Systematic Review of Longterm Outcomes After 1° vs. 2° Generation DES

Adnan Kastrati, MD
Deutsches Herzzentrum, Technische Universität München, Germany

Seoul, April 28, 2010

1° Generation DES

	Cypher	Taxus
1. Stent platform:	Stainless-steel	Stainless-steel
2. Drug carrier:	Permanent polymer	Permanent polymer
3. Drug:	Sirolimus	Paclitaxel


The NEW ENGLAND JOURNAL of MEDICINE

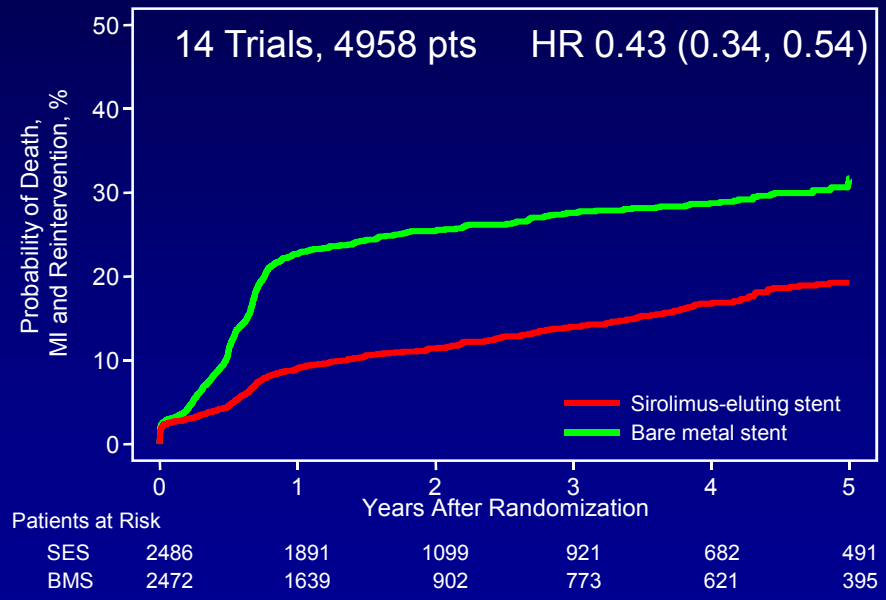
ORIGINAL ARTICLE

Analysis of 14 Trials Comparing Sirolimus-Eluting Stents with Bare-Metal Stents

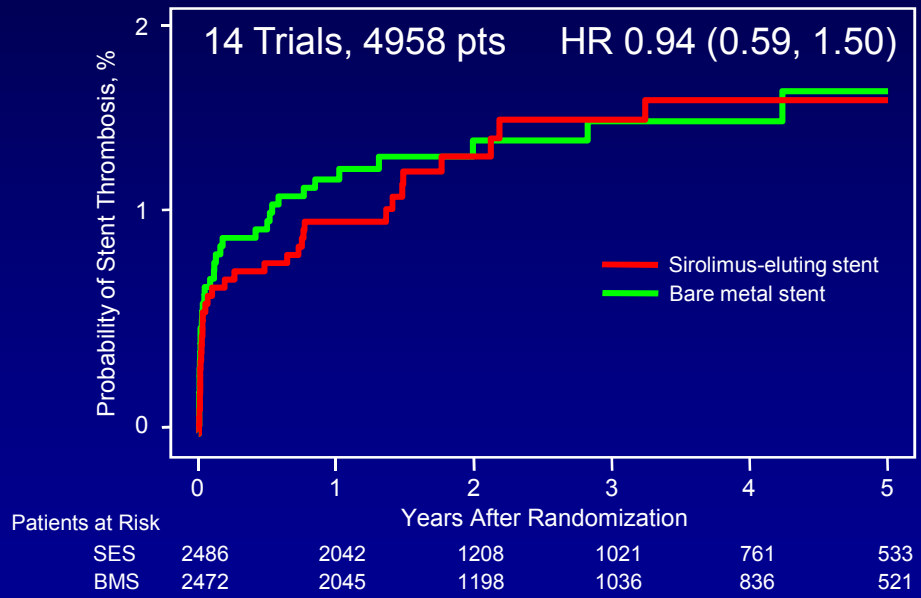
Adnan Kastrati, M.D., Julinda Mehilli, M.D., Jürgen Pache, M.D., Christoph Kaiser, M.D., Marco Valgimigli, M.D., Ph.D., Henning Kelbæk, M.D., Maurizio Menichelli, M.D., Manel Sabaté, M.D., Maarten J. Suttorp, M.D., Ph.D., Dietrich Baumgart, M.D., Melchior Seyfarth, M.D., Matthias E. Pfisterer, M.D., and Albert Schömig, M.D.

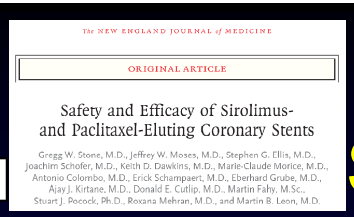
Incontestable Lessons From Studies on 1° Generation DES

Cypher is effective



Cypher is safe




The NEW ENGLAND JOURNAL of MEDICINE

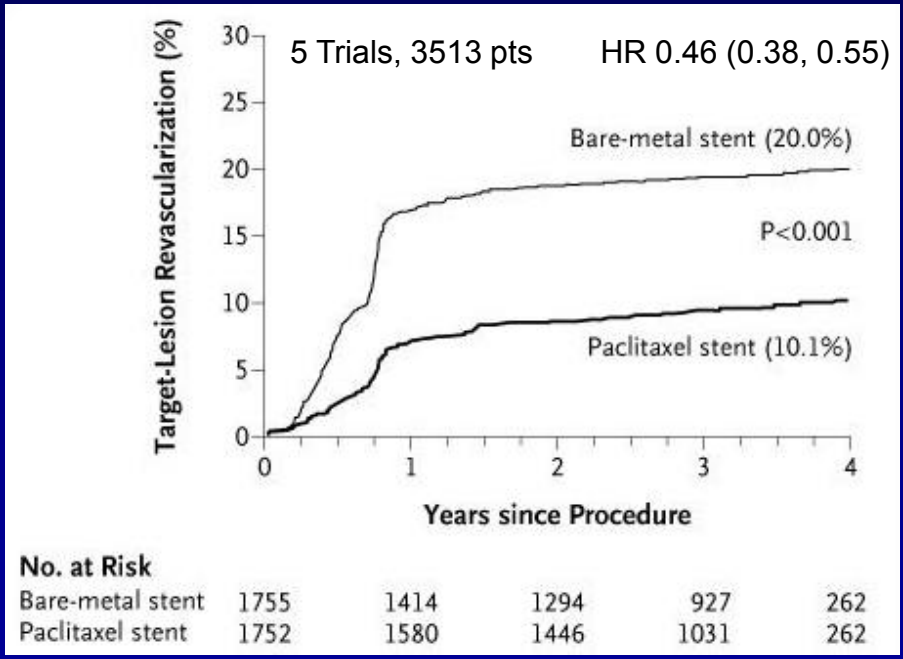
ORIGINAL ARTICLE

Safety and Efficacy of Sirolimus- and Paclitaxel-Eluting Coronary Stents

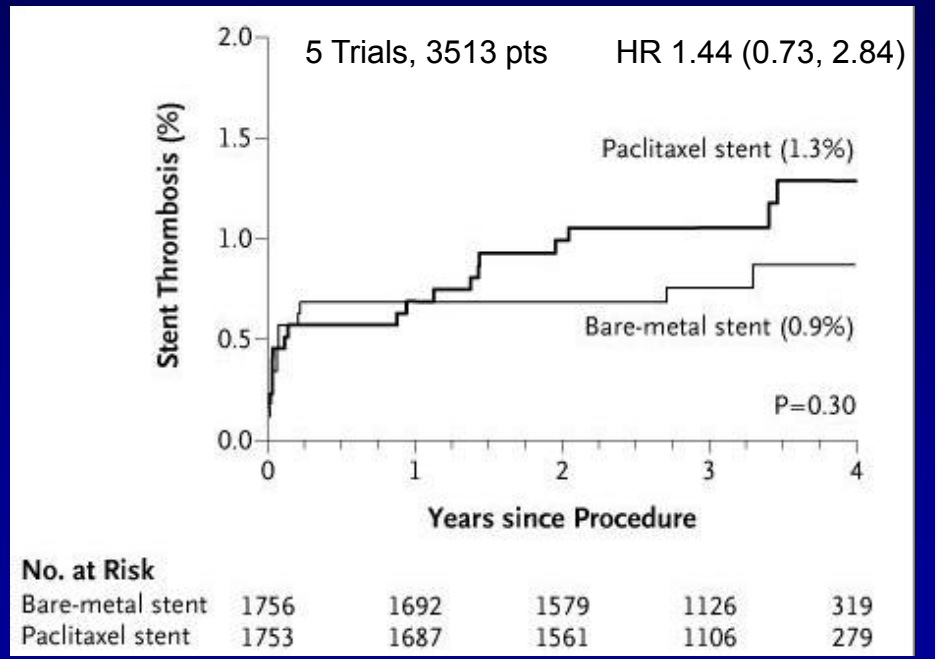
Gregg W. Stone, M.D., Jeffrey W. Moses, M.D., Stephen G. Ellis, M.D., Joachim Schofer, M.D., Keith D. Dawkins, M.D., Marie-Claude Morice, M.D., Antonio Colombo, M.D., Erick Schampaert, M.D., Eberhard Grube, M.D., Ajay J. Kirtane, M.D., Donald E. Cutlip, M.D., Martin Fahy, M.Sc., Stuart J. Pocock, Ph.D., Roxana Mehran, M.D., and Martin B. Leon, M.D.

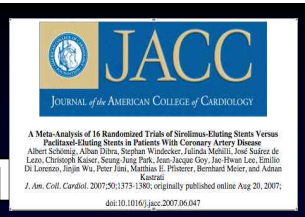
Incontestable Lessons From Studies on 1° Generation DES

Taxus is effective



Taxus is safe




JACC
JOURNAL of the AMERICAN COLLEGE of CARDIOLOGY

A Meta-Analysis of 16 Randomized Trials of Sirolimus-Eluting Stents Versus Paclitaxel-Eluting Stents in Patients With Coronary Artery Disease

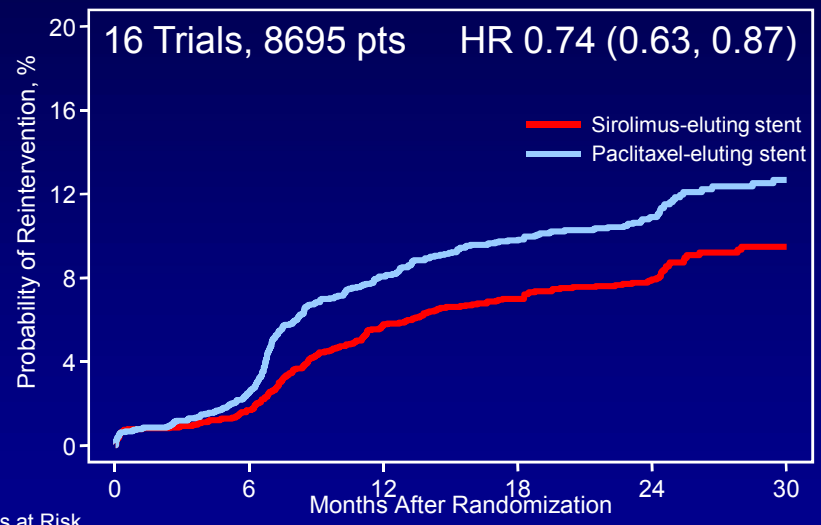
Albert Schömig, Alban Dibra, Stephan Windecker, Julinda Mehilli, José Suárez de Lezo, Christoph Kaiser, Seung-Jung Park, Jean-Jacque Goy, Jae-Hwan Lee, Emilio Di Lorenzo, Jinjin Wu, Peter Jani, Matthias E. Pfisterer, Bernhard Meier, and Adnan Kastrati

J. Am. Coll. Cardiol. 2007;50;1373-1380; originally published online Aug 20, 2007;

doi:10.1016/j.jacc.2007.06.047

Incontestable Lessons From Studies on 1° Generation DES

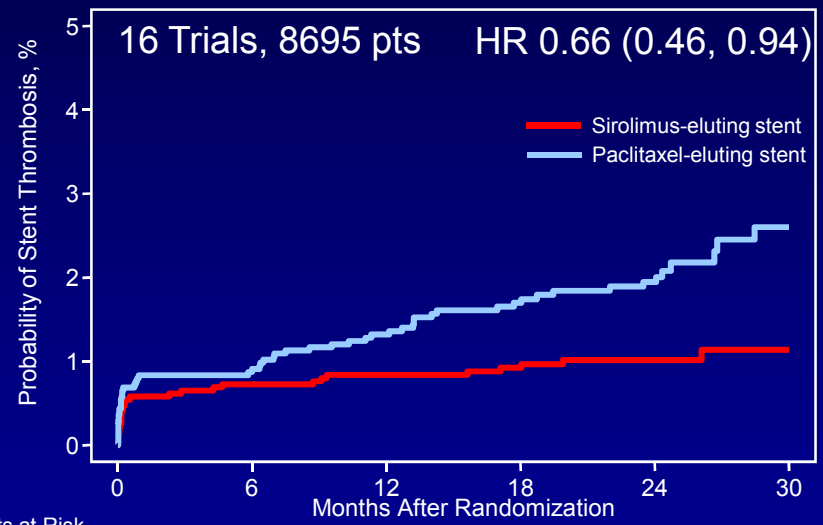
Cypher is more effective than Taxus



Patients at Risk

SES	2783	2692	2426	2131	1628	621
PES	2779	2641	2354	2037	1525	555

Cypher is safer than Taxus



Patients at Risk

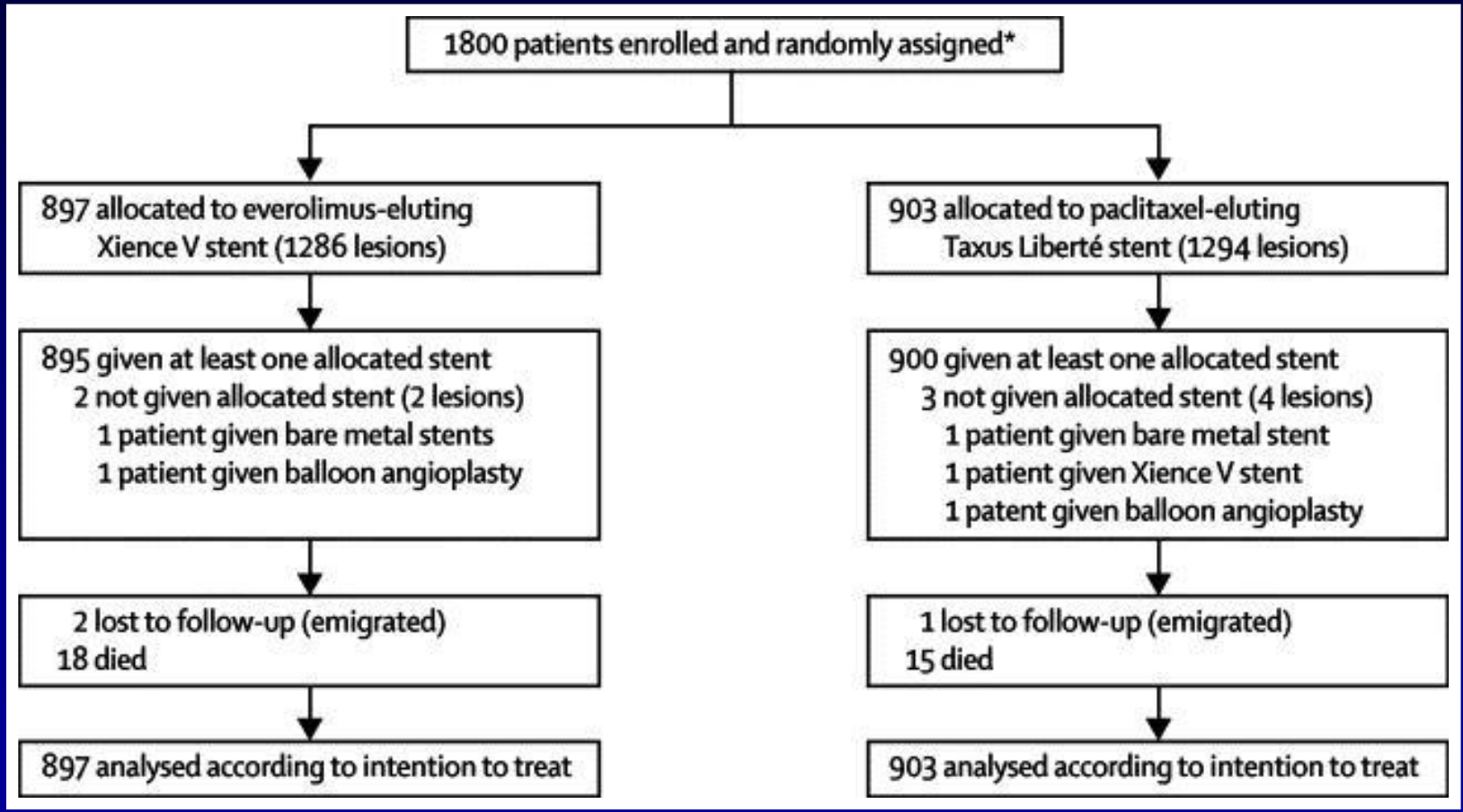
SES	2783	2718	2546	2266	1752	676
PES	2779	2687	2526	2224	1693	632

2° Generation DES

	Xience V	Endeavor Endeavor Resolute	Biodegrad. Pol. (Biomatrix, ISAR, Nevo)	ISAR-Dual Drug
1. Stent platform:	CoCr	CoCr	Stainl.-steel or CoCr	Stainless-steel
2. Drug carrier:	Permanent polymer	Permanent polymer	Biodegrad. polymer	No polymer
3. Drug:	Everolimus	Zotarolimus	Sirolimus or Biolimus	Sirolimus+Probucol

2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

COMPARE Trial

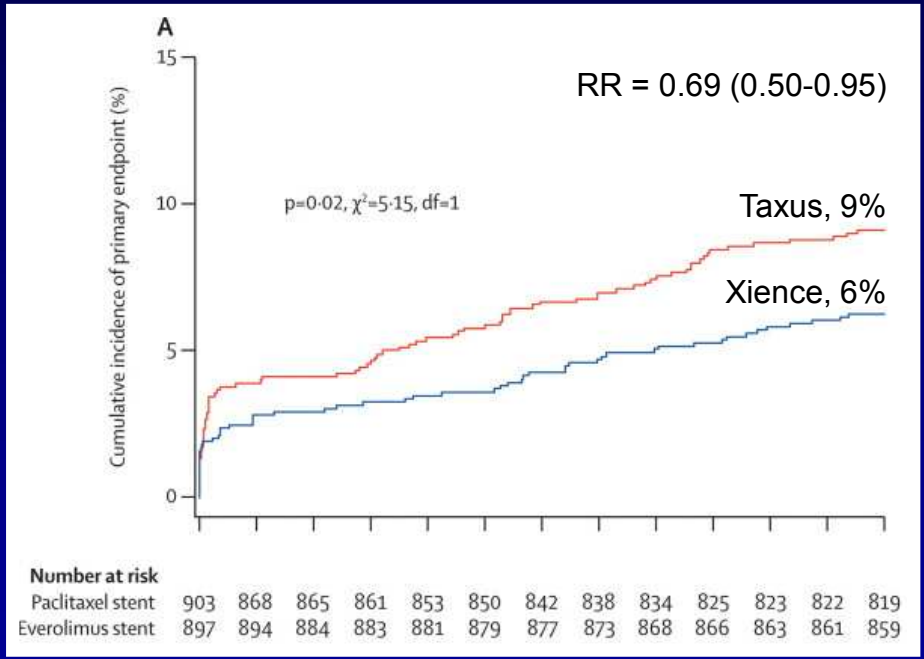


Kedhi et al, Lancet 2010

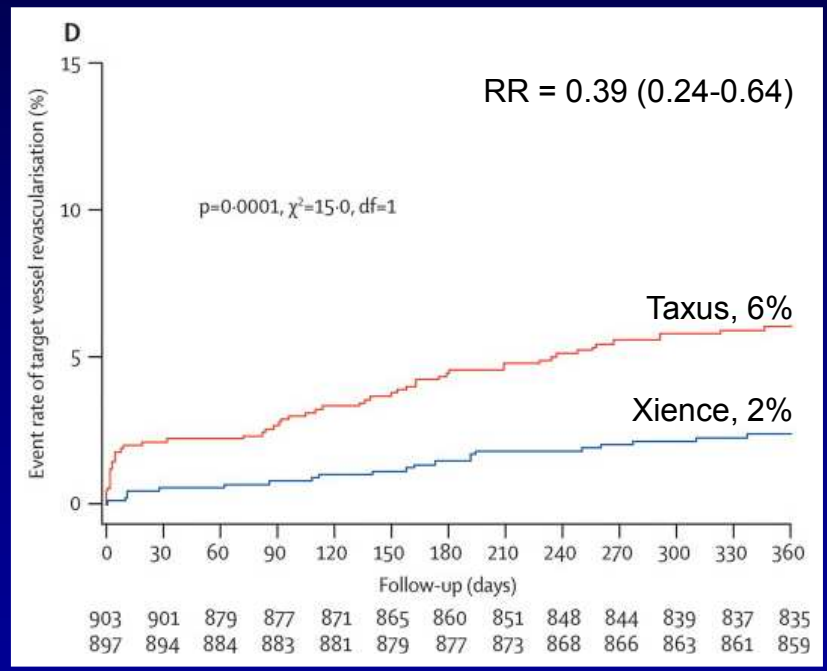
2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

COMPARE Trial

Death, MI, TVR



TVR

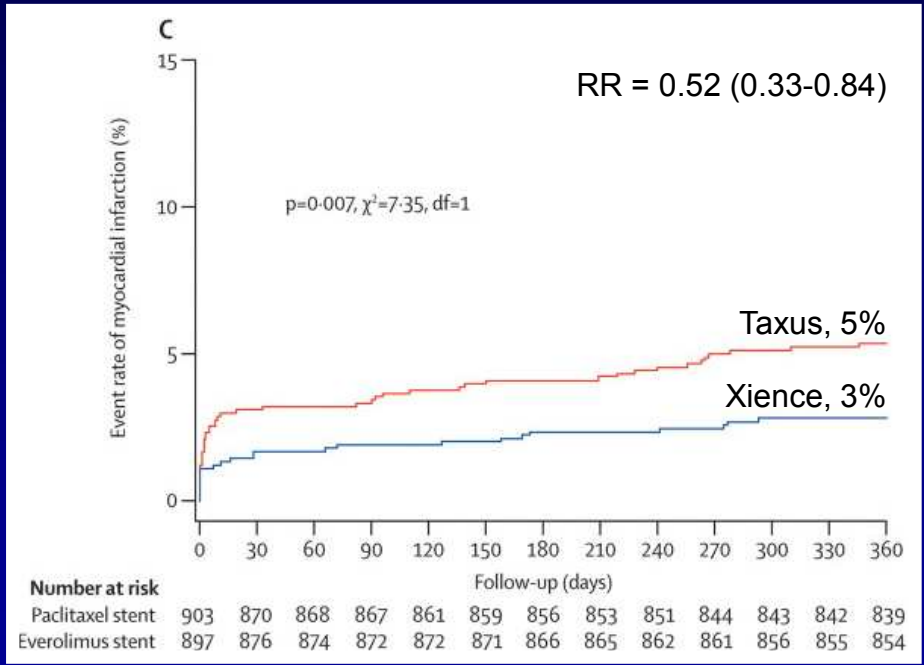


Kedhi et al, Lancet 2010

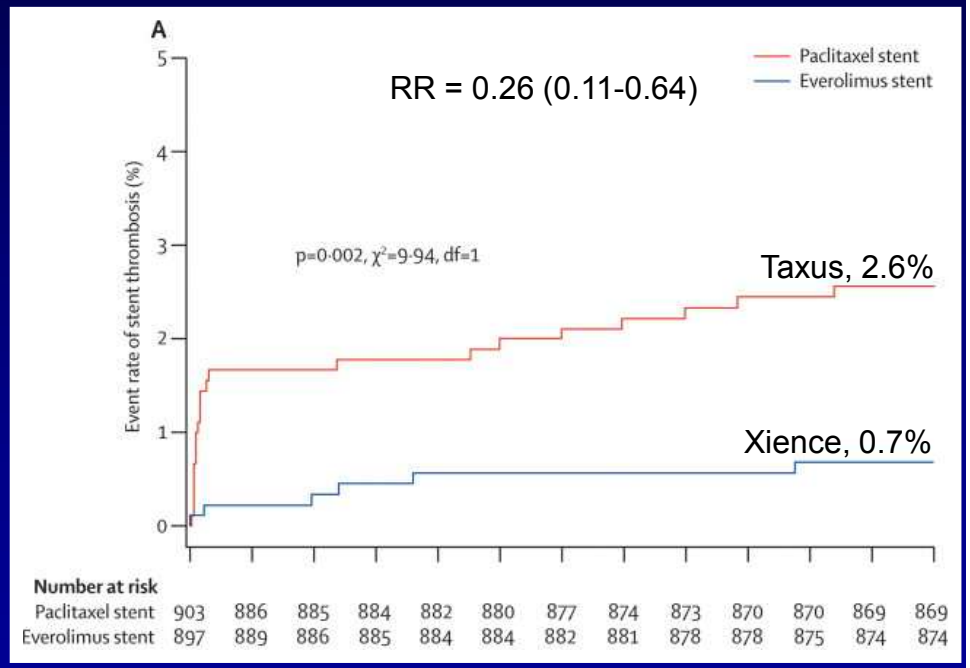
2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

COMPARE Trial

MI



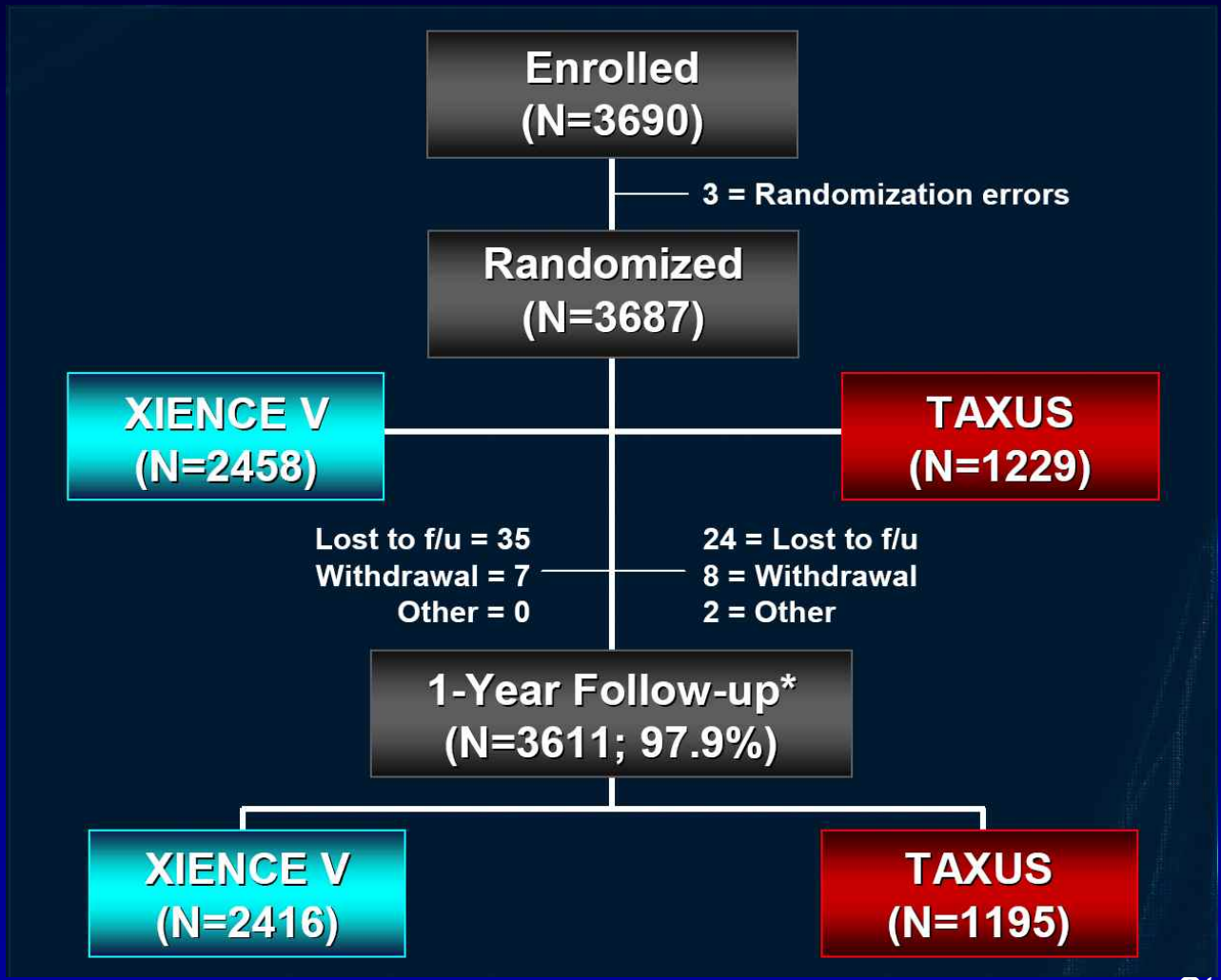
Stent Thrombosis (Def./Prob.)



Kedhi et al, Lancet 2010

2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

SPIRIT IV Trial

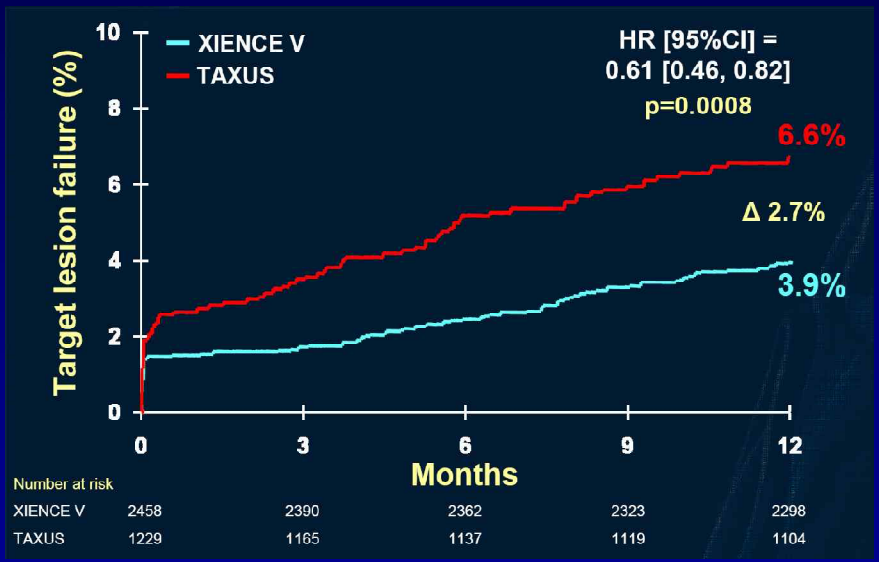


Stone, TCT 2009

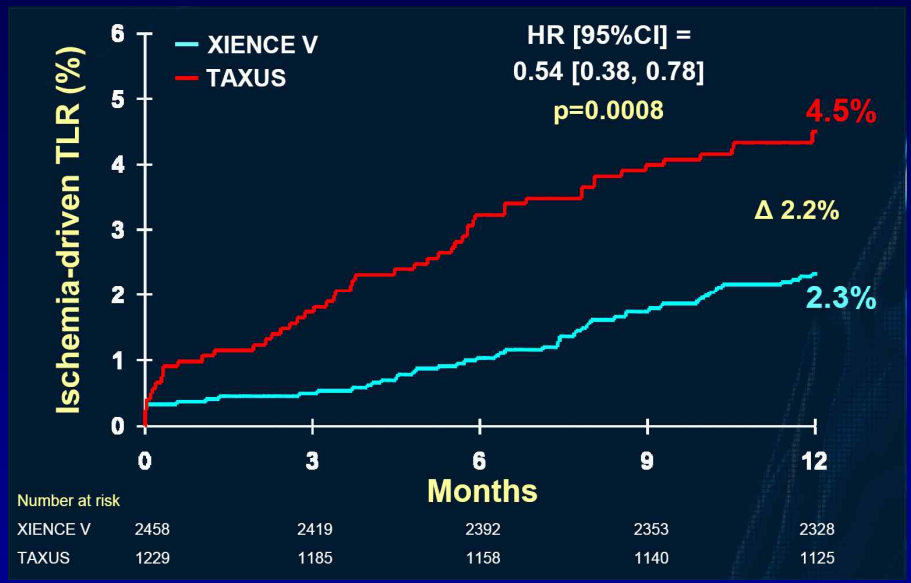
2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

SPIRIT IV Trial

Cardiac Death, MI, TLR



TLR

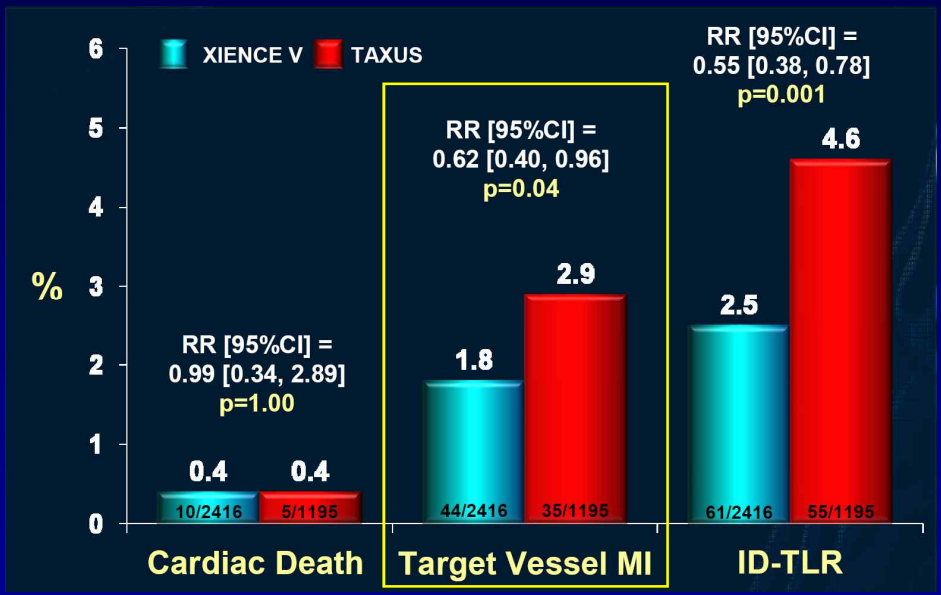


Stone, TCT 2009

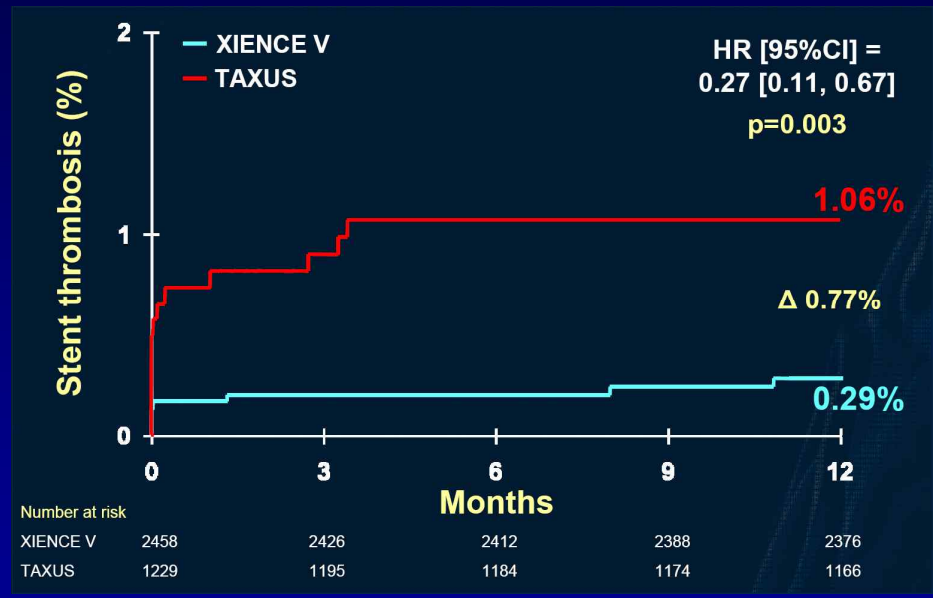
2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

SPIRIT IV Trial

Cardiac Death, MI, TLR



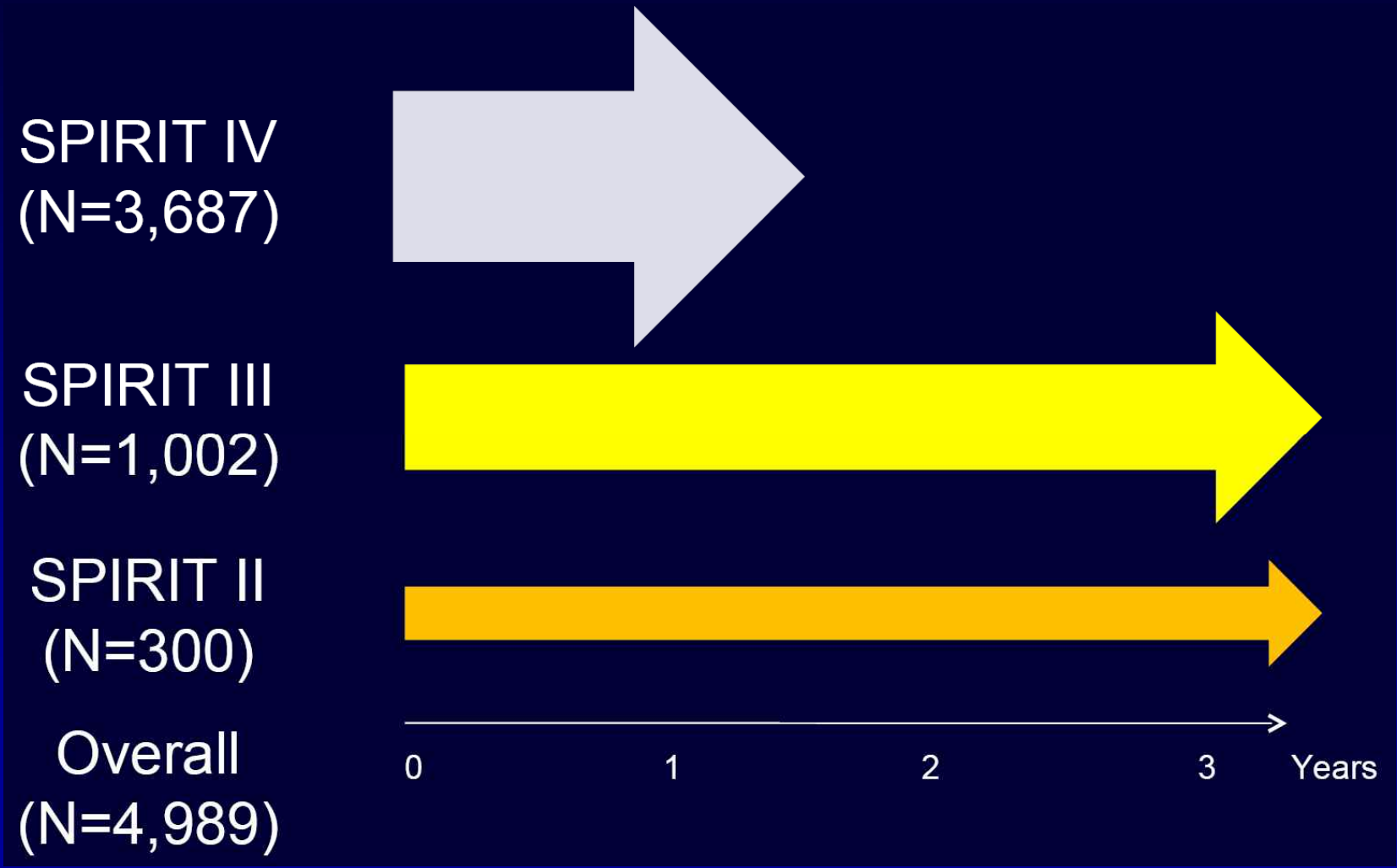
Stent Thrombosis (Def./Prob.)



Stone, TCT 2009

2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

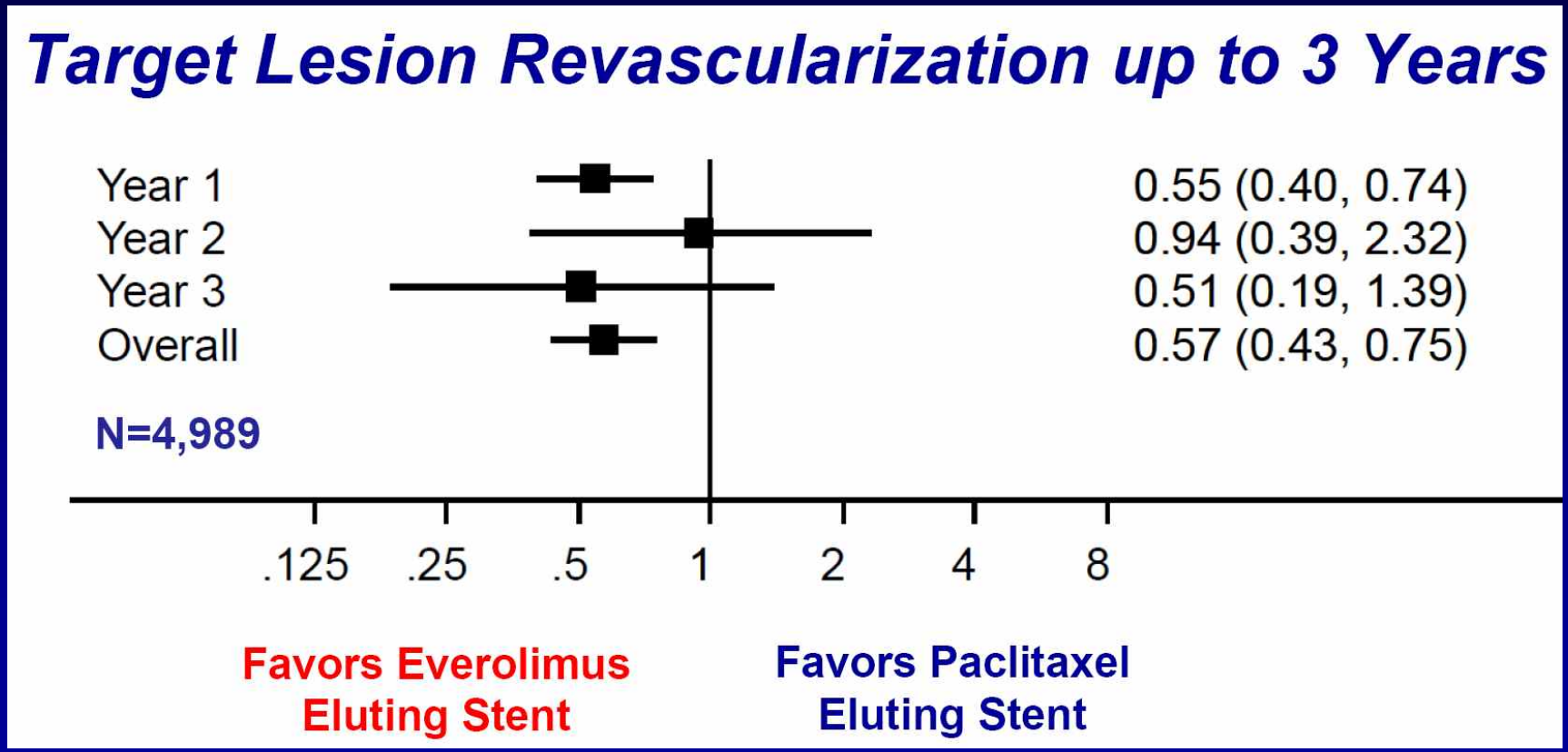
Meta-analysis of SPIRIT II, III & IV Trials



Windecker, Jüni; ACC 2010

2° Gen. DES vs 1° Gen. DES
Xience vs Taxus

Meta-analysis of SPIRIT II, III & IV Trials



Windecker, Jüni; ACC 2010

2° Gen. DES vs 1° Gen. DES
Xience vs Cypher

Subset of ISAR-TEST 4 Trial

1304 patients with *de novo* lesions

Xience V
n=652

Cypher
n=652

6 to 8-month repeat angiogram (77%)

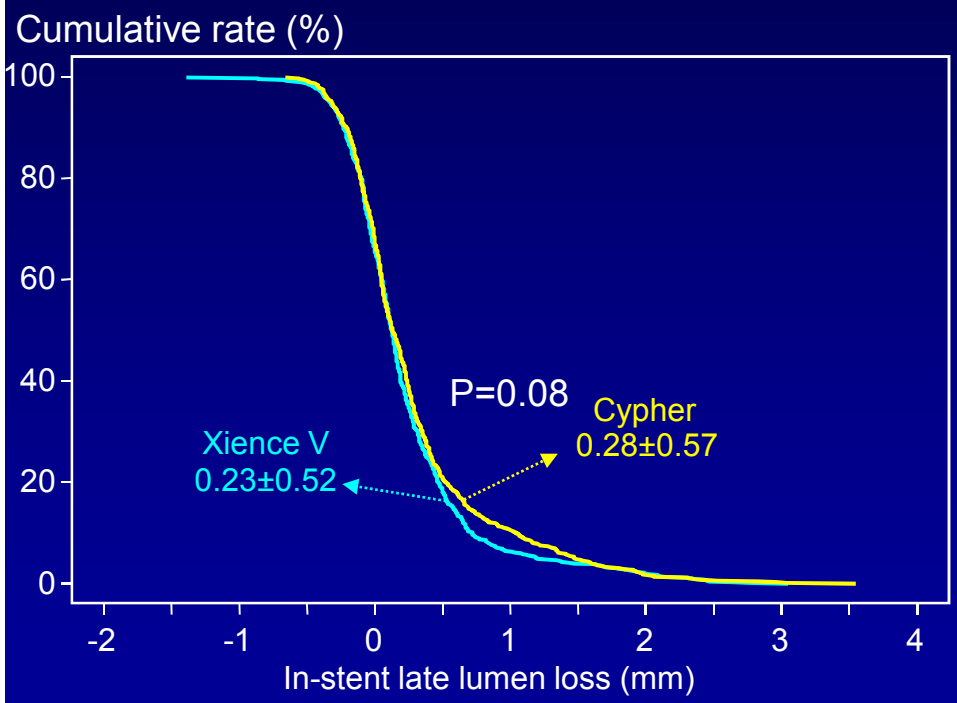
12-month clinical follow-up

Kastrati, TCT 2009

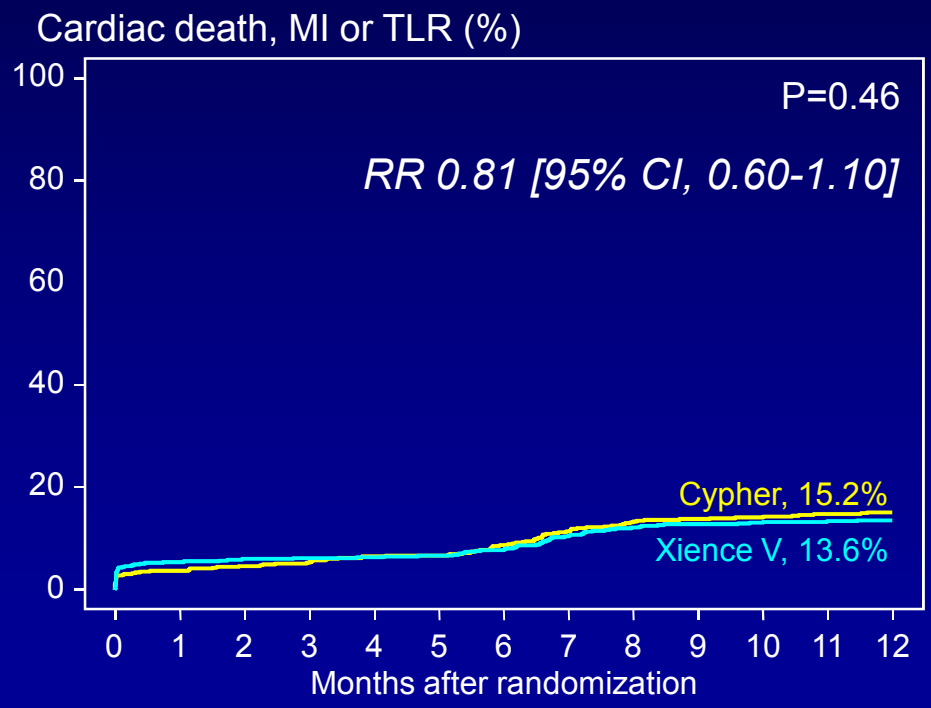
2° Gen. DES vs 1° Gen. DES
Xience vs Cypher

Subset of ISAR-TEST 4 Trial

In-Stent Late Lumen Loss



Primary Endpoint



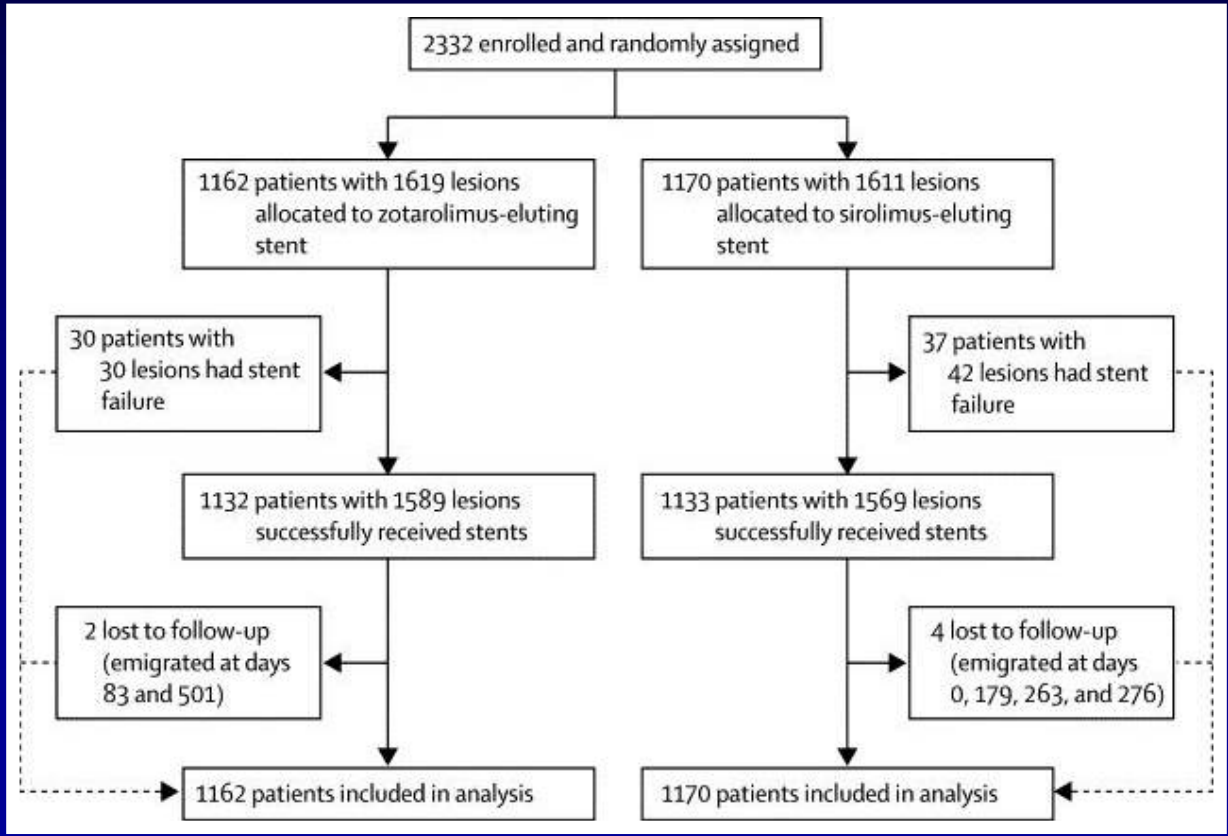
Kastrati, TCT 2009

2° Generation DES

	Xience V	Endeavor Endeavor Resolute	Biodegrad. Pol. (Biomatrix, ISAR, Nevo)	ISAR-Dual Drug
1. Stent platform:	CoCr	CoCr	Stainl.-steel or CoCr	Stainless-steel
2. Drug carrier:	Permanent polymer	Permanent polymer	Biodegrad. polymer	No polymer
3. Drug:	Everolimus	Zotarolimus	Sirolimus or Biolimus	Sirolimus+Probucol

2° Gen. DES vs 1° Gen. DES
Endeavor vs Cypher

SORT OUT III Trial

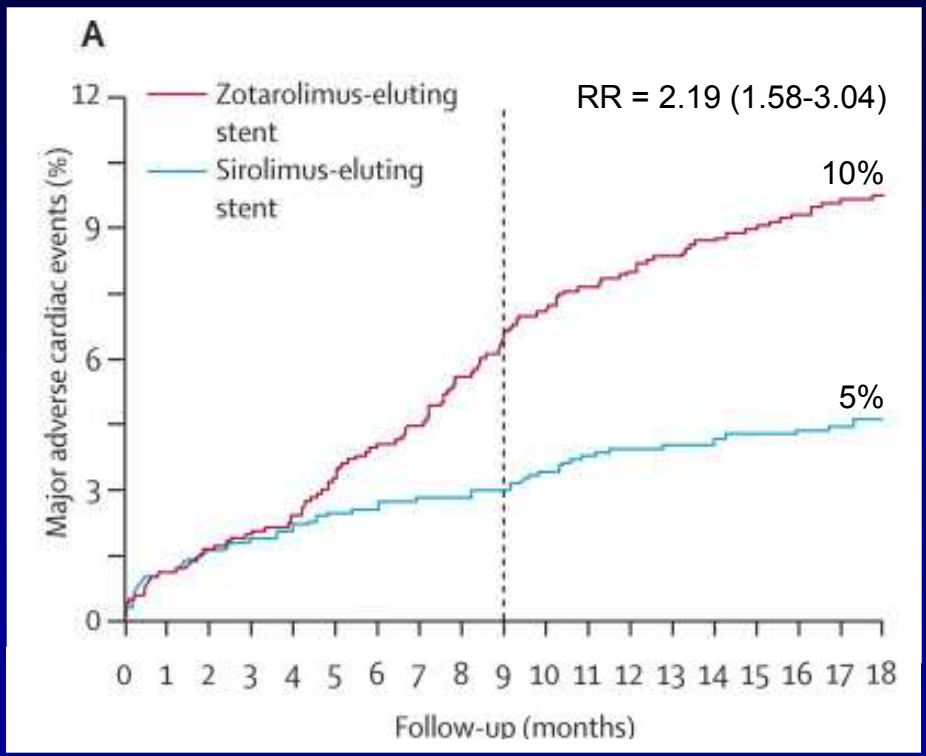


Rasmussen et al, Lancet 2010

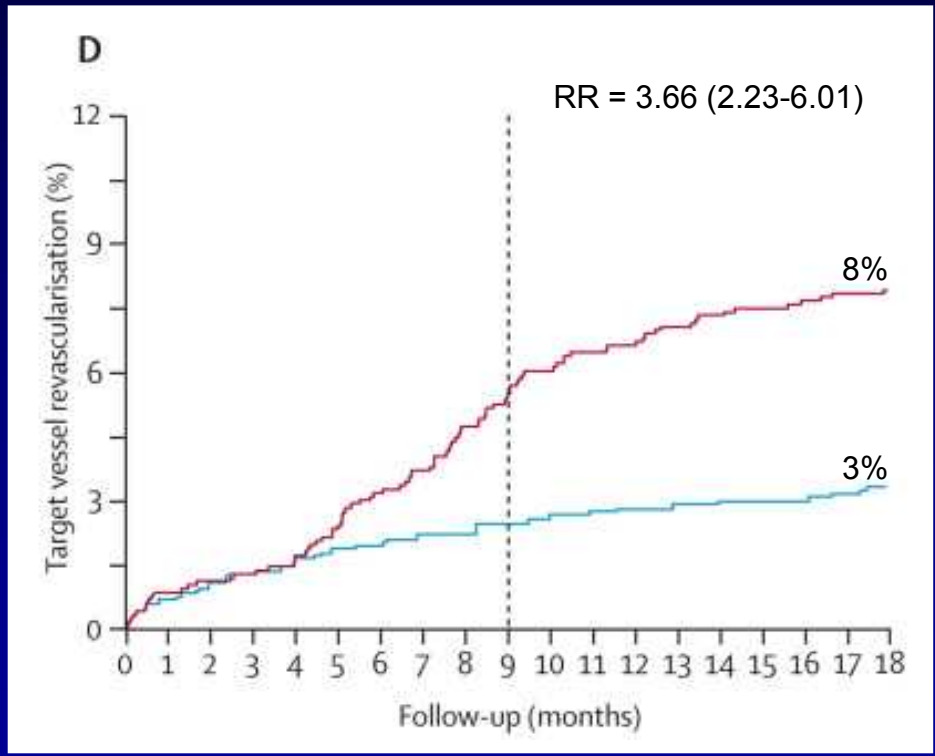
2° Gen. DES vs 1° Gen. DES
Endeavor vs Cypher

SORT OUT III Trial

Death, MI, TVR



TVR

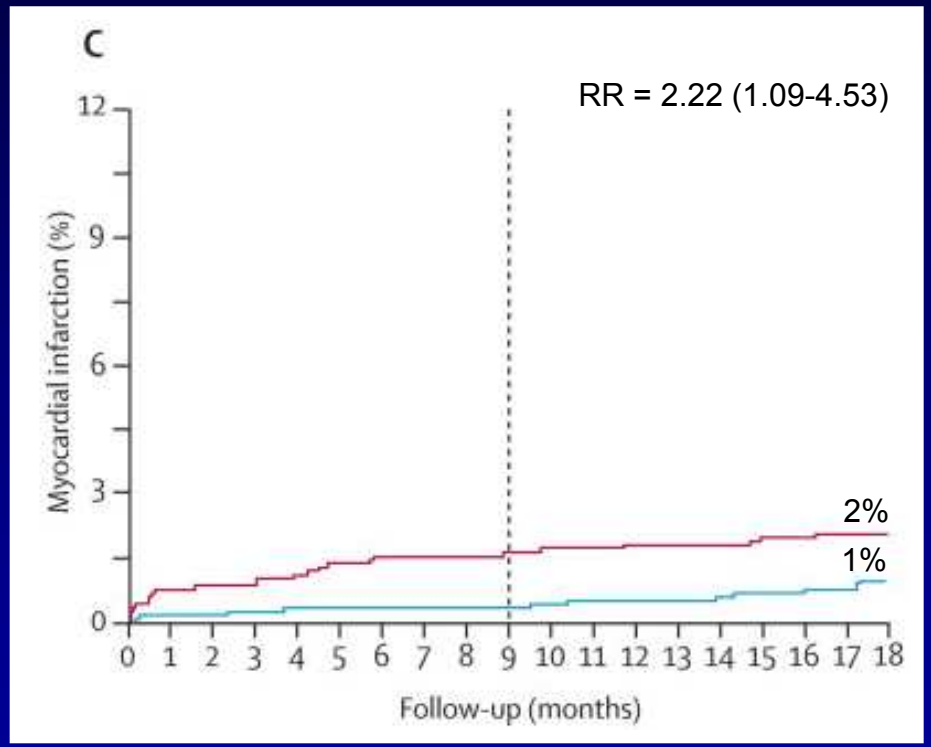


Rasmussen et al, Lancet 2010

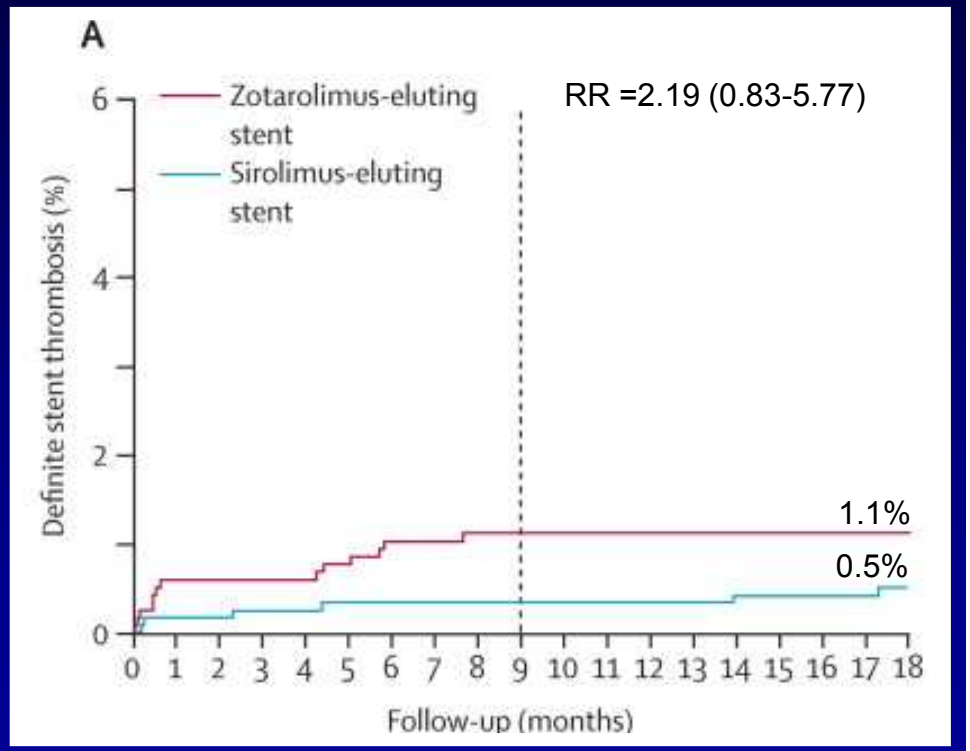
2° Gen. DES vs 1° Gen. DES
Endeavor vs Cypher

SORT OUT III Trial

MI



Stent Thrombosis (definite)

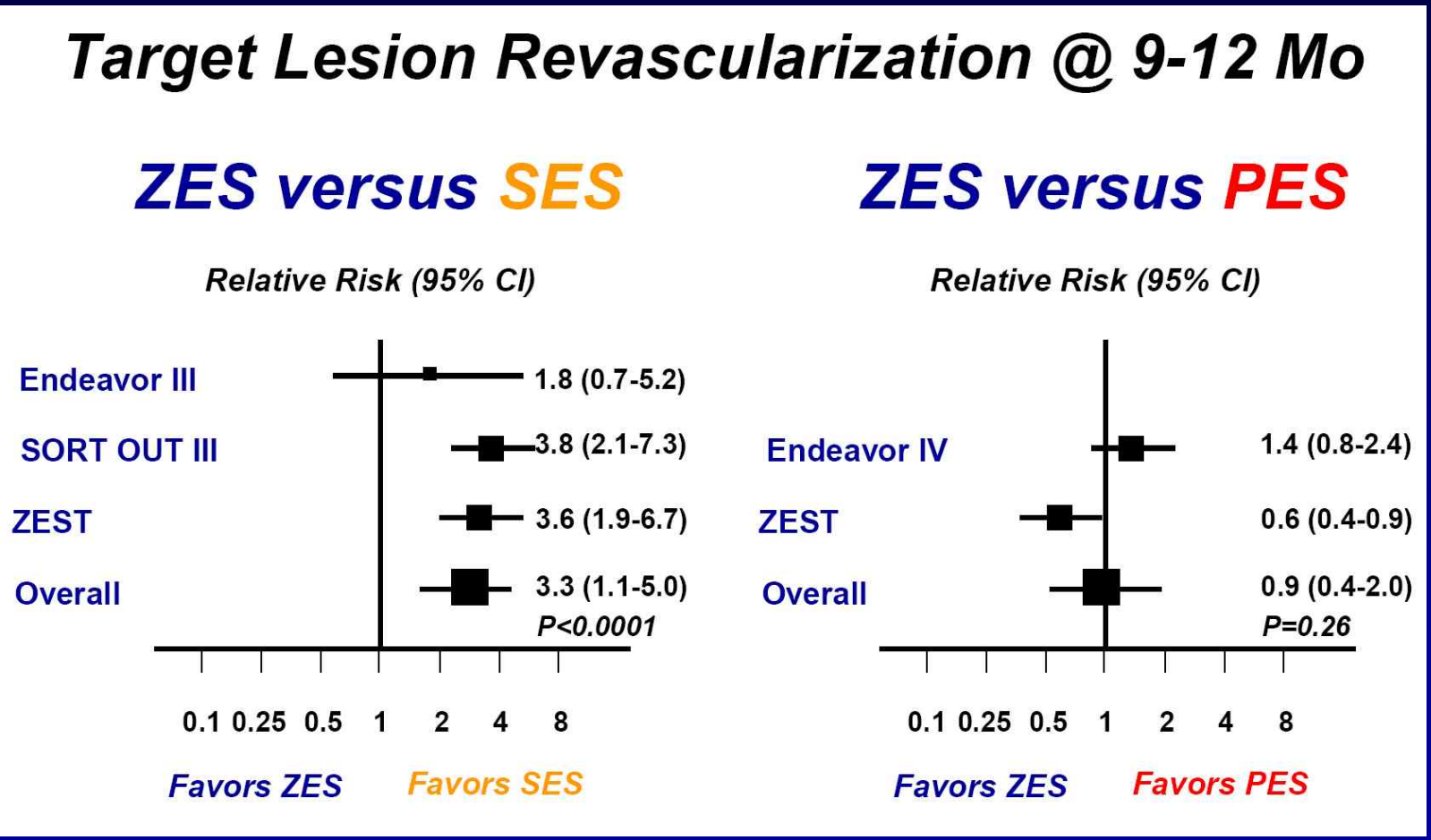


Rasmussen et al, Lancet 2010

2° Gen. DES vs 1° Gen. DES
Endeavor vs Cypher vs Taxus

Meta-analysis of
ENDEAVOR III&IV, SORT OUT III, ZEST Trials

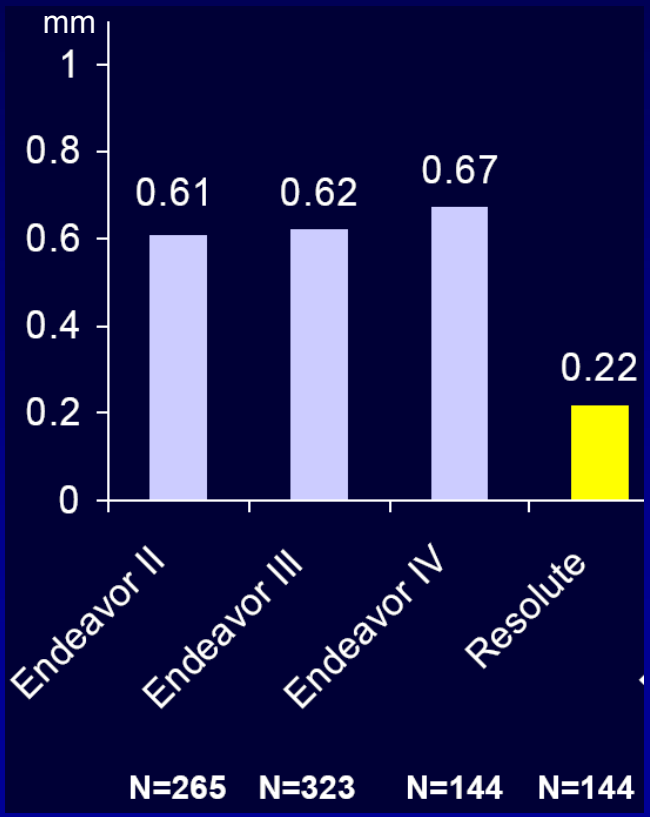
Target Lesion Revascularization @ 9-12 Mo



Windecker, Jüni; ACC 2010

2° Gen. DES vs 1° Gen. DES
From Endeavor to Endeavor Resolute

In-Stent Late Loss



Windecker, Jüni; ACC 2010

RESOLUTE-AC Trial

2300 „real life“ patients

Xience V
n=1500

Resolute
n=1500

12-month MACE

PCR, May 2010, Paris

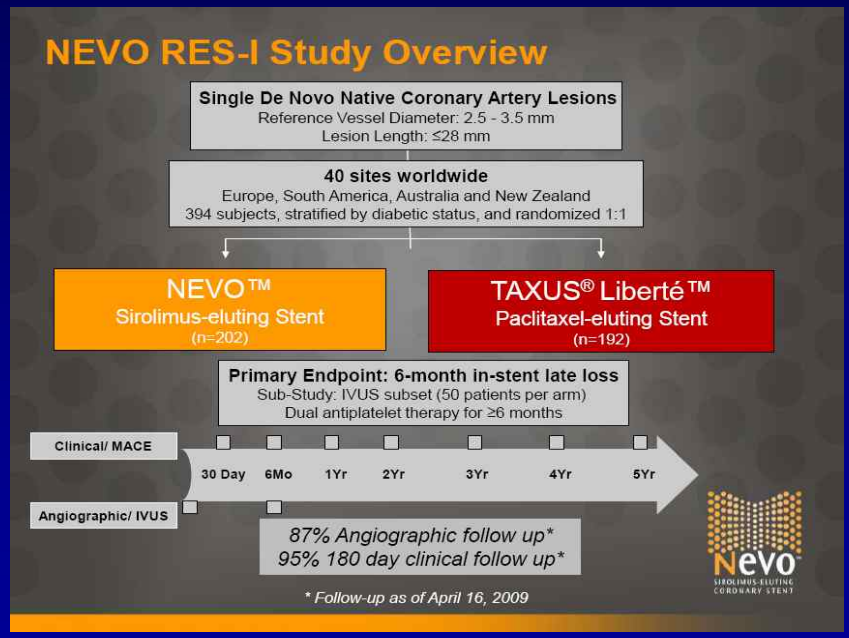
NCT00617084

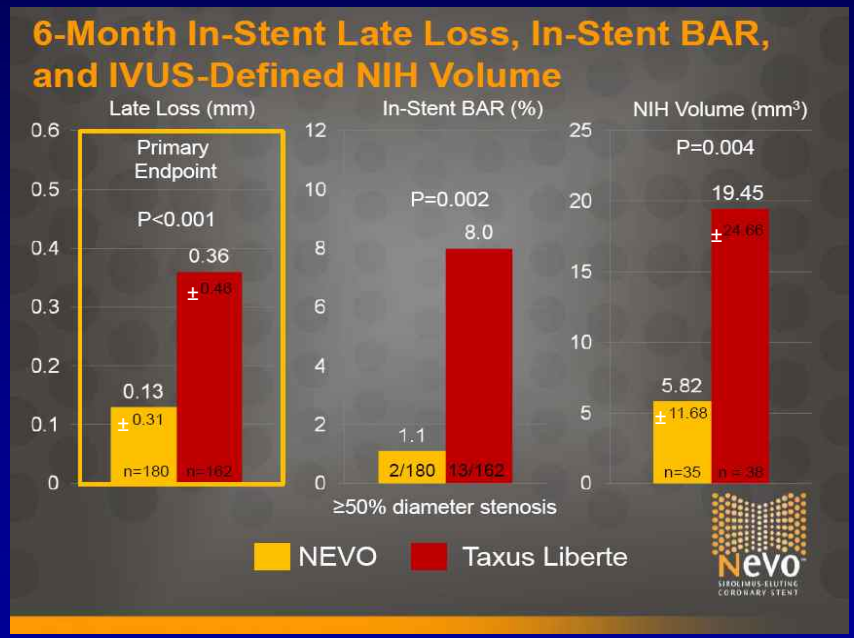
2° Generation DES

	Xience V	Endeavor Endeavor Resolute	Biodegrad. Pol. (Biomatrix, ISAR, Nevo)	ISAR-Dual Drug
1. Stent platform:	CoCr	CoCr	Stainl.-steel or CoCr	Stainless-steel
2. Drug carrier:	Permanent polymer	Permanent polymer	Biodegrad. polymer	No polymer
3. Drug:	Everolimus	Zotarolimus	Sirolimus or Biolimus	Sirolimus+Probucol

2° Gen. DES vs 1° Gen. DES
Nevo vs Taxus

NEVO RES I Trial

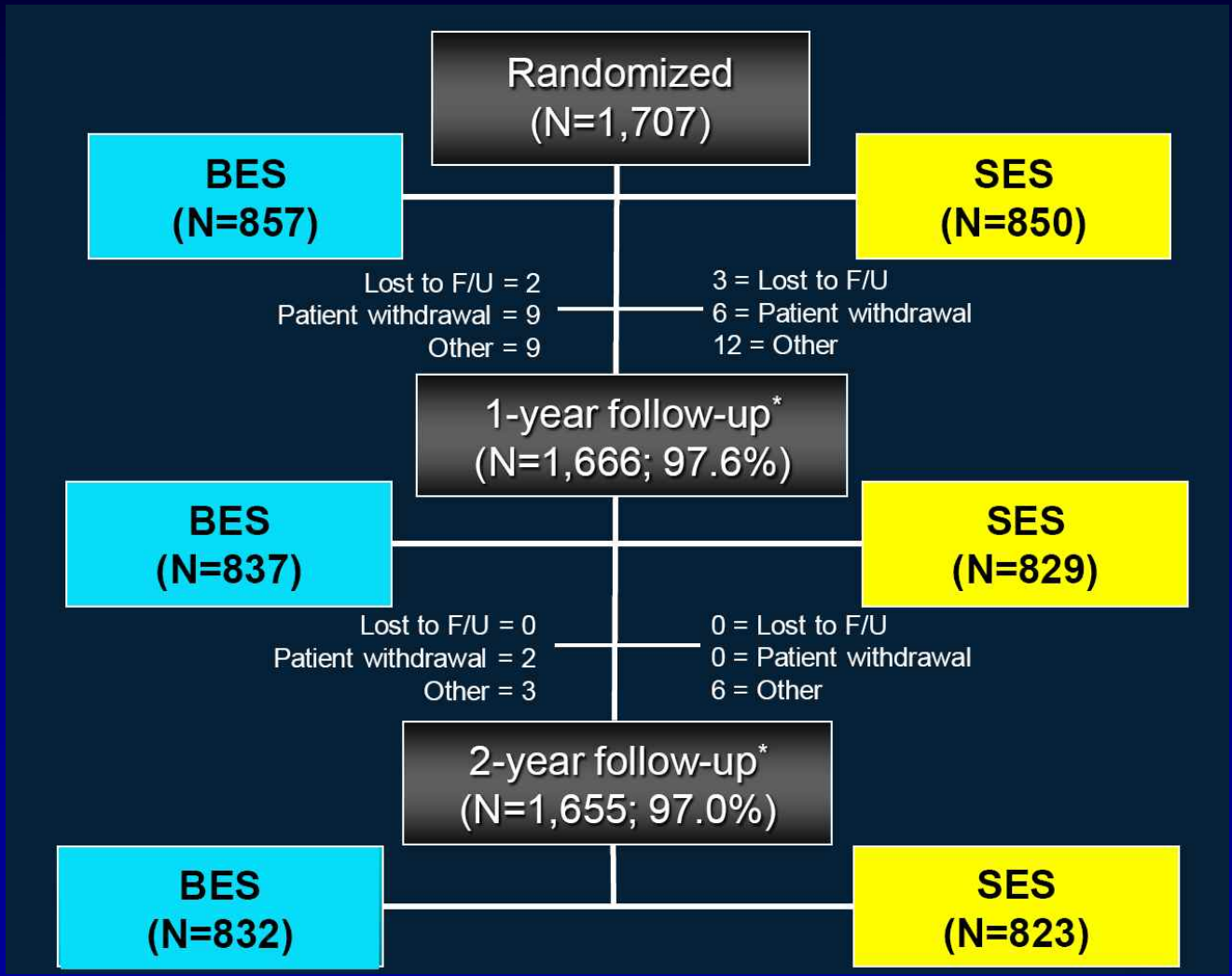




Spaulding et al, PCR 2009

2° Gen. DES vs 1° Gen. DES
BioMatrix vs Cypher

LEADERS Trial



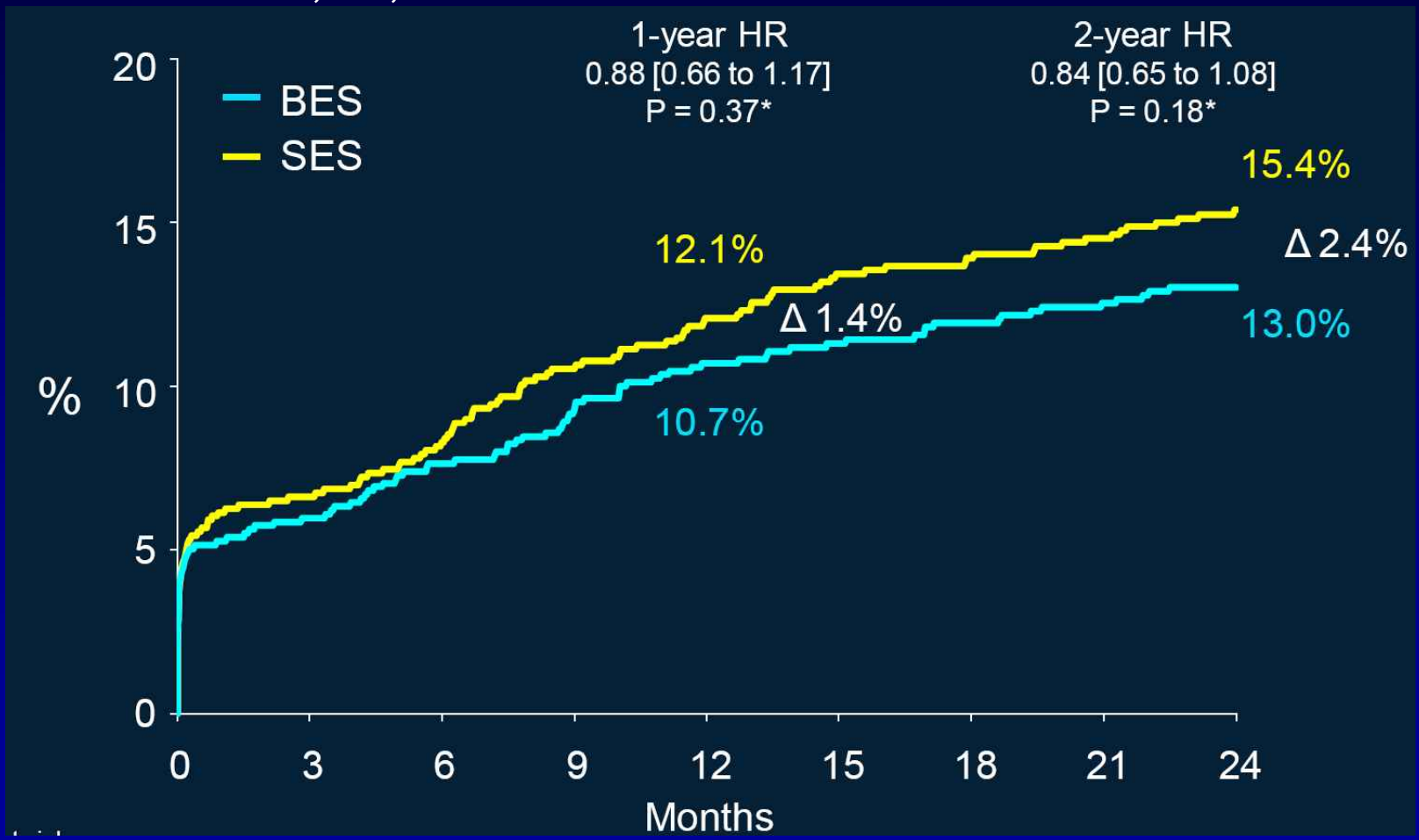
Windecker et al, Lancet 2008

Klauss et al, TCT 2009

2° Gen. DES vs 1° Gen. DES
BioMatrix vs Cypher

LEADERS Trial

Cardiac Death, MI, TLR



Klauss et al, TCT 2009

2° Gen. DES vs 1° Gen. DES
ISAR-BP DES vs Cypher/Xience

ISAR-TEST 4 Trial

2603 patients with *de novo* lesions

Biodegradable polymer DES
(ISAR-BP DES)
n=1299

Permanent polymer DES
(PP DES: Cypher & Xience)
n=1304

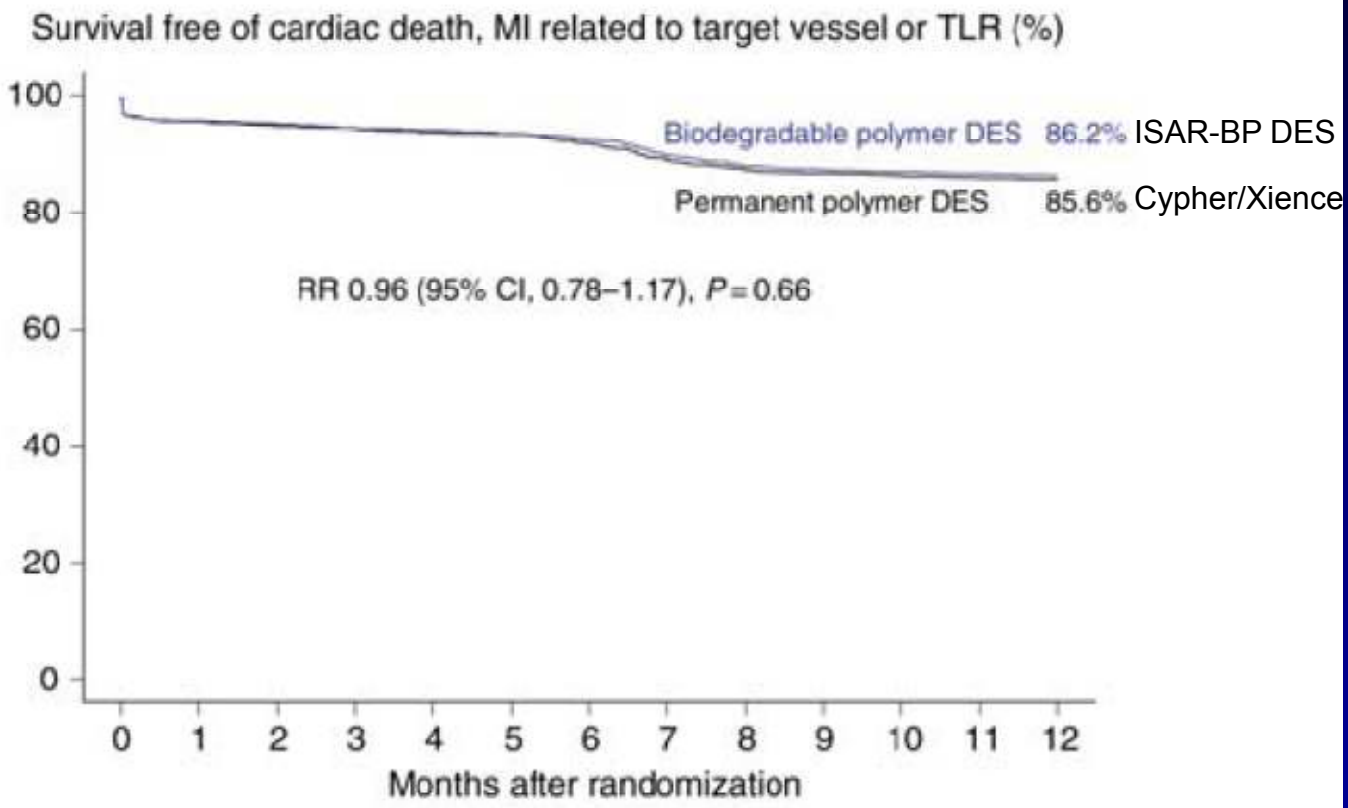
6 to 8-month repeat angiogram

12-month clinical follow-up

Byrne et al, EHJ 2009

2° Gen. DES vs 1° Gen. DES
ISAR-BP DES vs Cypher/Xience

ISAR-TEST 4 Trial



Patients at risk							
Biodegradable	1299	1217	1197	1173	1107	1090	1073
Permanent	1304	1214	1193	1161	1088	1069	1057

Byrne et al, EHJ 2009

2° Generation DES

	Xience V	Endeavor Endeavor Resolute	Biodegrad. Pol. (Biomatrix, ISAR, Nevo)	ISAR-Dual Drug
1. Stent platform:	CoCr	CoCr	Stainl.-steel or CoCr	Stainless-steel
2. Drug carrier:	Permanent polymer	Permanent polymer	Biodegrad. polymer	No polymer
3. Drug:	Everolimus	Zotarolimus	Sirolimus or Biolimus	Sirolimus+Probucol

2° Gen. DES vs 1° Gen. DES
ISAR-Dual DES vs Cypher vs Endeavor

ISAR-TEST 2 Trial

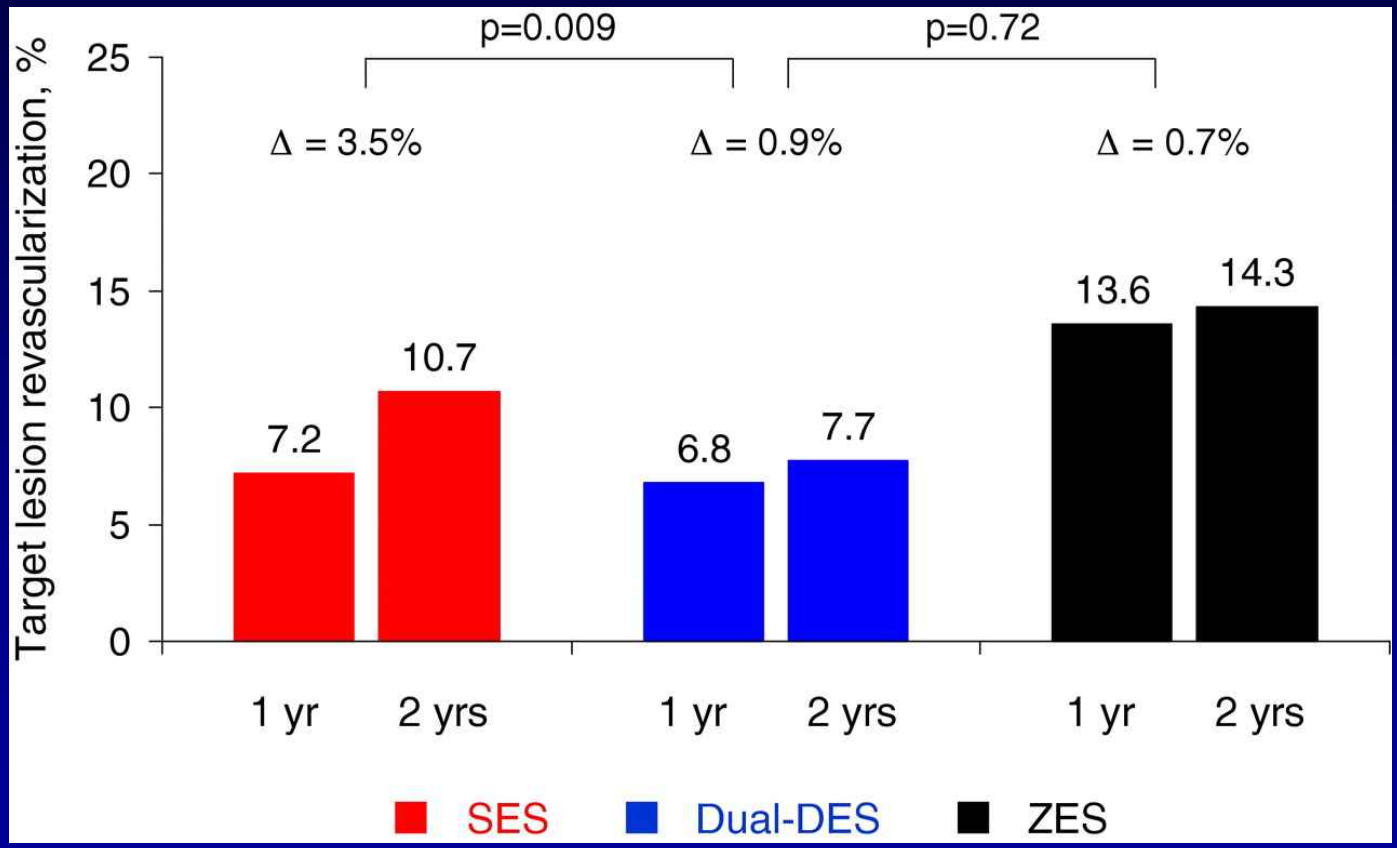
1007 pts randomized

Cypher	ISAR Dual-DES (Sirolimus+Probucol)	Endeavor
335 pts	333 pts	339 pts

Byrne et al, EHJ 2009

2° Gen. DES vs 1° Gen. DES
ISAR-Dual DES vs Cypher vs Endeavor

ISAR-TEST 2 Trial



Byrne et al, JACC 2010

Conclusions

- Currently available DES may present differences in efficacy and safety irrespective of the generation to which they belong.
- Although 2° generation DES enable generally higher device success rate, they may not necessarily be superior to 1° generation stents in terms efficacy and safety.
- Future, long-term outcome studies will better define the potential advantages of 2° generation DES.