



DESSOLVE III: 36-month update

A randomised comparison of a sirolimus-eluting bioabsorbable polymer-coated stent vs.
an everolimus-eluting durable polymer stent in an all-comer population

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On behalf of DESSOLVE III investigators

Patrick W. Serruys, MD. PhD.

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below.

Affiliation/Financial Relationship

- Grant/Research Support
- Consulting Fees/Honoraria

Company

- Abbott
- Biosensors
- Boston Scientific
- Medtronic
- Philips/Volcano
- Sinomedical Sciences Technology
- SMT
- Xeltis

- **MiStent drug-eluting stent with a fully absorbable polymer coating containing and embedding a micro-crystalline sirolimus into the vessel wall was developed to overcome limitations of current durable polymer DES eluting amorphous sirolimus.**
- **DESSOLVE III is a prospective, multi-centre, all-comers randomized controlled trial (n=1,398), demonstrating non-inferiority of the MiStent vs. the Xience in terms of device-oriented composite endpoint (DOCE) up to two years ^{1,2}.**
- **It remained to be elucidated whether the 9-month cytostatic neointimal inhibition by crystalline sirolimus has a beneficial effect during a longer term follow-up (up to 5 years per protocol).**

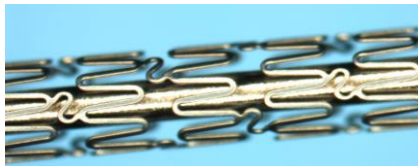
1. de Winter et al. Lancet. 2018;391:431-440.

2. Katagiri et al. EuroIntervention. 2019 Feb 5. pii: EIJ-D-18-00944.

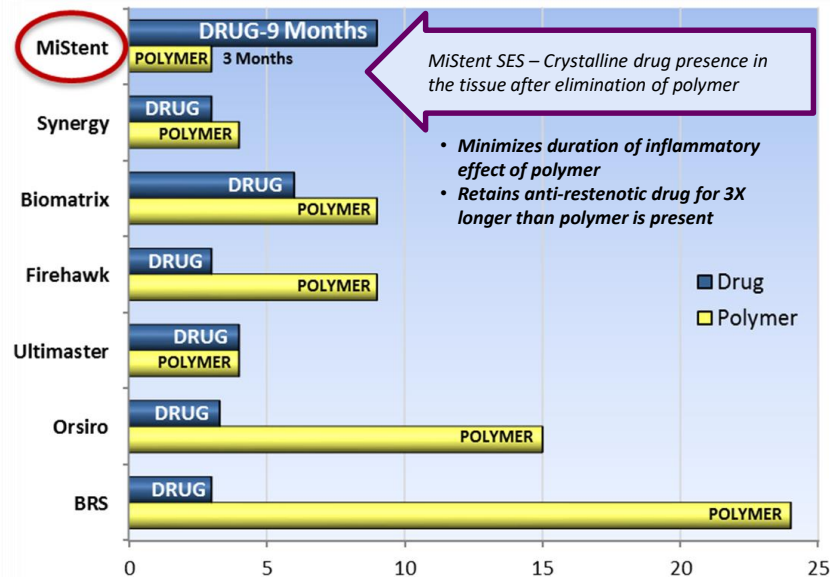
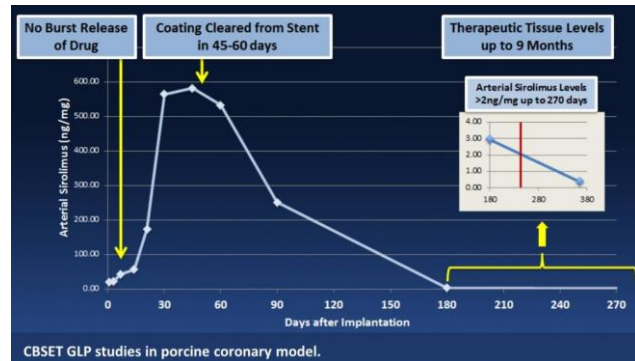
The MiStent SES[®] is a fully absorbable polymer coating containing and embedding a micro-crystalline sirolimus into vessel wall

Thin-Strut Stent

- Cobalt-chromium
- Strut thickness 64 microns

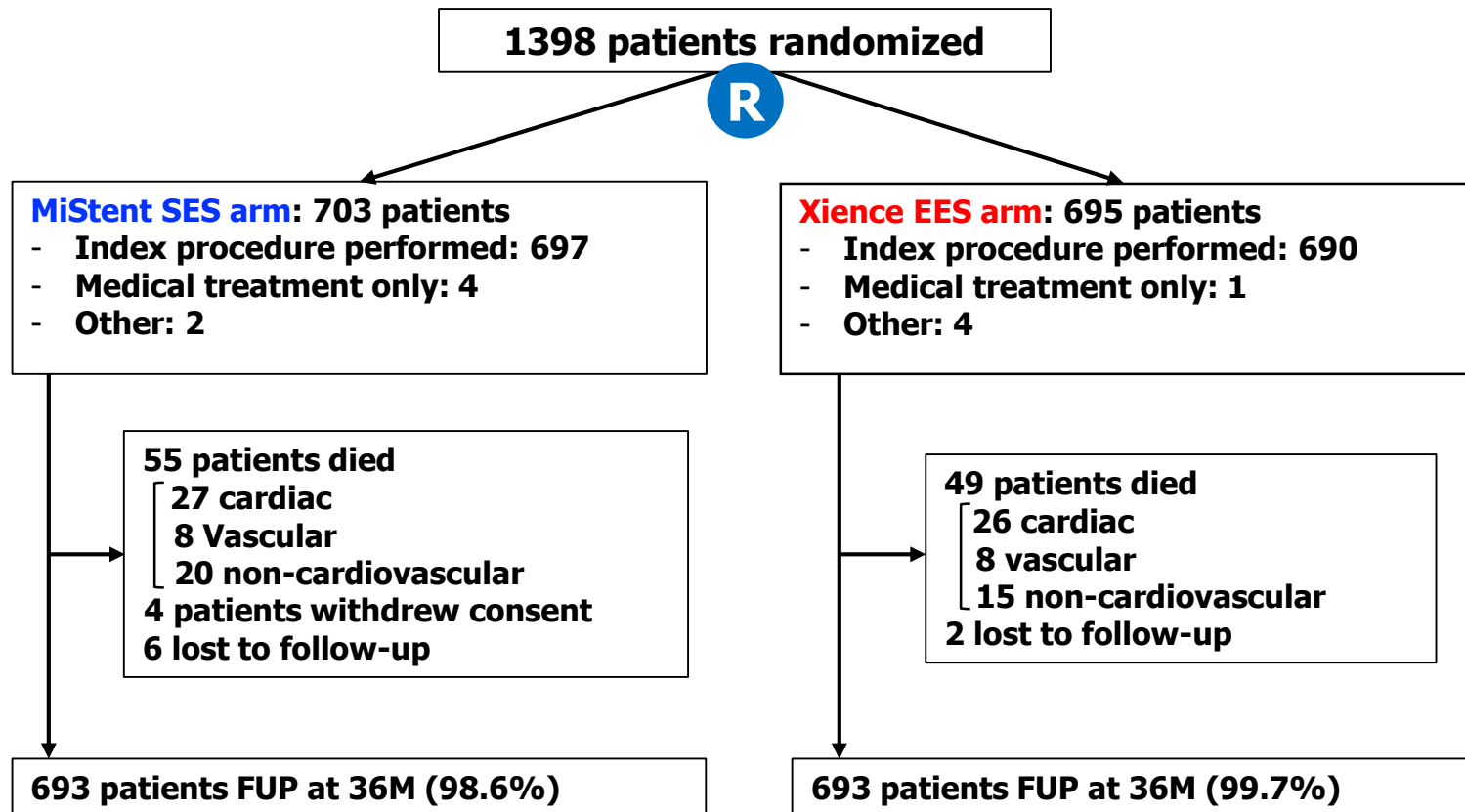


No drug burst, early absorption of polymer, continued drug elution for 9 months



The only product in its class with sustained drug elution in the absence of polymer

Patient flow chart of the DESSOLVE III trial up to 3 years



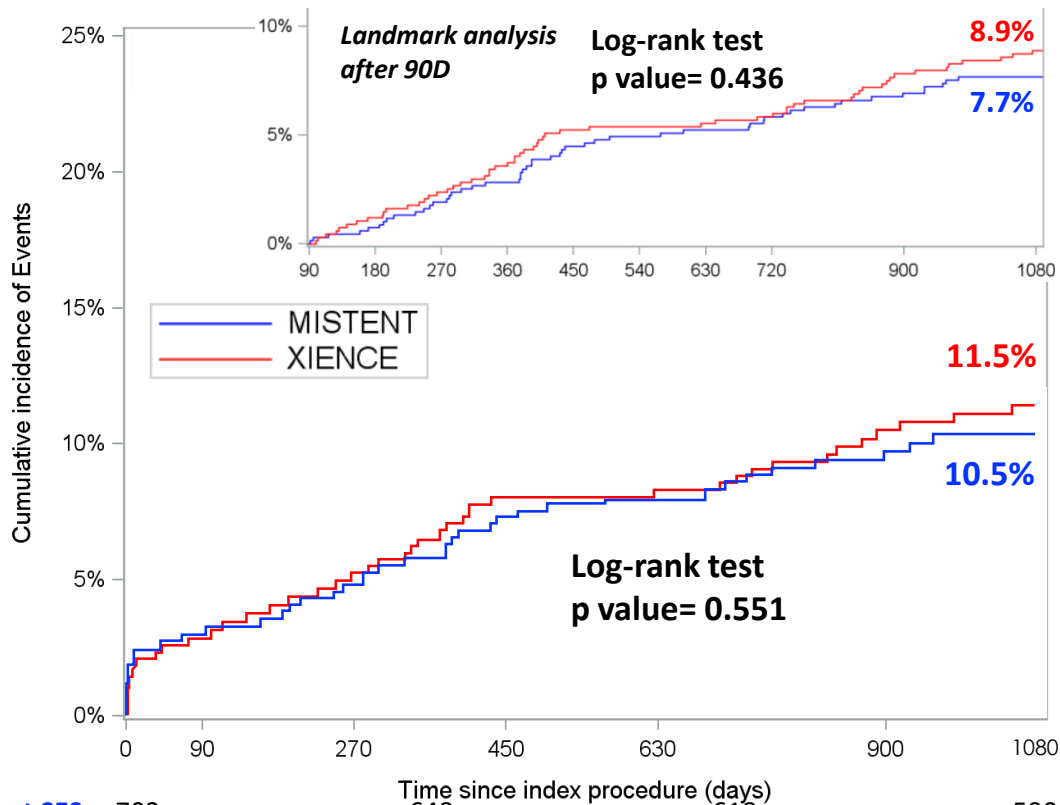
Characteristic	MiStent SES (n= 703)	Xience EES (n= 695)	p value
Age (years)	66.4± 10.7	66.3± 10.7	0.90
Male	70.3 %	73.8 %	0.14
Body Mass Index (kg/m ²)	27.9± 4.4	28.1±4.5	0.55
Risk Factors			
Current smoker	26.6 %	26.4 %	0.955
Diabetes Mellitus	26.6 %	27.1 %	0.811
Hypertension	71.5 %	75.4 %	0.10
Hypercholesterolemia	60.8 %	60.0 %	0.76
Family history of CAD	39.0 %	38.2 %	0.76
History of:			
Previous MI	27.1 %	27.7 %	0.78
Peripheral Artery Disease	9.3 %	10.5 %	0.47
Previous PCI	33.7 %	35.6 %	0.44
Previous CABG	7.3 %	9.5 %	0.13
Heart Failure	7.3 %	7.5 %	0.86
Renal Insufficiency*	6.7 %	6.7 %	0.98
Indication			0.78
Stable angina	41.1 %	41.3 %	
Acute coronary syndrome	48.9 %	48.7 %	
Unstable angina	23.0 %	23.9 %	
Non-ST elevation MI	21.2 %	19.1 %	
ST-elevation MI	14.7 %	15.7 %	

	MiStent SES n=1037 lesions	Xience EES n=993 lesions	p value
Vessel Location:			
LAD	41.5 %	39.7 %	0.41
LCX	26.1 %	26.1 %	0.98
RCA	30.3 %	31.9 %	0.42
Left Main	1.5 %	1.4 %	0.8
Bypass graft	0.6 %	0.9 %	0.39
Number of lesions treated	1.49± 0.83	1.44± 0.78	0.26
Index PCI performed	99.1 %	99.3 %	0.78
TIMI flow pre-procedure			0.68
Flow 0	8.9 %	9.4 %	
Flow 1	3.5 %	3.3 %	
Flow 2	18.0 %	15.6 %	
Flow 3	62.4 %	64.0 %	
Not done	7.2 %	7.7 %	
Restenotic Lesion	3.0 %	3.1 %	0.86
Small Vessel (≤ 2.75 mm)	40.7 %	40.8 %	0.97
Long Lesion (> 18 mm)	56.2 %	47.1 %	<0.001
Bifurcation Involved	7.4 %	6.9 %	0.68

	MiStent SES n=1037 lesions	Xience EES n=993 lesions	p value
Direct stenting	30.8 %	33.2 %	0.23
Maximum pressure (atm)	13.6± 3.7	13.7± 3.5	0.63
Maximum balloon length (mm)	15.9± 4.0	16.3± 4.3	0.17
Maximum balloon diameter (mm)	2.51± 0.41	2.47± 0.40	0.08
Stent characteristics			
Number of stents used per lesion	1.23± 0.56	1.23± 0.60	0.93
Total stent length (mm)	24.2± 12.8	25.0± 14.9	0.19
Overlapping stent	22.0 %	22.3 %	0.87
Post-stenting balloon dilatation			
Maximum pressure (atm)	16.5± 4.0	16.7± 3.7	0.33
Maximum balloon length (mm)	14.2± 4.7	14.2± 5.3	0.82
Maximum balloon diameter (mm)	3.22±0.54	3.17± 0.56	0.23
TIMI flow post-procedure			
Flow 0	0.2 %	0.3 %	
Flow 1	0.1 %	0.2 %	
Flow 2	1.3 %	1.6 %	
Flow 3	93.3 %	91.9 %	
Not done	5.1 %	5.9 %	

The primary endpoint (DOCE/TLF)

-defined as the composite of cardiac death, TV-MI, CI-TLR-

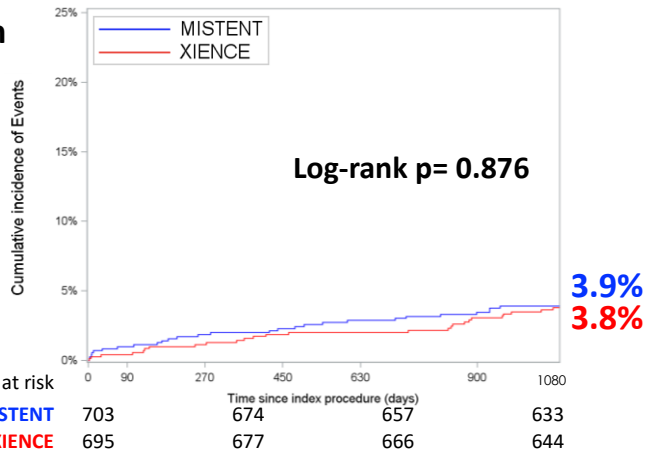


MiStent SES	703	648	618	590
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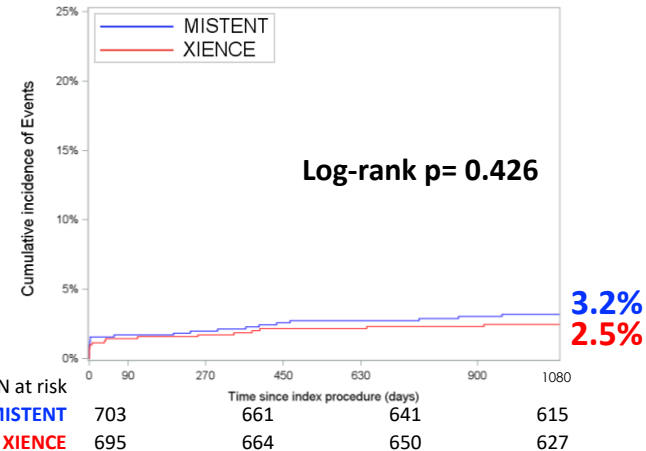
Xience EES	695	643	621	591
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Components of DOCE/TLF and ST

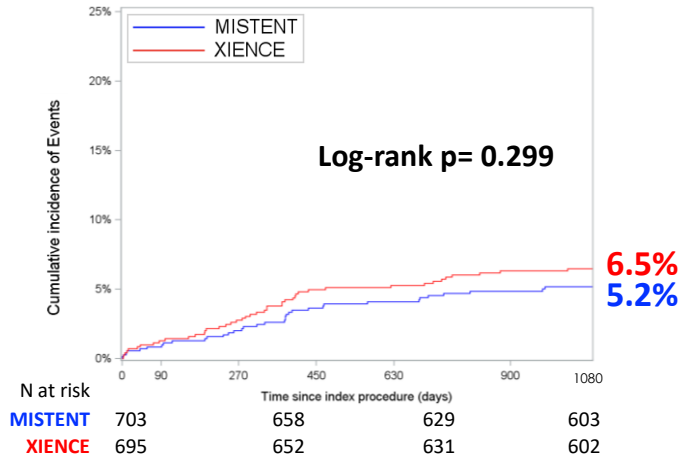
Cardiac death



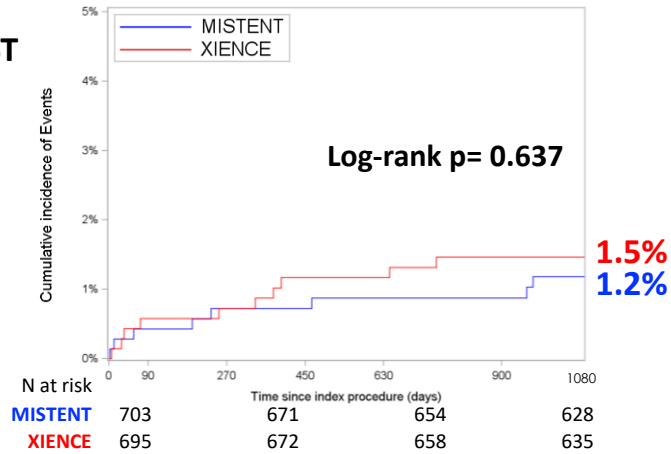
Target vessel MI



CI-TLR

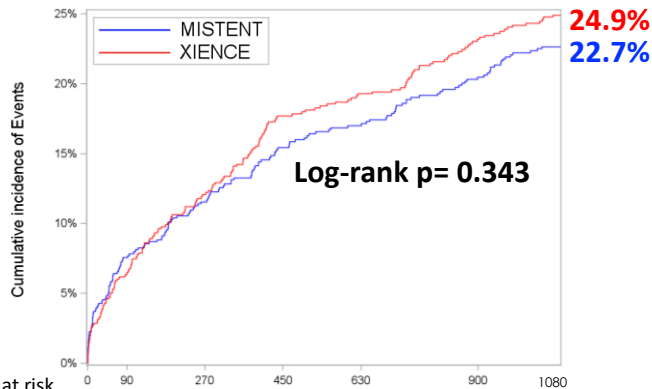


Def or Prob ST



POCE (all-cause death, any MI, any revascularization)

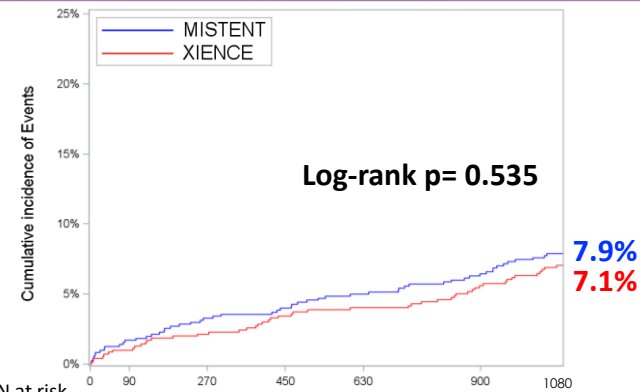
POCE



N at risk

	0	90	270	450	630	900	1080
MISTENT	703		606	566	532		
XIENCE	695		592	558	520		

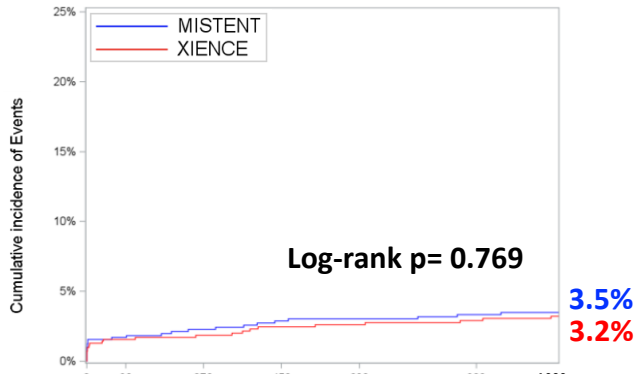
All-cause death



N at risk

	0	90	270	450	630	900	1080
MISTENT	703		674	657	633		
XIENCE	695		677	666	644		

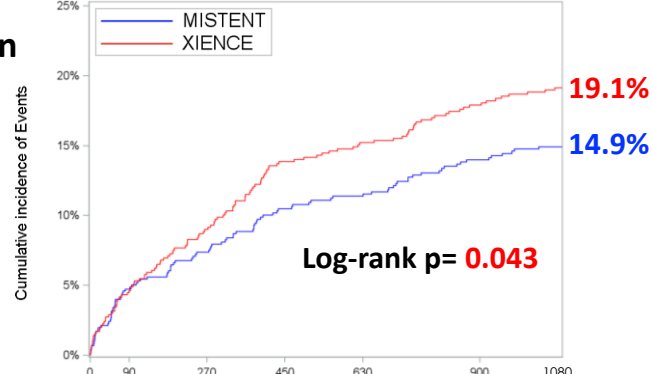
Any MI



N at risk

	0	90	270	450	630	900	1080
MISTENT	703		660	640	614		
XIENCE	695		663	648	624		

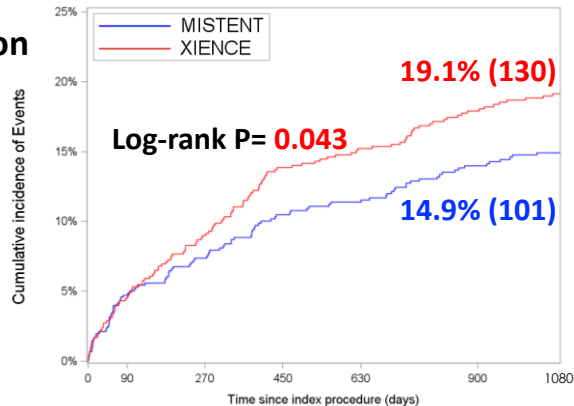
Any revascularization



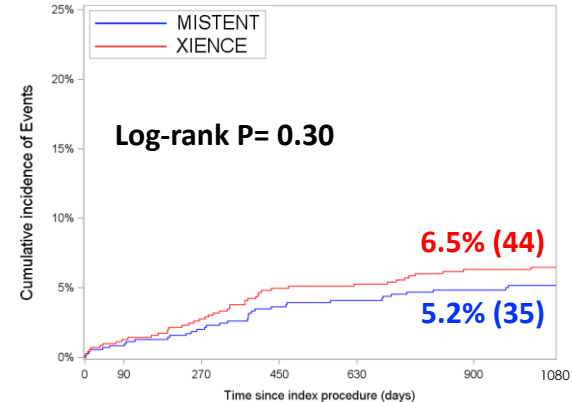
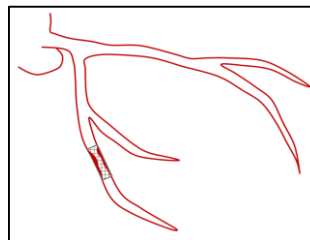
N at risk

	0	90	270	450	630	900	1080
MISTENT	703		615	575	541		
XIENCE	695		600	566	528		

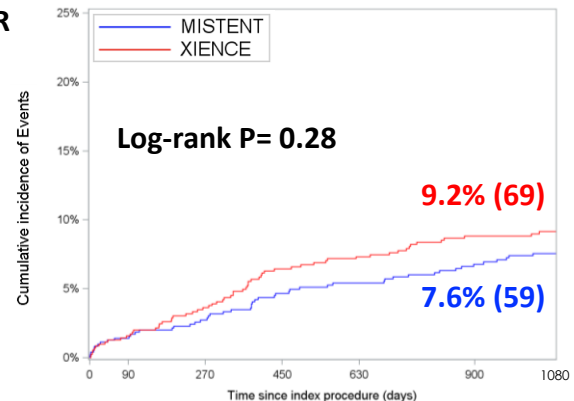
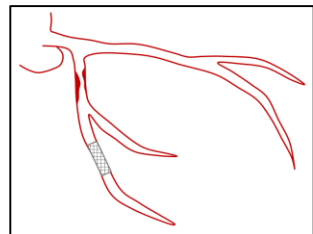
Any revascularization



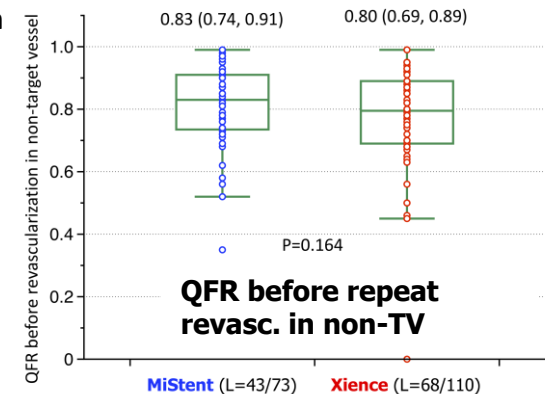
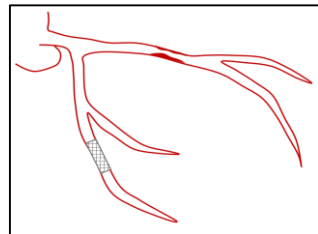
Clinically-indicated TLR



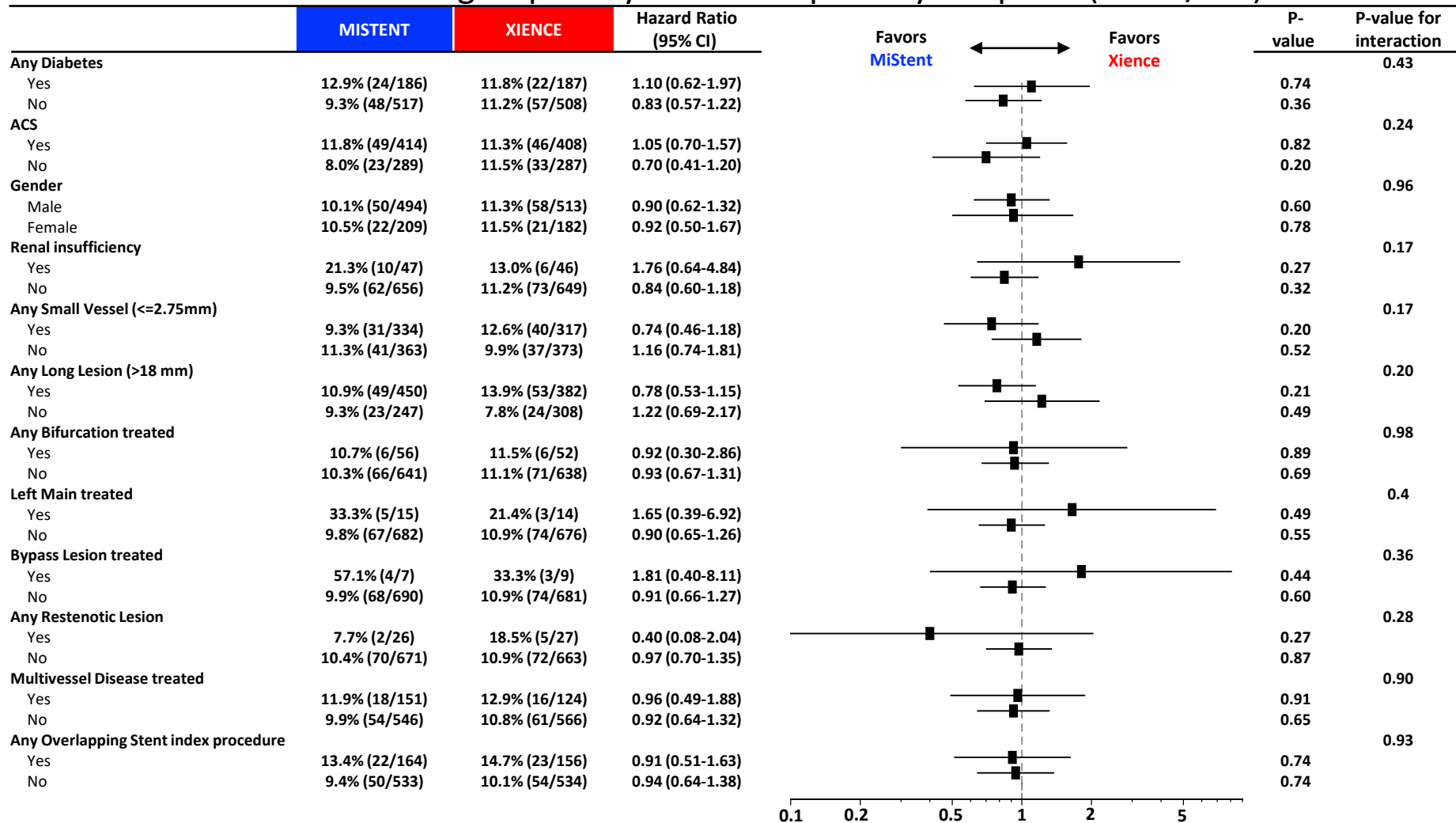
Clinically-indicated TVR



Non-TV revascularization



Subgroup analyses for the primary endpoint (DOCE/TLF)



- ***Why?*** To assess whether the 9-month cytostatic neointimal inhibition by crystalline sirolimus has a beneficial effect during the long-term follow-up.
- ***What?*** Three-year clinical outcomes of the MiStent drug-eluting stent with a fully biodegradable polymer containing a microcrystalline sirolimus vs. the Xience durable polymer everolimus-eluting stent.
- ***How?*** Randomizing 1398 all-comers PCI patients either to MiStent or Xience.
- ***What are the results?*** Three-year DOCE was 10.5% and 11.5% in the MiStent and Xience arm, respectively ($p=0.551$). Definite or probable stent thrombosis rate remained low and statistically similar 1.2% and 1.5% ($p=0.637$) between the stents.
- ***Why is this important?*** The efficacy and safety of the MiStent containing a microcrystalline sirolimus up to 3 years has been confirmed as compared to the best-in class second-generation DES, the Xience in a large all-comers population.

K. Arkenbout, J ten Berg, H. Boersma, P. Buszman, G. Cayla, Gerrit-Anne van Es, M. Ferrari, D. Fischer, S. Garg, P. Goube, B. Hamer, S. Hofma, S. James, G. Jessurun, K. Koch,
ECRI/Cardialysis - THANK YOU

M. Kosmider, S. Levesque, P. Lurz, K. Milewski, M. Noutsias, Y. Onuma, T. Oude Ophuis, B. Rensing, W. Rutsch, R.P.T. Troquay, G.J. Vlachojannis, W. Wijns, R. de Winter, J. Wöhrle, R. Wyderka, A. Zurakowski

DESSOLVE III participating sites



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B. Hamer, MD	Meander MC Amersfoort
G. Jessurun, MD	Treant Zorggroep loc. Scheper Ziekenhuis Emmen
R.P.T. Troquay, MD	VieCuri MC Venlo
K. Arkenbout, MD	Tergooi Blaricum

Germany

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D. Fischer, MD	Universitätsklinikum Münster
J. Wöhrle, MD	Universitätsklinikum Ulm

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- In an all-comers population, the MiStent sirolimus-eluting bioabsorbable polymer-coated stent had a similar efficacy and safety up to three-year follow-up, when compared with the Xience everolimus-eluting durable-polymer stent.
- This report provides a promising option of a drug-eluting stent in our daily practice.

TRIAL ORGANIZATION

Steering Committee

- Prof. Patrick W. Serruys (chair)
- Prof. R. de Winter
- Prof. W. Wijns
- Gerrit-Anne van Es

DSMB

- Prof. S. James (Chair)
- Prof. H. Boersma
- Dr. J ten Berg

CRO

- Cardialysis B.V. Rotterdam, the Netherlands

Sponsor: European Cardiovascular Research Institute (ECRI)

Grant givers: Micell Technologies, Durham, NC, USA. Stentys, Paris, France

CEC

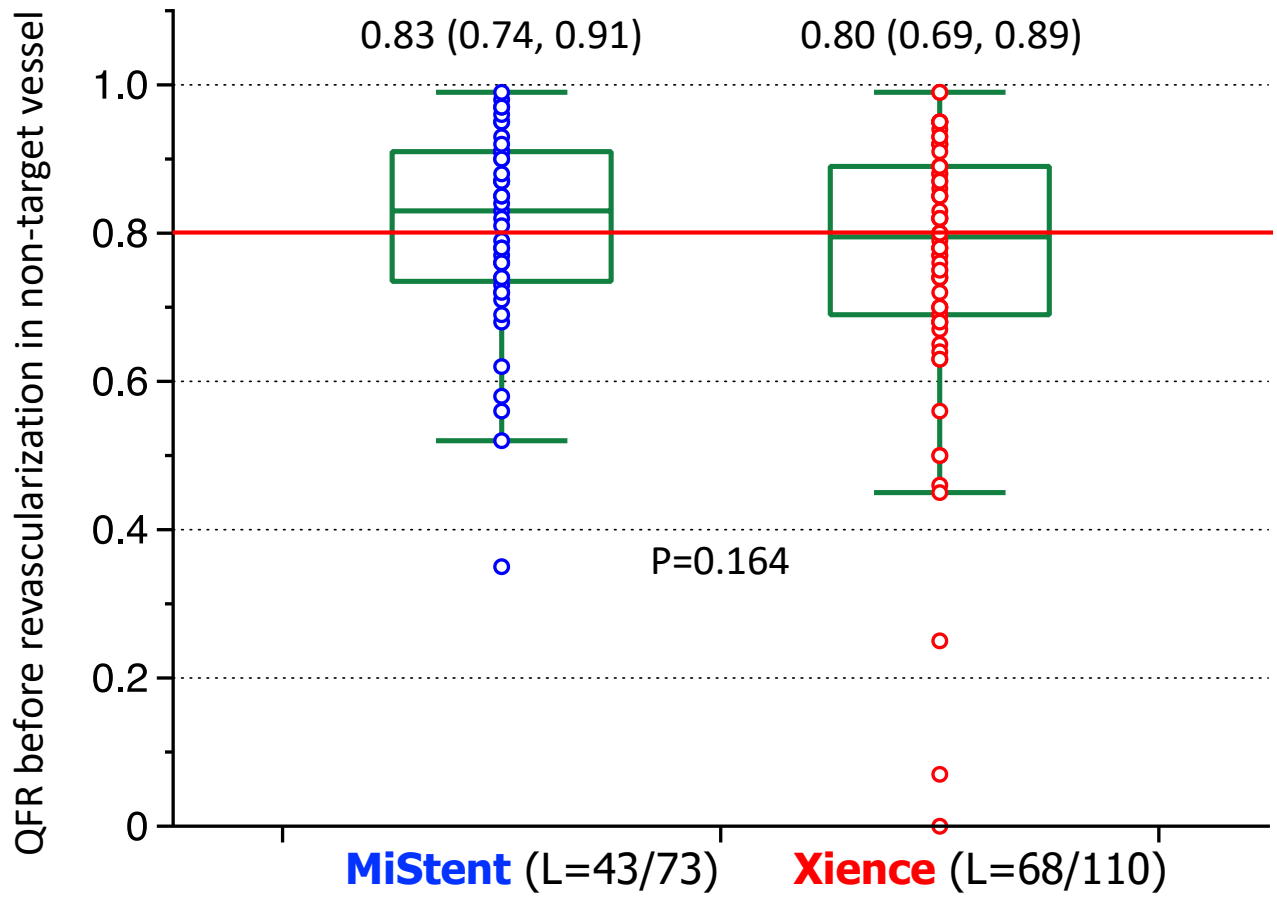
- Dr. B. Rensing
- Prof. W. Rutsch
- Dr. S. Garg
- Dr. G.J. Vlachojannis

Core lab (OCT and angiography)

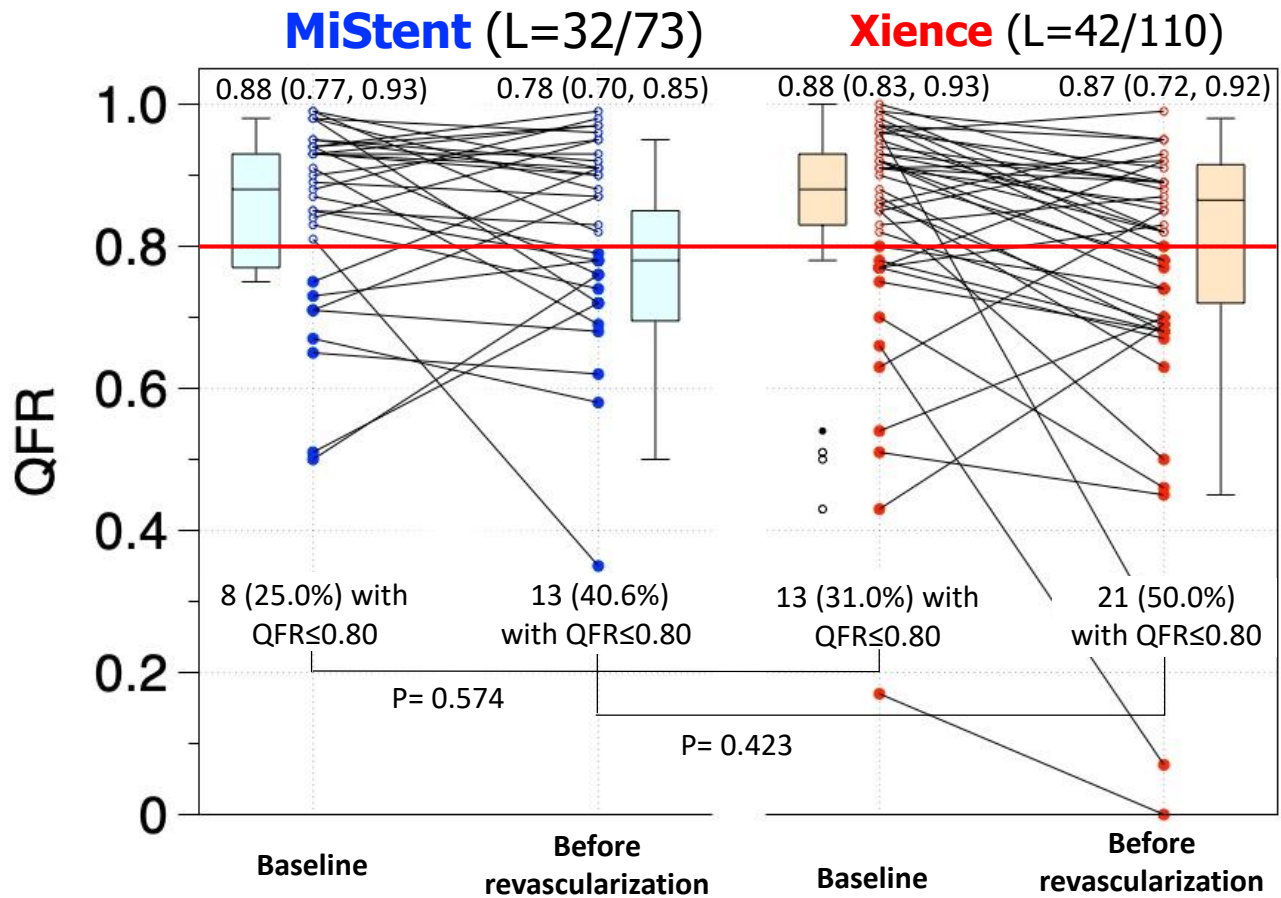
- Dr. Y. Onuma; Cardialysis B.V. Rotterdam, the Netherlands
- Dr. K. Takahashi

- Backup

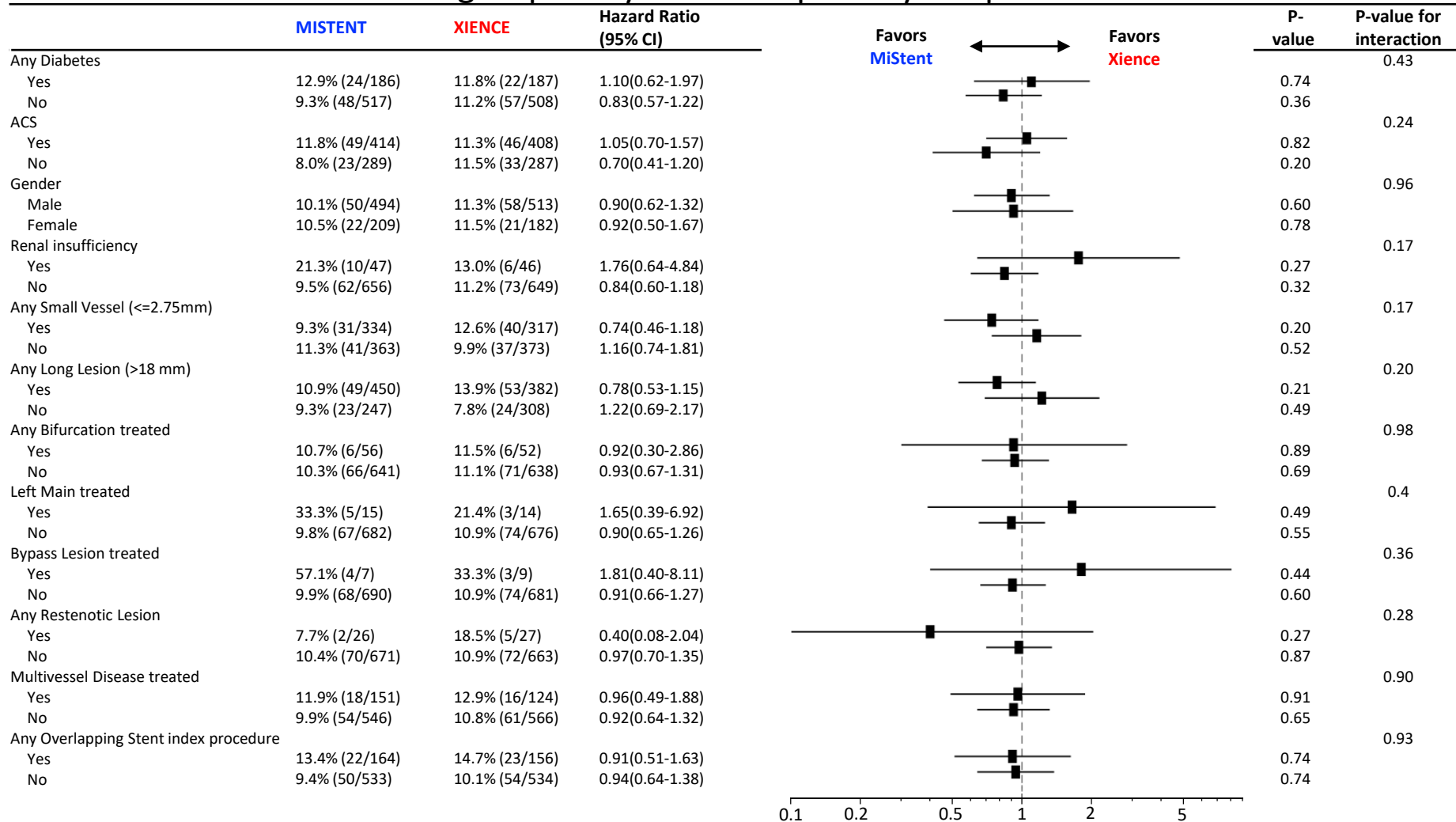
QFR before non-TV revascularization



Non-target vessel revascularization



Subgroup analyses of the primary endpoint



What are the essential results?

DOCE

Outcome	MISTENT	XIENCE	Difference (95% CI)	p-value
DOCE	10.5%	11.5%	-1.1 (-4.4, 2.2)%	0.55
Cardiac Death	3.9%	3.8%	0.1 (-1.9, 2.2)%	0.88
Target-Vessel MI	3.2%	2.5%	0.7 (-1.0, 2.5)%	0.43
Clinically-indicated TLR	5.2%	6.5%	-1.3 (-3.8, 1.2)%	0.30

POCE

Outcome	MISTENT	XIENCE	Difference (95% CI)	p-value
POCE	22.7%	24.9%	-2.3 (-6.7, 2.2)%	0.34
Any death	7.9%	7.1%	0.8 (-1.9, 3.6)%	0.54
Any MI	3.5%	3.2%	0.3 (-1.6, 2.2)%	0.77
Any revascularization	14.9%	19.1%	-3.1 (-8.2, -0.2)%	0.043

Subgroup analyses for the primary endpoint (DOCE/TLF)

