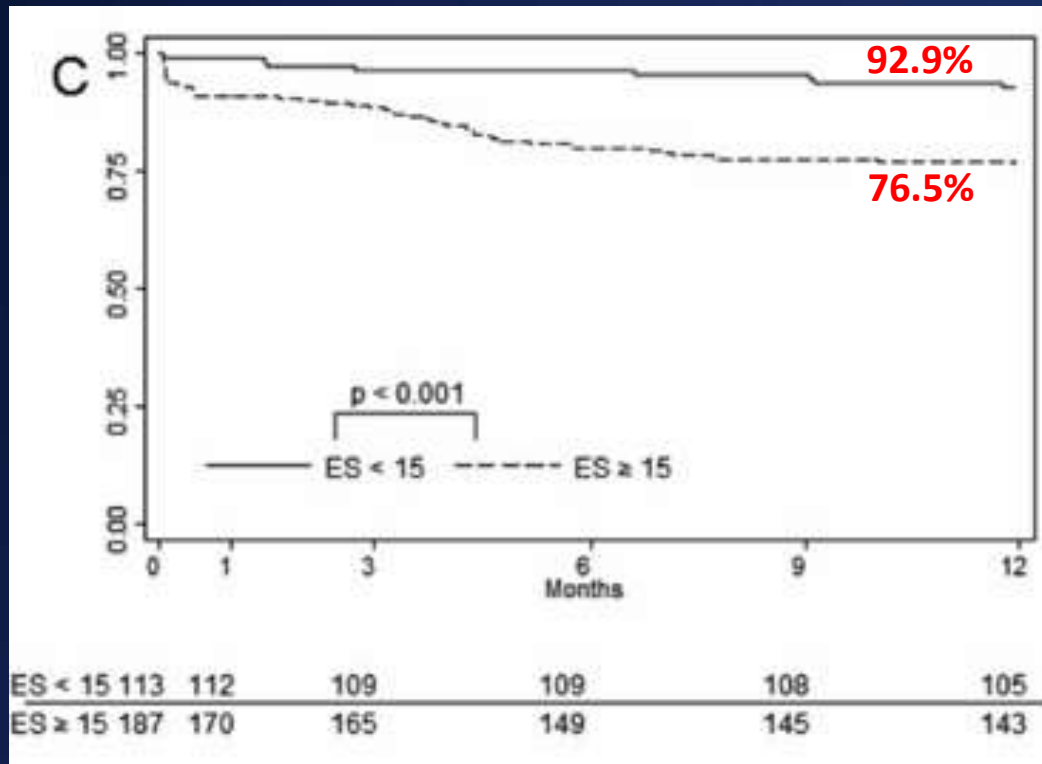
# Intermediate Surgical Risk | TAVI Outcomes

- Two European centers have directly compared TAVI outcomes of patients at lower- and higher-risk within their centers.
- Clinical outcomes were generally favorable for the patients at lower risk<sup>1,2</sup>.

	Bern <sup>1</sup>		Munich <sup>2</sup>	
	Lower Risk (n=254)	Higher Risk (n=94)	Lower Risk (n=105)	Higher Risk (n=105)
STS (%)	5.1 ± 1.4	13.3 ± 7.1	4.8 ± 2.6	7.13 ± 5.4
Log EuroSCORE (%)	22.1 ± 11.9	35.1 ± 15.7	17.8 ± 12.0	25.44 ± 16.0
30 Day Mortality (%)	3.9	14.9	3.8	11.4
Total Vascular Complications (%)	17.7	20.3	14.7	28.6
Stroke / TIA (%)	5.0	3.4	1	6.7

# Intermediate Surgical Risk | TAVI Outcomes

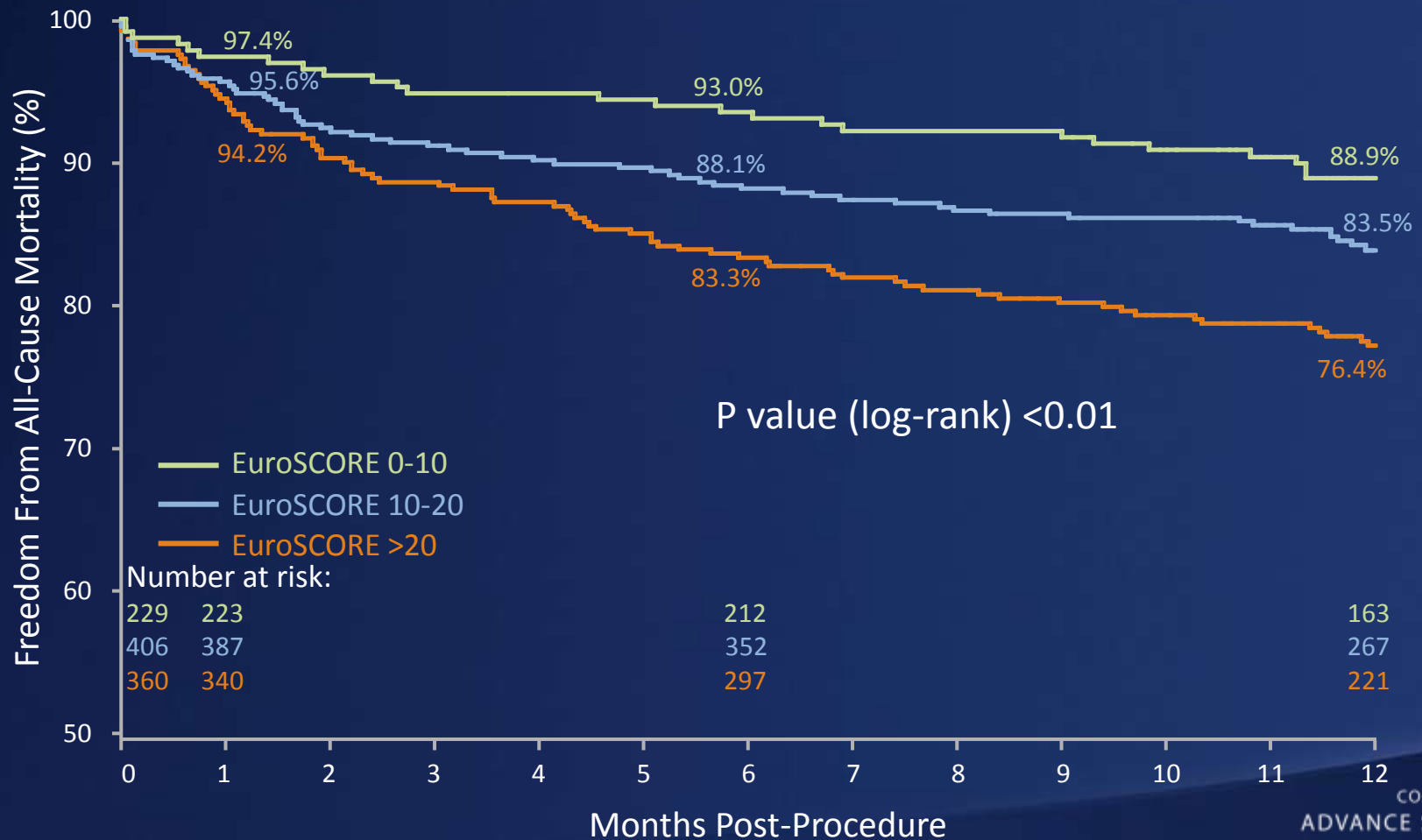
Schymik<sup>1</sup> demonstrated that for every 10-point increase in EuroSCORE the mortality risk increased within the first year by 67% (OR 1.67, 95% CI 1.34-2.08, P<0.0001)



Kaplan-Meier survival estimates  
EuroSCORE ≥15 vs EuroSCORE <15

# Intermediate Surgical Risk | CoreValve Outcomes

The CoreValve ADVANCE Study demonstrated that decreased surgical risk score correlated with decreased mortality



<sup>1</sup>Brecker, et al., presented at EuroPCR 2013



# Intermediate Surgical Risk | Impact of Comorbidities

Many studies have shown that comorbidities add risk to TAVI. This may explain why patients at lower surgical risk have shown better outcomes compared to their higher risk counterparts.

## Transcatheter Aortic Valve Implantation in Patients With "Porcelain" Aorta (from a Multicenter Real World Registry)

Ralf Zahn, MD<sup>1\*</sup>, Rudolf Schiele, MD<sup>2</sup>, Ulrich Gerckens, MD<sup>3</sup>, Axel Linke, MEd, Horst Sievert, MD<sup>2</sup>, Philipp Kahler, MD<sup>4</sup>, Rainer Hambrecht, MD<sup>5</sup>, Stefan Sack, MD<sup>6</sup>, Mohamed Abdel-Wahab, MD<sup>7</sup>, Ellen Hoffmann, MD<sup>8</sup>, and Jochen Senes, MD<sup>9</sup>, on behalf of the German Transcatheter Aortic Valve Interventions Registry Investigators

The presence of severe atherosclerosis of the ascending aorta, and its extension from the "porcelain" aorta, is associated with a worse clinical outcome in patients undergoing surgical aortic valve replacement. Percutaneous transcatheter aortic valve implantation (TAVI) for severe aortic stenosis can overcome this problem. In 1,374 TAVI procedures were performed at 27 hospitals in 247 patients (18.7%) with and 1,227 (89.3%) without a porcelain aorta. The mean reported prevalence of a porcelain aorta at the hospitals was 7.8% ± 14.8% (range 0% to 70%). Diabetes mellitus (46.3% vs 33.2%,  $p = 0.00018$ ), chronic obstructive pulmonary disease (43.5% vs 32.2%,  $p < 0.0001$ ), and peripheral arterial obstructive disease (34.7% vs 20.0%,  $p < 0.0001$ ) were more prevalent in

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## Effect of Body Mass Index on Short- and Long-term Outcomes After Transcatheter Aortic Valve Implantation

Robert M.A. van der Boon, MS<sup>1</sup>, Alade Chieffo, MD<sup>2</sup>, Nicolas Dumortier, MD<sup>3</sup>, Didier Tebette, MD<sup>2</sup>, Nicolas M. Van Mieghem, MD<sup>4</sup>, Gill L. Buchanan, MChB<sup>5</sup>, Olivier Vahdat, MD<sup>6</sup>, Bertrand Marcheix, MD, PhD<sup>7</sup>, Patrick W. Serruys, MD, PhD<sup>8</sup>, Jean Fajadet, MD<sup>9</sup>, Antonio Colombo, MD, PhD<sup>10</sup>, Didier Carrié, MD, PhD<sup>11</sup>, Ron T. van Domburg, PhD<sup>12</sup>, and Peter P.T. de Jaegere, MD, PhD<sup>13\*</sup>, on behalf of the PRAGMATIC-Plus Researchers

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Letter to the Editor

One year clinical outcomes in patients with severe aortic stenosis and left ventricular systolic dysfunction undergoing transcatheter aortic valve implantation: Results from the Italian CoreValve Registry<sup>1</sup>

Claudia Fiorina<sup>1\*</sup>, Marco Barbanti<sup>1a</sup>, Marco De Carlo<sup>1</sup>, Federico De Marco<sup>1</sup>, Giuseppe Tarantini<sup>1</sup>, Francesco Bologni<sup>1</sup>, Gennaro Iannone<sup>1</sup>, Anna Sonia Petronio<sup>1</sup>, Gian Paolo Usia<sup>1</sup>, Diego Maffeo<sup>1</sup>, Corrado Tamburino<sup>1a</sup>, Federica Ettori<sup>1</sup>

\* Author for correspondence.

## Transcatheter Aortic Valve Implantation in Patients With Severe Left Ventricular Dysfunction

Immediate and Mid-Term Results, A Multicenter Study

Chiara Fraccaro, MD; Rasha Al-Lamee, MA, MRCP; Giuseppe Tarantini, MD, PhD; Francesco Maisano, MD; Massimo Napolitano, MD; Matteo Montorfano, MD; Anna Chiara Frigo, MS; Sabino Iliceto, MD; Gino Gerosa, MD; Giambattista Isabella, MD; Antonio Colombo, MD

Catheterization and Cardiovascular Interventions 81(2005) 2019

## VALVULAR AND STRUCTURAL HEART DISEASES

### Original Studies

## Impact of Aortic Valve Calcification on the Outcome of Transcatheter Aortic Valve Implantation: Results from the Prospective Multicenter German TAVI Registry

Stephan Staubach,<sup>1</sup> MSc, Jennifer Franke,<sup>1</sup> MSc, Ulrich Gerckens,<sup>2</sup> MSc, Gerhard Schölknecht,<sup>3</sup> MSc, Ralf Zahn,<sup>4</sup> MSc, Holger Eggbrecht,<sup>5</sup> MSc, Rainer Hambrecht,<sup>6</sup> MSc, Stefan Sack,<sup>7</sup> MSc, Gert Richardt,<sup>8</sup> MSc, Martin Hosenk,<sup>9</sup> MSc

on behalf of the Acquired Cardiovascular Disease

Pulmonary hypertension is associated with worse early and late outcomes after aortic valve replacement: Implications for transcatheter aortic valve replacement

Eric E. Rosell, MD,<sup>1</sup> Akas Abdol Aziz, MD, MSc,<sup>2</sup> Perry L. Houghtaling, MS,<sup>3</sup> Wael A. Jaber, MD,<sup>4</sup> and Eugene H. Blackstone, MD<sup>5\*</sup>

**Objective:** Our objectives were to determine the prevalence of pulmonary hypertension (PH) in patients with aortic stenosis (AS) and to evaluate the impact of PH on early and late outcomes after transcatheter aortic valve replacement (TAVR).  
Journal of the American College of Cardiology 74(12):3161-3170, 2020. © 2020 by the American College of Cardiology Foundation. Published by Elsevier Inc. DOI: 10.1016/j.jacc.2020.07.038

## Outcomes of Patients With Chronic Lung Disease and Severe Aortic Stenosis Treated With Transcatheter Versus Surgical Aortic Valve Replacement or Standard Therapy

Insights From the PARTNER Trial (Placement of Aortic Transcatheter Valve)

Danny Dvir, MD,<sup>1</sup> Ron Wakeman, MD,<sup>2</sup> Israel M. Barbak, MD,<sup>3</sup> Sarah K. Kodali, MD,<sup>4</sup> Lars G. Svensson, MD, PhD,<sup>5</sup> E. Murat Tuzum, MD,<sup>6</sup> Ke Xu, PhD,<sup>7</sup> Siva Mirra, MD,<sup>8</sup> Maria C. Alcaz, Wilson Y. Szeto, MD,<sup>9</sup> Vimal H. Thourani, MD,<sup>10</sup> Raj Makkar, MD,<sup>11</sup> and Robert H. Mehta, MD, PhD<sup>12\*</sup>

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## Impact of Diabetes Mellitus on Early and Midterm Outcomes After Transcatheter Aortic Valve Implantation (from a Multicenter Registry)

Federico Corradi, MD<sup>1\*</sup>, Fabrizio D'Ascenzo, MD<sup>2</sup>, Francesco Giavanna, MD<sup>3</sup>, Stefano Salizzoni, MD<sup>4</sup>, Corrado Tamburino, MD<sup>5</sup>, Giuseppe Tarantini, MD<sup>6</sup>, Patricia Probst-Harms, MD<sup>7</sup>, Marco Barbanti, MD<sup>8</sup>, Valeria Gospario, MD<sup>9</sup>, Marco Mouton, MD<sup>10</sup>, Massimo Napolitano, MD<sup>11</sup>, Mario L. Rossi, MD<sup>12</sup>, Michele La Torre, MD<sup>13</sup>, Gaetano Ferraro, MD<sup>14</sup>, Pierluigi Croci, MD<sup>15</sup>, Paolo Scacciatella, MD<sup>16</sup>, Walter Gerosa, MD<sup>17</sup>, Chiara Colici, MD<sup>18</sup>, Giuseppe Bianchi-Zoccai, MD<sup>19</sup>, Claudio Moretti, MD<sup>20</sup>, Maurizio D'Antonio, MD<sup>21</sup>, Mauro Rinaldi, MD<sup>22</sup>, Florento Giba, MD<sup>23</sup>, and Sebastiano Maria, MD<sup>24</sup>

## The Impact of Frailty Status on Survival After Transcatheter Aortic Valve Replacement in Older Adults With Severe Aortic Stenosis

A Single-Center Experience

Journal of the American College of Cardiology 74(12):3161-3170, 2020. © 2020 by the American College of Cardiology Foundation. Published by Elsevier Inc. DOI: 10.1016/j.jacc.2020.07.038

## Chronic Obstructive Pulmonary Disease in Patients Undergoing Transcatheter Aortic Valve Implantation

Insights on Clinical Outcomes, Prognostic Markers, and Functional Status Changes

Michael Mok, MBBS,<sup>1</sup> Luis Nunez-Franco, MD,<sup>2</sup> Eric Dumont, MD,<sup>3</sup> Martin Umm, MD,<sup>4</sup> Robert DeLaurochelliere, MD,<sup>5</sup> Daniel Doyle, MD,<sup>6</sup> Joaquin Vliessen, MD,<sup>7</sup> Melanie Cost, MSc,<sup>8</sup> Henrique B. Ribeiro, MD,<sup>9</sup> Ricardo Alessi, MD,<sup>10</sup> Jérôme Laffont, MS,<sup>11</sup> Hugo DeLaurochelliere, MS,<sup>12</sup> Louis Laffont, MS,<sup>13</sup> Ignacio Amat-Santos, MD,<sup>14</sup> Philippe Pélissier, PhD,<sup>15</sup> François Mulan, MD,<sup>16</sup> Josep Rodés-Cabes, MD<sup>17\*</sup>

Quebec City, Quebec, Canada

**Objective:** This study sought to determine the effects of chronic obstructive pulmonary disease (COPD) on clinical outcomes in patients undergoing transcatheter aortic valve implantation (TAVI) and to determine the factors associated with worse outcomes in COPD patients.

**Background:** No data exist on the factors determining poorer outcomes in COPD patients undergoing TAVI.  
**Methods:** A total of 319 consecutive patients (29.5% with COPD) who underwent TAVI were studied. Functional status was evaluated by New York Heart Association (NYHA) functional class, Duke Activity Status Index, and the 6-min walk test (6MWT) at baseline and at 6 to 12 months. The TAVI treatment was considered futile if the patient either died or did not improve in NYHA functional class at 6-month follow-up.

**Results:** Survival rates at 1 year were 78.6% in COPD patients and 84.5% in patients without COPD ( $p = 0.008$ ). COPD was an independent predictor of cumulative mortality after TAVI (hazard ratio 1.84; 95% confidence interval: 1.08 to 3.12;  $p = 0.026$ ). Improvement in functional status was observed after TAVI ( $p < 0.001$  for NYHA functional class, Duke Activity Status Index, and 6MWT), but COPD patients exhibited less ( $p = 0.016$ ) improvement in NYHA functional class. Among COPD patients, a shorter Valvular and Congenital Heart Disease

## Impact of preoperative chronic kidney disease on short- and long-term outcomes after transcatheter aortic valve implantation: A Pooled-Rotterdam-Milano-Toulouse In Collaboration Plus (PRAGMATIC-Plus) initiative substudy

Nicolaas M. van Mieghem, MD,<sup>1</sup> Robert M. A. van der Boon, MSc,<sup>2</sup> Didier Tebette, MD,<sup>3</sup> Alade Chieffo, MD,<sup>4</sup> Nicolas M. Van Mieghem, MD,<sup>5</sup> Gill L. Buchanan, MChB,<sup>6</sup> Olivier Vahdat, MD,<sup>7</sup> Bertrand Marcheix, MD, PhD,<sup>8</sup> Patrick W. Serruys, MD, PhD,<sup>9</sup> Jean Fajadet, MD,<sup>10</sup> Antonio Colombo, MD, PhD,<sup>11</sup> Peter P. T. de Jaegere, MD, PhD,<sup>12</sup> and Didier Carrié, MD, PhD<sup>13\*</sup> (on behalf of the PRAGMATIC-Plus Investigators)

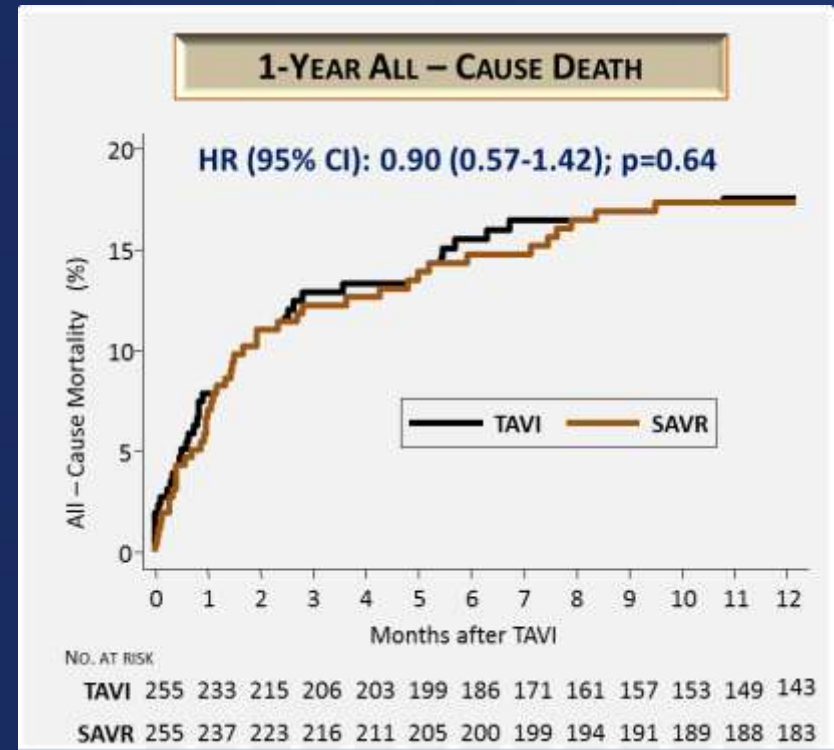
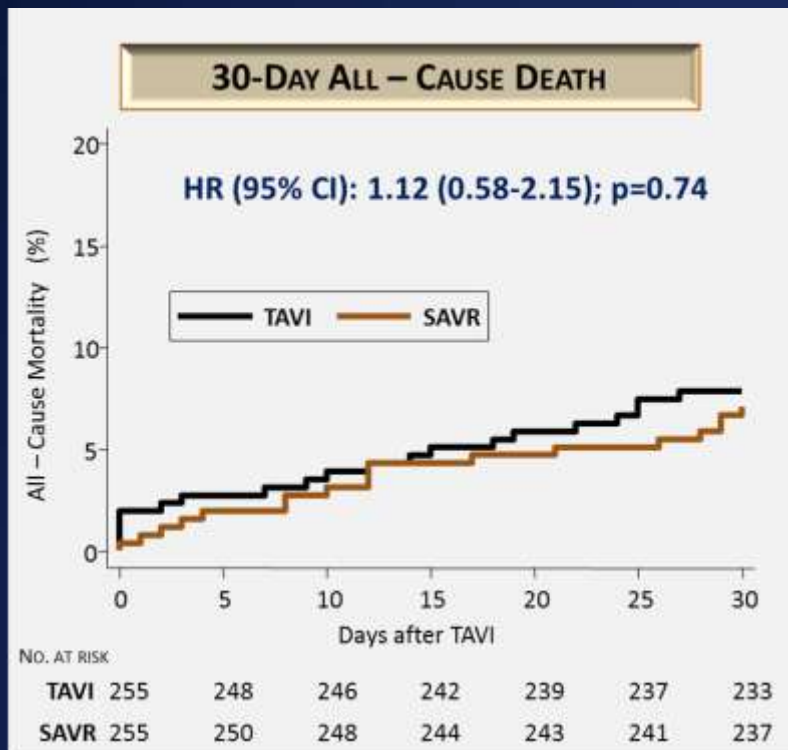
# Intermediate Surgical Risk | TAVI vs. SAVR

- Several studies have compared the effectiveness of TAVI and SAVR in propensity-matched patients at intermediate surgical risk<sup>1,2,3</sup>.
- ***All studies showed similar mortality rates between TAVI and SAVR***

	Piazza <sup>1</sup>			OBSERVANT <sup>2</sup>			Latib <sup>3</sup>		
	TAVI (n=255)	SAVR (n=255)	p	TAVI (n=133)	SAVR (n=133)	p	TAVI (n=111)	SAVR (n=111)	p
STS (%, mean)	3-8	3-8					4.6	4.6	
Log EuroSCORE (%, mean)	17.3	17.6		8.9	9.4		23.2	24.4	
<b>30 Day Mortality (%)</b>	<b>7.8</b>	<b>7.1</b>	<b>0.74</b>	<b>3.8</b>	<b>3.8</b>	<b>1.000</b>	<b>1.8</b>	<b>1.8</b>	<b>1.00</b>

# Intermediate Surgical Risk | TAVI vs. SAVR

- Results of the Piazza study<sup>1</sup> showed that TAVI and SAVR result in **similar 30-day (7.8% vs. 7.1%, p=0.74) and 1-year mortality (16.5% vs. 16.9%, p=0.64).**
- Stratified analyses of 1-year all-cause mortality showed women to have a greater benefit from TAVI vs. SAVR compared to men (P for interaction = 0.027).



# Intermediate Surgical Risk | TAVI vs. SAVR

- The Latib<sup>1</sup> study highlights that TAVI and SAVR patients experience similar mortality rates, but with a ***different spectrum of procedural complications***.

	Latib <sup>1</sup>		
	TF-TAVI (n=111)	SAVR (n=111)	p
Major Vascular Complications*	<b>14.4</b>	0	<0.001
Bleeding Complications*	66.7	<b>82.9</b>	0.005
Acute Kidney Injury	8.1	<b>26.1</b>	<0.001
Permanent Pacemaker Implant	<b>11.7</b>	2.7	0.009
30 Day Stroke / TIA (%)	3.6	8.1	0.08

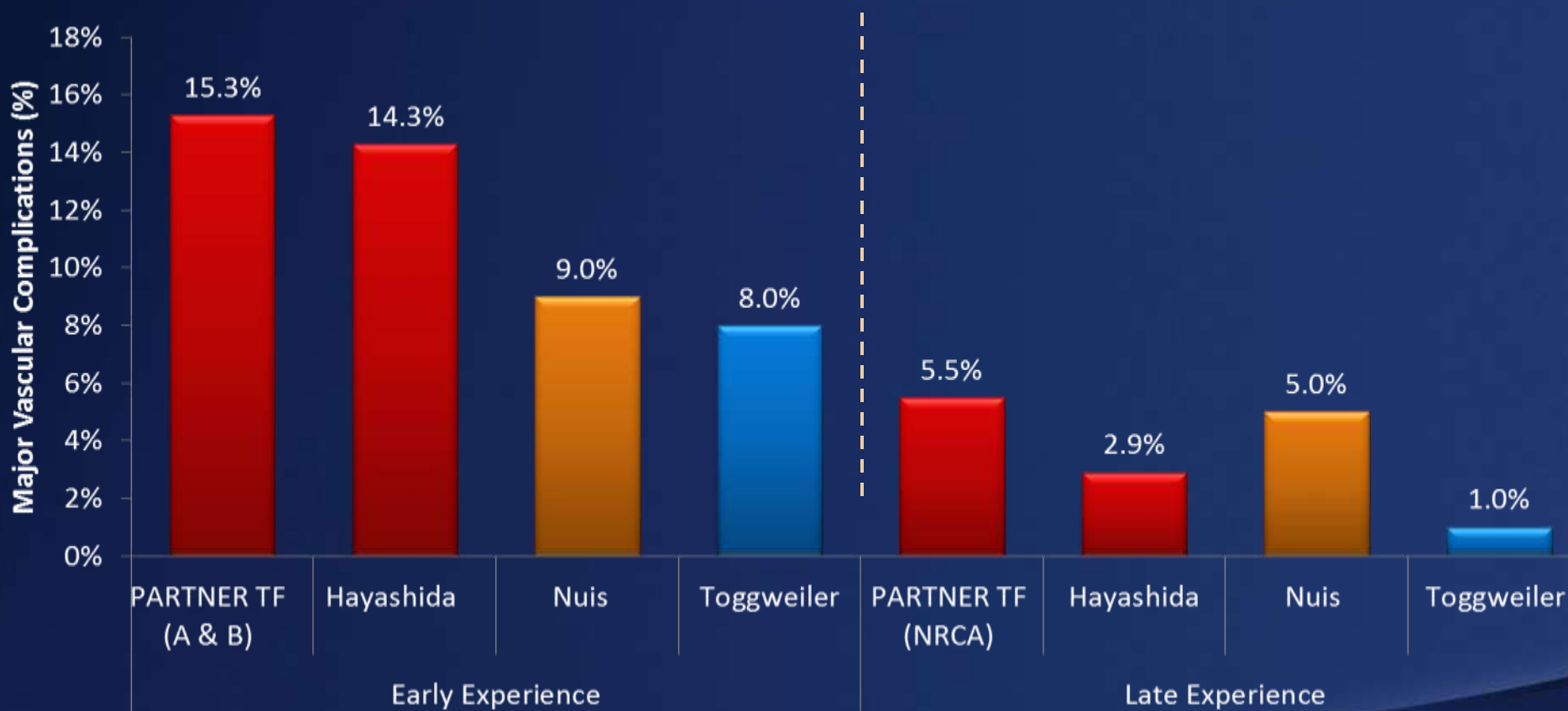
\* The Sapien device (22Fr / 24Fr delivery system) was used in 27% of the TF-TAVI patients in this study, which may contribute to higher complication rates than typically seen with contemporary devices.

## Intermediate Surgical Risk | Decreasing Complications

- Complications that are higher in TAVI compared to SAVR include major vascular complications, paravalvular leak, and in some series, stroke.
- For TAVI to be favored over SAVR, these rates should decrease.
  - Evidence shows that these complication rates are decreasing as operators gain experience and technology improves.
- Improving the risk profile of the patients will also contribute to decreased complication rates.

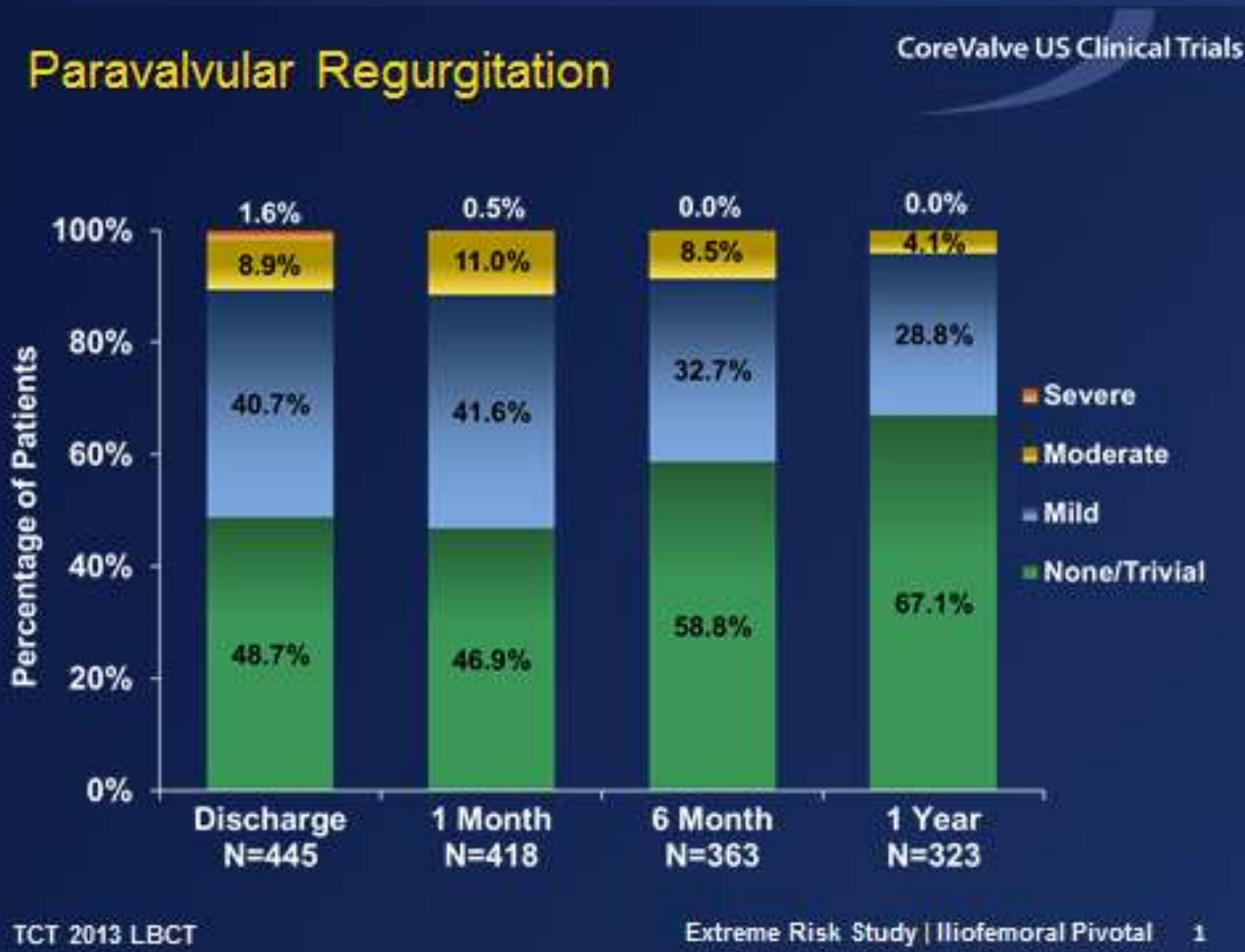
# Major Vascular Complications | Effect of Experience

- Major vascular complication rate is strongly impacted by operator experience.
- We may expect to see these rates to continue to decrease with time.



# Paravalvular Leak | Effect of Improved Imaging Techniques

The CoreValve Extreme Risk Pivotal Trial showed low rates of PVL, which may be attributable to strict valve sizing criteria using MSCT.



# Stroke | Lower-Risk Patients May Have Fewer Strokes

Multicenter registry data on 4,563 patients indicate that CoreValve has a historically low stroke rate, staying below 4.5% for any given cohort. Patients with fewer comorbidities may experience less stroke after TAVI.

	2007	2008	2009	2010	2011	2012
UK Registry	n=452; In-hospital stroke: 4.0%					
Italian Registry	n=663; Procedural stroke: 1.2%					
Milan Registry	n=46; In-hospital stroke: 0.0%					
Spanish Registry	n=108; 1 M stroke: 0.0%					
Ibero-American Registry	n=1170; In-hospital stroke: 1.4%					
FRANCE			n=66; 1 M stroke: 4.5%			
FRANCE 2				n=1043; 1 Y stroke: 4.3%		
ADVANCE				n=1015; 1 M stroke: 3.0%		

Arrows indicate implant period and the reported rate of total stroke for the CoreValve cohort



# Intermediate Surgical Risk | Discussion

- In contemporary clinical practice, TAVI is being performed in patients at lower surgical risk.
- Studies which compare outcomes between higher-risk and lower-risk TAVI patients<sup>1,2</sup> show that lower-risk patients have better outcomes.
- As TAVI technology continues to evolve and operators continue to gain experience, the risk to all patients is likely to continue to decline.
- Though we are seeing encouraging outcomes in lower-risk TAVI patients, modern randomized controlled trials are needed to confirm that TAVI is at least as good as SAVR in patients at intermediate surgical risk.