

Role of Imaging between complex versus non-complex PCI

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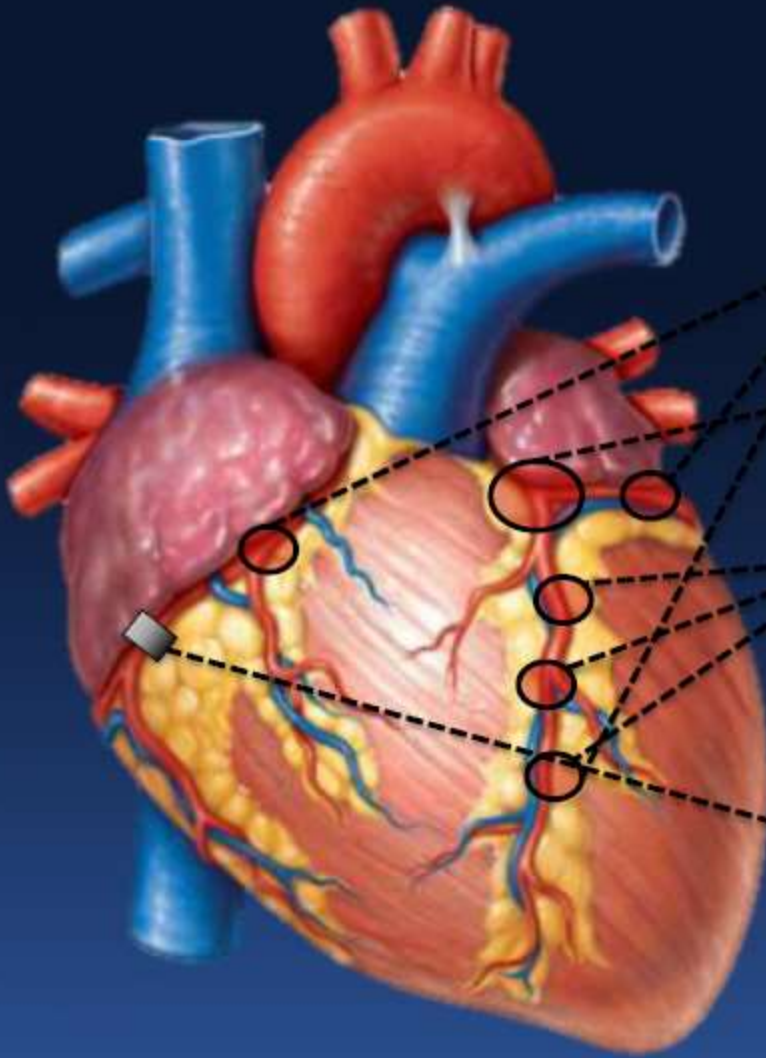
DISCLOSURE

1. Nothing to disclose regarding the slides

Complex PCI

Any of the following characteristics:

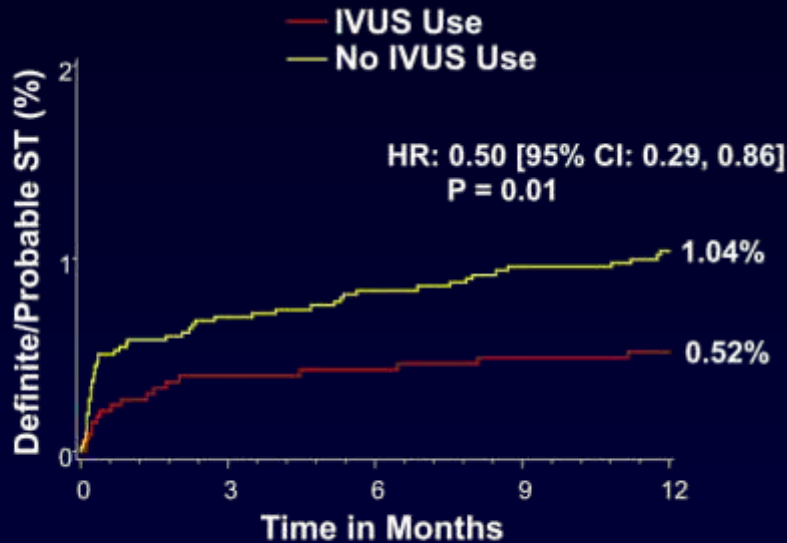
- 3-vessel PCI
- Bifurcation with 2 DES
- ≥ 3 DES implanted
- Total DES length > 60 mm
- Chronic total occlusion



Giustino. et al. J Am Coll Cardiol 2016

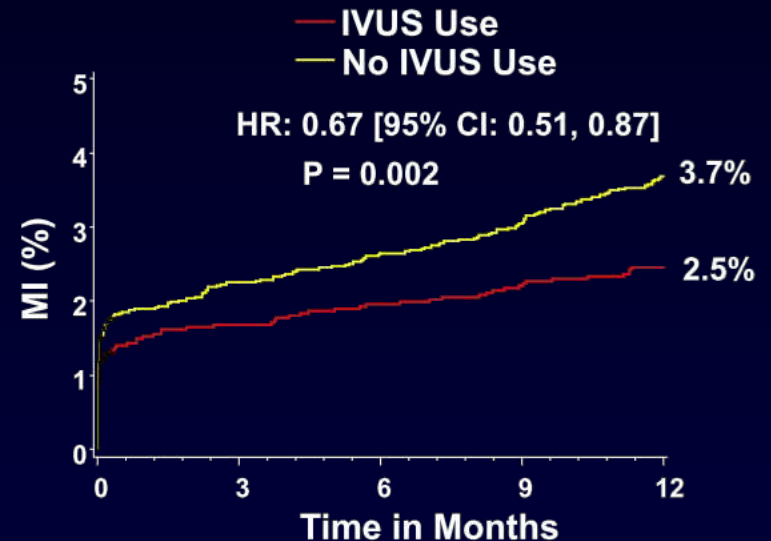
ADAPT-DES substudy (n=8,583 pts: IVUS=3,349 pts and no IVUS=5,234 pts)

Definite/Probable Stent Thrombosis



Number at risk:					
IVUS Use	3349	3251	3221	3197	3023
No IVUS Use	5234	5015	4978	4938	4585

MI



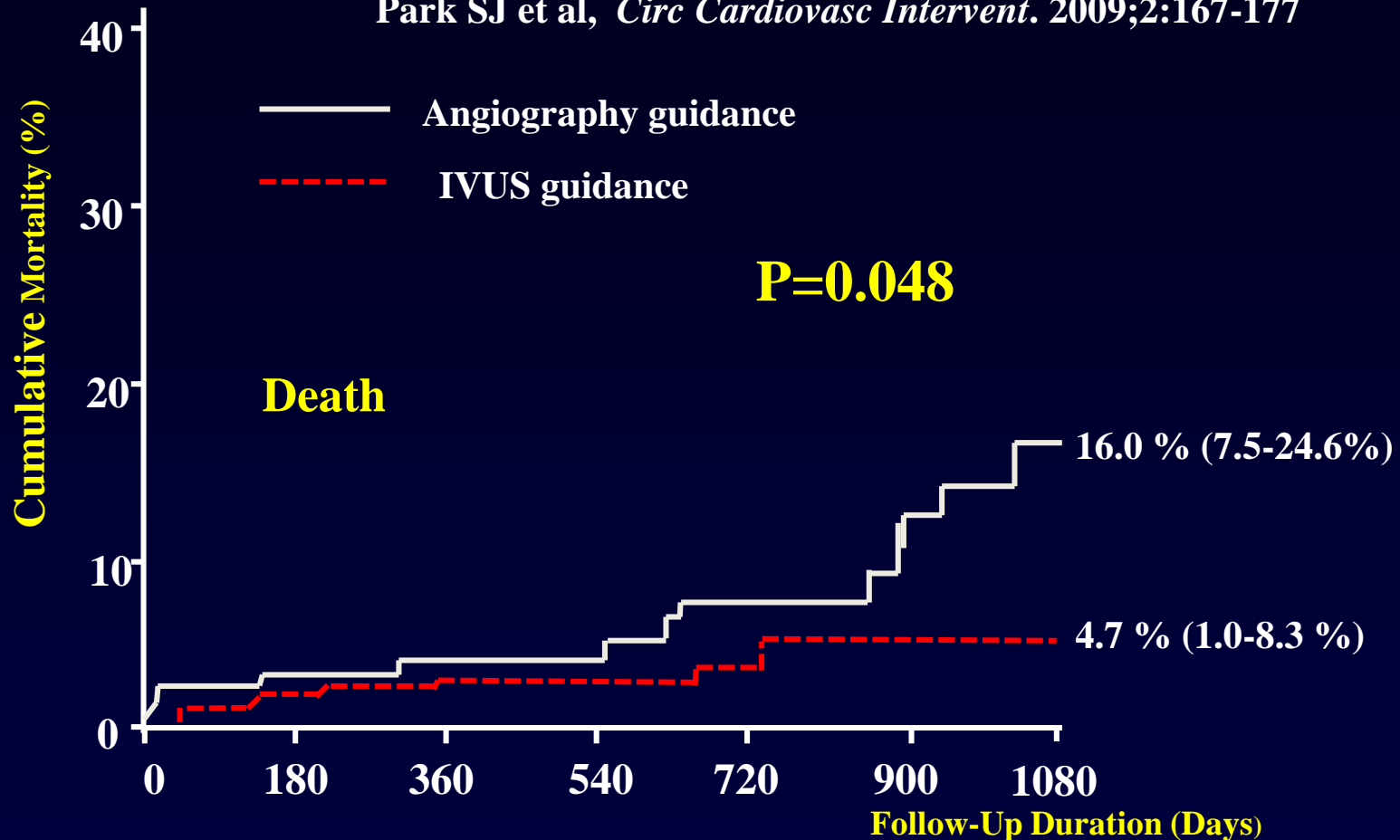
Number at risk:					
IVUS Use	3349	3209	3171	3141	2969
No IVUS Use	5234	4932	4882	4830	4460

IVUS guidance during DES PCI may result in less stent thrombosis as well as fewer myocardial infarctions and MACEs

Witzenbichler B, et al. *Circulation* 2014;129: 463-470

MAIN-COMPARE registry: 3-year mortality (145 propensity matched pairs)

Park SJ et al, *Circ Cardiovasc Intervent.* 2009;2:167-177



Patients at risk

IVUS-guidance

Angiography-guidance

145

140

98

37

145

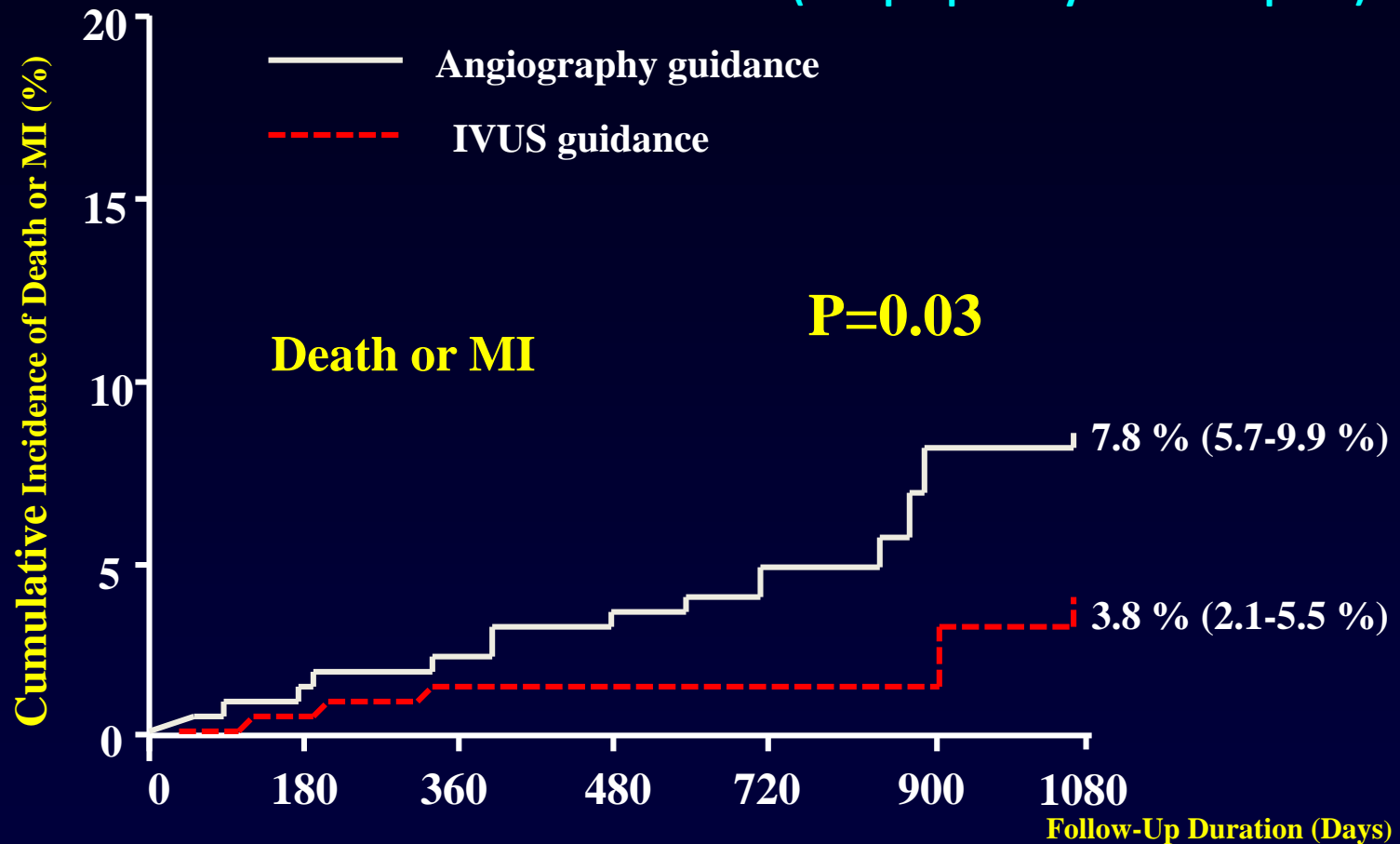
137

88

29

Impact of IVUS-Guidance on 3-Year Clinical Outcomes: DES for Bifurcation Lesions from a Korean multi-center bifurcation registry

(487 propensity matched pairs)



Patients at risk

IVUS-guidance

Angiography-guidance

0 180 360 480 720 900 1080

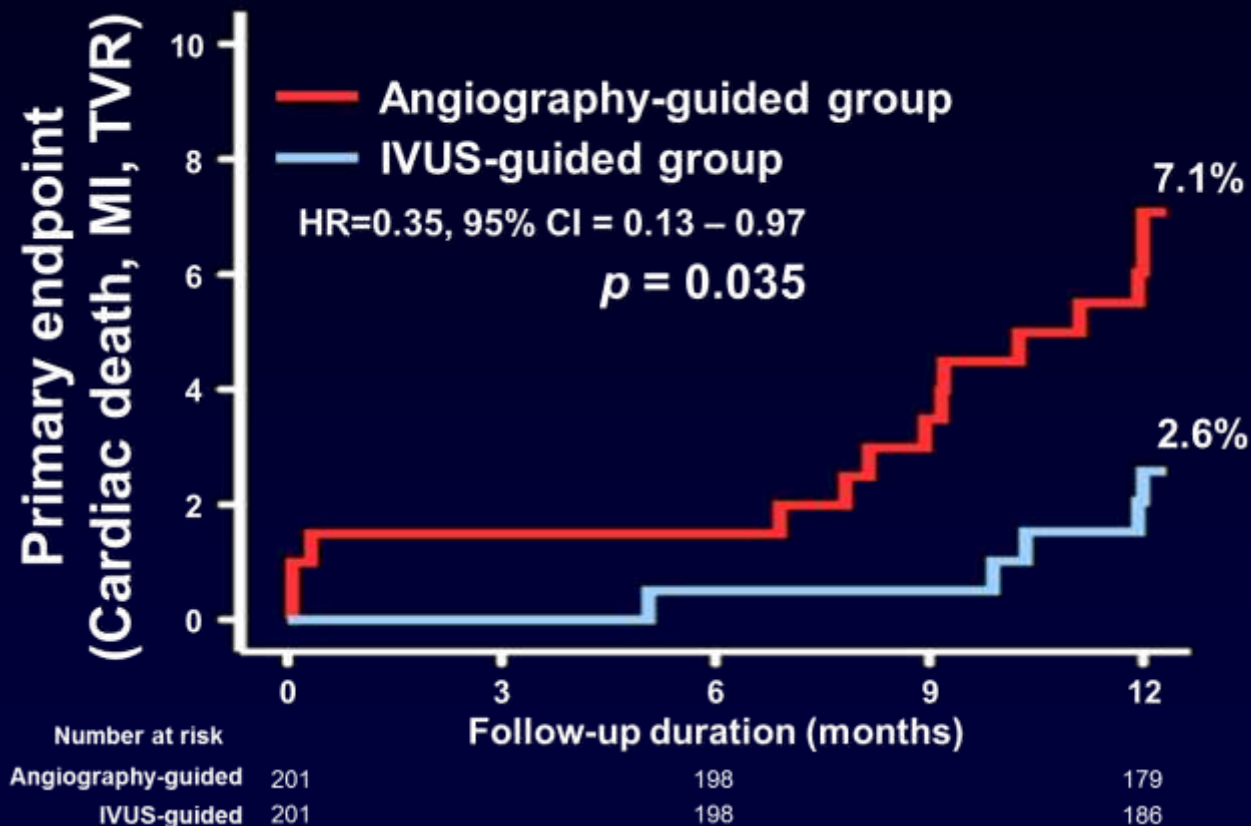
487 467 281 118

487 469 346 124

Follow-Up Duration (Days)

Kim JS, Hong MK, et al. *Am Heart J* 2011;161:180-187

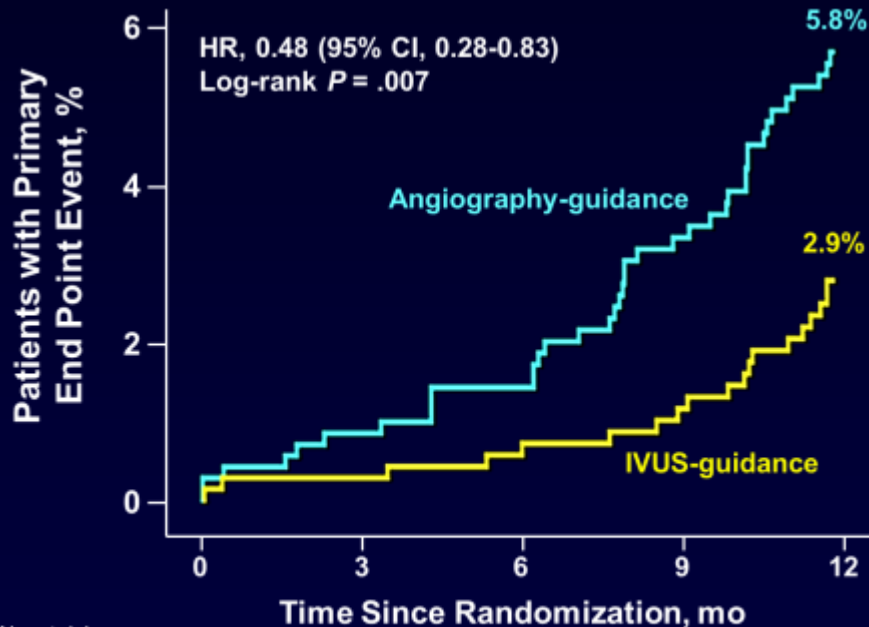
Chronic total occlusion: CTO-IVUS randomized trial



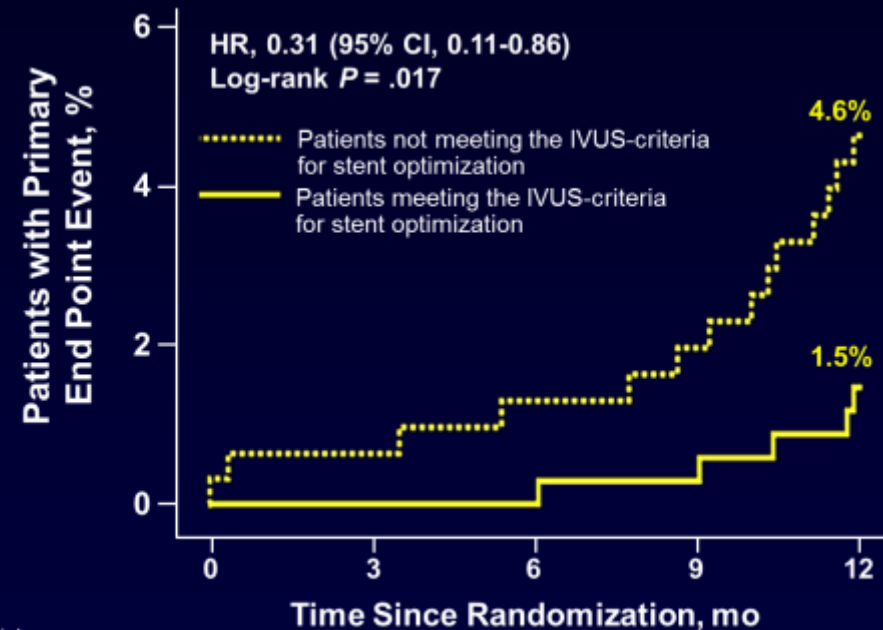
Kim BK, Jang Y et al, *Circ Cardiovasc Interv.* 2015;8:e002592

Diffuse long lesion: IVUS-XPL randomized trial

MACE: Cardiac death, MI, or TLR at 1 year



No. at risk	0	3	6	9	12
Angiography arm	700	673	660	643	624
IVUS arm	700	671	665	654	641

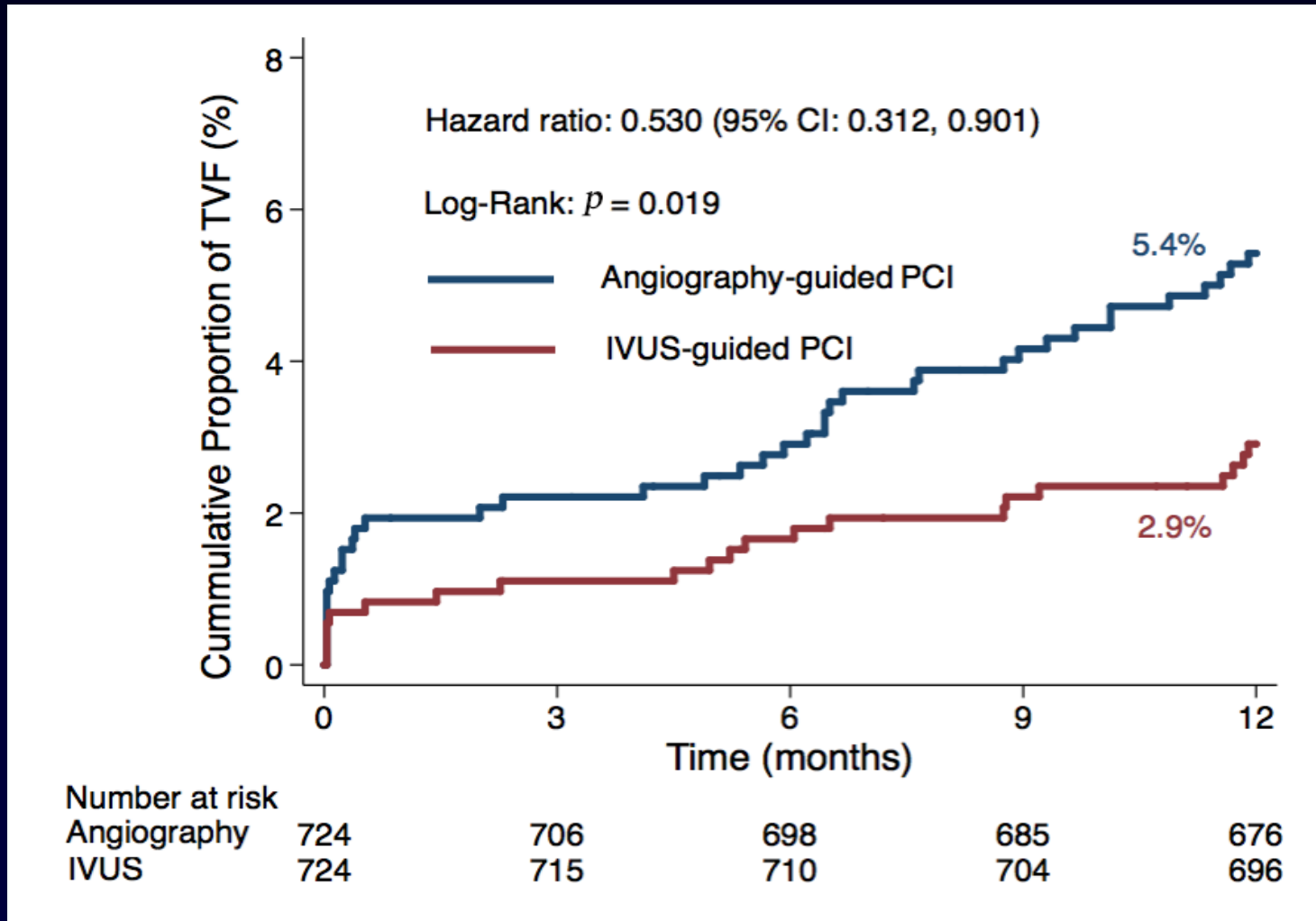


No. at risk	0	3	6	9	12
Not meeting the criteria	315	299	297	394	285
Meeting the criteria	363	362	345	338	334

Hong SJ, Hong MK (corresponding author), et al. *JAMA* 2015;314:2155-63

ULTIMATE trial

Primary Endpoint: TVF at 12 months



Zhang J, et al. *J Am Coll Cardiol* 2018;72:3126-37

Two-year follow-up of the ADAPT DES study

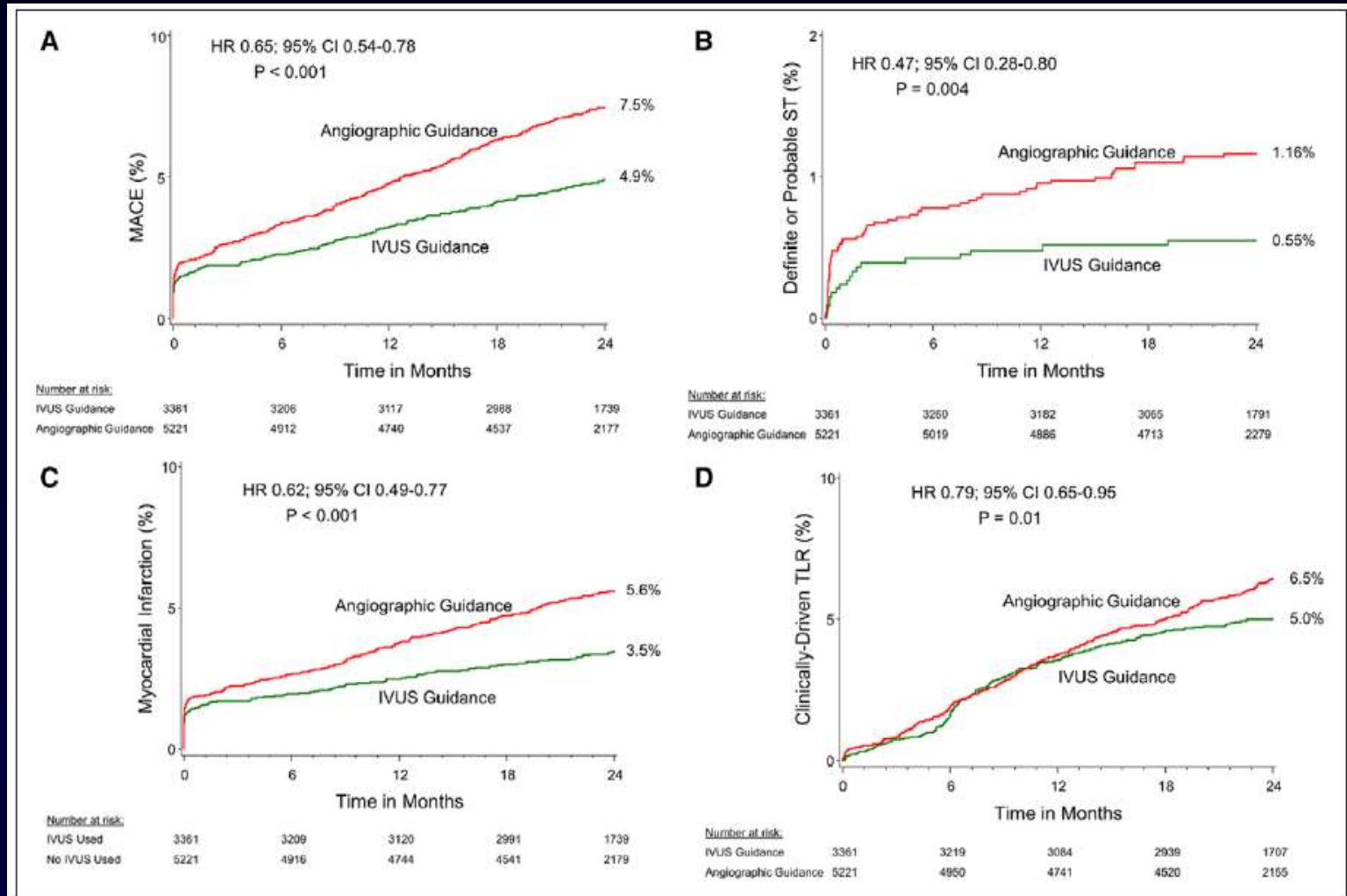


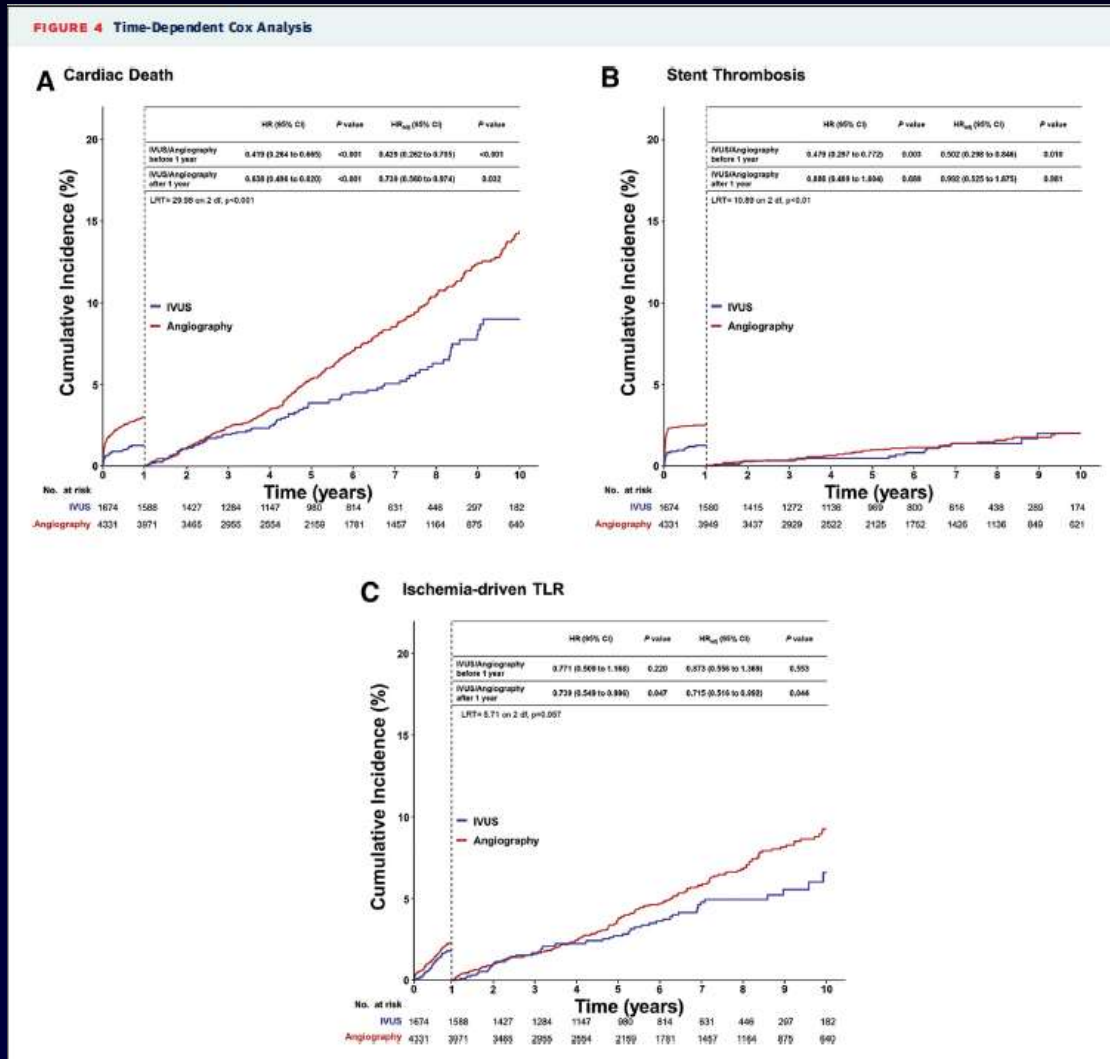
Figure 1. Time-to-event curves according to intravascular ultrasound (IVUS) guidance vs angiography guidance.

Kaplan-Meier survival curves through 2 y for (A) major adverse cardiac events (MACE), (B) definite or probable stent thrombosis (ST), (C) myocardial infarction, and (D) clinically driven target lesion revascularization (TLR) according to IVUS guidance vs angiography guidance. HR indicates hazard ratio.

Maehara A, et al. *Circ Cardiovasc Interv.* 2018;11:e006243

Use of IVUS in complex lesions: median 64 months FU

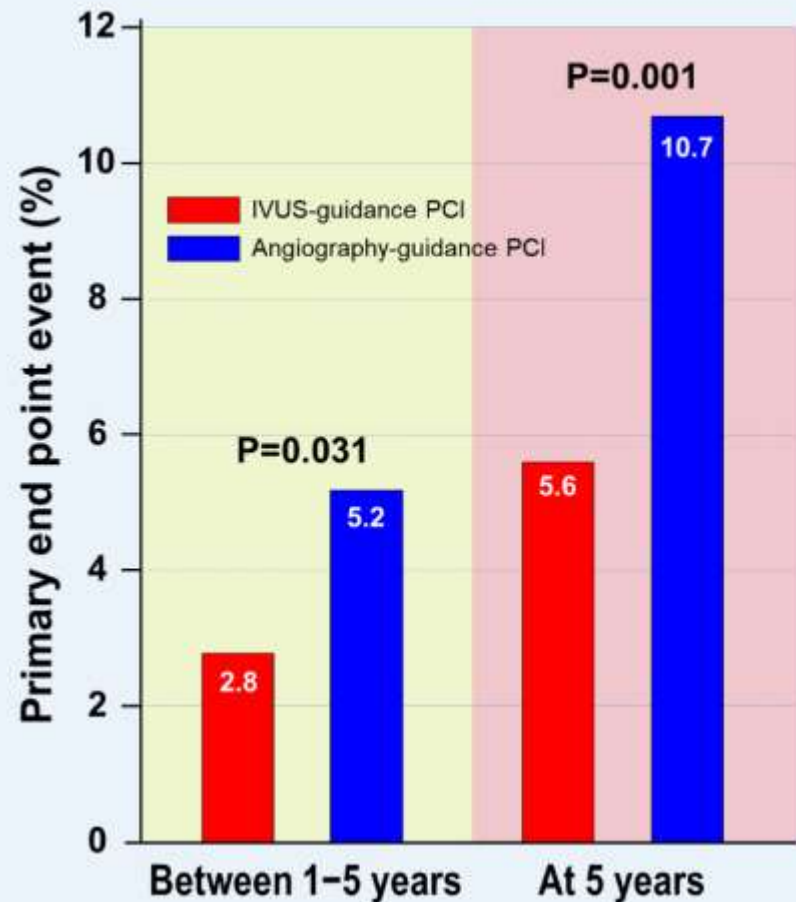
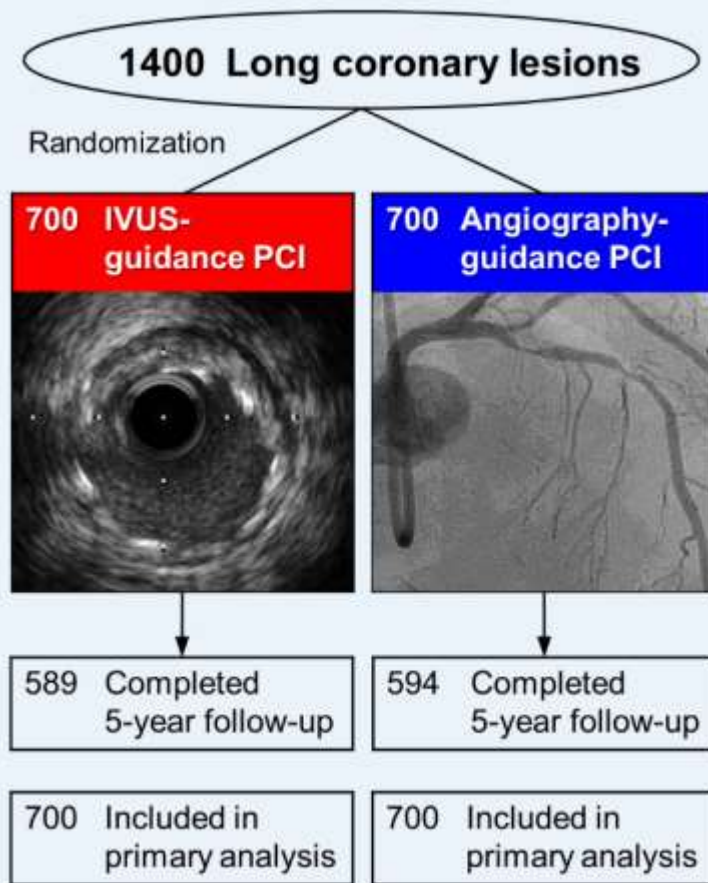
IVUS guidance= 1,674 patients; angiography guidance=4,331 patients



Choi KH. JACC Intv 2019;12:607-20



Five years follow-up of IVUS XPL trial



Hong SJ, Hong MK (corresponding author), et al. *JACC Cardiovascular Intv* (in press)

How about non-complex PCI?

Non-complex PCI: Prevalence

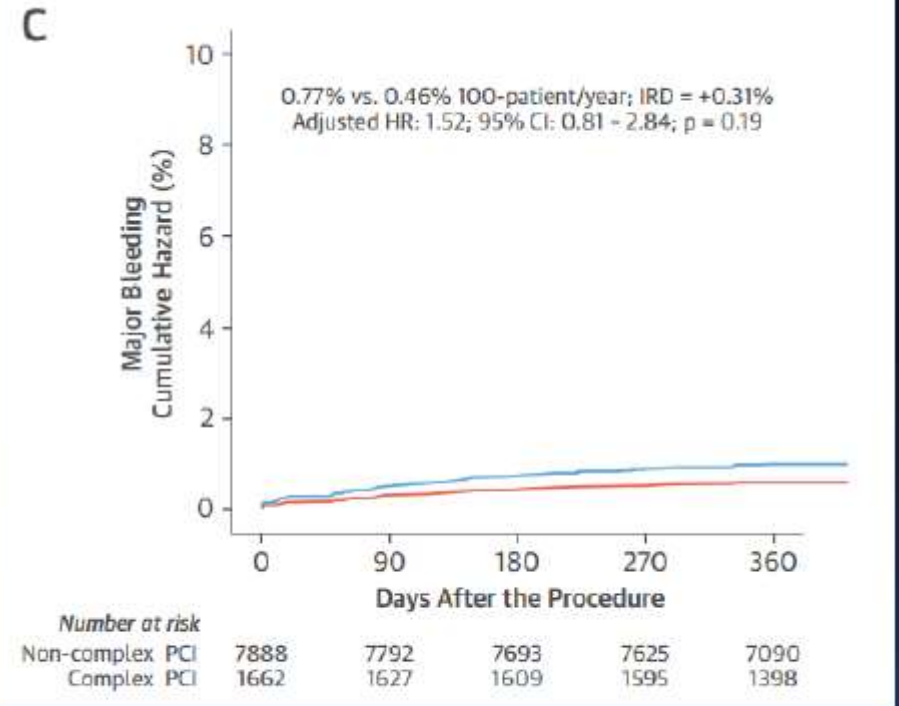
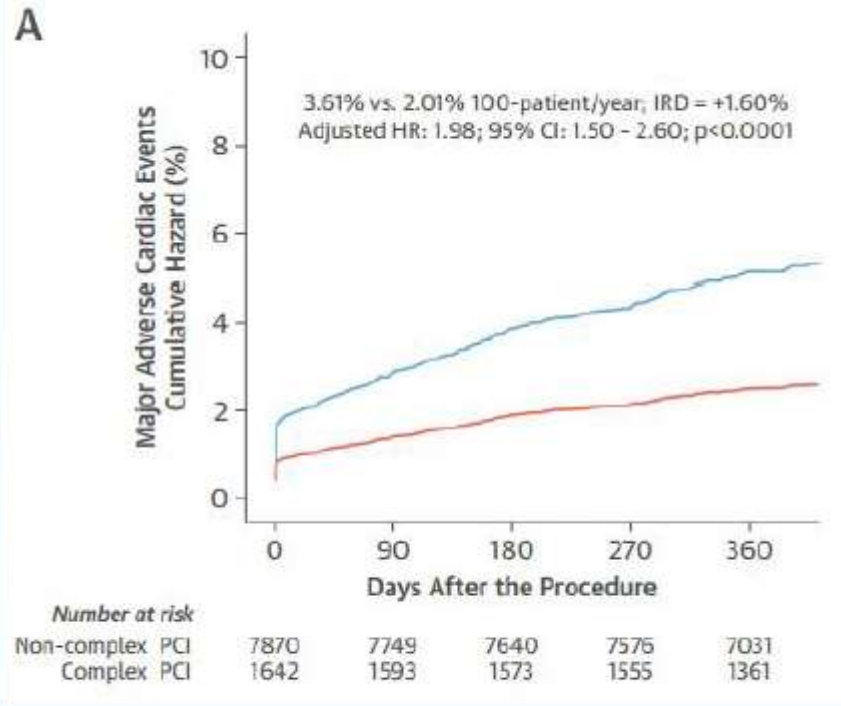
- Of 9,577 patients with available angiographic characteristics, 7,897 (**82.5%**) underwent non-complex PCI

Giustino. et al. J Am Coll Cardiol 2016

- Of 11,214 patients with DES implantation, 5,209 (**46.5%**) underwent non-complex PCI

Choi, K.H. et al. J Am Coll Cardiol Intv. 2019

Non-complex PCI: Rare Clinical Event



— Complex PCI — Non-complex PCI

Median follow-up time of 392 days (interquartile range: 366 to 710 days)

Giustino. et al. J Am Coll Cardiol 2016

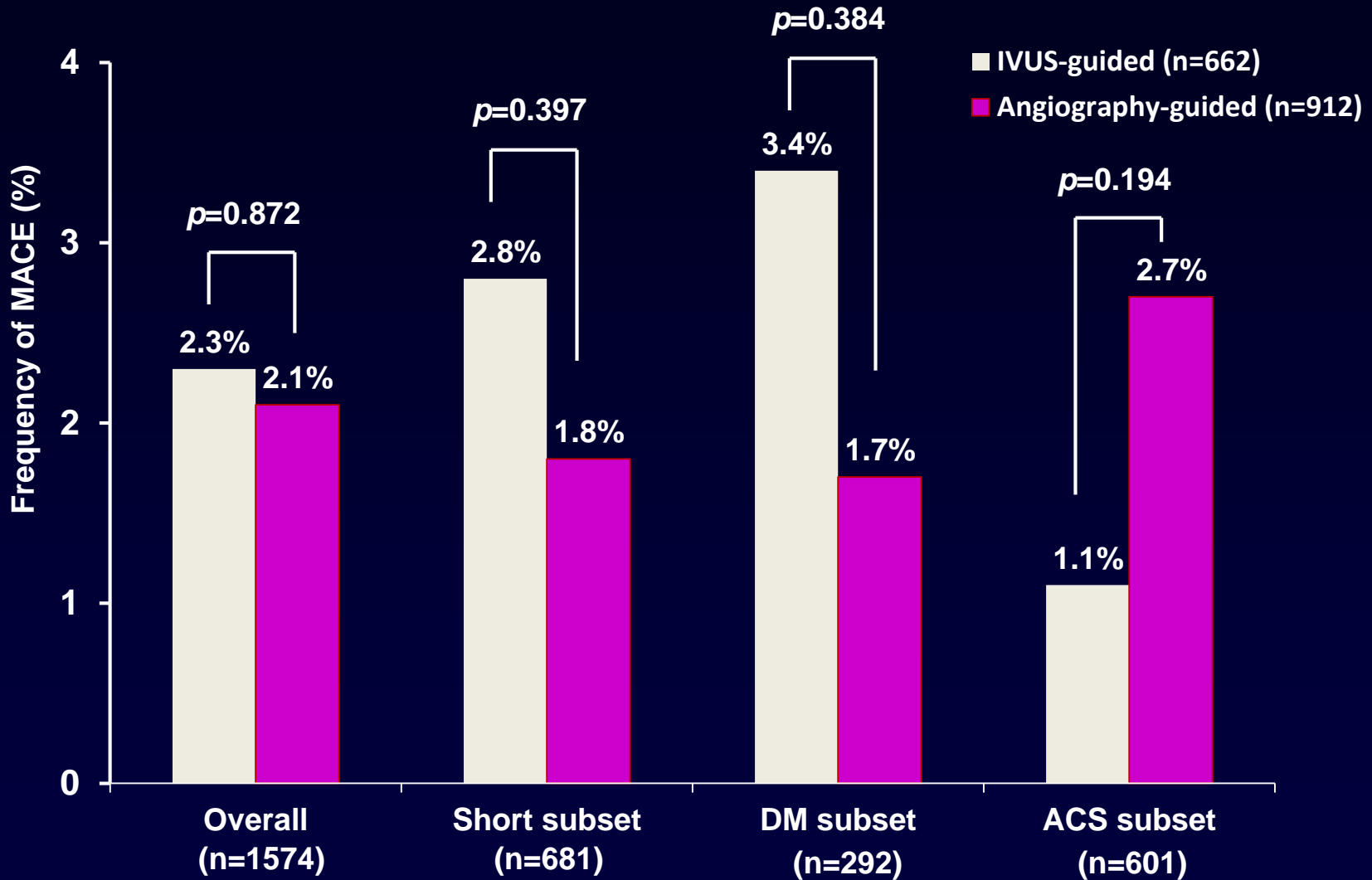
Non-complex PCI: Rare Clinical Events

Pooled data including 6 randomized OCT studies conducted in Severance cardiovascular hospital

At 5-year follow-up	N=436
Cardiac death	1 (0.2%)
Any MI	8 (1.8%)
Target lesion-related MI	2 (0.5%)
TLR	12 (2.8%)
Definite/probable ST	1 (0.2%)
A composite of cardiac death, target lesion-related MI, and TLR	13 (3.0%)

Lee SY, Hong MK (corresponding), et al. *J Am Heart Assoc.* 2019;8:e012800

Usefulness of IVUS in short-length narrowings (DES length ≤ 24 mm) in RESET trials



Yoon YW, Hong MK (corresponding author). *Am J Cardiol* 2013;112:642-646

Non-complex PCI: Rare Clinical Event

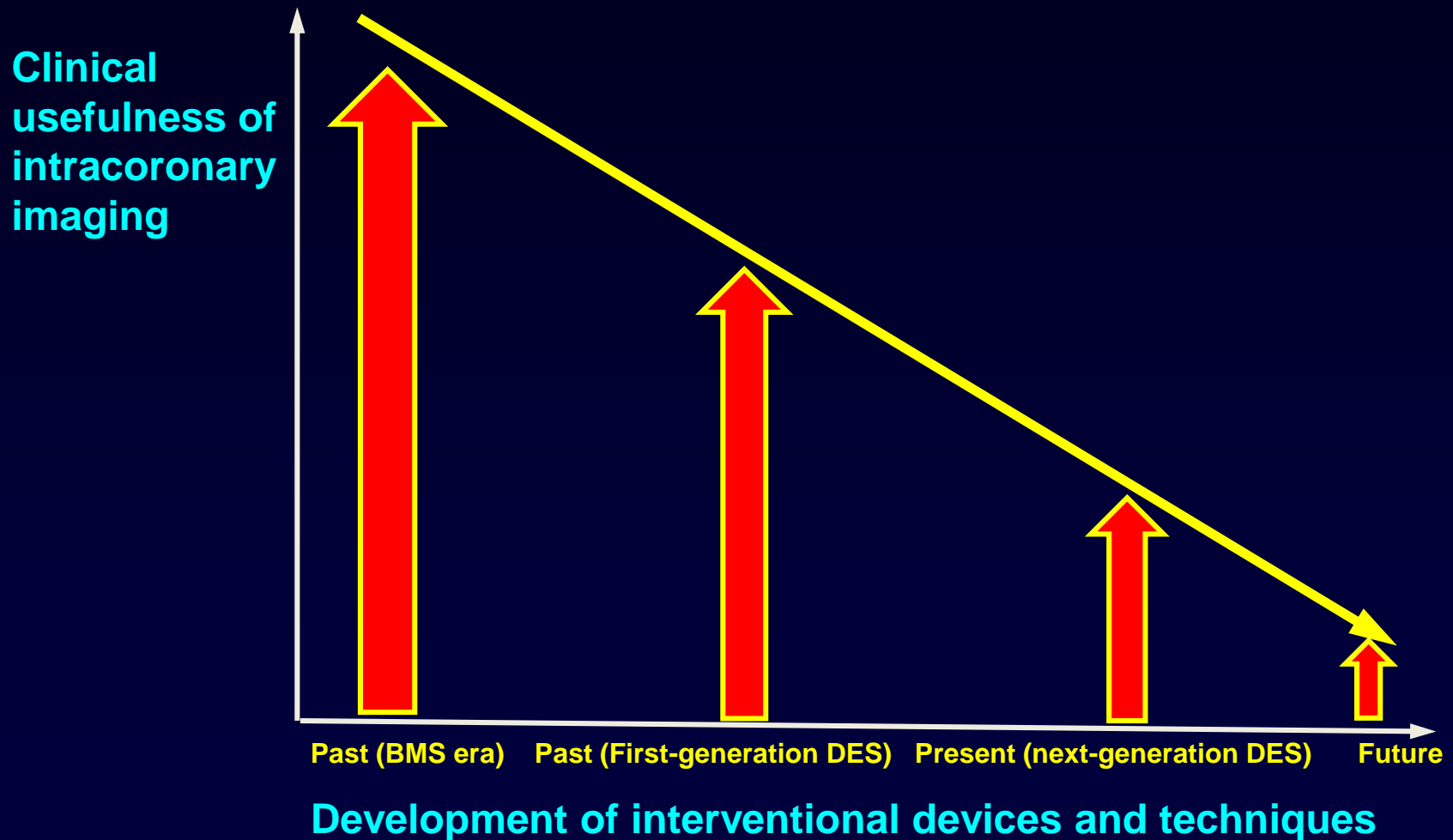
DETECT Trial: OCT versus angiography guidance

Major inclusion criteria: anticipated ≤ 24 mm DES in length

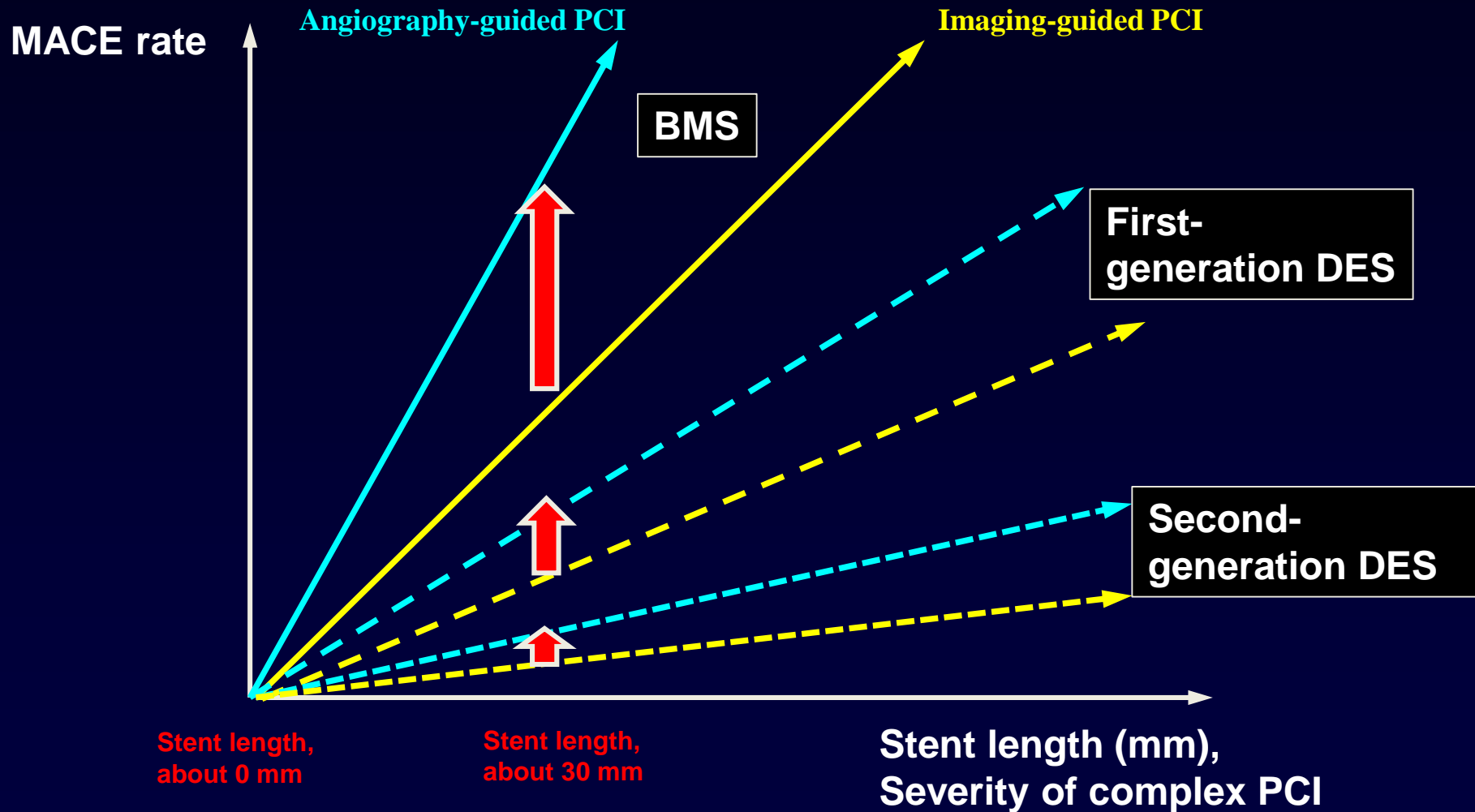
At 1 year	OCT guidance (n=445)	Angiography guidance (n=449)
Cardiac death	0	0
MI	1 (0.2%)	0
Definite/probable ST	1 (0.2%)	0
TVR	3 (0.7%)	1 (0.2%)

Lee SY, Hong MK, et al. JACC Img 2018

Relation between intervention vs. Imaging



Relation between complex PCI vs. Imaging



Conclusion

- ✓ **Do** intravascular imaging for complex PCI even in current generation DES
- ✓ Angiography guidance alone may be enough for non-complex PCI, if PCI-related complications do not occur

How to be an intervention master?

Needs for intracoronary imaging	Non-complex PCI	Complex PCI
Interventionist with experience of imaging	No	Yes
Interventionist without experience of imaging	Yes	Yes

Resident of Cardiology → Interventional fellowship → Independent Interventionist