Current Status of MitraClip

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COEX

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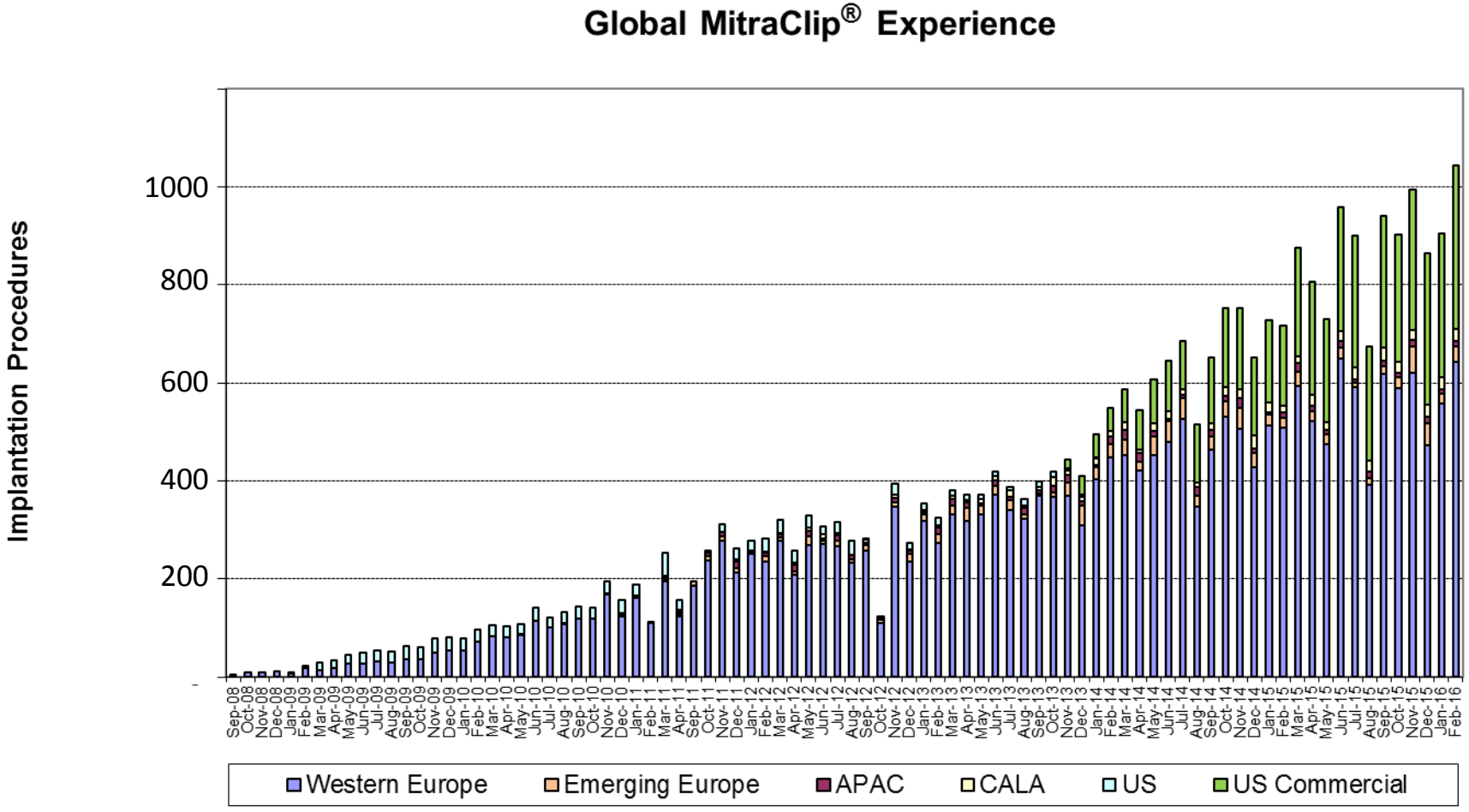
Disclosure Information

The following relationships exist:

Grant support: Abbott, BSC, Cardiokinetics, Edwards, WL Gore
Consultant: Abbott, BSC, Mitralign, WL Gore

Off label use of products and investigational devices will be discussed in this presentation

GLOBAL MITRACLIP® EXPERIENCE



Includes clinical and commercial procedures as of 02/29/2016. Source: Abbott Vascular

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Therapy for MR

	Degenerative	**Functional**
Low Surgical Risk	Surgical Mitral Repair	?
High Surgical Risk	Commercial MitraClip	Global Practice COAPT

Randomized Comparison of Percutaneous Repair and Surgery for Mitral Regurgitation

5-Year Results of EVEREST II

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ABSTRACT

BACKGROUND In the second Endovascular Valve Edge-to-Edge Repair Study trial, treatment of mitral regurgitation (MR) with a novel percutaneous device showed superior safety compared with surgery, but less effective reduction in MR at 1 year.

OBJECTIVES This study sought to evaluate the final 5-year clinical outcomes and durability of percutaneous mitral valve (MV) repair with the MitraClip device compared with conventional MV surgery.

METHODS Patients with grade 3+ or 4+ MR were randomly assigned to percutaneous repair with the device or conventional MV surgery in a 2:1 ratio (178:80). Patients prospectively consented to 5 years of follow-up.

RESULTS At 5 years, the rate of the composite endpoint of freedom from death, surgery, or 3+ or 4+ MR in the as-treated population was 44.2% versus 64.3% in the percutaneous repair and surgical groups, respectively ($p = 0.01$). The difference was driven by increased rates of 3+ to 4+ MR (12.3% vs. 1.8%; $p = 0.02$) and surgery (27.9% vs. 8.9%; $p = 0.003$) with percutaneous repair. After percutaneous repair, 78% of surgeries occurred within the first 6 months. Beyond 6 months, rates of surgery and moderate-to-severe MR were comparable between groups. Five-year mortality rates were 20.8% and 26.8% ($p = 0.4$) for percutaneous repair and surgery, respectively. In multivariable analysis, treatment strategy was not associated with survival.

CONCLUSIONS Patients treated with percutaneous repair more commonly required surgery for residual MR during the first year after treatment, but between 1- and 5-year follow-up, comparably low rates of surgery for MV dysfunction with either percutaneous or surgical therapy endorse the durability of MR reduction with both repair techniques. (EVEREST II Pivotal Study High Risk Registry; NCT00209274). (J Am Coll Cardiol 2015;66:2844-54) © 2015 by the American College of Cardiology Foundation.

Baseline Characteristics

EVEREST II RCT-Candidate for mitral valve surgery including CPB

Characteristic	MitraClip N = 184	Surgery N = 95	p-value
Age (mean), years	67	66	ns
Male	63%	66%	ns
History of CHF	91%	78%	0.005
NYHA Functional Class III/IV	51%	47%	ns
Degenerative MR Etiology	74%	73%	ns
Coronary Artery Disease	47%	46%	ns
Prior Myocardial Infarction	22%	21%	ns
Previous Cardiovascular Surgery	22%	19%	ns
Atrial Fibrillation	34%	39%	ns
COPD (with or without home O_2)	15%	15%	ns
Moderate to Severe Renal Disease	3%	2%	ns
Diabetes	8%	11%	ns
LV Ejection Fraction (mean), %	60	61	ns
LV End Systolic Dimension (mean), cm	3.7	3.5	ns

New Engl J Med 364:1395-1406, 2011

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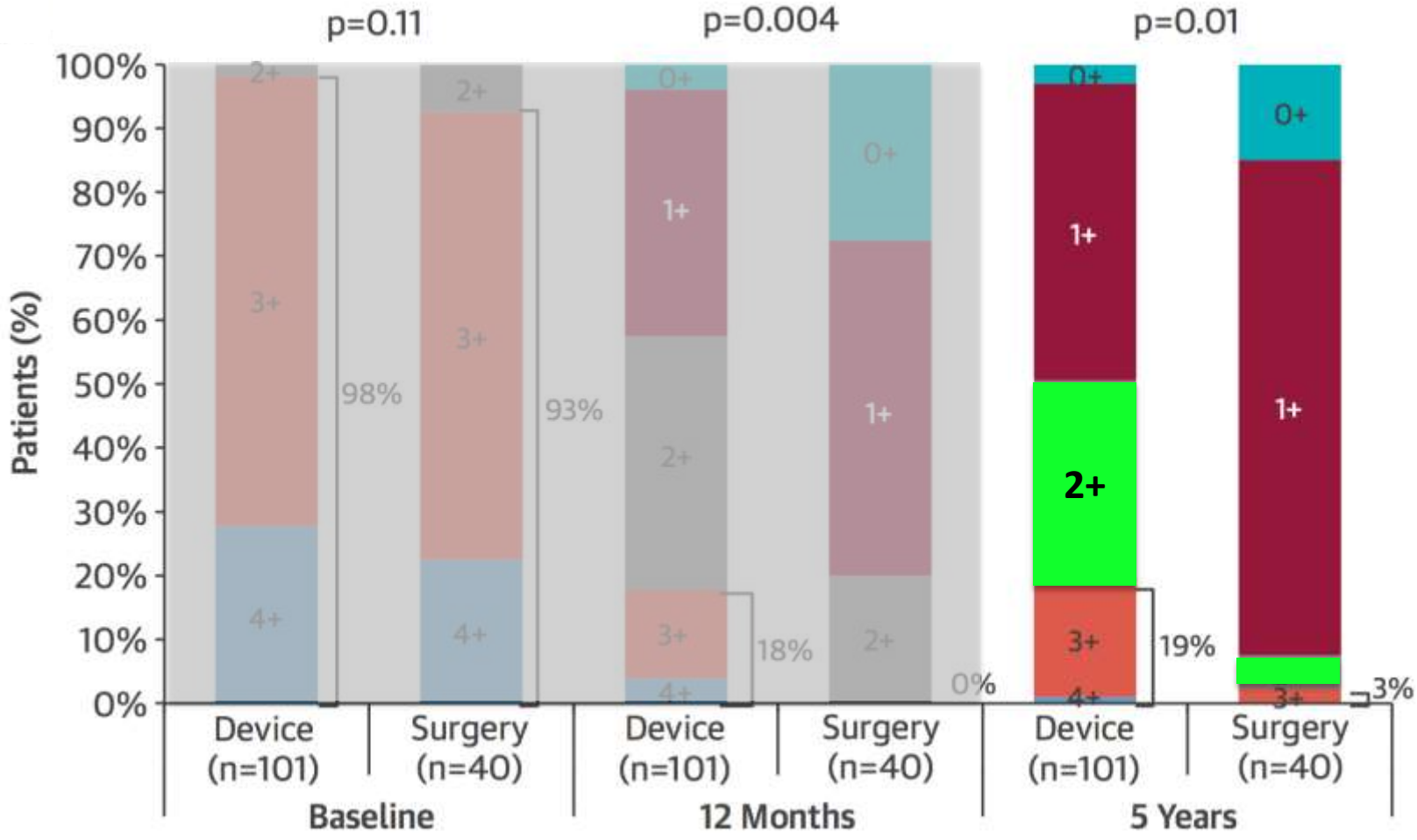
Mitral Regurgitation Severity

5 Year Outcomes



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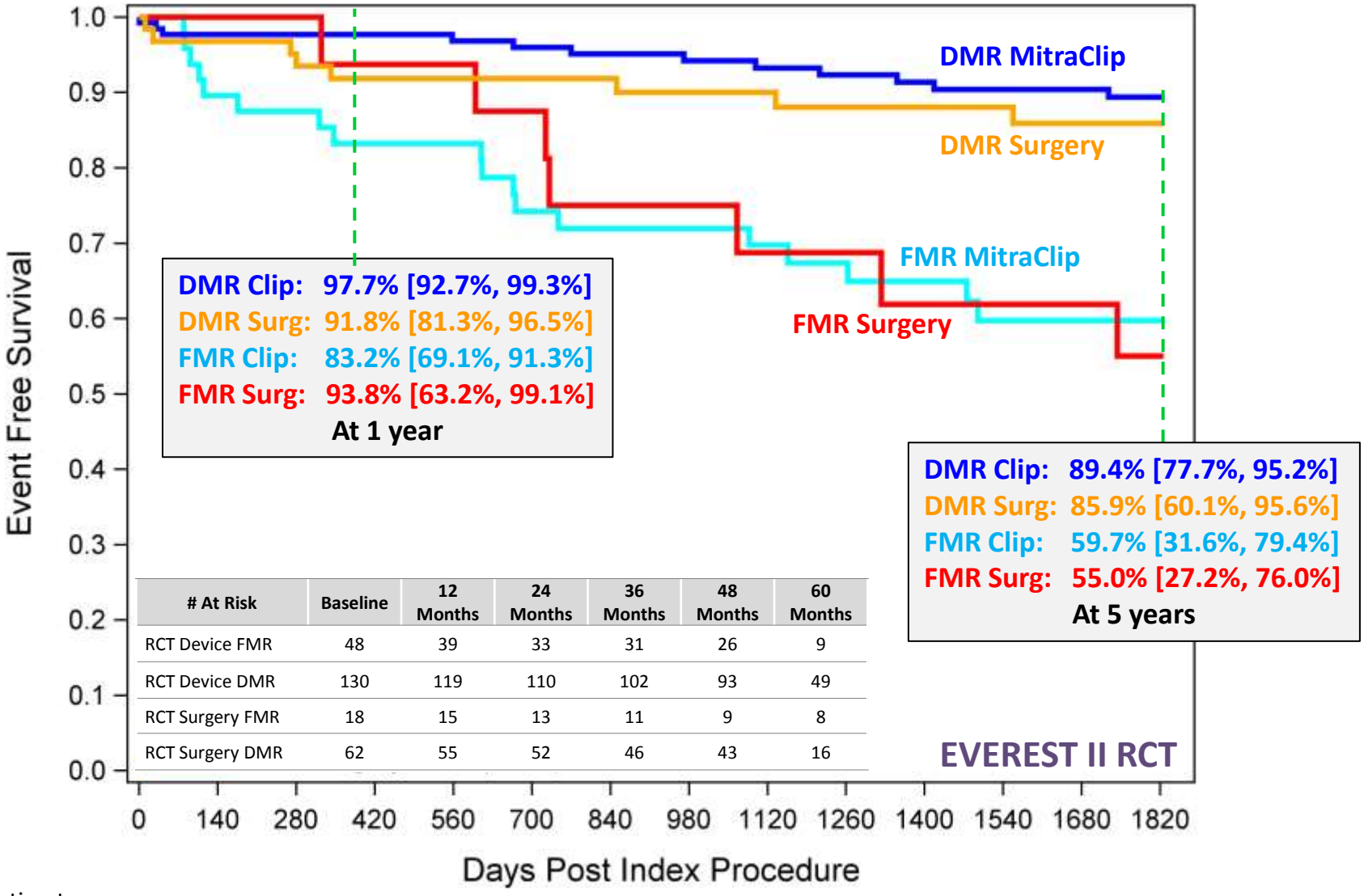
Feldman T: J Am Col ICardiol 2015;66:2844–54

Freedom From Mortality & Reintervention

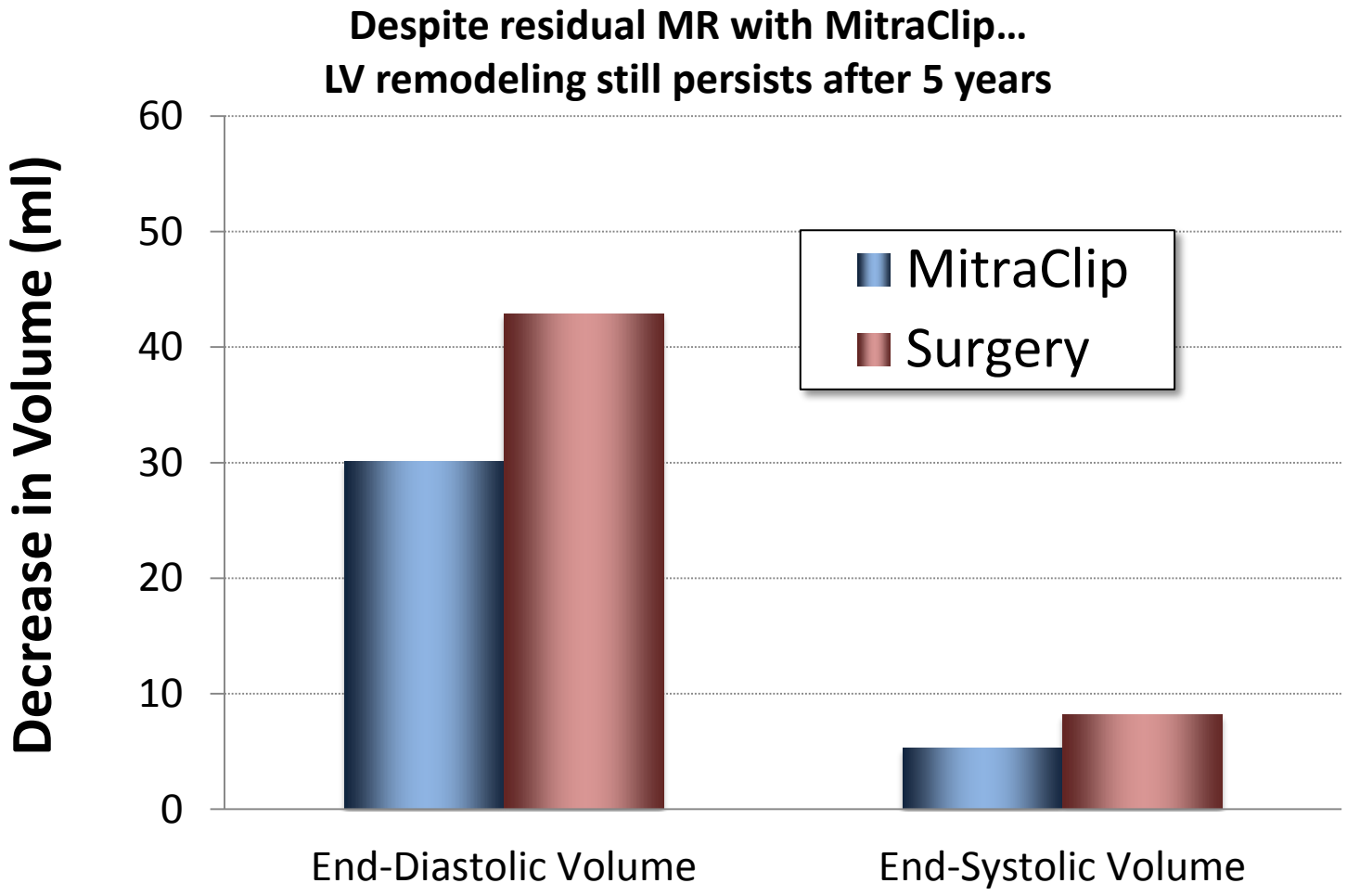


# At Risk	Baseline	12 Months	24 Months	36 Months	48 Months	60 Months
RCT Device FMR	48	39	33	31	26	9
RCT Device DMR	130	119	110	102	93	49
RCT Surgery FMR	18	15	13	11	9	8
RCT Surgery DMR	62	55	52	46	43	16

Kaplan-Meier estimate

Reduction in LV Volumes at 5 Years

EVEREST II RCT



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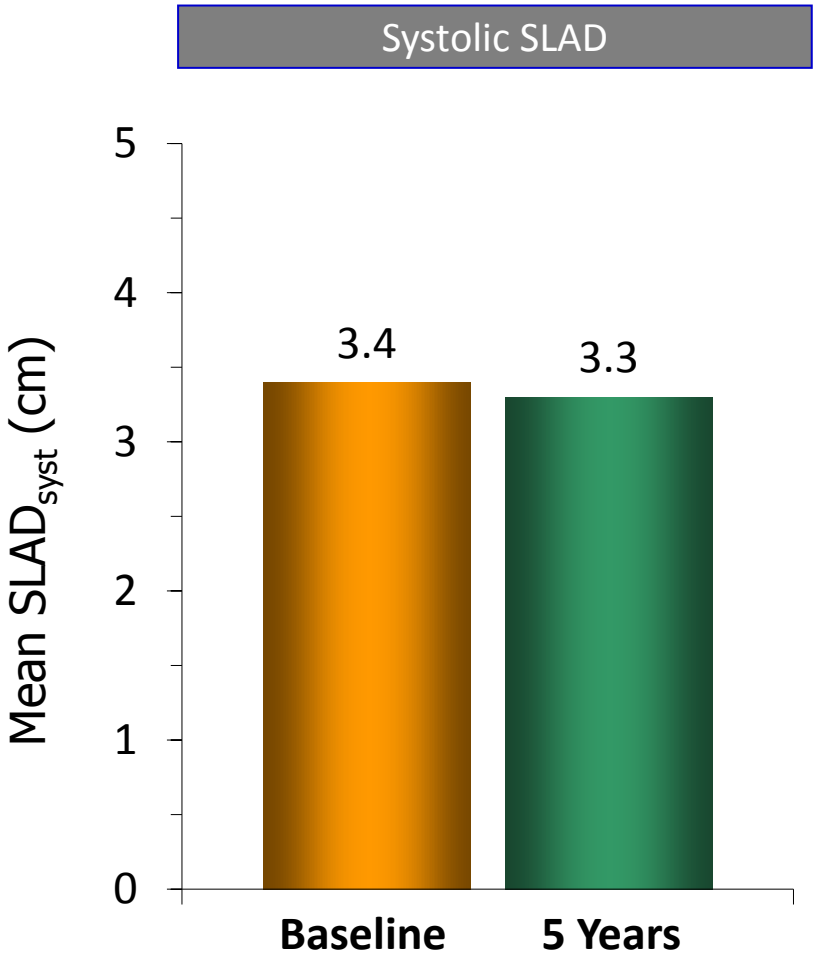
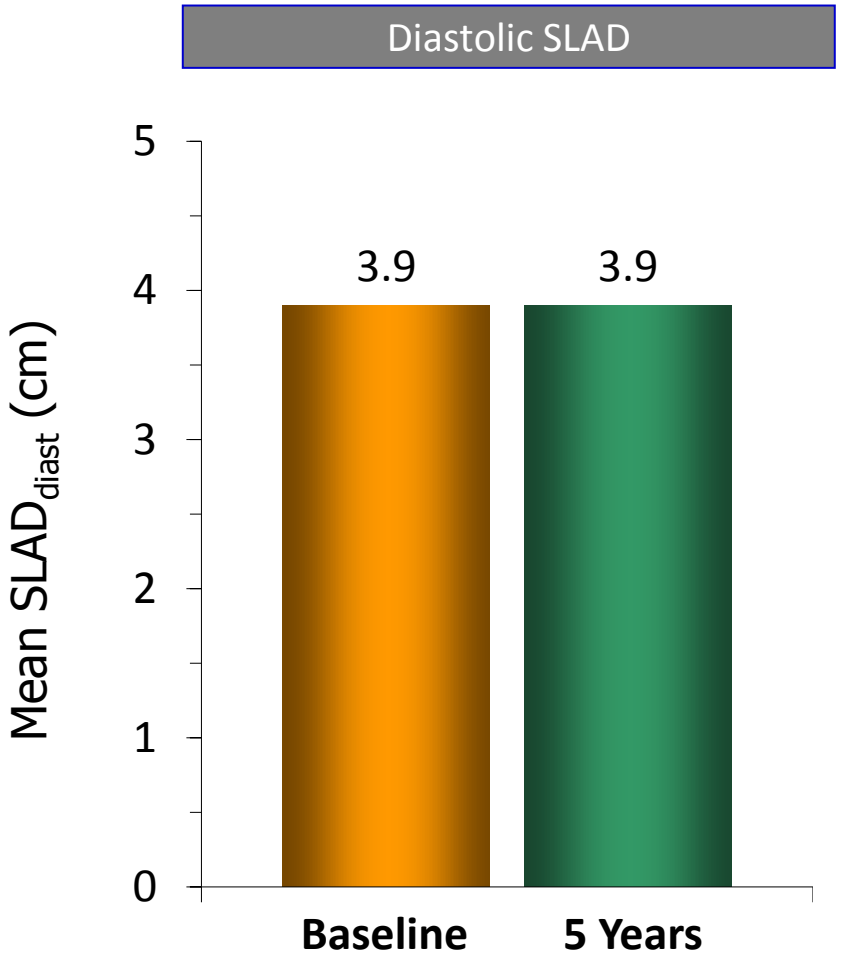
Septal Lateral Annular Dimensions

EVEREST II RCT All Treated Patients - MitraClip Group (N=178)





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Feldman T J Am Coll Cardiol 2015;66:2844–54

Therapy for MR

	Degenerative	**Functional**
Low Surgical Risk	Surgical Mitral Repair	?
High Surgical Risk	Commercial MitraClip	Global Practice COAPT

Improved Functional Status and Quality of Life in Prohibitive Surgical Risk Patients With Degenerative Mitral Regurgitation After Transcatheter Mitral Valve Repair

D. Scott Lim, MD,* Matthew R. Reynolds, MD, MSc,†‡ Ted Feldman, MD,§ Saibal Kar, MD,‖
Howa
Paul G

METHODS A prohibitive-risk DMR cohort was identified by a multidisciplinary heart team that retrospectively evaluated high-risk DMR patients enrolled in the EVEREST (Endovascular Valve Edge-to-Edge Repair Study) II studies.

RESULTS A total of 141 high-risk DMR patients were consecutively enrolled; 127 of these patients were retrospectively identified as meeting the definition of *prohibitive risk* and had 1-year follow-up (median: 1.47 years) available. Patients were elderly (mean age: 82.4 years), severely symptomatic (87% New York Heart Association class III/IV), and at prohibitive surgical risk (STS score: 13.2 ± 7.3%). TMVR (MitraClip) was successfully performed in 95.3%; hospital stay was 2.9 ± 3.1 days. Major adverse events at 30 days included death in 6.3%, myocardial infarction in 0.8%, and stroke in 2.4%. Through 1 year, there were a total of 30 deaths (23.6%), with no survival difference between patients discharged with MR ≤1+ or MR 2+. At 1 year, the majority of surviving patients (82.9%) remained MR ≤2+ at 1 year, and 86.9% were in New York Heart Association functional class I or II. Left ventricular

CONCLUSIONS TMVR in prohibitive surgical risk patients is associated with safety and good clinical outcomes, including decreases in rehospitalization, functional improvements, and favorable ventricular remodeling, at 1 year. (Real World Expanded Multi-center Study of the MitraClip System [REALISM]; NCT01931956)

TMVR in prohibitive surgical risk patients is associated with safety and good clinical outcomes, including decreases in rehospitalization, functional improvements, and favorable ventricular remodeling, at 1 year.

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J Am Coll Cardiol 2014;64:182–92

Baseline Demographics and Comorbidities

Characteristic	Prohibitive Risk DMR N = 127
Age (mean ± SD)	82 ± 9 years
Patients over 75 years of age	84%
Male Gender	55%
Coronary Artery Disease	73%
Prior Myocardial Infarction	24%
Previous Cardiovascular Surgery	48%
Atrial Fibrillation History	71%
Prior Stroke	10%
Diabetes	30%
Moderate to Severe Renal Disease	28%
Chronic Obstructive Pulmonary Disease	32%
STS Mortality Risk (mean ± SD) [v2.73, replacement]	13.2 ± 7.3%
SF-36 QoL Physical Component Score (mean ± SD)	32.0 ± 8.7
SF-36 QoL Mental Component Score (mean ± SD)	46.1 ± 12.5

Post-Procedural and Discharge Results

Post-Procedural and Discharge Results	**Prohibitive Risk DMR N = 127**
Post-Procedural (mean ± SD)	
ICU/CCU duration	1.4 ± 1.8 days
Length of hospital stay	2.9 ± 3.1 days
Discharge MR, (%)	
MR ≤ 2+ at Discharge	82%
MR ≤ 1+ at Discharge	54%
Discharged home, (%)	87%

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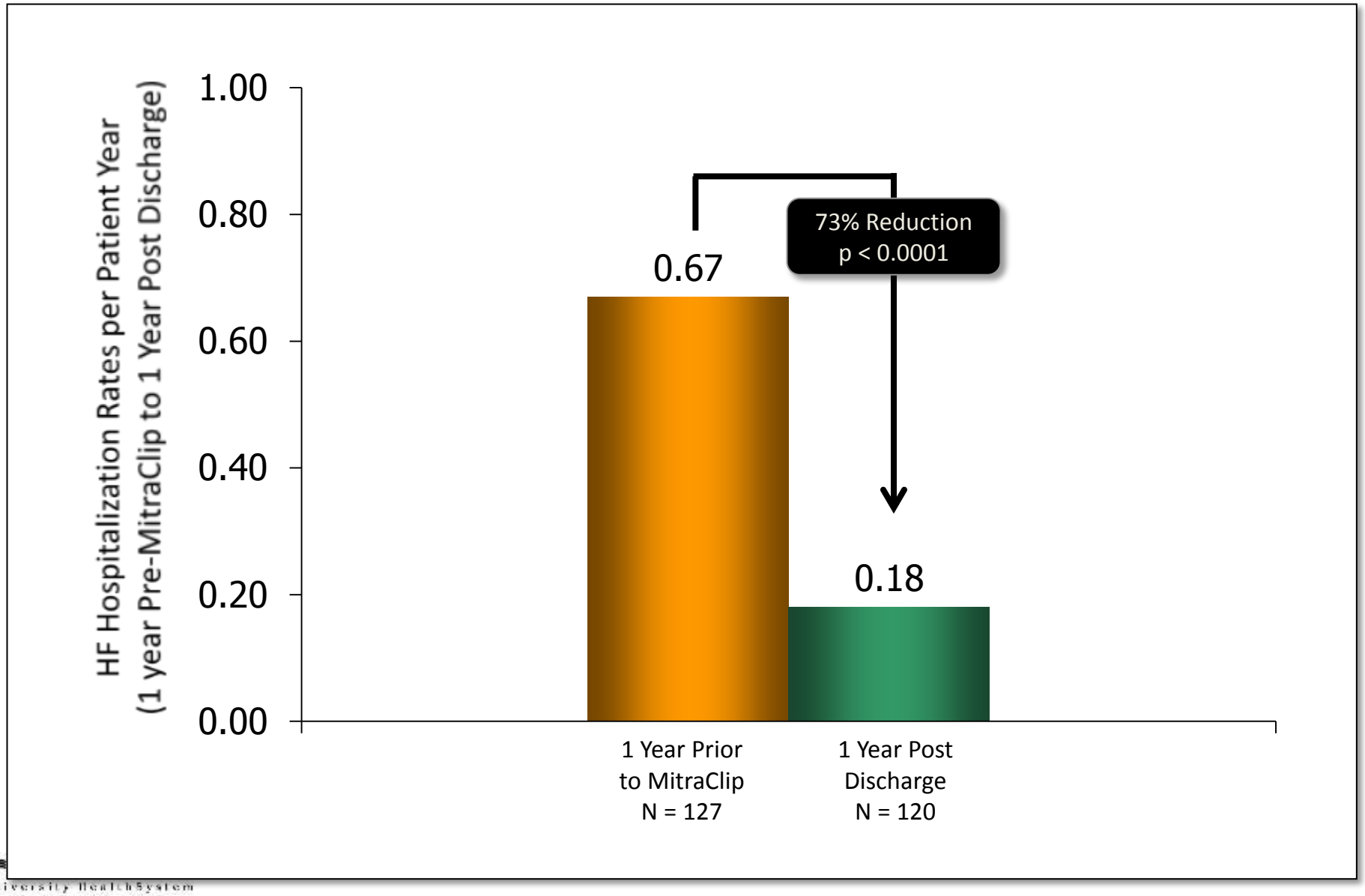
Hospitalizations For Heart Failure



Initial Experience With Commercial Transcatheter Mitral Valve Repair in the United States

Paul Sorajja, MD,[a] Michael Mack, MD,[b] Sreekanth Vemulapalli, MD,[c] David R. Holmes, Jr, MD,[d] Amanda Stebbins, MS,[c] Saibal Kar, MD,[e] D. Scott Lim, MD,[f] Vinod Thourani, MD,[g] Patrick McCarthy, MD,[h] Samir Kapadia, MD,[i] Paul Grayburn, MD,[j] Wesley A. Pedersen, MD,[a] Gorav Ailawadi, MD[f]

ABSTRACT

BACKGROUND Transcatheter mitral valve (MV) repair with the MitraClip received approval in 2013 for the treatment of prohibitive-risk patients with primary mitral regurgitation (MR).

OBJECTIVES The aim of this study was to report the initial U.S. commercial experience with transcatheter MV repair.

METHODS Data from the Society of Thoracic Surgeons/American College of Cardiology Transcatheter Valve Therapy Registry on patients commercially treated with this percutaneous mitral valve repair device were analyzed.

RESULTS Of 564 patients (56% men, median age 83 years), severe symptoms were present in 473 (86.0%). The median Society of Thoracic Surgeons Predicted Risk of Mortality scores for MV repair and replacement were 7.9% (interquartile range: 4.7% to 12.2%) and 10.0% (interquartile range: 6.3% to 14.5%), respectively. Frailty was noted in 323 patients (57.3%). Transcatheter MV repair was performed for degenerative disease, present in 90.8% of patients. Overall, MR was reduced to grade ≤2 in 93.0%. In-hospital mortality was 2.3%; 30-day mortality was 5.8%. Other 30-day events were stroke (1.8%), bleeding (2.6%), and device-related complications (1.4%). The median length of stay was 3 days (interquartile range: 1 to 6 days), with 84.0% patients discharged home. Overall, procedure success occurred in 90.6%. Variables associated with reduction in MR were end-diastolic dimension, MR severity, clip location, and case volume.

CONCLUSIONS In this study of the initial commercial U.S. experience, it was found that procedural success was achieved in approximately 91% of patients, and the majority of patients were discharged home with moderate or less MR. These data support the effectiveness of this therapy in appropriately selected high-risk patients in a commercial setting. Further study is required to determine the long-term impact of transcatheter MV repair in this patient population.
(J Am Coll Cardiol 2016;67:1129–40)

Sorajja P: J Am Coll Cardiol 2016;67:1129–40

Commercial MitraClip in the U.S.

STS/ACC TVT Registry

- All commercial cases enrolled in TVT registry through August 31, 2014 (n=564)
- in-hospital & 30-day outcomes

N=564	%
Median age (% men)	83 yrs (56%)
HF hospitalization prior yr	51.8
Atrial fibrillation	62.6
Prior CVA	8.7
Diabetes	25
Prior CABG	32.4
Prior MI	24.6
O2 dependency	14.7
Median STS-PROM MV repair	7.9% (4.7, 12.2)
Median STS-PROM MV replacement	10.0% (6.3, 14.5)

Paul Sorajja ACC 2015

Commercial MitraClip in the U.S.

STS/ACC TVT Registry

OUTCOMES

N=564	%
Etiology DMR	86
Procedure success	91.8
Resultant MR ≤2+	93
Device-related adverse events	2.7
Procedure complications	7.8
Hospital mortality	2.3
30 day mortality	5.8
Length of stay (days)	3±1.6
Discharge home	81.9

Therapy for MR

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Registries

Prospective-Multicenter

Study	n
REALISM US Continued Access	899
REALISM Compassionate/Emergency Use	66
ACCESS Europe Phase I	567
ACCESS Europe Phase II	286
German Transcatheter Mitral Valve Interventions (TRAMI)	1002
GRASP-It	304
MitraSwiss registry nationwide	265
Sentinel Registry EURObservational Research Programme ESC	628
MitraClip Asia-Pacific Registry (MARS)	145
ANZ MitraClip Registry	45

Clinical Outcomes Assessment of the MitraClip Percutaneous Therapy for High Surgical Risk

COAPT TRIAL

~430 patients enrolled at up to 75 US sites

Significant FMR ≥3+ core lab; EF<50%; CHF hospitalization or BNP>300

High risk for mitral valve surgery- Local Heart Team

Specific valve anatomic criteria

Randomize 1:1

MitraClip

Control group Standard of care

Safety: Composite death, stroke, worsening renal function, LVAD implant, heart transplant at 12 months

Effectiveness: Recurrent heart failure hospitalizations

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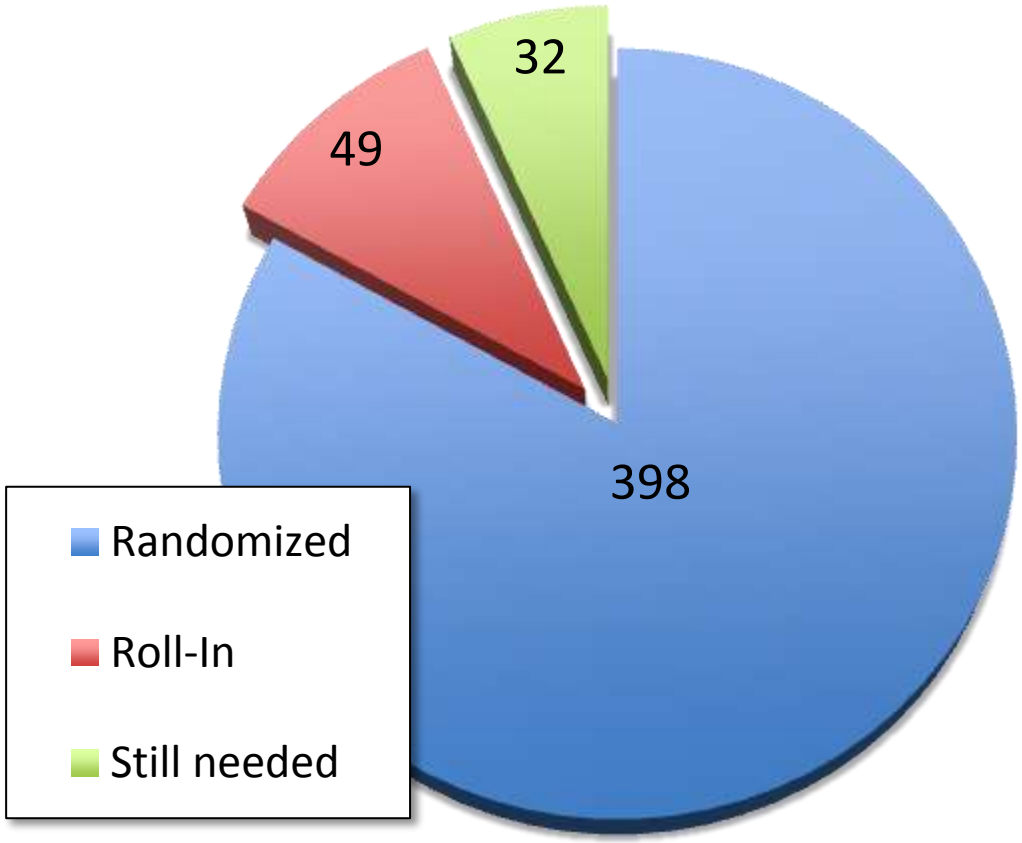
COAPT Enrollment Apr 25, 2016

83 active sites



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MitraClip RCTs in Functional MR

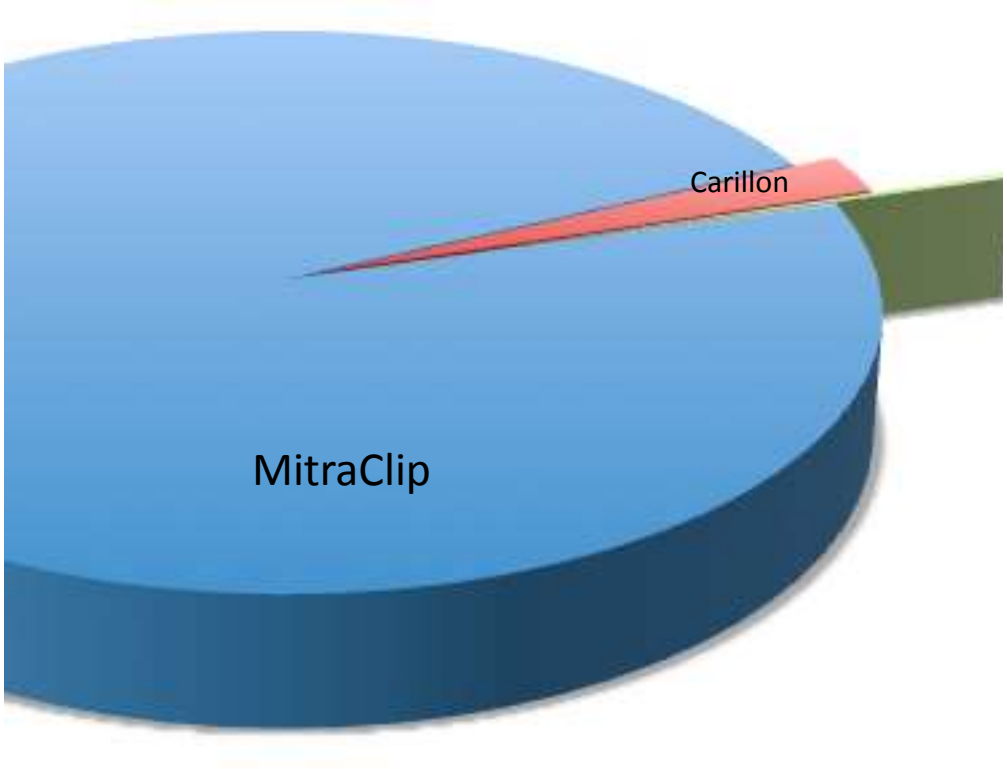
1348 patients

Heart failure and FMR

MitraClip vs. GDMT or MV Surgery

- **COAPT – 430**
- **MITRA-FR – 288**
- **RESHAPE-HF-2 – 420**
- **MATTERHORN (vs MVS) – 210**

Treated Patients



MitraClip	>30,000
Carillon	>400
Mitralign	≈80
Cardioband	≈90
Replacement	≈90