ESTRATEGIAS CONTEMPORANEAS PARA LA PREVENCION Y MANEJO DE LA TROMBOSIS DEL STENT

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ESTRATEGIAS CONTEMPORANEAS PARA LA PREVENCION Y MANEJO DE LA TROMBOSIS DEL STENT

Academic Research Consortium (ARC)

Standardized Definitions for ST

- **Definite/Confirmed**
  - Acute coronary syndrome AND
  - Angiographic confirmation of thrombus or occlusion OR
  - Pathologic confirmation of acute thrombosis
- **Probable**
  - Unexplained death within 30 days
  - Target vessel MI without angiographic confirmation of thrombosis or other identified culprit lesion
- **Possible**
  - Unexplained death after 30 days

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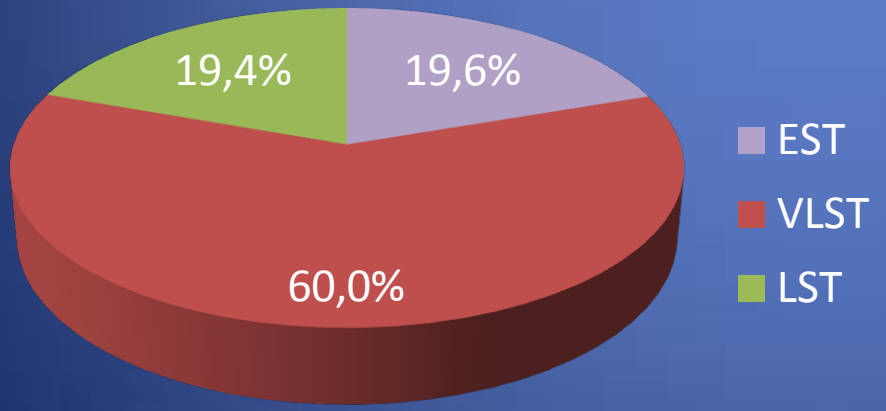
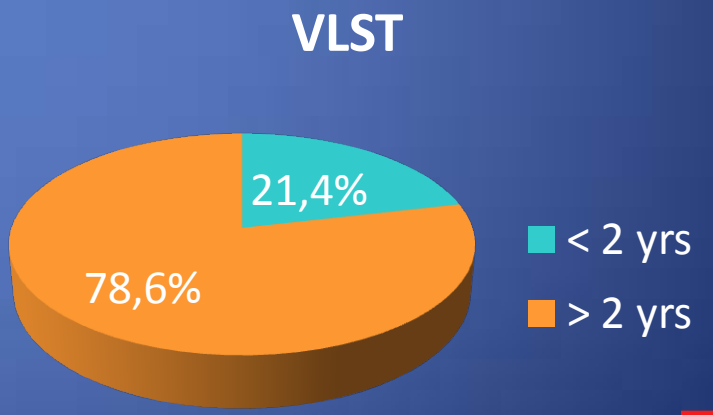
CathPCI Registry

- 1000 centers across the USA
- Feb 2009 to June 2010
- 7,315 from 585,123(1.8%)

STENT THROMBOSIS



VLST



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Eventos adversos secundarios a la ST

Table 3. In-Hospital Outcomes of Patients With ST

	Early ST	Late ST	Very Late ST	p Value
Death	110 (7.9)	52 (3.8)	155 (3.6)	<0.001
Stroke	14 (1.0)	3 (0.2)	11 (0.3)	<0.001
Bleeding event within 72 h	74 (5.4)	43 (3.2)	154 (3.6)	0.003

Values are n (%).
ST = stent thrombosis.

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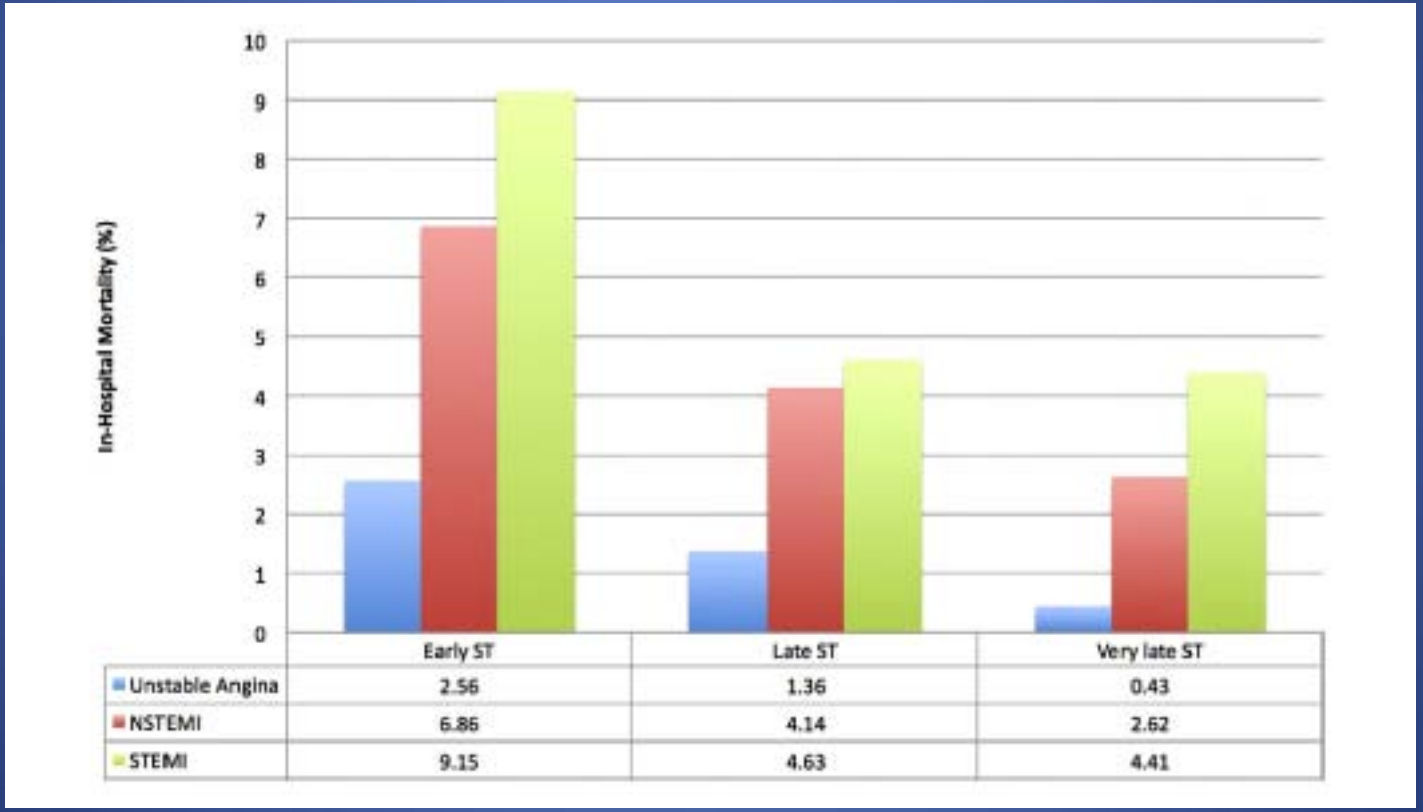
Mortality according to presentation



	Early ST	Late ST	Very late ST
Unstable Angina	2.56	1.36	0.43
NSTEMI	6.86	4.14	2.62
STEMI	9.15	4.63	4.41

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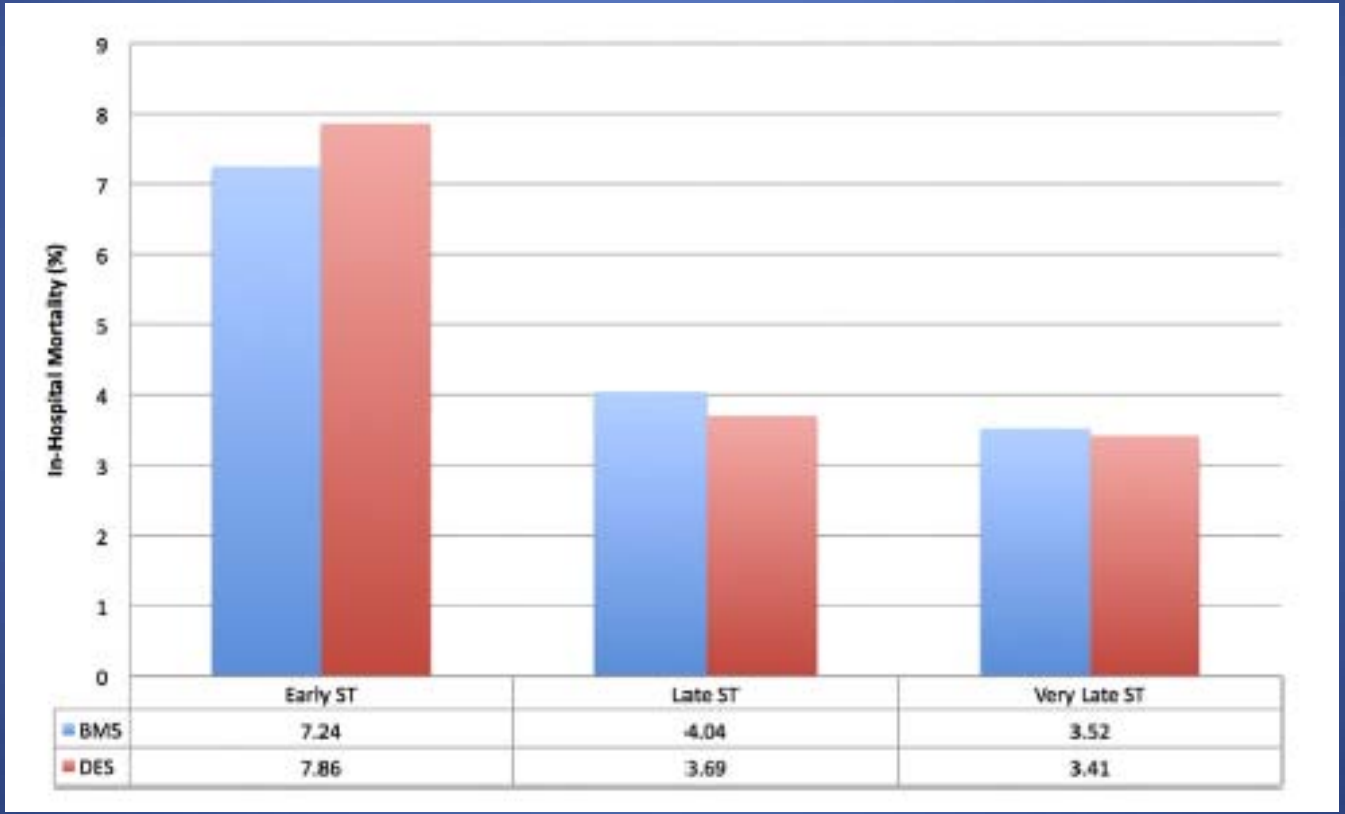
Mortality according to Stent type



	Early ST	Late ST	Very Late ST
BMS	7.24	4.04	3.52
DES	7.86	3.69	3.41

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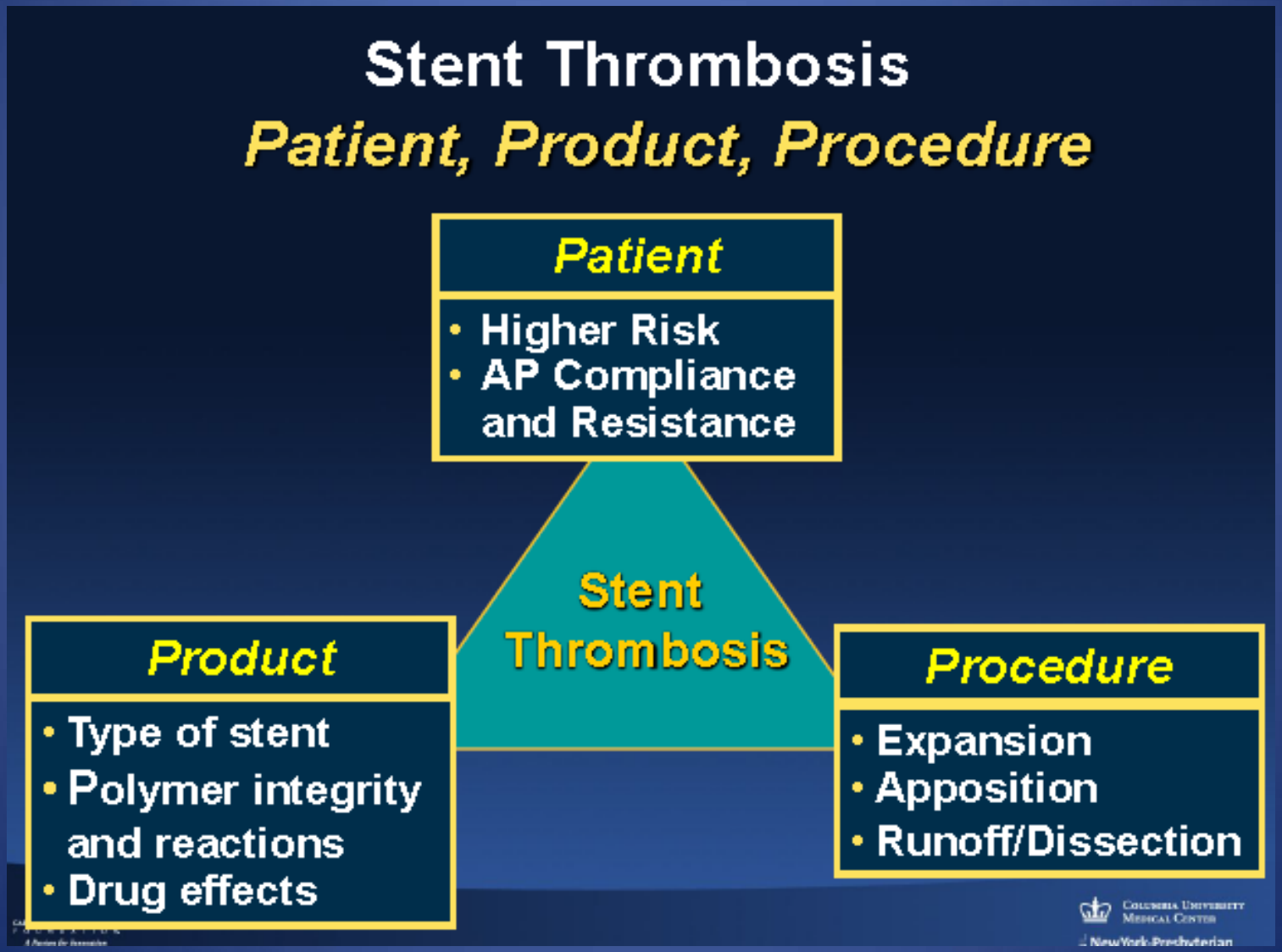

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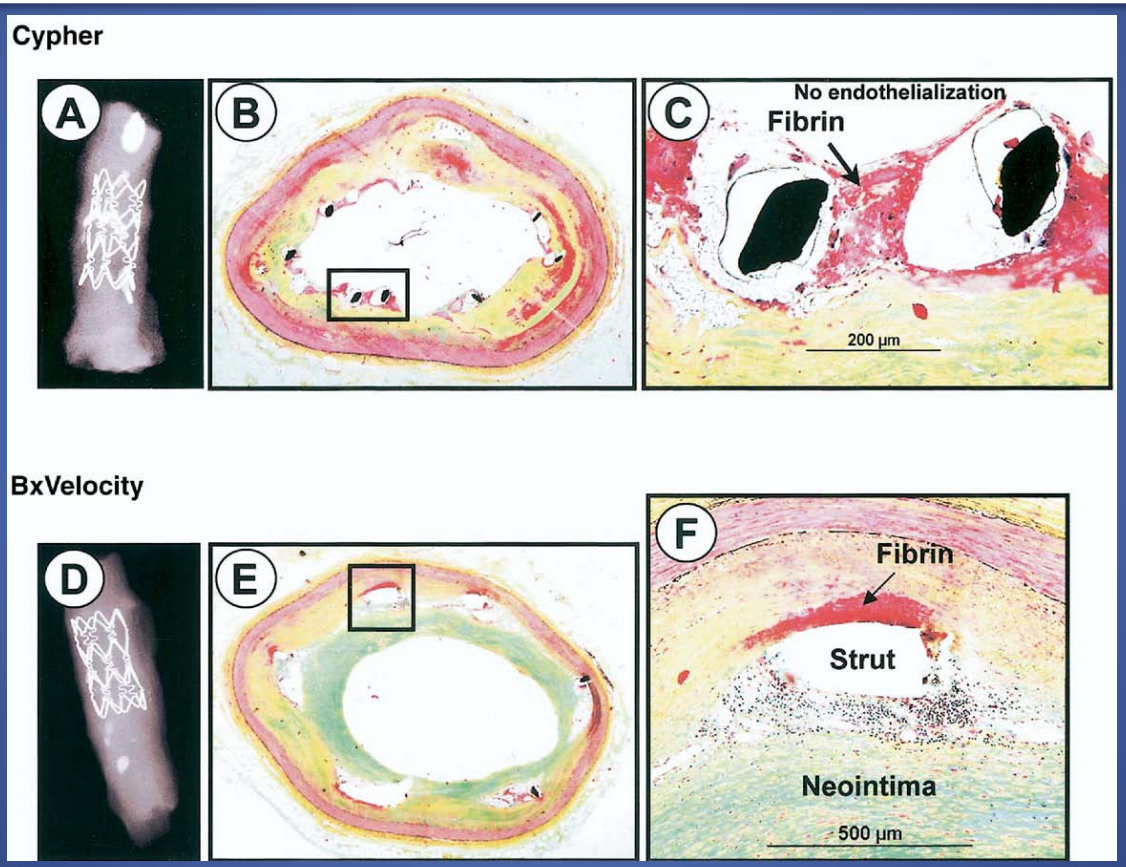
Características Patológicas Asociadas a la TS

CARACTERISTICA
Cicatrización retardada
- Deposición persistente de fibrina
- Pobre endotelización
Reacción local de hipersensibilidad
Stent en bifurcación u ostial
Falta de adhesión a la pared (malapposition)
Reestenosis
Penetración de celdillas al núcleo necrótico

ESTRATEGIAS CONTEMPORANEAS PARA LA PREVENCION Y MANEJO DE LA TROMBOSIS DEL STENT

Características Patológicas Asociadas a la TS



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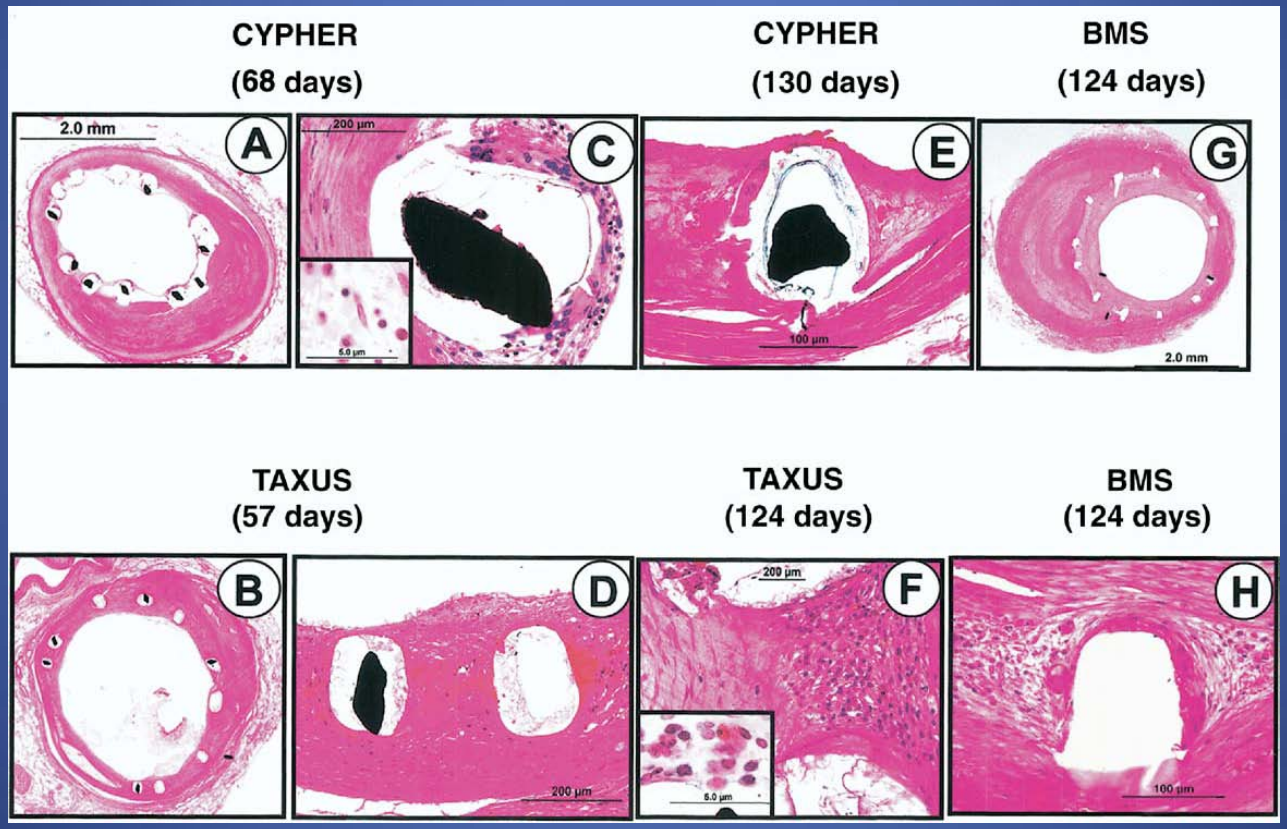
Características Patológicas Asociadas a la TS



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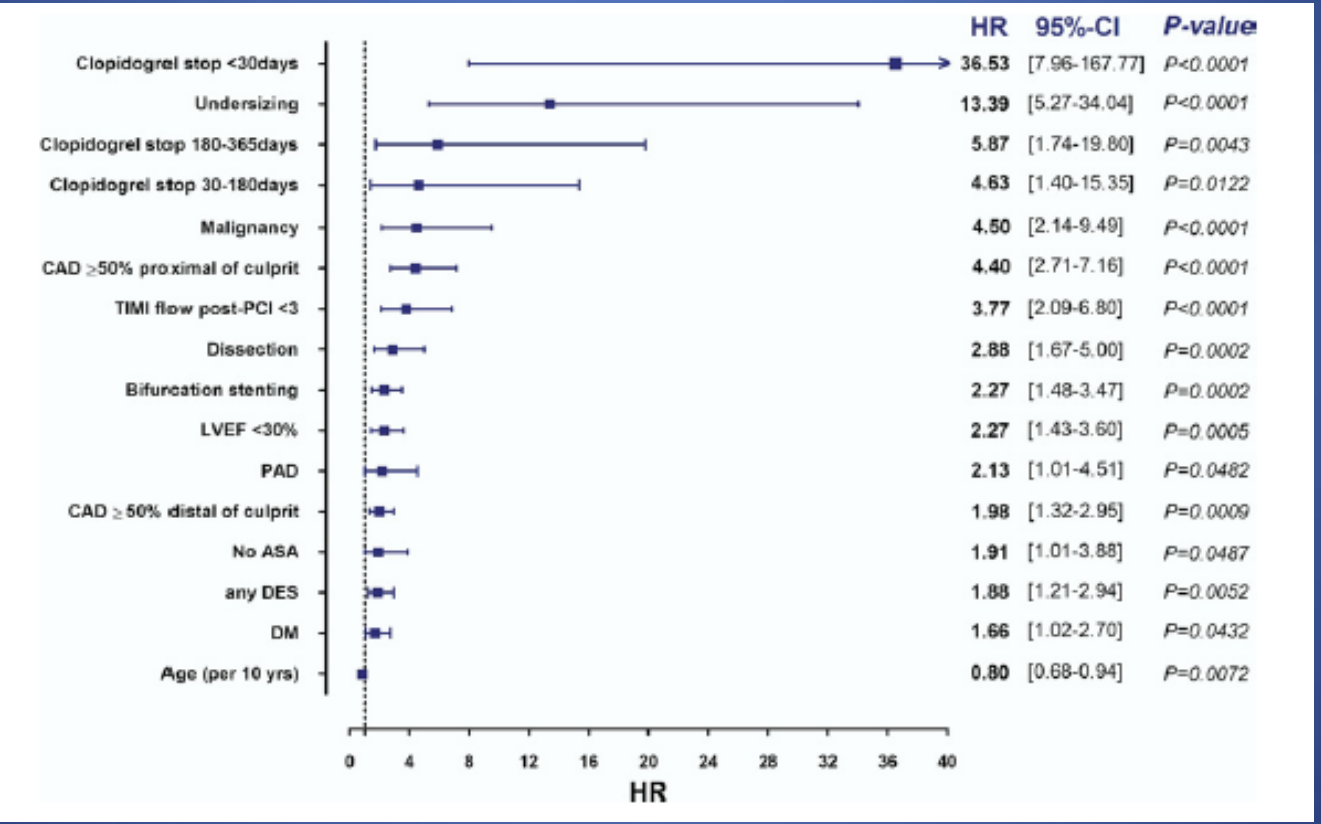
Predictores Clínicos de Trombosis del Stent



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ESTRATEGIAS CONTEMPORANEAS PARA LA PREVENCION Y MANEJO DE LA TROMBOSIS DEL STENT

Hallazgos de IVUS en TS

	ST (n = 18)	Control Subjects (n = 36)	p Value
Reference segment			
Mean EEM CSA, mm^2	13.6 ± 3.9	13.7 ± 3.5	0.50
Mean lumen CSA, mm^2	6.9 ± 1.7	6.9 ± 1.8	0.96
Stent segment			
Mean EEM, mm^2	19.4 ± 5.8	15.1 ± 4.6	0.003
Remodeling index	1.24 (1.06–1.43)	0.99 (0.90–1.11)	<0.001
Mean stent CSA, mm^2	7.8 ± 1.6	7.6 ± 1.4	0.42
Minimal stent CSA, mm^2	5.7 ± 1.4	5.9 ± 1.4	0.99
Minimal stent CSA < 4 mm^2	3 (16.7)	3 (8.3)	0.38
Stent expansion index	0.87 ± 0.3	0.91 ± 0.3	0.69
ISA	14 (77.8)	15 (41.7)	0.01
Maximal ISA CSA, mm^2	4.11 ± 2.3	1.16 ± 1.5	0.001

ESTRATEGIAS CONTEMPORANEAS PARA LA PREVENCION Y MANEJO DE LA TROMBOSIS DEL STENT

Hallazgos de TCO en TS

	ST (n = 18 Lesions; 4,407 Struts)	Control Subjects (n = 36 Lesions; 9,064 Struts)	p Value
Cross-section level analysis			
Minimum stent area, mm^2	5.04 ± 1.23	5.50 ± 1.27	0.26
Mean stent area, mm^2	7.24 ± 0.97	7.69 ± 1.61	0.20
Mean neointimal area, mm^2	1.57 ± 0.68	1.68 ± 0.71	0.41
Strut-level analysis			
Number of struts analyzed/patient	244 ± 131	251 ± 86	0.81
Number of uncovered struts/patient	25.00 (8.25–52.25)	9.00 (4.25–14.00)	0.006
Frequency of uncovered struts/patient, %	12.27 (5.50–23.33)	4.14 (3.00–6.22)	0.001
Number of malapposed struts/patient	10.00 (2.25–21.75)	4.00 (0.00–7.00)	0.02
Frequency of malapposed struts/patient, %	4.60 (1.85–7.19)	1.81 (0.00–2.99)	0.001
Neointimal thickness of covered struts, mm	0.23 ± 0.15	0.17 ± 0.09	0.28

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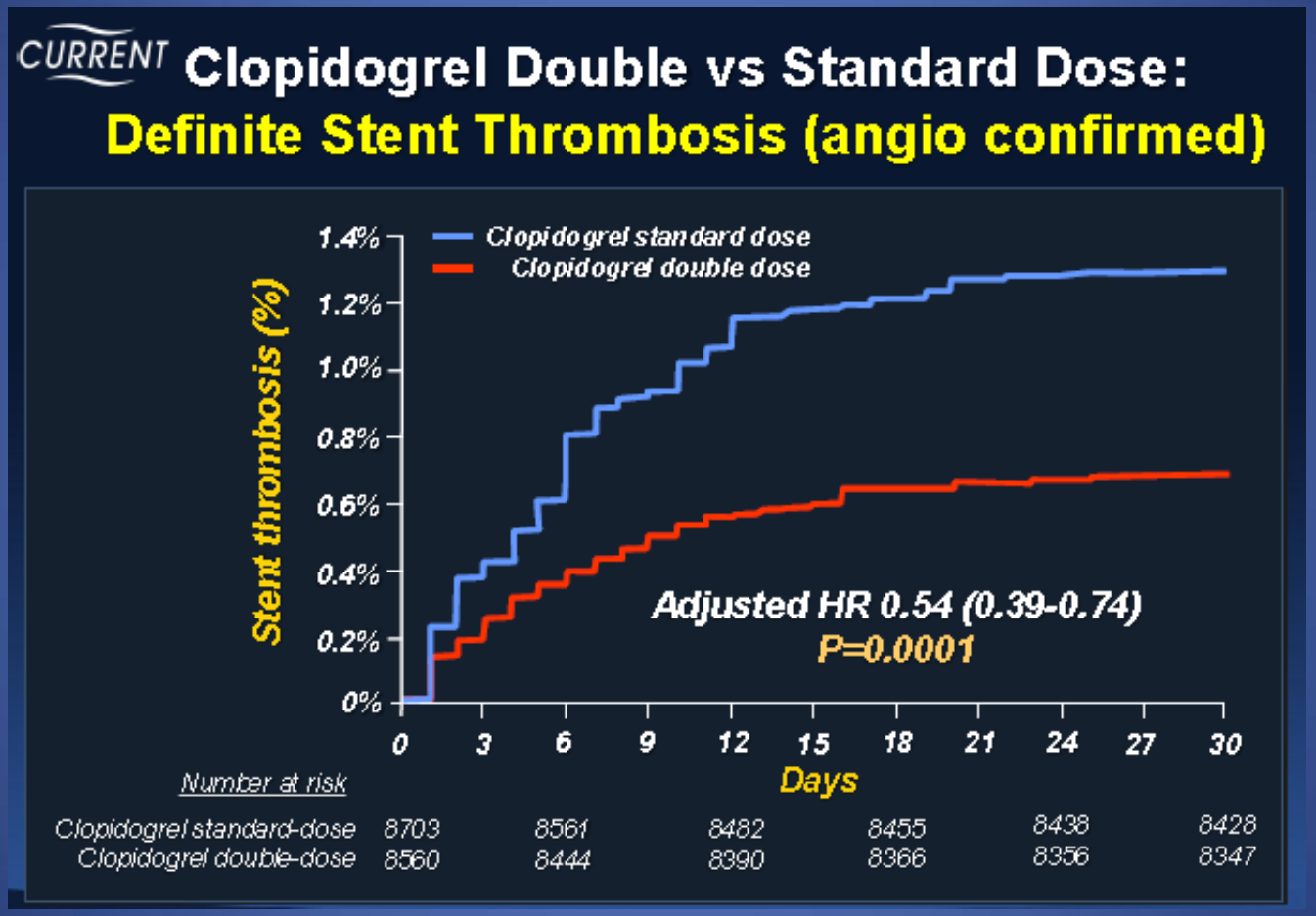

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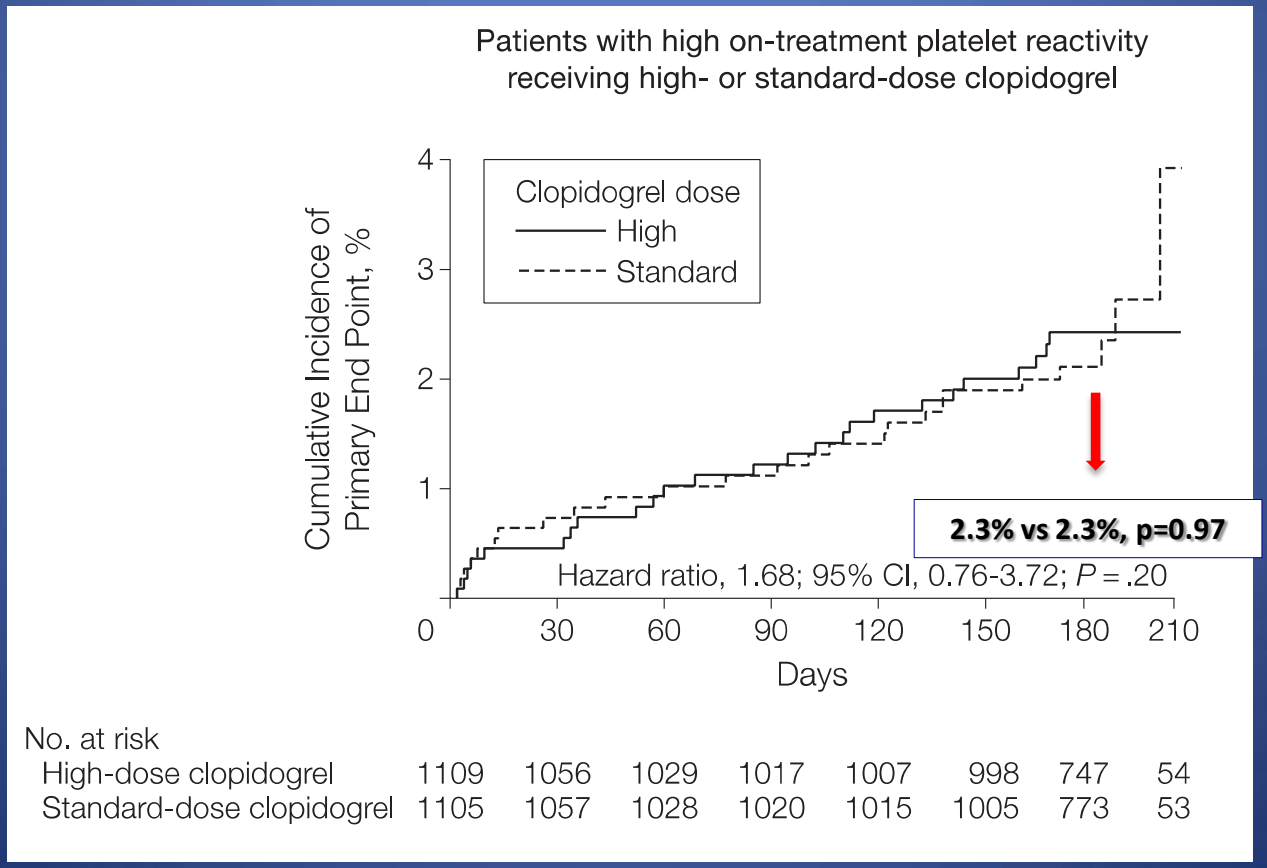
GRAVITAS

High vs Standard Clopidogrel Maintenance Dose in High On-treatment Platelet Reactivity



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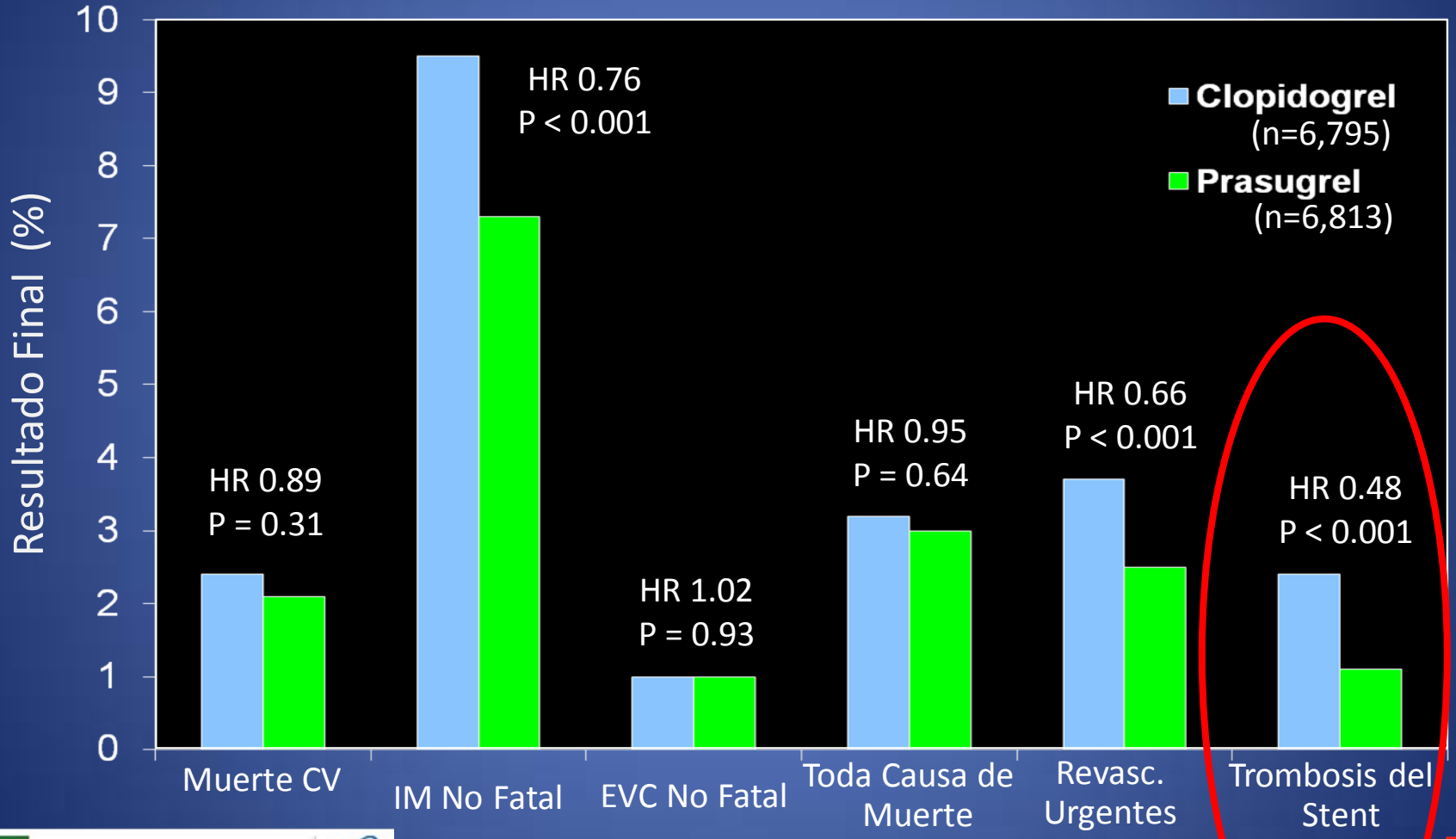
TRÎTON TIMI·38

Resultados Finales de Mayor Eficacia: Grupo Total a 15 Meses



HR basados en estimados de Kaplan-Meier a 15 meses

Wiviott SD, et al. NEJM 2007;357:2001-2015

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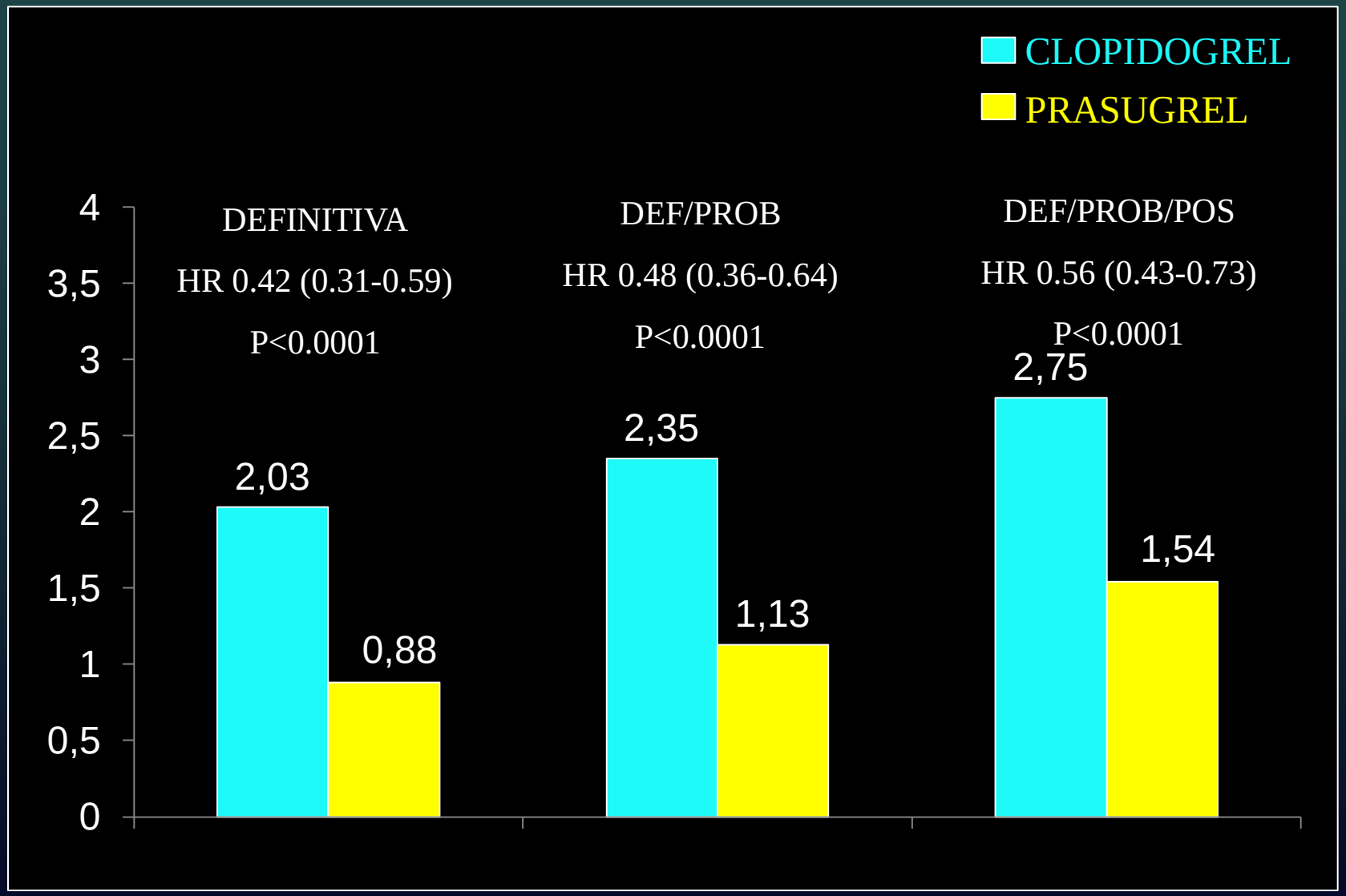
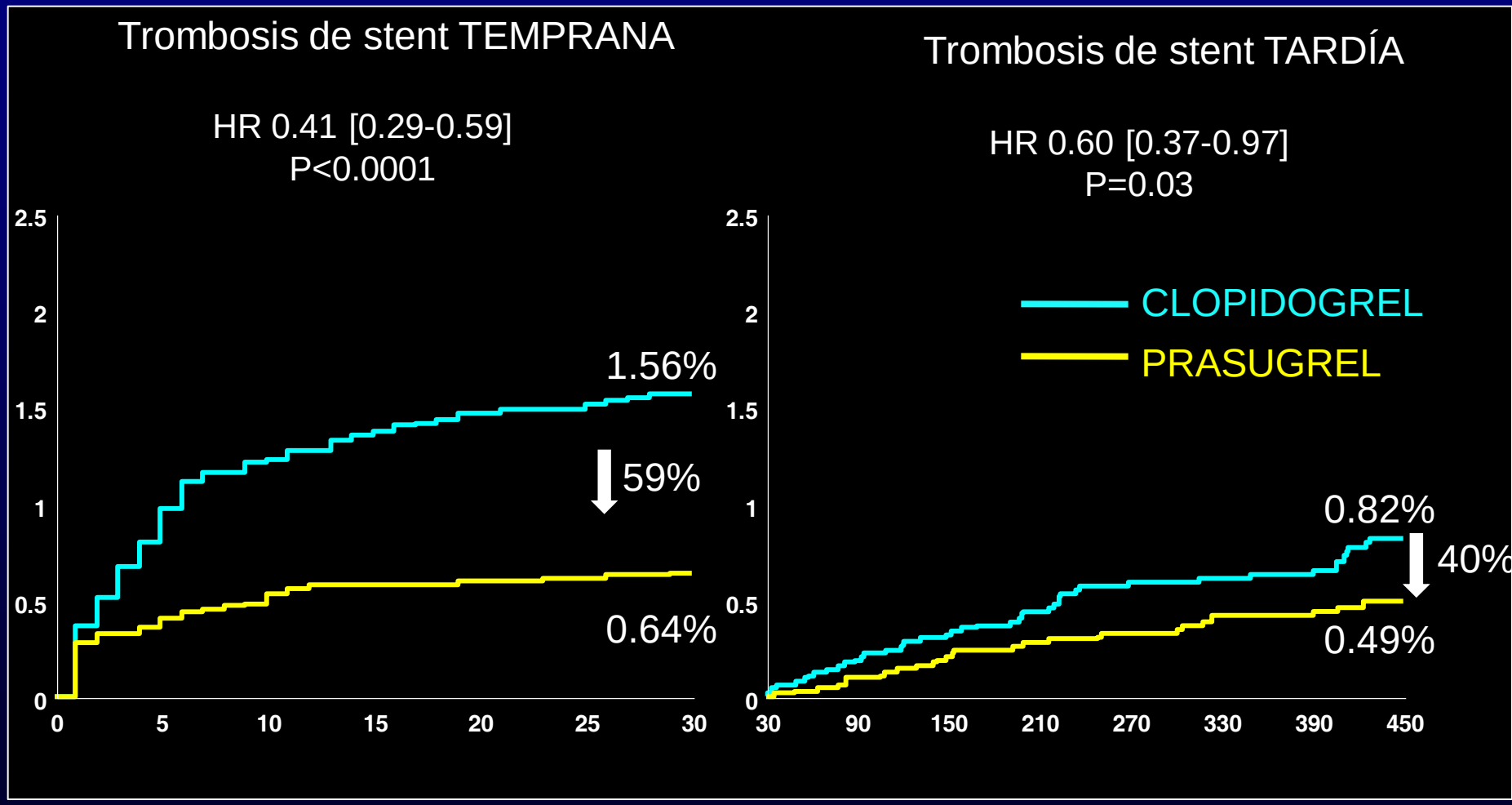
TRÎTON TIMI·38

Trombosis con stent por categoría de ARC (N=12,844)



TRITON TIMI·38

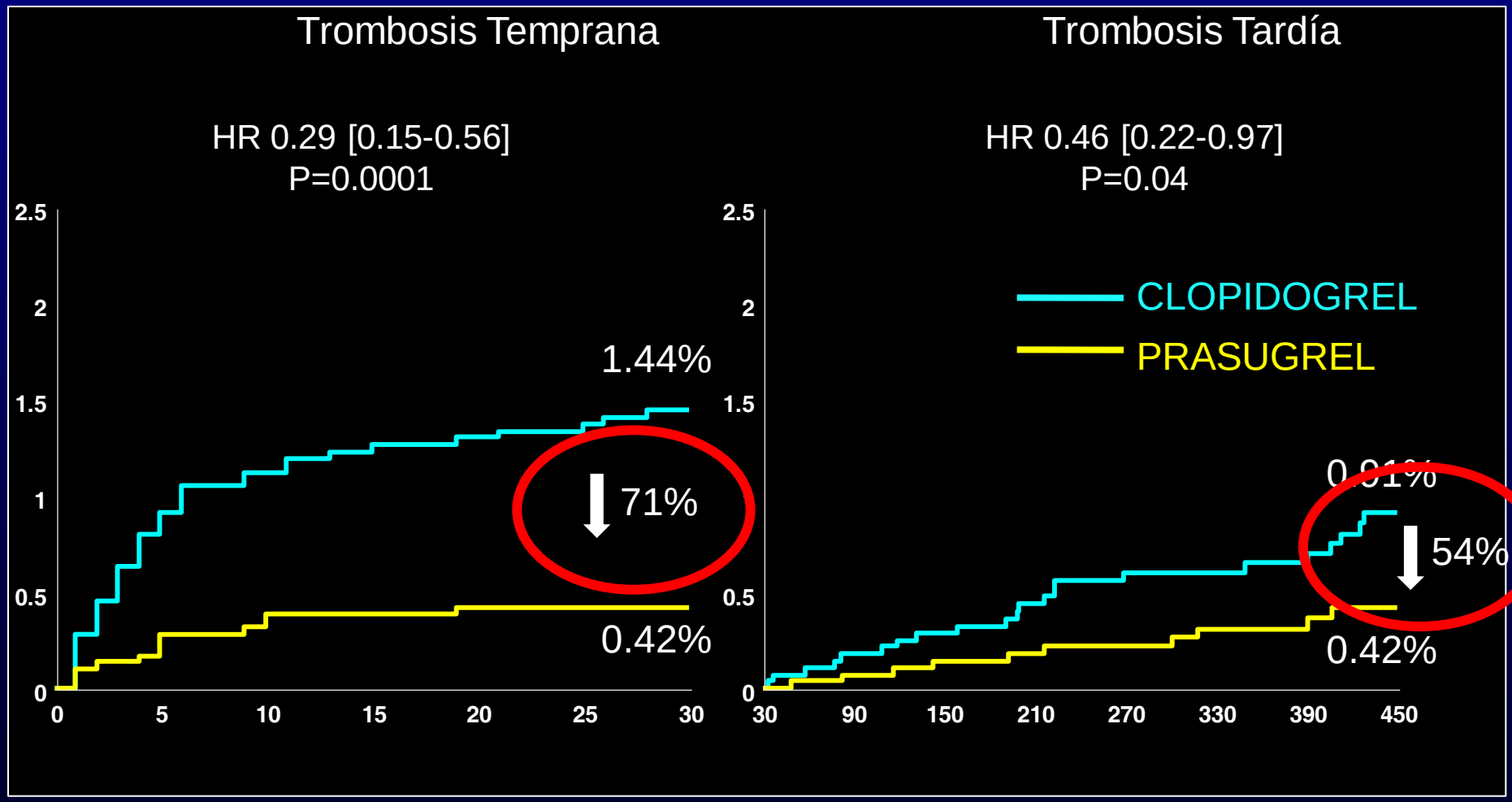
Trombosis de stent definitiva/probable: cualquier stent (N=12,844)



Wiviott SD, et al. Lancet 2008;370:1353–63

TRITON TIMI·38

Trombosis de stent Definitiva/Probable: Únicamente DES (N=5743)



Wiviott SD, et al. Lancet 2008;370:1353–63

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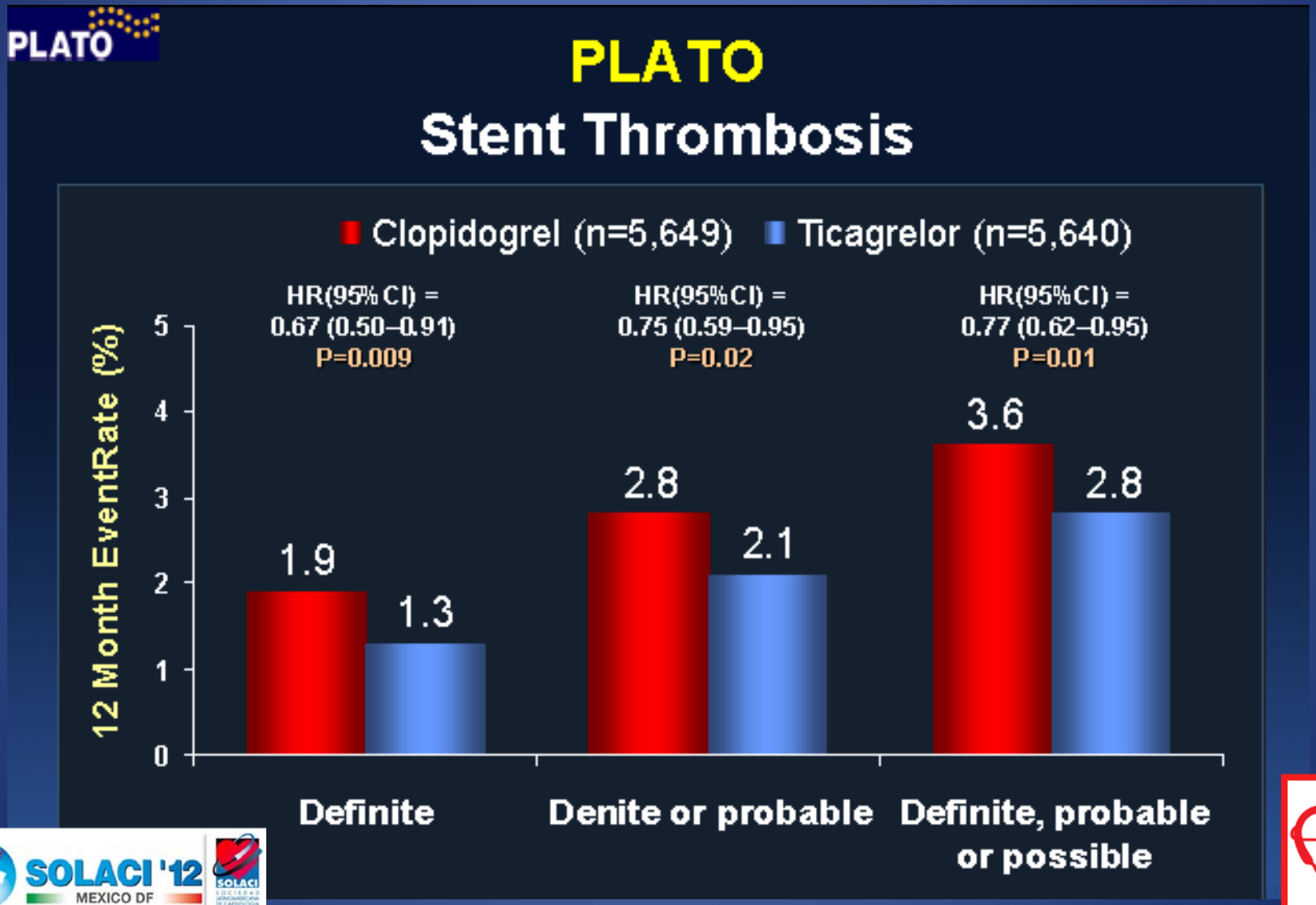

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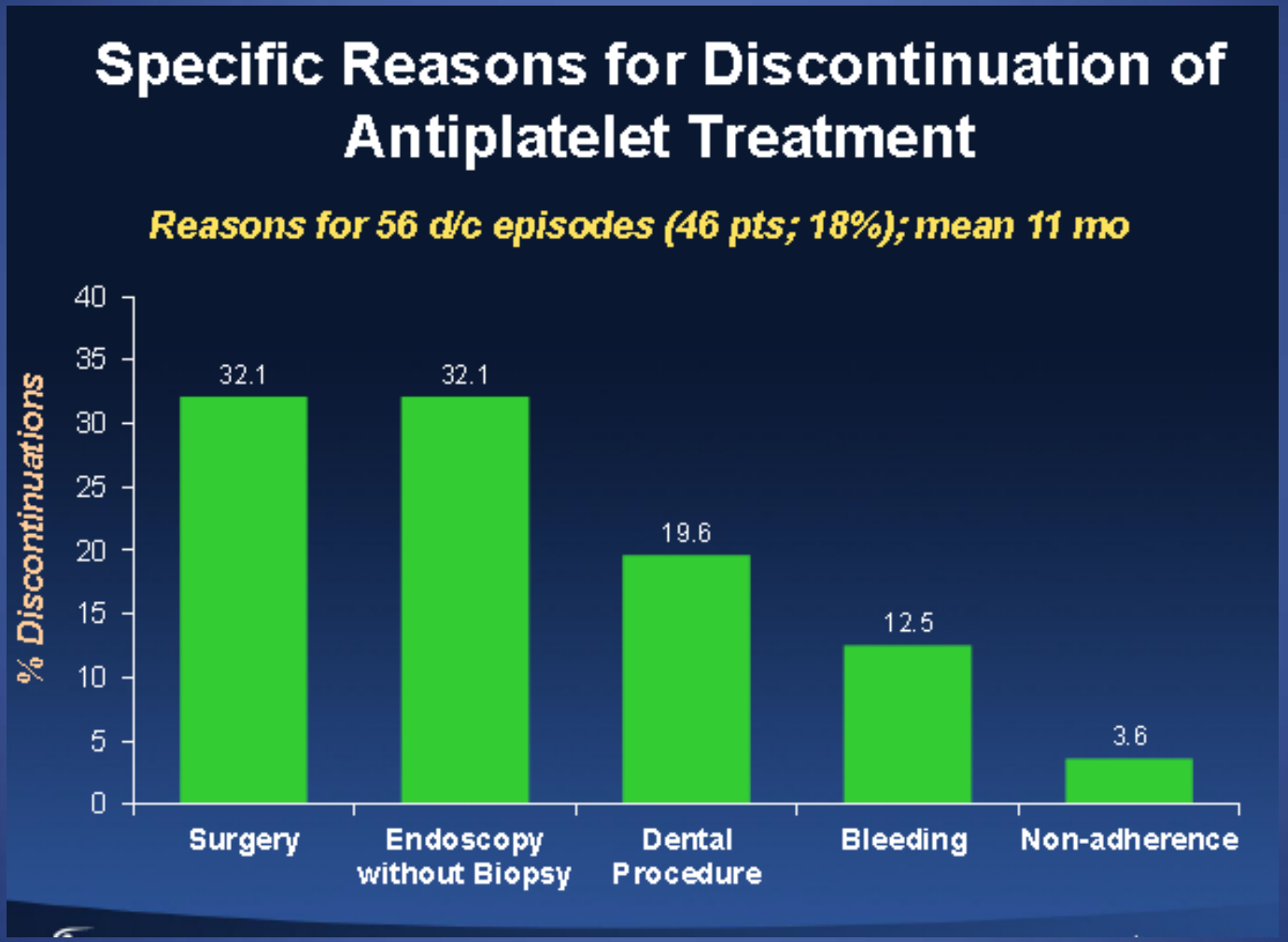

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Bridging Strategies

- Stop aspirin and continue P2Y12 inhibitor
- If bleeding risk is too high and necessitates dicontinuation of DAPT, continue ASA and minimize time off the P2Y12 inhibitor
  - Use a shorter-acting P2Y12 inhibitor
  - Use platelet reactivity testing to measure platelet inhibition?
- If no AP therapy can be used at all perioperatively, consider IIbIIIa bridge

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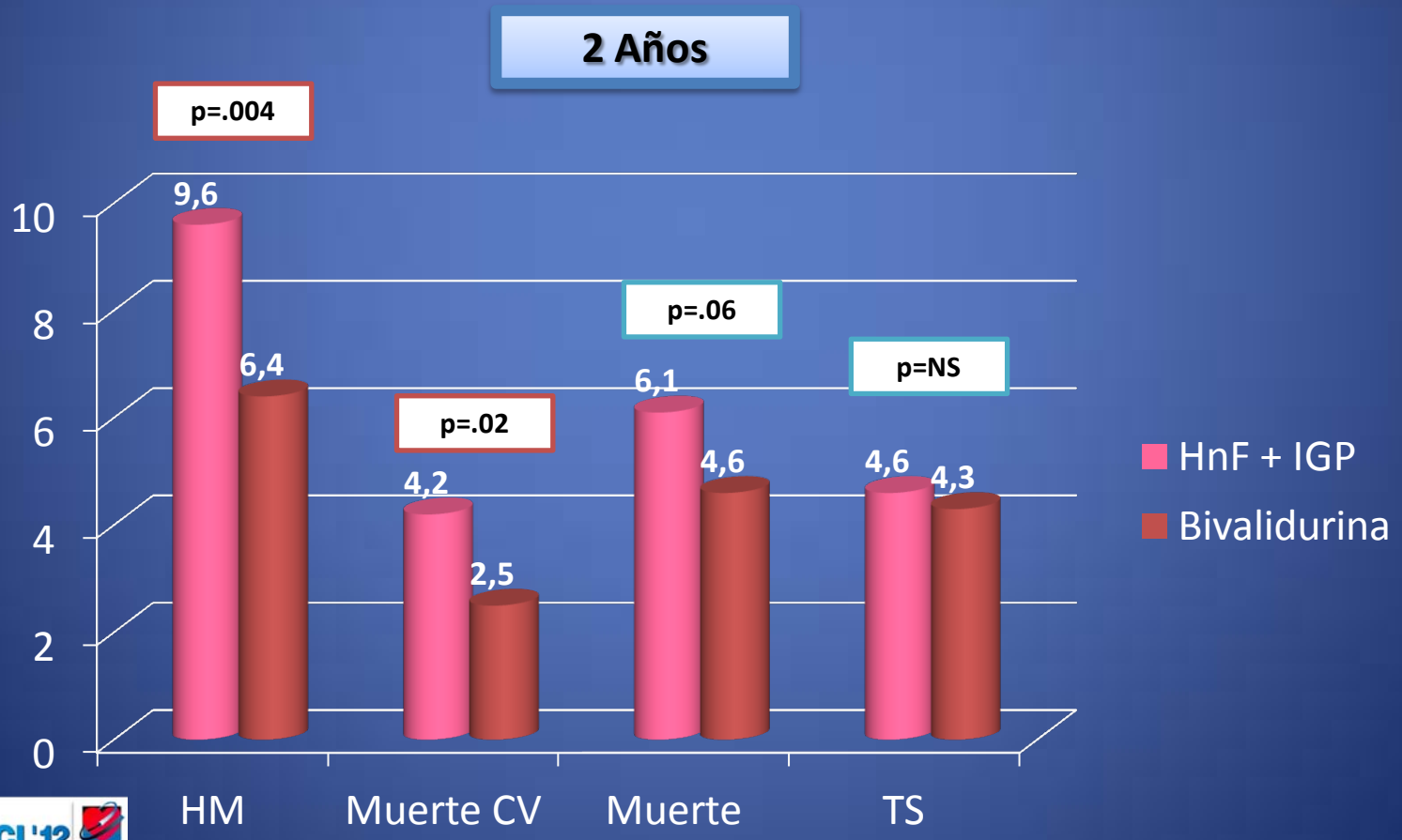
HORIZONS - AMI



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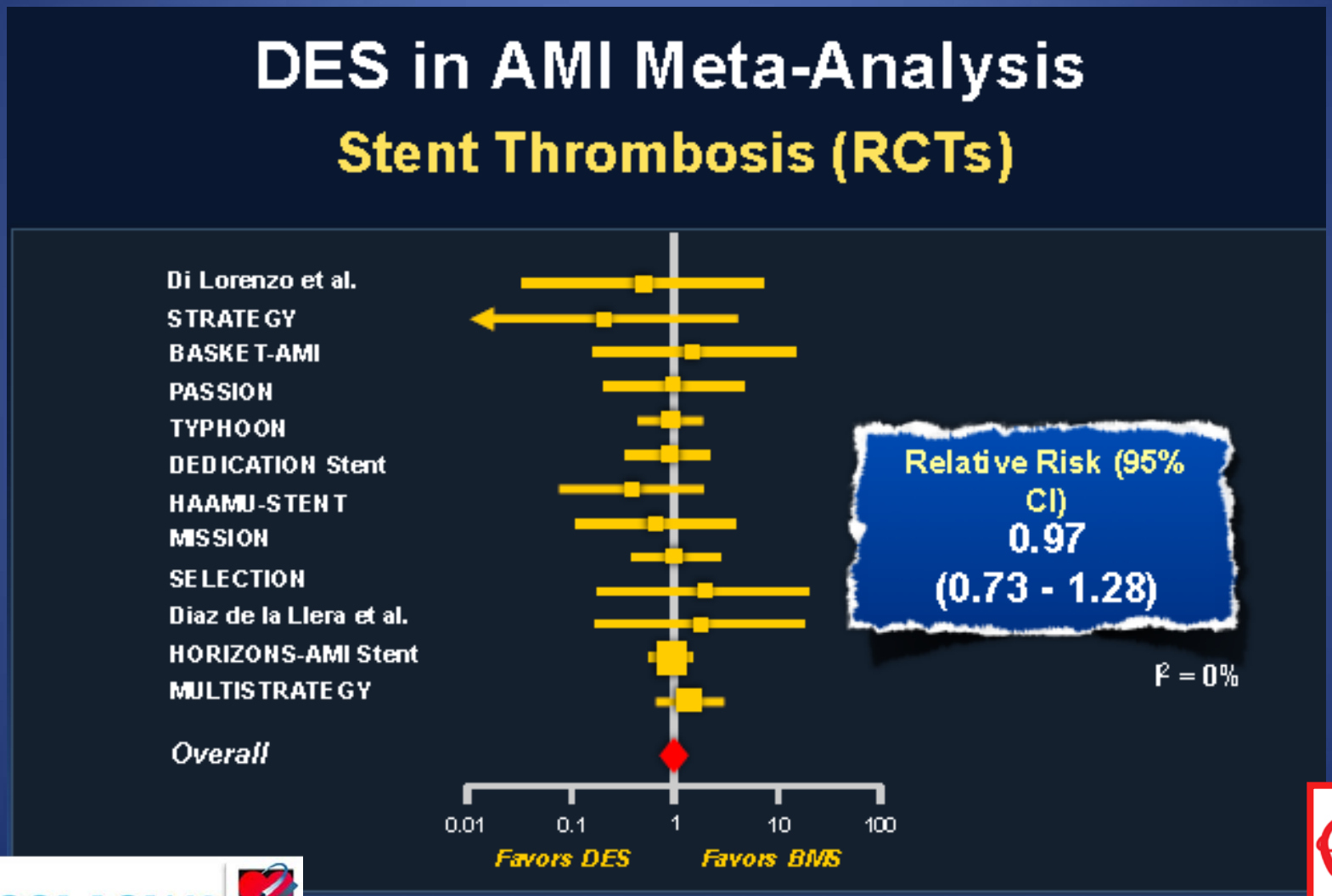

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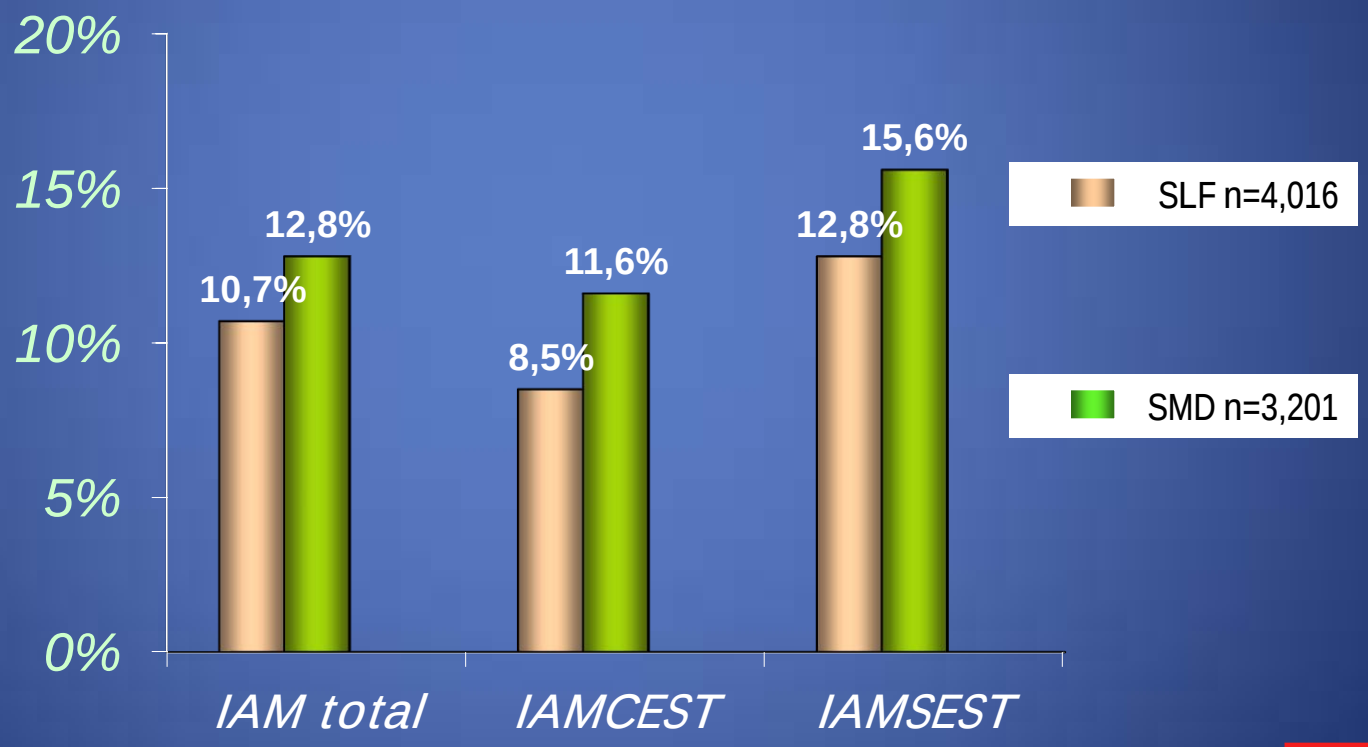
REGISTRO ESTATAL DE ICP EN MASSACHUSETTS: MORTALIDAD A 2 AÑOS



Mauri L et al. N Eng J Med 2008;359:1330-42

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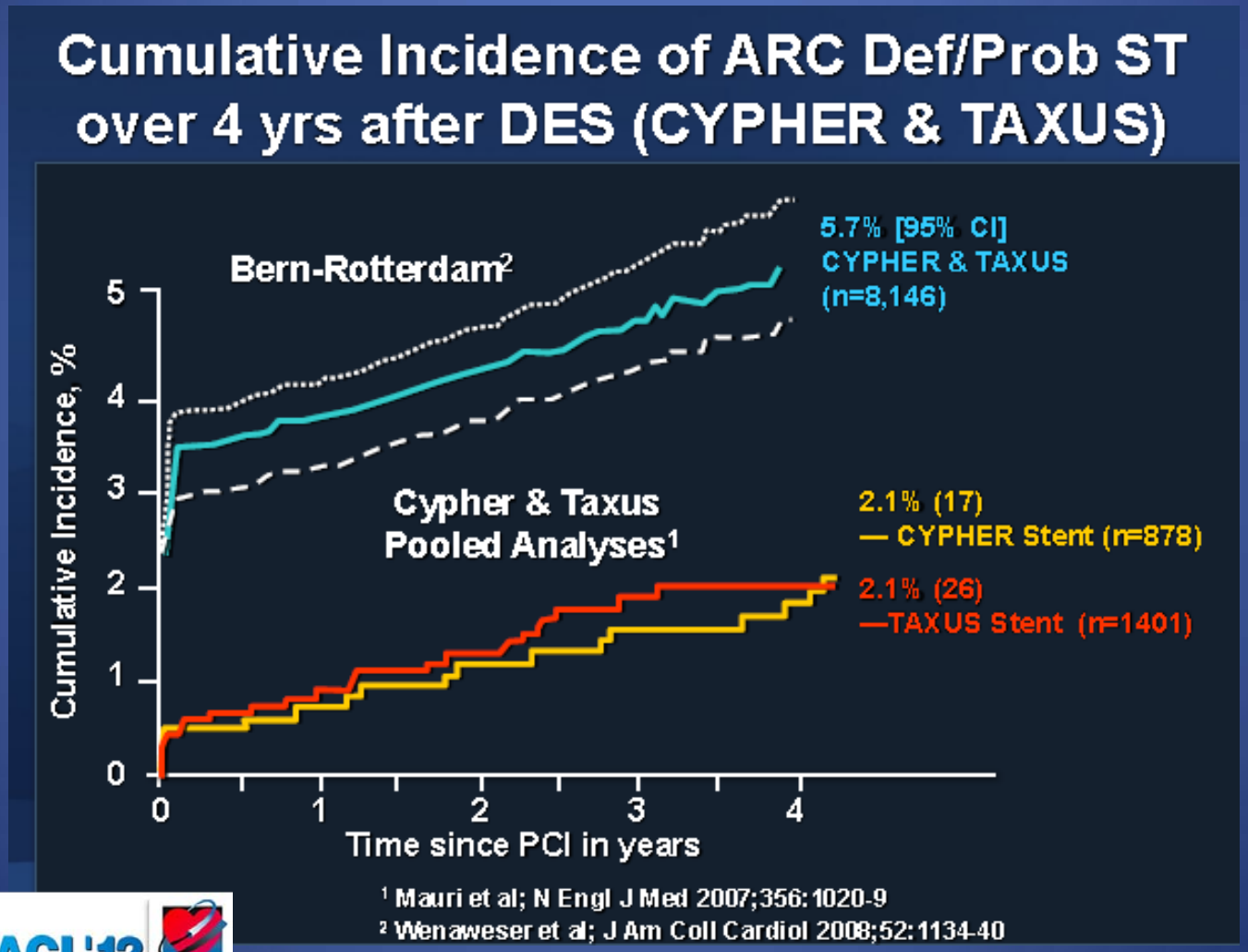

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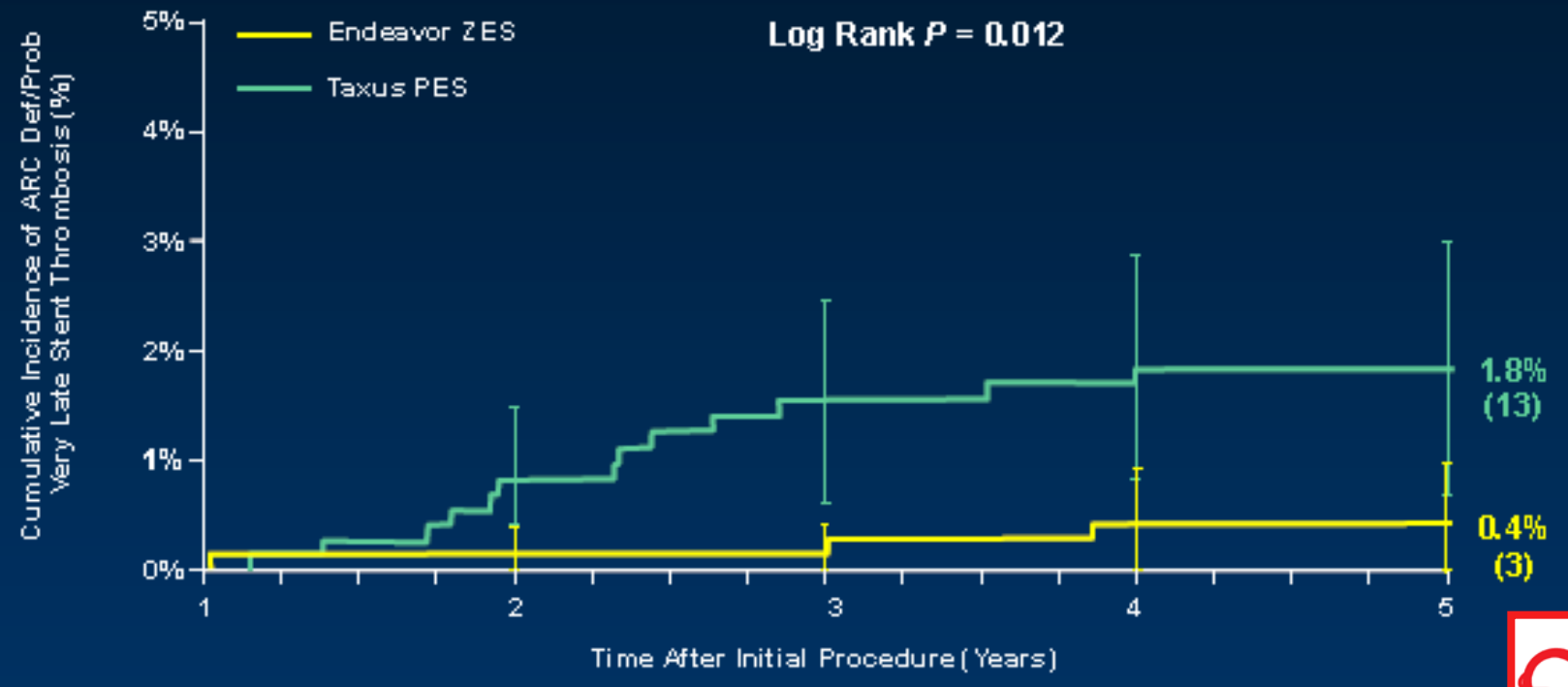
ENDEAVOR IV

Cumulative Incidence of Very Late ST to 5 Years



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ESTRATEGIAS CONTEMPORANEAS PARA LA PREVENCION Y MANEJO DE LA TROMBOSIS DEL STENT

Individual component of primary endpoint (ITT)

Variables	E-ZES+3-month DAPT (n=1,059)	Standard therapy (n=1,058)	Difference (95% CI)	p
Death, n (%)				
From any cause	5 (0.5)	8 (1.0)	-0.5% (-1.4 – 0.4)	0.39
From cardiovascular cause	2 (0.2)	4 (0.4)	-0.2% (-0.6 – 0.3)	0.41
MI, n (%)	2 (0.2)	4 (0.4)	-0.2% (-0.7 ~ 0.3)	0.41
TVR, n (%)	31 (3.9)	27 (3.7)	0.2% (-2.3 – 2.6)	0.70
Non-TVR, n (%)	15 (1.5)	11 (1.5)	0.0% (-1.3 – 1.4)	0.52
Stent thrombosis, n (%)	2 (0.2)	3 (0.3)	-0.1% (-0.5 – 0.3)	0.65
< 1months	2	0		
1-3 months	0	0		
3-12 months	0	3		
Bleeding, n (%)				
Major or minor	5 (0.5)	10 (1.0)	-0.5% (-1.2 – 0.2)	0.20
Major	2 (0.2)	6 (0.6)	-0.4% (-0.9 – 0.1)	0.16
CVA, n (%)	6 (0.6)	6 (0.7)	0.1% (-0.1 – 1.0)	0.96

SEVERANCE CARDIOVASCULAR HOSPITAL YONSEI UNIVERSITY COLLEGE OF MEDICINE RESET

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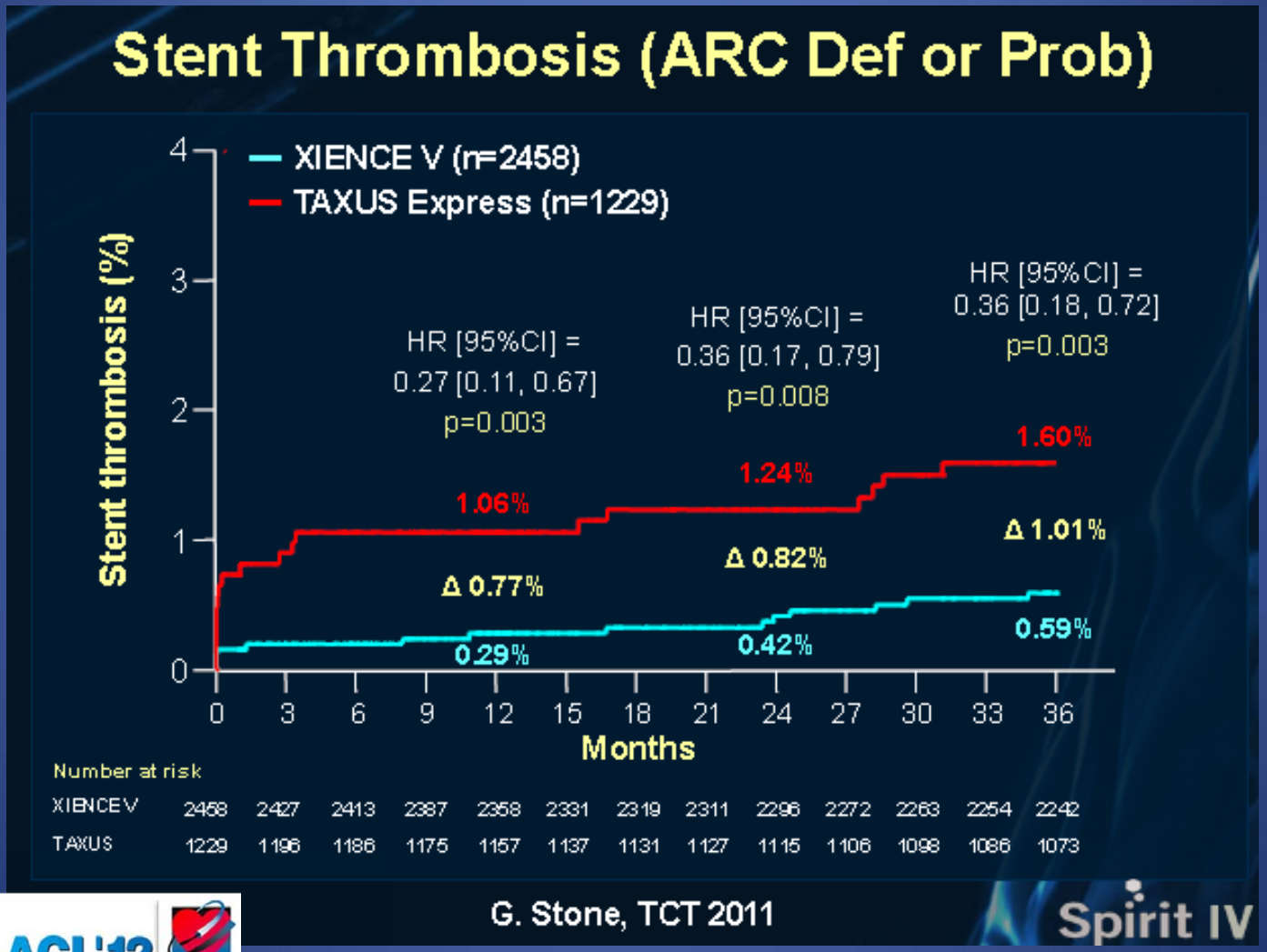

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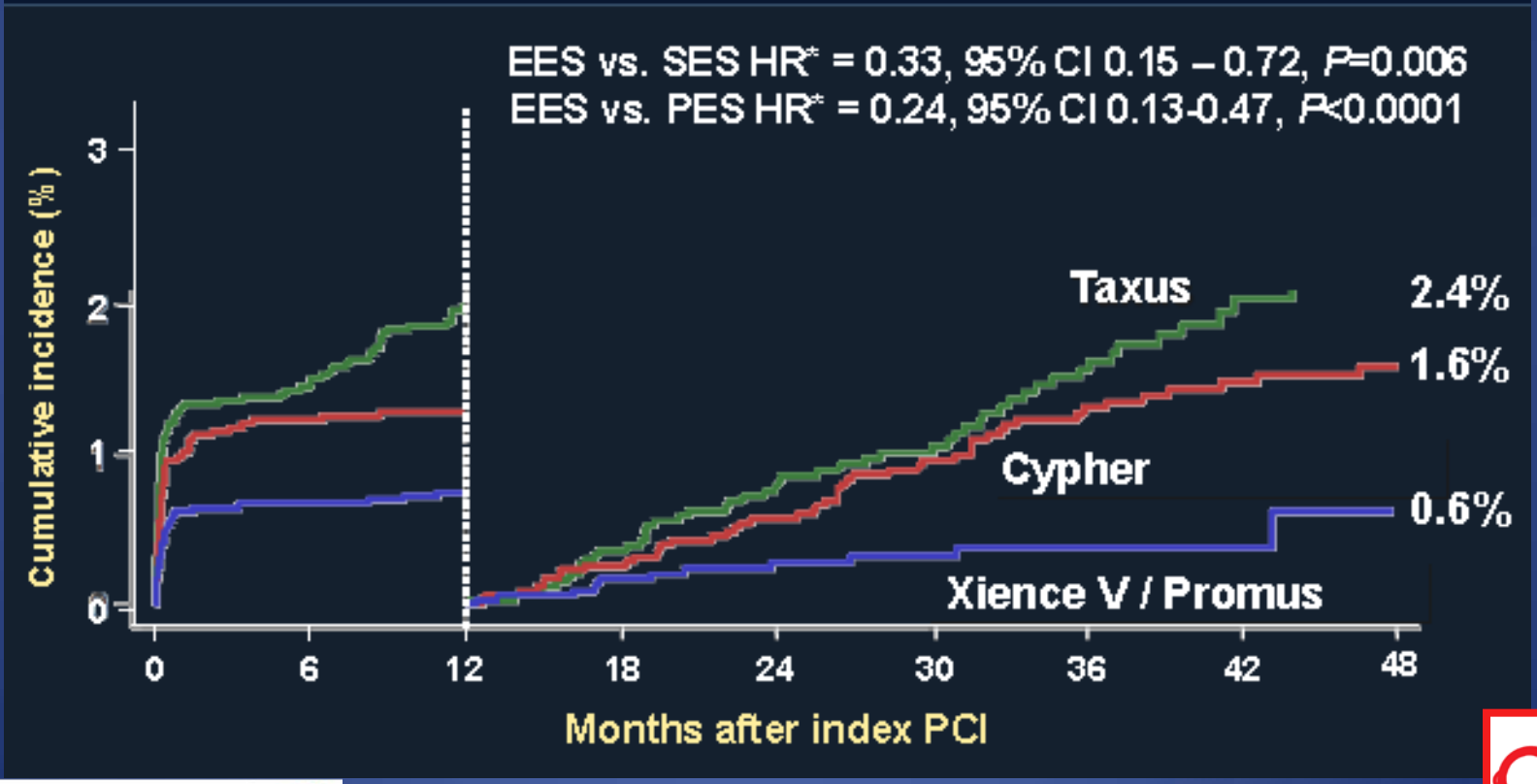
Bern Rotterdam (n=12,339 pts)

ARC Definite ST: Landmark analysis



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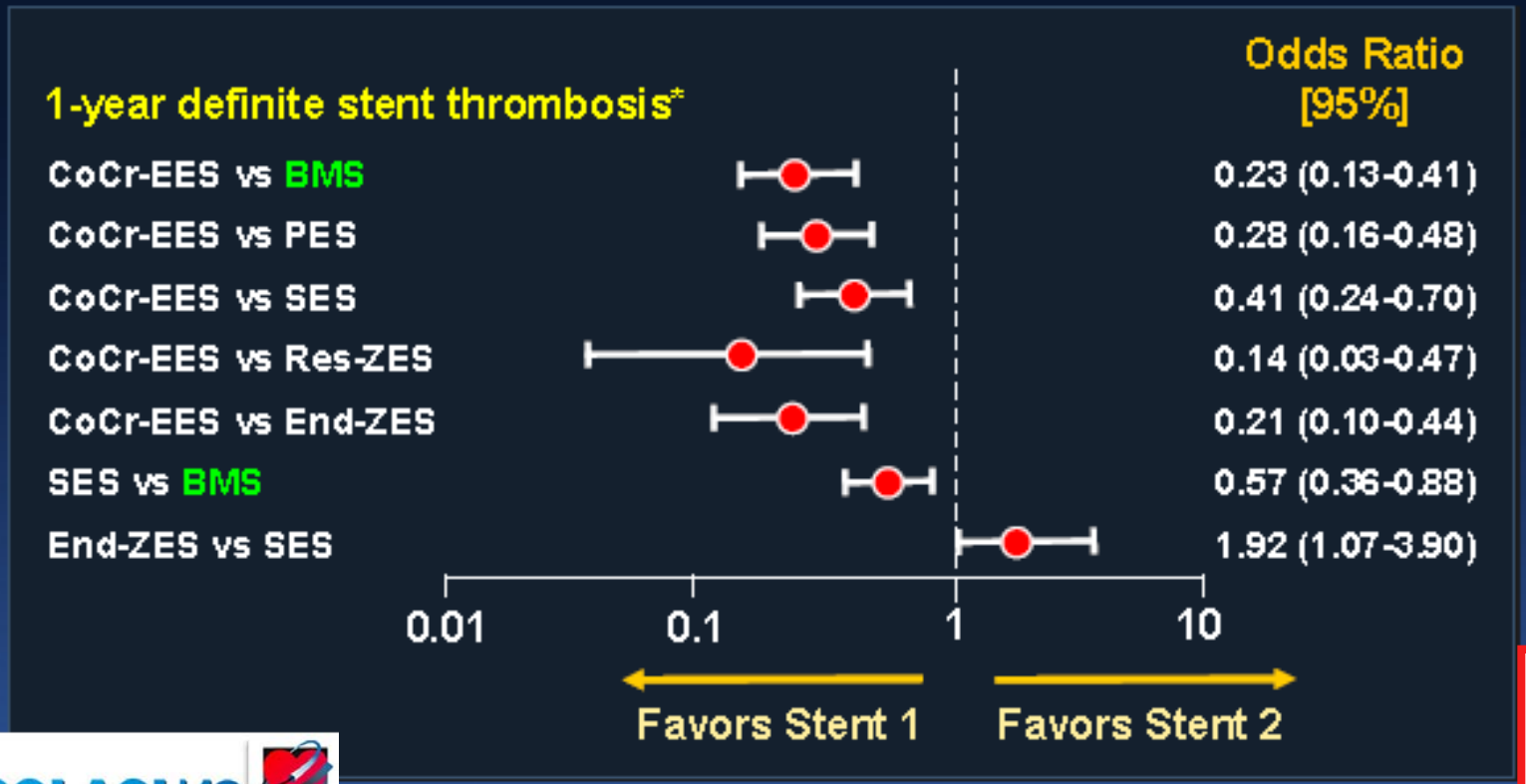
Stent Thrombosis Network Meta-analysis

Primary EP: ARC Definite ST (FU through 2 years)

49 RCTs, 50,844 pts



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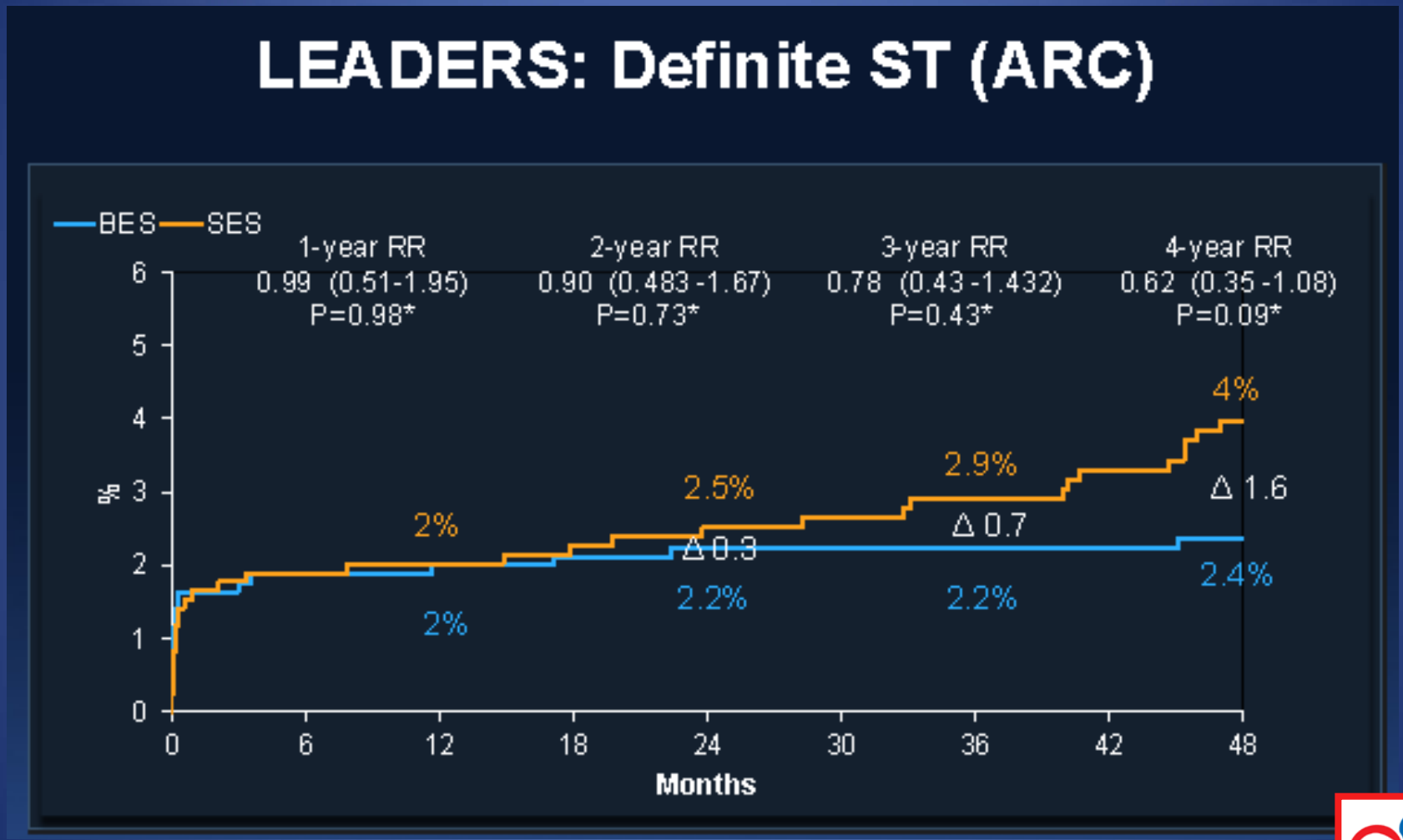

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Tx Modality in ST

	Early ST (n = 1,391)	Late ST (n = 1,370)	Very Late ST (n = 4,318)	p Value
Procedural characteristics				
Thrombectomy performed	447 (32.1)	401 (29.3)	1,475 (34.2)	0.003
Additional stent placed				<0.001
DES	374 (26.9)	482 (35.2)	2,031 (47.0)	
BMS	338 (24.3)	284 (20.7)	988 (22.9)	
No stent placed	679 (48.8)	604 (44.1)	1,299 (30.1)	
IABP or other mechanical support placed during procedure	186 (13.4)	119 (8.7)	403 (9.3)	<0.001
Dissection	28 (2.0)	22 (1.6)	39 (0.9)	0.002
Coronary perforation	6 (0.4)	8 (0.6)	11 (0.3)	0.172
Post-procedure TIMI flow grade				0.003
3	1,274 (91.6)	1,286 (93.9)	4,085 (94.6)	
0–2	96 (6.9)	71 (5.2)	198 (4.6)	

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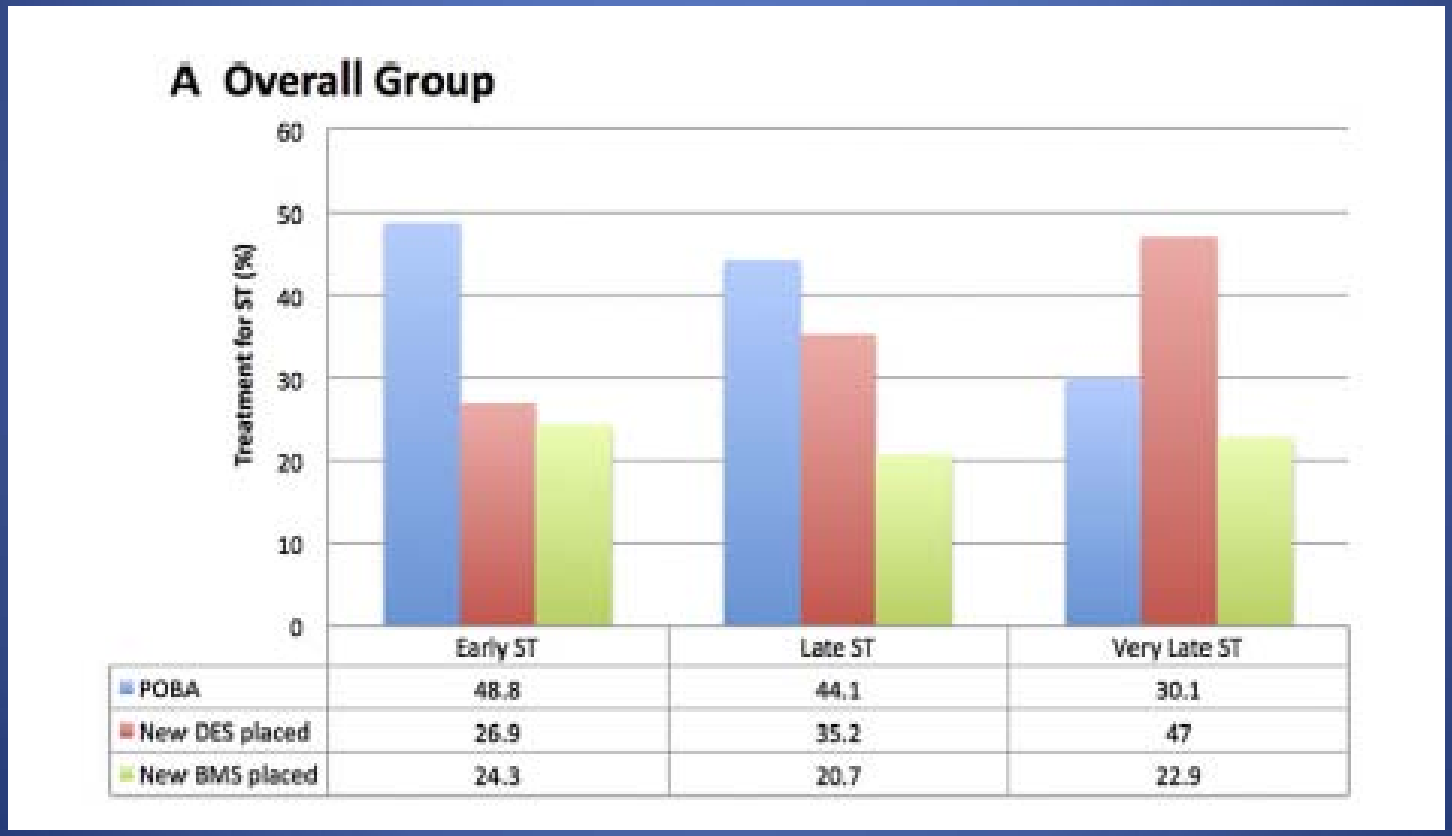
Treatment Modality in ST



	Early ST	Late ST	Very Late ST
POBA	48.8	44.1	30.1
New DES placed	26.9	35.2	47
New BMS placed	24.3	20.7	22.9

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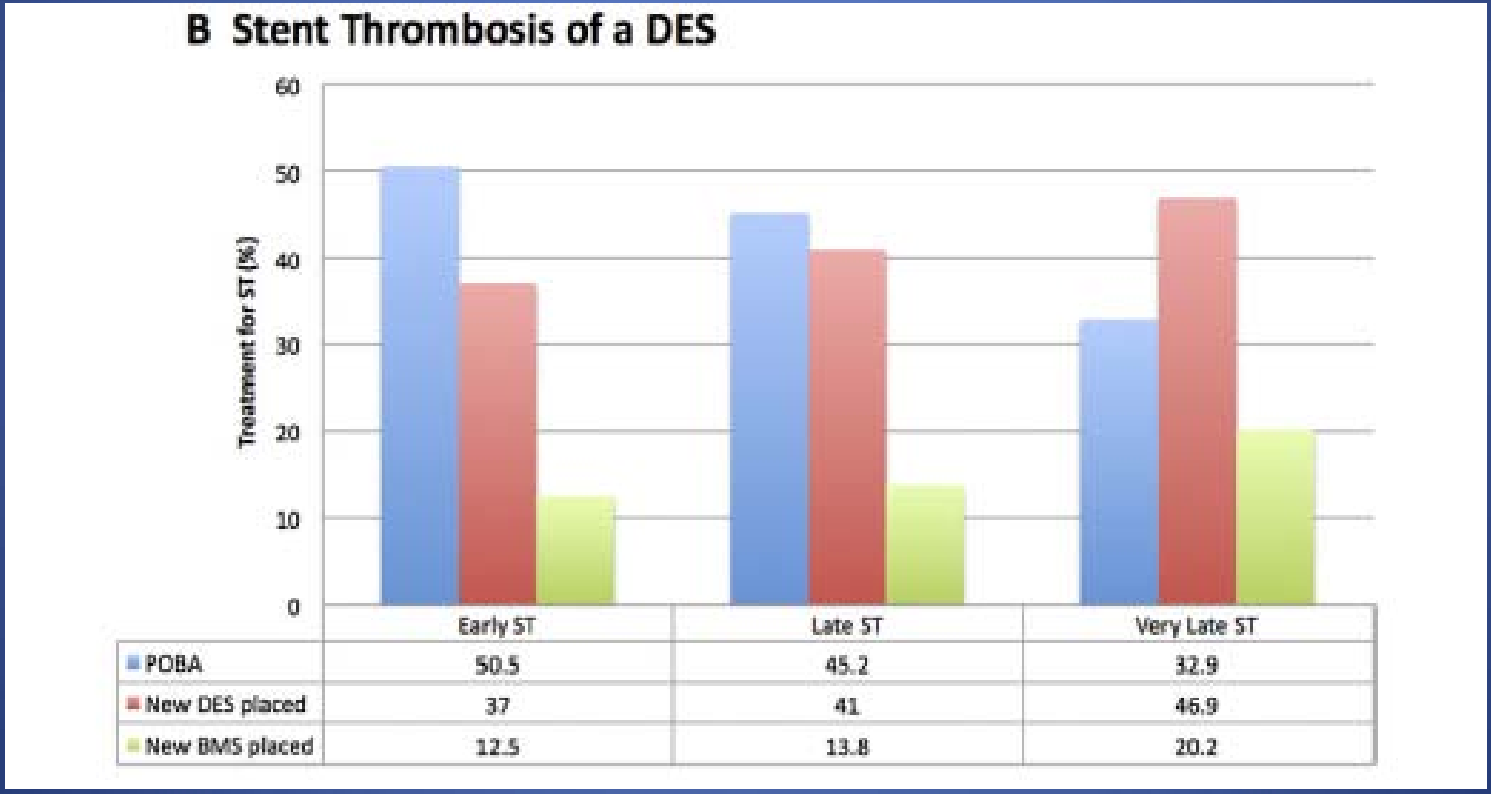
Treatment Modality in ST



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Tx Modalities in ST

	Early ST (n = 1,391)	Late ST (n = 1,370)	Very Late ST (n = 4,318)	p Value
Intraprocedural medications				
Anticoagulants				
Unfractionated heparin	989 (71.1)	948 (69.0)	3,180 (73.9)	0.001
Bivalirudin	416 (29.9)	493 (36.0)	1,354 (31.4)	0.001
LMWH	169 (12.2)	154 (11.3)	499 (11.6)	0.736
Fondaparinux	15 (1.1)	19 (1.4)	57 (1.3)	0.737
Aspirin	1,224 (90.1)	1,219 (90.0)	3,901 (90.9)	0.536
Glycoprotein IIb/IIIa inhibitor	1,023 (73.9)	876 (64.0)	2,949 (68.7)	<0.001
Thienopyridines				
Clopidogrel	1,102 (80.6)	1,099 (81.4)	3,355 (79.2)	0.1609
Prasugrel	175 (12.6)	127 (9.3)	329 (7.6)	<0.001
Ticlopidine	11 (0.8)	14 (1.0)	24 (0.6)	0.174

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Abordaje Integral para la Prevención de la TS

Cómo Minimizar la Trombosis del Stent

- **Mejor Selección del Paciente**
  - Escrutinio para probabilidad de adherencia y riesgo de sangrado/ posibilidad de tolerar la TAPD
  - Ausencia de procedimientos quirúrgicos
- **Mejor Selección del Stent y de la Técnica**
  - Considerar stents con menor riesgo de trombosis
  - Medición apropiada del diámetro del vaso, implante y post-dilatación a altas presiones
  - Asegurar ausencia de disecciones residuales o enfermedad no tratada proximal o distal
  - Evitar en la medida de lo posible el uso de dos stents en las bifurcaciones
- **Mejor Cuidado peri y Post-procedimiento**

Uso de antiplaquetarios más potentes en escenarios clínicos apropiados (síndromes coronarios agudos en ptes con bajo riesgo de sangrado)

- La educación del paciente y un seguimiento clínico apropiado son esenciales
- Uso de los antiagregantes plaquetarios sin interrupción durante un período de un año