ABSORB BVS

Y Onuma

R-J van Geuns

PW Serruys

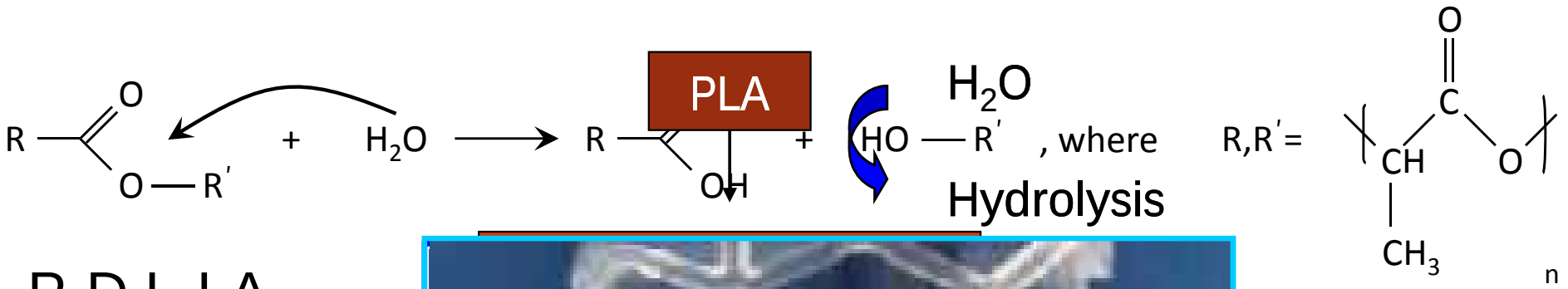
13:20-35 TCT-AP

On behalf of the ABSORB cohort A, B and Extend investigators

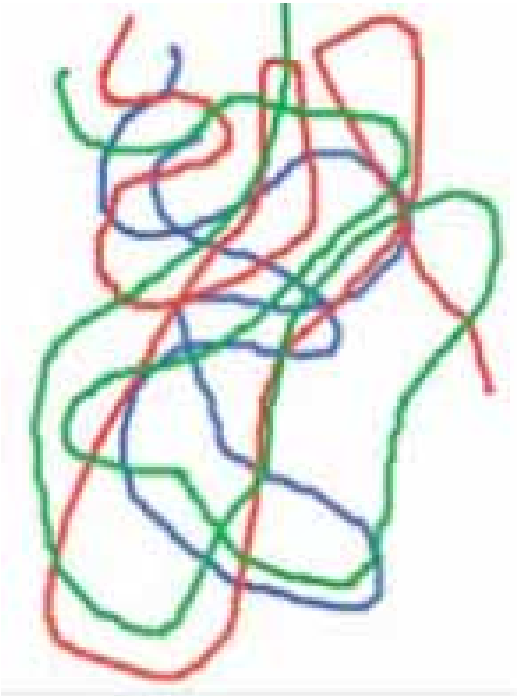
The ABSORB Cohort A, B and Extend trial was sponsored and funded by Abbott Vascular, Santa Clara, California

Polylactide Degradation Mechanism

Hydrolysis via Random Chain Scission of Ester Bonds

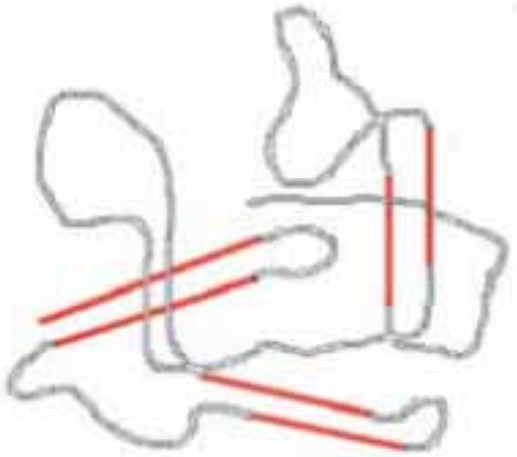


P-D,L-LA



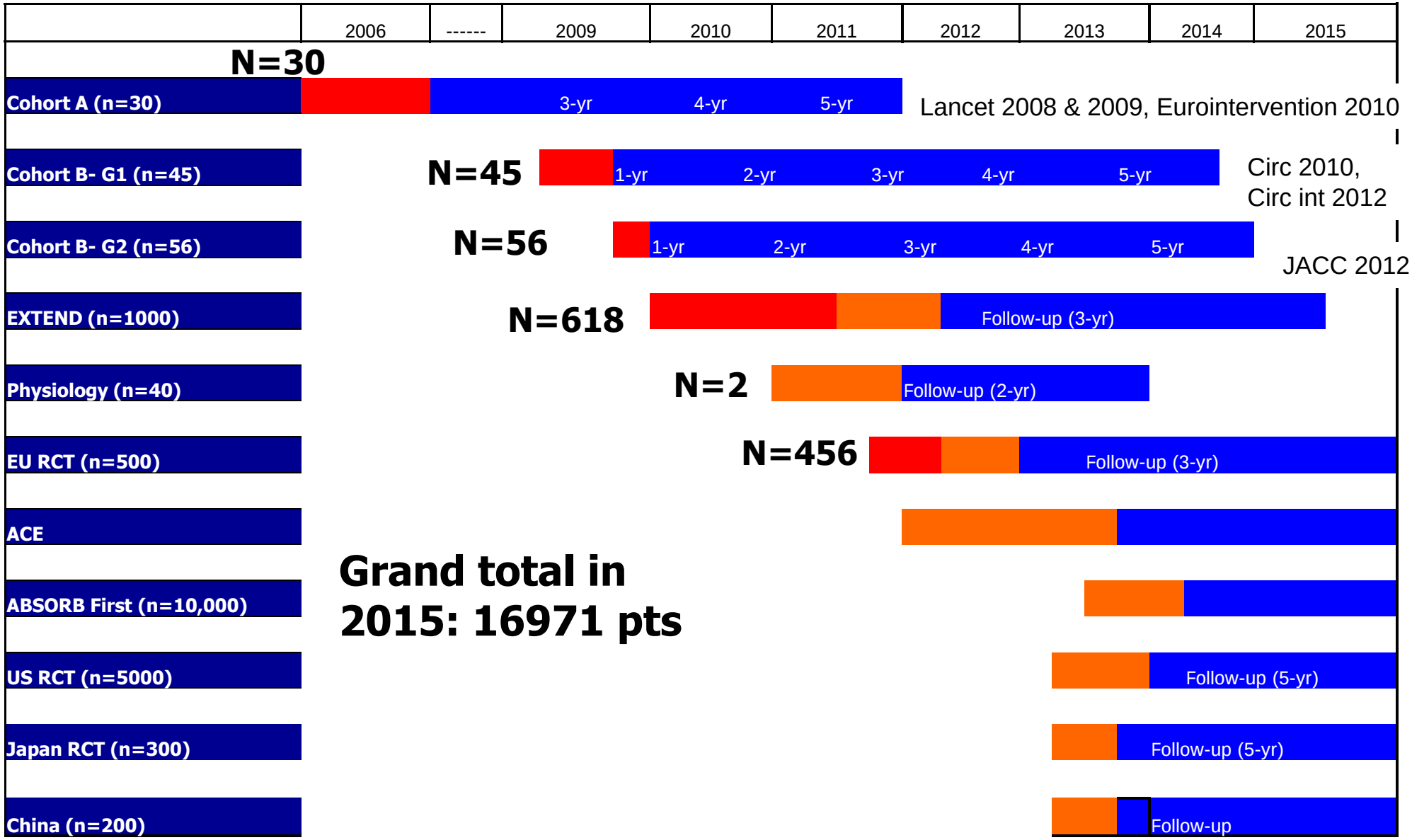
Amorphous

P-L,L-LA



Semicrystalline

Overview of ABSORB studies

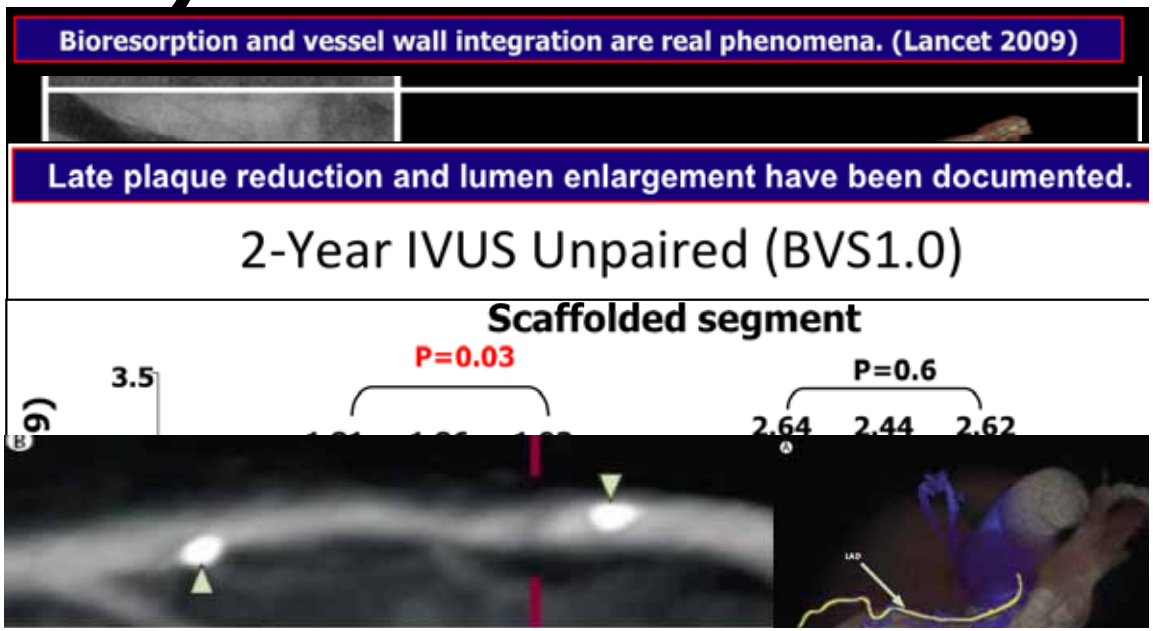


Follow-up Enrolled To be Enrolled

* Timelines based on patient follow-up dates, not data availability

What did we learn from ABSORB cohort A (2006-)?

- Bioresorption does occur
- Late enlargement of lumen, as a result of plaque shrinkage, has been documented
- Vasomotion and endothelial function can be restored in the scaffolded segment
- Stented lesion can be assessed by non-invasive imaging
- Restenosis and Thrombosis have not been seen up to 5 years, despite discontinuation of clopidogrel



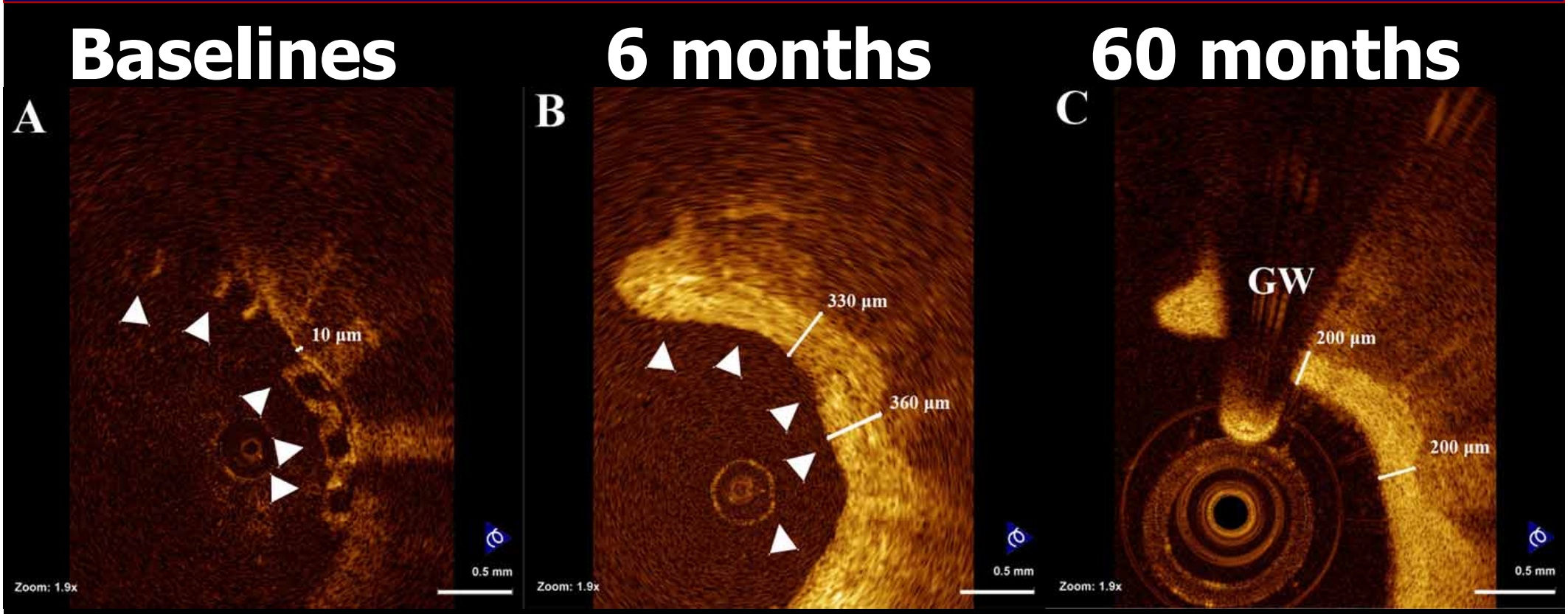
Hierarchical	6 Months 30 Patients	12 Months 29 Patients*	3 Years 29 Patients*	5 Years 29 Patients*
Ischemia Driven MACE, %(n)	3.3% (1)*	3.4% (1)*	3.4% (1)*	3.4% (1)*
Cardiac Death, %	0.0%	0.0%	0.0%	0.0%
MI, %(n)				
Q-Wave MI	0.0%	0.0%	0.0%	0.0%
Non Q-Wave MI	3.3% (1)**	3.4% (1)**	3.4% (1)**	3.4% (1)**
Ischemia Driven TLR , %				
by PCI	0.0%	0.0%	0.0%	0.0%
by CABG	0.0%	0.0%	0.0%	0.0%

No new MACE events between 6 months and 5 years
No stent thrombosis up to 5 years (All patients off clopidogrel)

*One patient withdrew consent after 6 months but the vital status of the patients and absence of cardiac event is known through the referring physician.

**This patient also underwent a TLR, not qualified as ID-TLR (DS = 42%) followed by post-procedural troponin qualified as non-Q MI and died from his Hodgkin's disease at 888 days post-procedure.

. Sealing and shielding of plaques as a result of scaffold implantation : can the scaffold cap the plaque? 60 Months Follow up



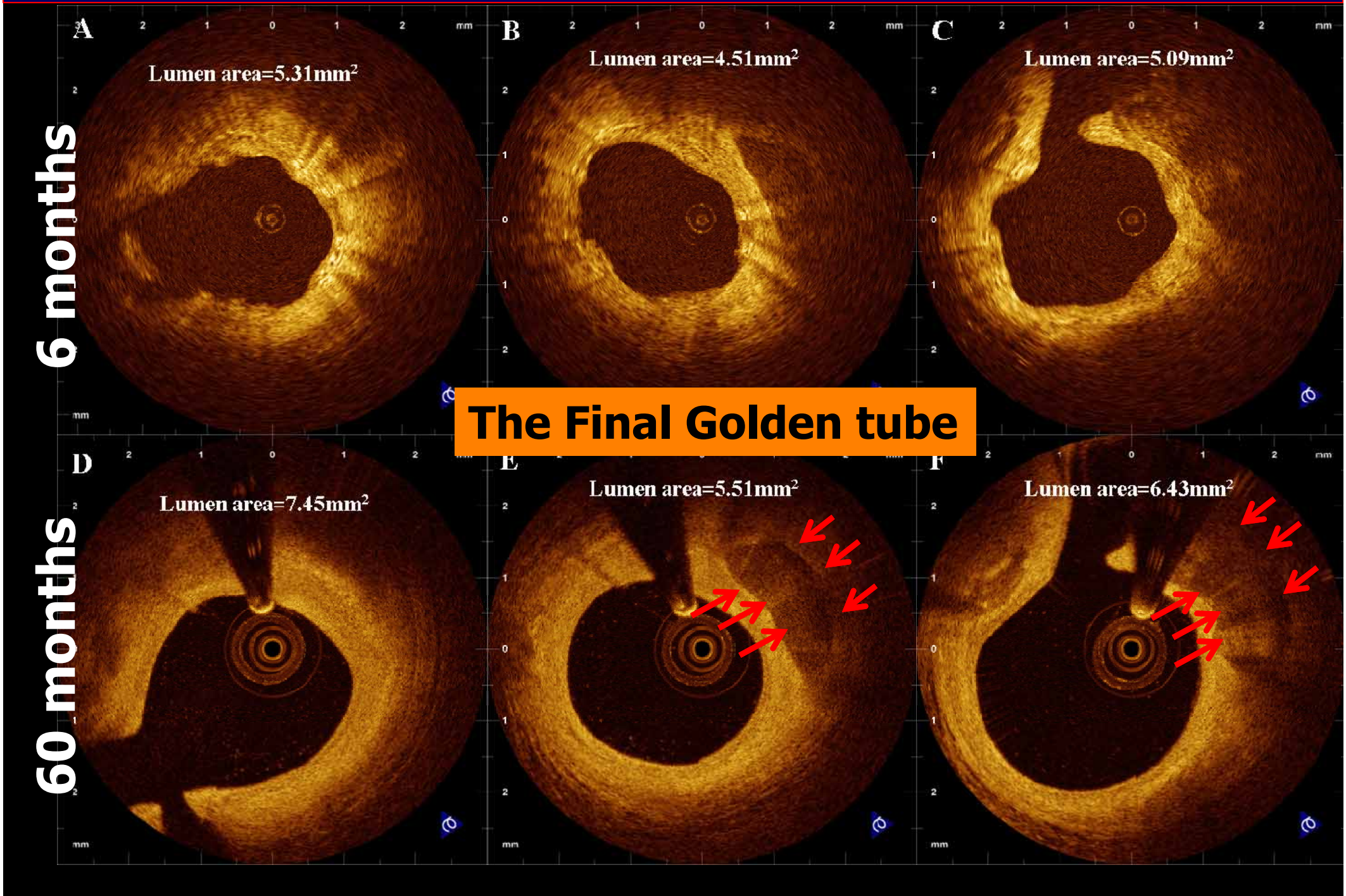
Images in Cardiovascular Medicine

Five-Year Optical Coherence Tomography Follow-Up of an Everolimus-Eluting Bioresorbable Vascular Scaffold

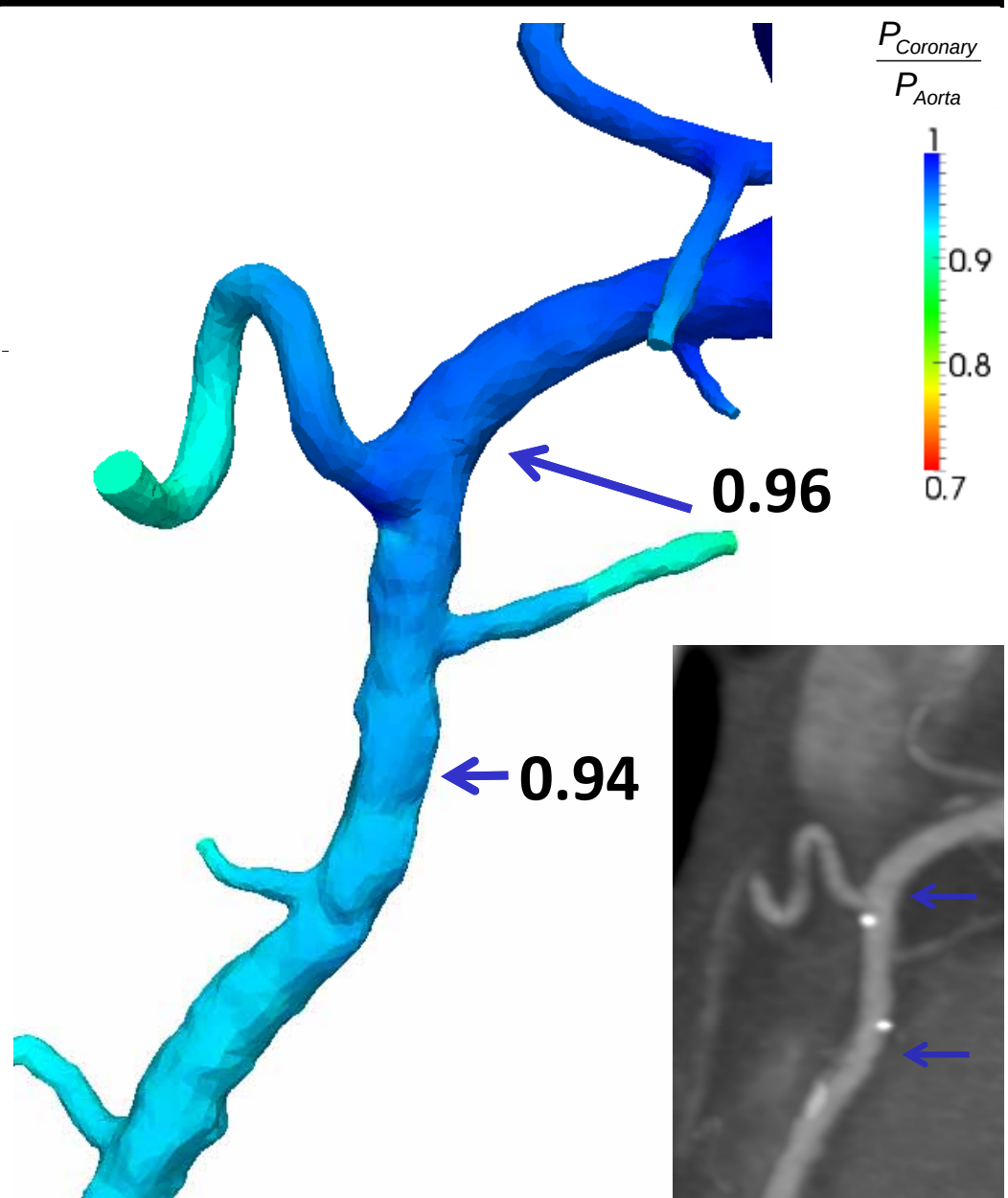
Changing the Paradigm of Coronary Stenting?

Antonios Karanasos, MD; Cihan Simsek, MD; Patrick Serruys, MD, PhD; Jurgen Ligthart, BSc; Karen Witberg, CCRN; Robert-Jan van Geuns, MD, PhD; George Sianos, MD, PhD; Felix Zijlstra, MD, PhD; Evelyn Regar, MD, PhD

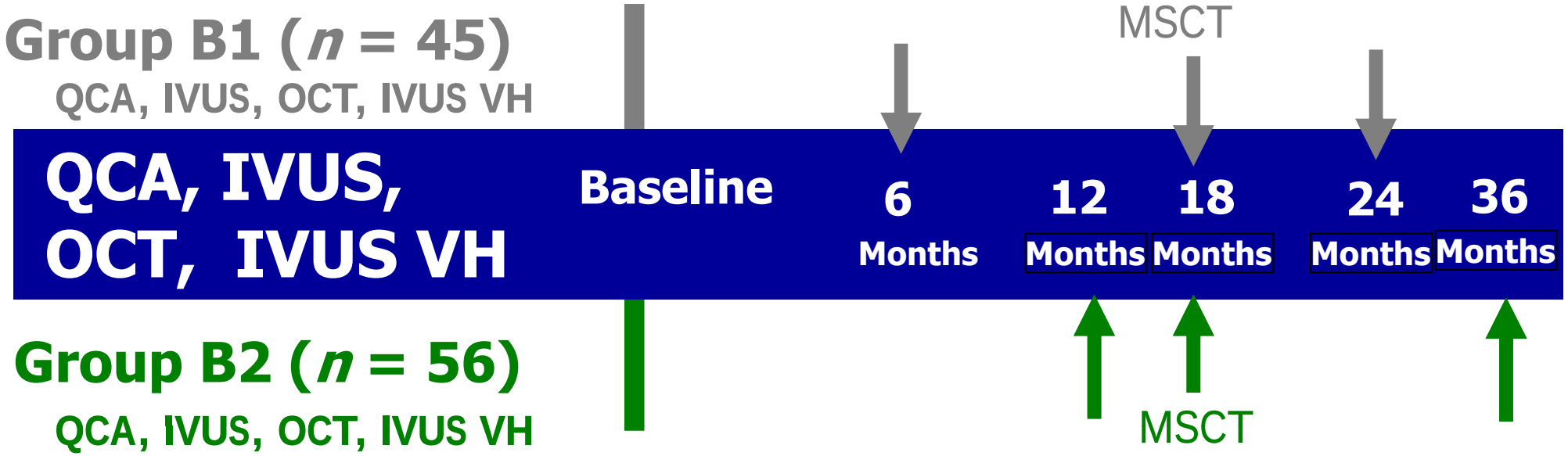
Sealing and shielding of plaques as a result of scaffold implantation : can the scaffold cap the plaque… and late lumen enlargement !!!



Non-invasive assessment of FFR at 5 years showed persistence of the normalization of coronary flow dynamics



ABSORB cohort B

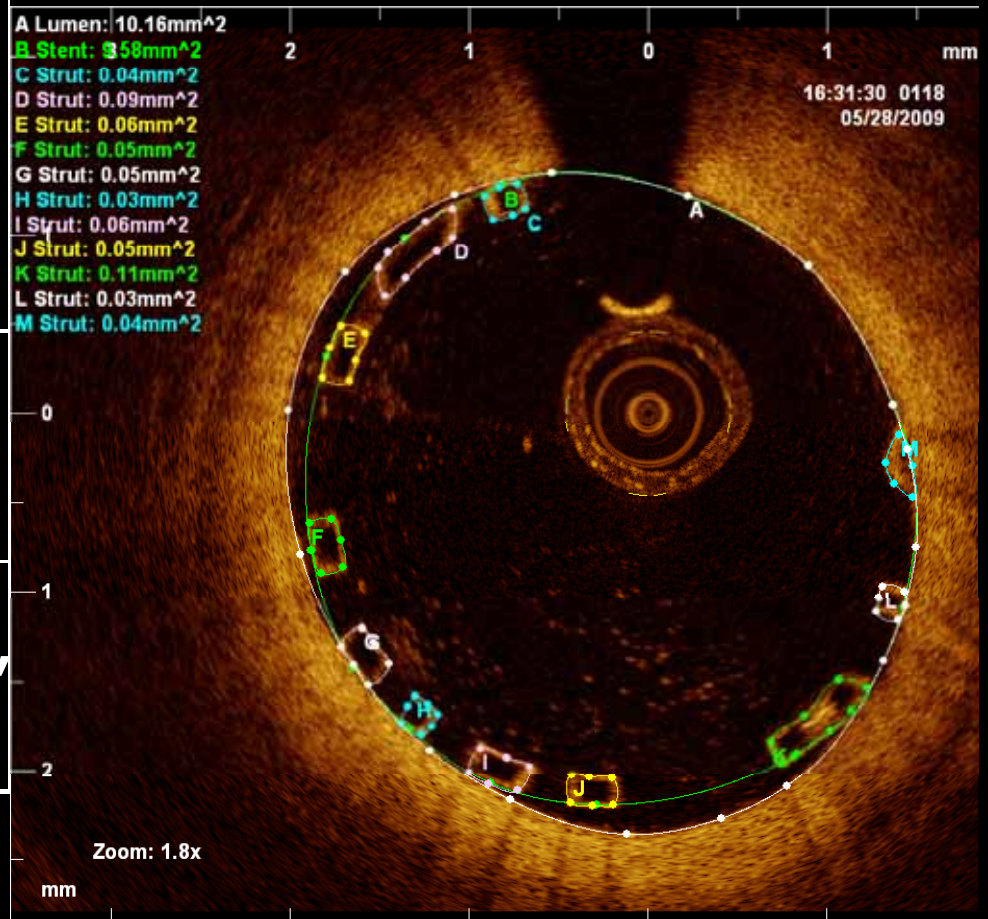


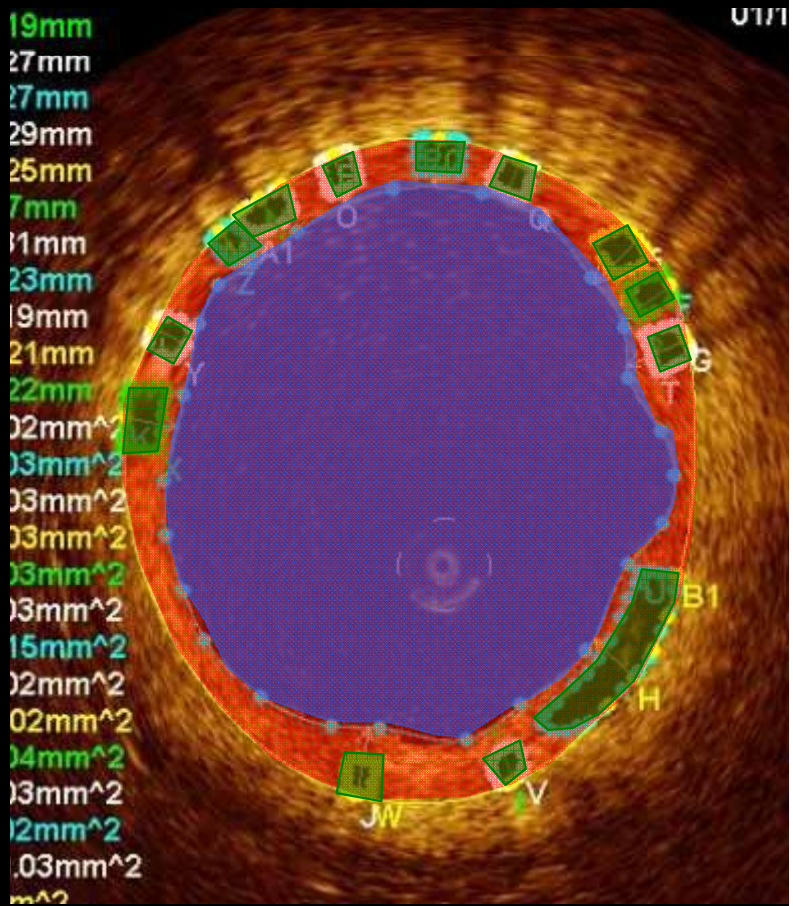
- Sponsor/ Funding: Abbott Vascular
- Primary Investigators:
  - PW Serruys MD, PhD
  - J Ormiston MD
- DSMB: J Tijssen PhD, M Wiemer MD, P Urban MD
- CEC: C Hanet MD, R Tölg MD, V Umans MD
- Angiographic, IVUS and OCT Corelab: Cardialysis
- Prospective, open label, FIM
- 3.0 x 18mm devices to treat up to 2 lesions ≤ 14mm in length

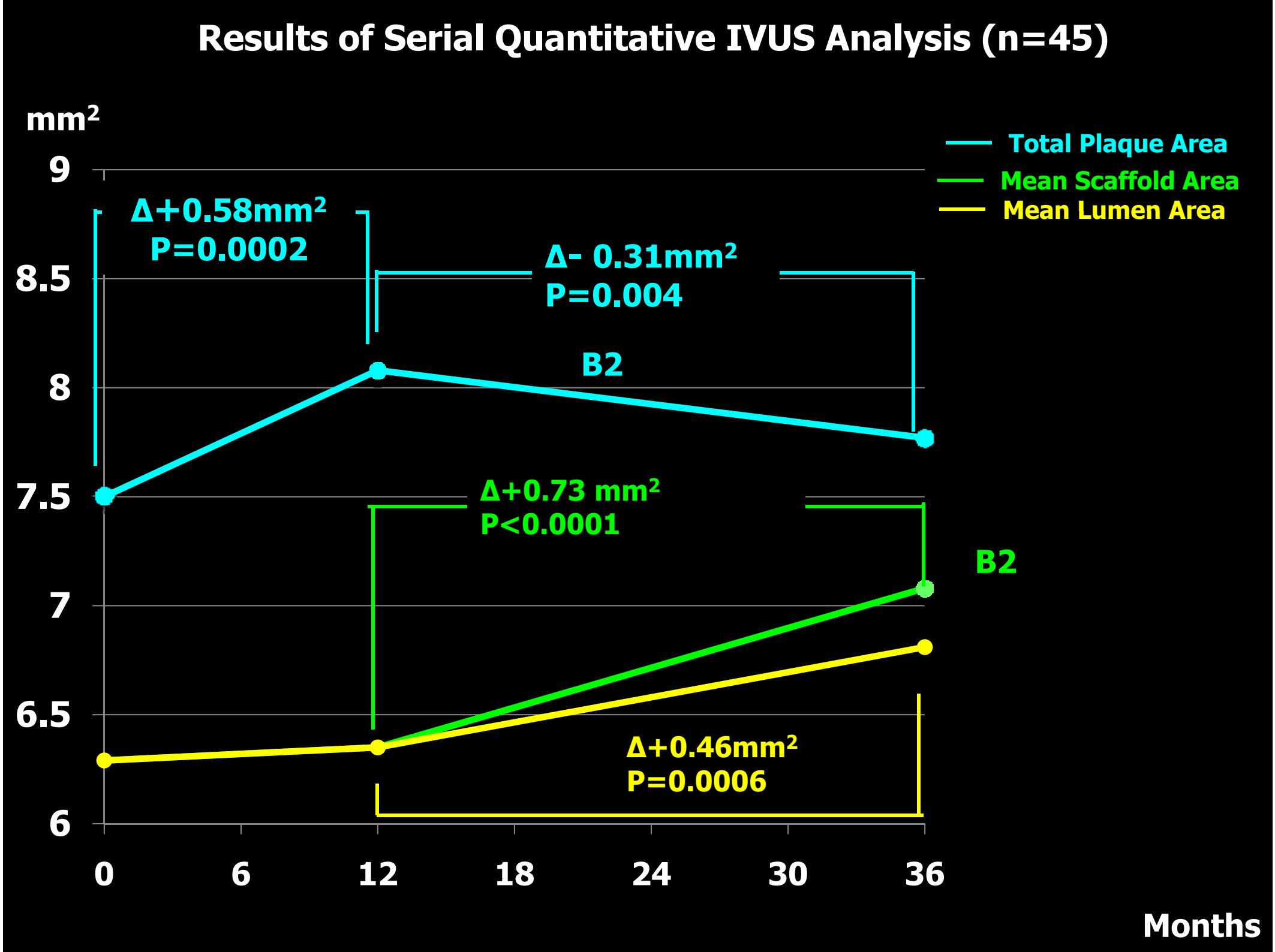
- 12 sites Europe, Australia, New Zealand
- B de Bruyne, MD, PhD
- D Dudek, MD
- E Christiansen, MD
- P Smits, MD, PhD
- B Chevalier, MD
- D McClean, MD
- J Koolen, MD, PhD
- S Windecker, MD
- R Whitbourn, MD
- I Meredith, MD, PhD
- 101 patients enrolled between 19 March and 6 November 2009

Temporal evolution of neointima, scaffold and lumen in human at 6 ,12, 24 and 36 months

Circulation 2010 JACC 2011 Circ Int 2012
Mean Neointimal Thickness, micron
Scaffold area, mm^2
Mean Lumen, mm^2

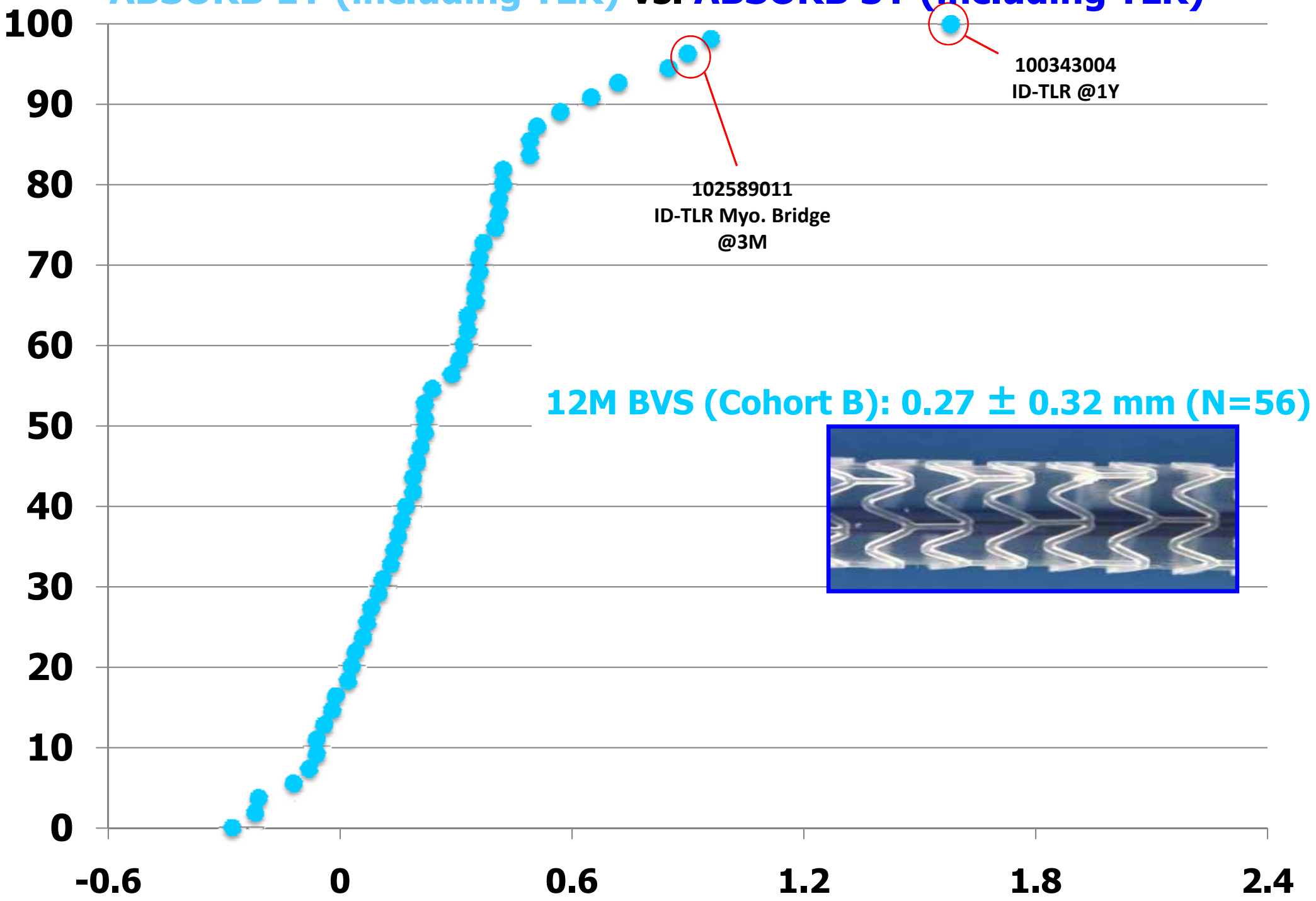





Results of Serial Quantitative IVUS Analysis (n=45)
mm²
9
8.5
8
7.5
7
6.5
6
Total Plaque Area
Mean Scaffold Area
Mean Lumen Area
Δ+0.58mm²
P=0.0002
Δ- 0.31mm²
P=0.004
B2
Δ+0.73 mm²
P<0.0001
B2
Δ+0.46mm²
P=0.0006
0
6
12
18
24
30
36
Months

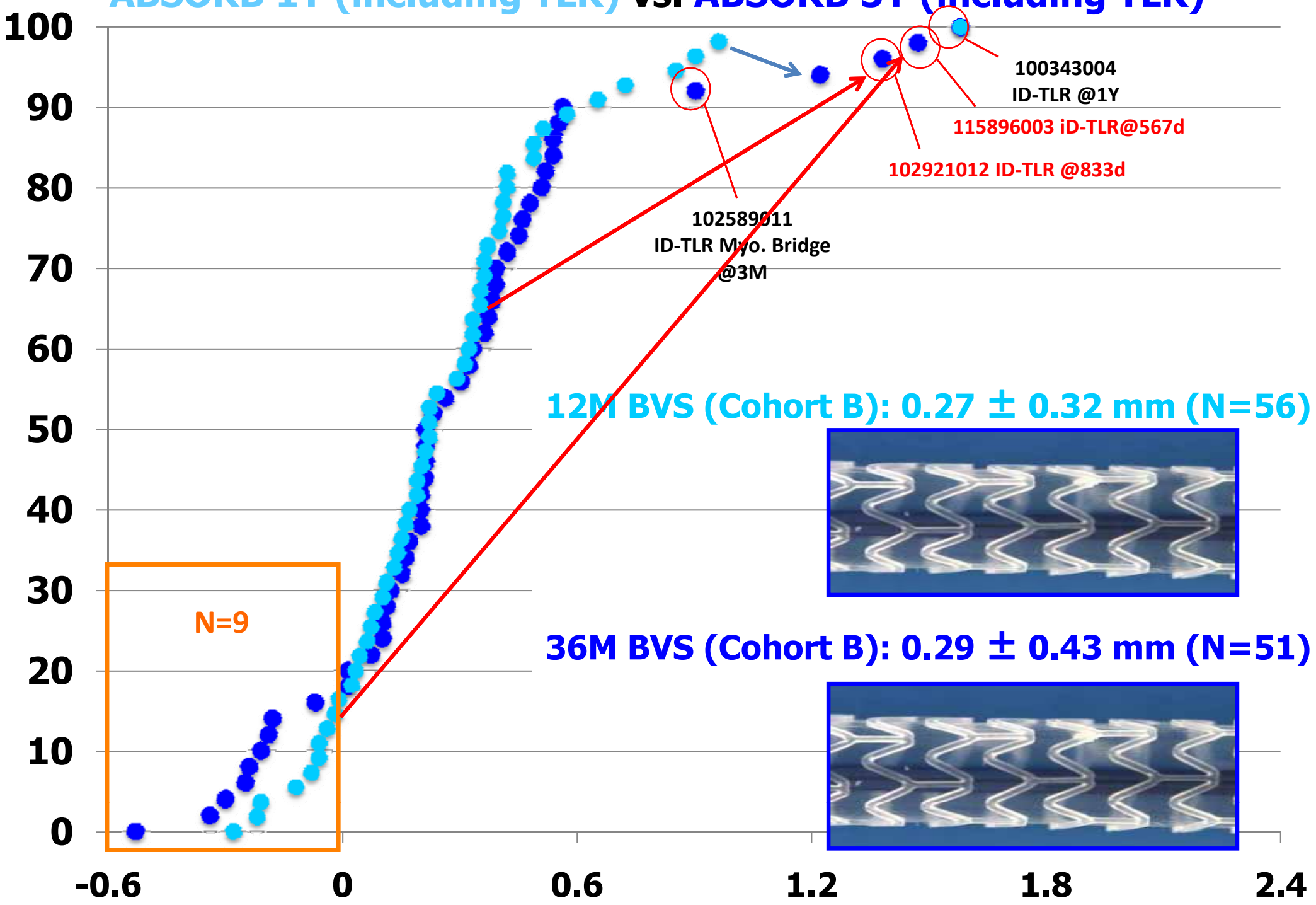
Insight on evolution of late luminal loss over times

ABSORB 1Y (including TLR) vs. ABSORB 3Y (including TLR)



Insight on evolution of late luminal loss over times

ABSORB 1Y (including TLR) vs. ABSORB 3Y (including TLR)



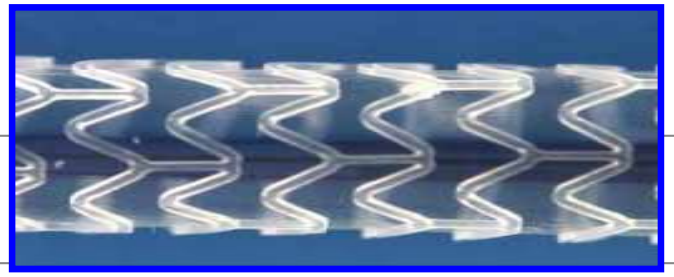
Insight on evolution of late luminal loss over times

ABSORB 3Y (including TLRs) vs. Xience 2Y

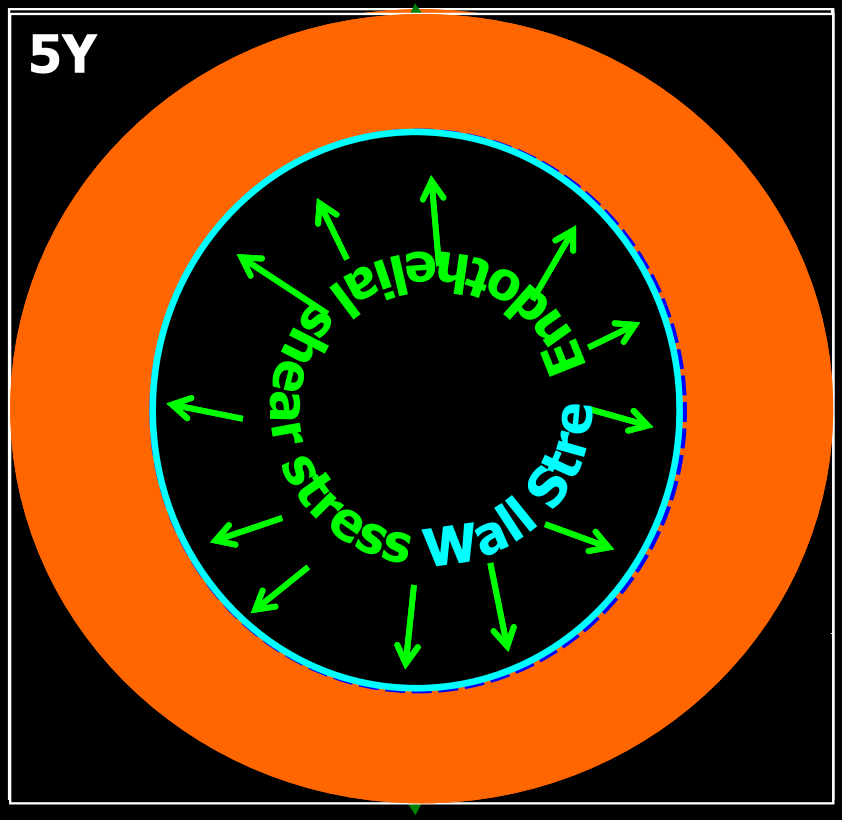
100
90
80
70
60
50
40
30
20
10
0

-0.6
0
0.6
1.2
1.8
2.4

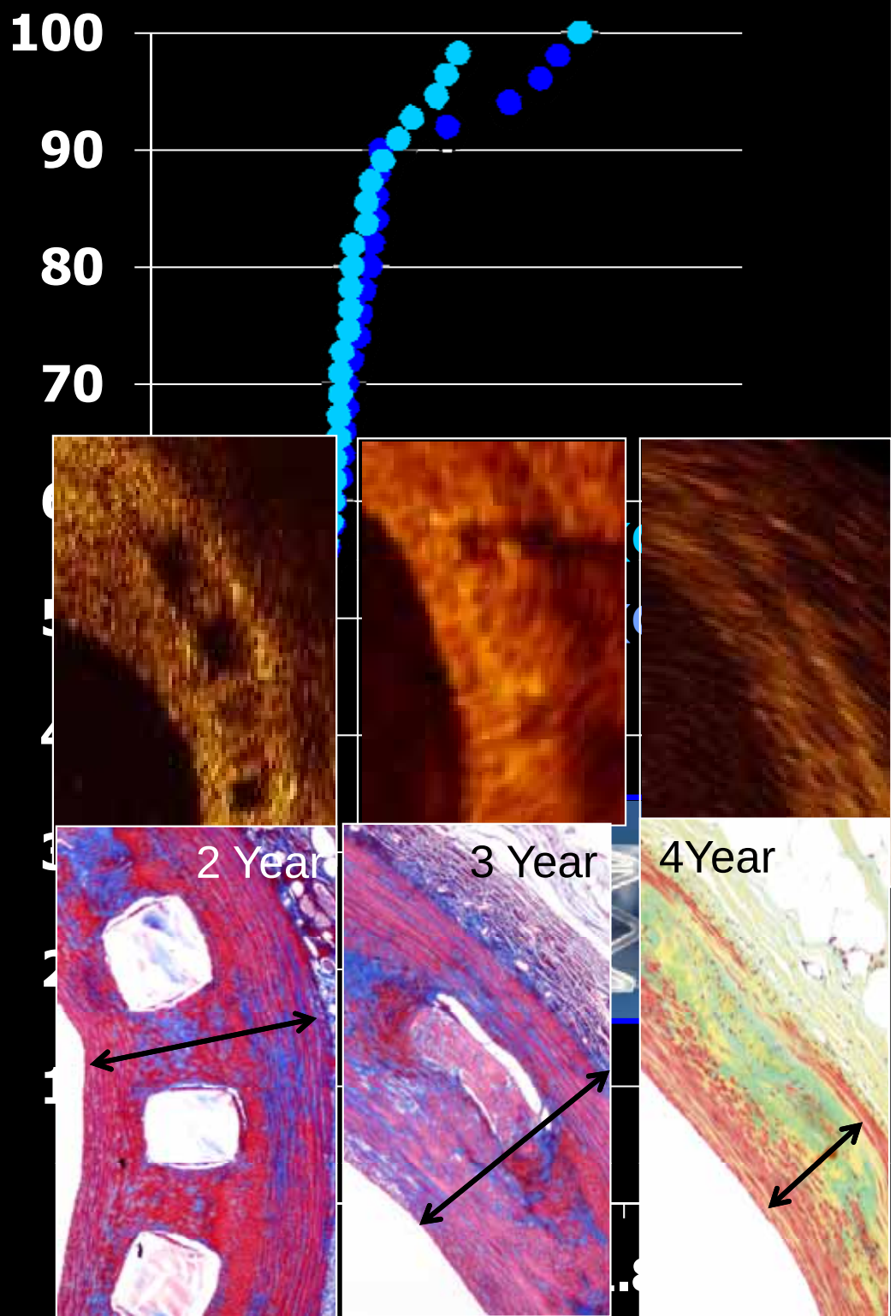
36M BVS (Cohort B): 0.29 ± 0.43 mm (N=51)



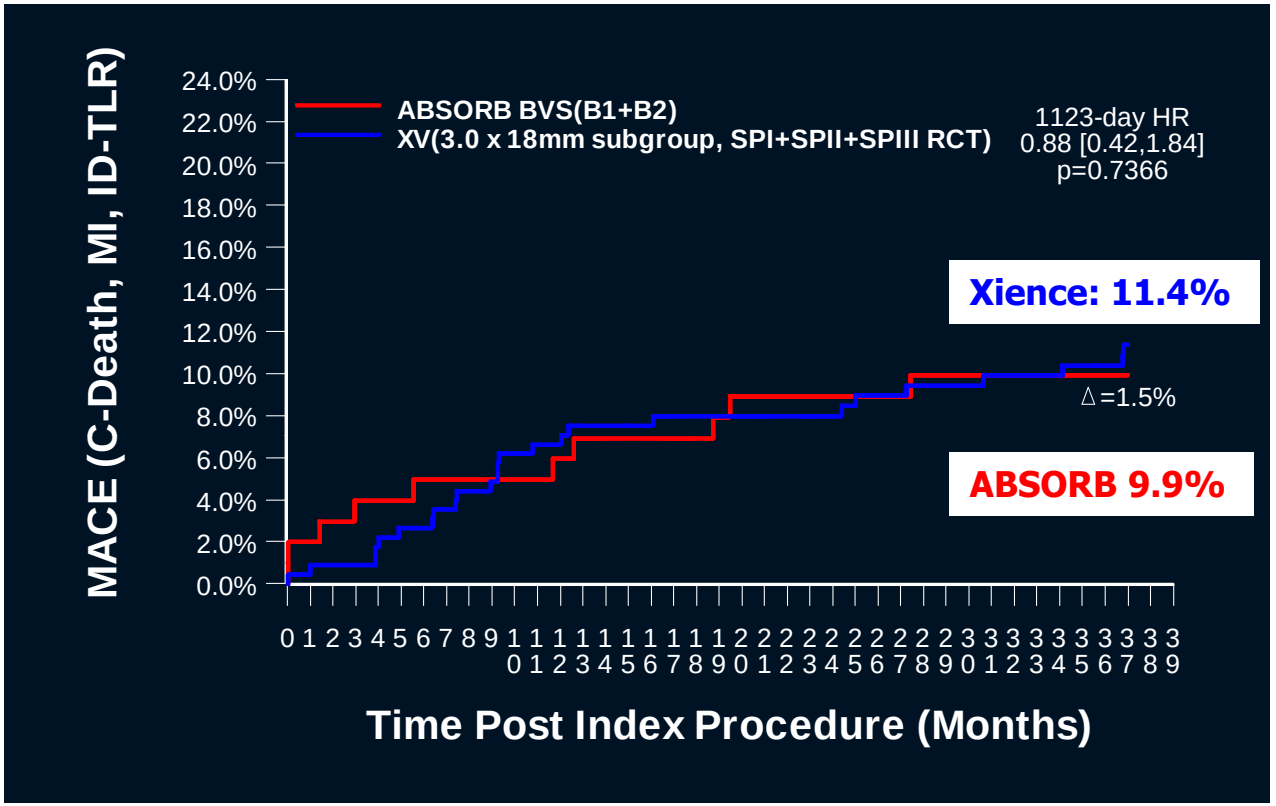
24M EES (SPIRIT II): 0.33 ± 0.37mm (N=96)



At 5 years, the vessel wall thinning (plaque media reduction?) will result in late lumen enlargement.



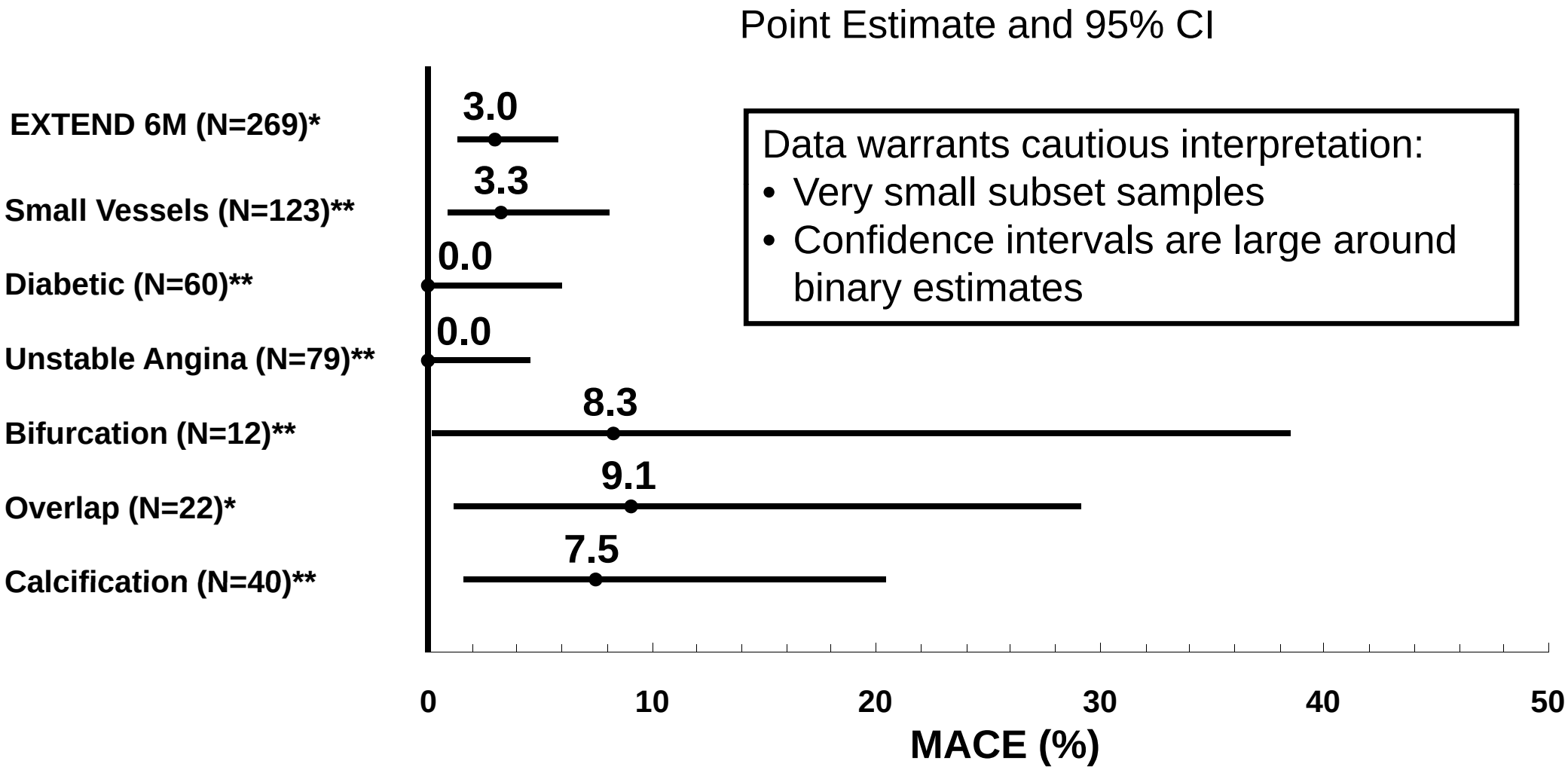
KM estimate of MACE rate in patients treated with Absorb BVS (ABSORB Cohort B, n=101) vs. patients treated with a single 3.0x 18 mm metallic XIENCE V (SPIRIT FIRST+II+III, n=227)



Time After Index Procedure (days)								
	0	**37**	**194**	**284**	**393**	**573**	**758**	**1123**
ABSORB BVS(B1+B2) At Risk	101	99	96	96	94	92	91	89
XV(3.0 x 18mm subgroup, SPI+SPII+SPIII RCT) At Risk	227	224	219	211	204	202	191	182

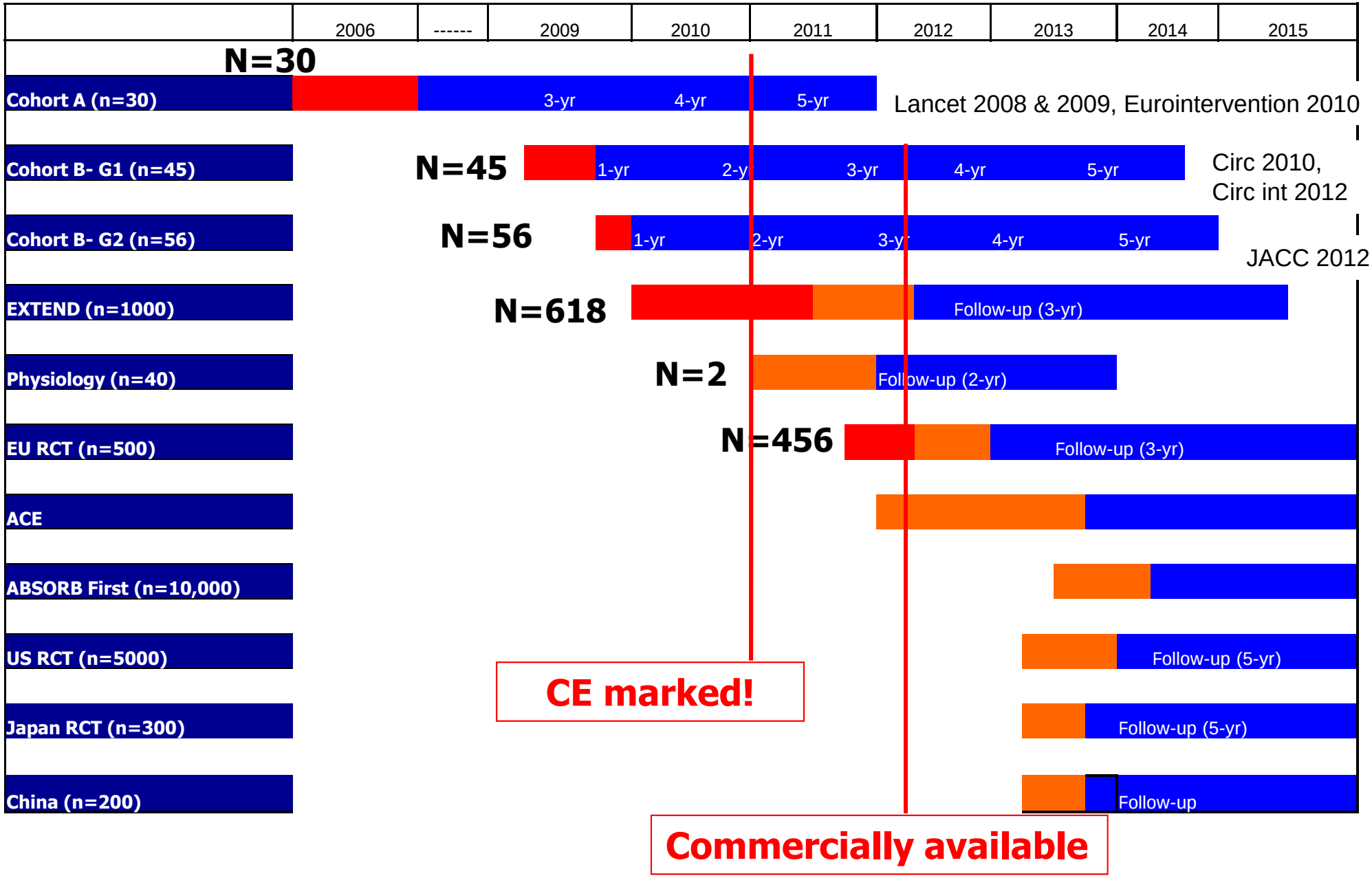
P-values are not from formal hypotheses testing and are displayed for exploratory purpose only

Preliminary Confidence Intervals for MACE at 6-months in the subgroups of the ABSORB Extend



* All patients from EXTEND only; ** Patients from pooled EXTEND and Cohort B

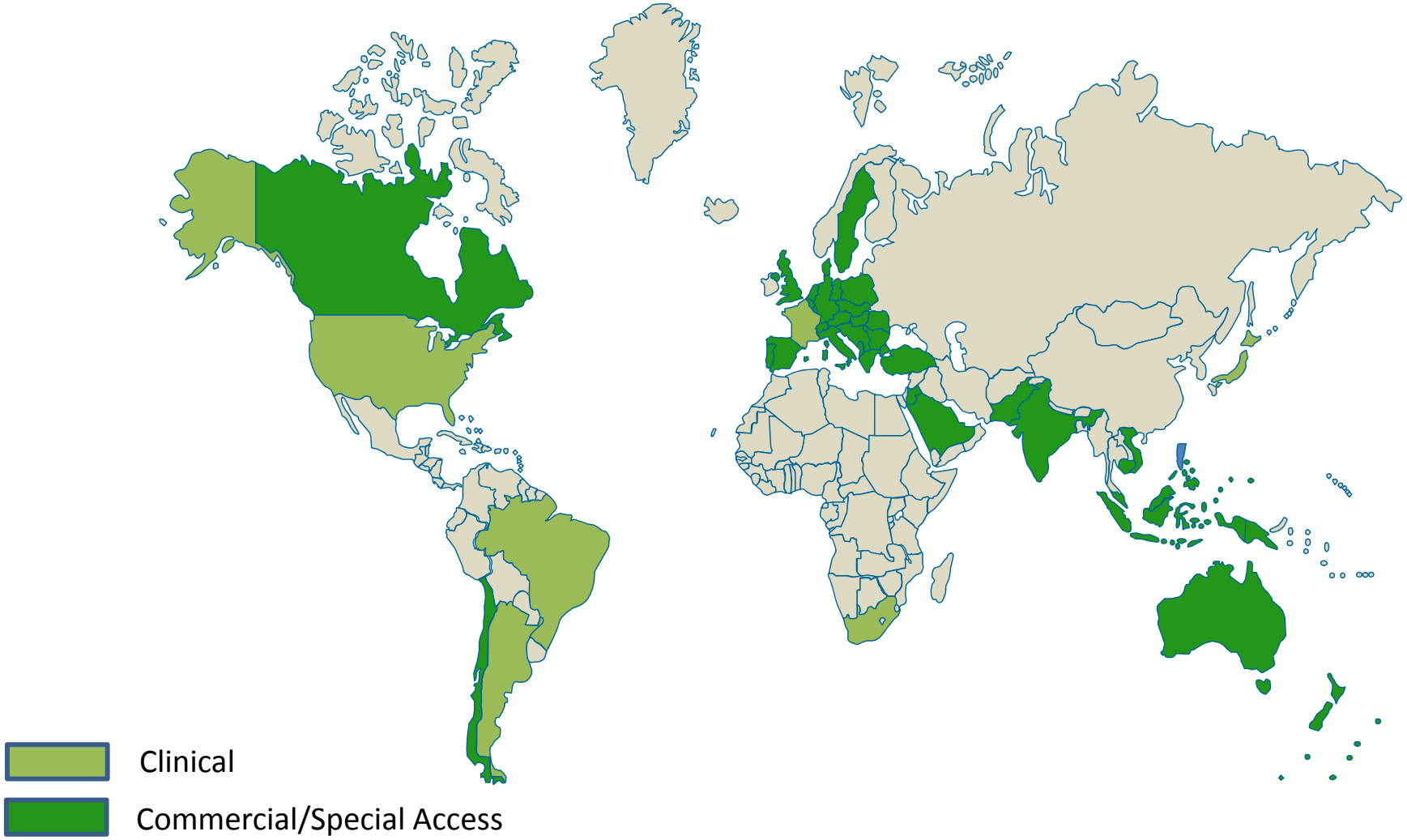
Overview of ABSORB studies



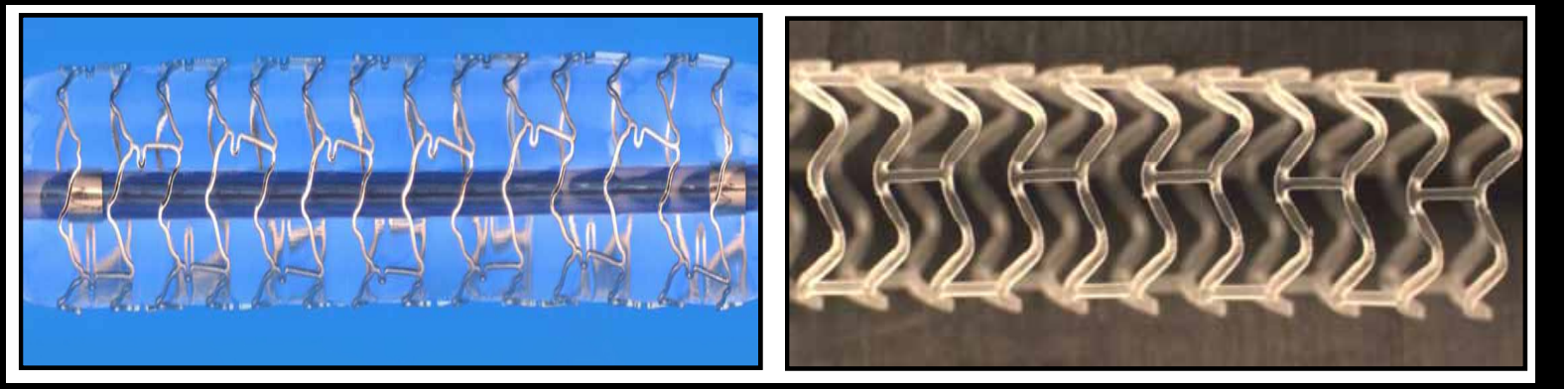
Follow-up Enrolled To be Enrolled

* Timelines based on patient follow-up dates, not data availability

Bioresorbable Vascular Scaffold Worldwide
Current Exposure by Country



Metal vs. bioresorbable everolimus-eluting scaffolds:



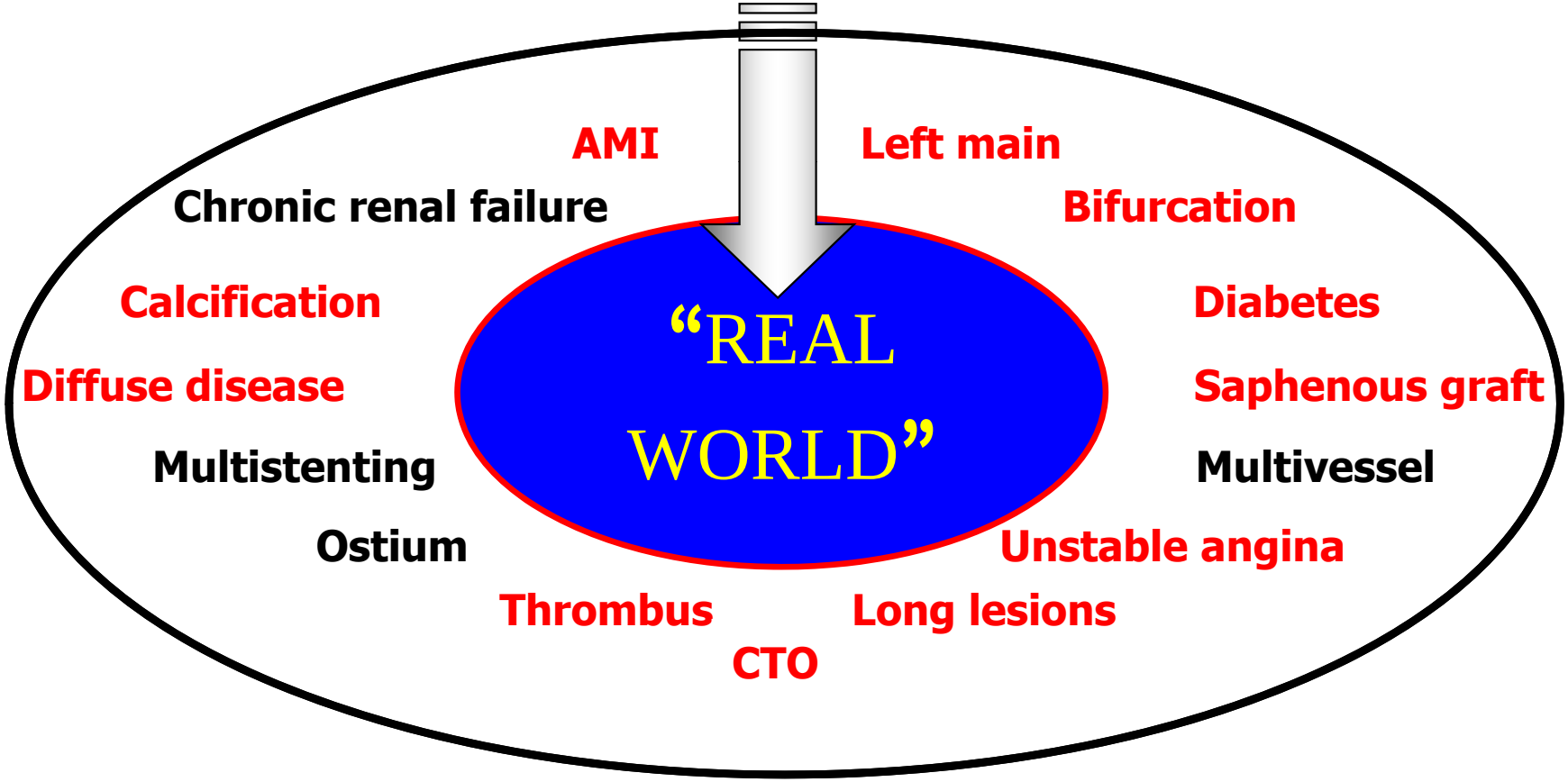
	XIENCE V	ABSORB
Platform	Cobalt chromium	Poly-L-lactide (PLLA)
Polymer coating	Non-erodible polymer (polyvinylidene fluoride co-hexafluoropropylene and poly-n-butyl methacrylate)	Poly-D,L-lactide (PDLLA)
Anti-proliferative drug	Everolimus 100 µgr/cm^2	Everolimus 100 µgr/cm^2
Drug release	80% in 1 month 100% in 4 months	80% in 1 month 100% in 4 months
Strut thickness	**87 µm**	**156 µm**

Metallic
everolimus-eluting stents

Bioresorbable
everolimus-eluting scaffolds

Impact of CE mark approval and market penetration

CE mark approval for drug-eluting stents
BVS: 2011

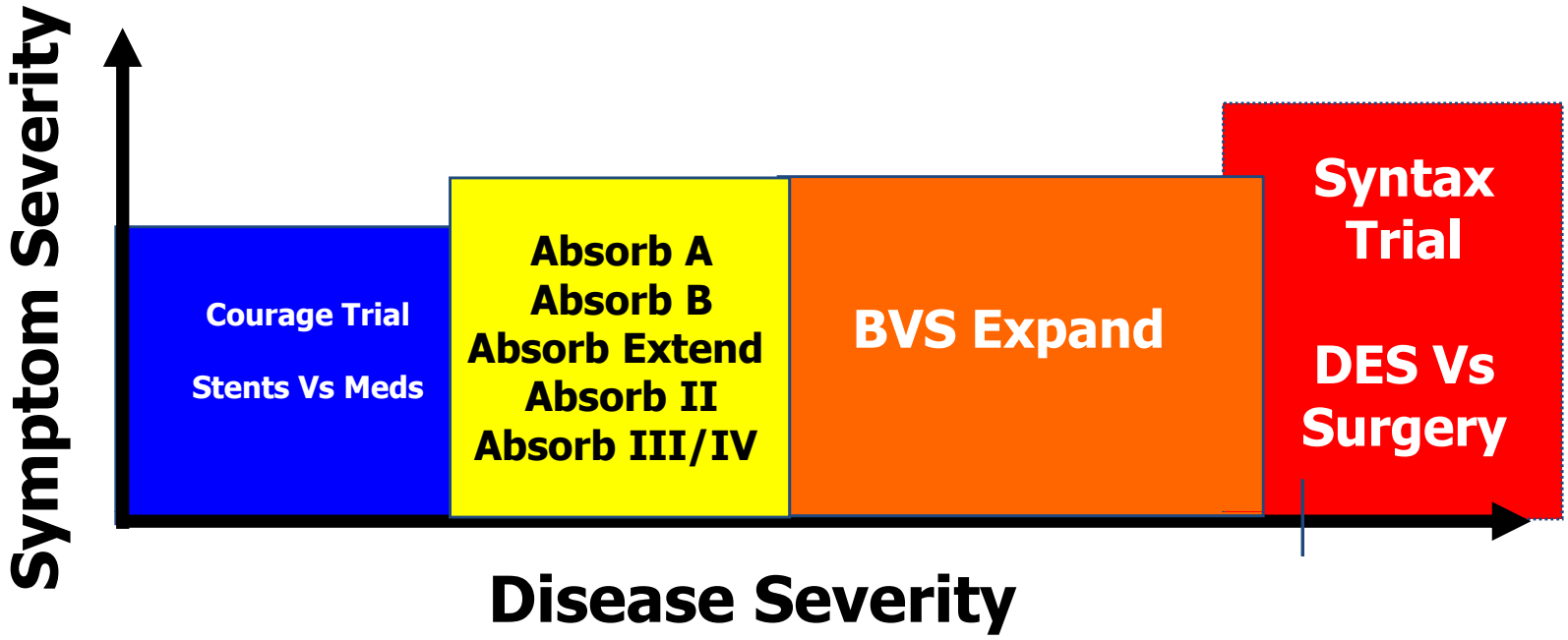


… We do not yet have any randomized pivotal trial

BVS Expand: Single Center Registry (Thorax Centre, Erasmus MC)

- Larger diameter up to 4.0 mm
- Longer length: > 32 mm
- Bifurcations
- Calcified lesions
- ACS patients (non-STEMI)
- No previous CABG or metallic stent in target vessel

Target: 300 patients
Start Sept 1st 2012



Company	Stent	Development	Pre-clinical	Clinical trials	Post-market
Kyoto Medical	Igaki-Tamai	✓	✓	✓	
Biotronik	Dreams	✓	✓	✓	
Abbott	Absorb	✓	✓	✓	✓
Art	Art18AZ	✓	✓	✓	
Reva Medical	Resolve	✓	✓	✓	
Xenogenics	Ideal biostent	✓	✓		
Orbus Neich	Acute	✓	✓		
Elixir	DESolve	✓	✓	✓	
Amaranth	Amaranth PLLA	✓	✓		
Huaan Biotech	Xinsorb	✓	✓	✓	
S3V	Avatar	✓	✓		
Meril	MeRes	✓	✓		
Zorion Medical	Zorion BRS	✓	✓		
Lifetech	Lifetech Iron	✓	✓		

Conclusion

- **ABSORB cohort A (5 year FUP) demonstrated**
  - **Bioresorption of strut**
  - **Late lumen enlargement**
  - **Restoration of vasomotion**
  - **Feasibility of serial non-invasive follow-up**
  - **Long-term safety**
- **ABSORB cohort B (3 Year FUP) demonstrated**
  - **On OCT, enlargement of scaffold area that compensates for persistent increase of neointima**
  - **On IVUS, enlargement of scaffold area & lumen area with reduction of plaque area**
  - **On Angiography at 36 months, stable late loss over the last 24 months with vasodilation on intracoronary administration of nitrate**
  - **The 3-Y MACE rate of ABSORB is comparable to Xience (in a non-randomized post-hoc analysis)**
- **ABSORB scaffolds are now commercially available and starts to be used in complex lesions: LM, Bif, CTO, AMI and so on… Some of the preliminary acute results look promising**