

Comparison of long-term outcomes
in patients receive Cypher stents vs.
patients receiving Taxus stents:
The REWARDS Registry

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Disclosure

- Advisory Board:

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- Grant Support:

Sanofi, Boston Scientific, Biotronik

- Speaker Honoraria

Biotronik Boston Scientific, Shering Plough, Medtronic

- Royalties

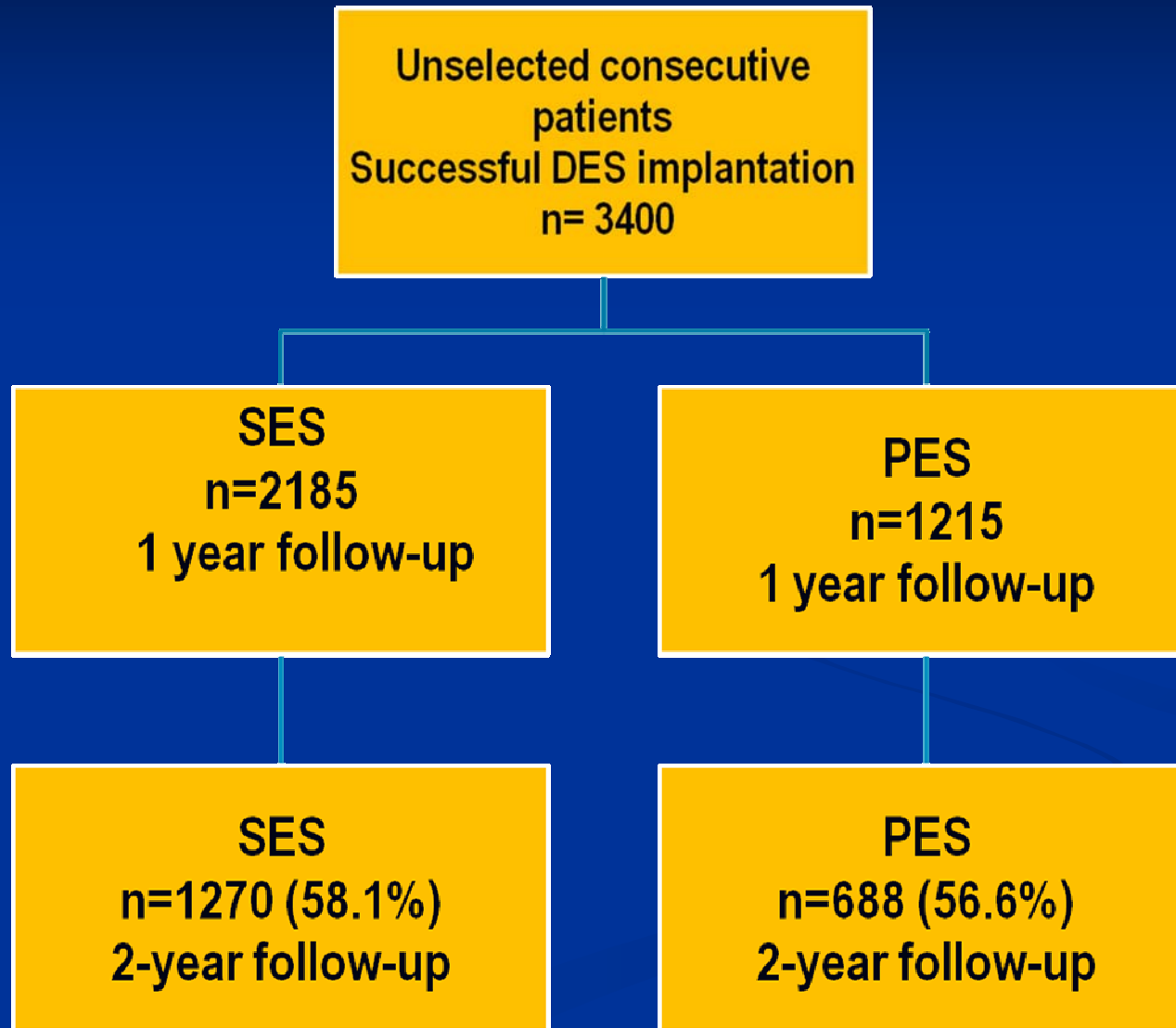
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No Conflicts related to this presentation

The objective of this analysis was to compare the 1-year clinical outcomes (Efficacy and Safety) of patients receiving Cypher stents to those receiving Taxus stents with **nonrestrictive use** for all subset of patients and lesions.

- Investigator Sponsor Study
- Single Center with 11 cath labs
- 30 independent attending investigators
- Conducted under local IRB approval
- Clinical Follow-up at 1, 6 and 12 month via Telephone or clinic office visit
- All events were adjudicated by independent physicians committee
- Data Management CRI, Washington Hospital Center

Patient Population



REWARDS

Procedural details and Adjunctive therapies

- Percutaneous coronary intervention (PCI) using standard technique via femoral approach.
- Patients pre-treated with 325mg Aspirin and loaded with Clopidogrel 300-600mg unless on a maintenance dose. Clopidogrel recommended for a minimum of 6 months for both groups.
- Type of anticoagulation, IIb IIIa glycoprotein inhibitors and adjunctive devices was at the discretion of the operator.

- **MACE:** Composite of Death, Q wave Myocardial Infarction, TVR
- **Stent Thrombosis:** Angiographically documented stent thrombosis
 - In hospital: prior to discharge
 - Sub-acute: ≤ 30 days from stent implantation
 - Late: > 30 days from stent implantation
 - ST, Ddefinite and probable defined as per the Academic Research Consortium (ARC) definition.

Statistical Methodologies

- A p-value <0.05 denotes statistical significance.
- Predictors of MACE and stent thrombosis were identified by Cox proportional hazard analysis – stepwise multivariate Cox regression model with an entry of 0.05 and a stay of 0.2
- Propensity score assessment was performed by nonparsimonious logistic regression model. The following 18 variables were included in this model:
sex, age, prior myocardial infarction, prior coronary bypass grafting, prior PCI, diabetes, hypertension, hypercholesterolemia, chronic renal insufficiency, current smoker, presentation with unstable angina, presentation with MI, number of lesions dilated, length of procedure, lesion in the right coronary artery, left anterior descending artery, proximal location, and type C lesion.

REWARDS

Demographics and Clinical Features

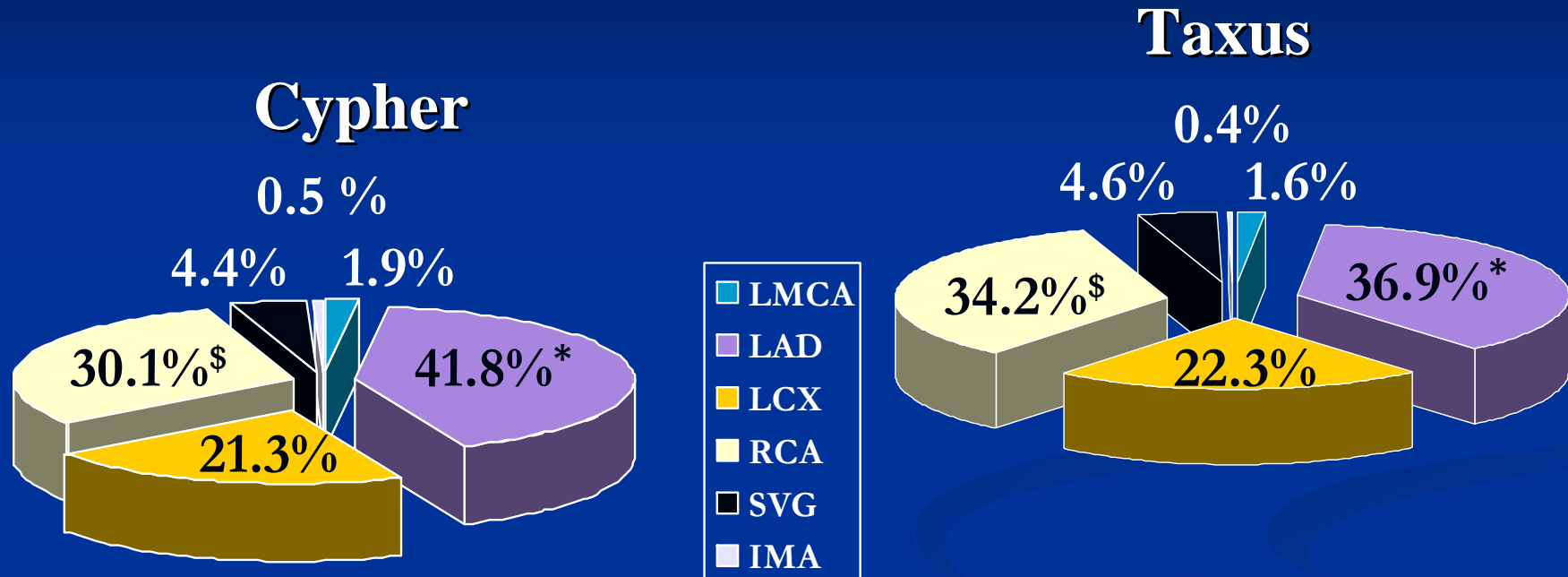
	<u>SES (n=2185)</u>	<u>PES (n=1215)</u>	<u>P</u>
Male gender, n (%)	1388 (63.8)	806 (66.5)	NS
Age, mean yrs \pm SD	65.2 \pm 11.4	65.4 \pm 12.0	NS
<u>Clinical history</u>			
Diabetes, n (%)	772 (35.7)	404 (33.4)	NS
Smoking- current, n (%)	396 (18.1)	230 (18.9)	NS
Hypertension, n (%)	1749 (80.6)	975 (80.4)	NS
Dyslipidemia, n (%)	1847 (85.9)	1006 (83.3)	0.04
Previous Myocardial Infarction, n (%)	657 (31.7)	396 (34.3)	NS
Previous Coronary Bypass Surgery, n (%)	335 (15.5)	203 (16.8)	NS
Previous PCI, n (%)	418 (19.8)	274 (23.5)	0.01
<u>Presentation</u>			
Acute Myocardial Infarction, n (%)	280 (12.9)	130 (10.7)	NS
Left Ventricular Ejection Fraction, % \pm SD	48 \pm 14	48 \pm 14	NS

Angiographic characteristics

	<u>SES (n=3986*)</u>	<u>PES (n=2129*)</u>	<u>P</u>
<u>Target Vessel</u>			
Left main coronary artery, n (%)	82 (2.1)	29 (1.4)	NS
Left anterior descending artery, n (%)	1606 (40.3)	797 (37.4)	0.03
Left circumflex artery, n (%)	915 (23.0)	495 (23.3)	NS
Right coronary artery, n (%)	1213 (30.4)	713 (33.5)	0.01
Saphenous vein graft, n (%)	155 (3.9)	86 (4.0)	NS
<u>Lesion Type</u>			
Type A, n (%)	262 (7.0)	102 (5.0)	0.004
Type B1/B2, n (%)	2738 (72.9)	1467 (72.6)	NS
Type C, n (%)	755 (20.1)	452 (22.4)	0.04
In-stent restenosis, n (%)	153 (3.8)	75 (3.5)	NS

* Lesion based

Lesion Characteristics



*More LAD lesions in the Cypher group ($p=0.003$)

\$More RCA lesions in the Taxus group ($p=0.009$)

Procedural details

	<u>SES (n=3986*)</u>	<u>PES (n=2129*)</u>	<u>P</u>
Number of lesions dilated, mm±SD	1.84±2.36	1.68±0.91	0.005
Primary stenting, n (%)	1331 (37.5)	688 (34.8)	NS
Pre-dilation, n (%)	1190 (36.7)	879 (47.7)	<0.001
Post-dilation, n (%)	761 (23.4)	432 (23.4)	NS
<u>Stent Details</u>			
Diameter, mm±SD	3.03±0.47	3.08±1.44	NS
Length, mm±SD	21.23±6.8	19.62±6.26	<0.001
Number of stents implanted, mm±SD	1.42±0.74	1.55±0.80	<0.001
Glycoprotein IIb IIIa inhibitor use, n (%)	310 (14.3)	130 (10.7)	0.003

* Lesion based

Procedural Details

Angiographic Characteristics (%)	Cypher (n=2628)	Taxus (n=1248)	p Value
Procedural Devices			
Balloon	58.2	59.9	0.354
Rotablation	2.9	1.8	0.031
Direct Stenting	36.5	37.8	0.435
Cutting Balloon	6.3	4.8	0.064
IVUS guidance	73.8	66.2	<0.001
DES details			
Diameter	3.01 ± 0.33	3.06 ± 0.35	0.971
Length	21.38 ± 6.58	19.65 ± 6.17	<0.001
Number per patient	1.39 ± 0.72	1.55 ± 0.93	<0.001

REWARDS

Procedural outcomes

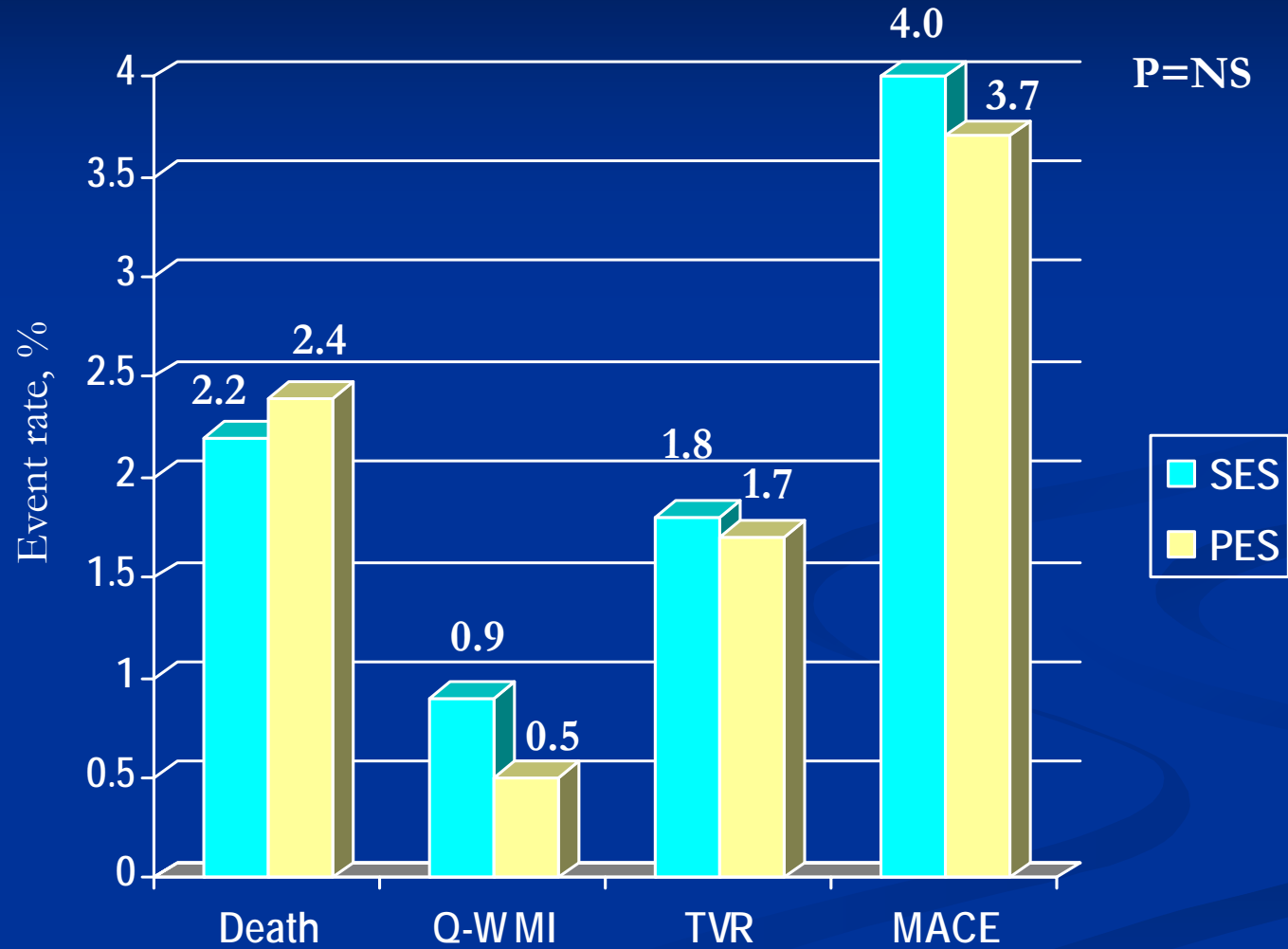
	<u>SES</u> (n=3986*)	<u>PES</u> (n=2129*)	<u>P</u>
Angiographic success, n (%)	3854 (97.6)	2050 (98.4)	0.04
No reflow, n (%)	19 (0.5)	13 (0.7)	NS
Acute closure, n (%)	14 (0.4)	10 (0.5)	NS
Dissection, n (%)	28 (0.8)	11 (0.6)	NS
Intra-aortic balloon pump use, n (%) * Lesion based	74 (3.4)	38 (3.1)	NS

In-hospital outcomes

	<u>SES (n=2185)</u>	<u>PES (n=1215)</u>	<u>P</u>
Death (all cause), n (%)	37 (1.7)	19 (1.6)	NS
Death (cardiac), n (%)	22 (1.0)	12 (1.0)	NS
Q-wave myocardial infarction, n (%)	11 (0.5)	7 (0.6)	NS
Coronary bypass surgery, n (%)	13 (0.6)	6 (0.5)	NS
Stent thrombosis, n (%)	8 (0.4)	4 (0.3)	NS
Neurological event, n (%)	10 (0.5)	4 (0.3)	NS
Renal insufficiency, n (%)	80 (4.1)	39 (4.2)	NS

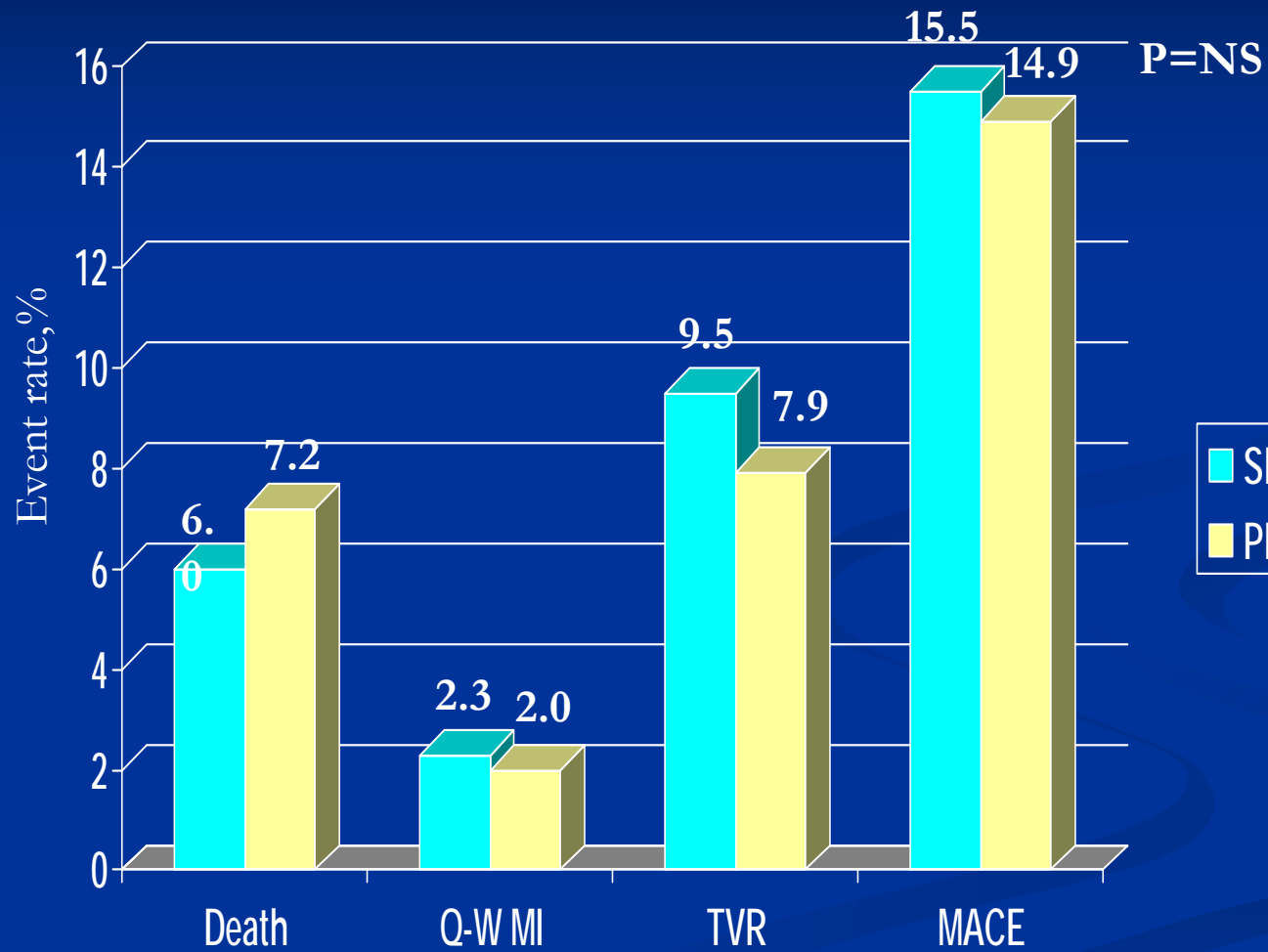
REWARDS

30 day clinical outcomes



REWARDS

12 month clinical outcomes

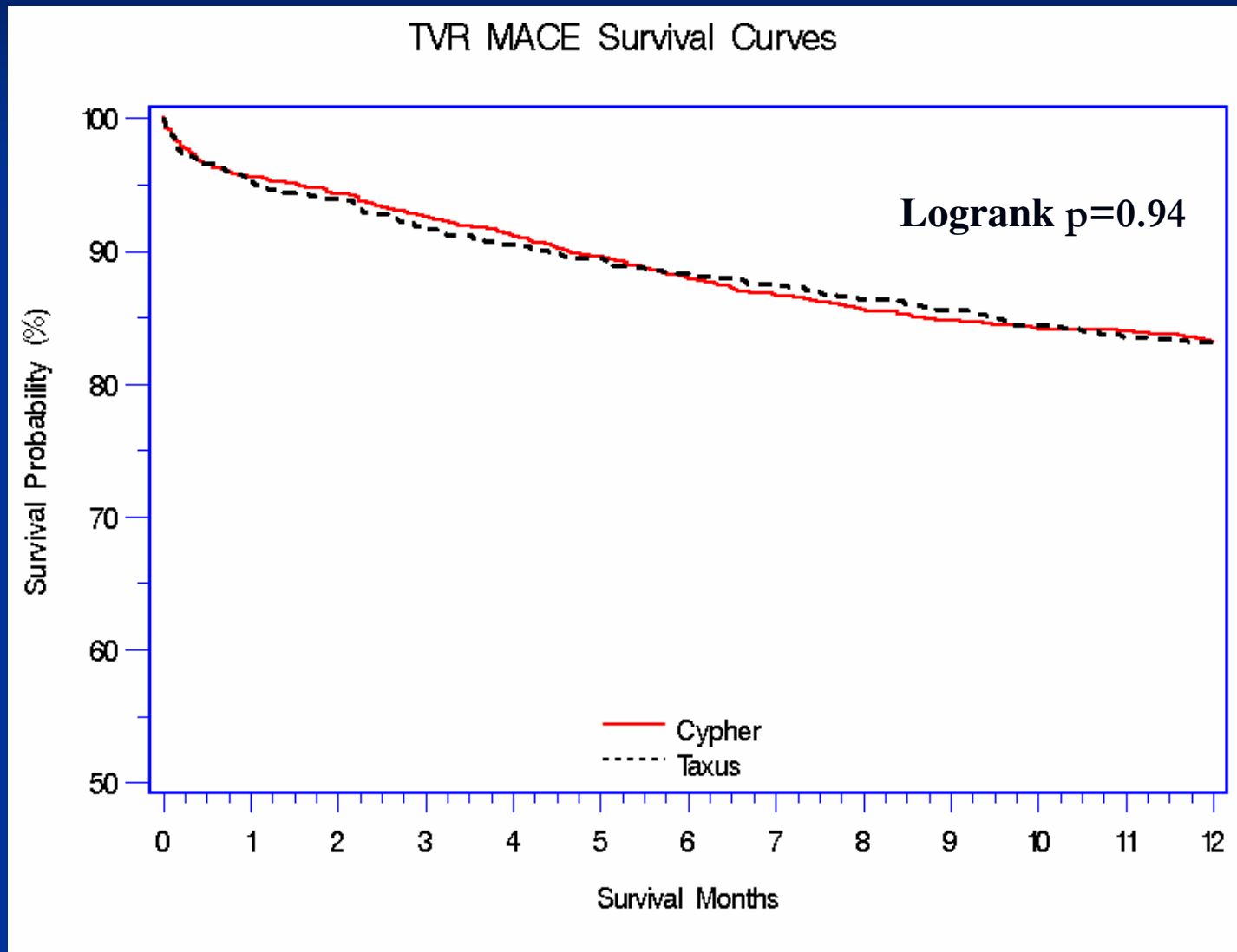


REWARDS

1 to 2 year clinical outcomes

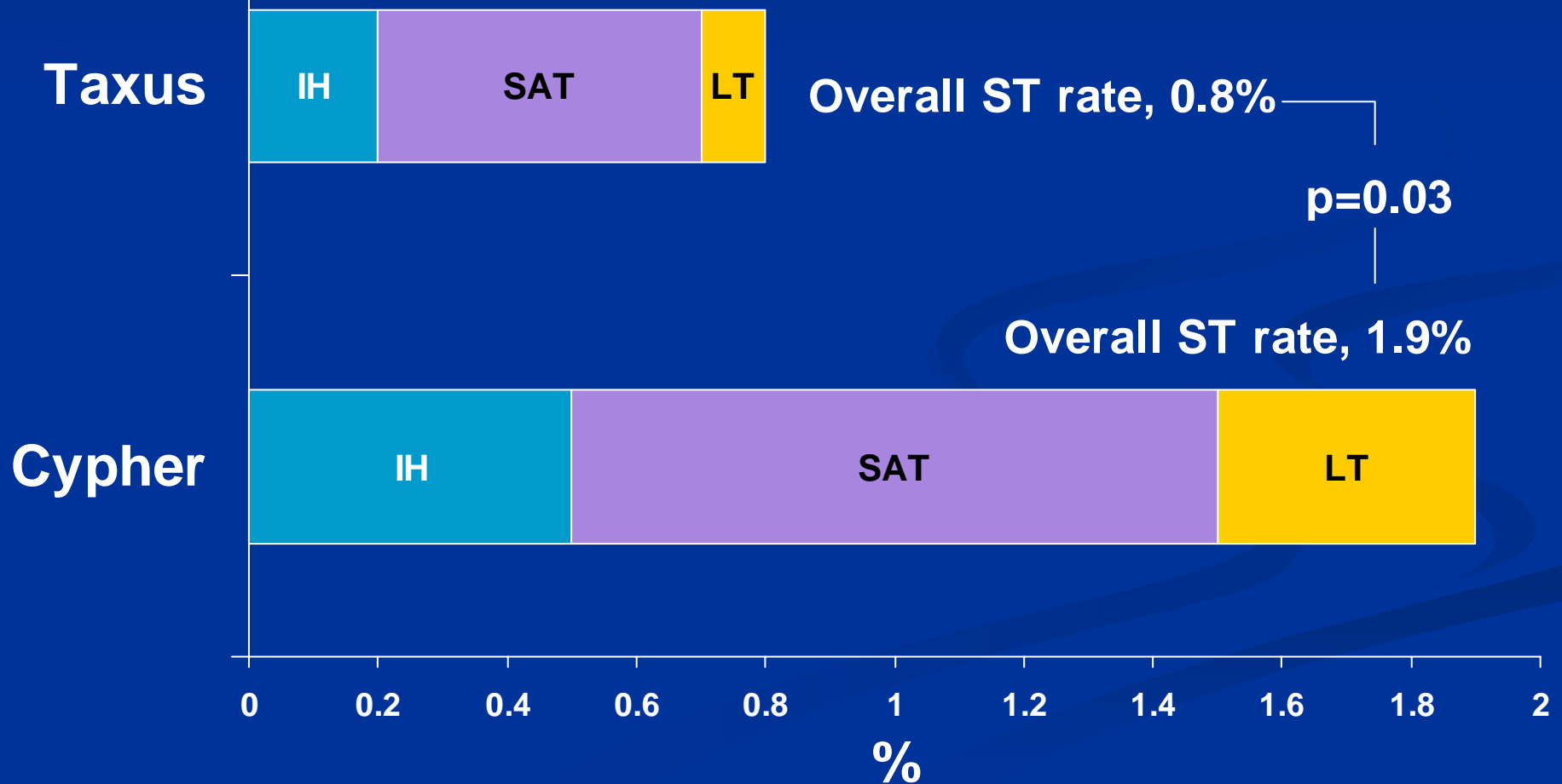
	SES (n=1269)	PES (n=688)	P
Death, n (%)	47 (4.1)	20 (3.1)	NS
Q-wave myocardial infarction, n (%)	6 (0.6)	8 (1.4)	NS
Target vessel revascularization, n (%)	57 (5.0)	23 (3.8)	NS
Major adverse cardiac events, n (%)	98 (7.7)	40 (5.8)	NS
Stent thrombosis, n (%)	3 (0.24)	2 (0.29)	NS

K-M Curve for 12 month MACE



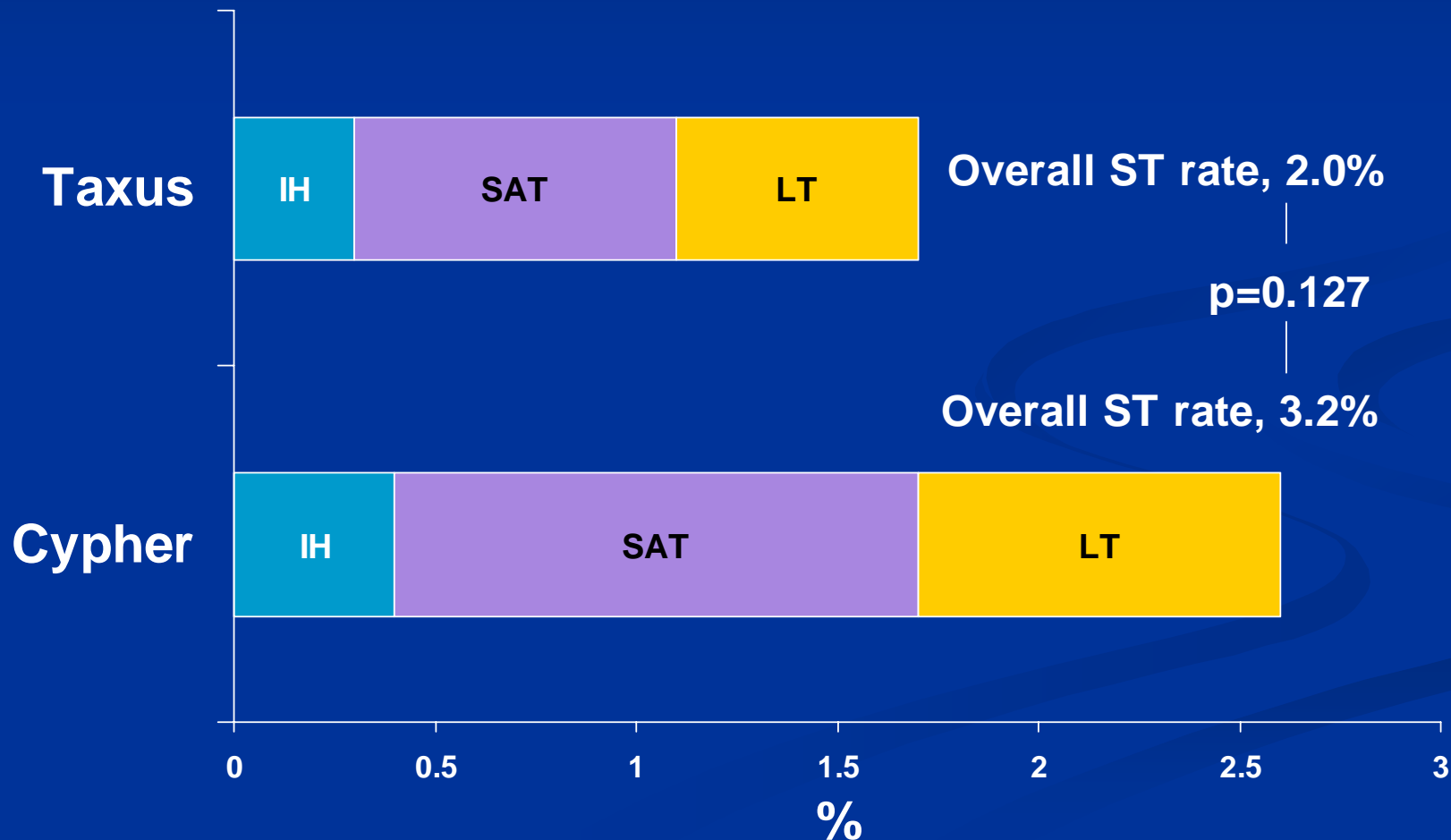
Cumulative Stent Thrombosis – 12 Months

Overall stent thrombosis for both stents at 1 year **1.6%**



Cumulative Stent Thrombosis – 24 Months

Overall stent thrombosis for both stents at 2 year 2.8%



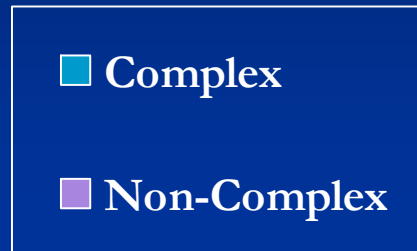
1) Complex Patients and Lesions

defined as at least one of the following:

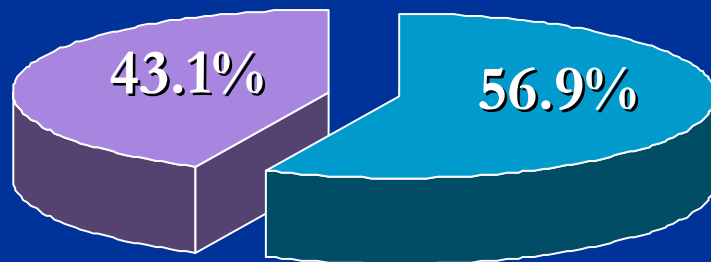
Osital lesion	Type C lesion	AMI
ISR	CTO	IDDM
Non-native artery lesion	2+ DESs	On Chronic Dialysis
Long lesion (>33mm)		Prior CABG

2) Insulin Dependent Diabetes Mellitus

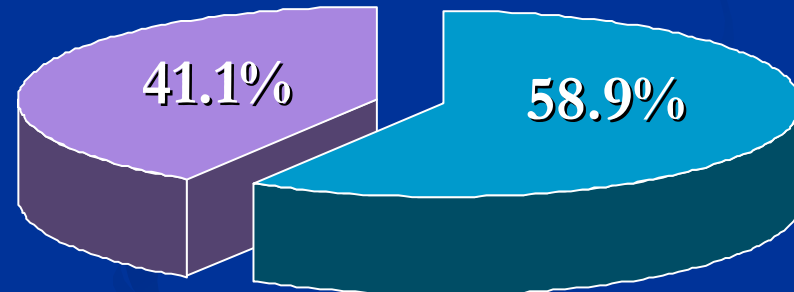
Complex Patients Subset



Cypher

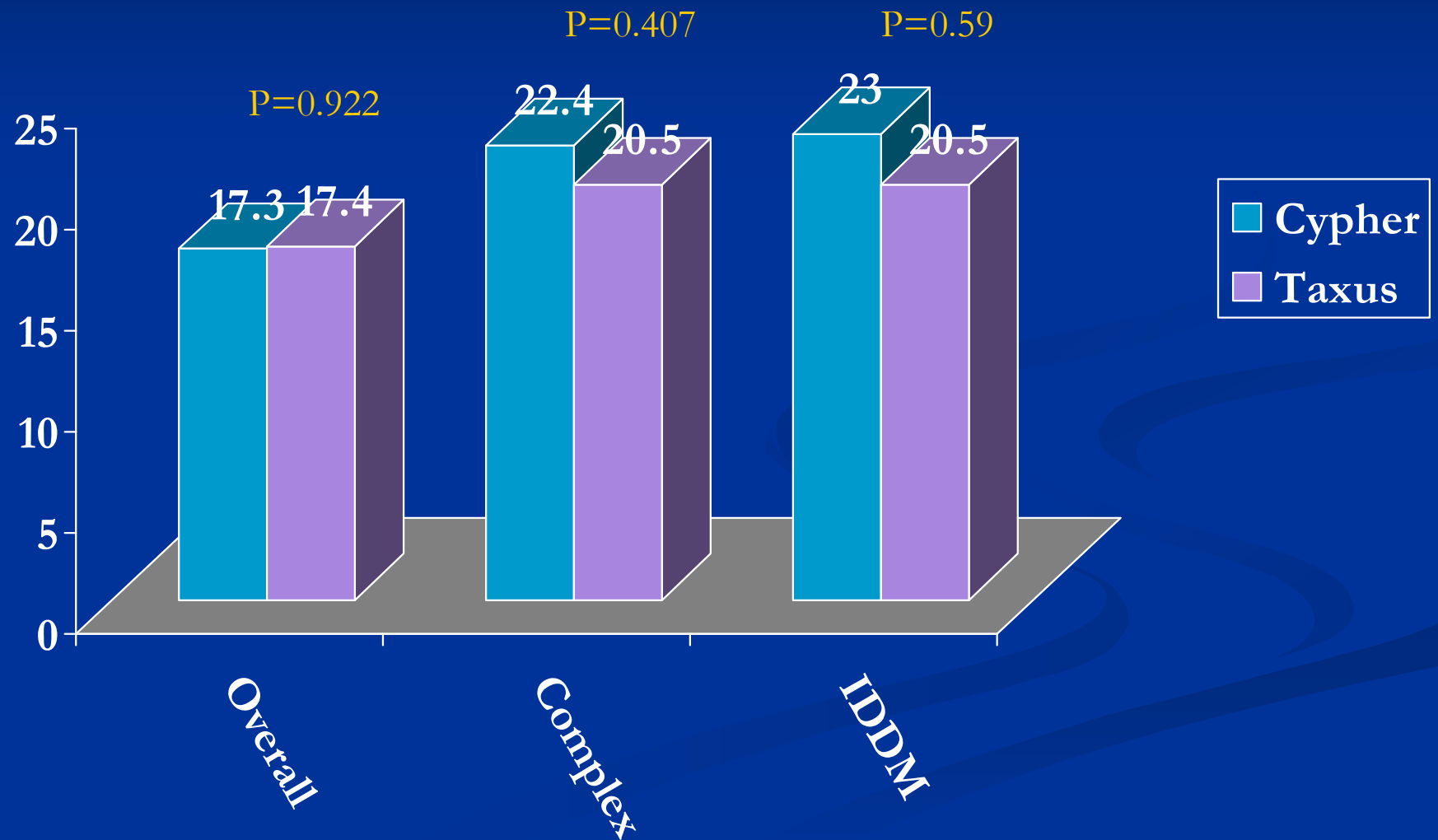


Taxus



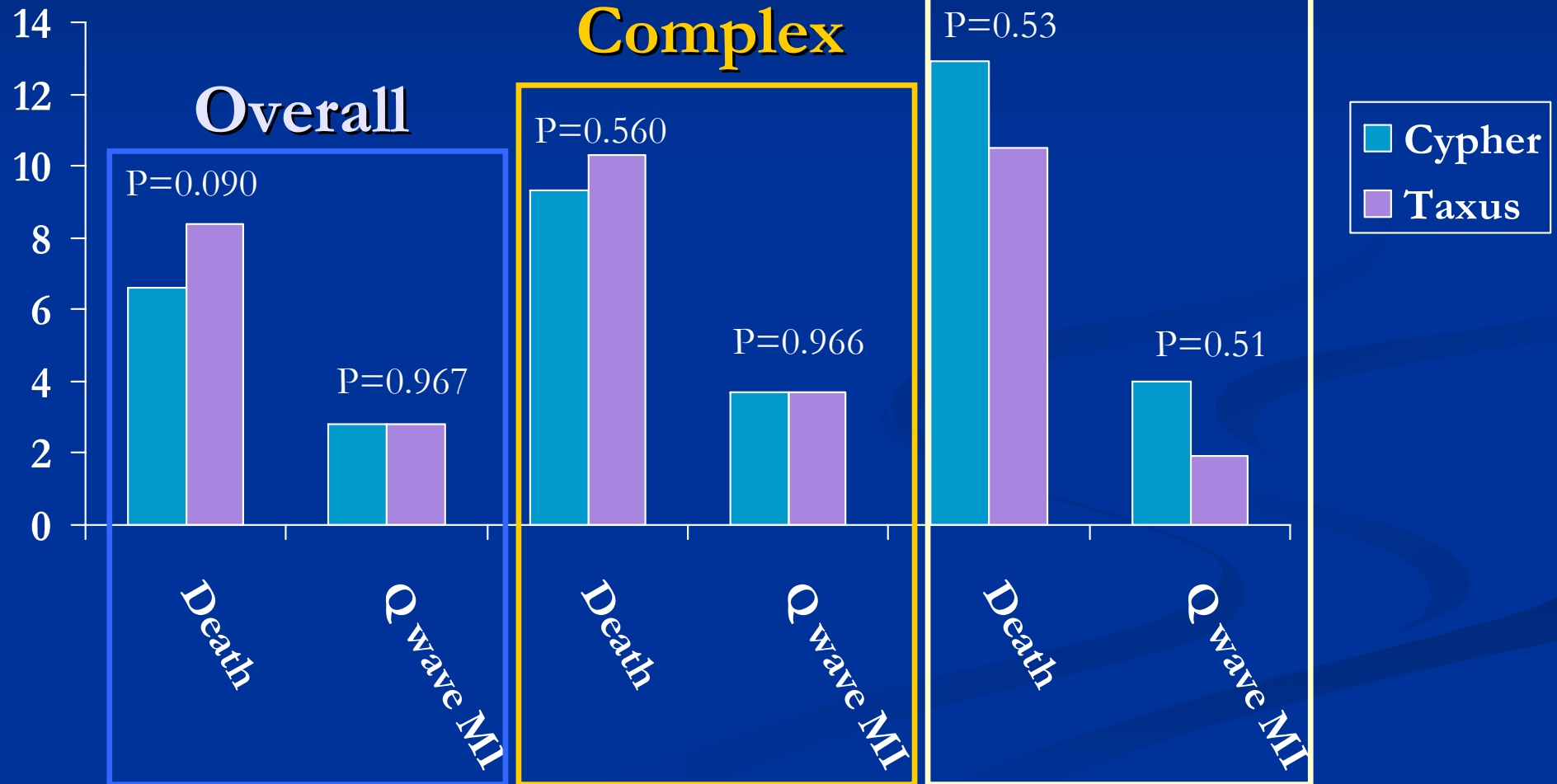
REWARDS

12 Month MACE

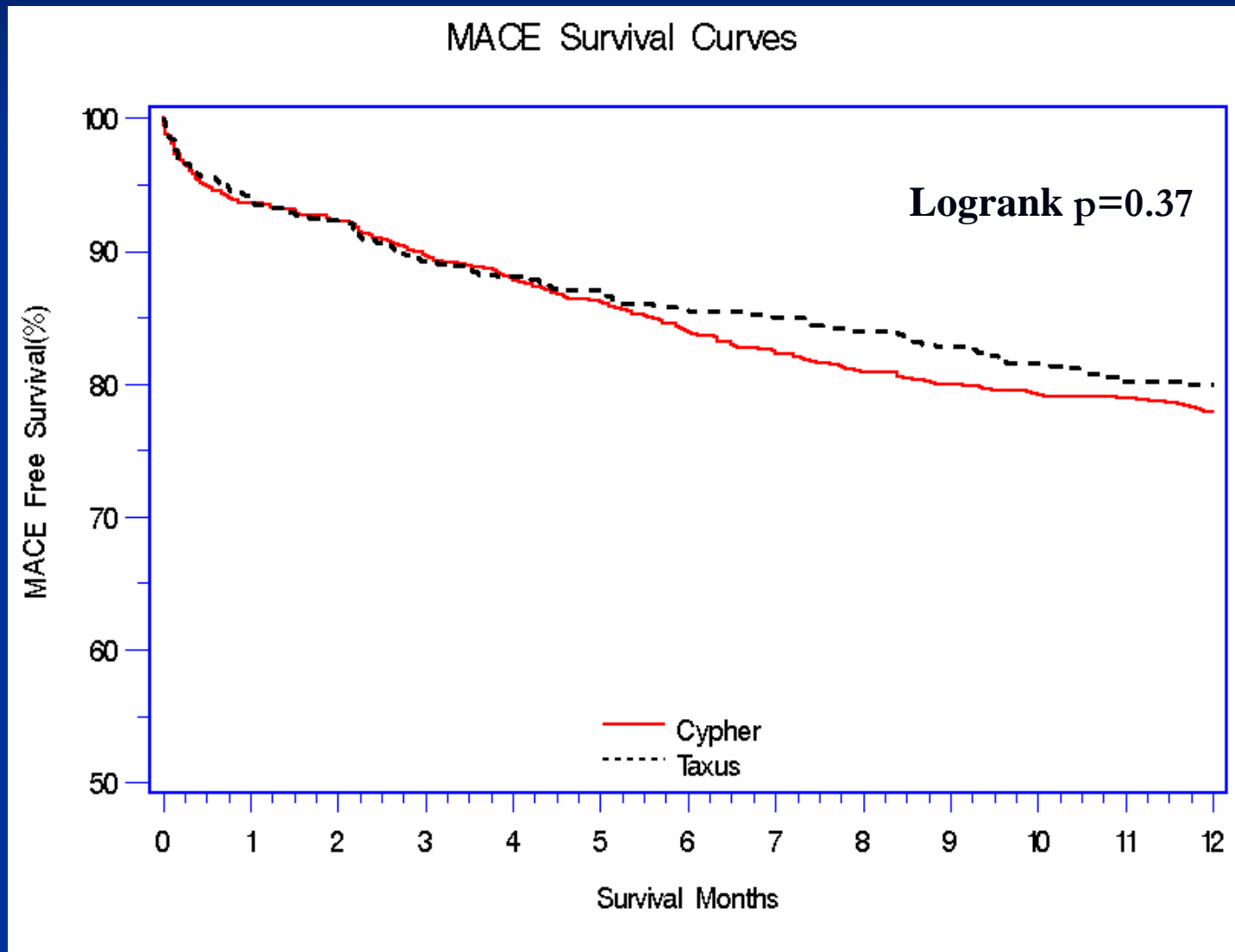


12 Month Clinical Outcomes

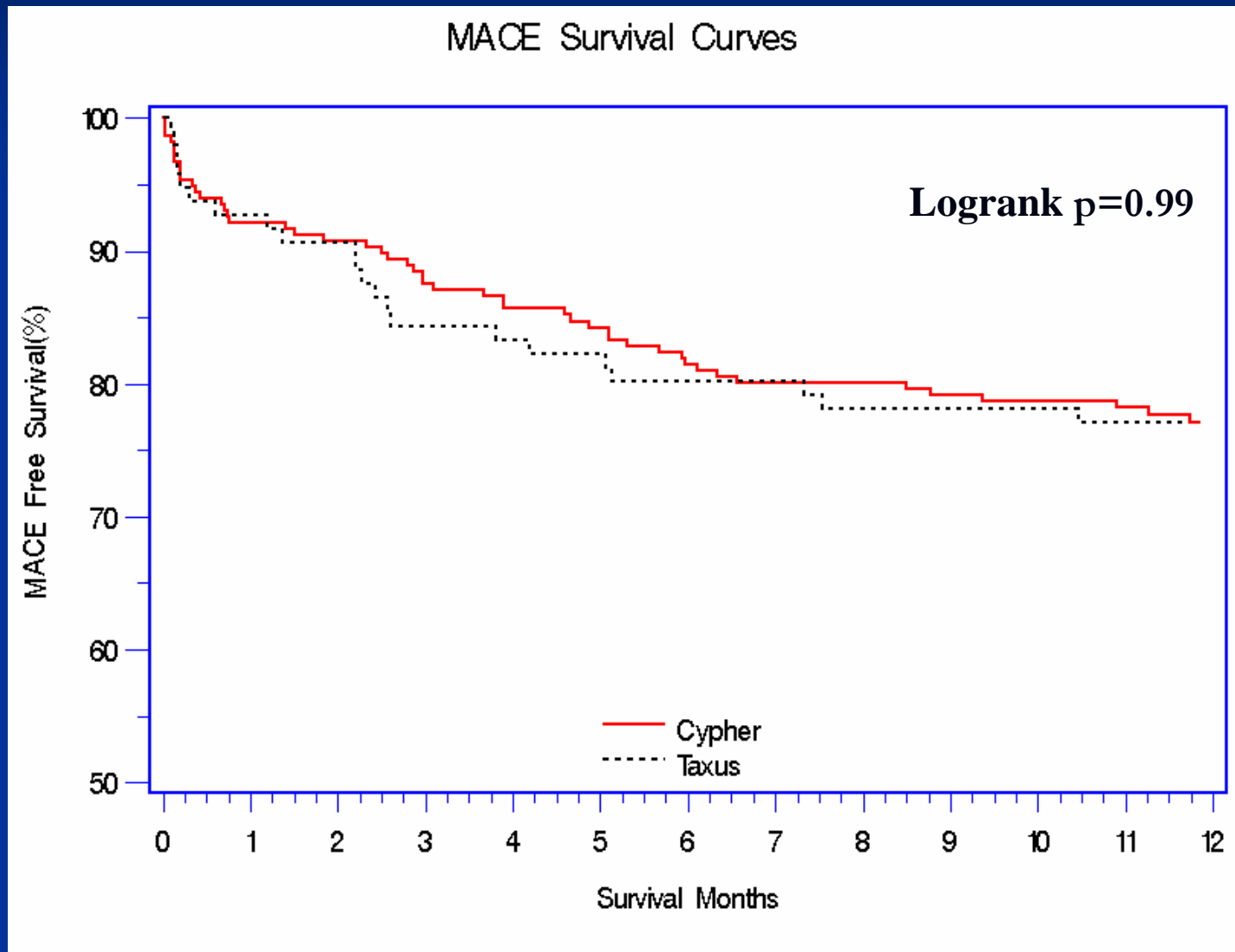
IDDM



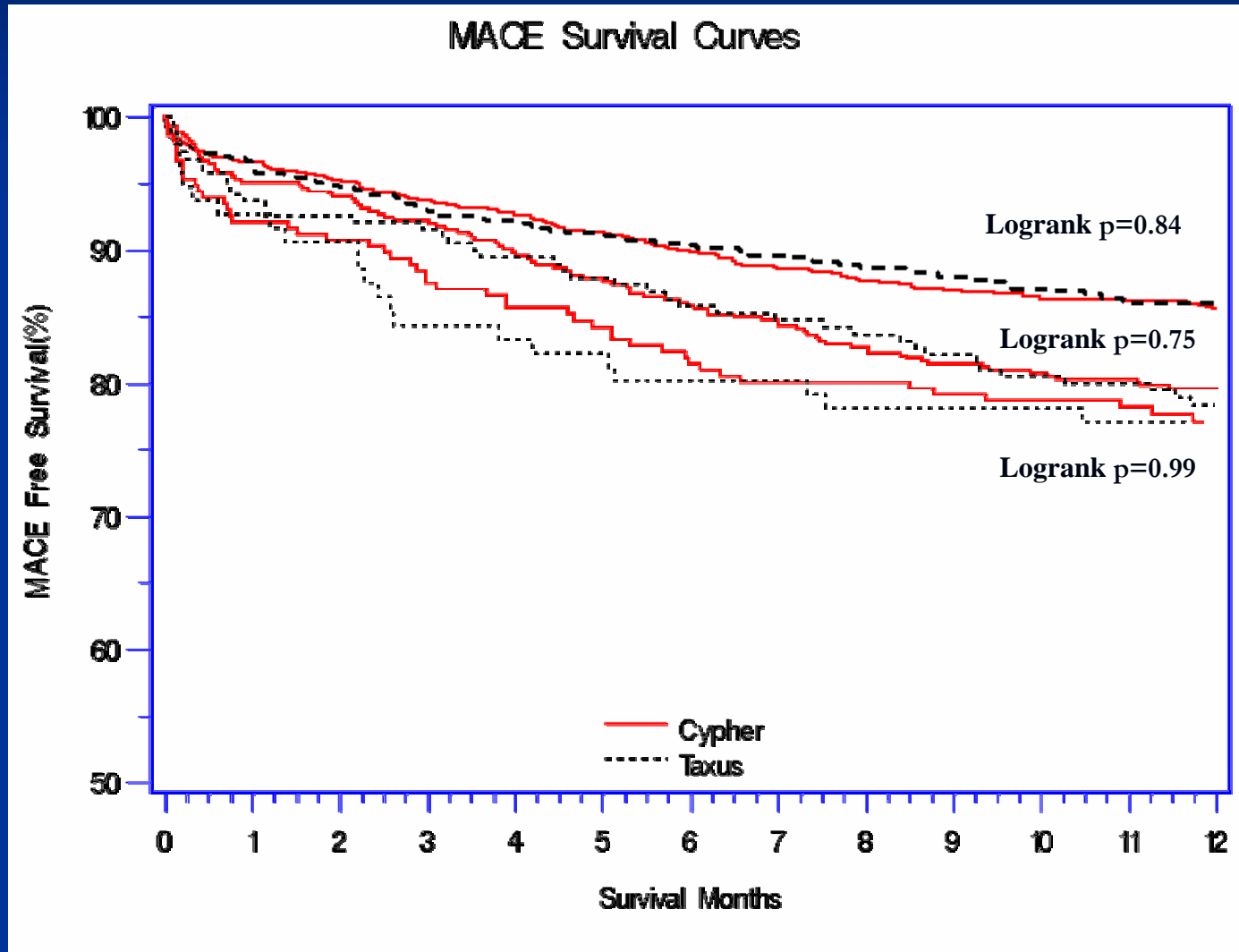
REWARDS K-M Curve - 12 month MACE Complex Patient Subset



REWARDS K-M Curve - 12 month MACE IDDM Patients

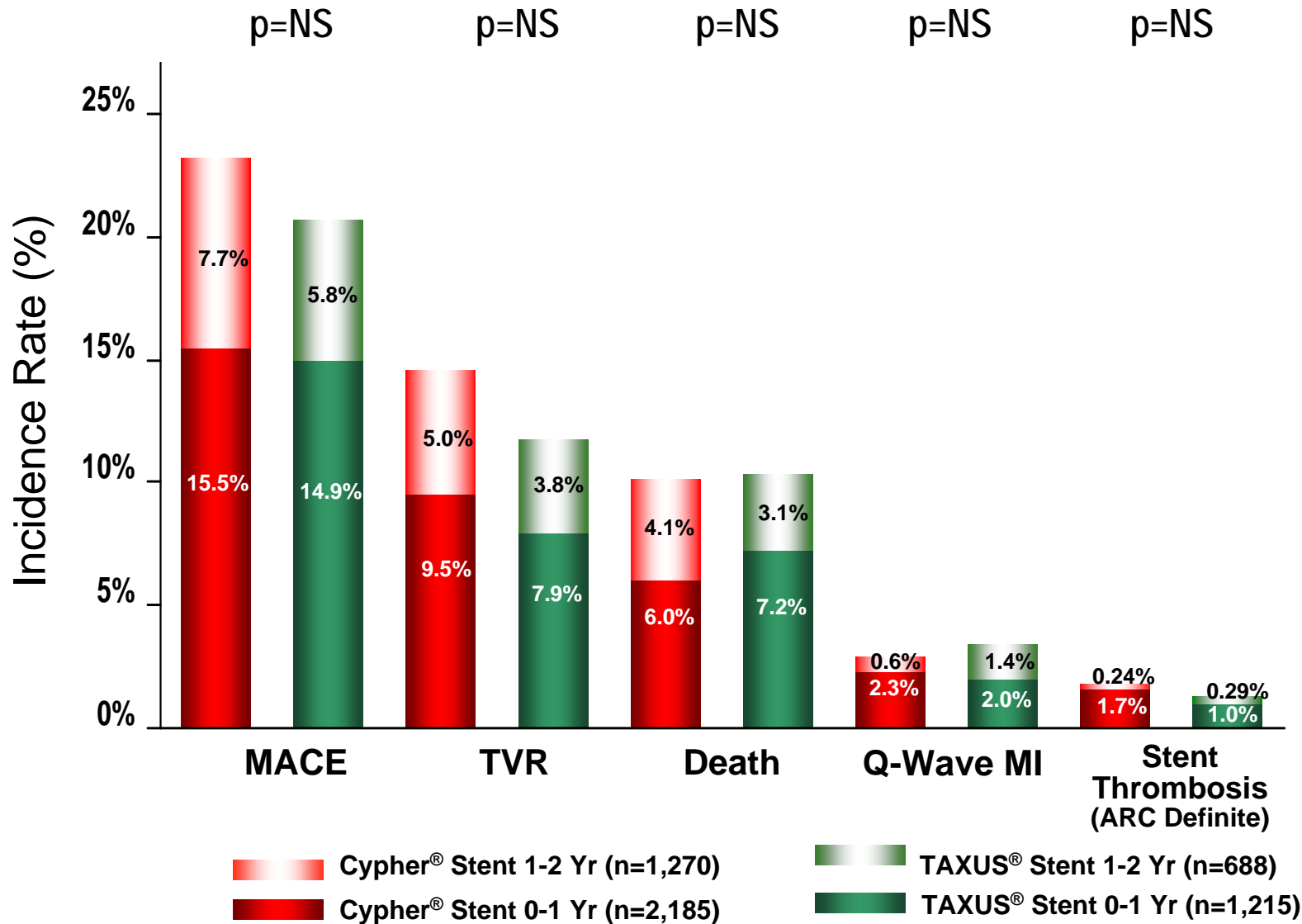


K-M Curve - 12 month MACE



} No DM
← NIDDM
← IDDM

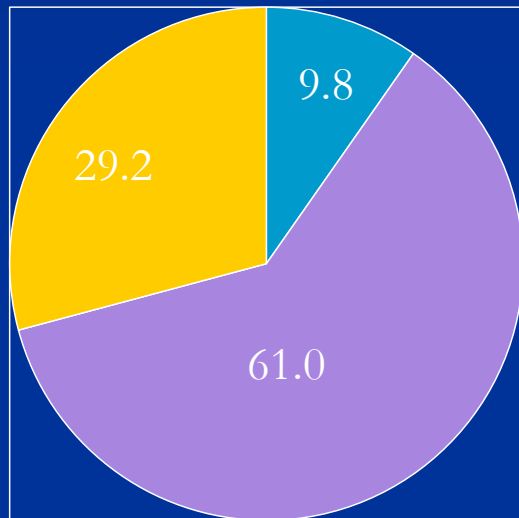
REWARDS 2-Years



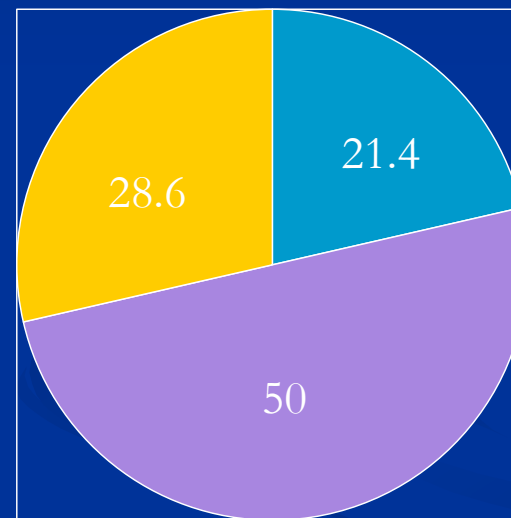
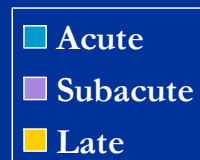
Adapted from Dr. Probal Roy, ACC 2007.

The safety and effectiveness of the TAXUS® Express® Stent as used in labeled indications have not been established in patients for longer than 12 months. VLST not reported.

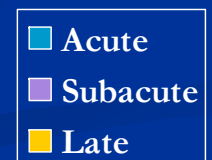
Results- Stent thrombosis



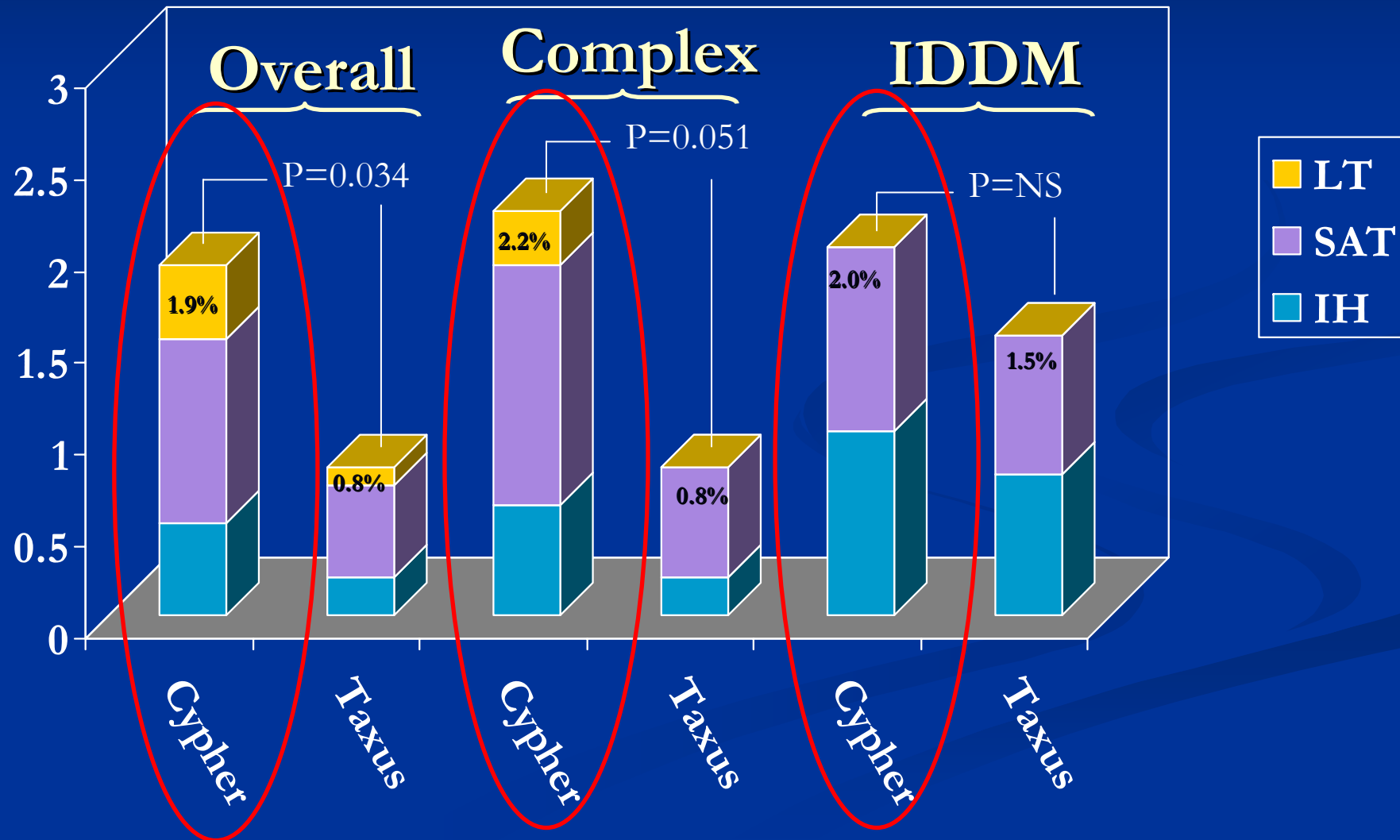
SES (n=41)



PES (n=14)

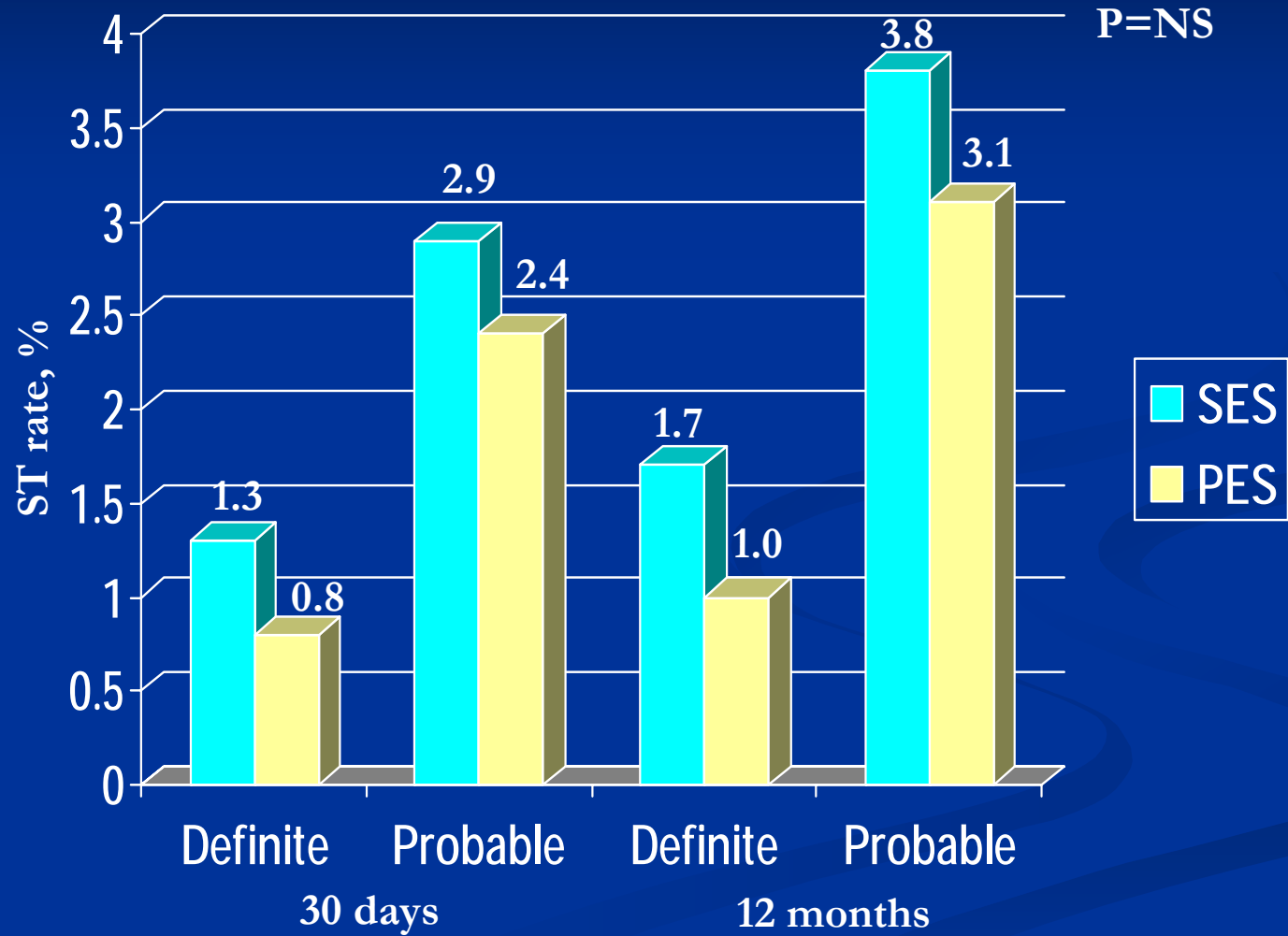


12 Month Cumulative Stent Thrombosis



REWARDS

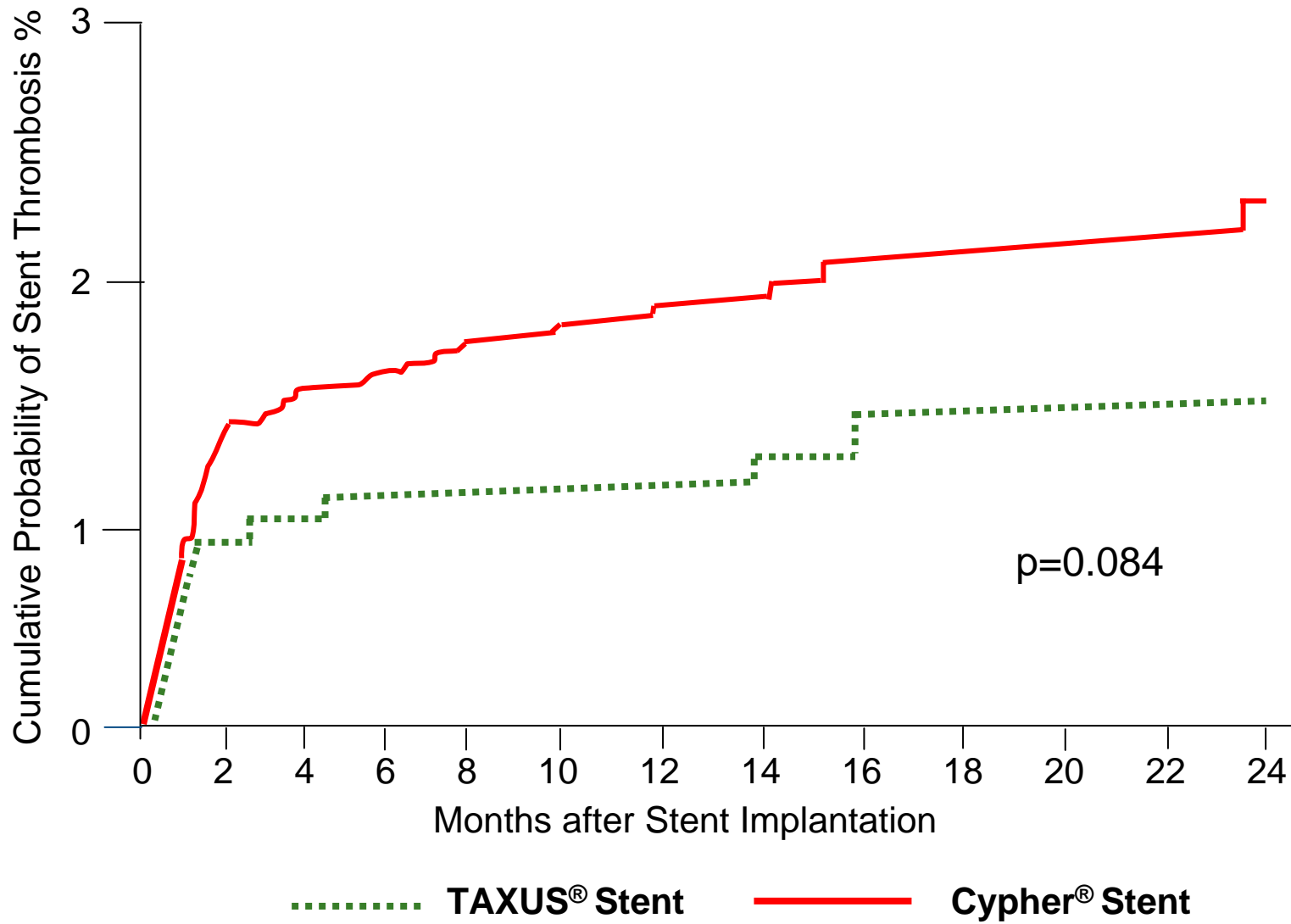
Stent thrombosis 2 YEARS



Stent thrombosis

<u>Definite ST</u>	SES (n= 2185)	PES (n=1215)	<u>P</u>
30 days	29 (1.3)	10 (0.8)	NS
1 year-cumulative	38 (1.7)	12 (1.0)	NS
	(n= 1270)	(n=688)	
1-2 years	3 (0.24)	2 (0.29)	NS
<u>Probable ST</u>	(n= 2185)	(n=1215)	
30 days	63 (2.9)	29 (2.4)	NS
1 year-cumulative	83 (3.8)	38 (3.1)	NS
	(n= 1270)	(n=688)	
1-2 years	3 (0.24)	3 (0.44)	NS

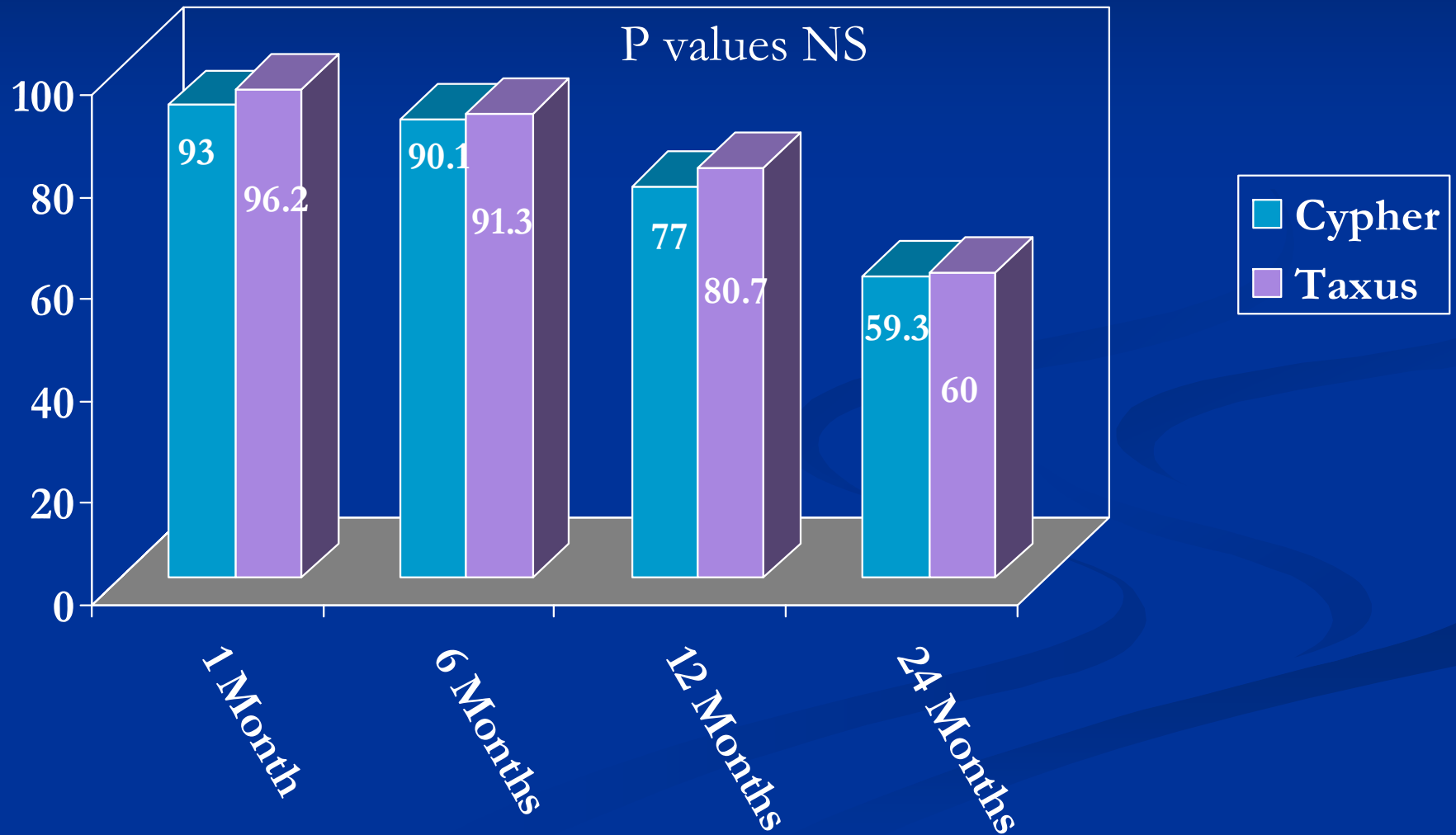
REWARDS 2-Years Stent Thrombosis (ARC Definite + Probable)



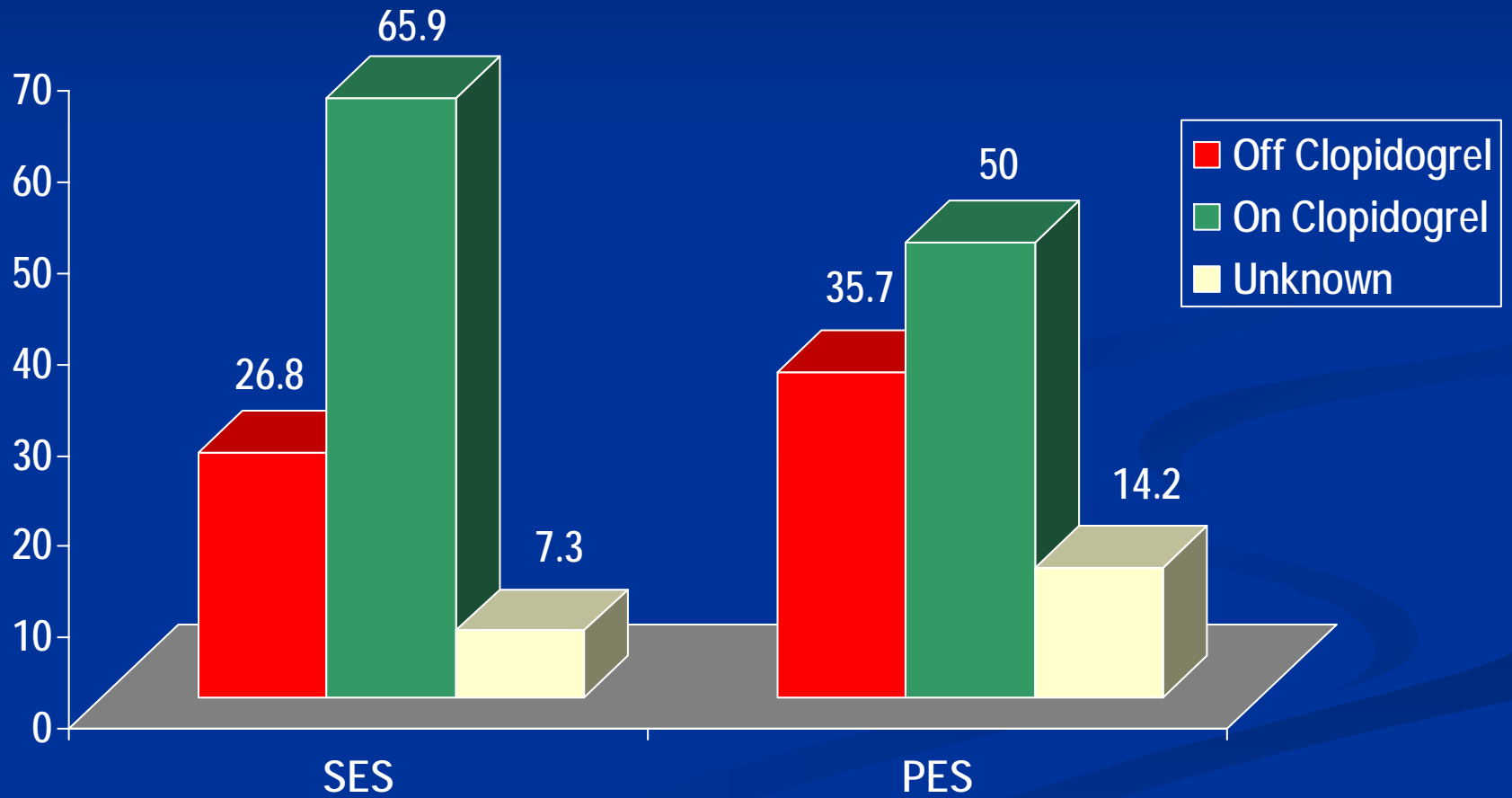
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The safety and effectiveness of the TAXUS® Express® Stent as used in labeled indications have not been established in patients for longer than 12 months. VLST not reported.

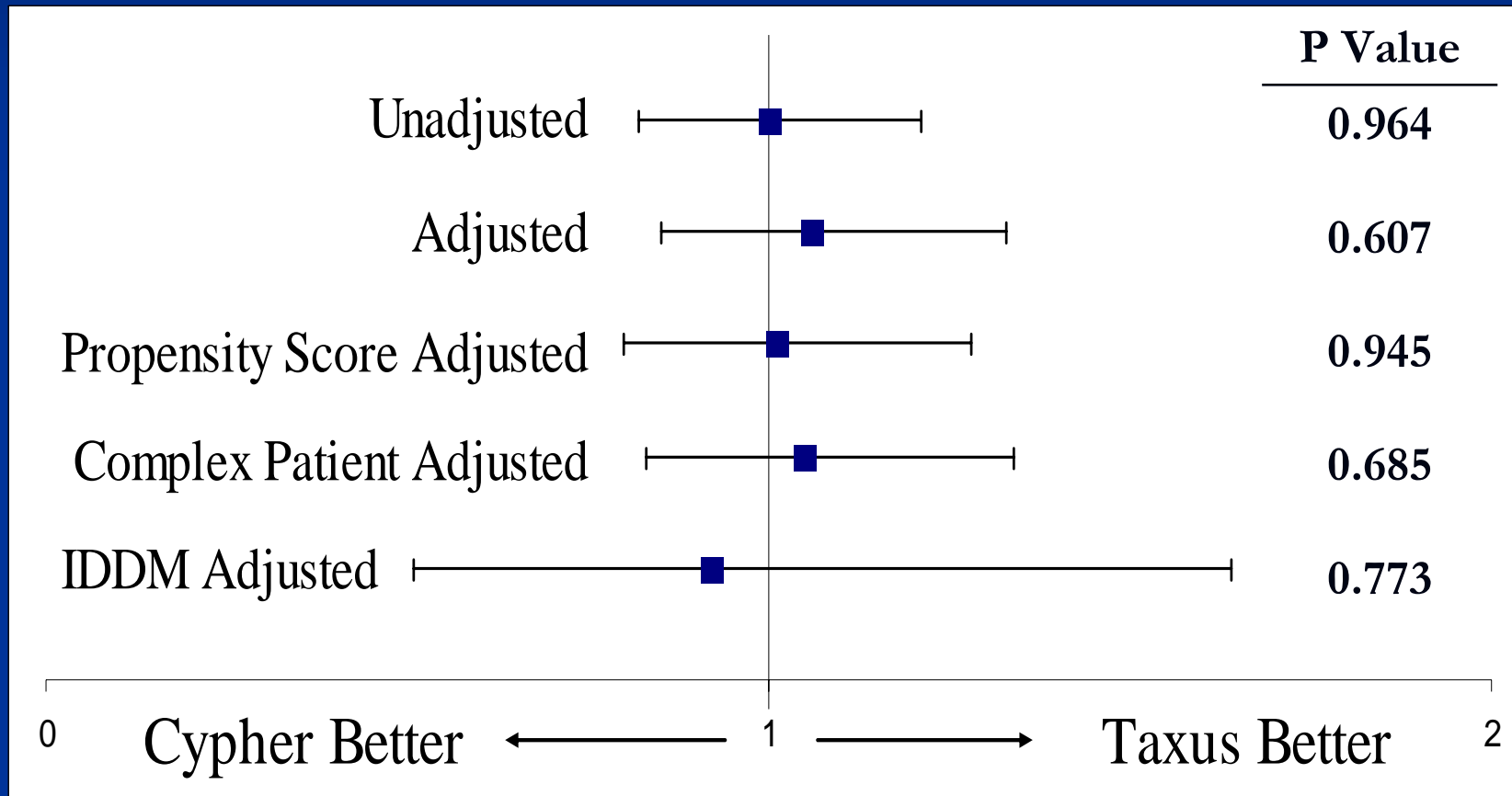
Clopidogrel Compliance



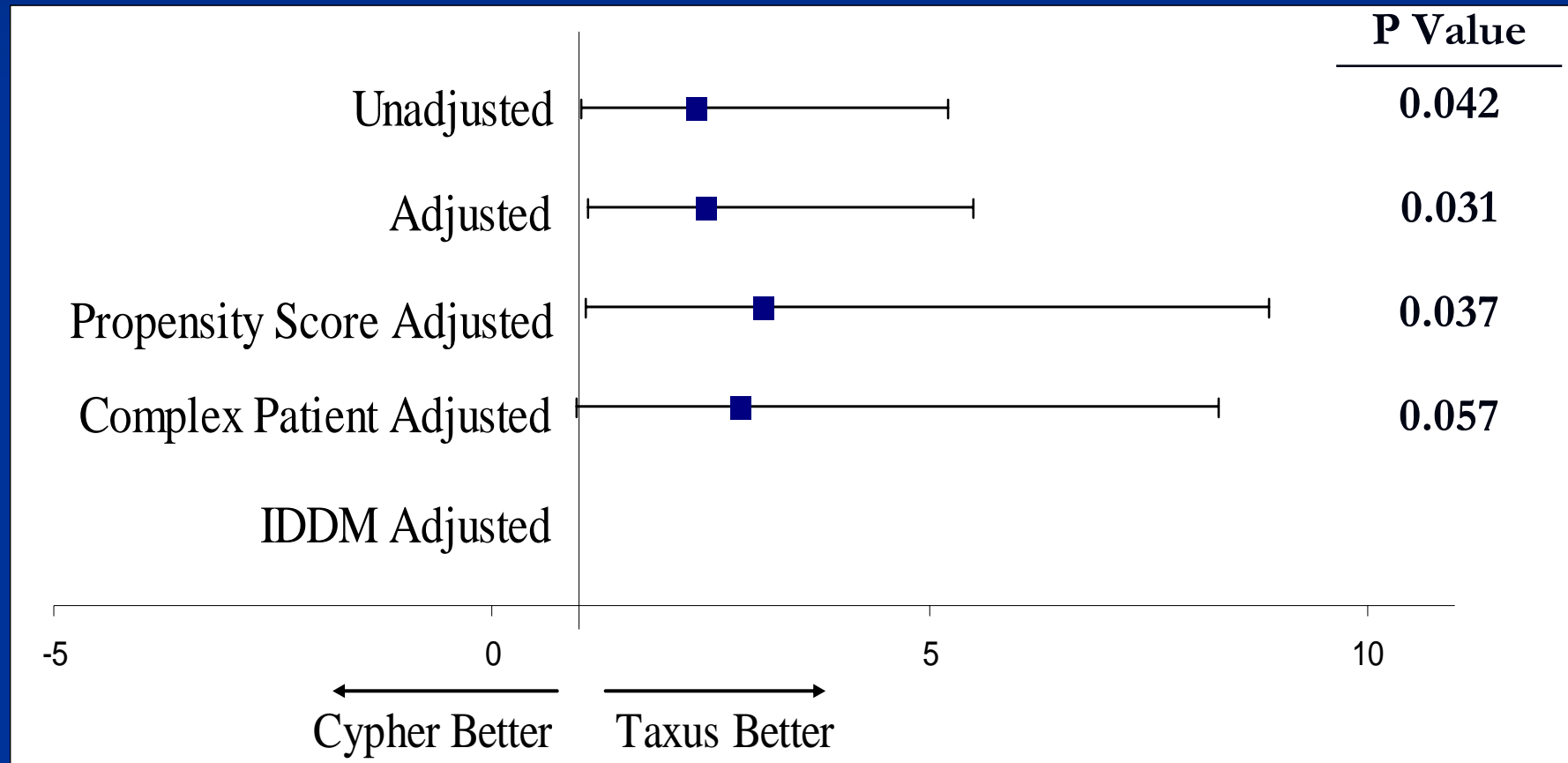
Results- Clopidogrel Compliance at time of Stent Thrombosis



Hazard Ratios 12 month MACE



Hazard Ratios 12 month Cumulative Stent Thrombosis

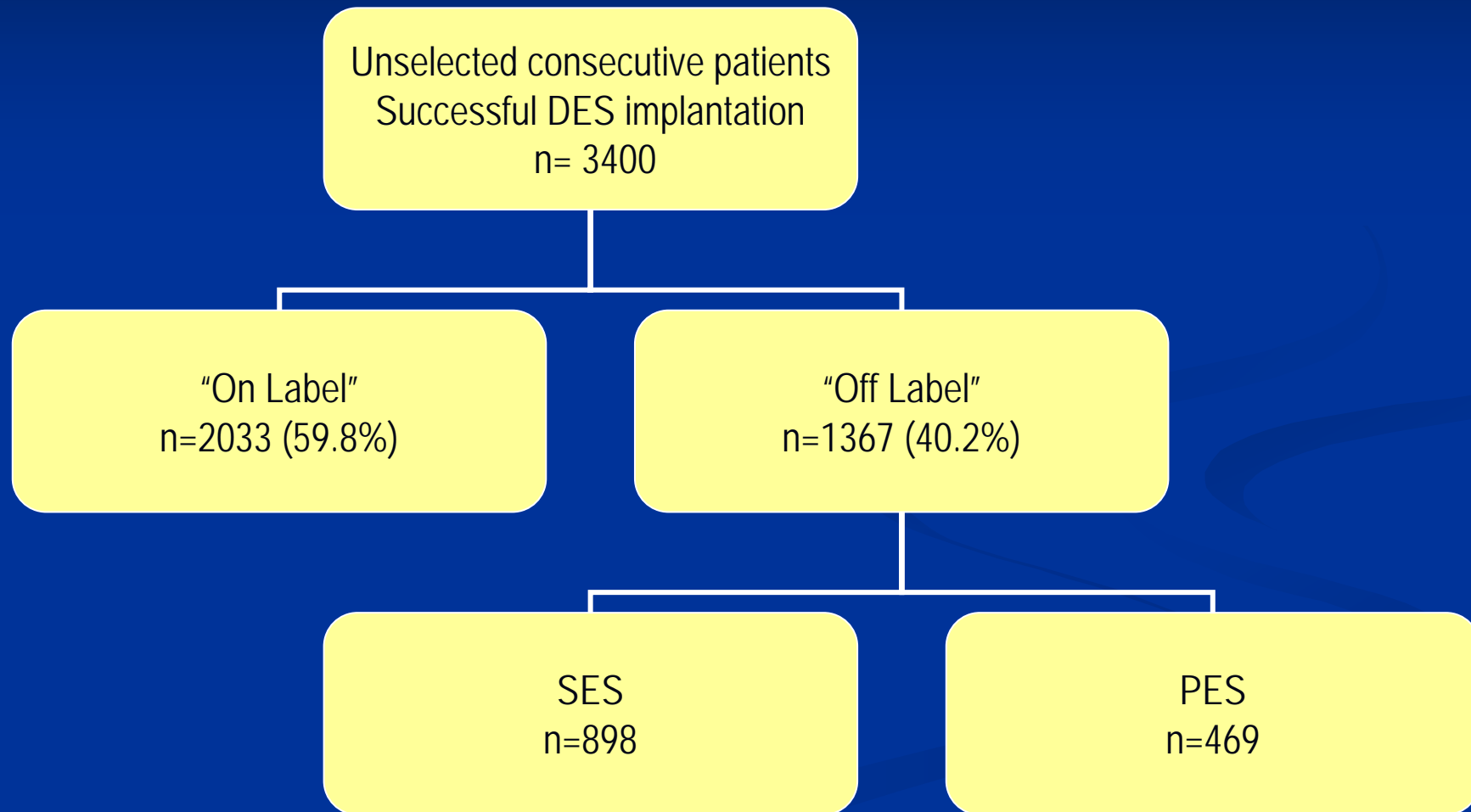


Results- "Off Label" Utilization

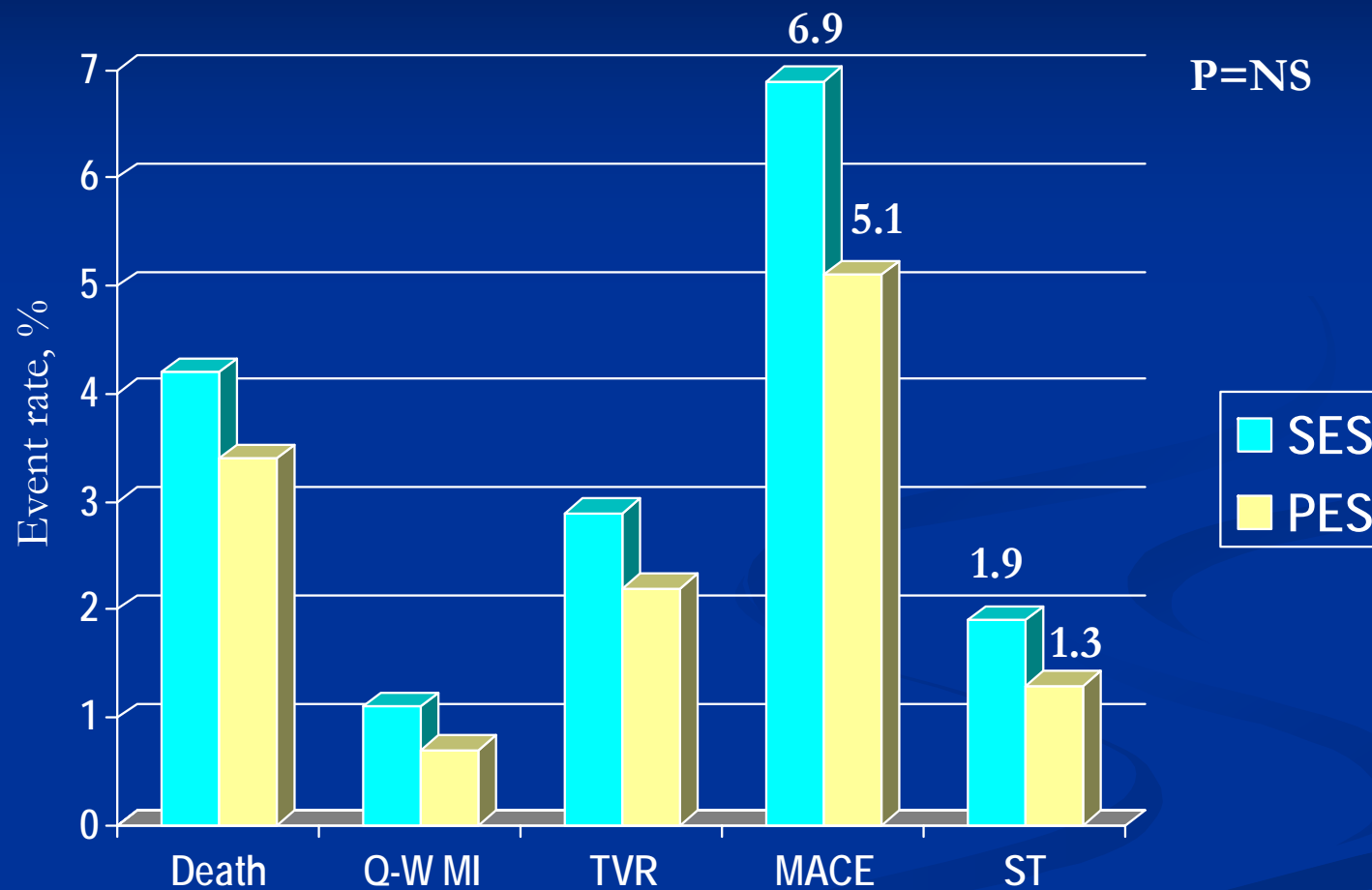
Definition-

- total stented length >33mm
- in-stent restenotic lesions
- bypass graft lesions
- use of >2 stents, >2 overlapping stents
- acute MI
- unprotected left main coronary artery lesion
- ostial lesion

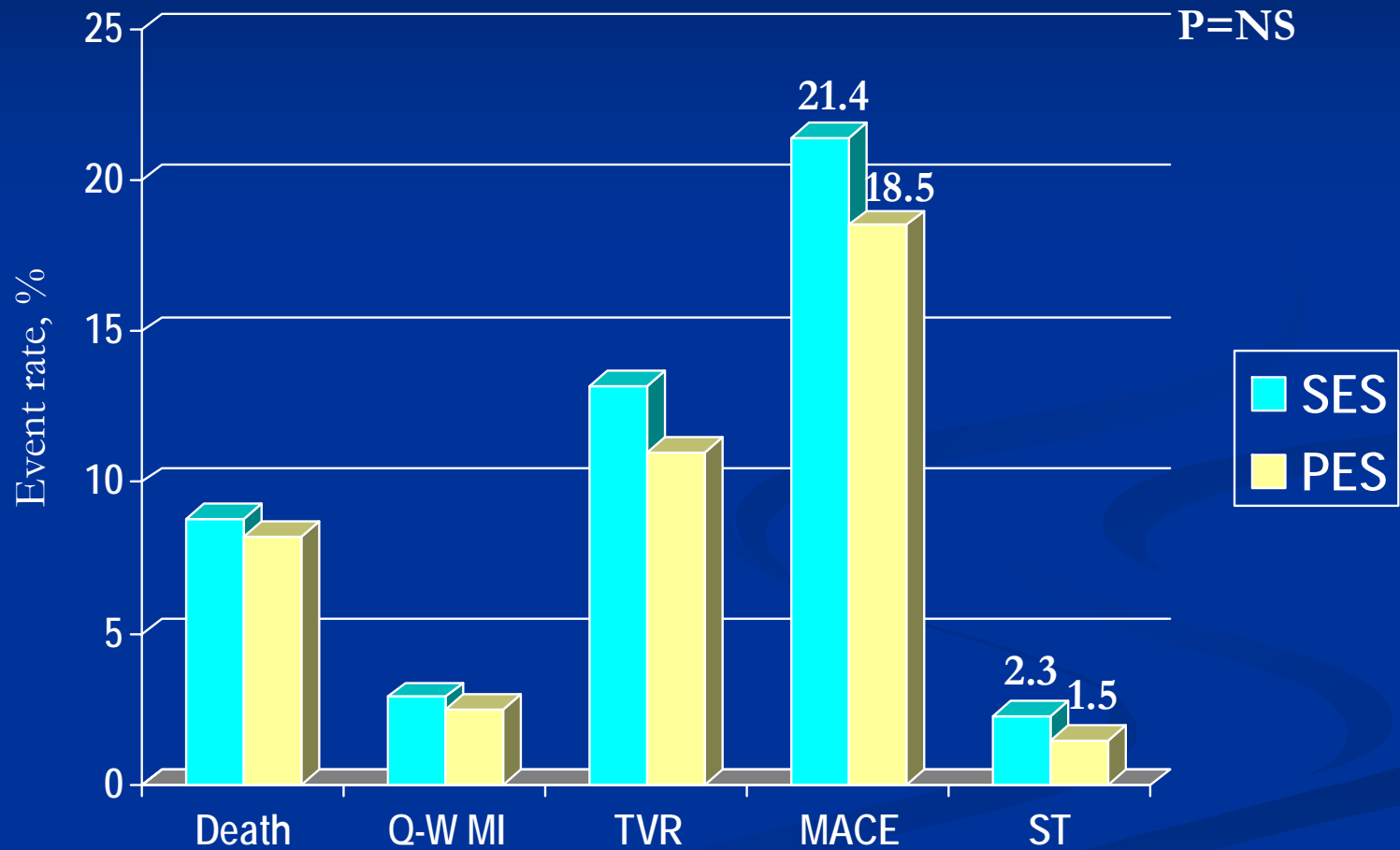
Results- "Off Label" Utilization



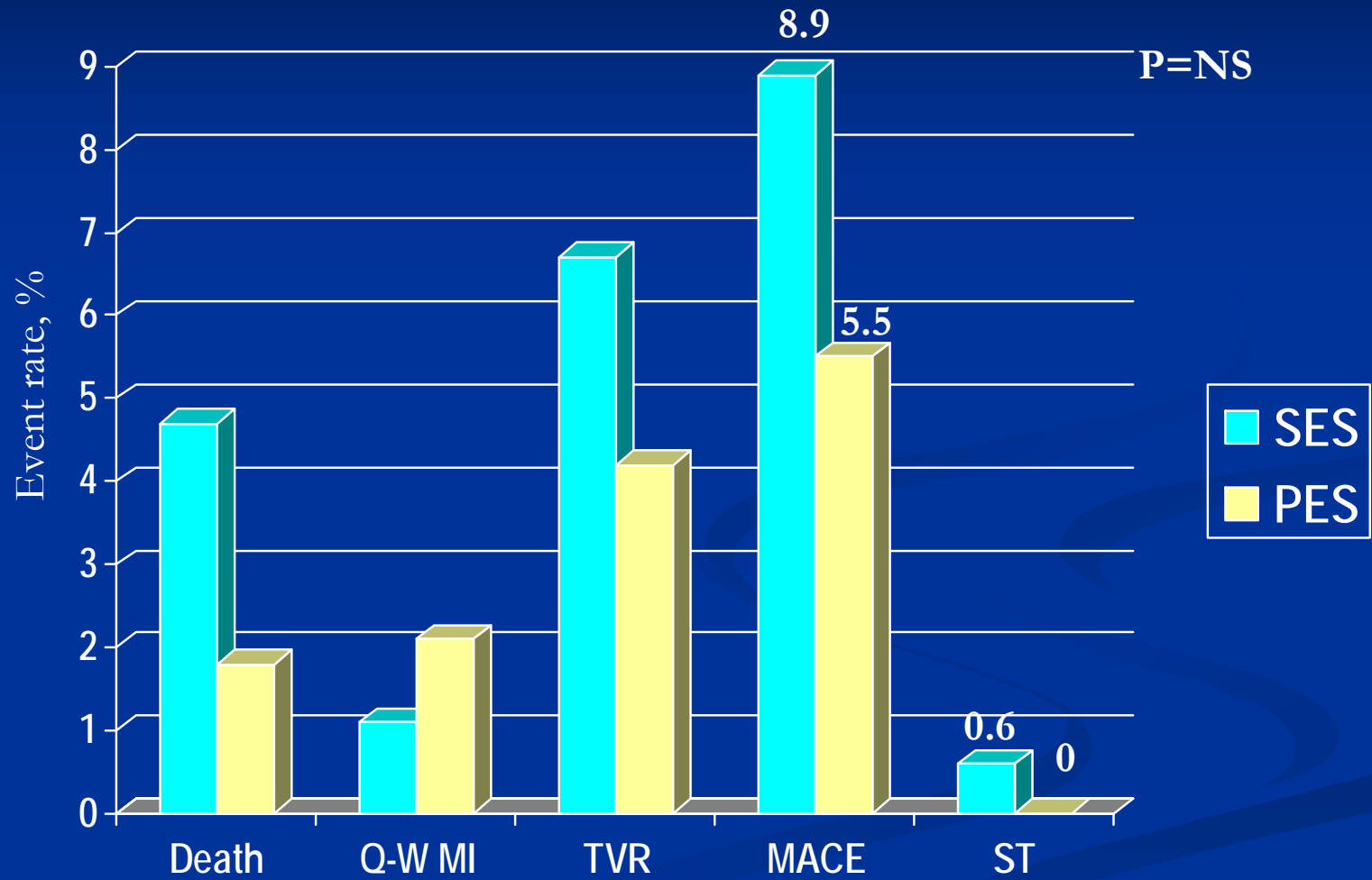
Results- "Off Label" Utilization: 30 day outcomes



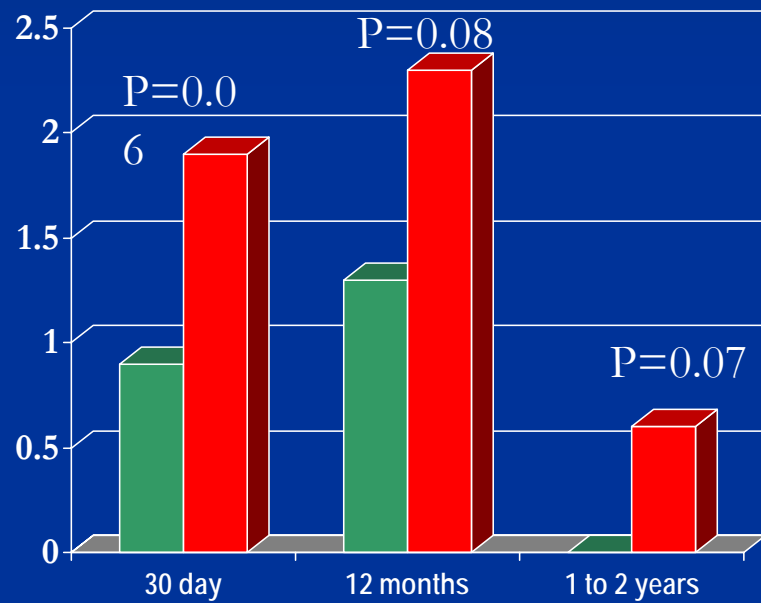
Results- "Off Label" Utilization: 12 month outcomes



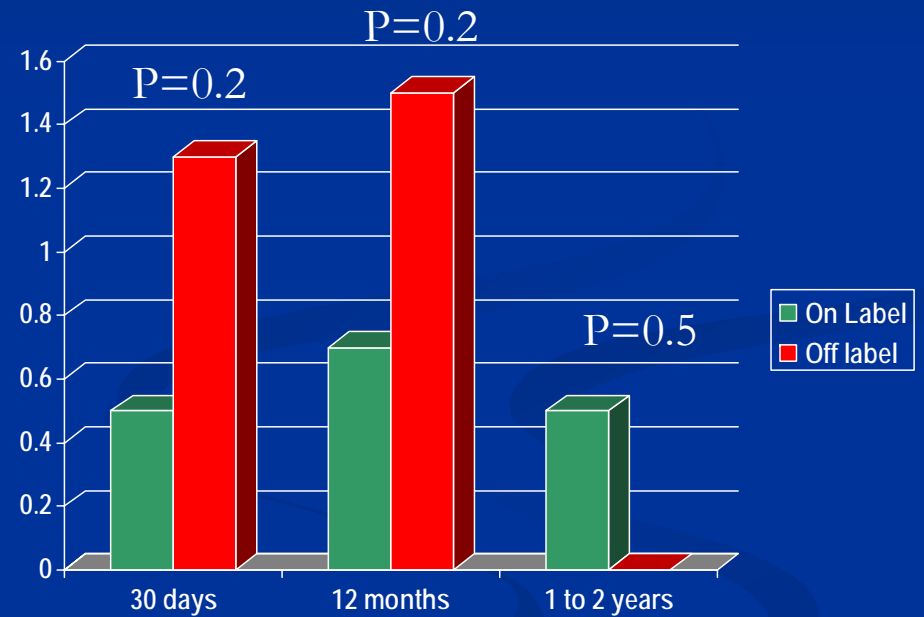
Results- "Off Label" Utilization: Event rates between 1 and 2 years



Stent Thrombosis- "Off Label" versus "On Label"



SES



PES

In an unselected patients population and lesions receiving DES there was no significant difference between patients receiving Cypher or Taxus stents with respect to MACE at 2 year.

This similarity remained after adjustment for characteristic differences and propensity score

Stent thrombosis, however, was significantly higher in patients receiving Cypher than Taxus stents at 1 year. This significance remained after adjustment and may attributed to differences in Plavix intake.

Conclusions

- The present study demonstrates that the unrestricted use of SES and PES in a non-selected population was associated with comparable clinical outcomes. Both stent types were efficacious in reducing repeat revascularization.
- There was no difference in rates of ST between SES and PES.
- Stent thrombosis (1.5% at one year and 0.26% between 1 and 2 years for the entire DES cohort) remains a serious concern for both stent types.