Randomized Comparison of the Sirolimus Eluting Non-biodegradeable Polymer Coated Cypher Select+ Stent and the Biolimus eluting Biodegradeable Polymer Coated Nobori stent in Unselected Patients Treated with Percutaneous Coronary Intervention

The SORT OUT V Trial

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Potential conflicts of interest

Speaker's name: Evald H Christiansen

☒ **I have the following** potential conflicts of interest to report:

☐ Other(s)

Cordis, Johnson & Johnson: Research grants, speaker's fees.
Terumo: Research grants
St Jude Medical: speaker's fees

☐ **I do not have any potential conflict of interest**

Background

- After implantation of the sirolimus eluting non-biodegradeable polymer coated Cypher stent the risk of restenosis is low, but the risk of stent thrombosis is a concern.
- Stent thrombosis may be related to the polymer coating of the Cypher stent.
- The biolimus eluting Nobori stent has a biodegradable polymer coating, and initial data indicate a low risk of restenosis and stent thrombosis after implantation.
- There are no large scale randomized comparison studies of Cypher and Nobori stents in all-comer populations.

SORT OUT V OBJECTIVE

To compare the efficacy and safety of the sirolimus-eluting Cypher Select+ stent and the biolimus-eluting Nobori stent in an all-comer population.

ClinicalTrials.gov Identifier: NCT01254981

Patient Population

Study period: July 2009 to January 2011

Criteria of inclusion

- 18 years of age or older
- Chronic stable coronary artery disease or acute coronary syndromes

Criteria of exclusion

- Life expectancy less than one year
- Allergy to aspirin, clopidogrel, sirolimus, or biolimus
- Participation in another randomized trial
- Unacceptable risk by 12-month dual antiplatelet treatment
- Unable to provide written informed consent

No restrictions were placed on number of treated lesions or treated vessels or lesion length

Statistical Assumptions

Primary endpoint

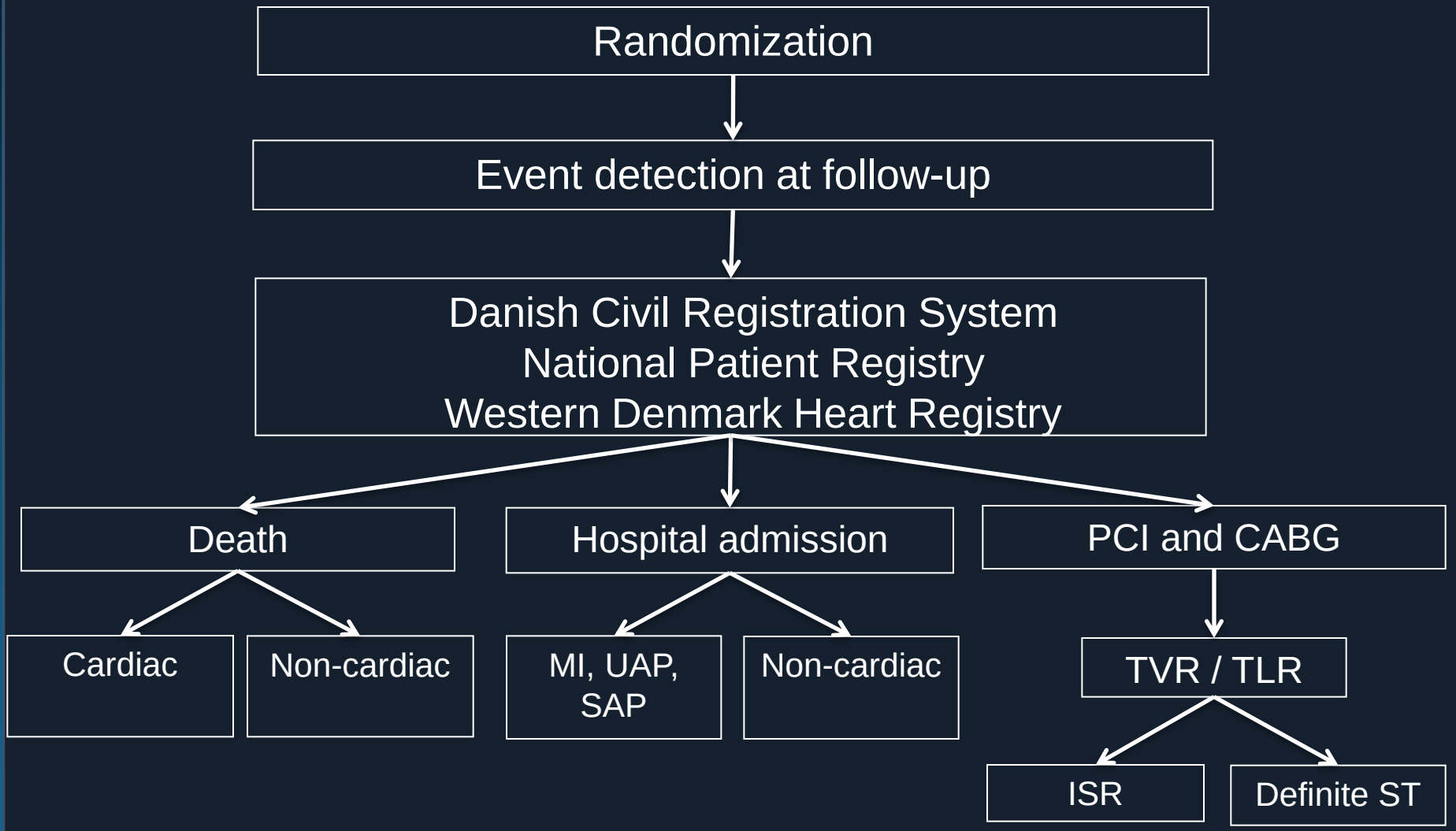
- Major Adverse Cardiac Events at 9 months
  (composite of cardiac death, myocardial infarction, definite stent thrombosis and clinically driven target vessel revascularization)

Power calculation

- Non-inferiority design
- Estimated 9-month event rate; Cypher group: 0.03
- Non-inferiority margin: 0.02
- One-sided type I error: 0.05
- Power 90%
- Number of patients 2400

Secondary endpoints: Individual components of the primary endpoint

Clinical event detection



Patient Characteristics

	BIOLIMUS-ELUTING STENT	SIROLIMUS-ELUTING STENT	p
No. of patients	1229	1239	
Age (years)	65.0 ±10.6	65.2 ±10.3	0.51
Men	74.6 %	75.1 %	0.79
Diabetes	15.1 %	15.3 %	0.89
Hypertension	57.7 %	54.7 %	0.30
Lipid-lowering therapy	60.0 %	61.1 %	0.81
Current smoker	33.6 %	33.1 %	0.78
Prior CABG	8.1 %	5.9 %	0.04
Prior percutaneous coronary intervention	17.3 %	16.5 %	0.56
Prior myocardial infarction	17.7 %	17.3 %	0.82
Body mass Index (kg/m^2)	27.5 ± 5.2	27.4 ± 5.2	0.66

Patient Characteristics

	BIOLIMUS-ELUTING STENT	SIROLIMUS-ELUTING STENT	p
No. of patients	1229	1239	
Indication for PCI			0.71
Stable angina	49.5 %	48.1 %	
NSTEMI / unstable angina	30.3 %	31.0 %	
STEMI	18.3 %	18.3 %	
Other	2.0 %	2.6 %	

Lesion Characteristics

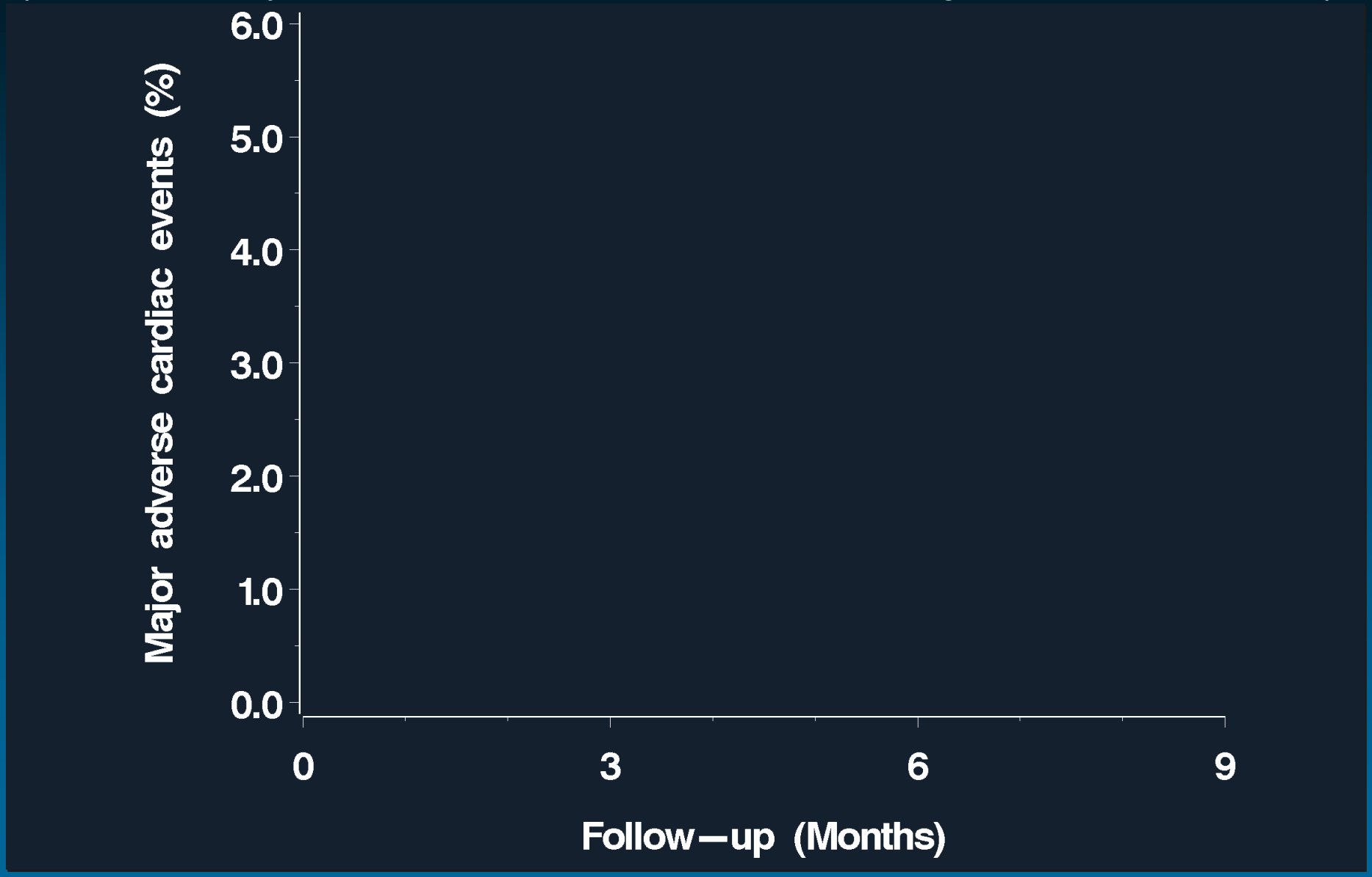
	BIOLIMUS-ELUTING STENT	SIROLIMUS-ELUTING STENT	p
No. of lesions	1,532	1555	
Target vessel location			0.34
Left main	1.4	1.4	
Left anterior descending artery	40.7	40.9	
Left circumflexus	23.2	22.5	
Right coronary	33.2	34.4	
Saphenous vein graft	1.6	0.8	
Lesion type B2/C	61.0	58.8	0.25
Bifurcation lesions	15.0	15.1	0.98
Chronic total occlusion lesions	6.0	7.2	0.21
Lesion lenght > 18 mm	34.1	33.6	0.80
Reference vessel size (mm)	3.2 (3.0 - 3.5)	3.3 (3.0 - 3.6)	0.03

Lesion Characteristics

	BIOLIMUS-ELUTING STENT	SIROLIMUS-ELUTING STENT	p
No. of lesions per patient	1.25	1.26	0.71
No. of stents			
Per patient	1.0 (1.0 - 2.0)	1.0 (1.0 - 2.0)	0.77
> 1 stent	37.1 %	37.6 %	0.80
Total stent length (mm)	22.0 (14.0 - 32.0)	23.0 (13.0 - 33.0)	0.22
Direct stenting	21.6	22.4	0.60
Maximum pressure (atm)	16.0 (14.0 - 20.0)	18.0 (15.0 - 20.0)	<.0001
Stent delivery failure	2.9 %	2.6 %	0.60
Use of GP IIb/IIIa inhib.	15.9 %	16.9 %	0.51

1º Endpoint: Major Adverse Cardiac Events

(Cardiac death, myocardial infarction, definite stent thrombosis, target vessel revascularization)



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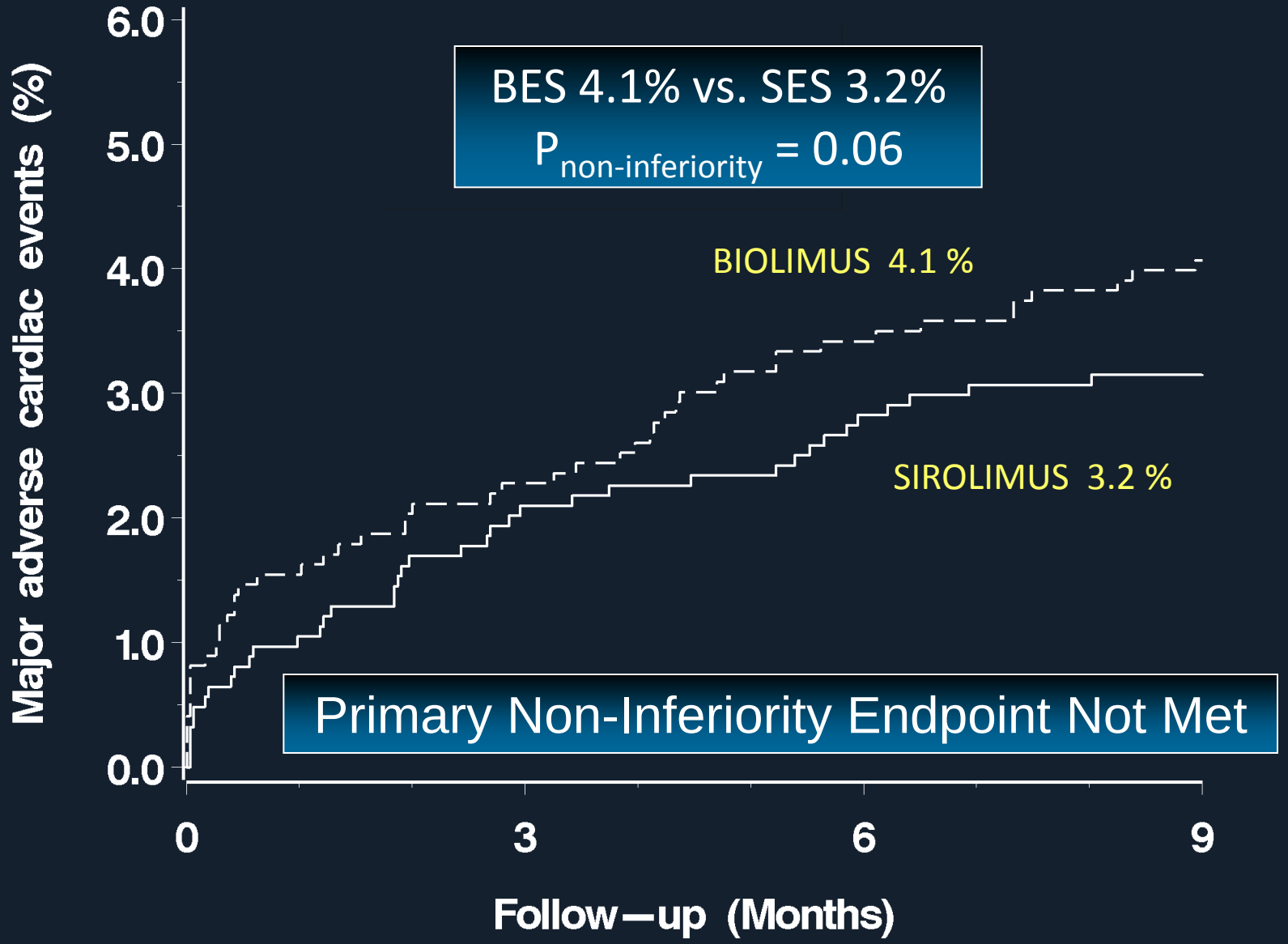


1º Endpoint: Major Adverse Cardiac Events

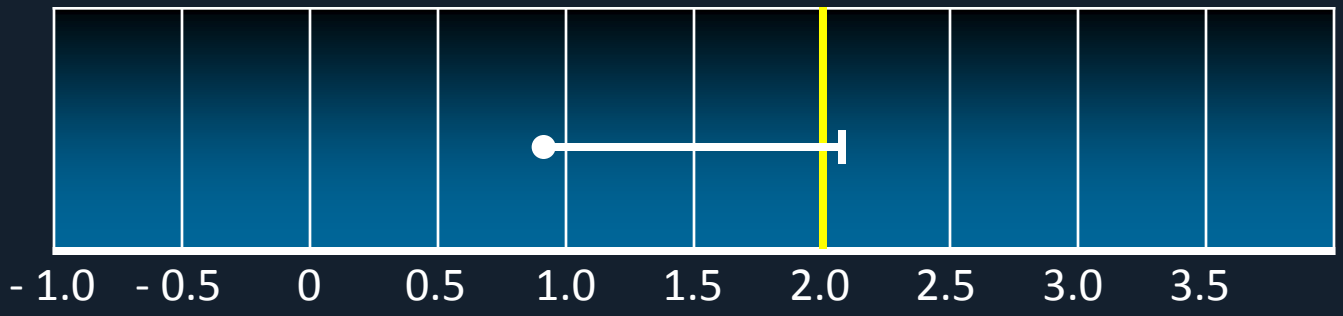
(Cardiac death, myocardial infarction, definite stent thrombosis, target vessel revascularization)

BES 4.1% vs. SES 3.2%

$P_{non\text{-}inferiority} = 0.06$

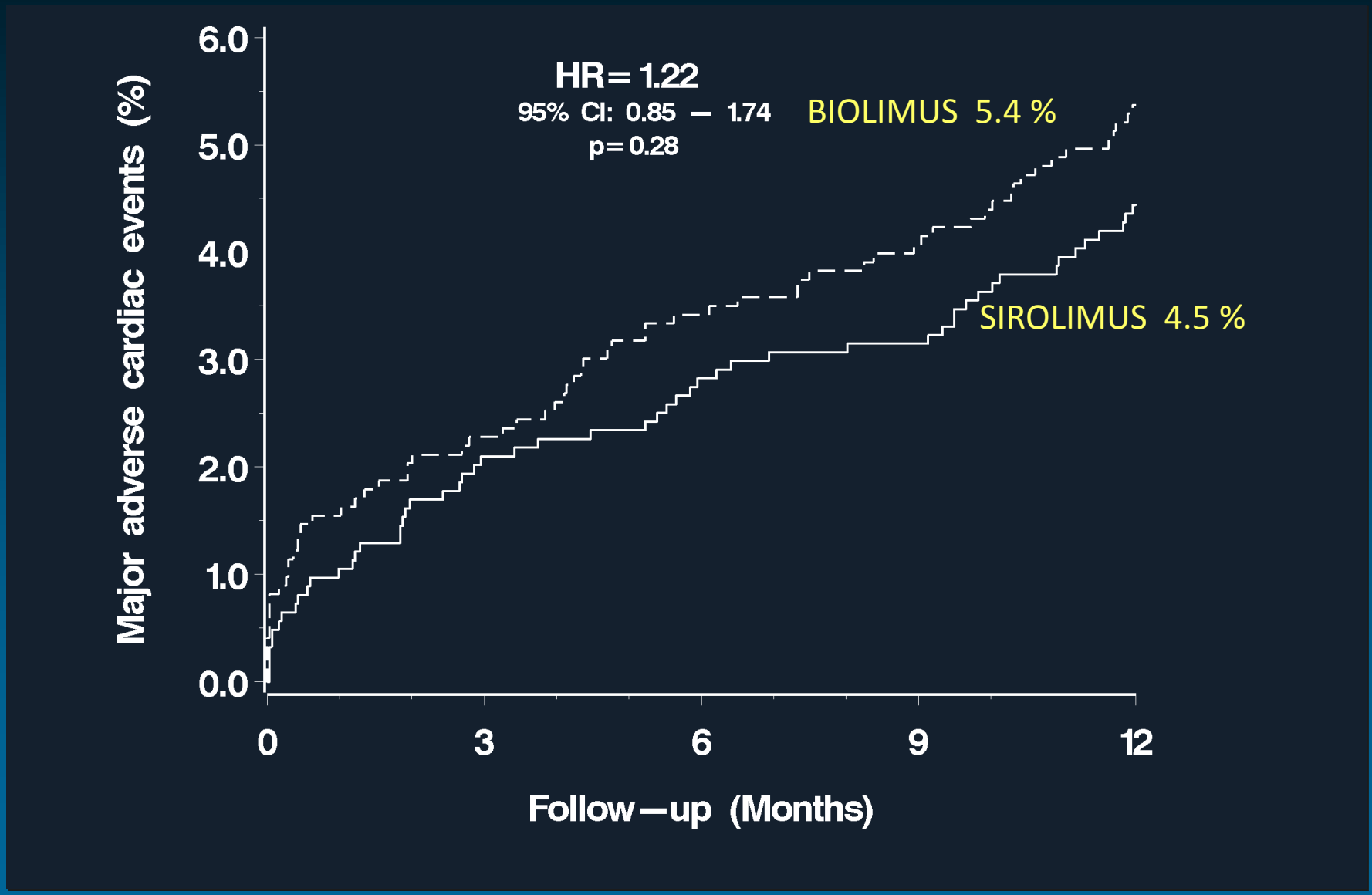
Difference: 0.9%

Upper one-sided 95% CI: 2.1%

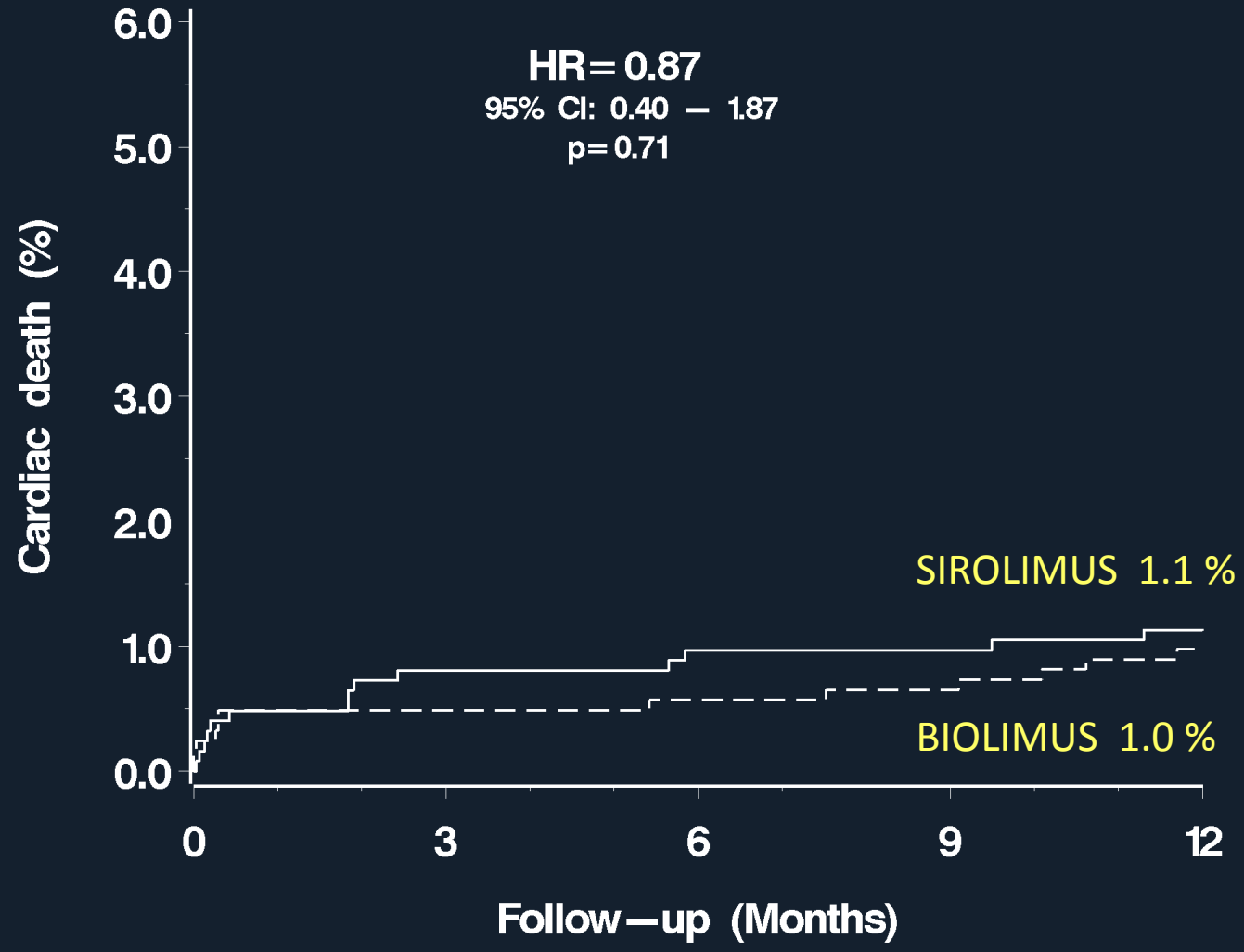


Major Adverse Cardiac Events at 12 month

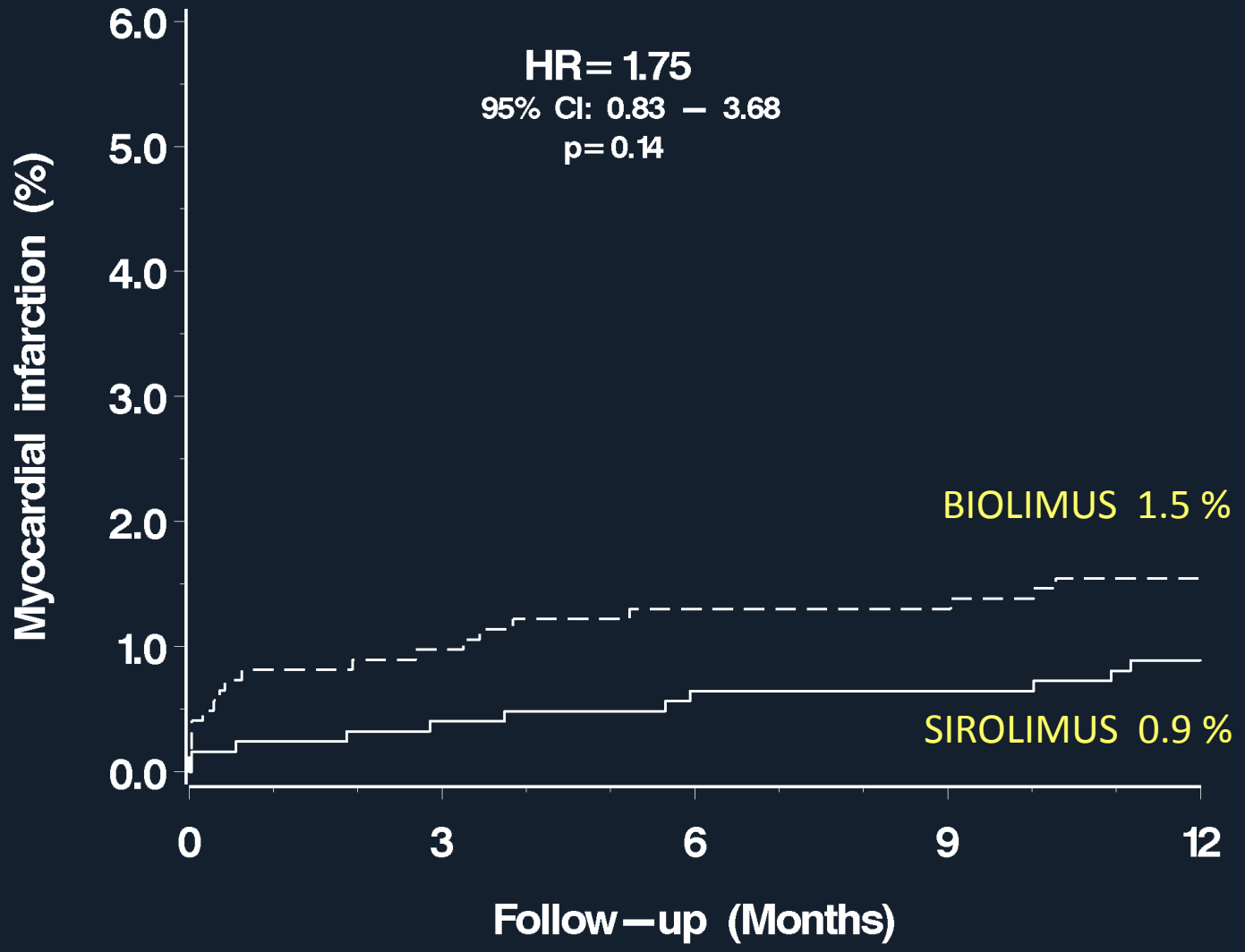
(Cardiac death, myocardial infarction, definite stent thrombosis, target vessel revascularization)



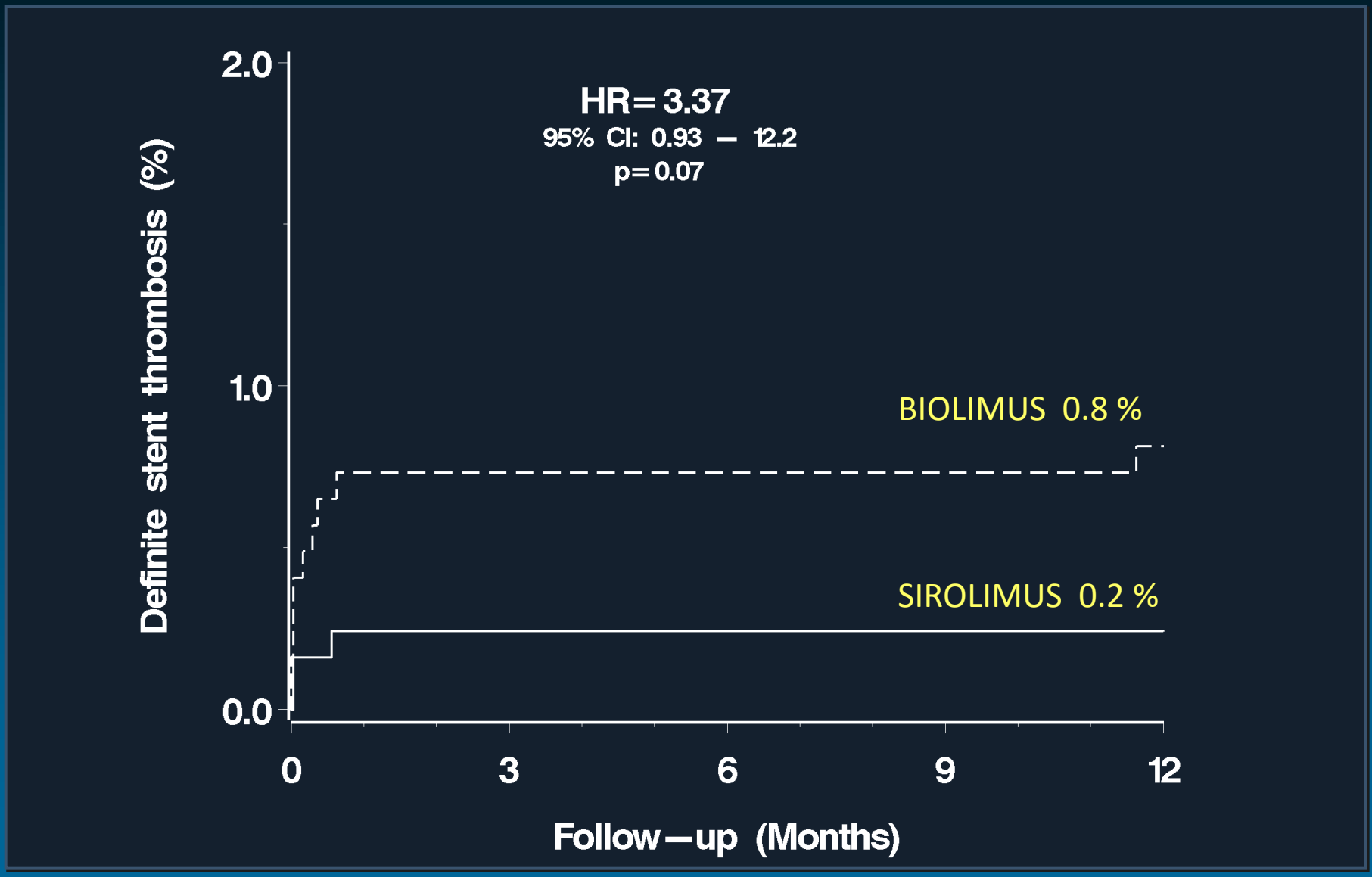
Cardiac Death



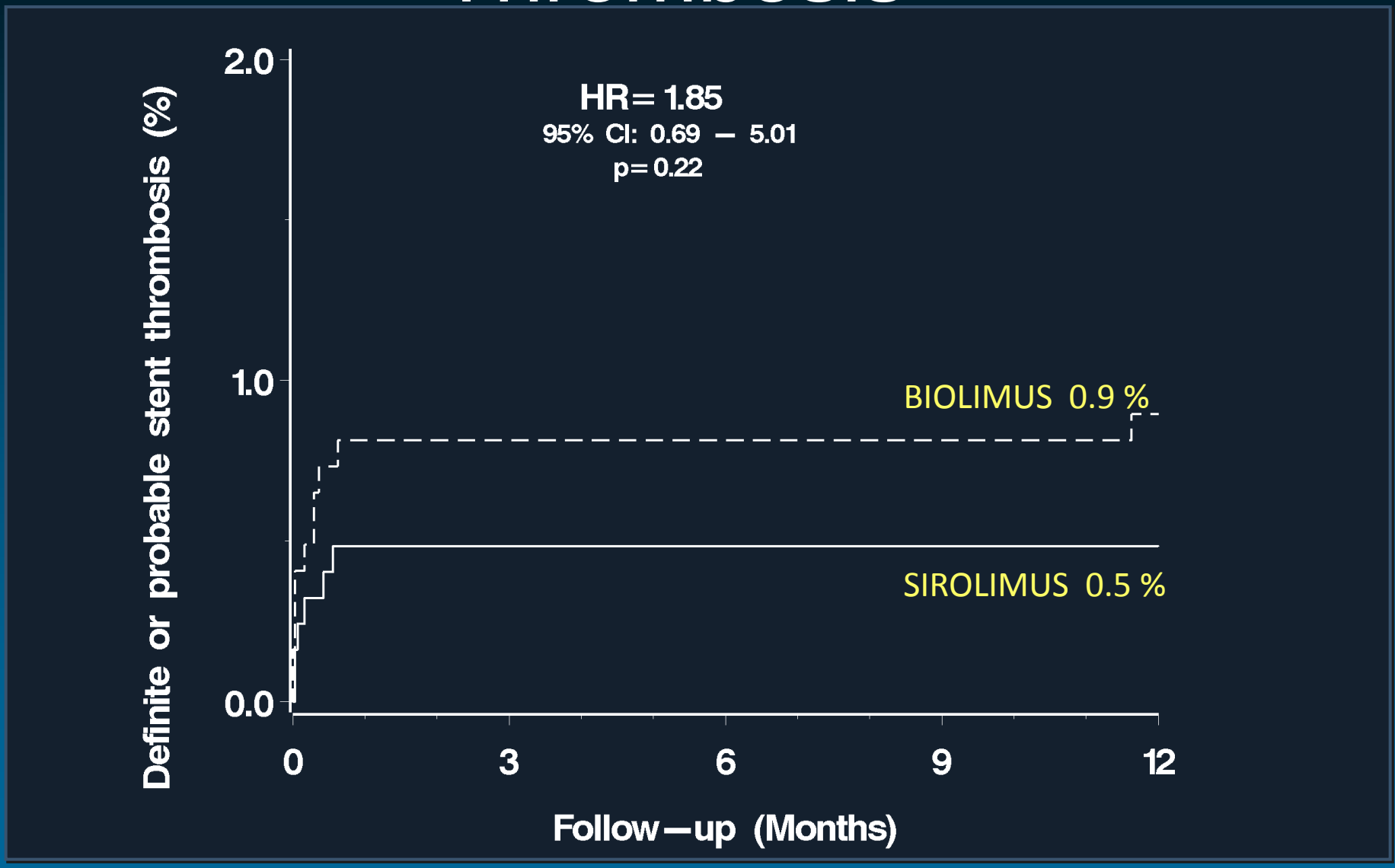
Myocardial Infarction



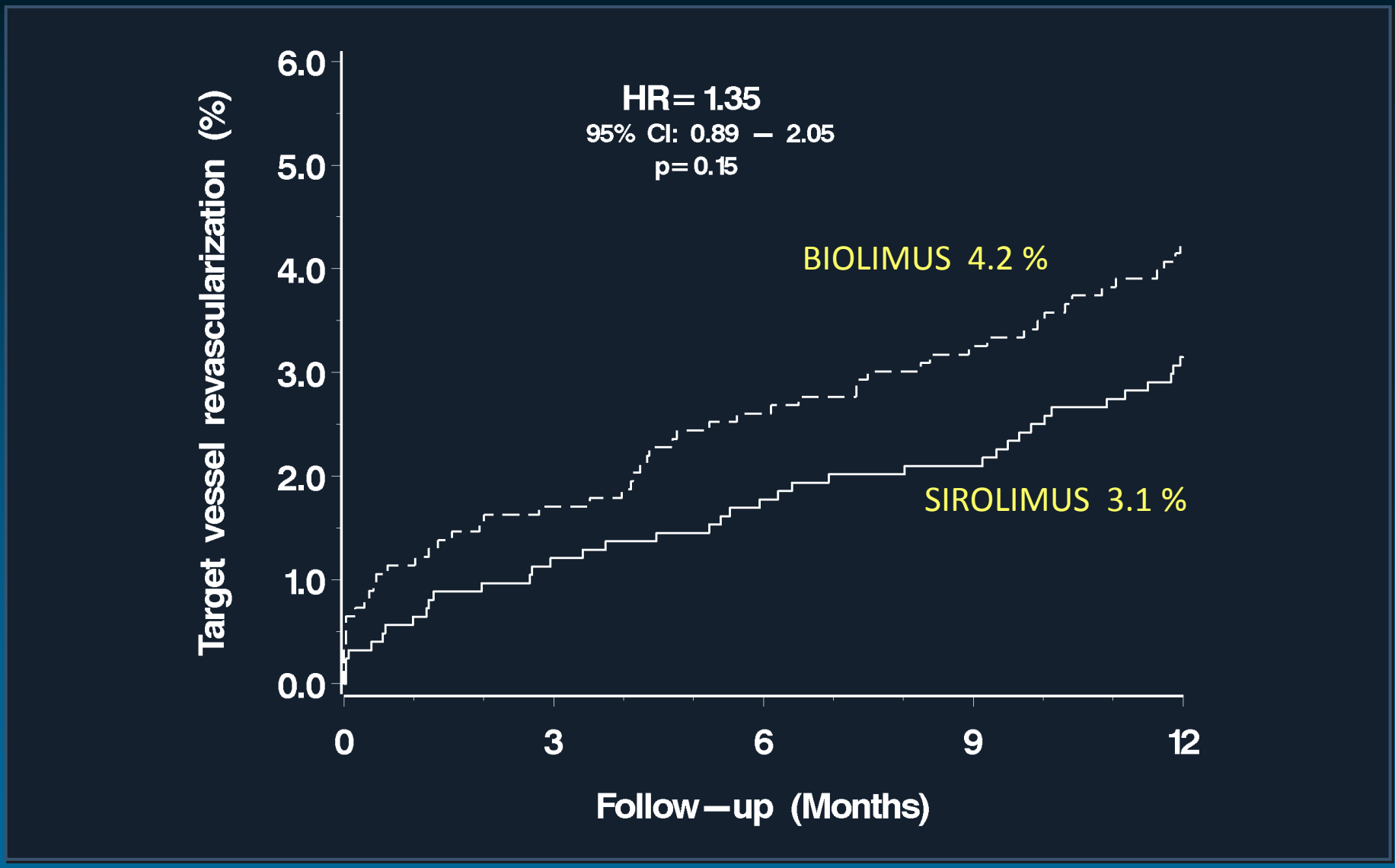
Definite Stent Thrombosis



Definite or Probable Stent Thrombosis

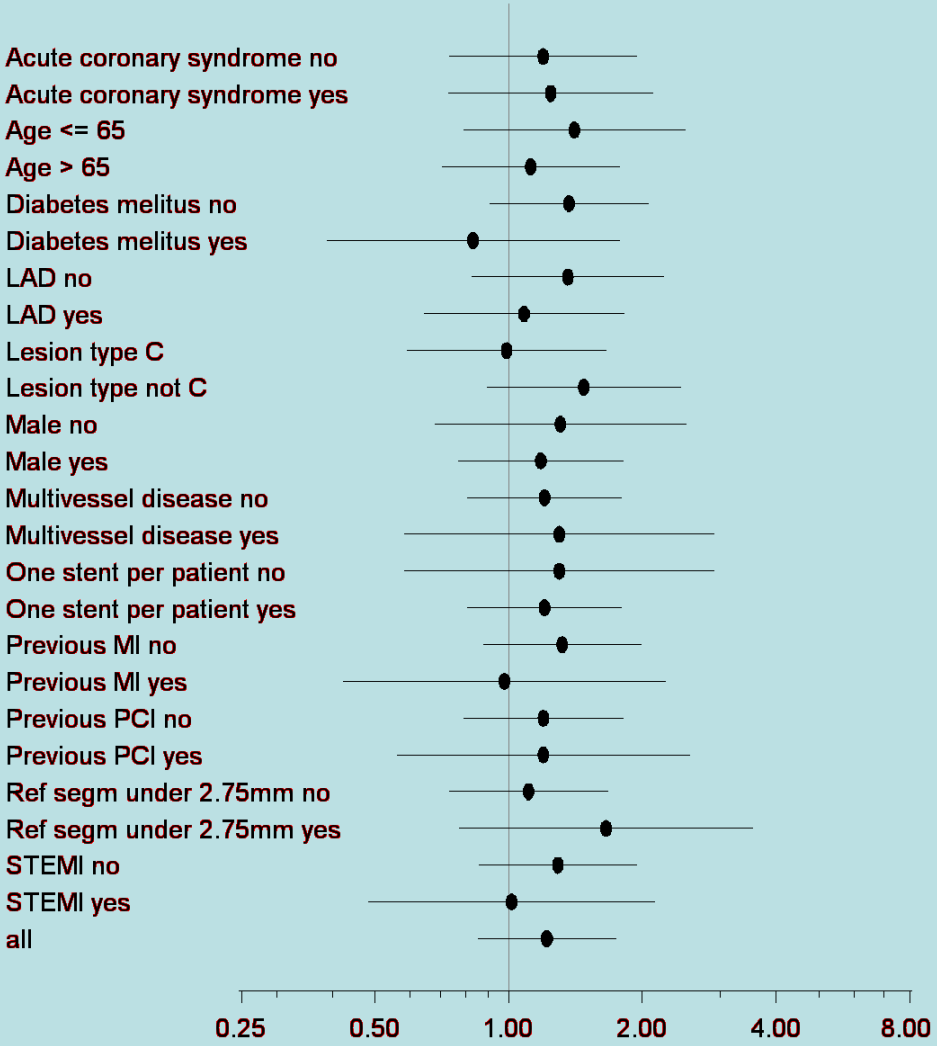


Target Vessel Revascularization



Major Adverse Cardiac Events at 12 month

(Cardiac death, myocardial infarction, definite stent thrombosis, target vessel revascularization)



	Events (%)		Hazard Ratio	
	BES	SES	(95% CI)	p
Acute coronary syndrome no	36(5.7)	30(4.8)	1.20 (0.74 - 1.94)	0.91
Acute coronary syndrome yes	30(5.0)	25(4.1)	1.24 (0.73 - 2.11)	-
Age <= 65	28(4.4)	20(3.2)	1.40 (0.79 - 2.49)	0.55
Age > 65	38(6.4)	35(5.7)	1.12 (0.71 - 1.77)	-
Diabetes melitus no	54(5.2)	40(3.8)	1.37 (0.91 - 2.06)	0.26
Diabetes melitus yes	12(6.5)	15(7.9)	0.83 (0.39 - 1.77)	-
LAD no	37(5.6)	27(4.2)	1.36 (0.83 - 2.23)	0.53
LAD yes	29(5.1)	28(4.7)	1.08 (0.64 - 1.82)	-
Lesion type C	29(5.5)	29(5.5)	0.99 (0.59 - 1.66)	0.28
Lesion type not C	37(5.3)	26(3.7)	1.48 (0.89 - 2.44)	-
Male no	21(6.7)	16(5.2)	1.31 (0.68 - 2.50)	0.80
Male yes	45(4.9)	39(4.2)	1.18 (0.77 - 1.81)	-
Multivessel disease no	53(5.2)	44(4.3)	1.20 (0.81 - 1.80)	0.87
Multivessel disease yes	13(6.4)	11(5.0)	1.30 (0.58 - 2.90)	-
One stent per patient no	13(6.4)	11(5.0)	1.30 (0.58 - 2.90)	0.87
One stent per patient yes	53(5.2)	44(4.3)	1.20 (0.81 - 1.80)	-
Previous MI no	53(5.4)	41(4.2)	1.32 (0.88 - 1.98)	0.52
Previous MI yes	11(5.3)	11(5.3)	0.98 (0.42 - 2.25)	-
Previous PCI no	49(5.0)	42(4.2)	1.20 (0.79 - 1.81)	1.00
Previous PCI yes	15(7.3)	12(6.1)	1.20 (0.56 - 2.55)	-
Ref segm under 2.75mm no	46(5.1)	45(4.6)	1.11 (0.73 - 1.67)	0.37
Ref segm under 2.75mm yes	20(6.2)	10(3.8)	1.66 (0.77 - 3.54)	-
STEMI no	52(5.2)	41(4.1)	1.29 (0.86 - 1.94)	0.58
STEMI yes	14(6.2)	14(6.2)	1.01 (0.48 - 2.13)	-
all	66(5.4)	55(4.4)	1.22 (0.85 - 1.74)	-

Conclusion

- In this study the biolimus-eluting stent was not found to be non-inferior to the sirolimus-eluting stent: It was not possible to reject the inferiority hypothesis
- These results may change at longer term follow up

SORT OUT Study Organization

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- Participating centers
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  Odense University Hospital

Backup slide: events a 12 month follow-up