



**Porto Alegre, RS  
BRASIL**

# **Angioplastia de Tronco Coronário Izquierdo: Perspectiva**

**Dr. Gilberto L. Nunes**

**30º Congreso Uruguayo de Cardiología**

# Declaração de Potencial Conflito de Interesse

**Nome do Palestrante:** Gilberto Lahorgue Nunes

**Título da Apresentação:** Angioplastia de tronco coronário izquierdo

<b><u>CATEGORIAS DE POTENCIAL CONFLITO DE INTERESSE</u></b>	<b><u>INDÚSTRIA(S)</u></b>
Patrocínio de transporte e/ou hospedagem em Congressos	Abbott, Biotronik,, Terumo
Patrocínio em estudos clínicos e/ou experimentais subvencionados pela indústria	-
Ser conferencista / palestrante em eventos patrocinados pela indústria	Terumo, BioSensors
Participar de comitês normativos de estudos científicos patrocinados pela indústria	-
Receber apoio institucional da indústria	Abbott, Biotronik, Terumo, Boston
Preparo de textos científicos em periódicos patrocinados pela indústria	-
Ter ações da indústria	-

# PCI in Unprotected Left Main Stenosis



**Cardiac Surgeons Only!!!**

# ACC/AHA 2002 Guideline Update for the Management of Patients With Chronic Stable Angina

## Revascularization for Chronic Stable Angina

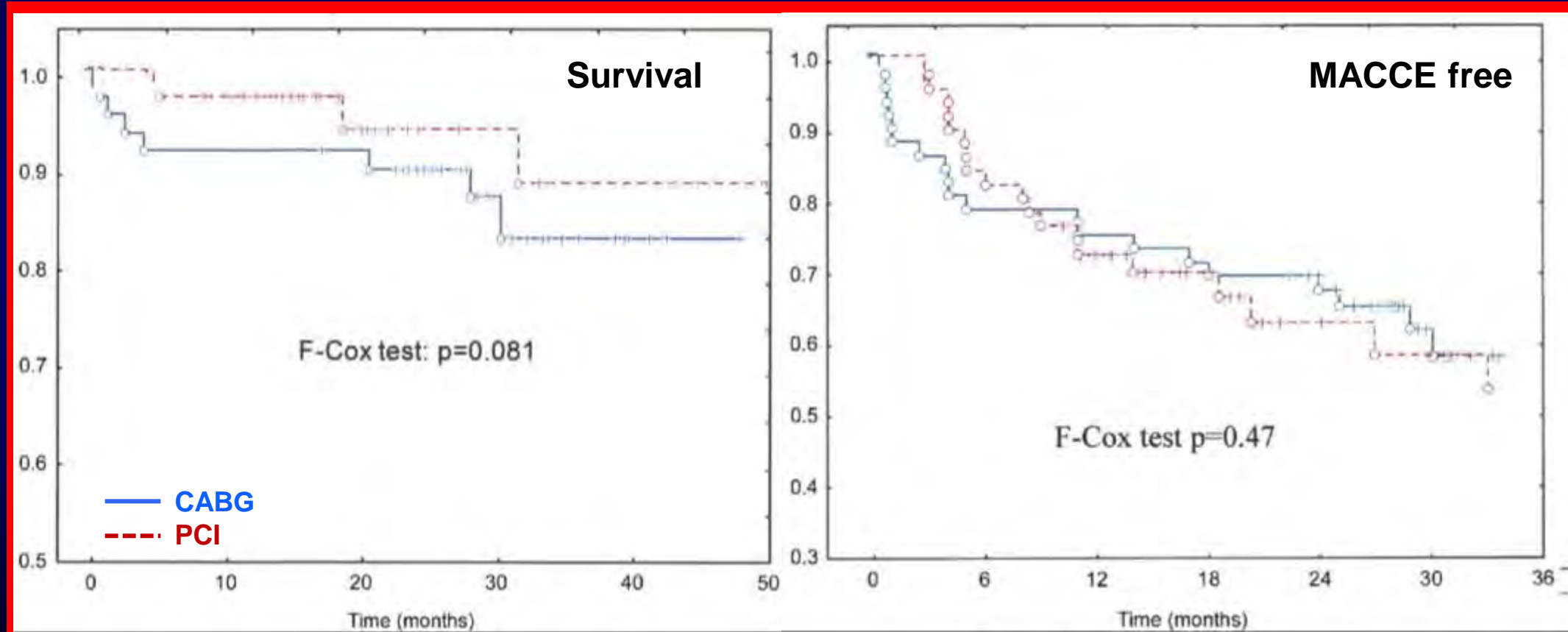
(Recommendations for Revascularization With PCI (or Other Catheter-Based Techniques) and CABG in Patients With Stable Angina)

- **Class III**

5. Use of PCI in patients with significant left main coronary artery disease who are candidates for CABG. (Level of Evidence: B)

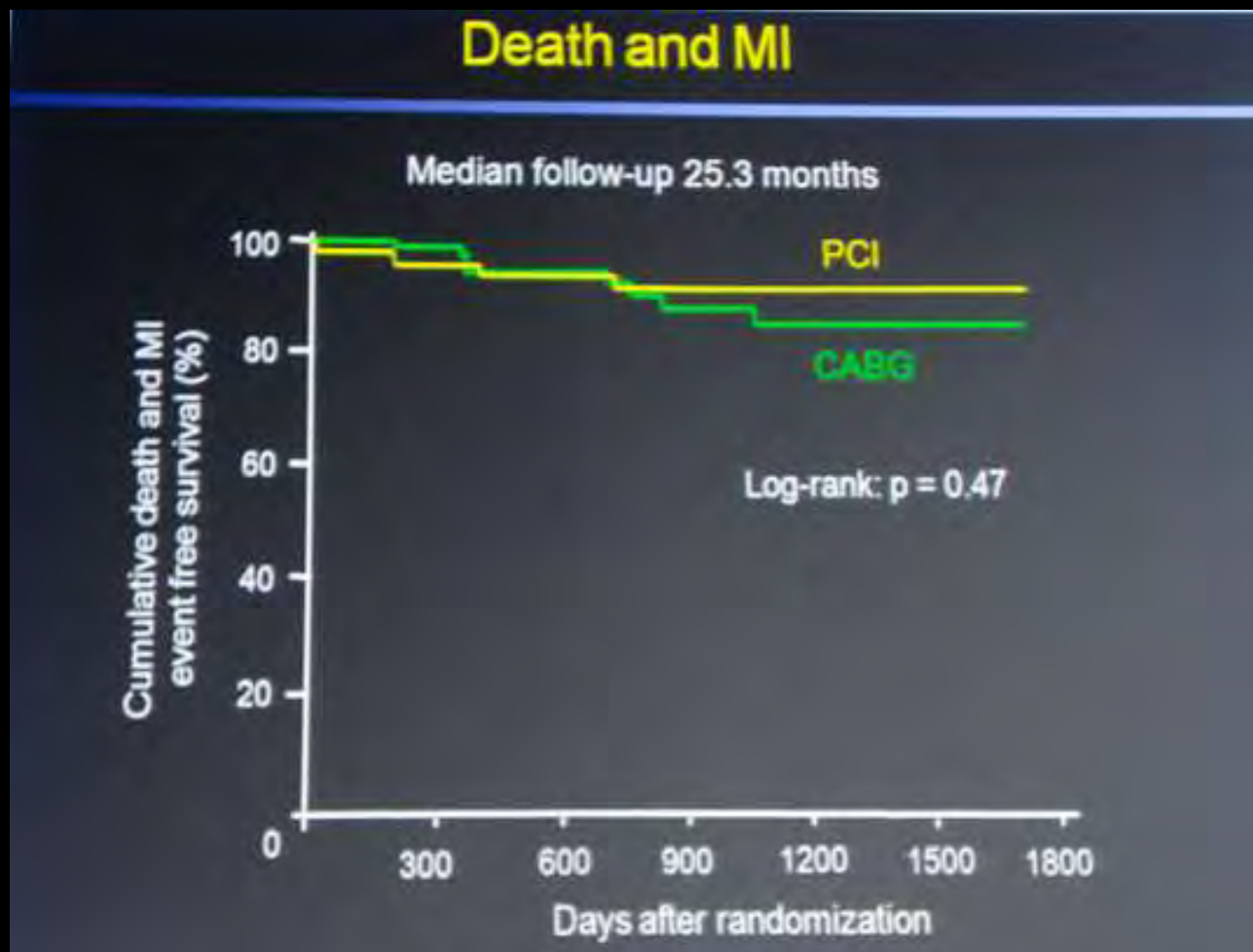
# LE MANS Randomized Trial

## Survival After PCI and CABG

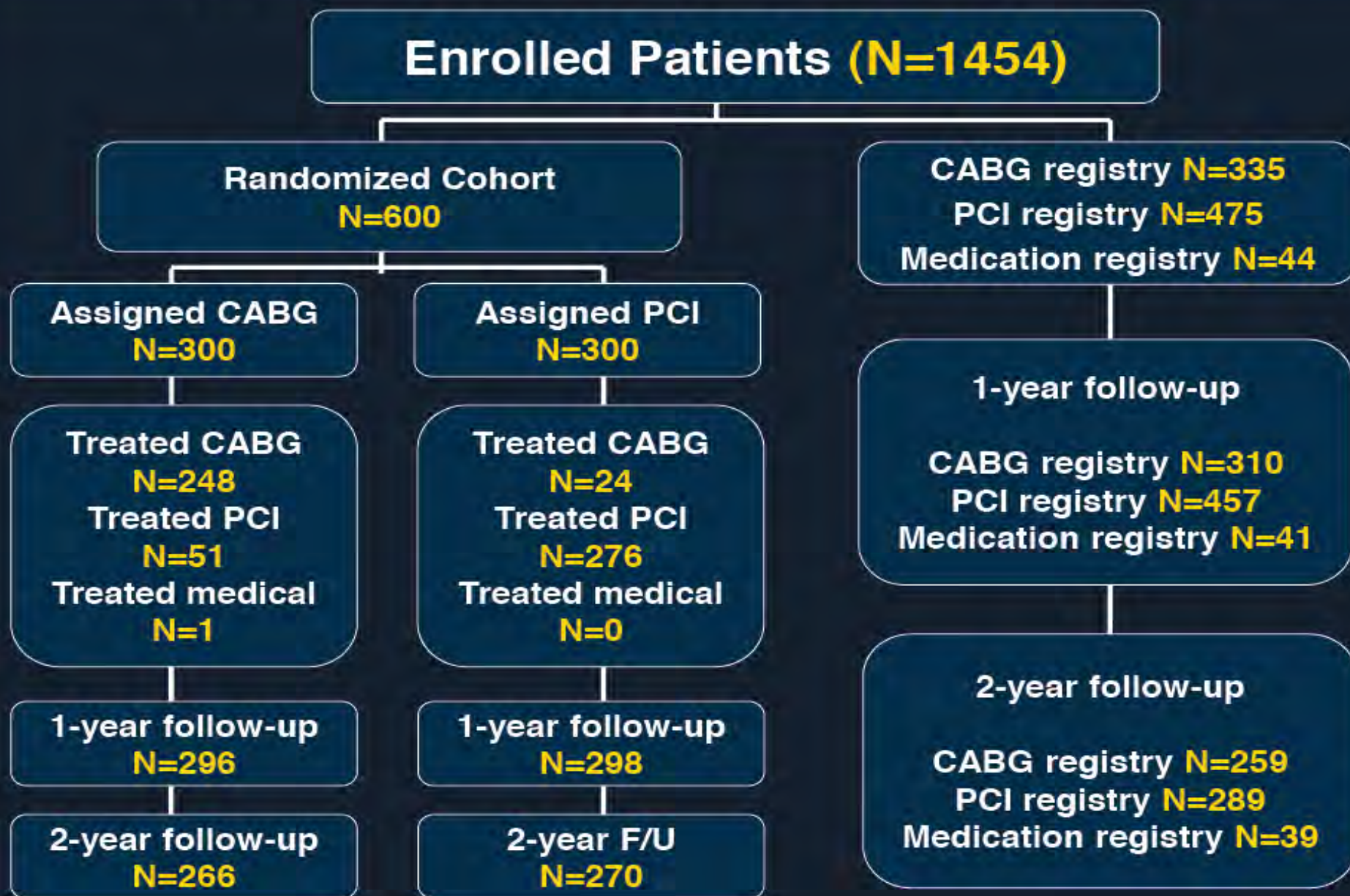


# Randomized, Multicentre Trial Between PCI with Sirolimus-Eluting Stent Versus CABG for Unprotected Left Main

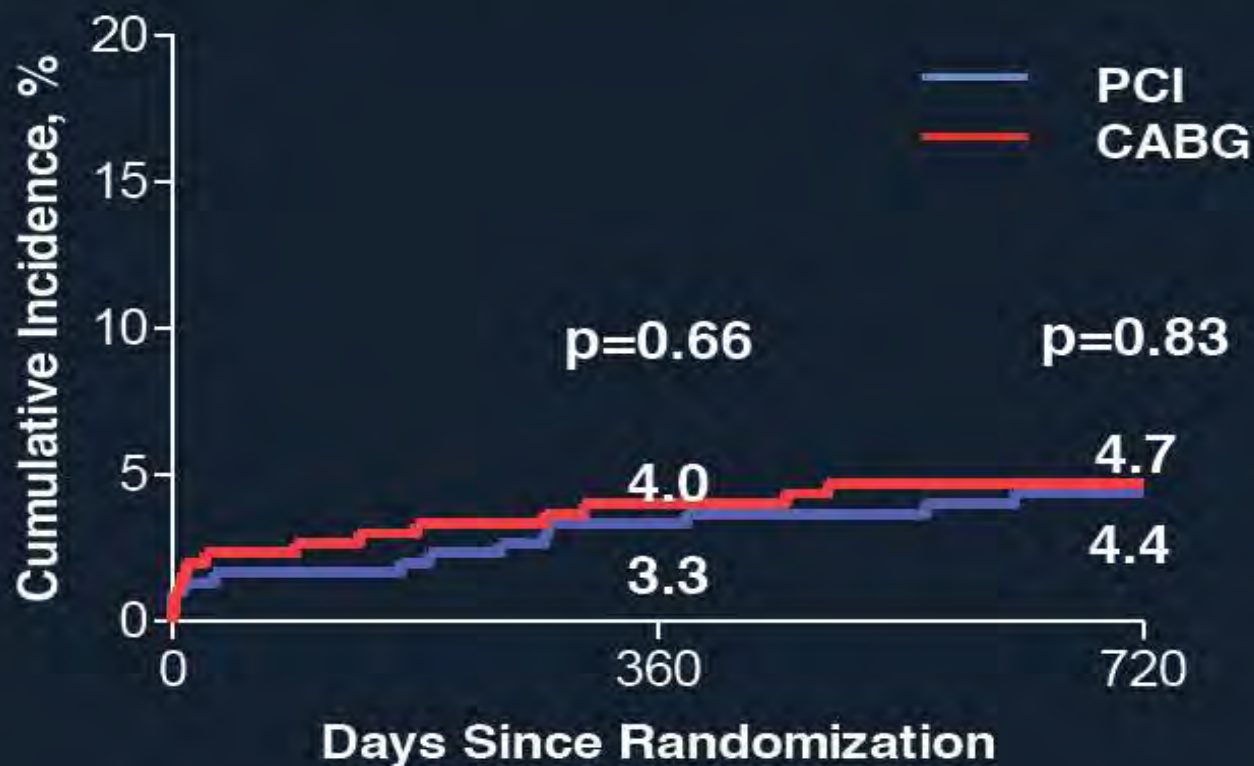
167 patients with unprotected left main disease



# PRECOMBAT: Patient Flow



# PRECOMBAT: Death, MI or Stroke

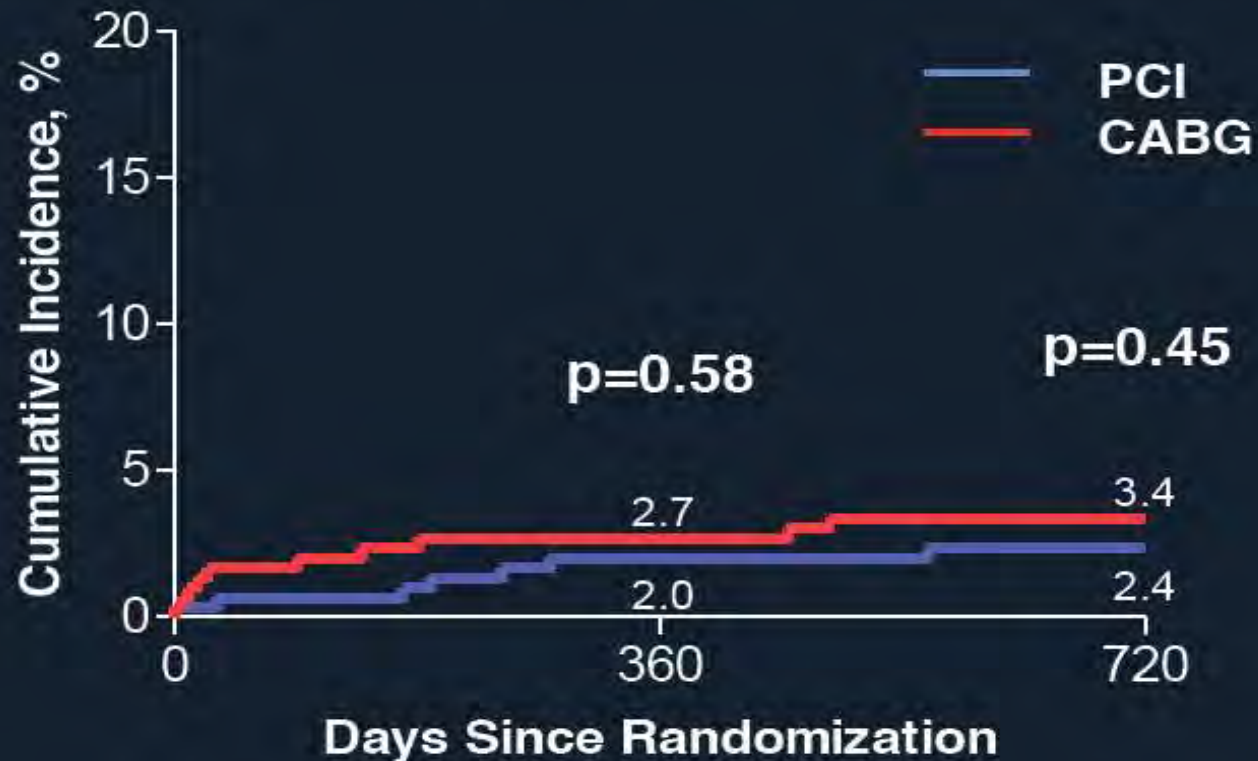


## No. at Risk

PCI	300	288	256
CABG	300	284	248



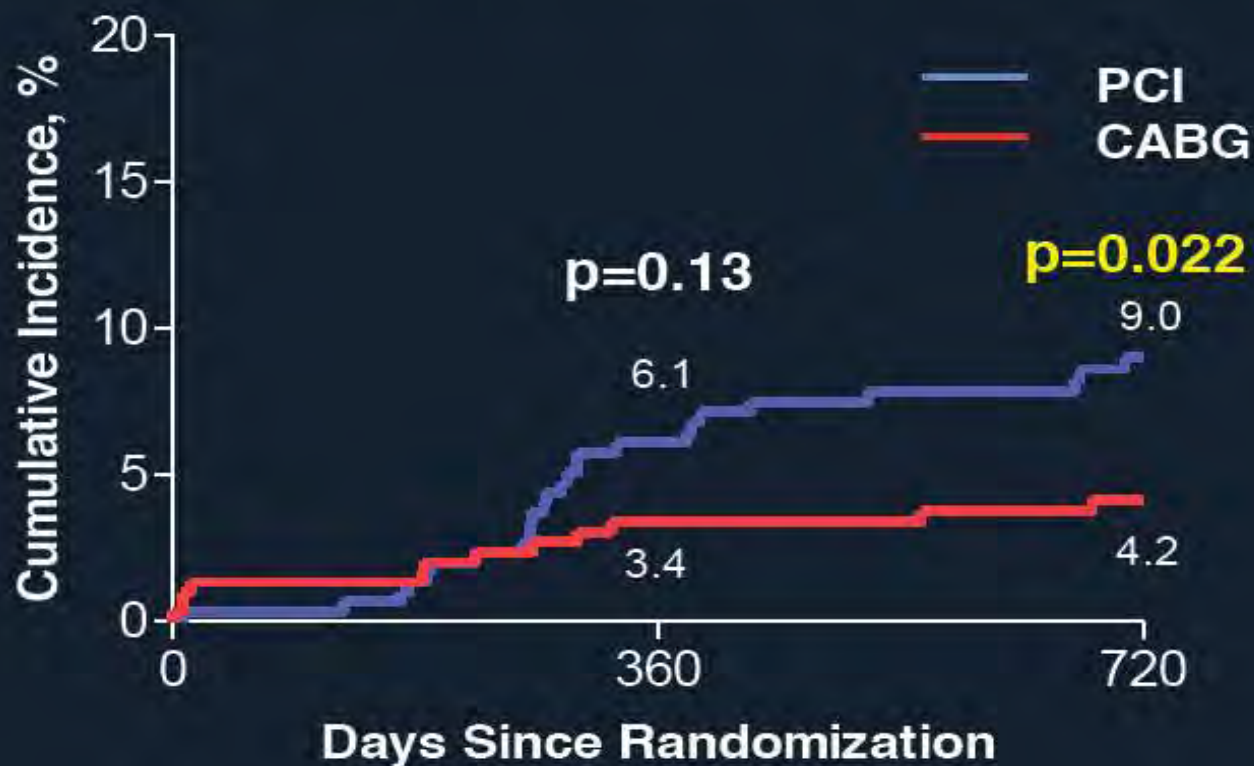
# PRECOMBAT: Death



## No. at Risk

PCI	300	292	261
CABG	300	287	251

# PRECOMBAT: Ischemia-Driven TVR



## No. at Risk

	0	360	720
PCI	300	274	237
CABG	300	279	242

# SYNTAX Trial Design

SYNTAX



62 EU Sites

+



23 US Sites

Heart Team (surgeon & interventional cardiologist)

Amenable for both  
treatment options

Amenable for only one  
treatment approach

Stratification:  
LM and Diabetes

Randomized Arms  
N=1800

Two Registry Arms  
N=1275

CABG  
n=897

vs

TAXUS\*  
n=903

CABG  
n=1077

PCI  
n=198

3VD  
n=549  
(66.3%)

LM  
n=348  
(33.7%)

3VD  
n=546  
(65.4%)

LM  
n=357  
(34.6%)

\*TAXUS Express

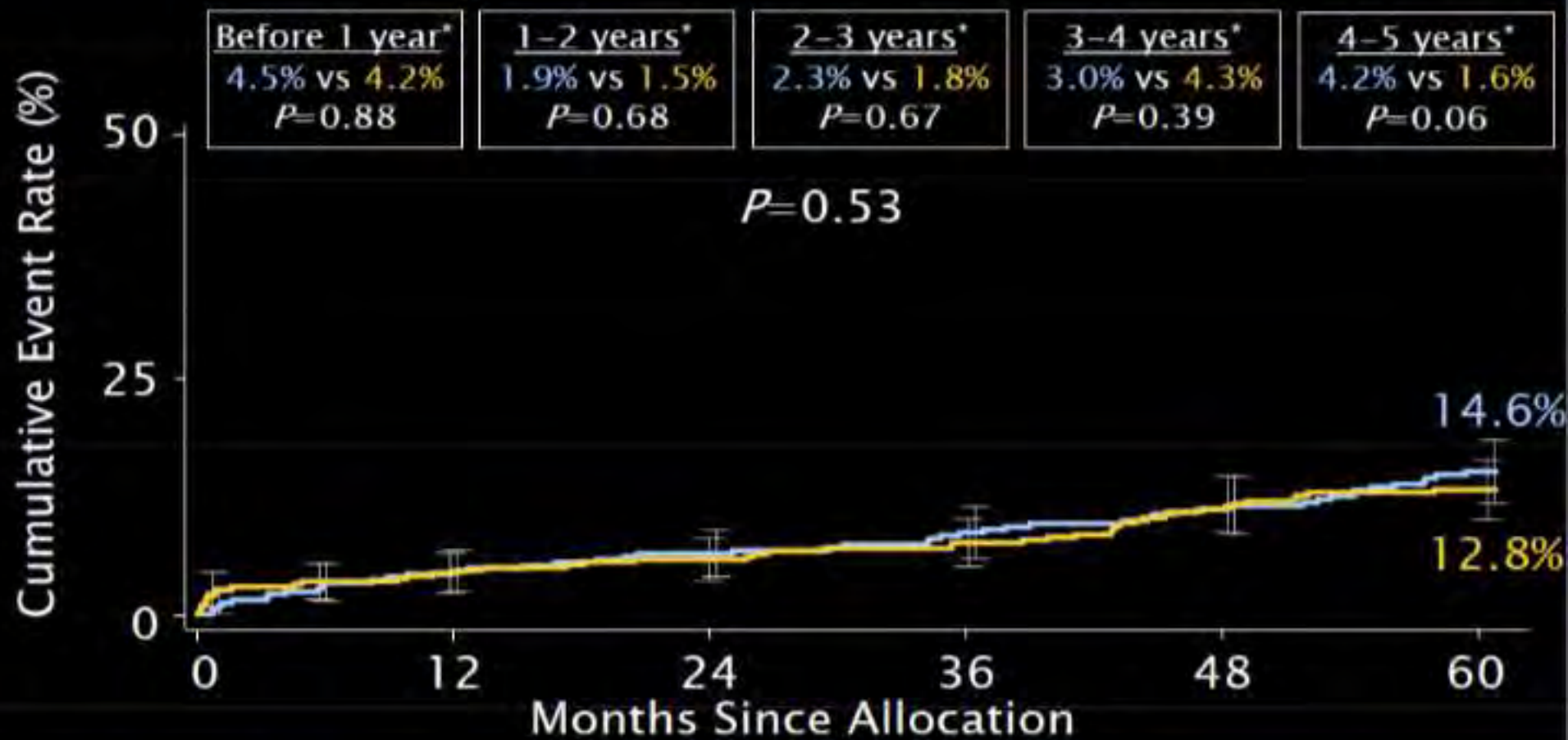
# All-Cause Death to 5 Years

## *Left Main Subset*

SYNTAX

CABG (N=348)

TAXUS (N=357)



Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank P value; \*Binary rates

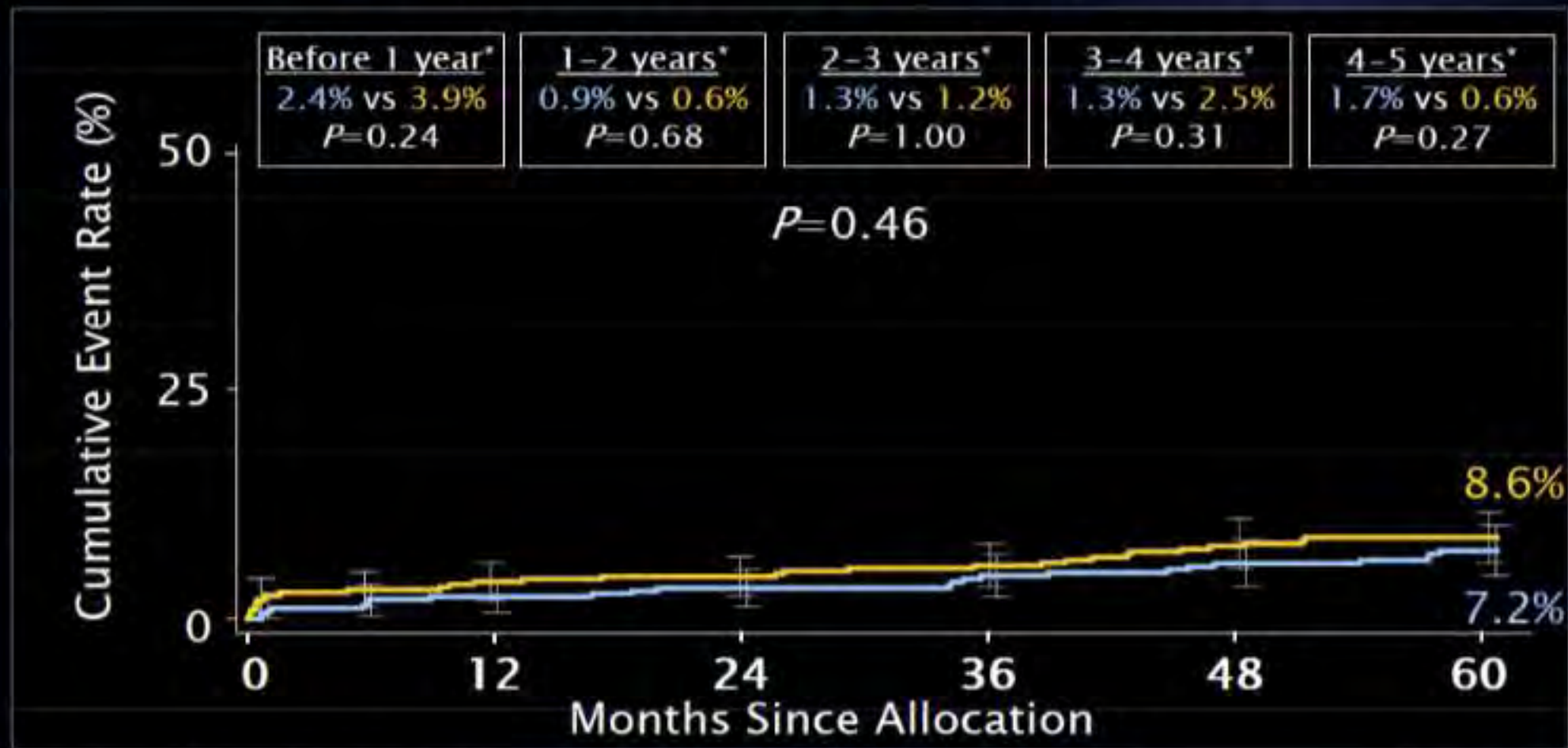
ITT population

# Cardiac Death to 5 Years *Left Main Subset*

SYNTAX

■ CABG (N=348)

■ TAXUS (N=357)



Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank P value; \*Binary rates

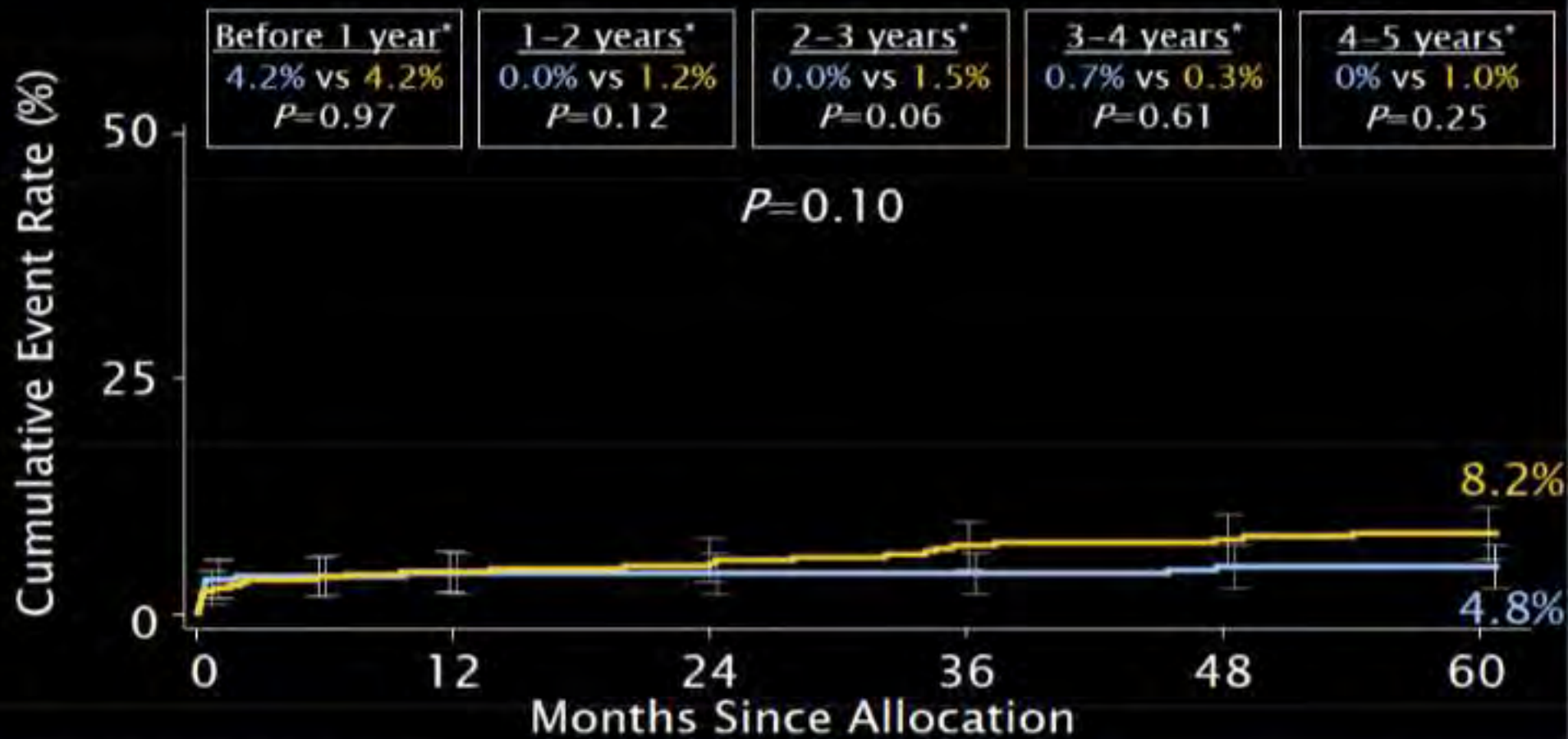
ITT population

# Myocardial Infarction to 5 Years *Left Main Subset*

SYNTAX

CABG (N=348)

TAXUS (N=357)



Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank P value; \*Binary rates

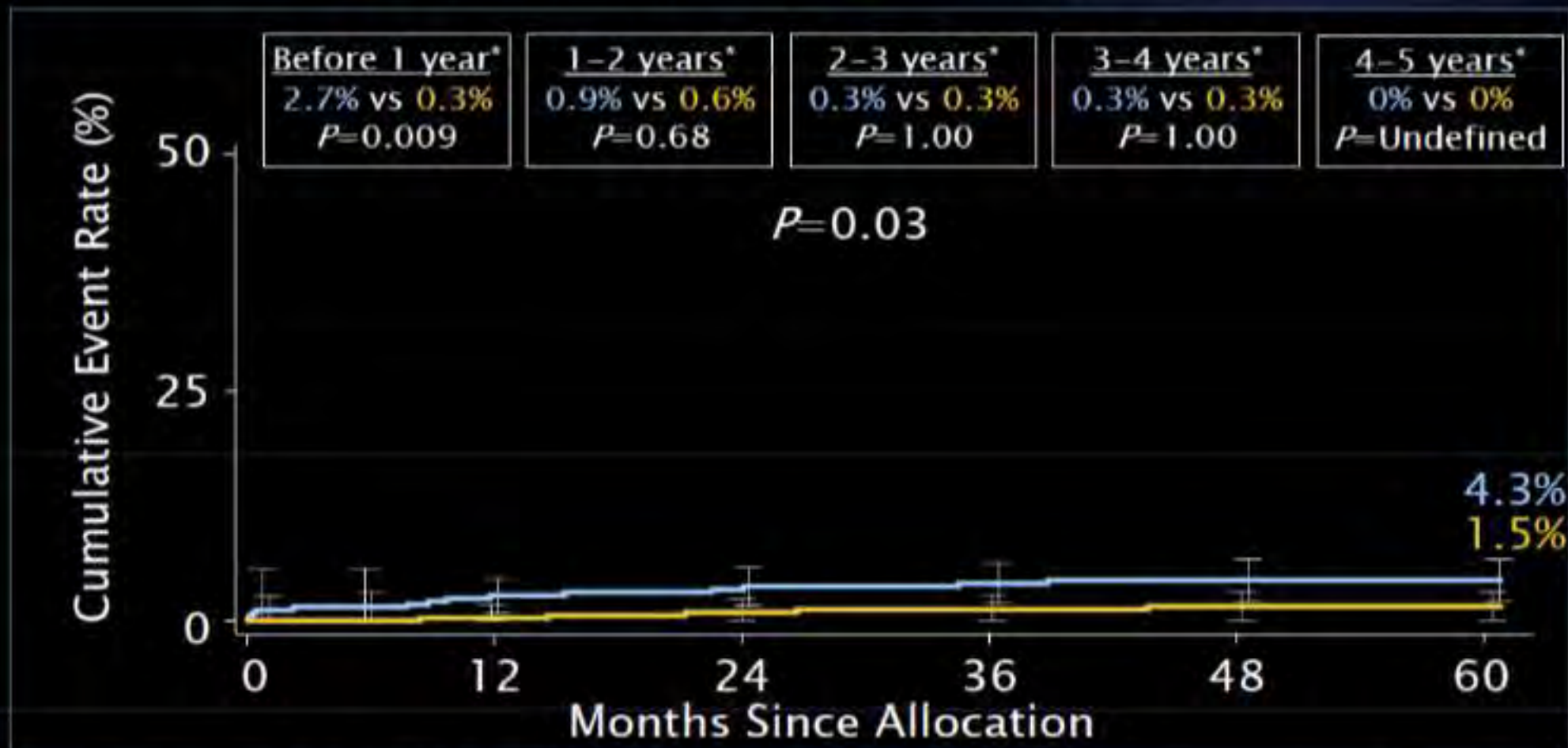
ITT population

# CVA to 5 Years Left Main Subset



■ CABG (N=348)

■ TAXUS (N=357)



Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank P value; \*Binary rates

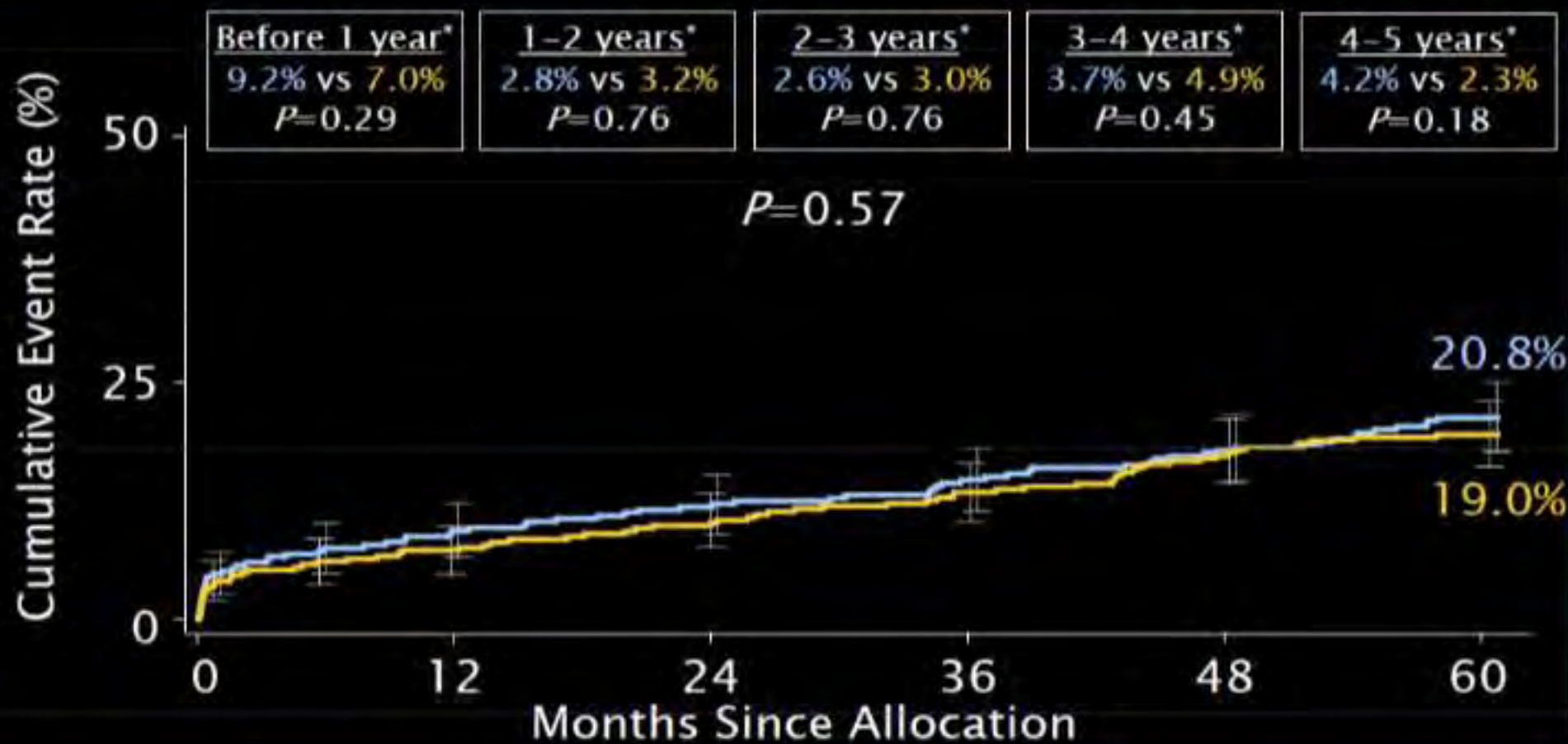
ITT population

# All-Cause Death/CVA/MI to 5 Years *Left Main Subset*

SYNTAX)

CABG (N=348)

TAXUS (N=357)



Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank P value; \*Binary rates

ITT population

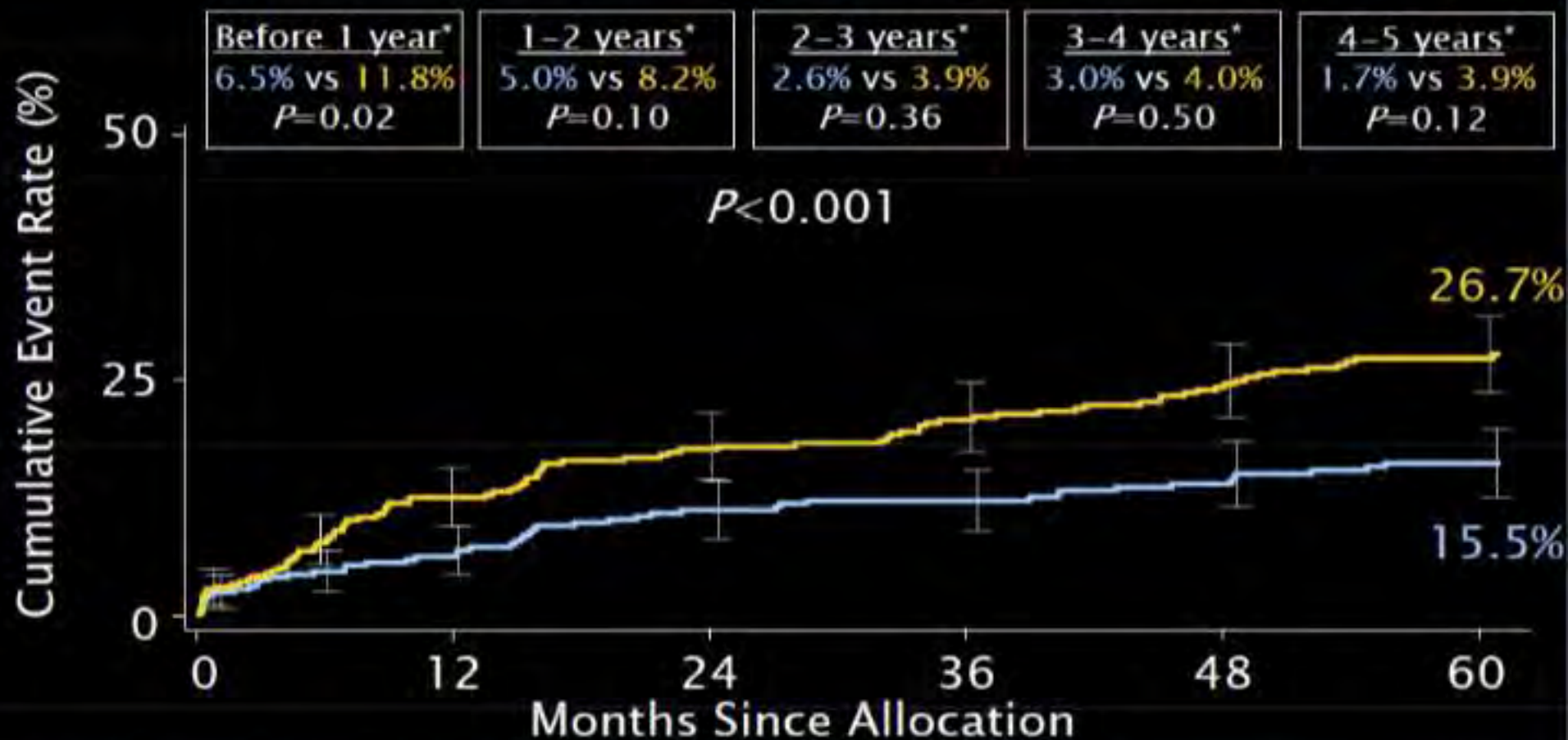


# Repeat Revascularization to 5 Years *Left Main Subset*

SYNTAX

CABG (N=348)

TAXUS (N=357)



Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank  $P$  value; \*Binary rates

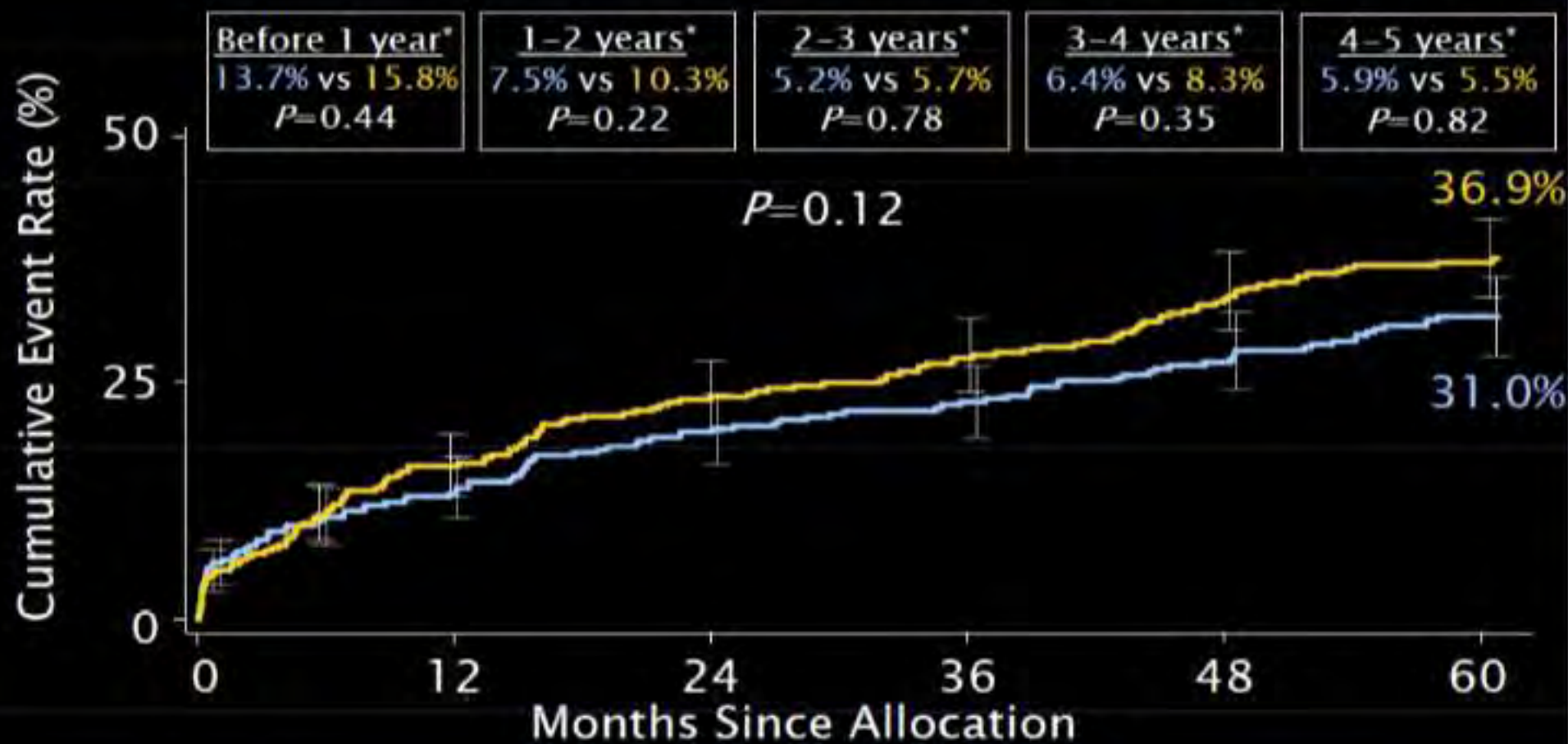
ITT population

# MACCE to 5 Years *Left Main Subset*

SYNTAX

CABG (N=348)

TAXUS (N=357)



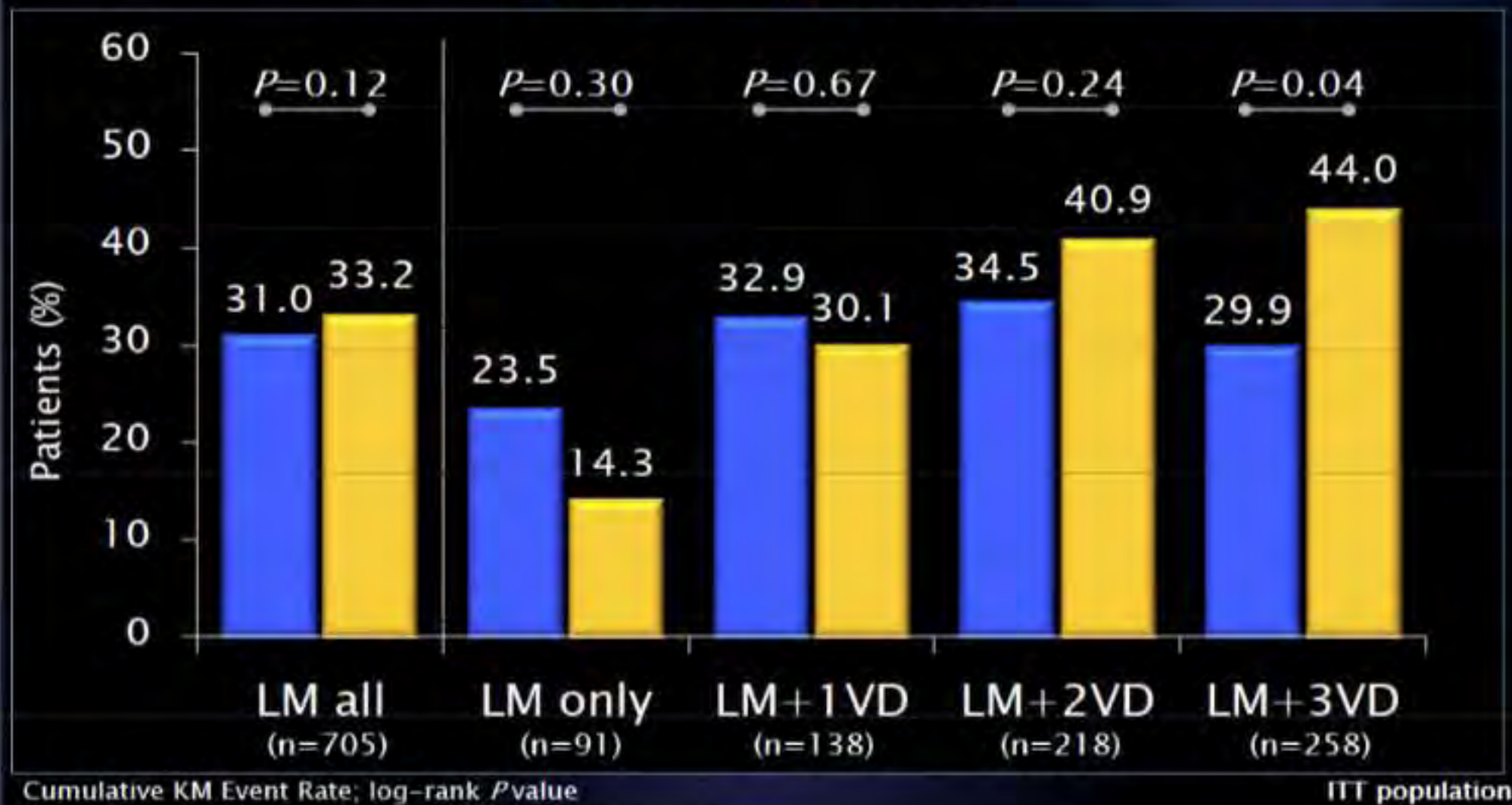
Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank P value; \*Binary rates

ITT population

# MACCE to 5 Years *Left Main Subsets*

SYNTAX

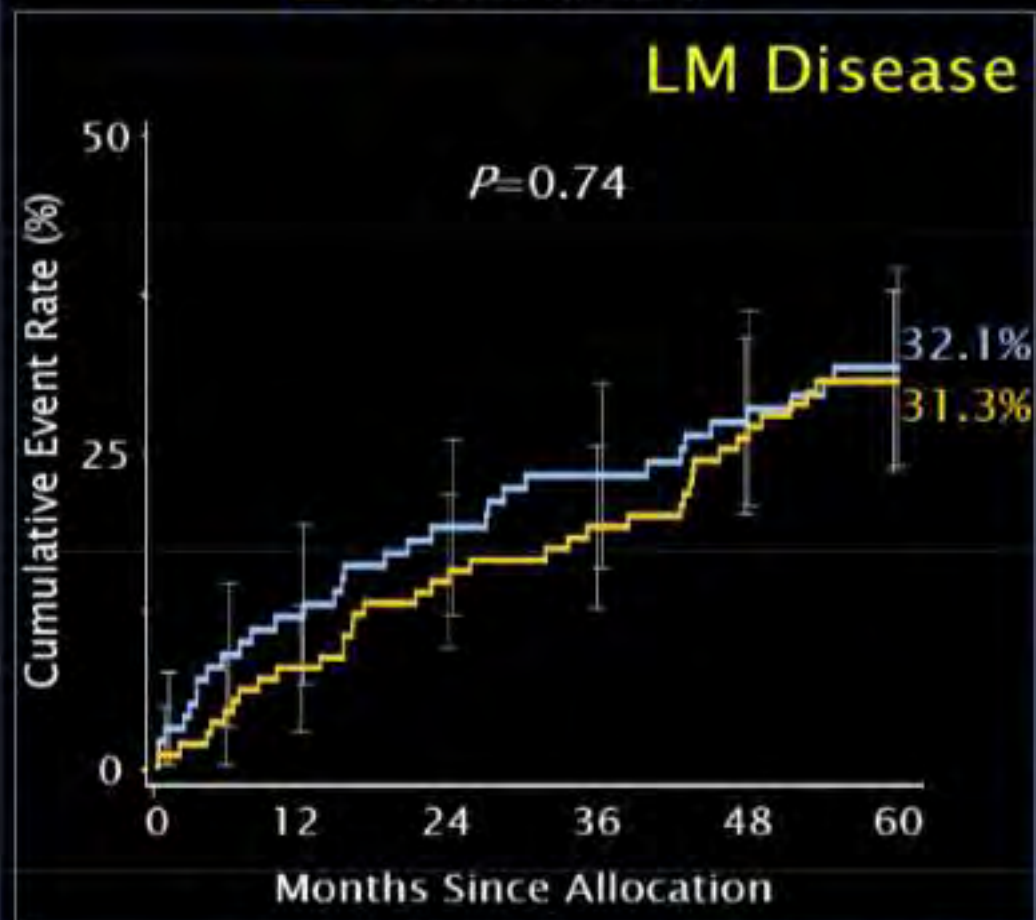
CABG TAXUS



# MACCE to 5 Years by SYNTAX Score Tercile *Low to Intermediate Scores (0-32)*



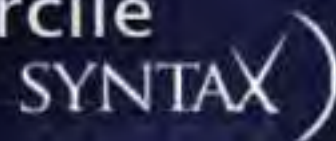
■ CABG (N=196)  
■ TAXUS (N=221)



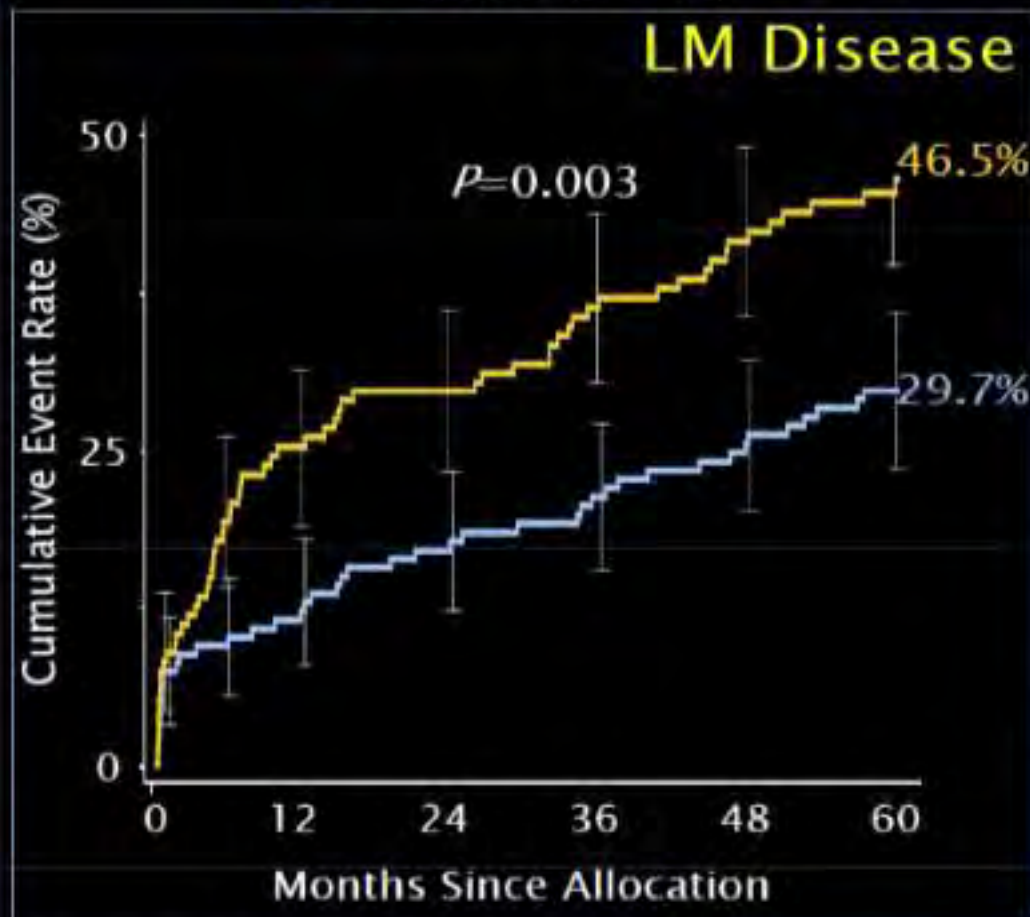
	CABG	PCI	P value
Death	15.1%	7.9%	<b>0.02</b>
CVA	3.9%	1.4%	0.11
MI	3.8%	6.1%	0.33
Death, CVA or MI	19.8%	14.8%	0.16
Revasc.	18.6%	22.6%	0.36

# MACCE to 5 Years by SYNTAX Score Tercile

LM Subset *High Scores*  $\geq 33$



■ CABG (N=149)  
■ TAXUS (N=135)

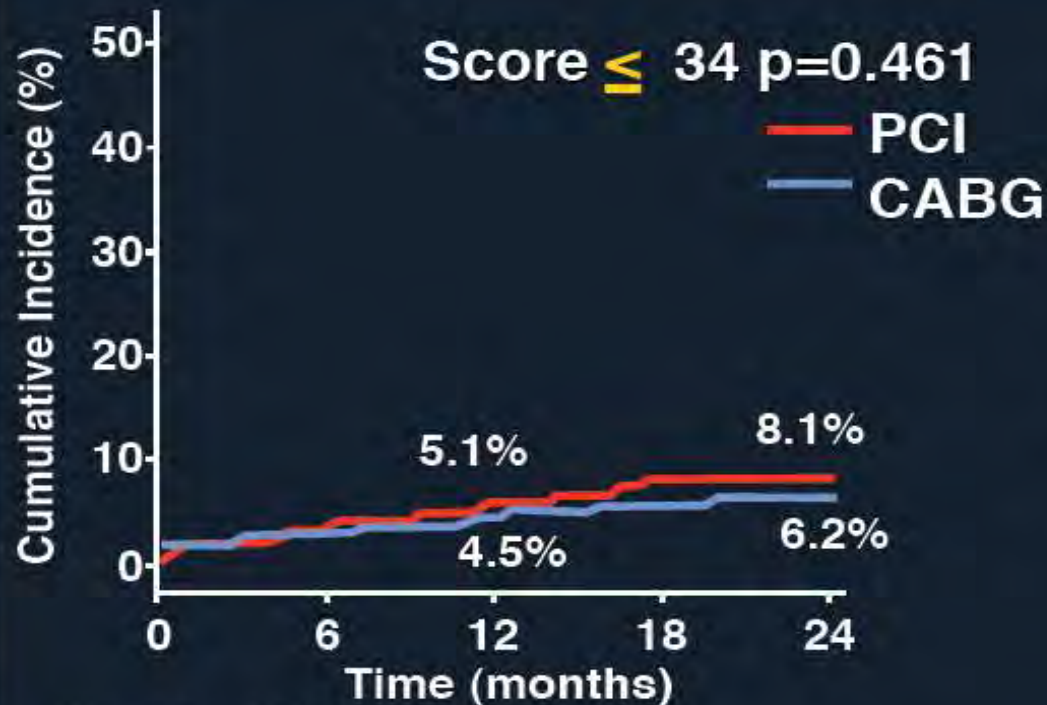


	CABG	PCI	P value
Death	14.1%	20.9%	0.11
CVA	4.9%	1.6%	0.13
MI	6.1%	11.7%	0.13
Death, CVA or MI	22.1%	26.1%	0.40
Revasc.	11.6%	34.1%	<0.001

Cumulative KM Event Rate  $\pm$  1.5 SE; log-rank P value

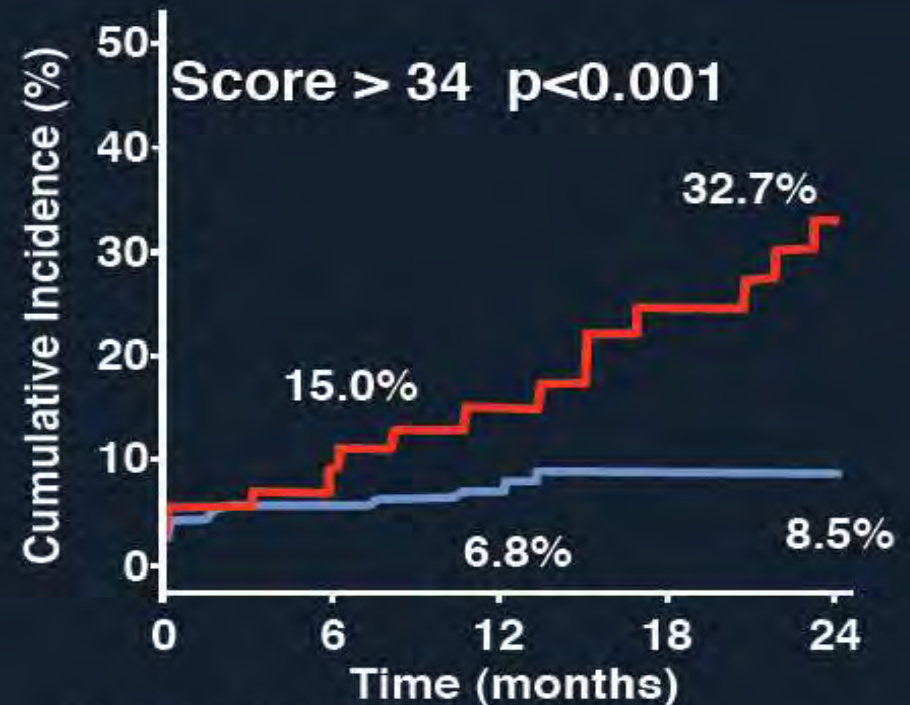
Site-reported Data; ITT population

# SYNTAX Score and Mortality in Left Main Stenting



Number at risk

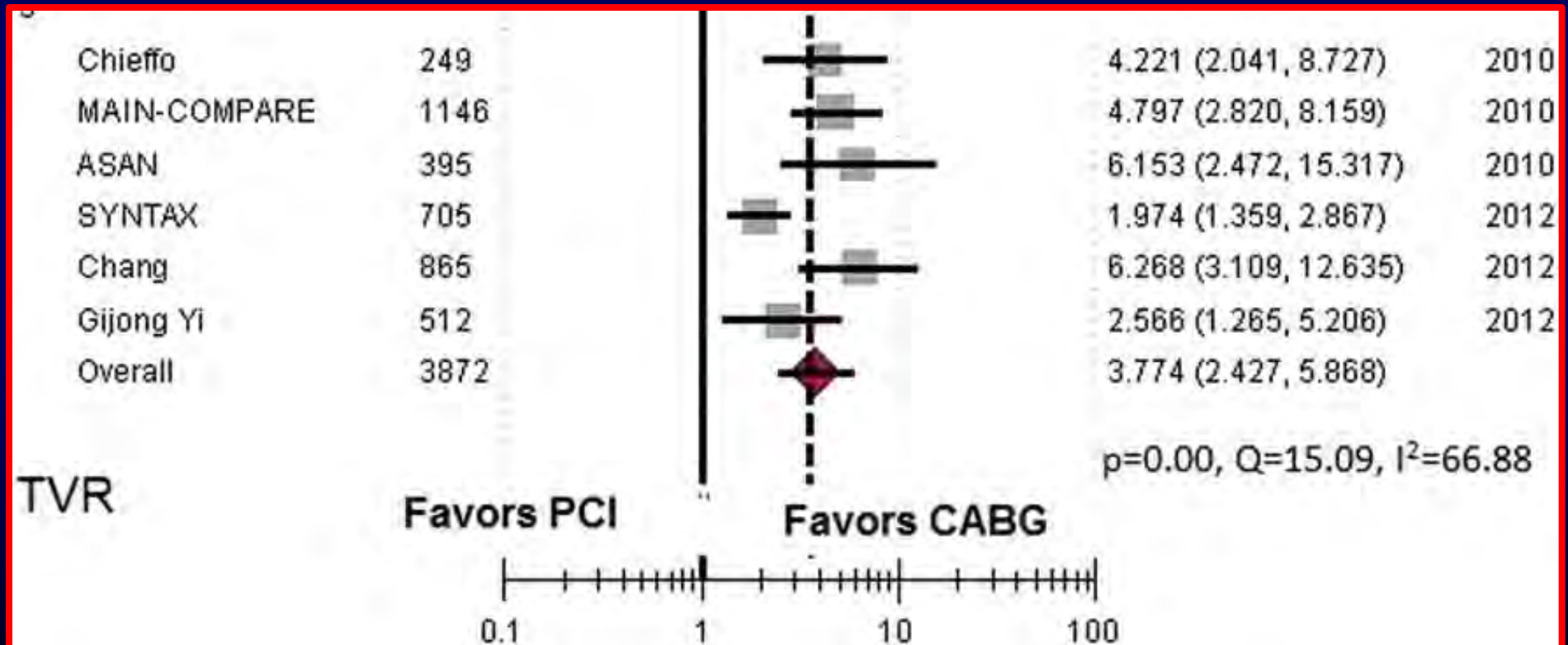
PCI	186	148	124	87
CABG	204	186	153	129



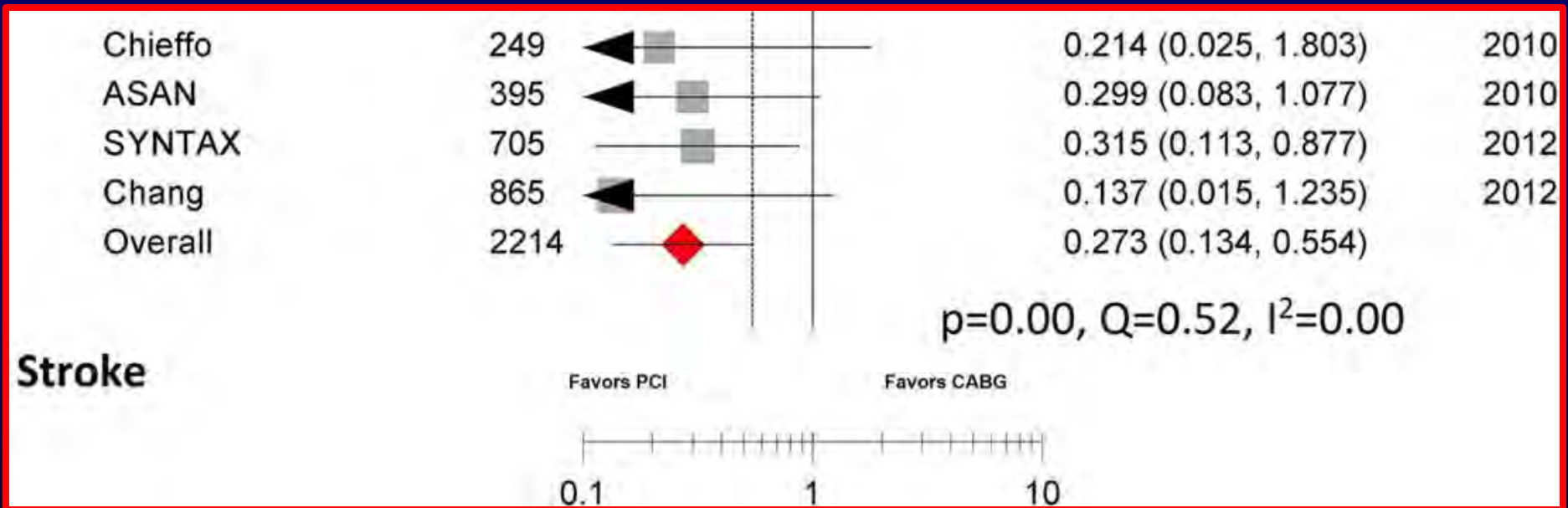
Number at risk

PCI	49	39	31	22
CABG	145	123	104	96

# Left Main Coronary Artery Stenosis: A Meta-Analysis of Drug-Eluting Stents Versus Coronary Artery Bypass Grafting

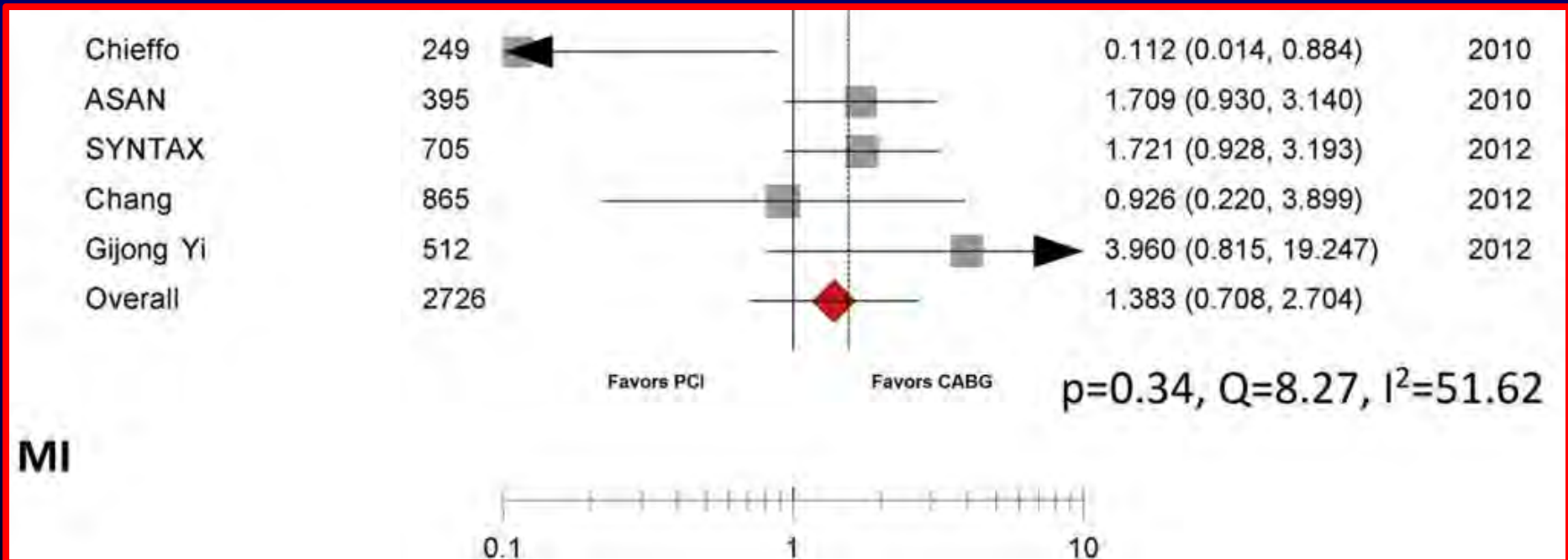


# Left Main Coronary Artery Stenosis: A Meta-Analysis of Drug-Eluting Stents Versus Coronary Artery Bypass Grafting

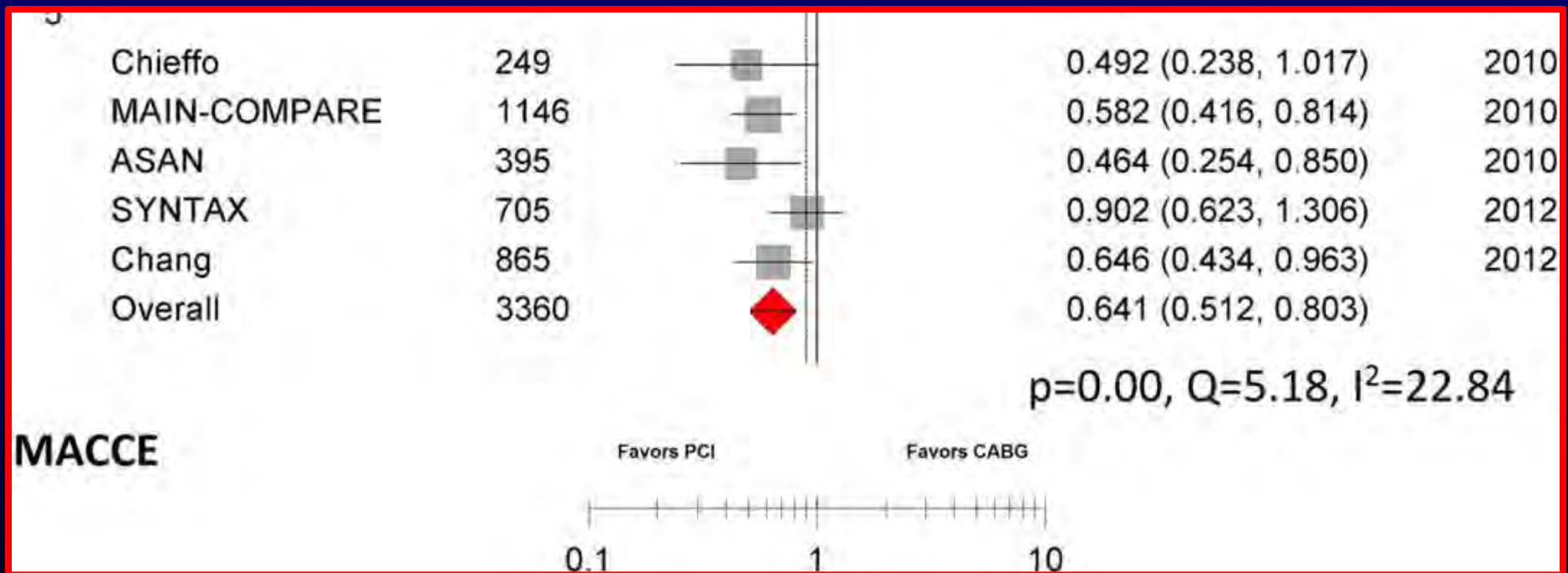




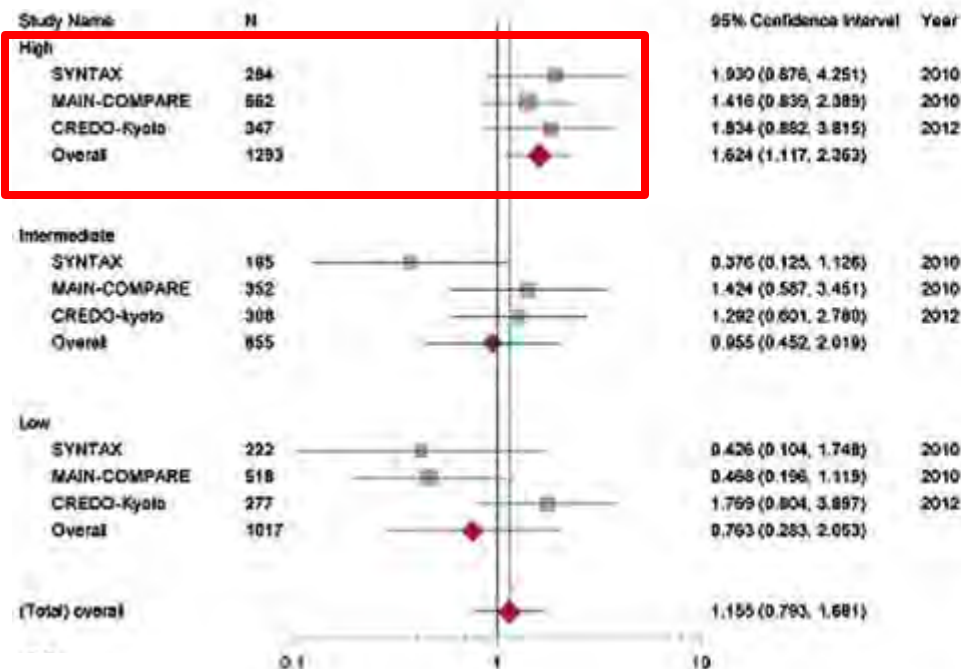
# Left Main Coronary Artery Stenosis: A Meta-Analysis of Drug-Eluting Stents Versus Coronary Artery Bypass Grafting



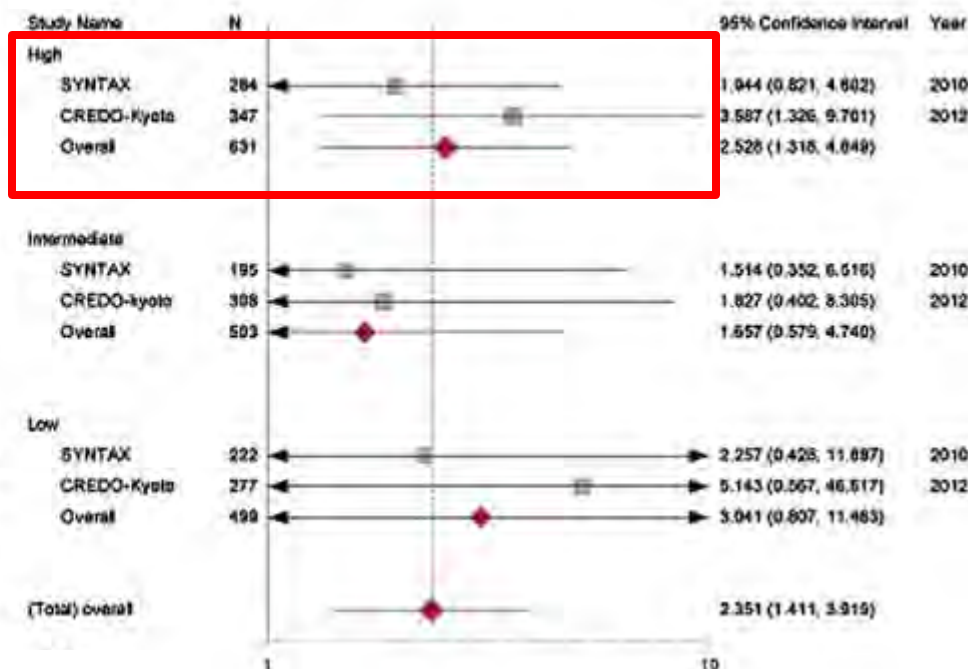
# Left Main Coronary Artery Stenosis: A Meta-Analysis of Drug-Eluting Stents Versus Coronary Artery Bypass Grafting



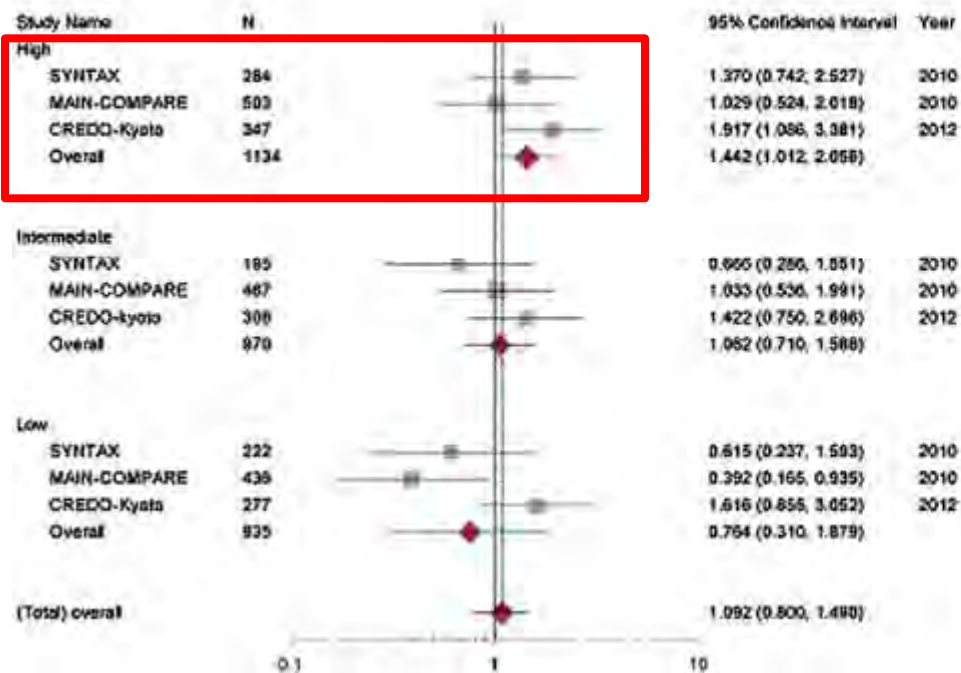
## Mortality



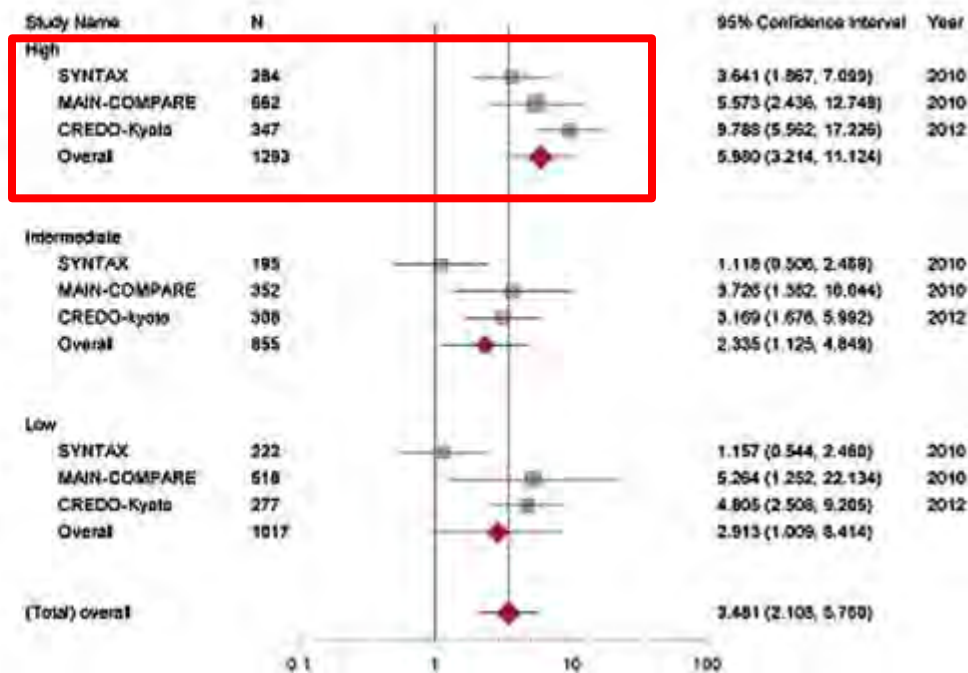
## MI



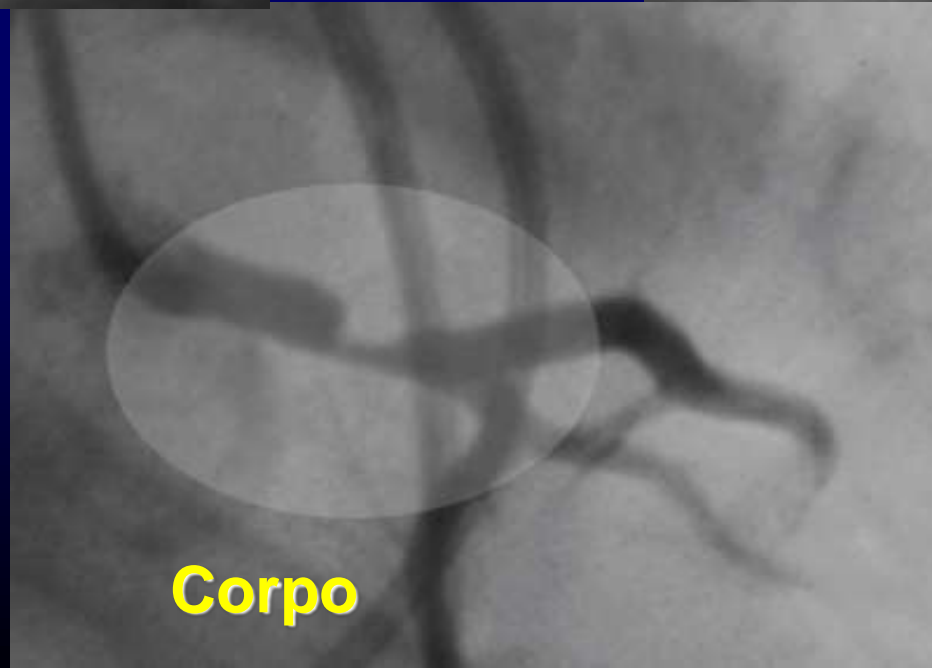
## MACCE



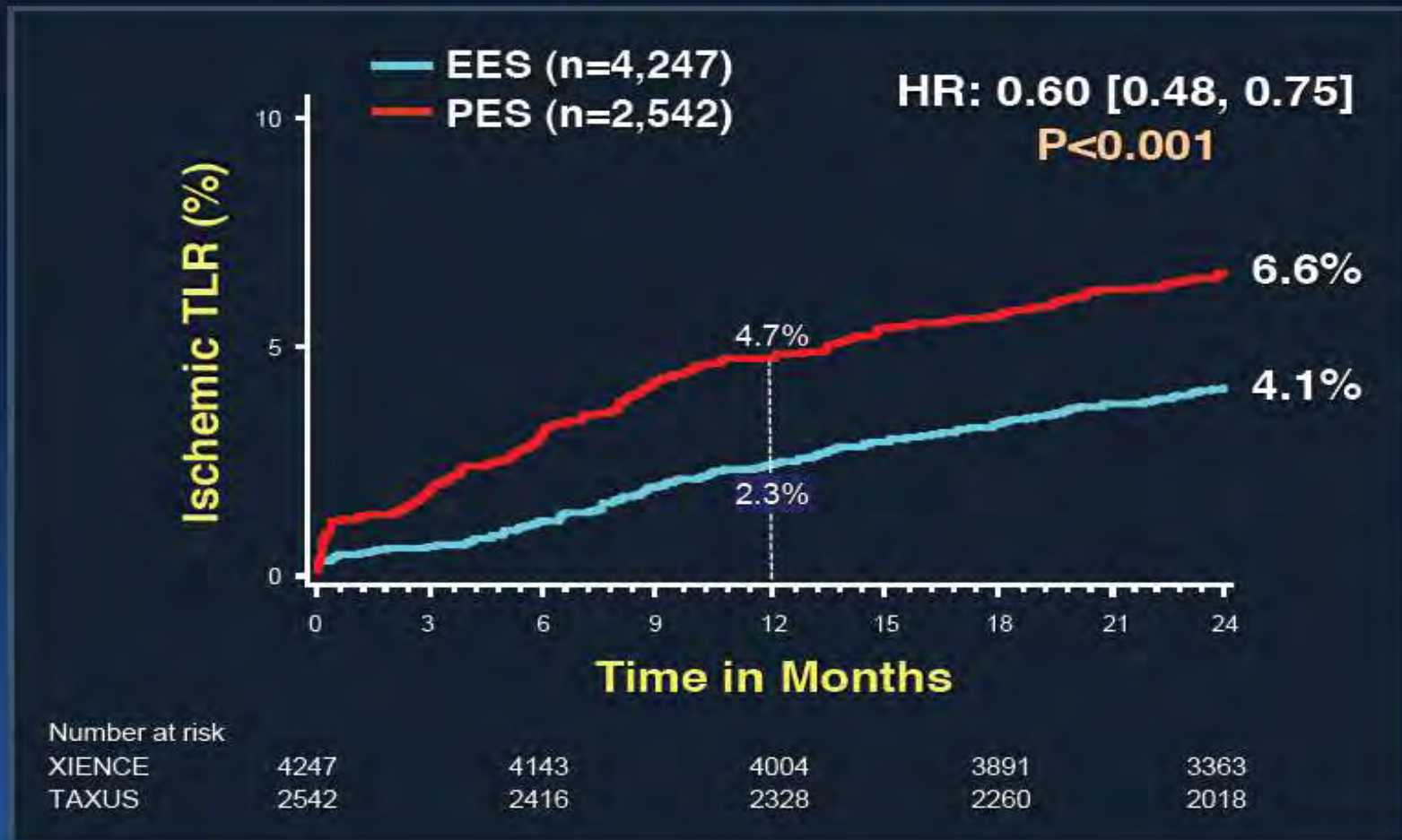
## TVR



# A Localização Faz a Diferença .....



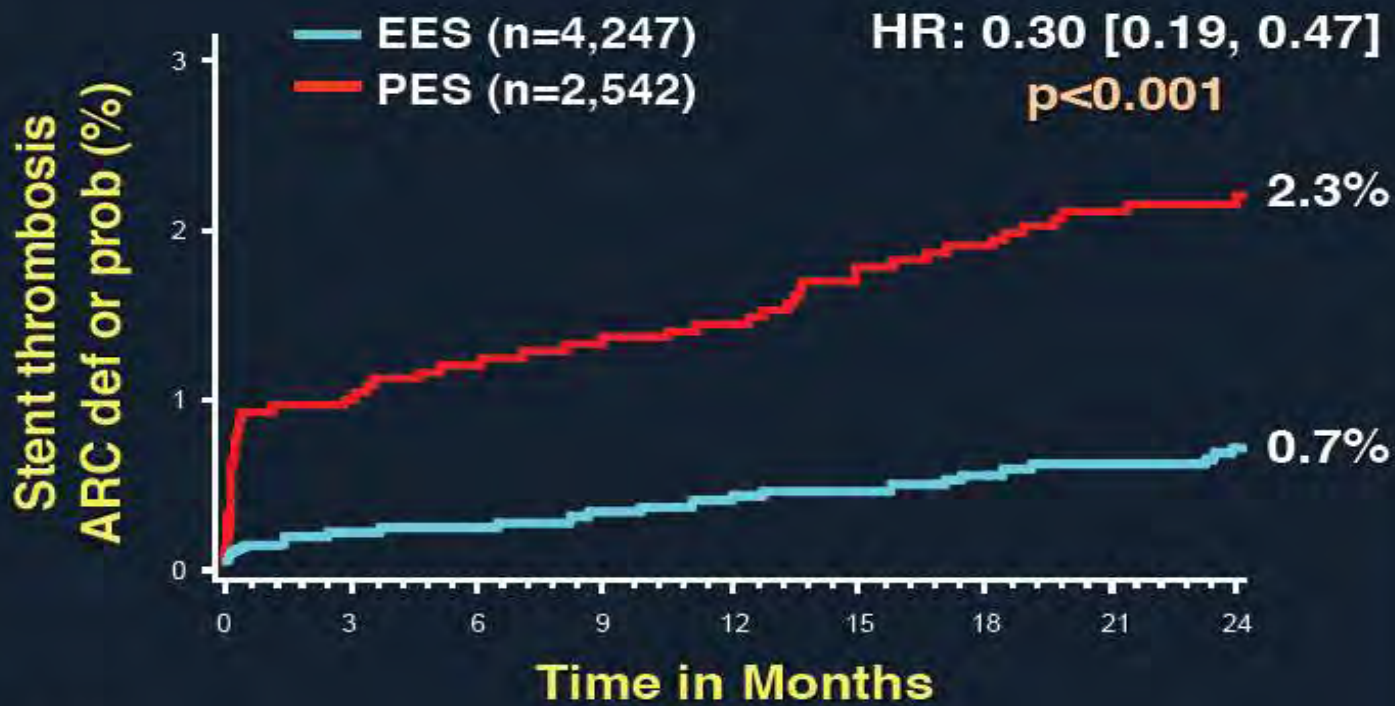
# SPIRIT II, III, IV and COMPARE trials Pooled database analysis (n=6,789) Ischemic TLR



# SPIRIT II, III, IV and COMPARE trials

## Pooled database analysis (n=6,789)

### Stent thrombosis (ARC definite/probable)



Number at risk	0	3	6	9	12	15	18	21	24
XIENCE	4247	4177	4082	3998	3479				
TAXUS	2542	2463	2408	2350	2110				

# EXCEL: Study Design

**4100 pts with left main disease**

@ 165 international sites

↓  
SYNTAX score  $\leq 32$

Consensus agreement by heart team

↓

**Yes**  
**(N=3100)**

→ **No**

**(N=1000)**

Enrollment  
registry

**R**

**PCI (Xience Prime)**  
**(N=1550)**

**CABG**  
**(N=1550)**

Clinical follow-up: 1 mo, 6 mo  
and yearly through 5 years



# 2014 ESC/EACTS Guidelines on myocardial revascularization

## The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Recommendation for the type of revascularization in patients with SCAD with suitable coronary anatomy for both procedures and low predicted surgical mortality

Recommendations according to extent of CAD	CABG		PCI	
	Class	Level	Class	Level
One or two-vessel disease without proximal LAD stenosis.	<b>IIb</b>	<b>C</b>	<b>I</b>	<b>C</b>
One-vessel disease with proximal LAD stenosis.	<b>I</b>	<b>A</b>	<b>I</b>	<b>A</b>
Two-vessel disease with proximal LAD stenosis.	<b>I</b>	<b>B</b>	<b>I</b>	<b>C</b>
Left main disease with a SYNTAX score 22.	<b>I</b>	<b>B</b>	<b>I</b>	<b>B</b>
Left main disease with a SYNTAX score 23–32.	<b>I</b>	<b>B</b>	<b>IIb</b>	<b>B</b>
Left main disease with a SYNTAX score >32.	<b>I</b>	<b>B</b>	<b>III</b>	<b>B</b>
Three-vessel disease with a SYNTAX score 22.	<b>I</b>	<b>A</b>	<b>I</b>	<b>B</b>
Three-vessel disease with a SYNTAX score 23–32.	<b>I</b>	<b>A</b>	<b>III</b>	<b>B</b>
Three-vessel disease with a SYNTAX score >32.	<b>I</b>	<b>A</b>	<b>III</b>	<b>B</b>



# As Evidências Atuais Indicam que a ICP com SF é Uma Alternativa Segura e Eficaz para Tratamento das Lesões em Tronco Não Protegido

- Intervencionista experiente e com excelência de resultados;
- Aspectos técnicos:
  - Utilizar stents farmacológicos de 2<sup>a</sup> ou 3<sup>a</sup> geração
  - Evitar duplo stent
  - Uso do IVUS
  - Novos antiplaquetários em pacientes de alto risco
- Pacientes elegíveis para cirurgia e com baixa/moderada complexidade anatômica (SYNTAX score < 32);
- Pacientes com SYNTAX score alto (>32) e com alto risco cirúrgico (EuroScore/ STS) ou não elegíveis para cirurgia.



**Michael Mack**  
**Cardiovascular Surgeon**



Despite his distinguished career as a surgeon, Kirklin recognized the limitations of his specialty. He is cited in numerous reference sources for the following quotes:

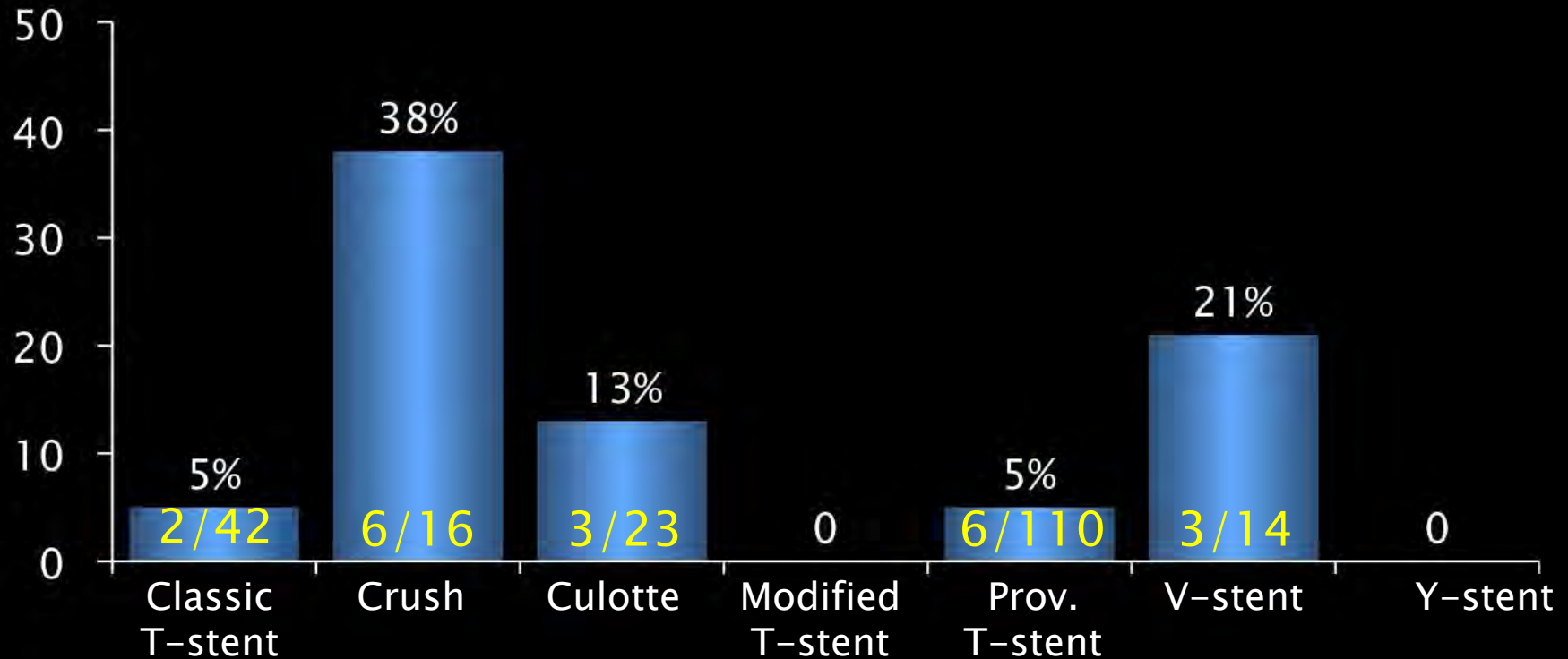
**"Surgery is always second best. If you can do something else, it's better."**



Dr. John Kirklin, developer of the heart-lung machine, dead at the age of 86.

# Baseline LM Bifurcation Stenting Techniques Requiring Re-treatment

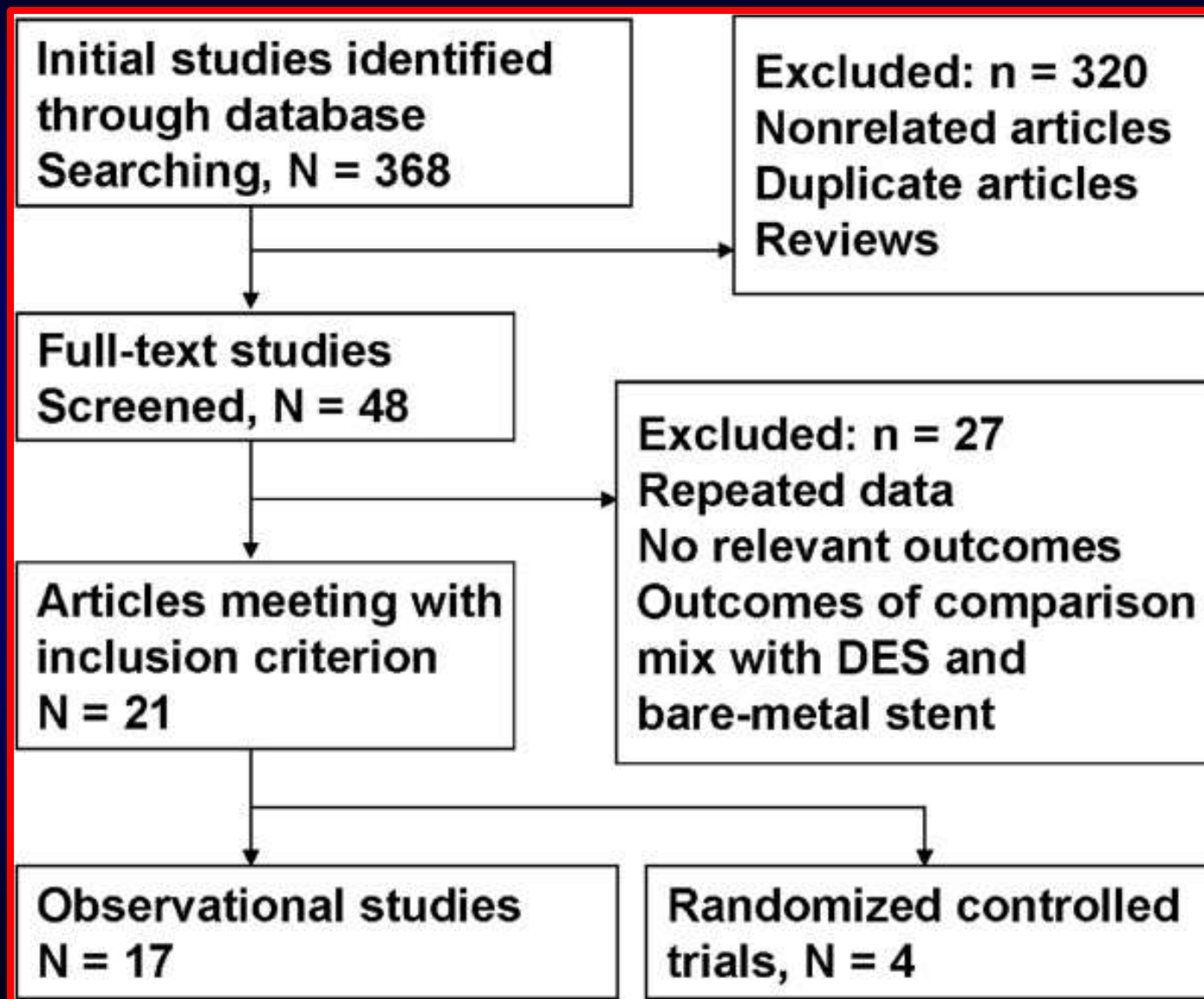
*LM Distal PCI (n=20 lesions)*



→ 5/20 (25%) lesions originally treated with 1 stent  
15/20 (75%) originally treated with 2 or 3 stents

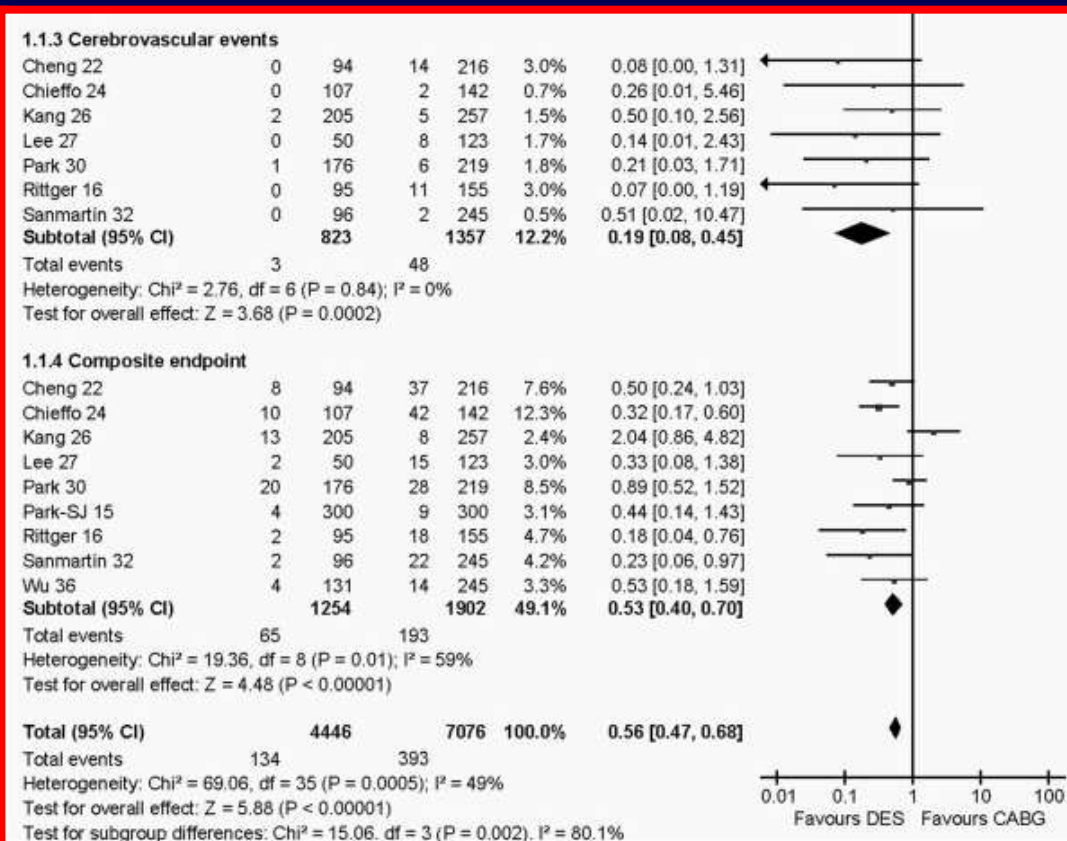
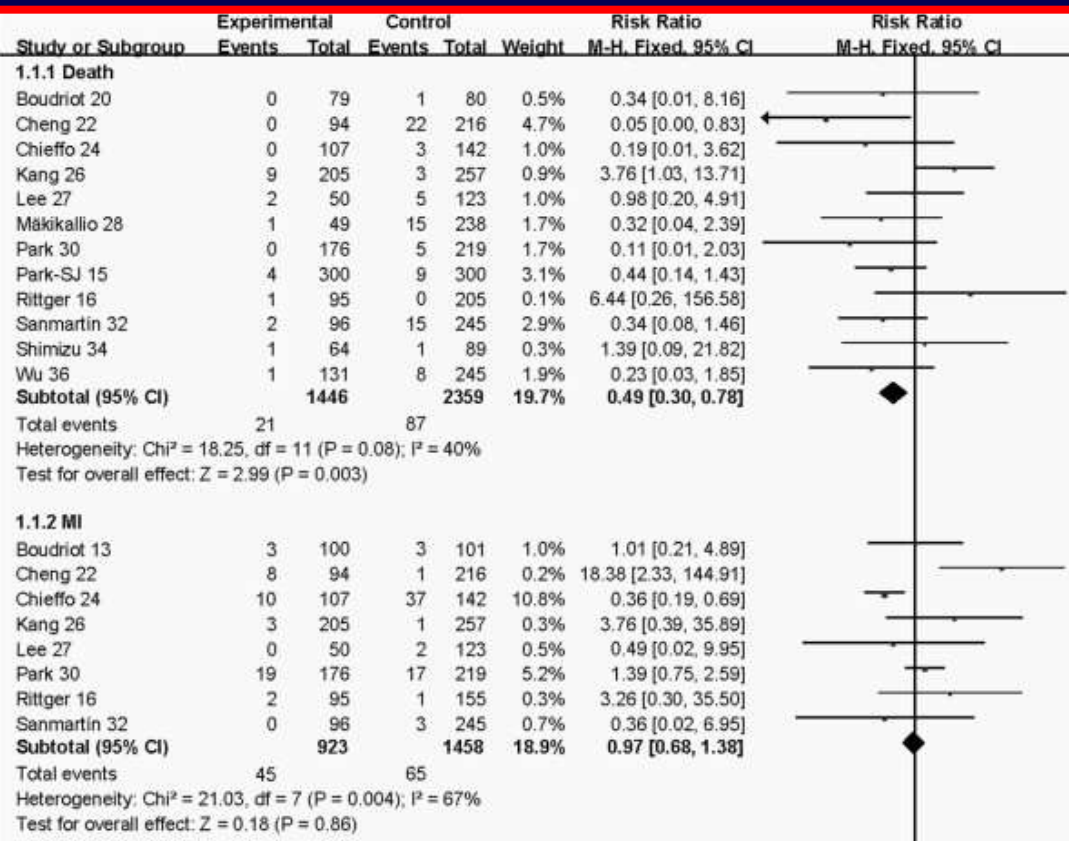
Bar graphs represent percent of baseline treated lesions

# Meta-Analysis DES vs CABG in LM



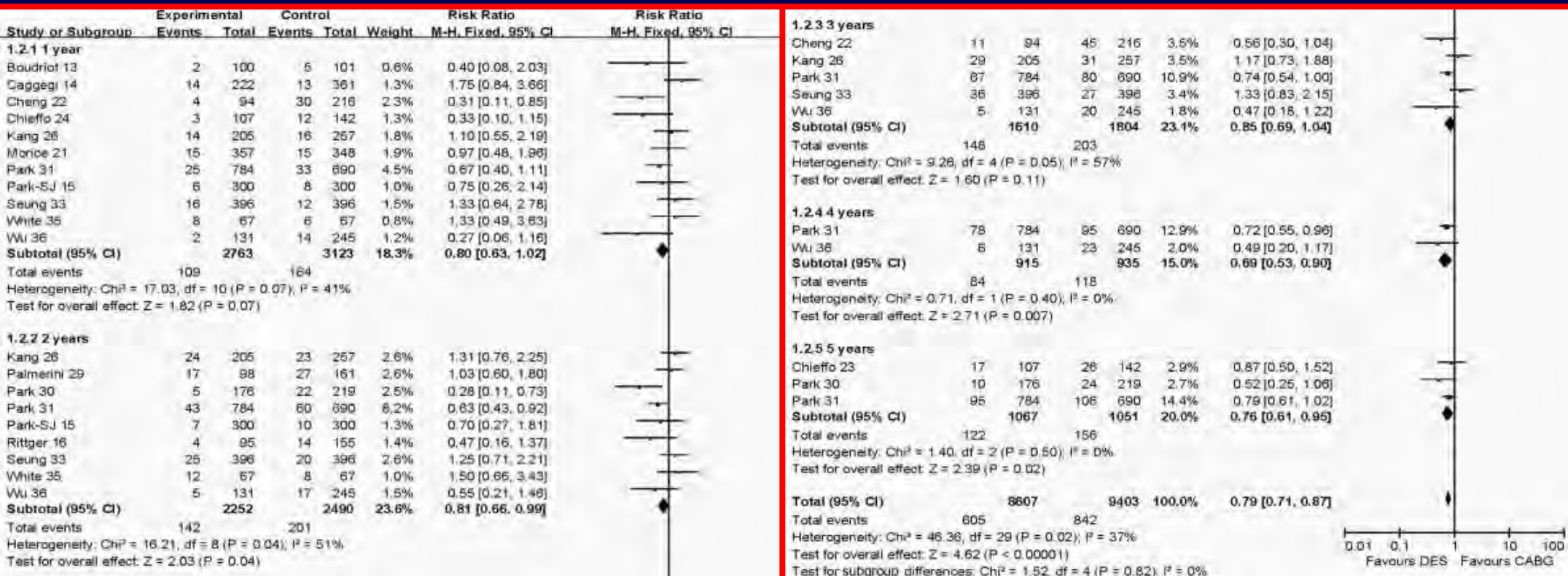
# Meta-Analysis DES vs CABG in LM

## Early outcomes (< 30 days)



# Meta-Analysis DES vs CABG in LM

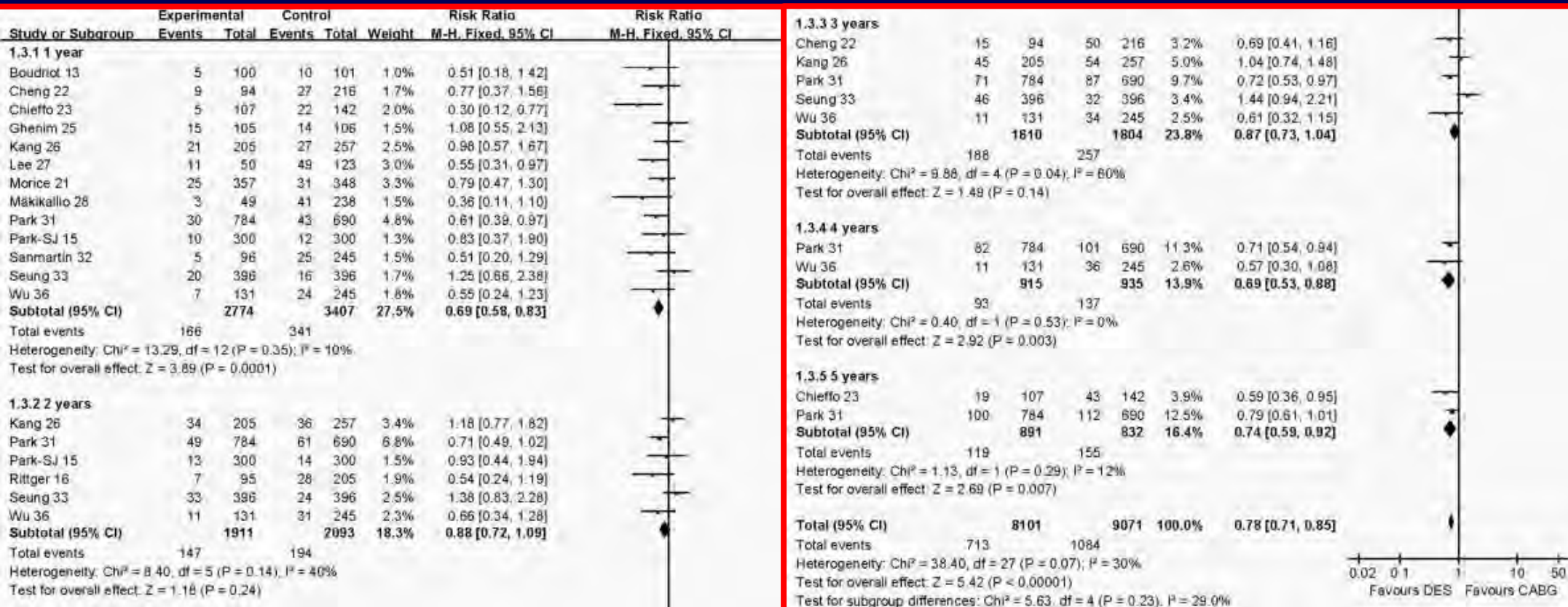
## Death (up to 5 years)





# Meta-Analysis DES vs CABG in LM

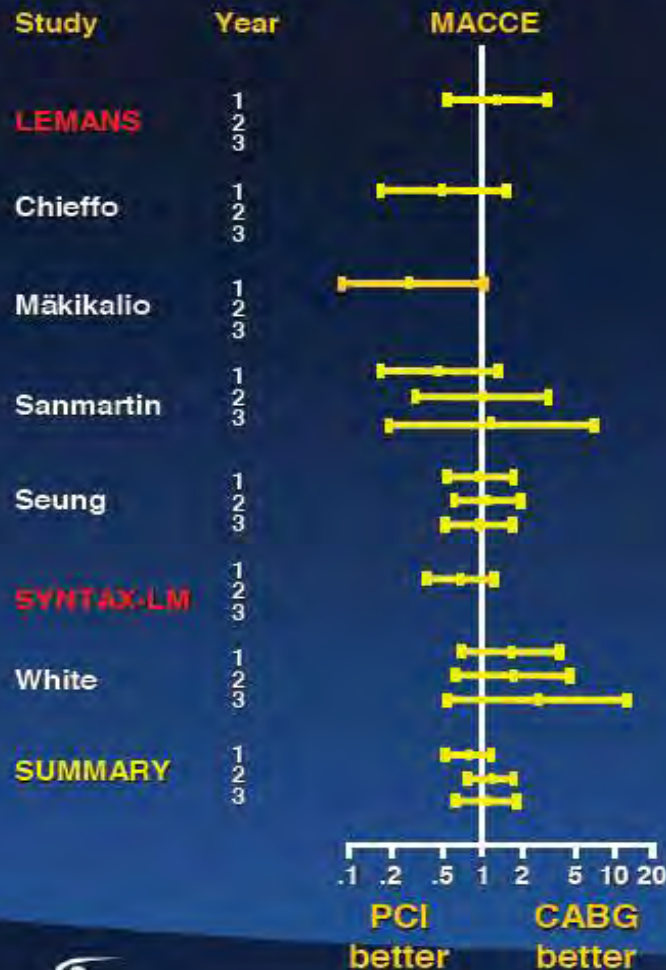
## Death, MI, CVA (up to 5 years)



# Meta-analysis of PCI vs. CABG for LM Ds.

**10 studies** (2 RCTs, 8 observational [7 matched or adjusted])

**N=3,773 pts** (2,114 CABG and 1,659 PCI [78.7% DES])



## OR [95%CI] for D/CVA/MI at each year

	Year 1	Year 2	Year 3
<b>Random effects</b>	0.84 [0.57-1.22]	1.25 [0.81-1.94]	1.16 [0.68-1.98]
<b>Fixed effects</b>	0.82 [0.62-1.09]	1.25 [0.81-1.94]	1.16 [0.68-1.96]
<b>Heterogeneity</b>	P=0.18	P=0.70	P=0.48

Year 1: 1,239 PCI pts and 1,614 CABG pts;  
 Year 2: 432 PCI pts and 652 CABG pts;  
 Year 3: 236 PCI pts and 451 CABG pts.



# 5-Year Outcomes Following Percutaneous Coronary Intervention With Drug-Eluting Stent Implantation Versus Coronary Artery Bypass Graft for Unprotected Left Main Coronary Artery Lesions

## The Milan Experience

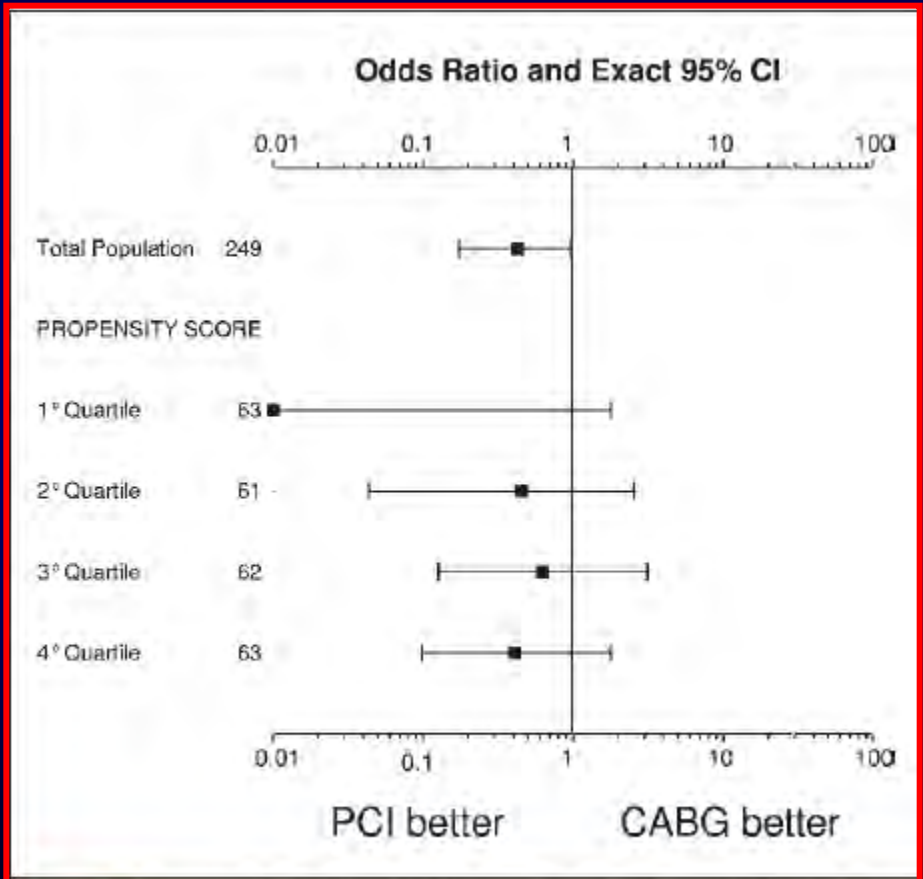


Figure 1. Composite End Point of Cardiac Death, MI, and CVA at 5 Years

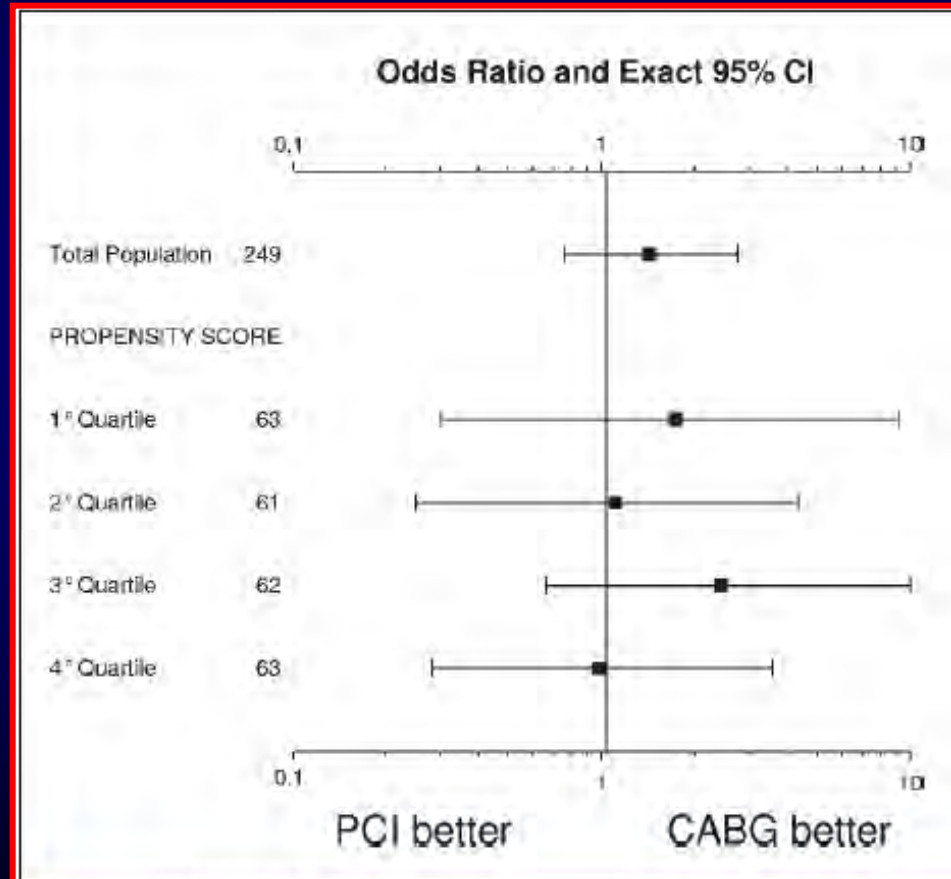
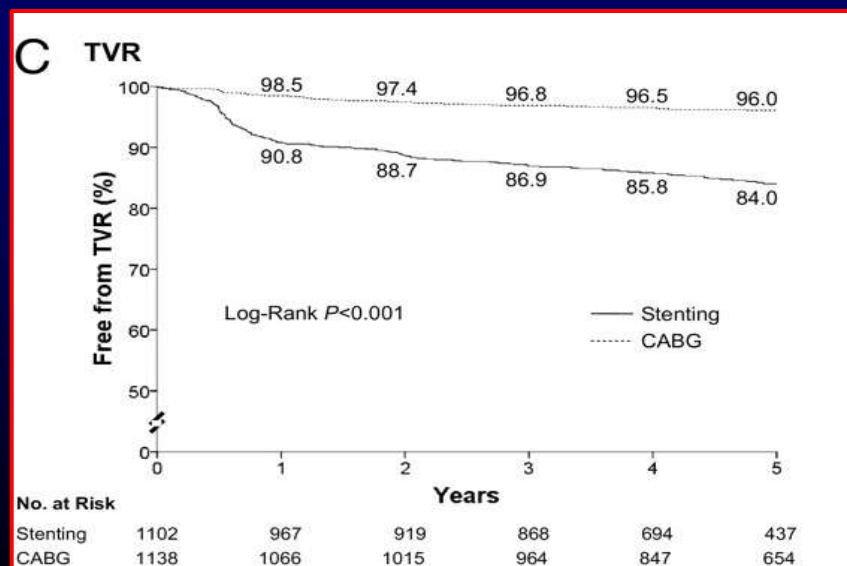
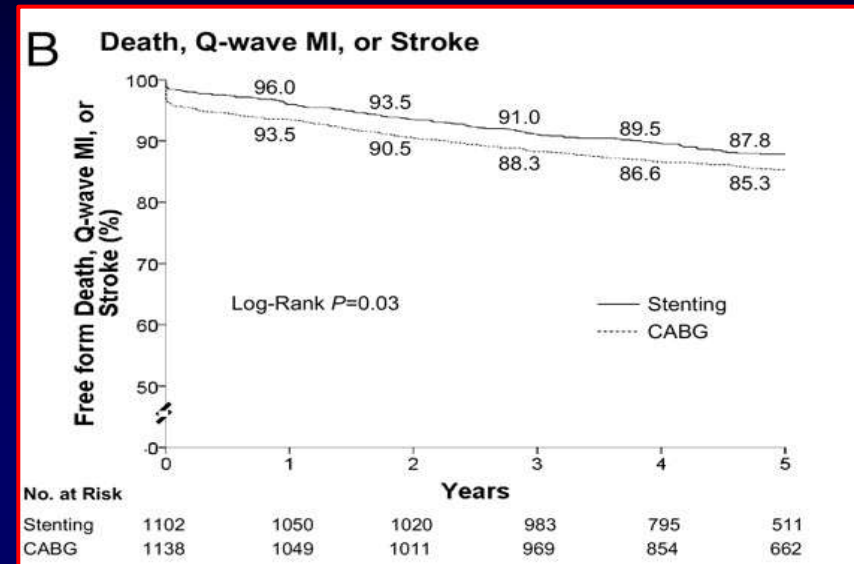
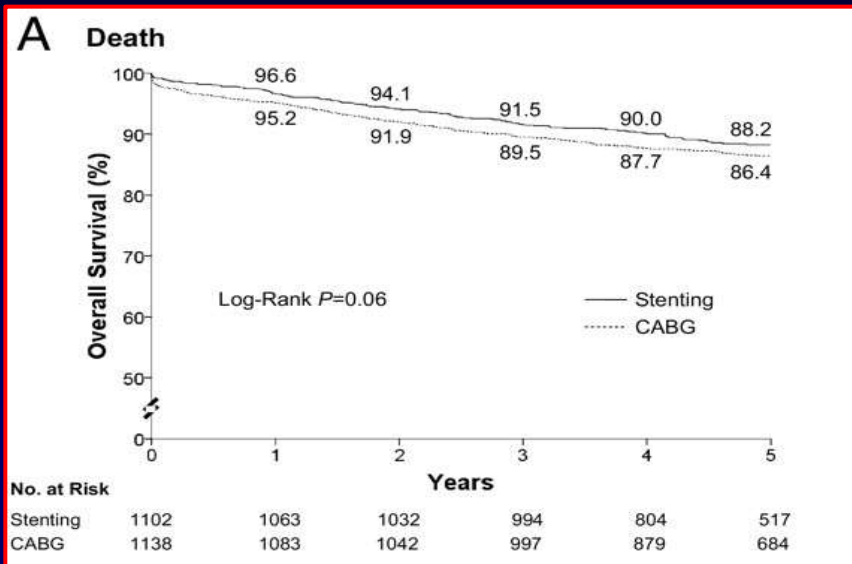


Figure 2. MACCE at 5 Years

# 5-Year Results From the MAIN-COMPARE (Revascularization for Unprotected Left Main Coronary Artery Stenosis: Comparison of Percutaneous Coronary Angioplasty Versus Surgical Revascularization) Registry



# Contemporary Trials of LM CABG vs PCI

## *Superior Treatment Modality for Outcomes*

Trial*	N	Death	MI	Stroke	Revasc	
Sanmartin 2007	341	ND	ND		CABG better	
MAIN-COMPARE 2008	1102			n/a		
LEMANS 2008	105					
Palmerini 2006	311					
Chieffo 2006	249		PCI better	PCI better		
Lee 2006	173		ND		ND	
Brener 2008	287					
Makikallio 2008	287		n/a	n/a	n/a	
White 2008	343					

\*Studies with >100 patients per arm reported 2000-2008  
 ND=no difference; n/a=not available/not reported

# Patient Characteristics

## *LM Subset*

SYNTAX)

	CABG N=348	TAXUS N=357	P value
Age*, mean $\pm$ SD (y)	65.6 $\pm$ 10.1	65.4 $\pm$ 9.8	0.78
Medically treated diabetes*, %	22.4	21.8	0.86
BMI, mean $\pm$ SD	27.7 $\pm$ 5.0	28.2 $\pm$ 4.9	0.24
Additive euroSCORE*, mean $\pm$ SD	3.9 $\pm$ 2.9	3.9 $\pm$ 2.8	0.91
Total Parsonnet score*, mean $\pm$ SD	9.1 $\pm$ 7.4	8.9 $\pm$ 7.8	0.77
Total SYNTAX Score, mean $\pm$ SD	26.7 $\pm$ 11.5	28.1 $\pm$ 12.4	0.13
No. lesions, mean $\pm$ SD	3.2 $\pm$ 1.9	3.3 $\pm$ 1.8	0.89

Core laboratory reported unless \*Site-reported

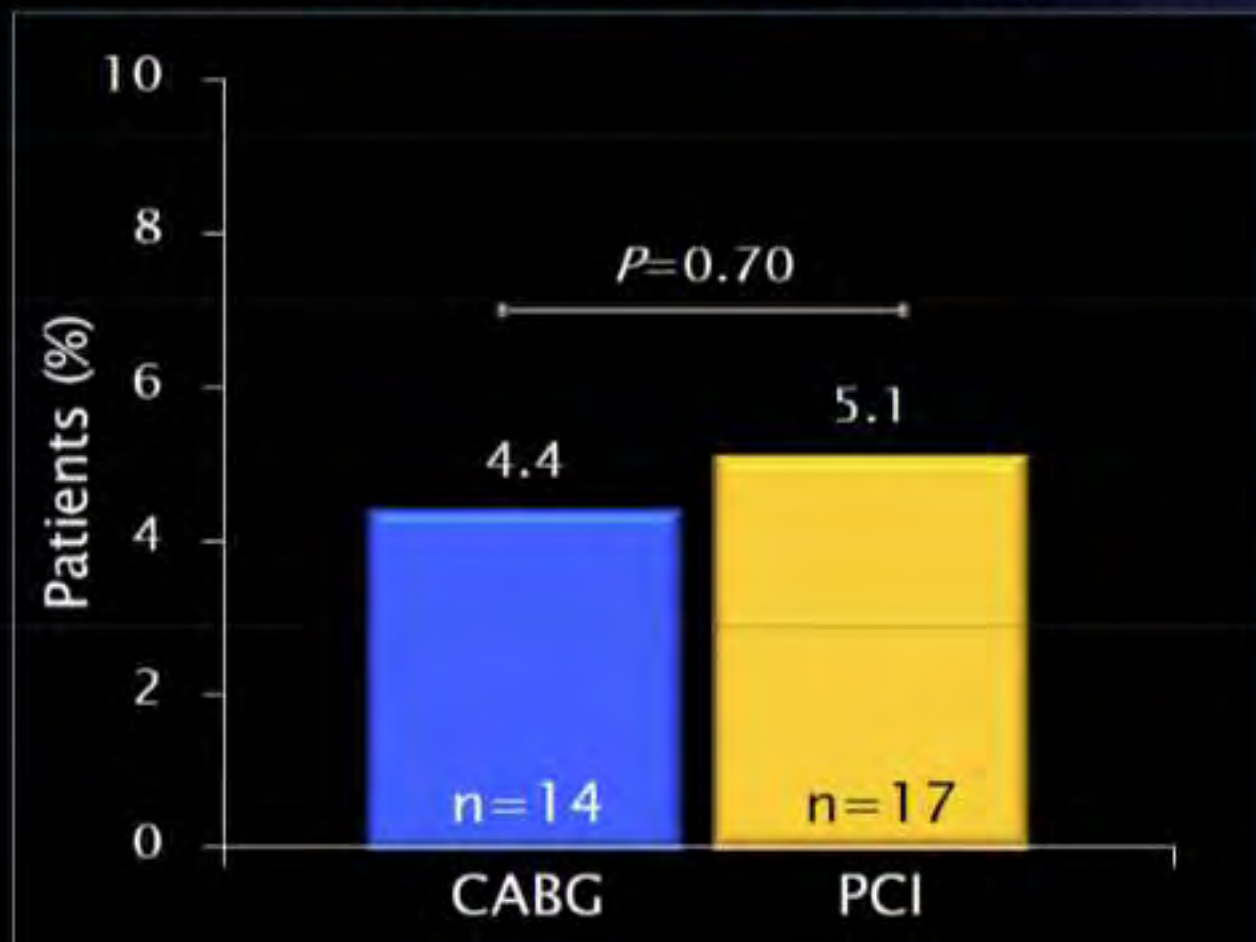
# Symptomatic Graft Occlusion & Stent Thrombosis to 5 Years

SYNTAX<sup>®</sup>

*LM Subset*

CABG (n=348)

TAXUS (n=357)



Post-procedure; ITT population

# Patient Disposition to 5 Years

## LM Subset Intent-to-Treat

SYNTAX





# Heterogeneity in the Left Main Group

