

# STS/EACTS Latin America Cardiovascular Surgery Conference

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## Optimal Timing for Referral and Best Imaging Modality for Degenerative Mitral Valve Disease

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The Society  
of Thoracic  
Surgeons



**EACTS**  
European Association For Cardio-Thoracic Surgery

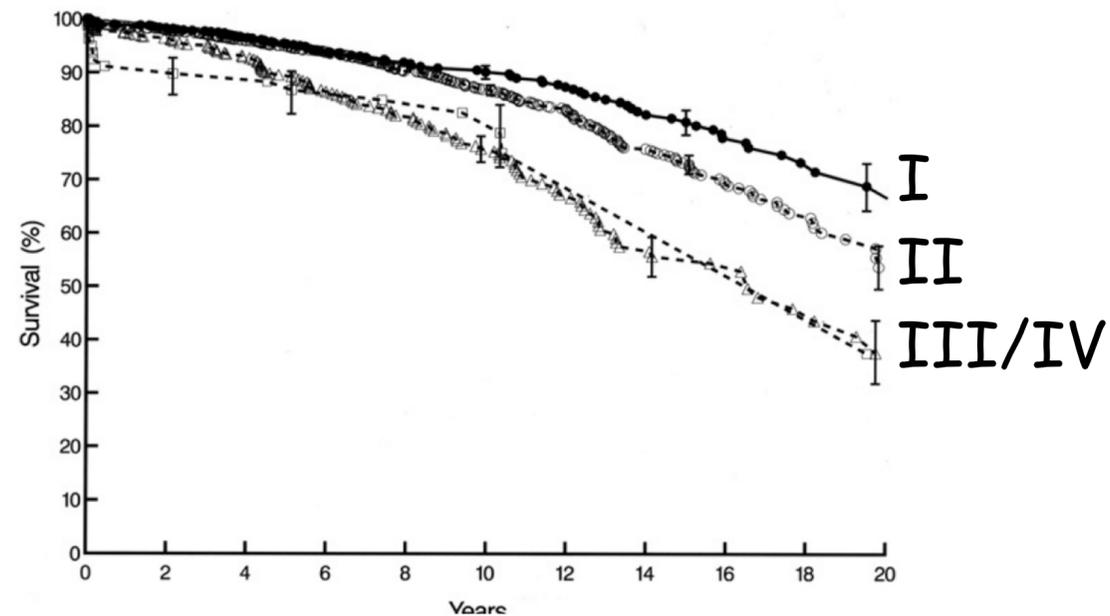


# Presenter Disclosure Information

- Consulting fees and honoraria
  - ACC Foundation (Significant level)
  - Biomedical Solutions (Moderate level)
  - Edwards Lifesciences (Significant level)
  - Medtronic, Inc. (Significant level)
  - St. Jude Medical, Inc. (Moderate level)
- Research support
  - Edwards Lifesciences (Significant level)
  - Medtronic, Inc. (Moderate level)
  - St. Jude Medical, Inc. (Significant level)

# Pre-Operative Symptoms vs. Survival Following Surgery for Primary MR

4586 patients with primary (degenerative) MR, operated (CCF) 1985 - 2008



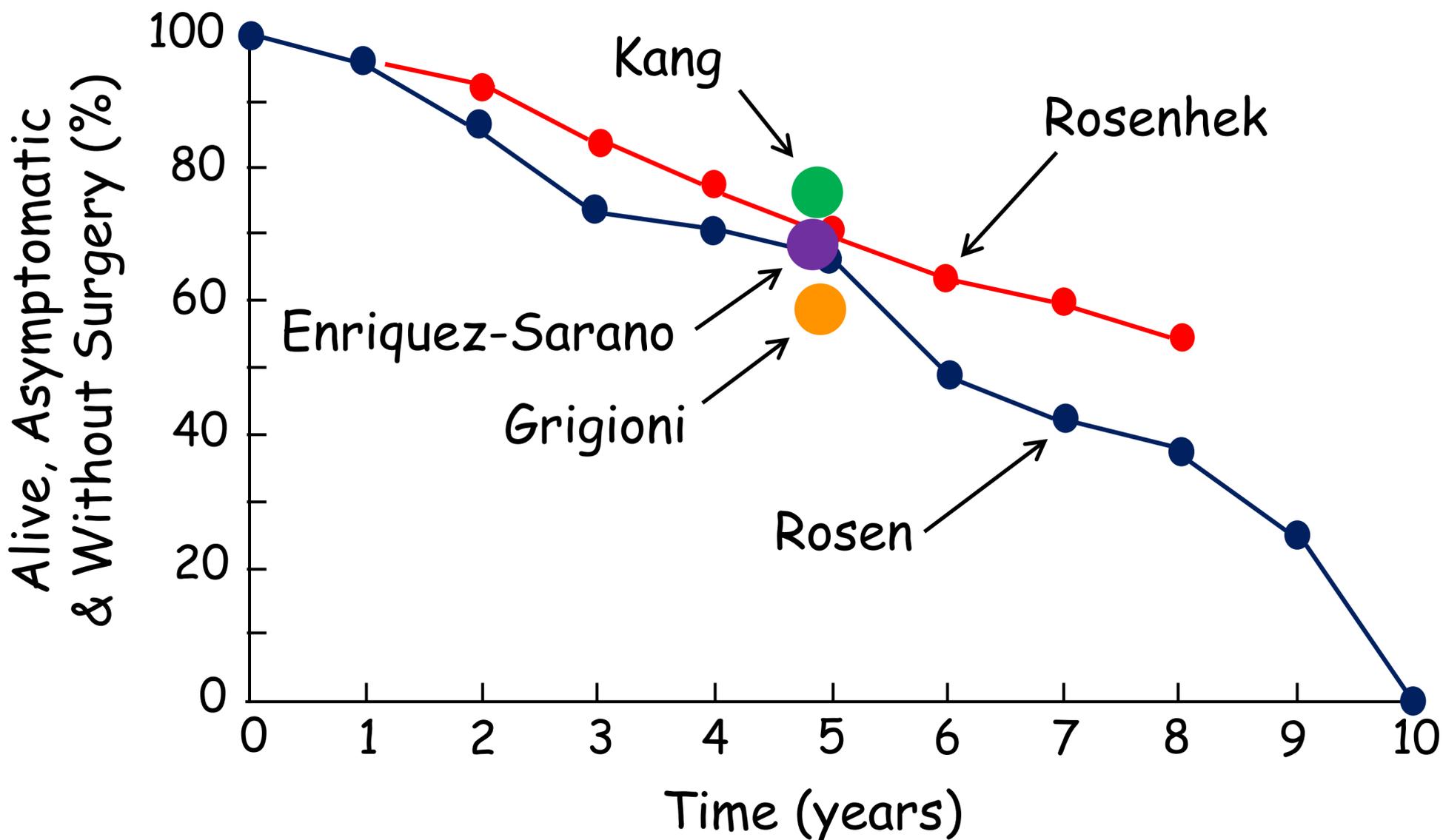
- 1985-2008
- 4586 patients underwent surgery for degenerative MR
- 93% MV repair
- Higher NYHA class ~ lower long-term survival
  
- Higher pre-op NYHA class ~
  - Lower LVEF, AFib, TR
- Survival largely related to LVEF, comorbidities

# Chronic Severe Primary MR

## AHA/ACC, ESC Guideline Indications for Intervention

Stage		AHA/ACC 2017	ESC 2012
D	Symptoms and LV EF $\geq$ 30%	I	I
C2	LV dysfunction (EF 30 - 60%, ESD $\geq$ 40 / > 45 mm)	I	I
C, D	Other cardiac surgery (CABG, AVR)	I	
C, D	MV repair preferable to MV replacement	I	I
C1	Non-rheumatic, new afib or PASP > 50 mm Hg, likely repair	IIa	IIa
C1	'Prophylactic' MV repair (No symptoms + no LV dysfunction):		
	• HV Center of Excellence + 95% success + op mort < 1%	IIa	
	• Progressive $\uparrow$ in LV size or $\downarrow$ in LVEF	IIa	
	• Success + low risk + flail + LVIDS $\geq$ 40 mm		IIa
	• LA $\geq$ 60 mL/m <sup>2</sup> or ex PASP $\geq$ 60 mm Hg		IIb

# Natural History of Degenerative MR



Rosen S, et al. Am J Cardiol  
1994;74:374-80.

Enriquez-Sarano M, et al. N Engl  
J Med 2005;352:875-83.

Rosenhek R, et al. Circulation  
2006;113:2238-44.

Grigioni F, et al. J Am Coll  
Cardiol Img 2008;1:133-41.

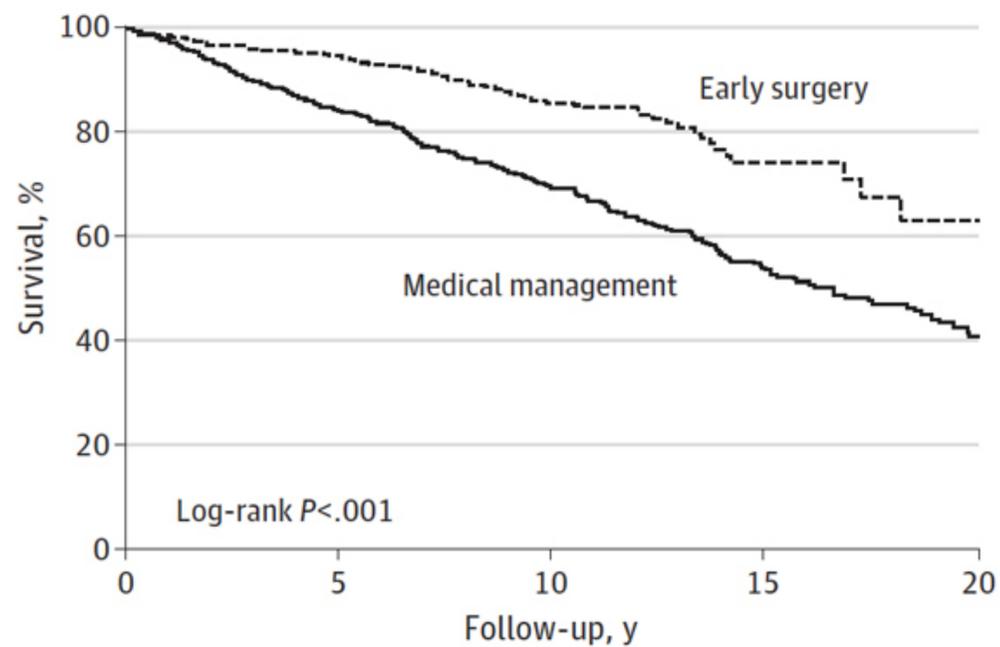
Kang DH, et al. Circulation  
2009;119:797-804.

# Early Intervention vs. Watchful Waiting

MIDA Registry: 2097 patients, 10.3 year follow-up

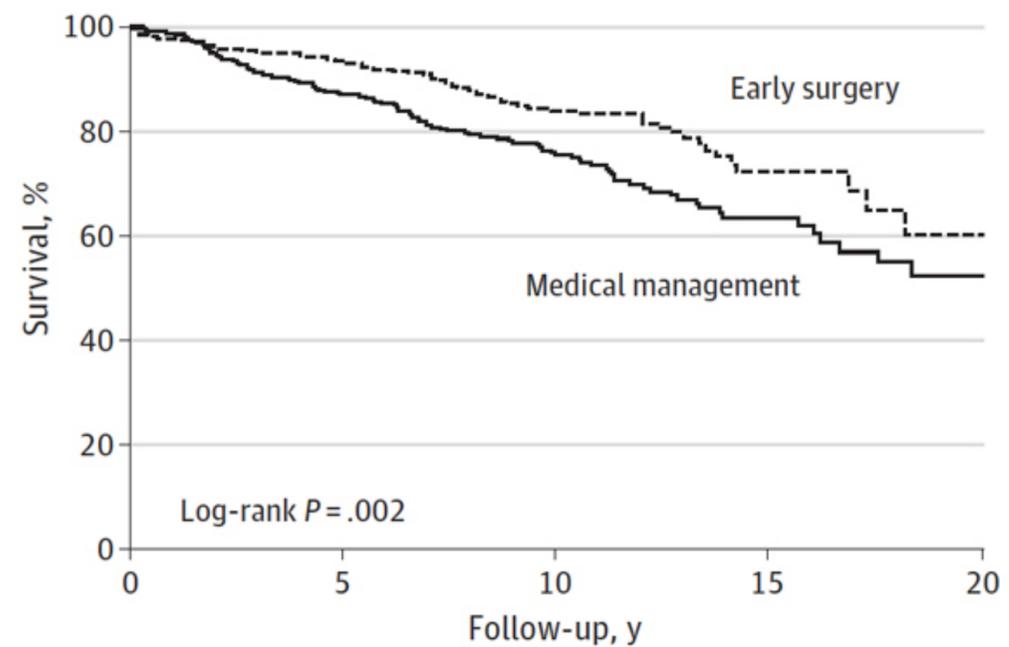
## Survival

Overall population



No. at risk	0	5	10	15	20
Medical management	575	477	296	126	42
Early surgery	446	412	203	41	10

Propensity-matched cohort



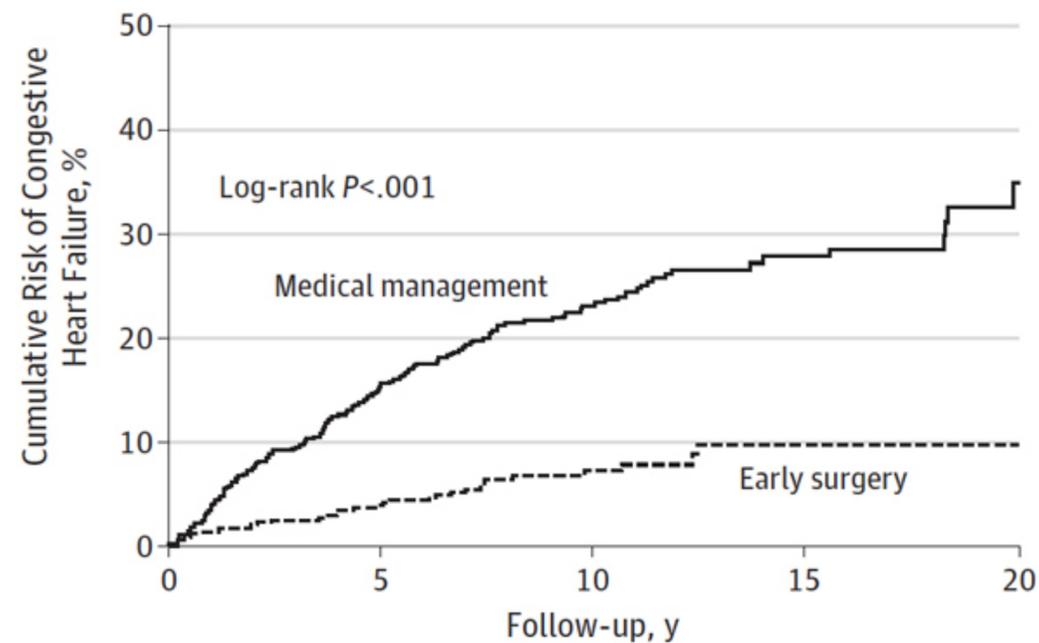
No. at risk	0	5	10	15	20
Medical management	324	276	157	53	8
Early surgery	324	295	160	35	10

# Early Intervention vs. Watchful Waiting

MIDA Registry: 2097 patients, 10.3 year follow-up

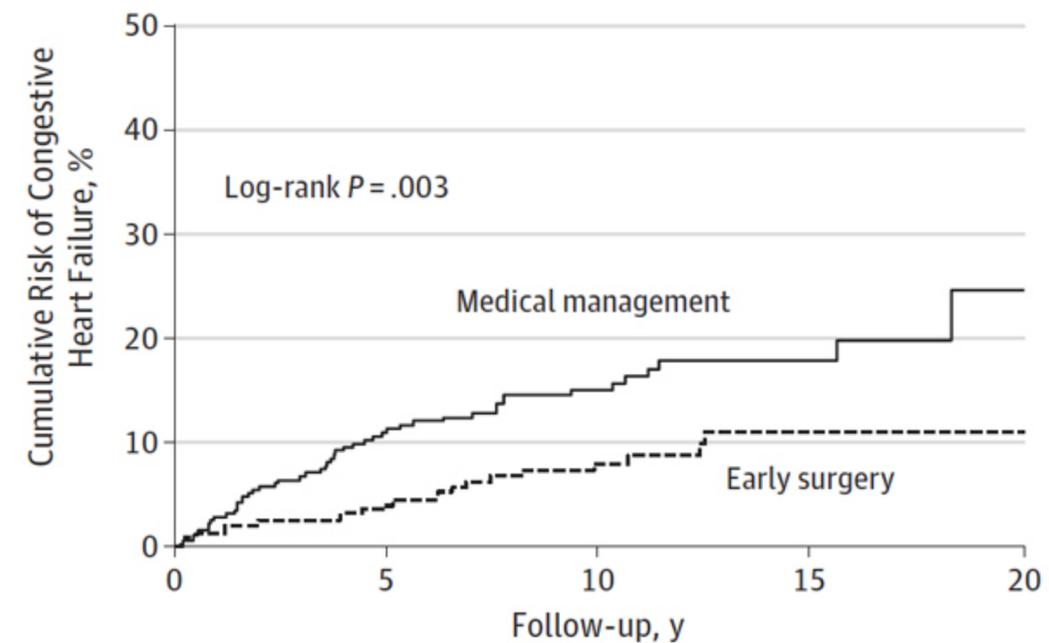
## Heart Failure

Overall population



No. at risk	0	5	10	15	20
Medical management	575	419	249	100	27
Early surgery	446	399	189	37	9

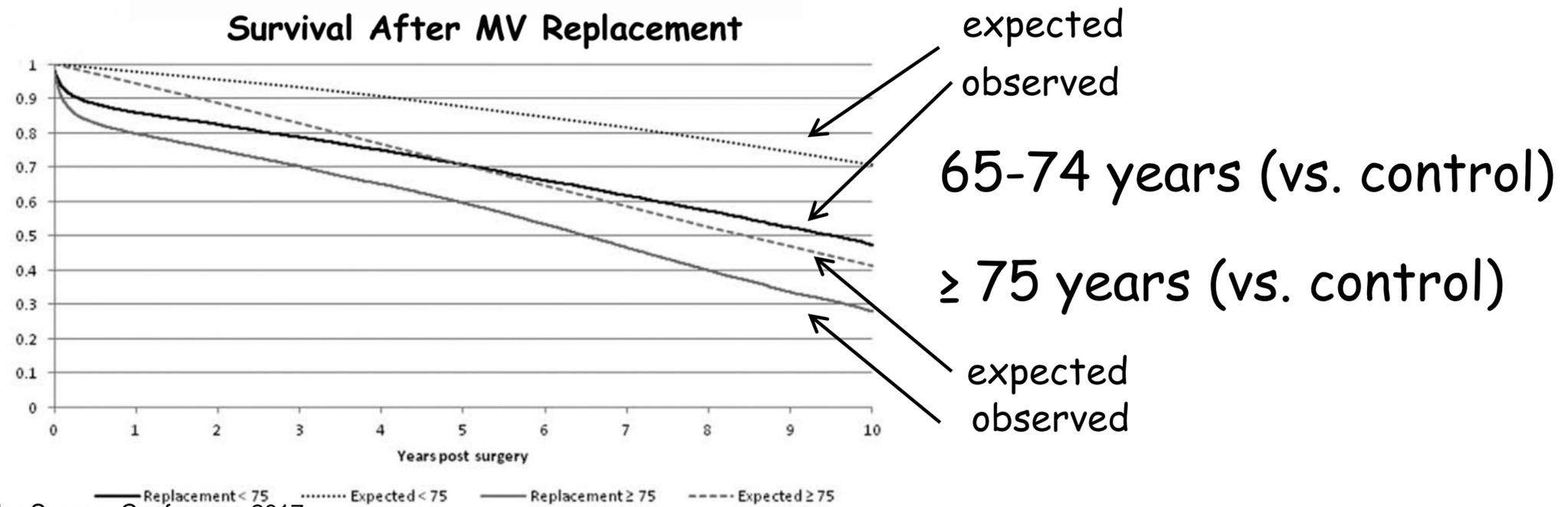
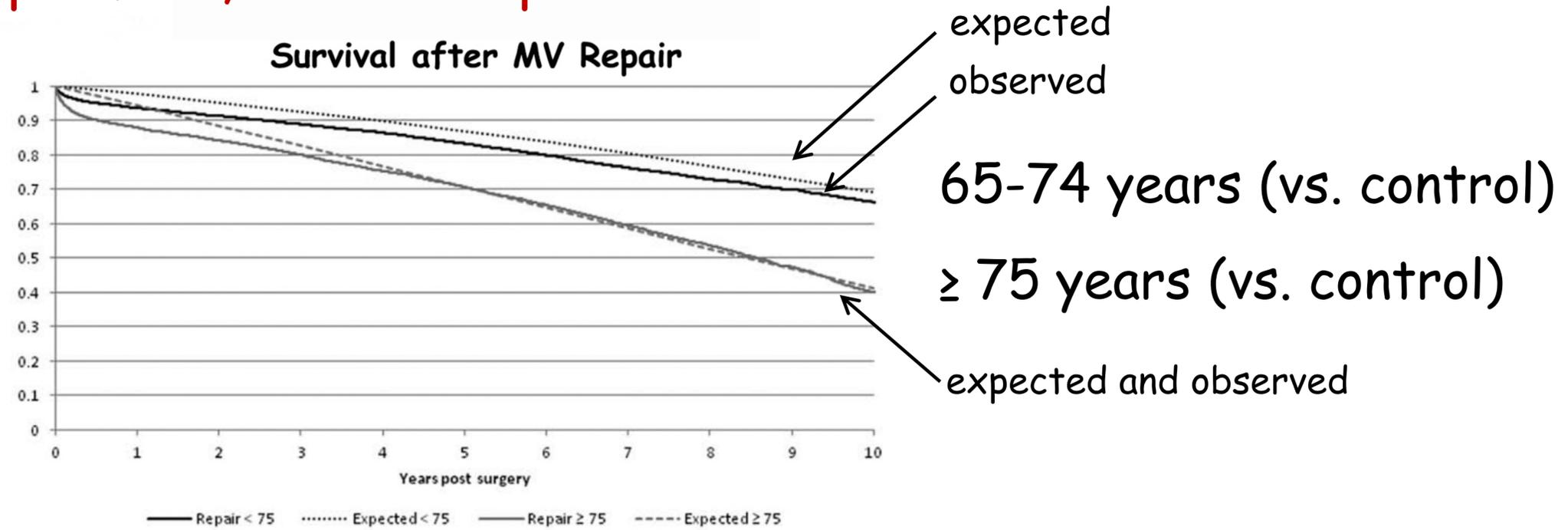
Propensity-matched cohort



No. at risk	0	5	10	15	20
Medical management	324	253	142	48	3
Early surgery	324	289	149	31	9

# Survival: MV Repair vs. Replacement

27,279 Medicare patients ( $\geq 65$  years)  
17,360 MV repair; 29,919 MV replacement



# Chronic Severe Primary MR

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C, D	<b>MV repair preferable to MV replacement</b>	<b>I</b>	<b>I</b>
C1	Non-rheumatic, new afib or PASP $>$ 50 mm Hg, likely repair	IIa	IIa
C1	<b>'Prophylactic' MV repair (No symptoms + no LV dysfunction):</b>		
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	• Progressive $\uparrow$ in LV size or $\downarrow$ in LVEF	IIa	
	• Success + low risk + flail + LVIDS $\geq$ 40 mm		IIa
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# Optimal Imaging Modality? or Optimal Multi-Modality Imaging Assessment?

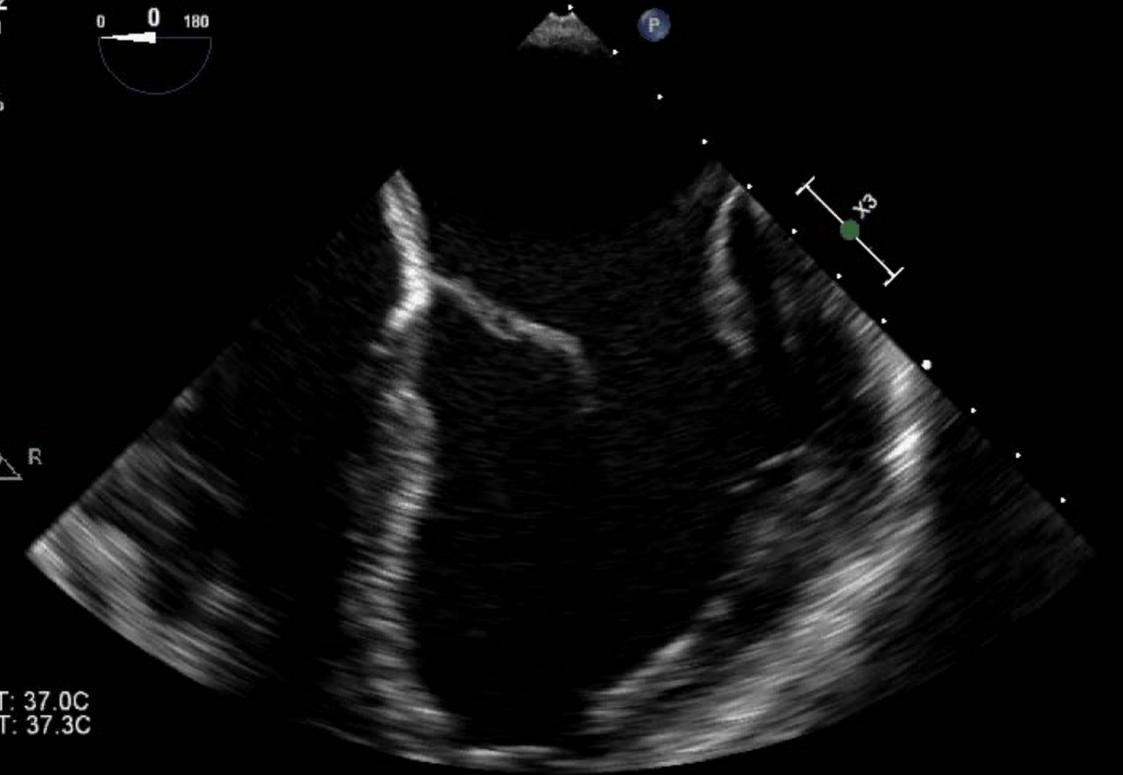


Adult Echo  
X7-2t  
53Hz  
12cm  
2D  
52%  
C 50  
P Off  
Gen



TIS0.1 MI 0.4

M4

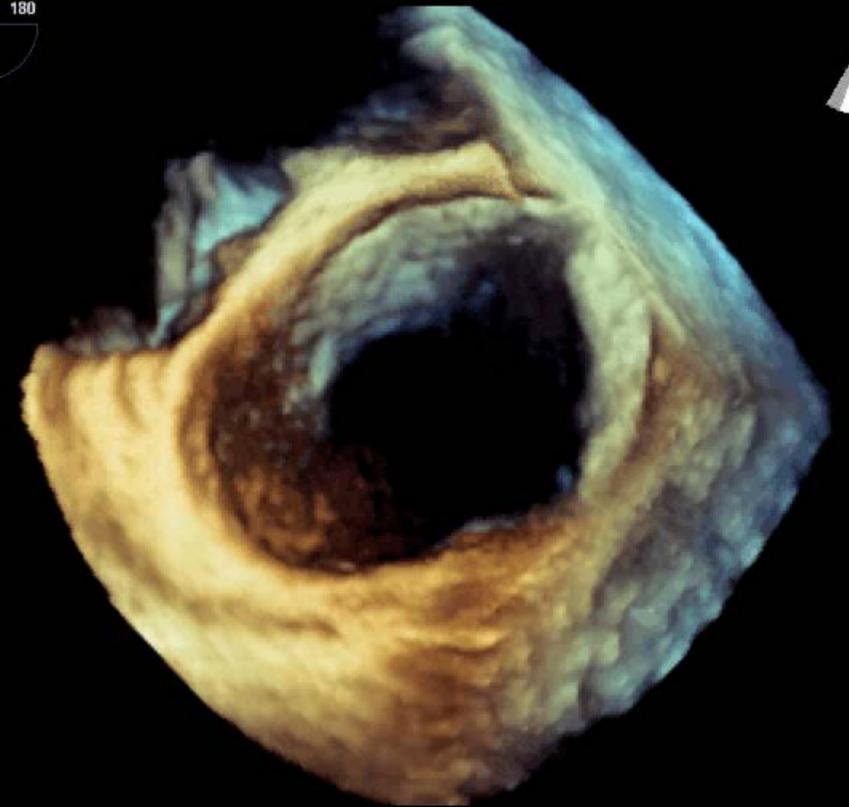


PAT T: 37.0C  
TEE T: 37.3C

20112  
7.3cm  
3D Zoom  
2D / 3D  
% 51 / 36  
C 50 / 30  
Gen



73 bpm



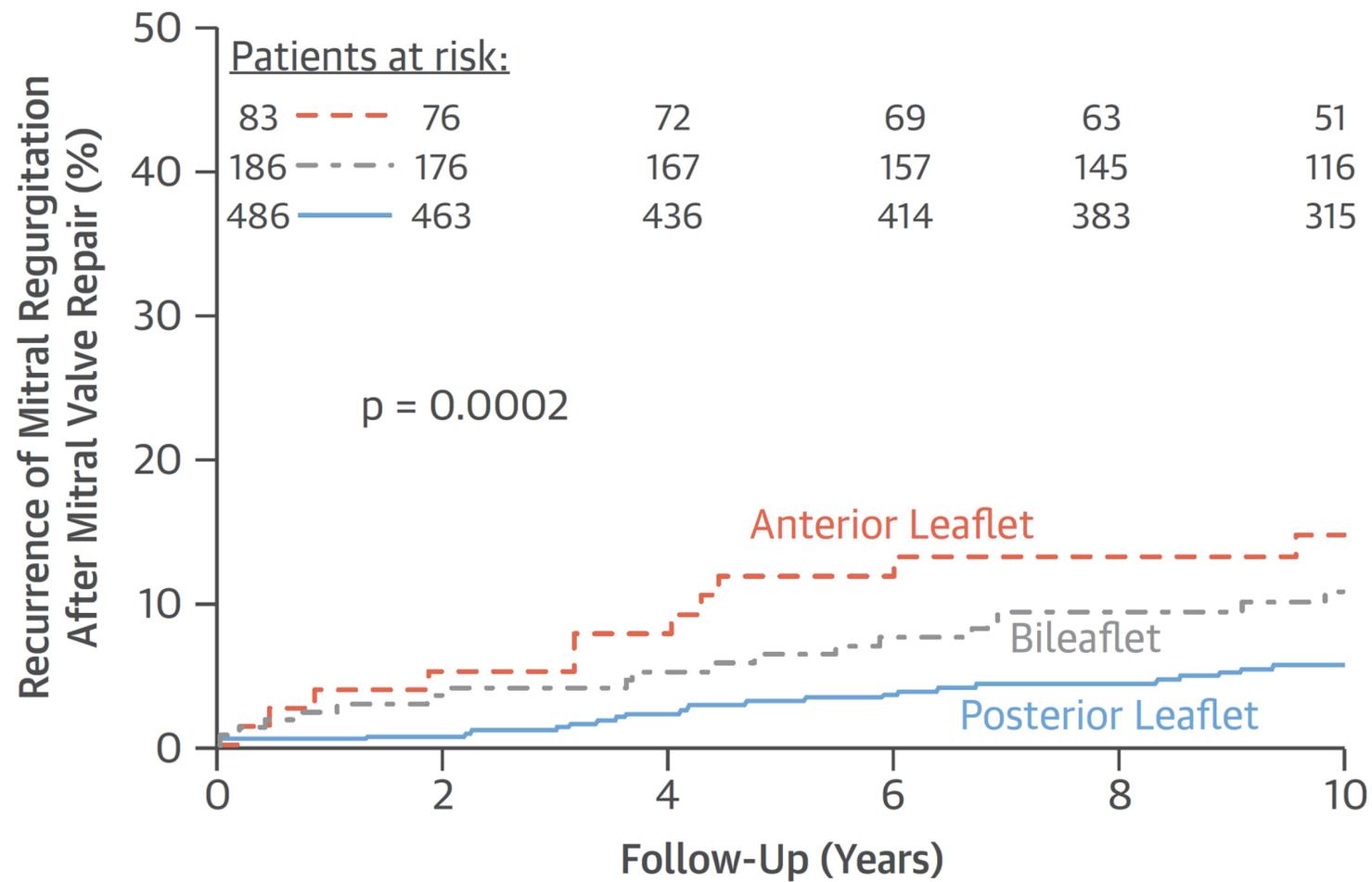
PAT T: 37.0C  
TEE T: 39.8C

Delay 0ms

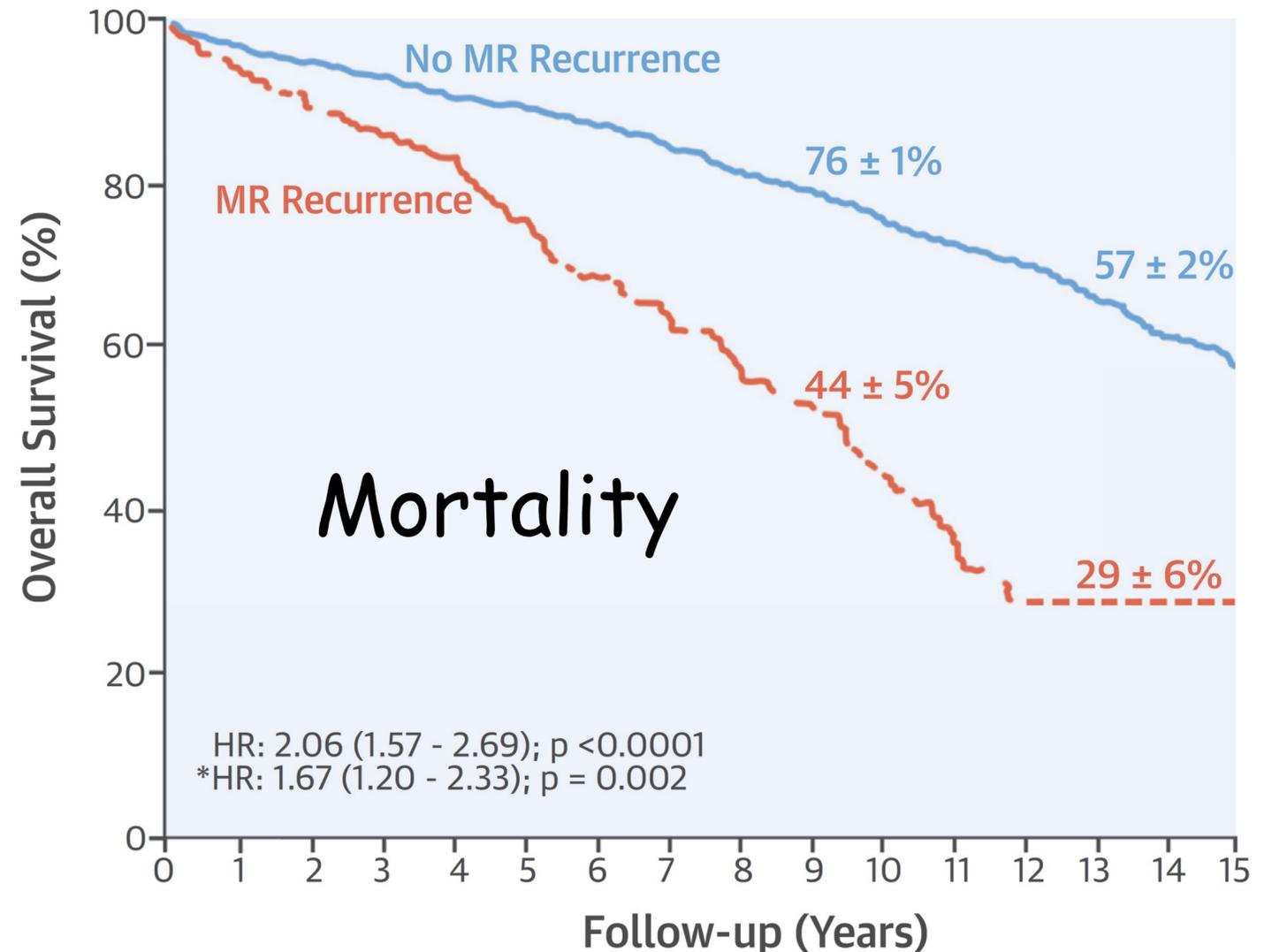
70 bpm

# Degenerative MV: Repair Recurrent MR

1,218 patients with MV repair for degenerative MR  
 Follow-up 11.5 years (IQR 9.2 - 13.6 years)



Recurrent MR after MV Repair

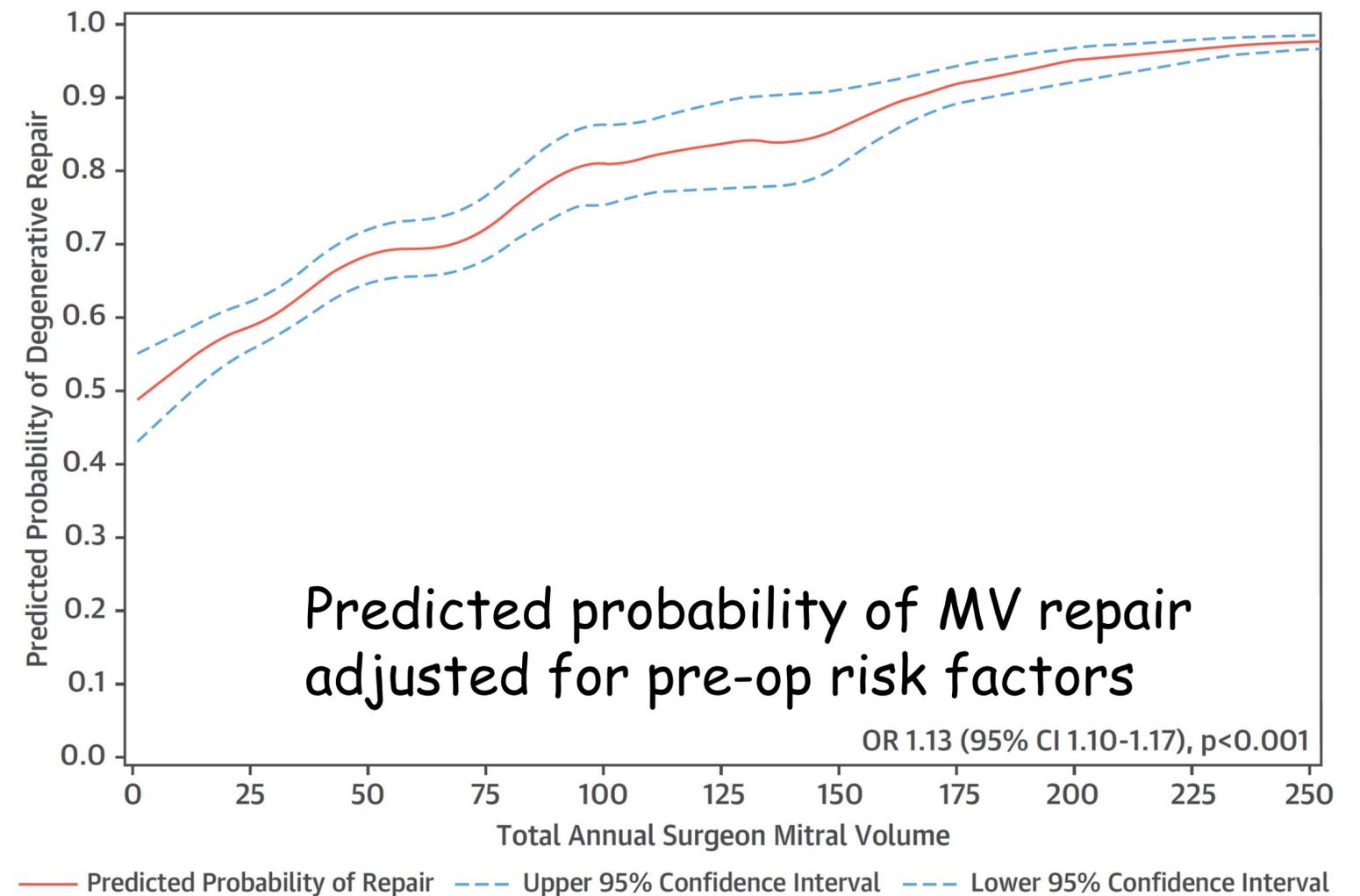
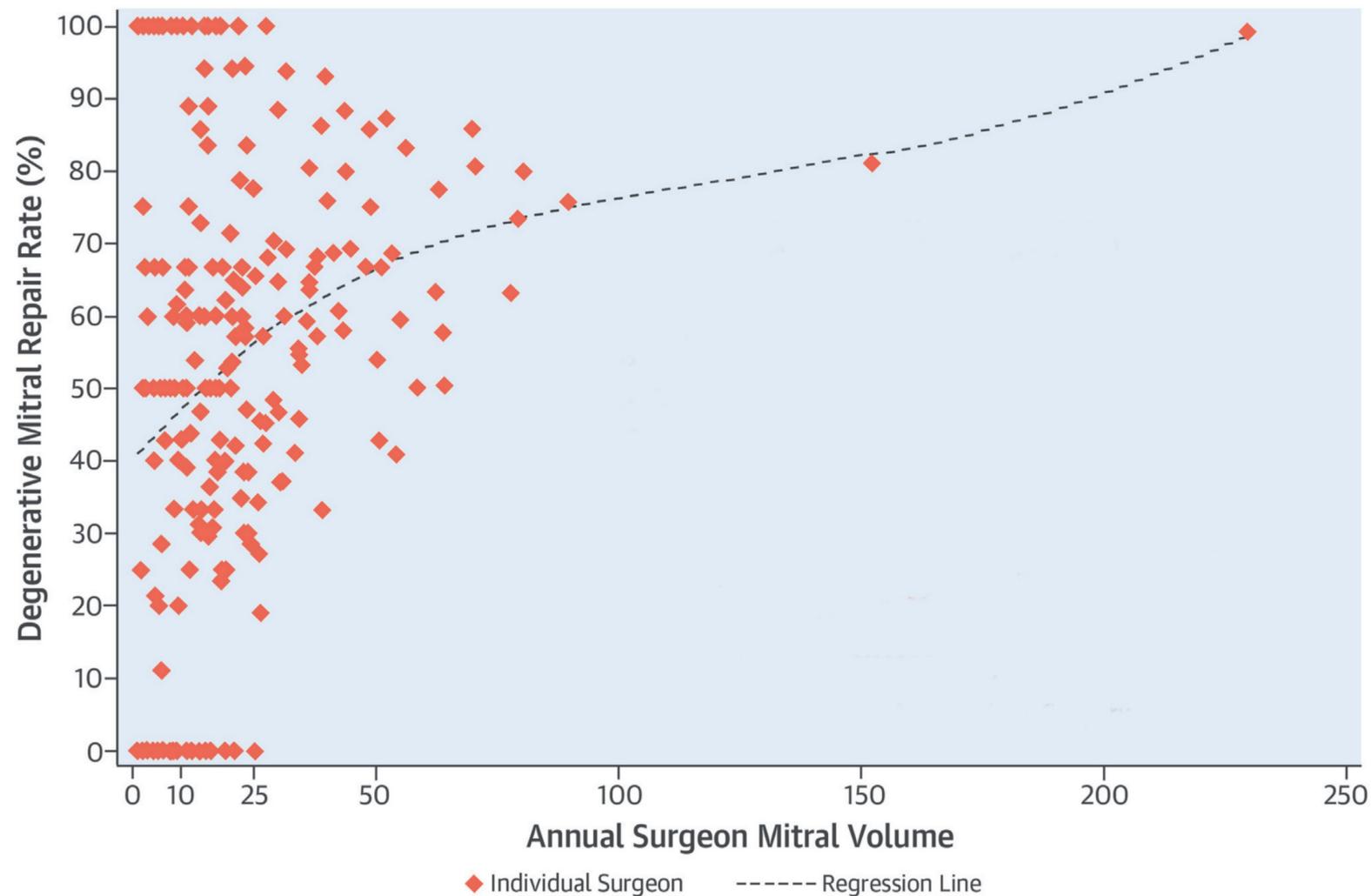


Patients at Risk:		0	2	4	6	8	10	12	14	15
1,085	1,004	935	831	477	169					
131	100	67	37	15	10					

# Surgeon Volume vs. MV Repair Rate

New York State Database

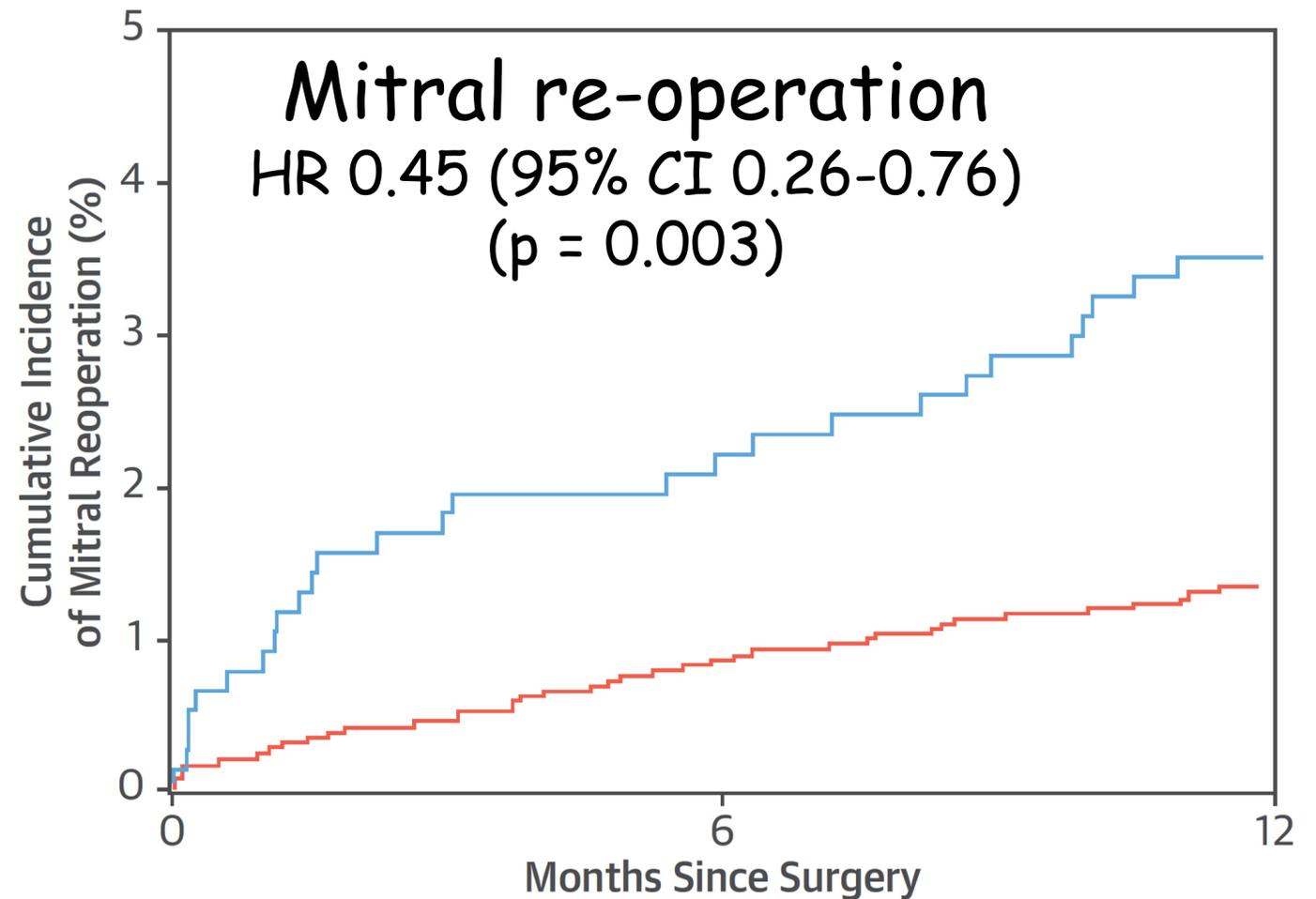
5,475 patients underwent surgery for degenerative MV disease 2002-2013



# Surgeon Volume vs. Outcomes

New York State Database

5,475 patients underwent surgery for degenerative MV disease 2002-2013



Number at Risk		0	6	12
1-24 /Year	760	726	709	
25 or More /Year	2,900	2,842	2,819	

Volume	Adjusted HR (95% CI)	1-yr Survival (95% CI)
≤ 10	Reference	94.1% (91.1-96.0%)
11 - 24	0.72 (0.42-1.22)	95.8% (94.4-96.8%)
25 - 50	0.52 (0.31-0.85)	97.0% (96.1-97.7%)
≥ 51	0.46 (0.28-0.76)	97.8% (97.1-98.4%)

**Adjusted HR of 1-year mortality**  
(p < 0.001)

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# Optimal Timing for Referral and Best Imaging Modality for Degenerative MV Disease

- Referral for any symptoms, LV systolic dysfunction (EF  $\leq$  60%).
- Mitral valve repair rather than mitral valve replacement.
- Optimal imaging = multimodality imaging.
- Early intervention (the asymptomatic patient):
  - Surgeon and center of excellence (volume + results)
  - Anticipate successful repair in a low-risk patient
  - Progressive  $\uparrow$  LV size or  $\downarrow$  LV EF

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# Gracias!



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