

Asian Pacific TCT



# Syntax – Data synthesis and Clinical Recommendations



Patrick W. Serruys MD PhD

Friedrich W. Mohr MD

Yoshinobu Onuma MD

On behalf of the SYNTAX investigators

12:35–13:05, 2009

Symposium Arena, Level 3, Asian Pacific TCT

# Background



- At the time of the trial design (in 2003–2004), a retrospective website survey of 104 medical centers over a period of 3 months, showed that 12,072 patients (1 / 3 LM, 2 / 3 3VD) were revascularized by surgery (2 / 3) or by PCI (1 / 3).
- The SYNTAX randomized trial is an attempt to provide an evidence–base to determine whether this approach, which is already currently practiced, is valid.

# SYNTAX: *Intended All-Comers* Design with Nested Registries



- Intended all-comers study design *instead of* a highly selected patient population
- Consensus physician agreement (surgeon & cardiologist) *instead of* inclusion & exclusion criteria
- And, nested registries for CABG only and PCI only to define patient characteristics and outcomes of these two unique treatment options

# Patient Profiling



Local Heart team (surgeon & interventional cardiologist) assessed each patient in regards to:

- Patient's operative risk (EuroSCORE & Parsonnet score)
- Coronary lesion complexity (newly developed SYNTAX score)
- Goal: SYNTAX score to provide guidance on optimal revascularization strategies for patients with high-risk lesions



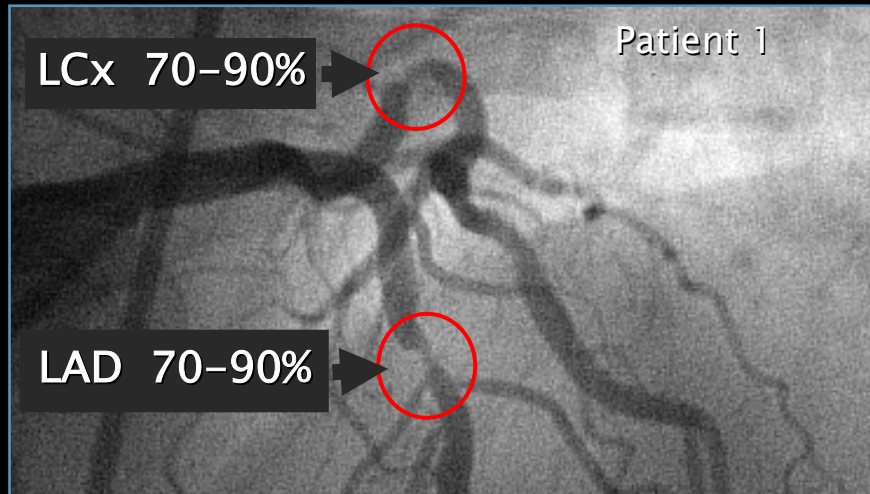
Sianos et al, EuroIntervention 2005;1:219-227  
Valgimigli et al, Am J Cardiol 2007;99:1072-1081  
Serruys et al, EuroIntervention 2007;3:450-459

BARI classification of coronary segments  
Leaman score, Circ 1981;63:285-299  
Lesions classification ACC/AHA, Circ 2001;103:3019-3041  
Bifurcation classification, CCI 2000;49:274-283  
CTO classification, J Am Coll Cardiol 1997;30:649-656

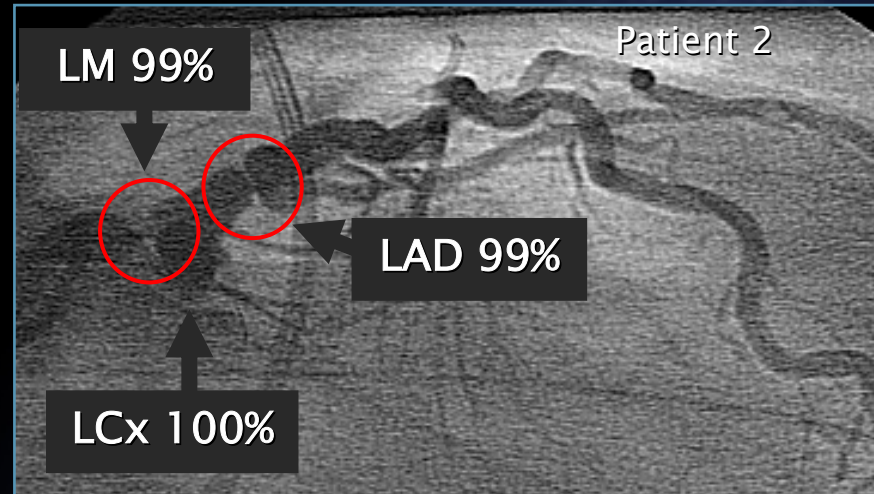


# There is '3-vessel disease' and '3-vessel disease'

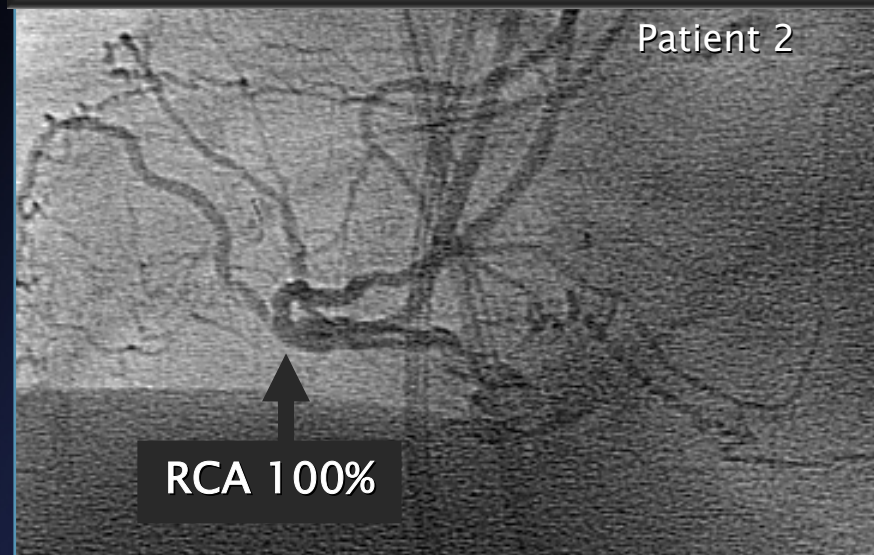
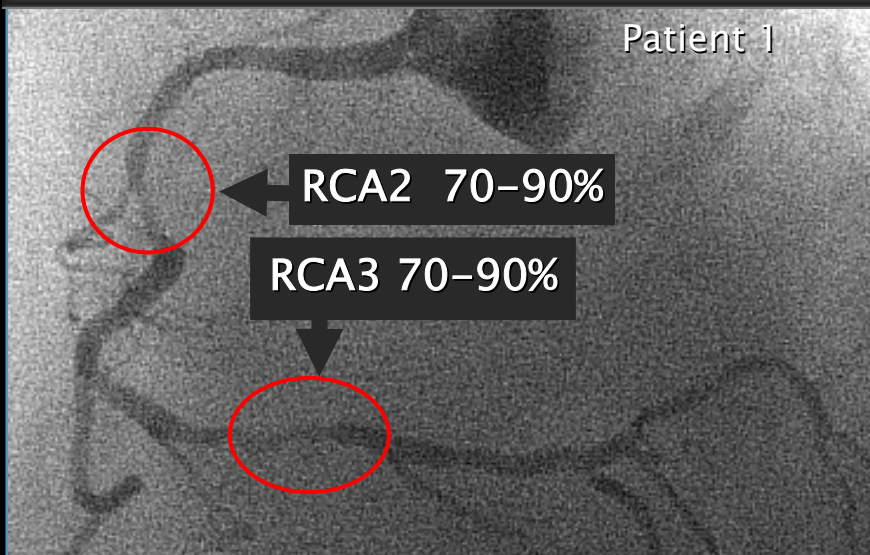
SYNTAX



SYNTAX SCORE 21



SYNTAX SCORE 55



# SYNTAX Trial Patient Distribution

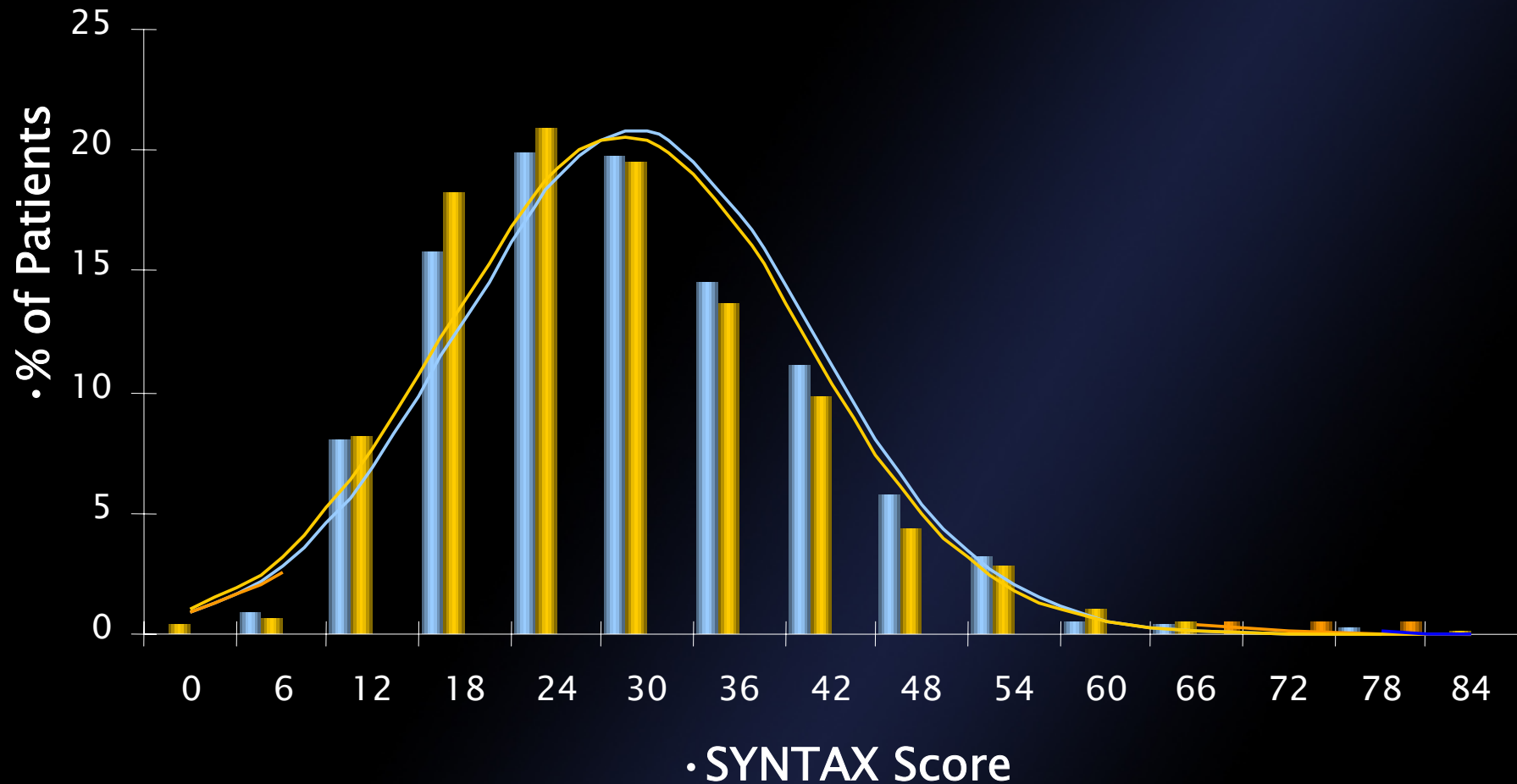


Enrolled  
SYNTAX  
trial patients  
(N=3075)

# SYNTAX Score Distribution by Cohort and Treatment Group



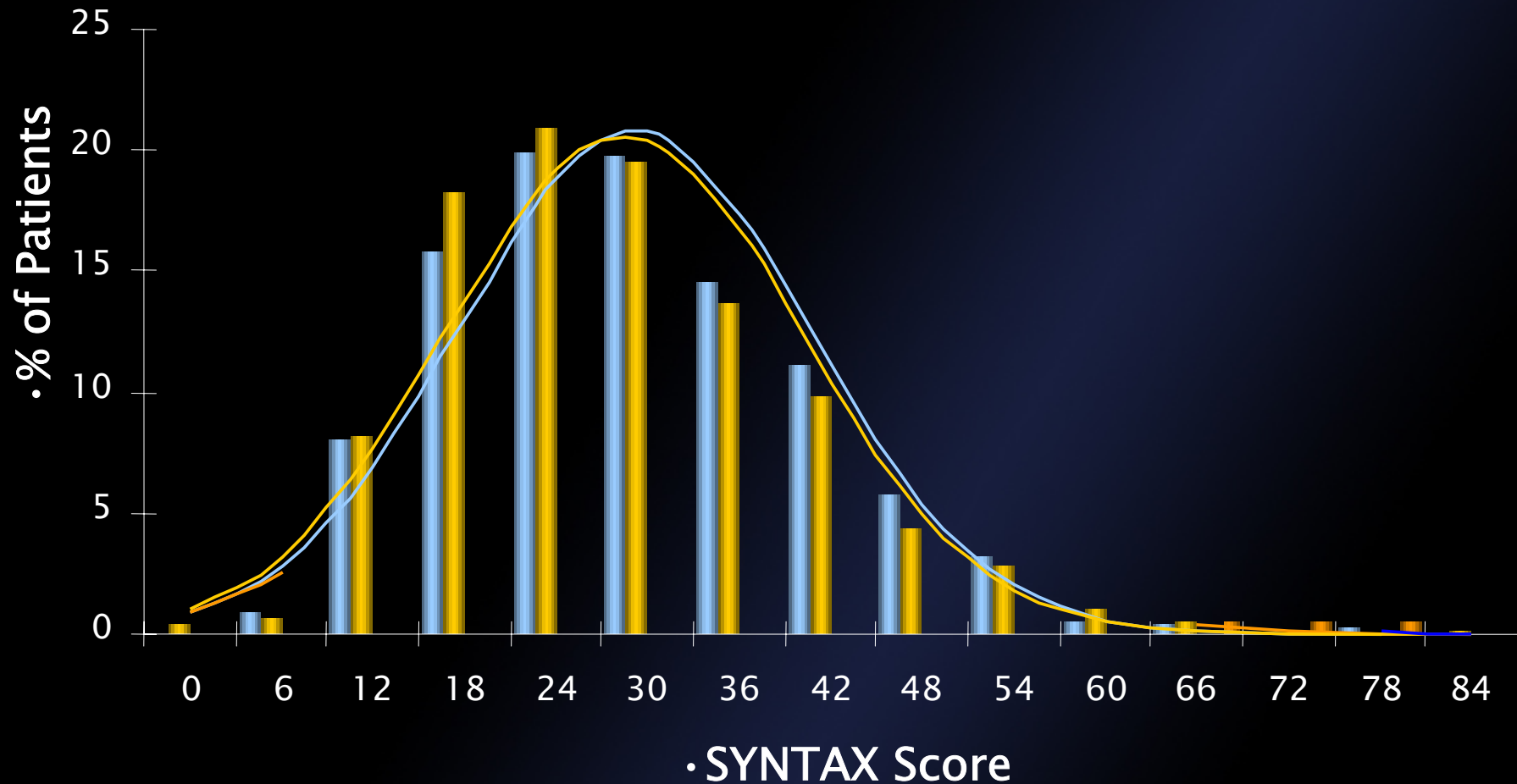
■ CABG RCT       $26.7 \pm 11.5$   
■ PCI RCT         $28.1 \pm 12.4$



# SYNTAX Score Distribution by Cohort and Treatment Group



**CABG RCT**       $26.7 \pm 11.5$   
**PCI RCT**         $28.1 \pm 12.4$

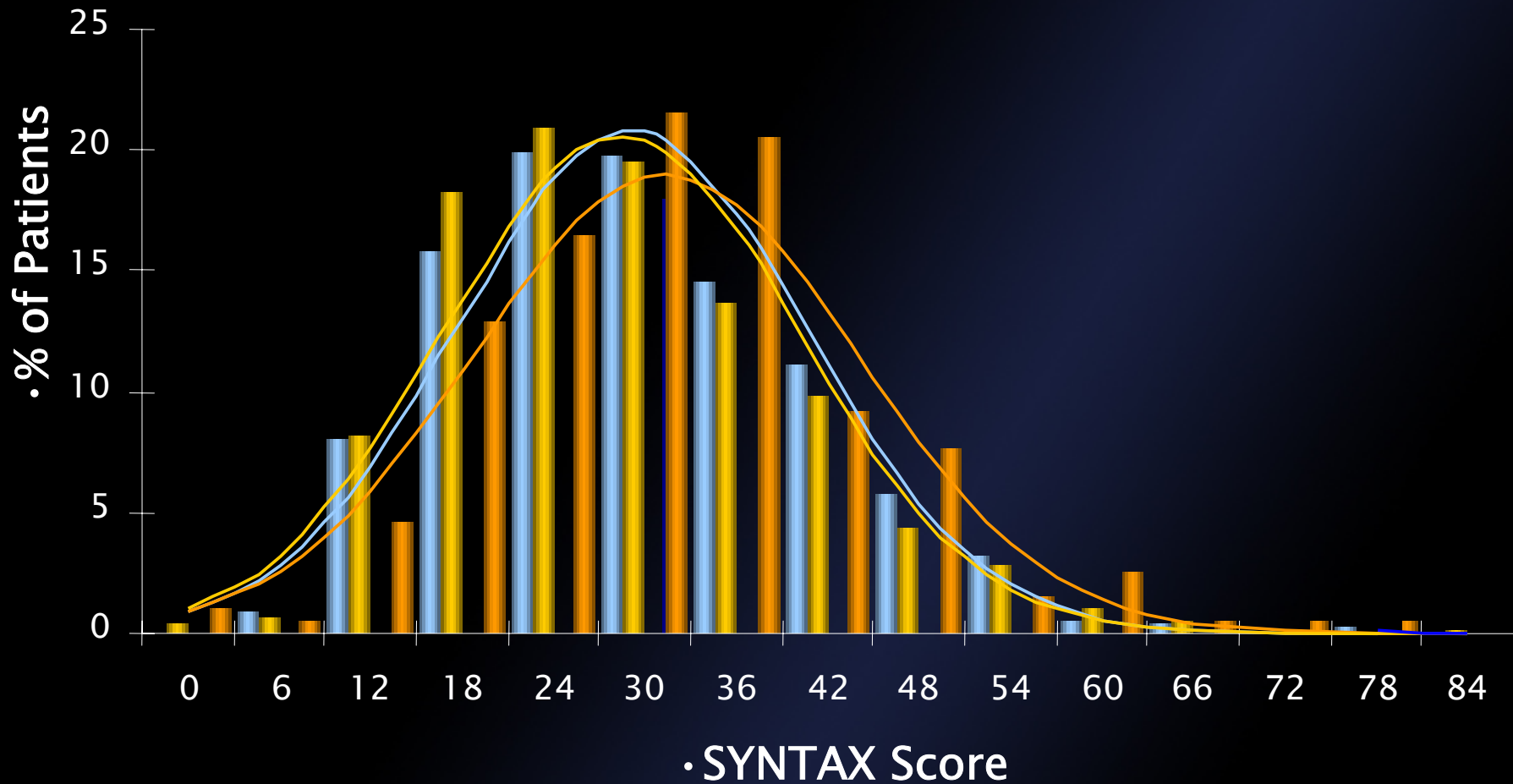




# SYNTAX Score Distribution by Cohort and Treatment Group



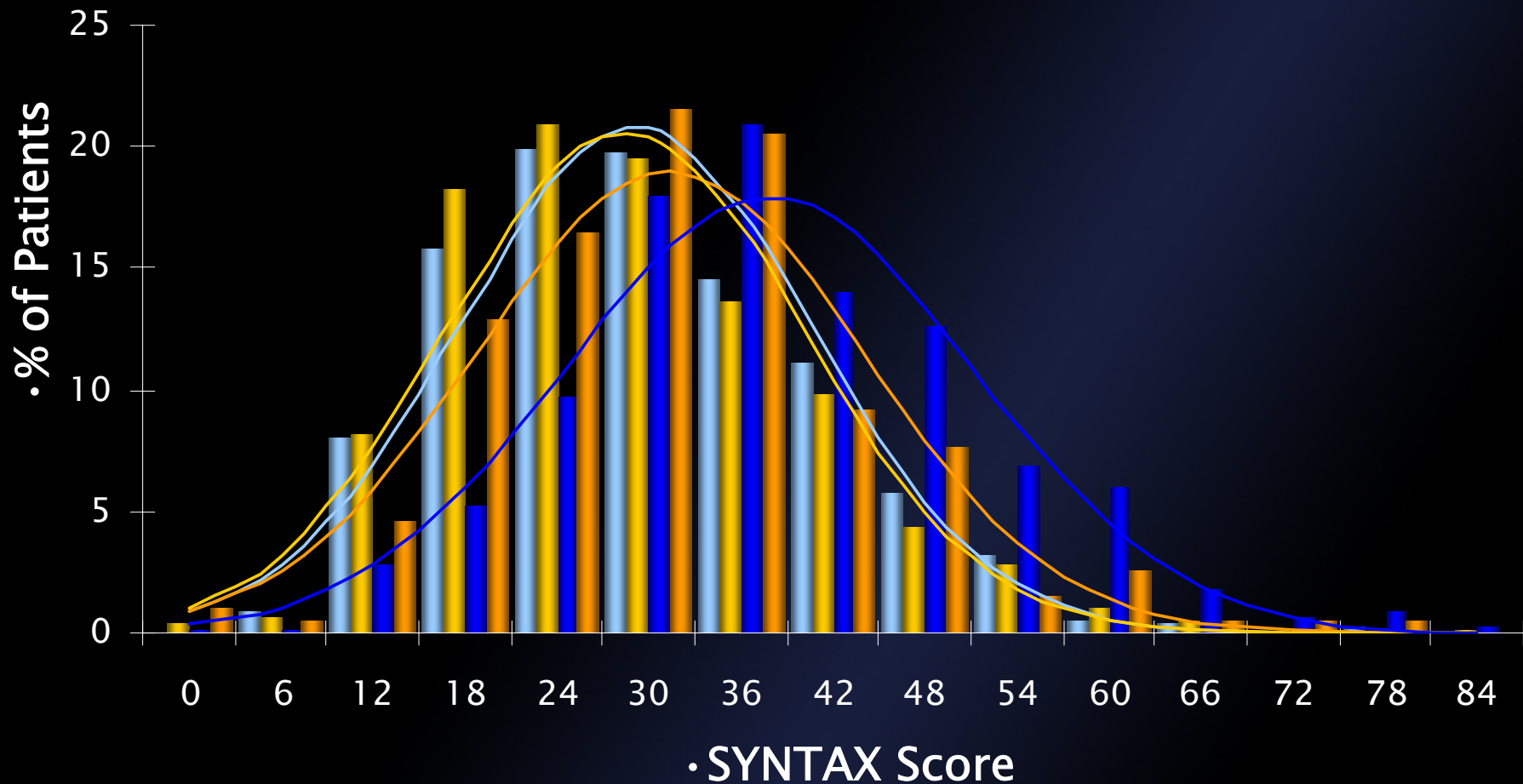
<span style="color: blue;">■</span> CABG RCT	$26.7 \pm 11.5$	<span style="color: orange;">■</span> PCI REGISTRY	$31.6 \pm 12.3$
<span style="color: yellow;">■</span> PCI RCT	$28.1 \pm 12.4$		



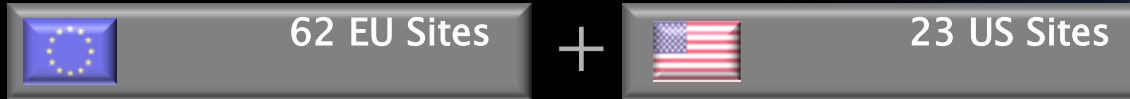
# SYNTAX Score Distribution by Cohort and Treatment Group



 CABG RCT	$26.7 \pm 11.5$	 CABG REGISTRY	$35.5 \pm 13.7$
 PCI RCT	$28.1 \pm 12.4$	 PCI REGISTRY	$31.6 \pm 12.3$



# SYNTAX Trial Design



Heart Team (surgeon & interventionalist)

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  
66.3%

LM  
33.7%

3VD  
65.4%

LM  
34.6%

\*Taxus Express

# Patient Characteristics (II)

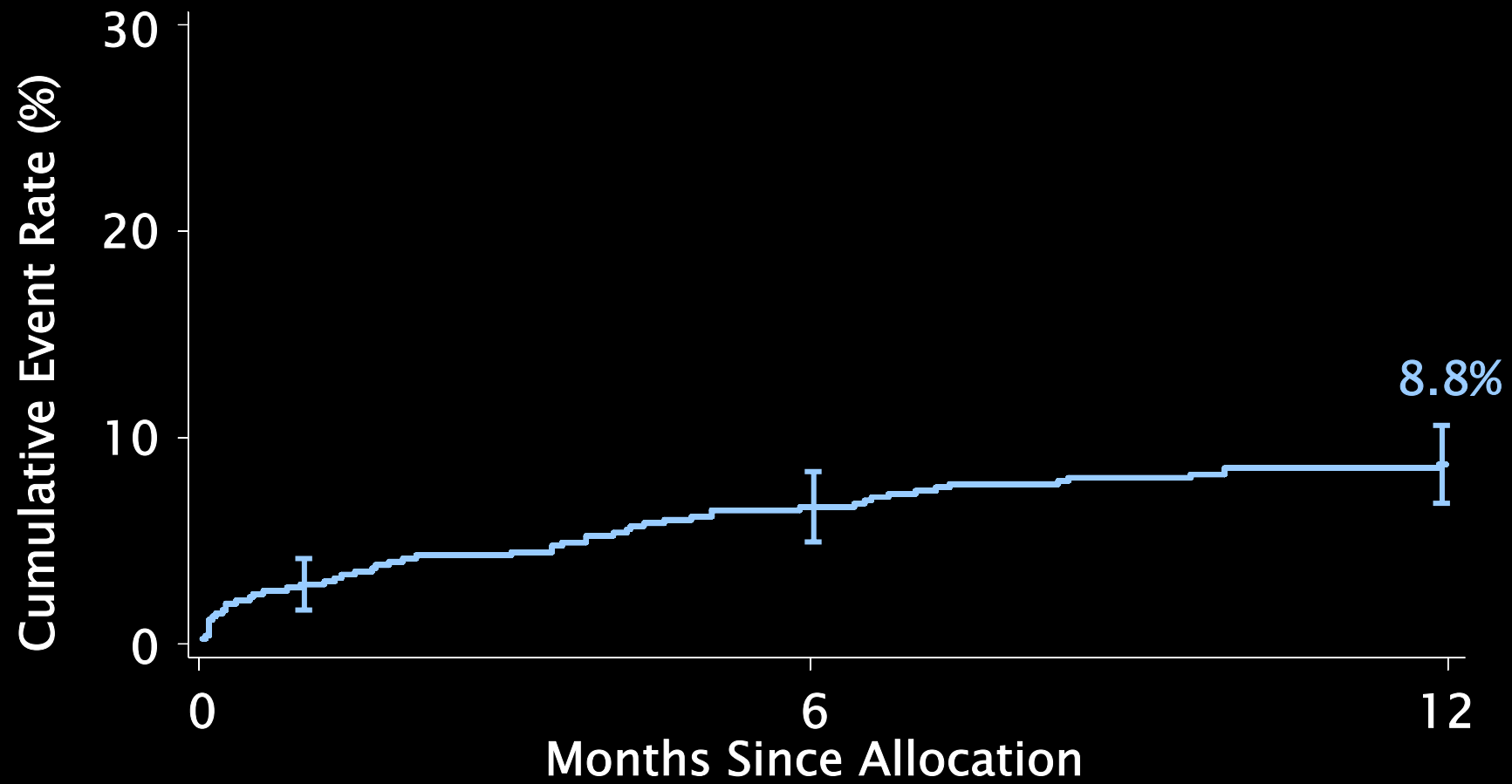
*Notable Differences CABG RCT + Registry*



<i>Patient-based</i>	CABG RCT* (n=897)	CABG Reg (n=644)
Total SYNTAX Score	24.8 ± 10.0	35.5 ± 13.7
Diffuse disease or small vessels, %	21.0	31.8
Number of lesions, mean ± SD	4.0 ± 1.7	4.8 ± 1.9
3VD only, %	61.2	52.5
Left main, any, %	38.8	47.5
Left Main only	5.5	1.6
Left Main + 1 vessel	7.9	5.4
Left Main + 2 vessel	11.8	10.4
Left Main + 3 vessel	13.6	30.1
Total occlusion, %	26.2	59.3
Bifurcation, %	64.5	64.6
Trifurcation, %	7.0	13.0

# Overall MACCE to 12 Months

## *CABG Registry*

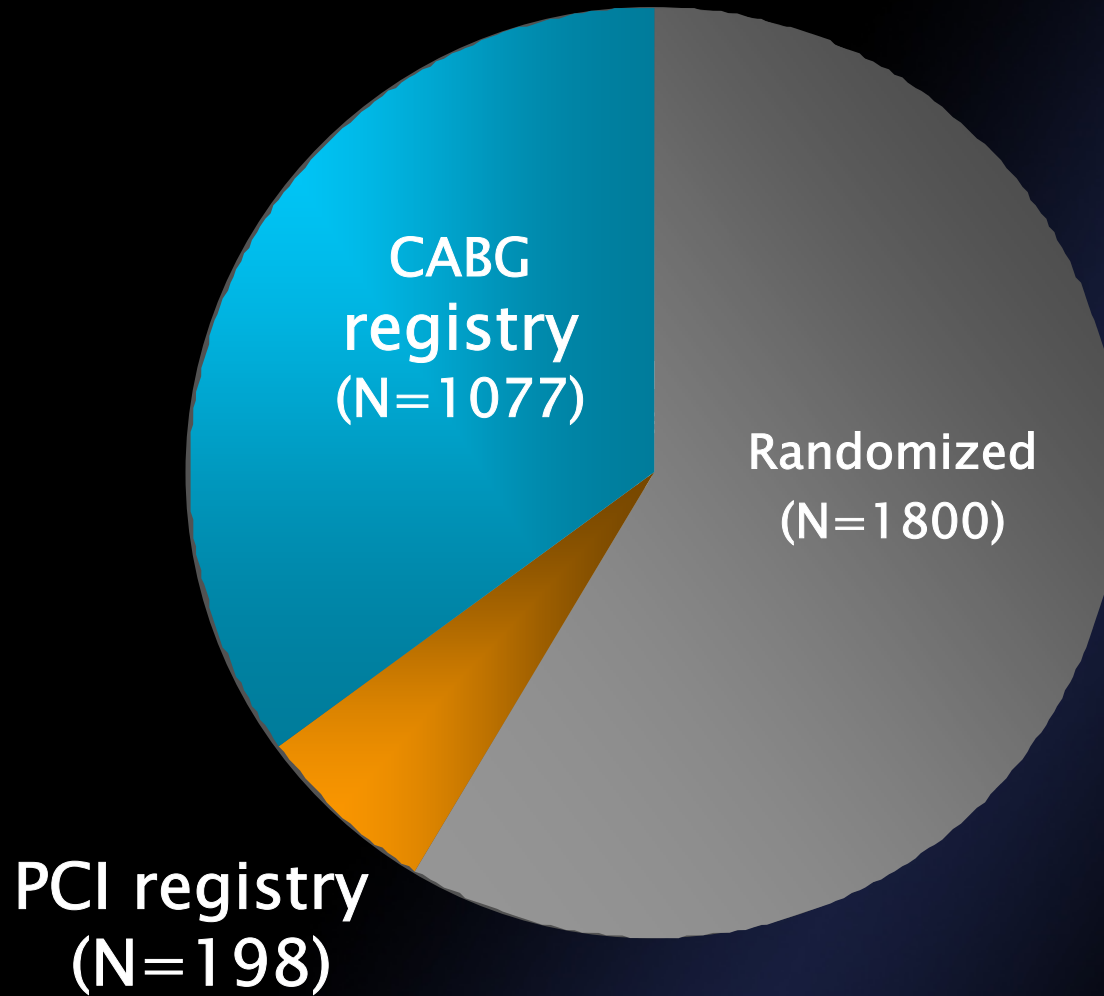


Event Rate  $\pm$  1.5 SE

Per-protocol population



# SYNTAX Trial Patient Distribution



# Patient Characteristics

## *Notable Differences PCI RCT + Registry*

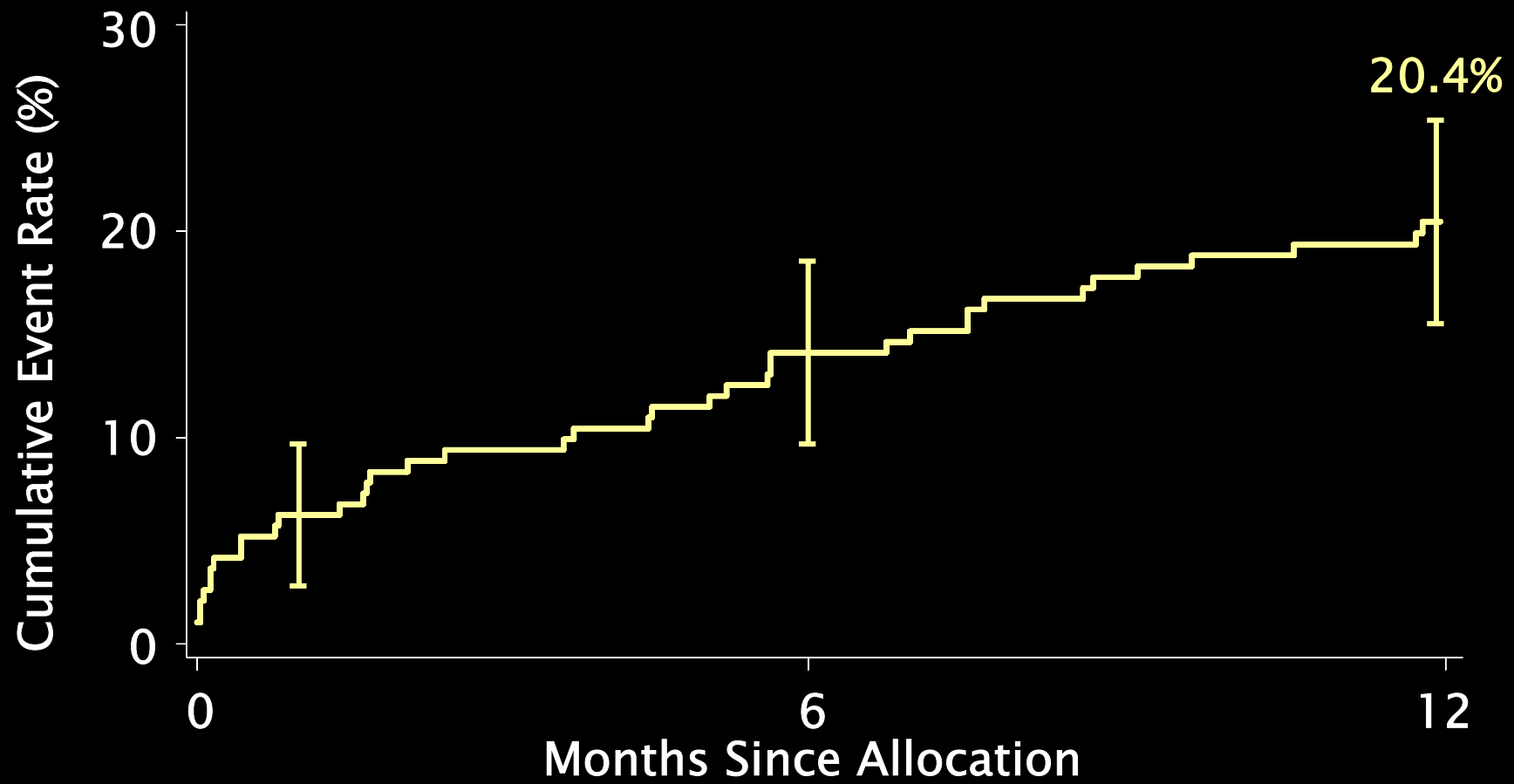


	<b>TAXUS RCT n=903</b>	<b>PCI Reg n=192</b>
Age, mean±SD (y)	65.2 ± 9.7	<b>71.2 ± 10</b>
Male, %	76.4	70.3
SYNTAX score	28.4 ± 11.5	<b>31.6 ± 12.3</b>
Diabetes, %	28.2	<b>35.4</b>
Hyperlipidemia, %	78.7	67.5
Current smoker, %	18.5	11.2
Prior MI, %	31.9	<b>40.4</b>
Unstable angina, %	28.9	<b>38.0</b>
Add. EuroSCORE, mean±SD	3.8 ± 2.6	<b>5.8 ± 3.1</b>
Total Parsonnet score, mean±SD	8.5 ± 7.0	<b>14.4 ± 9.5</b>

• \*For descriptive purposes only; no statistical comparisons done

# Overall MACCE to 12 Months

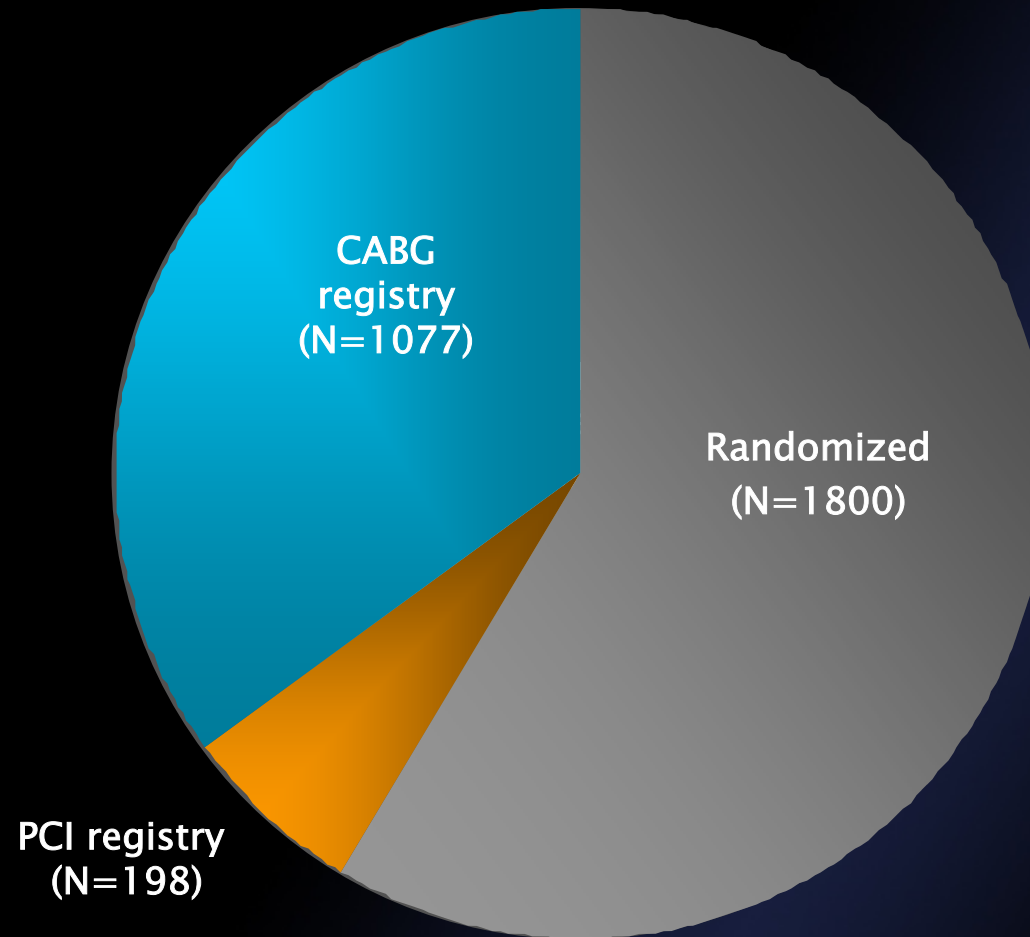
## *PCI Registry*



Event Rate  $\pm$  1.5 SE

Per-protocol population

# SYNTAX Trial Patient Distribution



# Patient Characteristics (II)

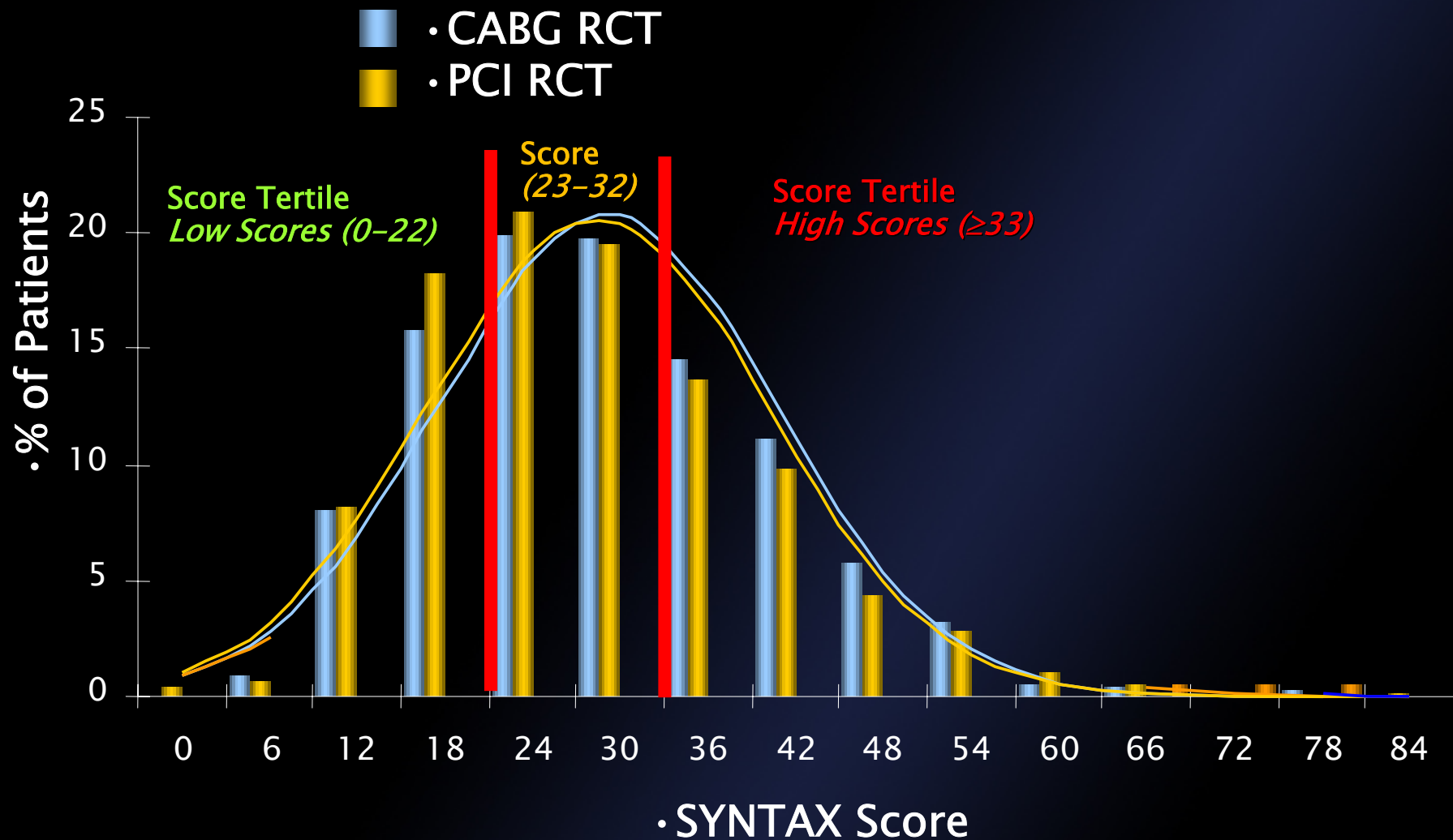
## Randomized Cohort



<i>Patient-based</i>	<b>CABG N=897</b>	<b>TAXUS N=903</b>	<i>P</i> value
Total SYNTAX Score	29.1 ± 11.4	28.4 ± 11.5	0.19
Diffuse disease or small vessels, %	10.7	11.3	0.69
No. lesions, mean ± SD	4.4 ± 1.8	4.3 ± 1.8	0.44
3VD only, %	66.3	65.4	0.70
Left main, any, %	33.7	34.6	0.70
Left Main only	3.1	3.8	0.46
Left Main + 1 vessel	5.1	5.4	0.78
Left Main + 2 vessel	12.0	11.5	0.72
Left Main + 3 vessel	13.5	13.9	0.78
Total occlusion, %	22.2	24.2	0.33
Bifurcation, %	73.3	72.4	0.67
Trifurcation, %	10.6	10.7	0.92



# SYNTAX Score Distribution by Cohort and Treatment Group

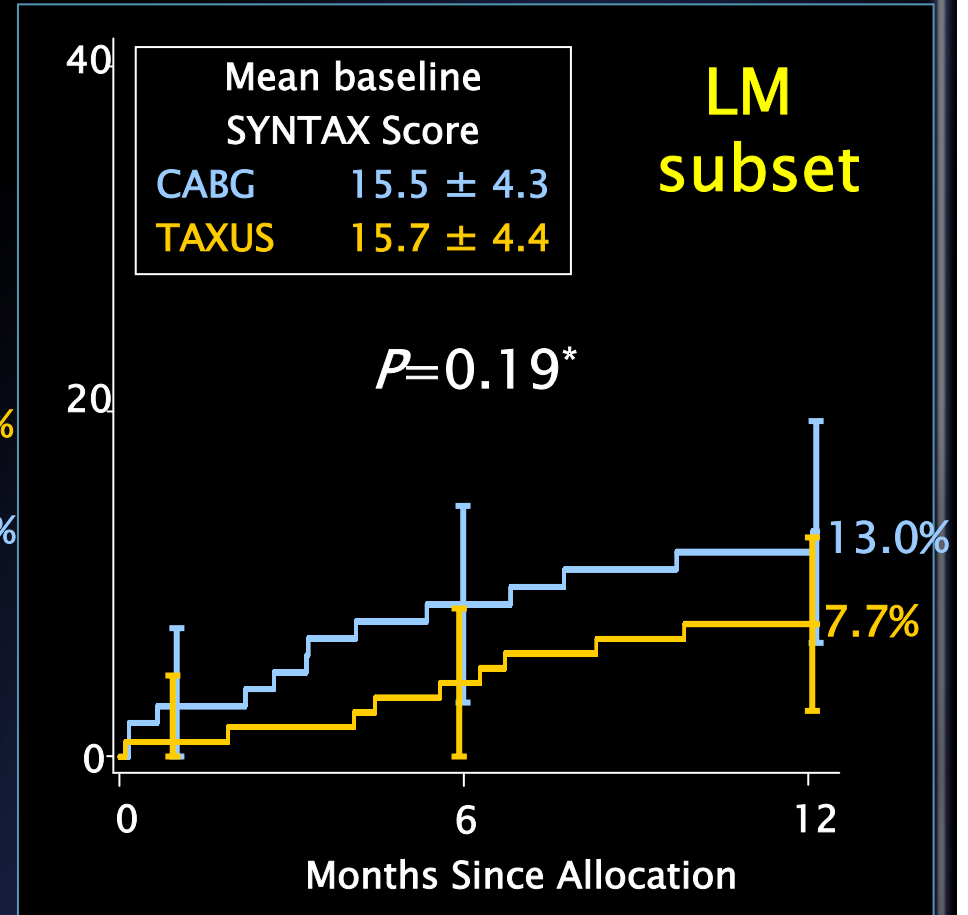
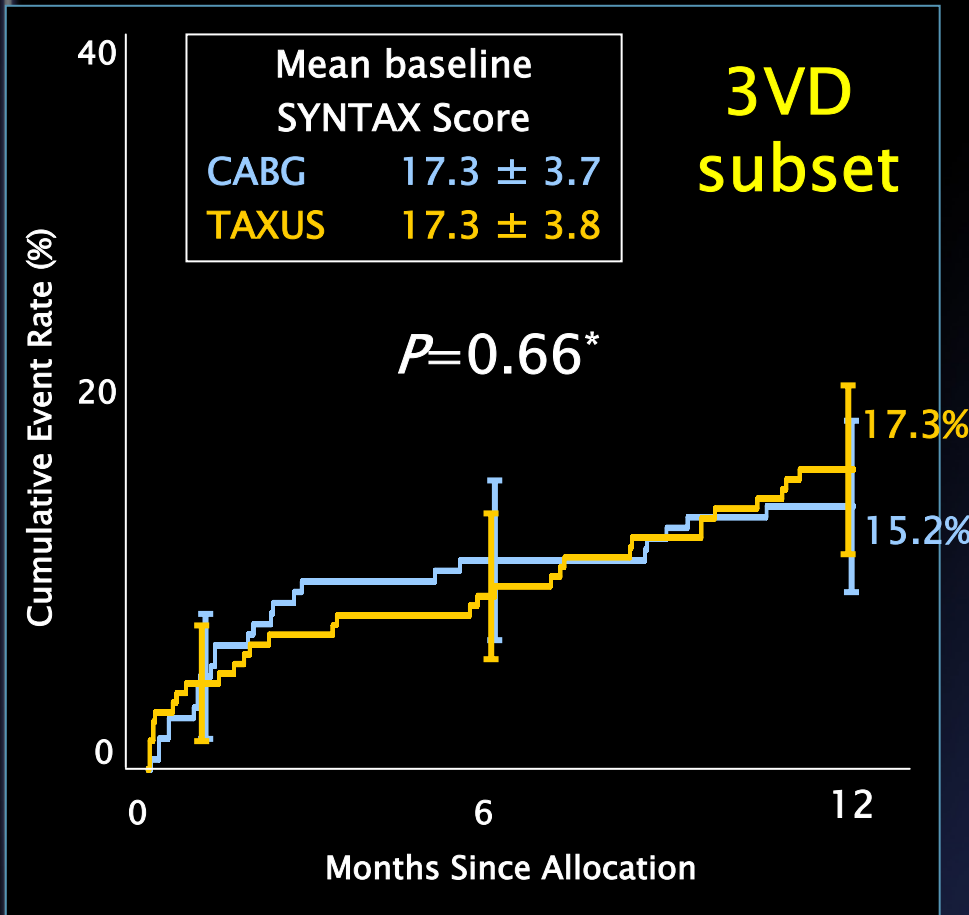


# MACCE to 12 Months by SYNTAX Score Tertile *Low Scores (0-22)*



■ CABG (N=171)  
■ TAXUS (N=181)

■ CABG (N=103)  
■ TAXUS (N=118)



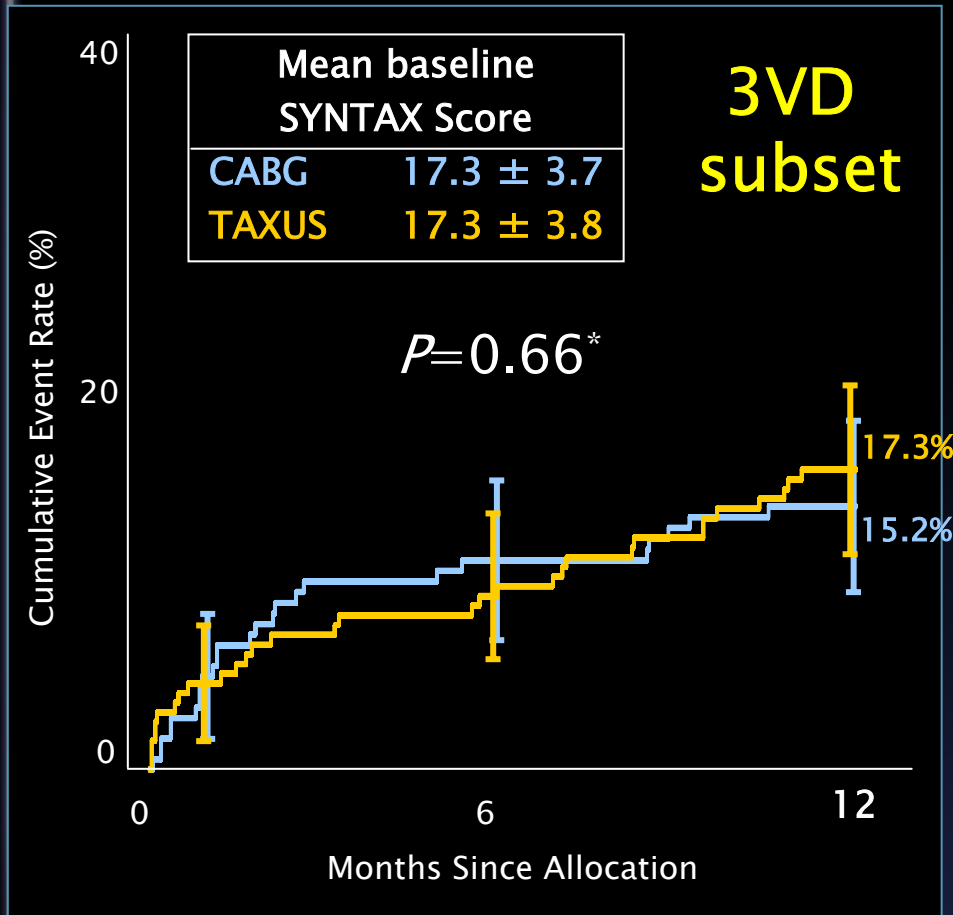
Event rate ± 1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

# MACCE to 12 Months by SYNTAX Score Tertile *Low Scores (0-22)*



■ CABG (N=171)  
■ TAXUS (N=181)



	CABG	PCI	P-value
Death	4.3%	2.8%	0.44
CVA	1.9%	0.6%	0.35
MI	4.2%	3.3%	0.63
Death, CVA or MI	8.5%	5.6%	0.26
Revasc.	6.9%	14.1%	0.03

Event rate ± 1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

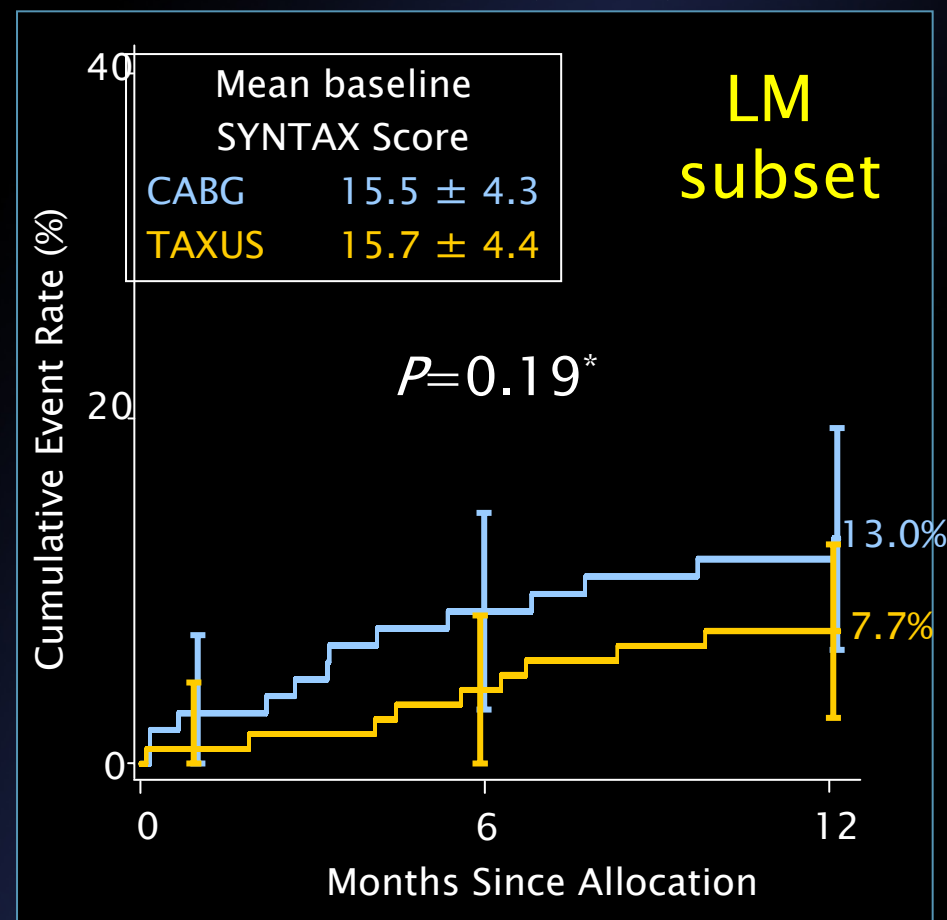
# MACCE to 12 Months by SYNTAX Score Tertile *Low Scores (0-22)*



	CABG	PCI	P-value
Death	3.0	0.9	0.15
CVA	2.0	0.0	0.21
MI	2.0	1.7	1.0
Death, CVA or MI	6.1	1.7	0.15
Revasc.	8.1	7.7	0.22

■ CABG (N=103)

■ TAXUS (N=118)



Event rate ± 1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

# MACCE to 12 Months by SYNTAX Score Tertile



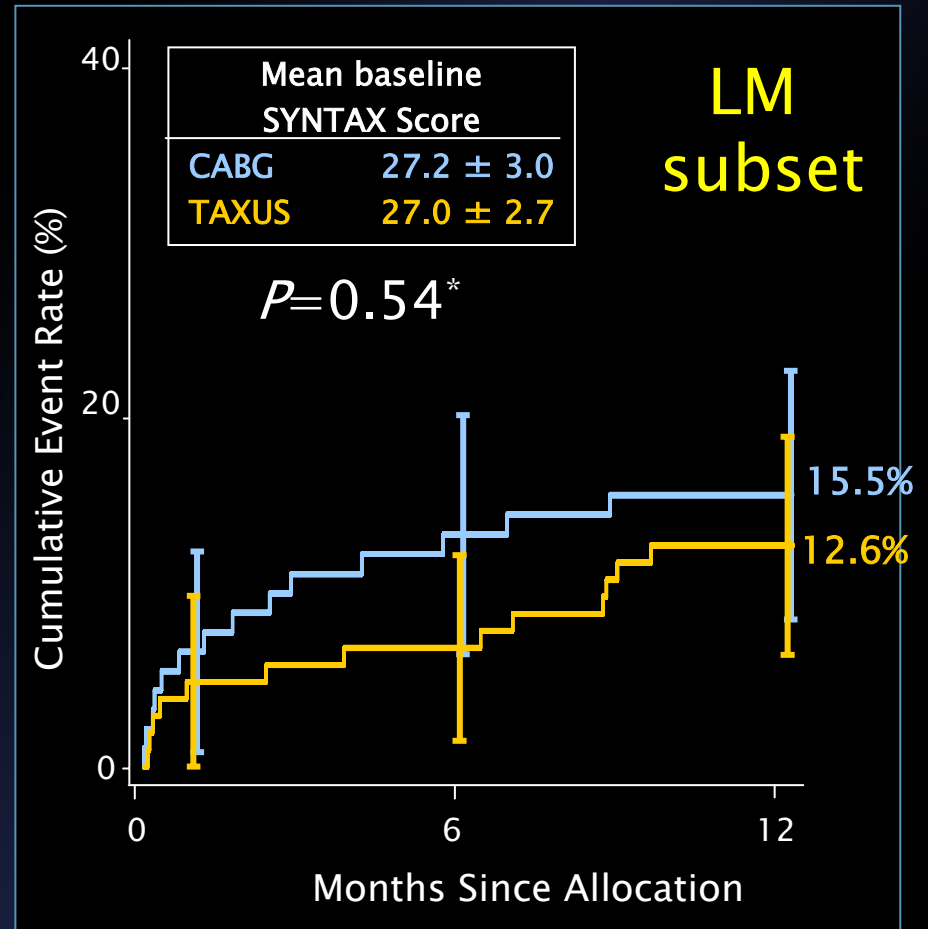
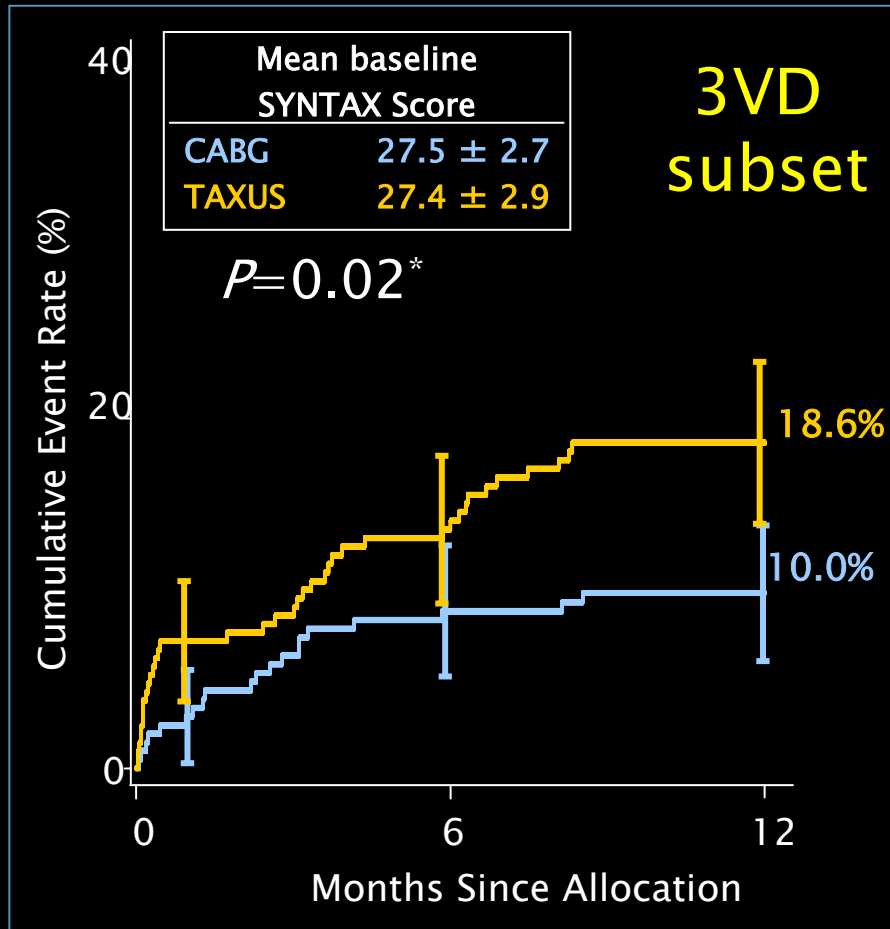
Intermediate Scores (23-32)

■ CABG (N=208)

■ TAXUS (N=207)

■ CABG (N=92)

■ TAXUS (N=195)



Event Rate ± 1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

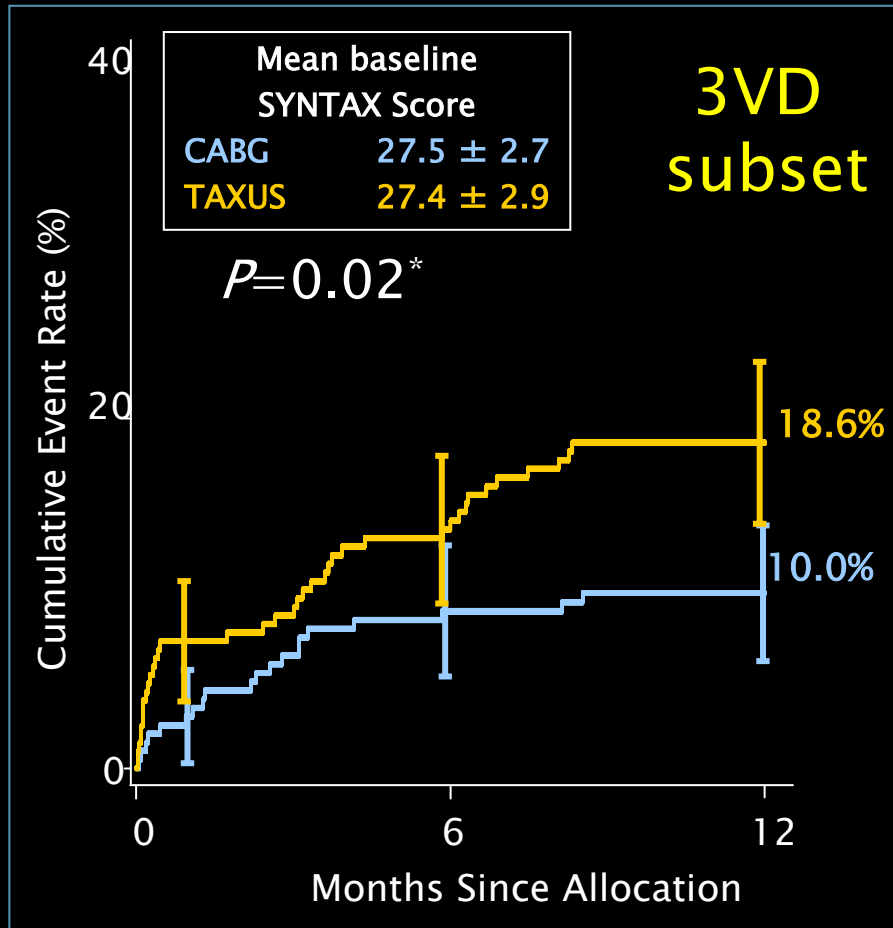


# MACCE to 12 Months by SYNTAX Score Tertile



Intermediate Scores (23-32)

- CABG (N=208)
- TAXUS (N=207)



	CABG	PCI	P-value
Death	3.0%	4.4%	0.48
CVA	2.5%	1.5%	0.50
MI	2.0%	5.8%	0.05
Death, CVA or MI	6.5%	8.7%	0.41
Revasc.	4.6%	13.5%	0.003

Event Rate ± 1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

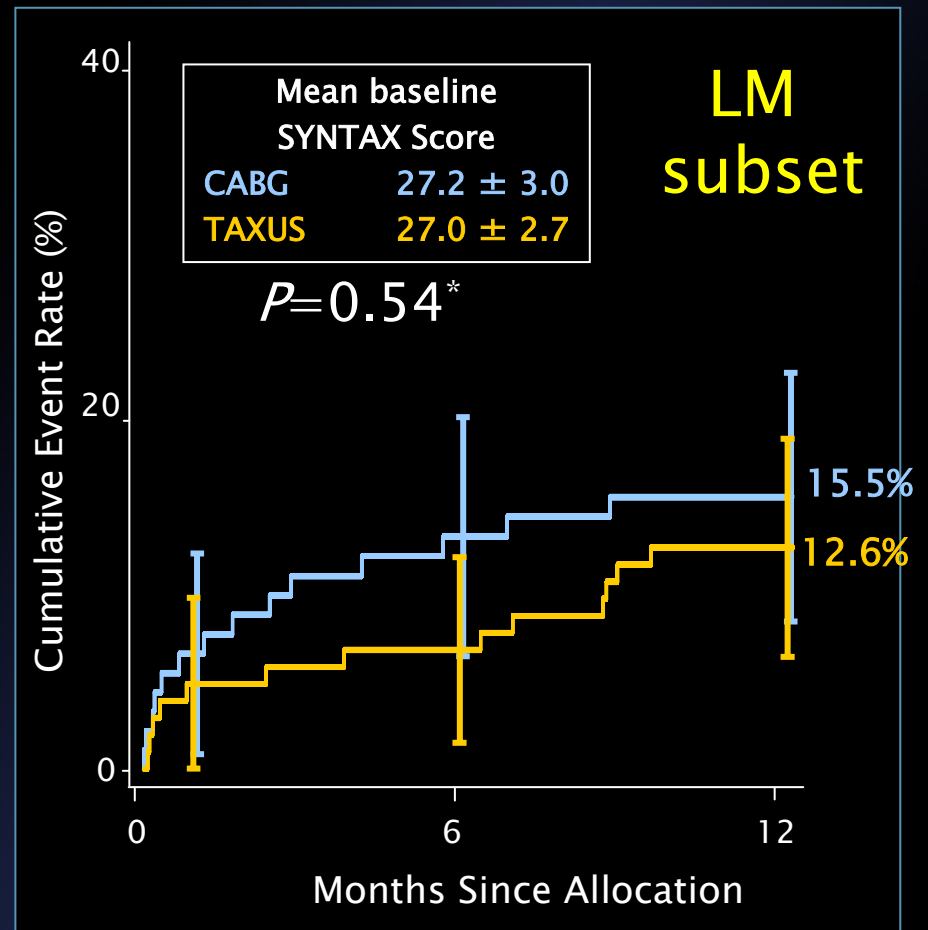
# MACCE to 12 Months by SYNTAX Score Tertile

Intermediate Scores (23–32)



	CABG	PCI	P-value
Death	6.7	1.0	0.051
CVA	2.2	0.0	0.21
MI	3.4	2.9	1.0
Death, CVA or MI	10.1	3.9	0.09
Revasc.	7.9	9.7	0.65

■ CABG (N=92)  
■ TAXUS (N=195)



Event Rate ± 1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

# MACCE to 12 Months by SYNTAX Score Tertile



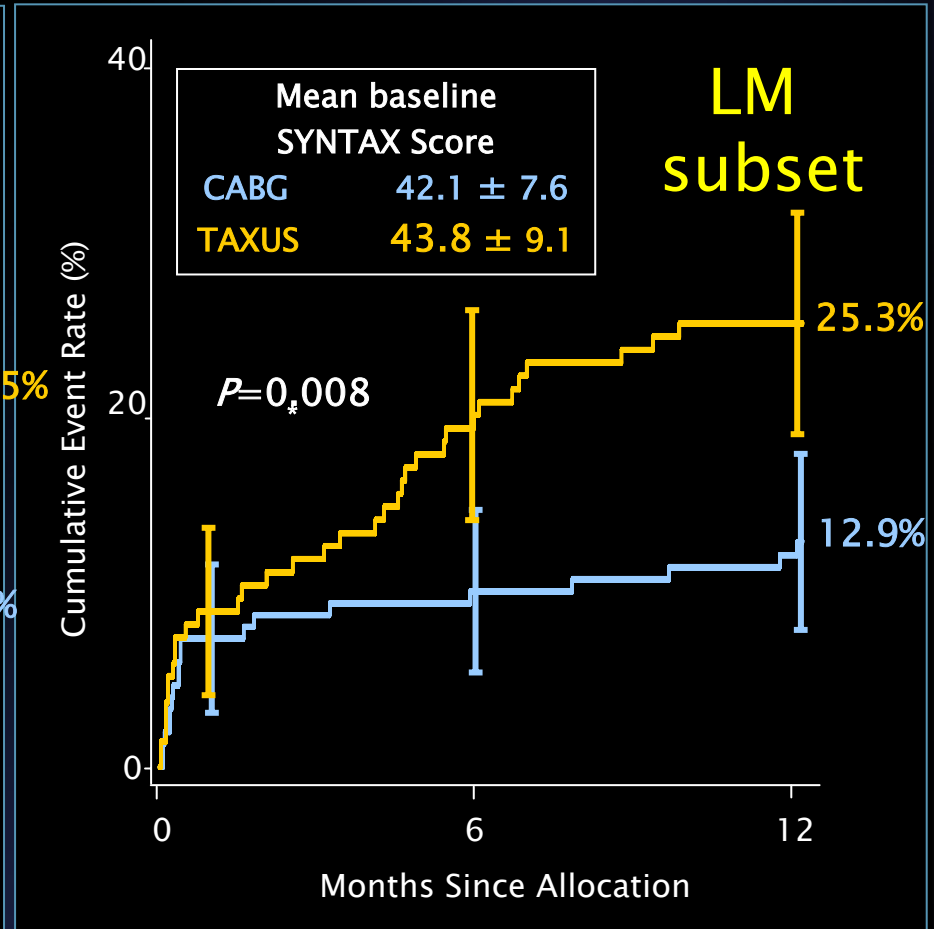
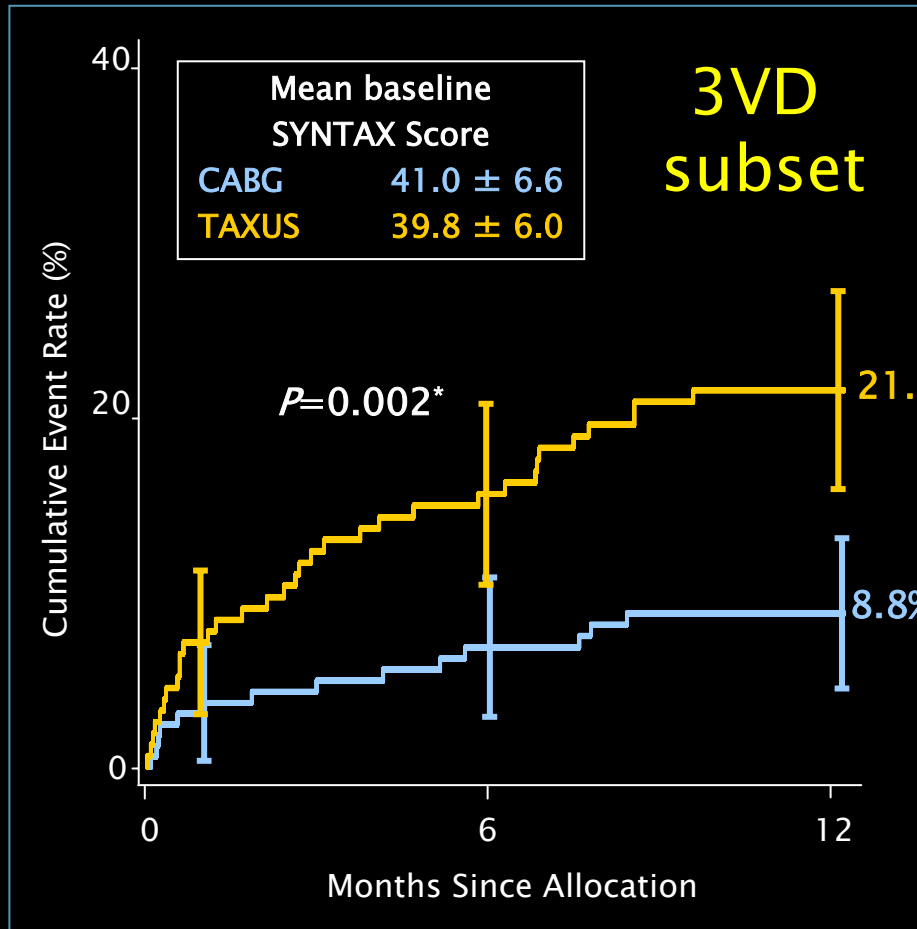
High Scores ( $\geq 33$ )

■ CABG (N=150)

■ TAXUS (N=135)

■ CABG (N=166)

■ TAXUS (N=155)



Event Rate  $\pm$  1.5 SE, \*Fisher exact test

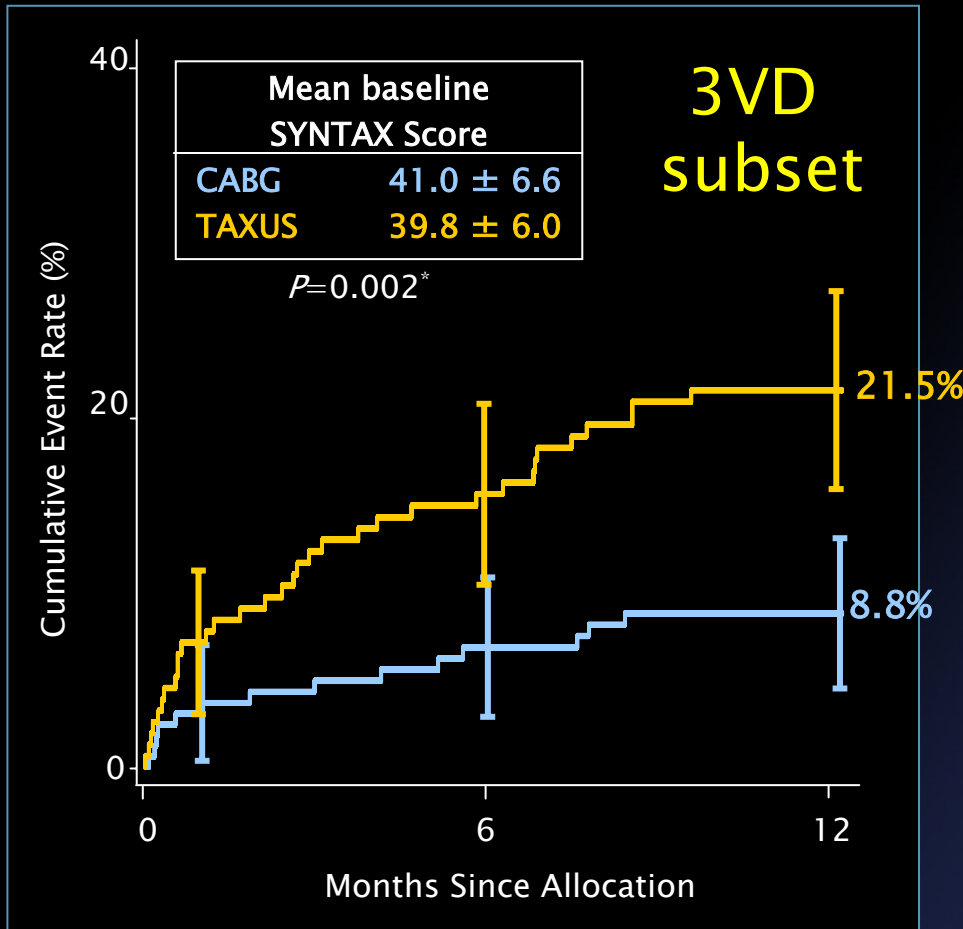
Calculated by core laboratory; ITT population

# MACCE to 12 Months by SYNTAX Score Tertile

## High Scores ( $\geq 33$ )



- CABG (N=150)
- TAXUS (N=135)



	CABG	PCI	P-value
<b>Death</b>	1.2%	6.5%	0.02
<b>CVA</b>	1.2%	0.0%	0.50
<b>MI</b>	1.9%	6.5%	0.04
<b>Death, CVA or MI</b>	4.3%	9.7%	0.07
<b>Revasc.</b>	5.1%	16.6%	0.001

Event Rate  $\pm$  1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

# MACCE to 12 Months by SYNTAX Score Tertile

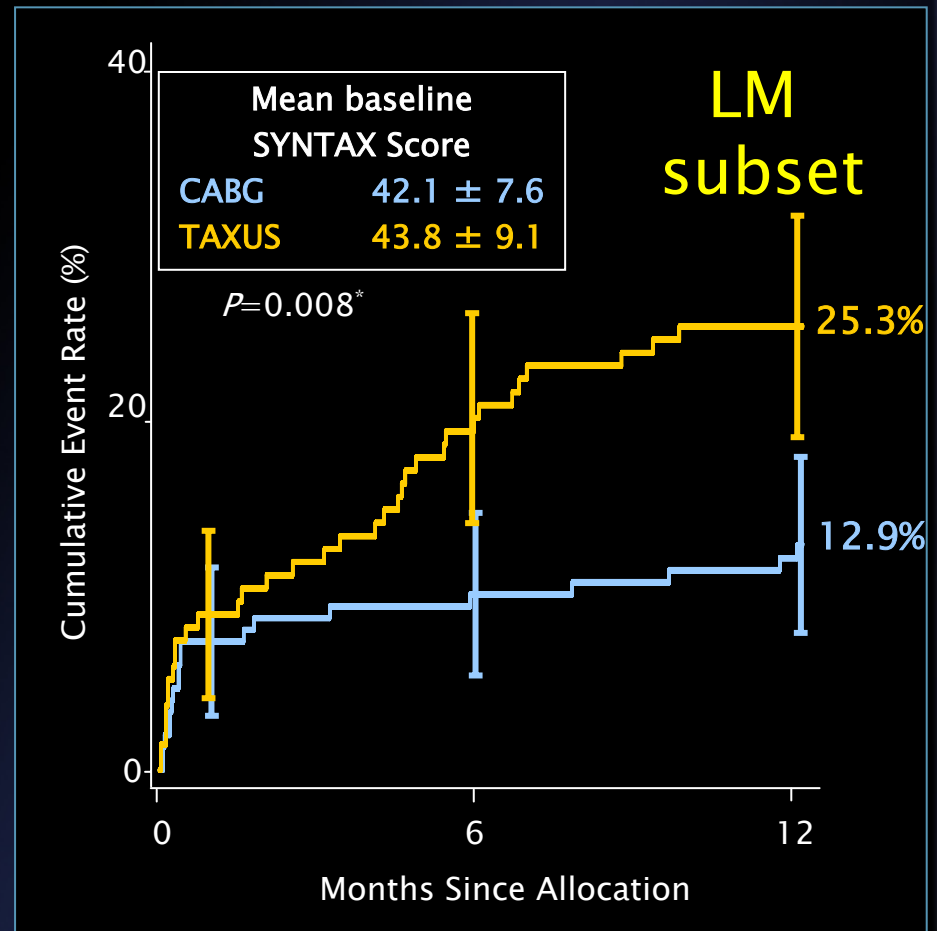
High Scores ( $\geq 33$ )



	CABG	PCI	P-value
<b>Death</b>	4.1	9.7	0.06
CVA	3.4	0.7	0.69
MI	6.1	7.5	0.65
Death, CVA or MI	10.9	14.2	0.41
<b>Revasc.</b>	4.8	17.2	<0.01

■ CABG (N=166)

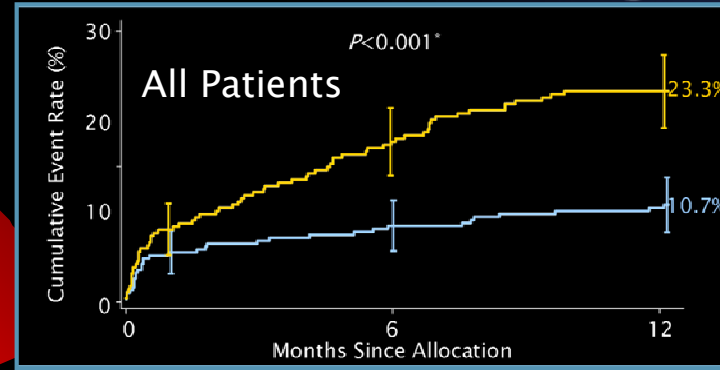
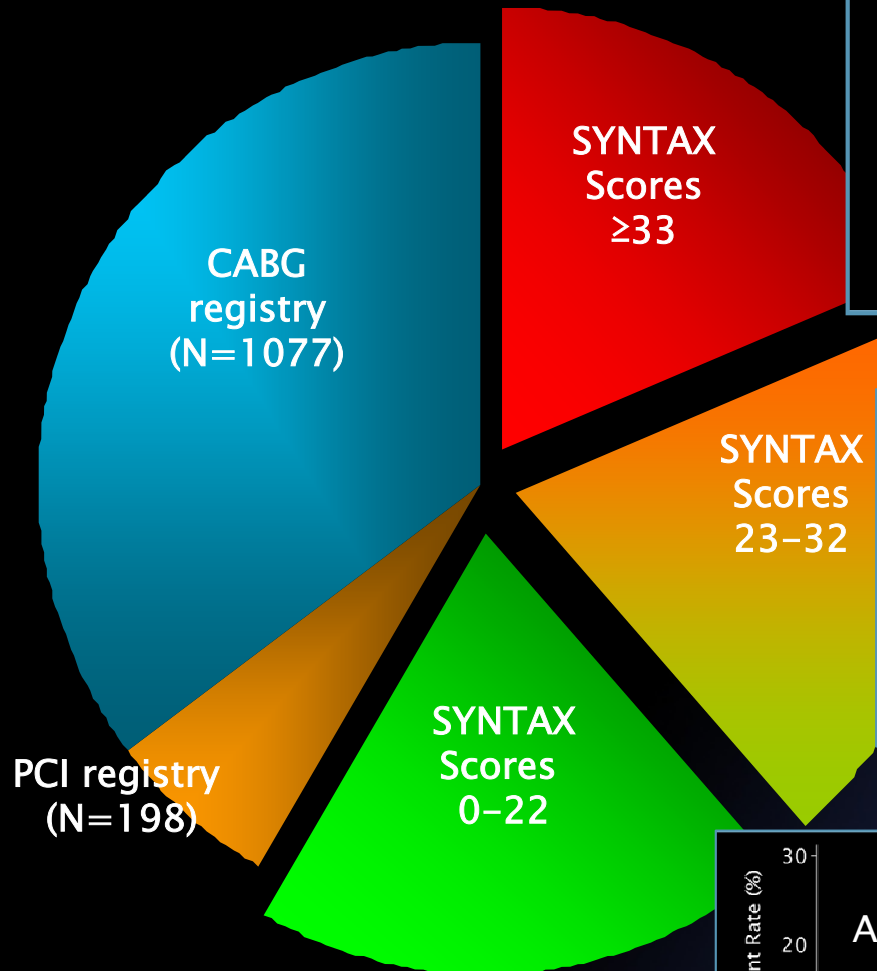
■ TAXUS (N=155)



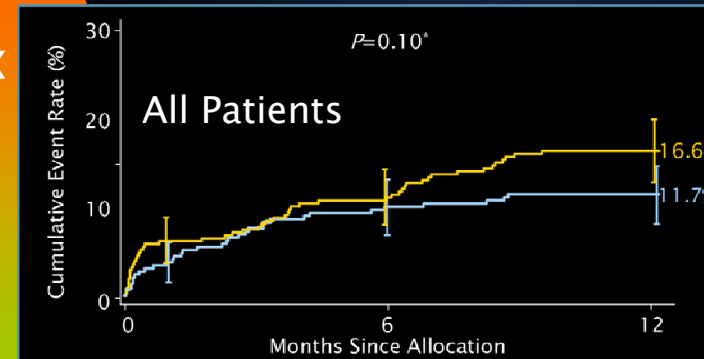
Event Rate  $\pm$  1.5 SE, \*Fisher exact test

Calculated by core laboratory; ITT population

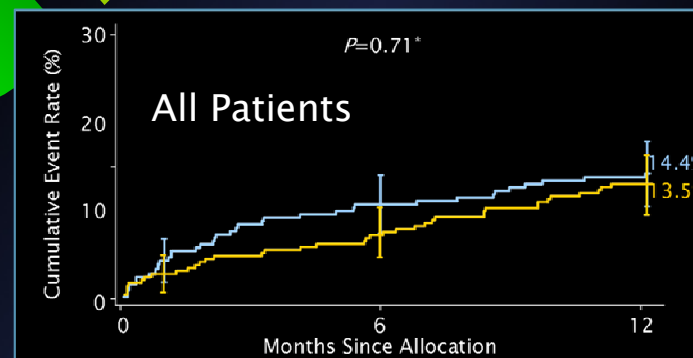
# SYNTAX Trial Patient Distribution



-

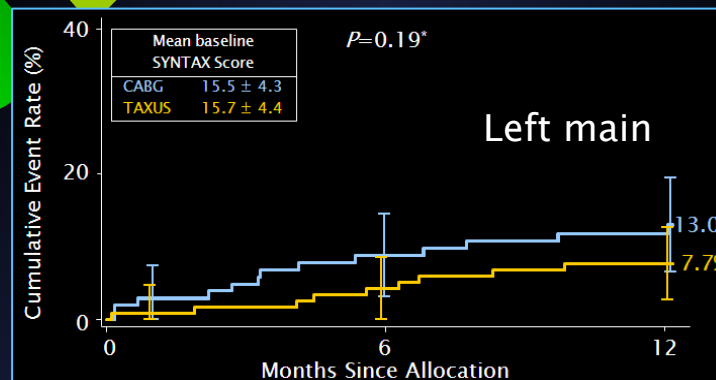
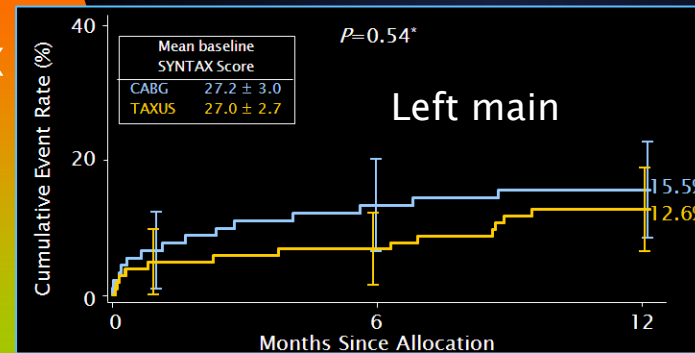
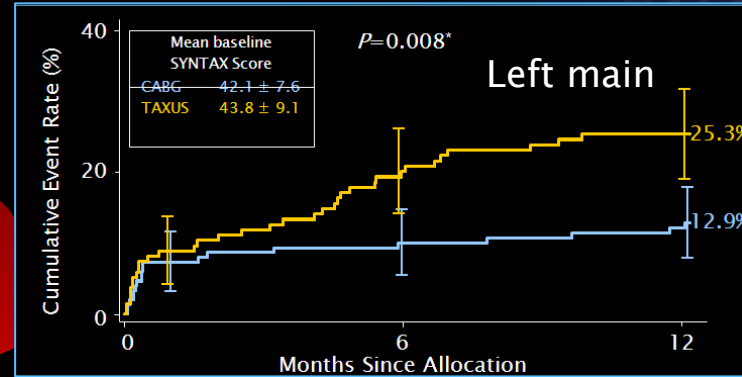
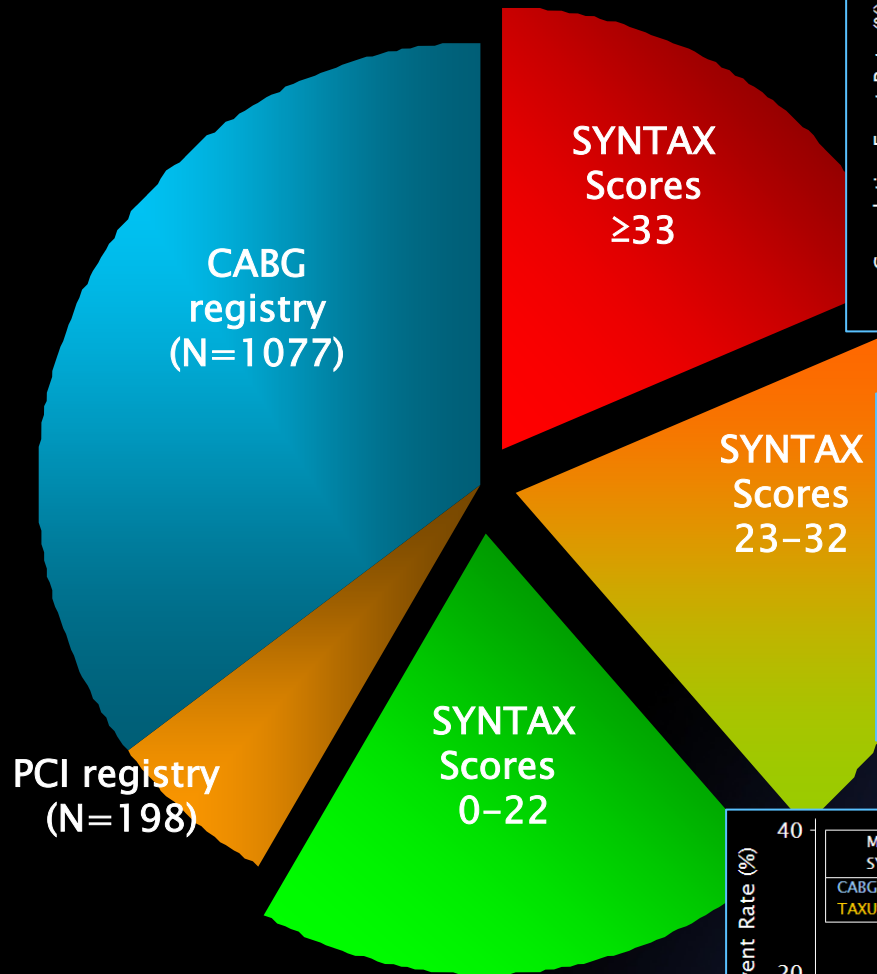
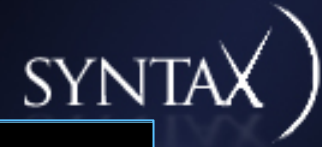


-/+



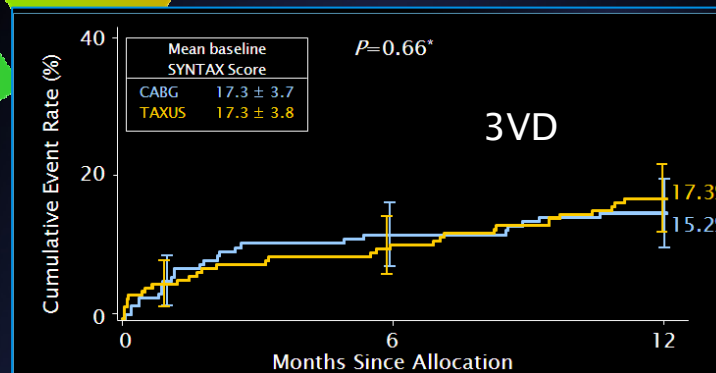
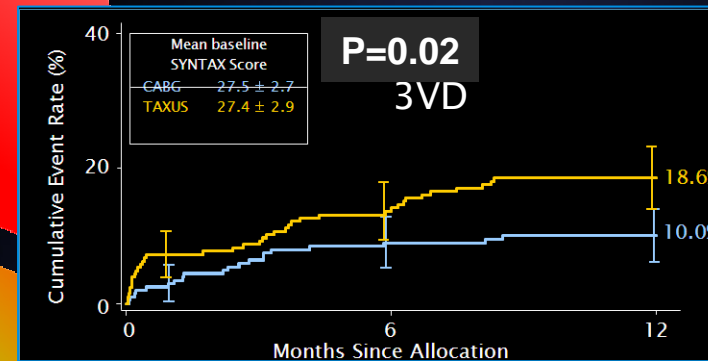
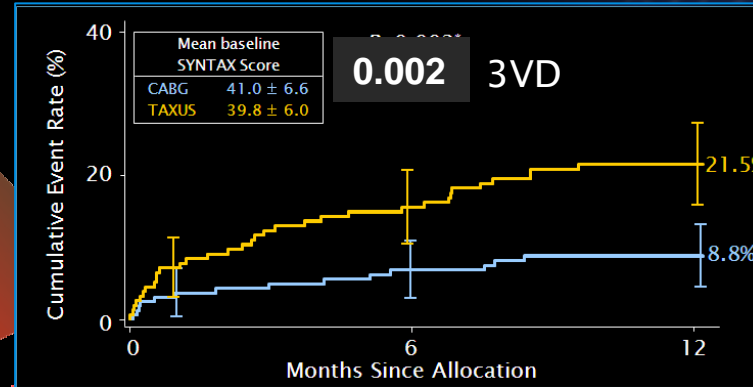
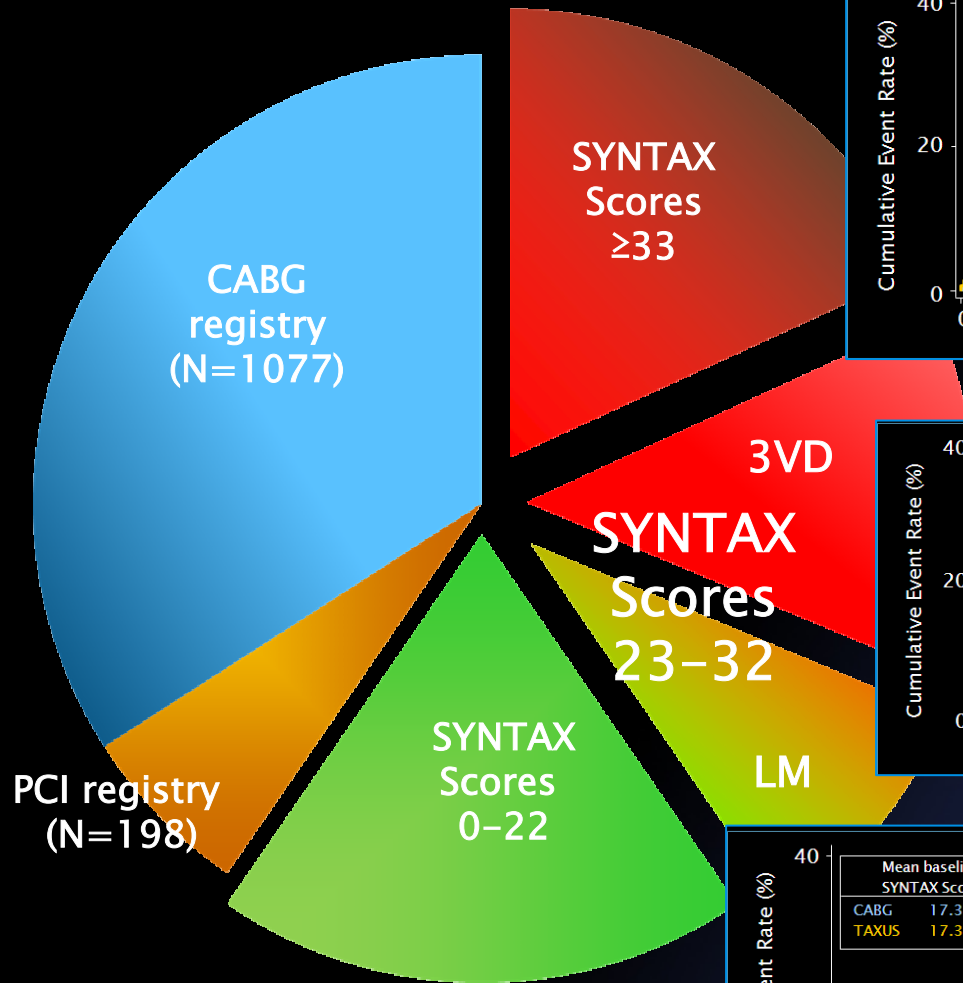
+

# SYNTAX Trial Patient Distribution



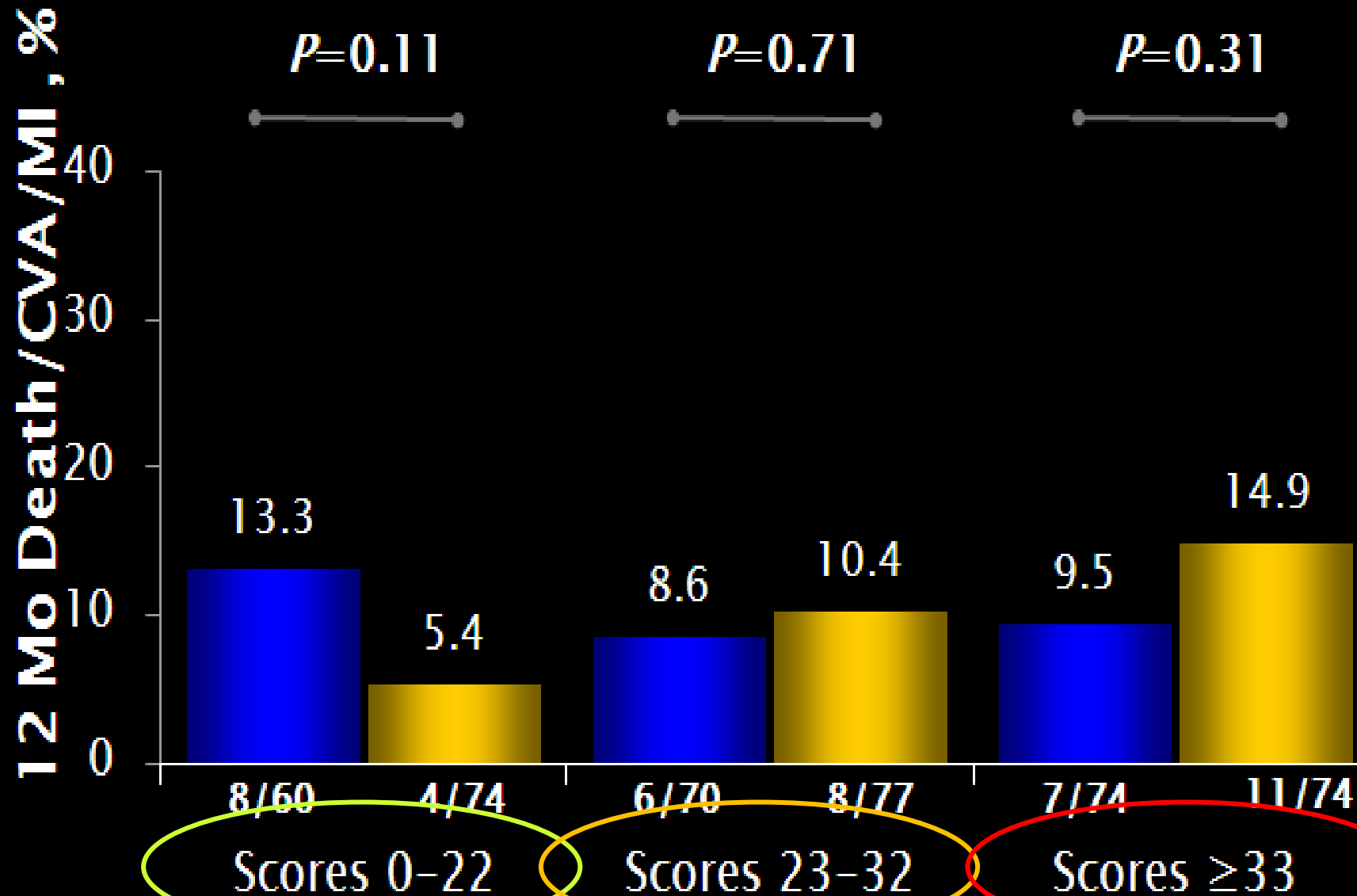


# SYNTAX Trial Patient Distribution

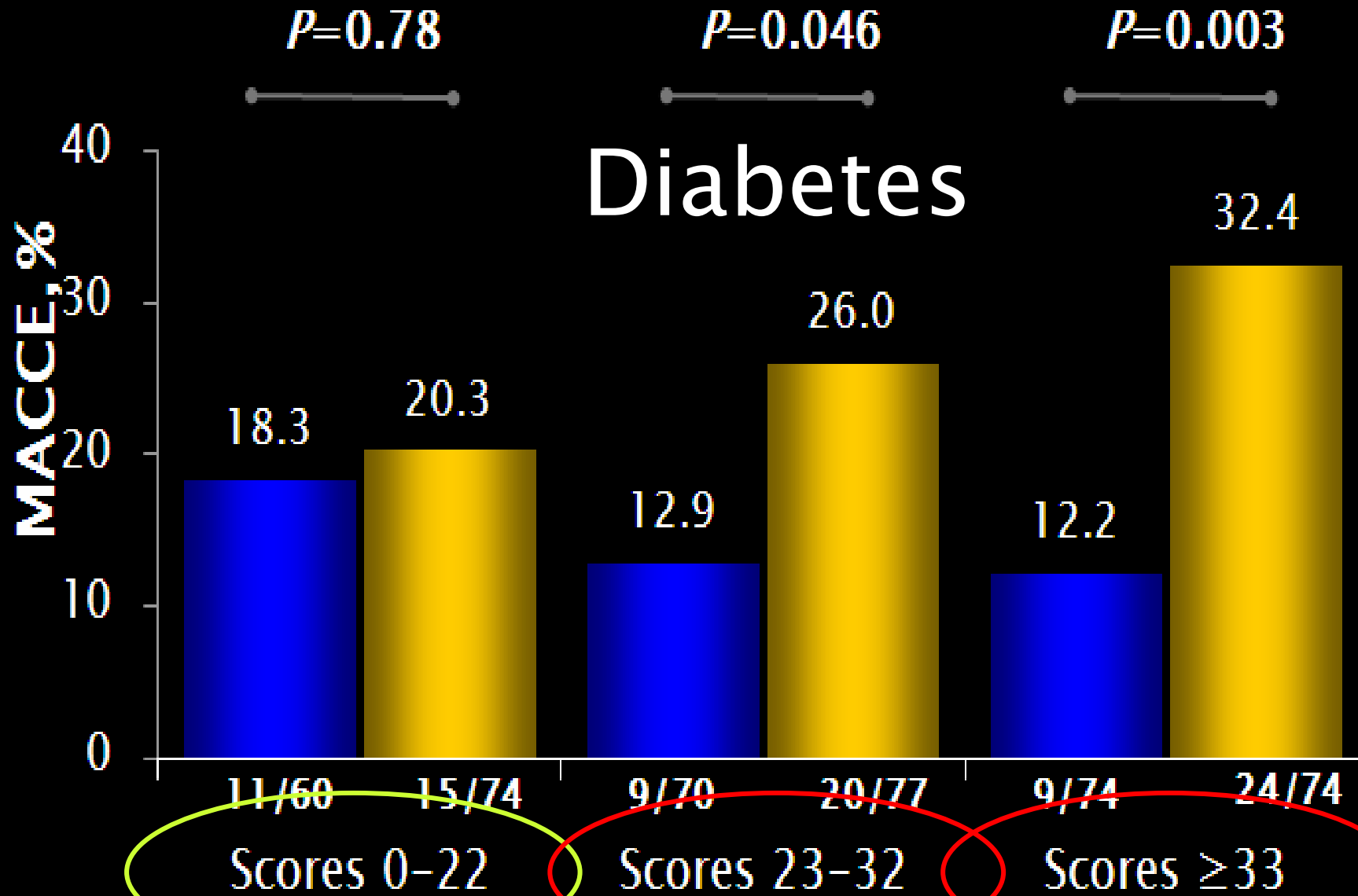


# SYNTAX Trial Patient Distribution

SYNTAX



# SYNTAX Trial Patient Distribution



# Conclusion

Patients with 3-vessel and/or left main disease



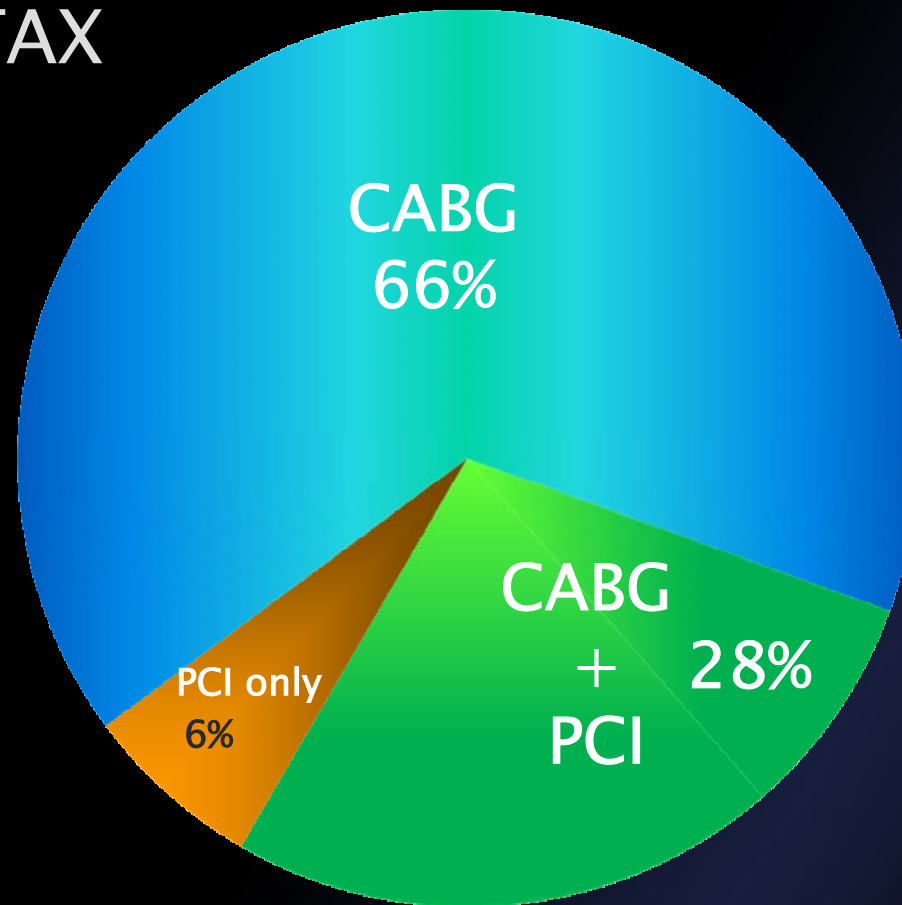
Both diabetic status and lesion complexity impact the relative safety between CABG and TAXUS Express stents and should be considered when evaluating treatment options in patients with left main and/or 3-vessel disease

## Diabetes

Lesion Complexity

	Non Diabetic	Oral Meds	Insulin
High	CABG	CABG	CABG
Medium	TAXUS or CABG	TAXUS or CABG	CABG
Low	TAXUS or CABG	TAXUS or CABG	CABG

# Post SYNTAX



Results of the SYNTAX trial suggest that 66 % of all patients are still best treated with CABG, however, for the remaining patients PCI is an excellent alternative to surgery at least for one year

# Conclusions



- Using as criteria, a non-significant difference in MACCE, we may state:
- Results of the SYNTAX trial suggest that 66% of all patients are still best treated with CABG, however, for the remaining patients PCI (Syntax Score 0–22) is an excellent alternative to surgery in multivessel disease, in left main disease and in diabetic patients...at least for a period of one year F/up
- Left main disease, non-diabetic with score of 23–32 could also be treated by PCI.