Optimal Duration of Antiplatelet Therapy Following Left Main and Bifurcation PCI

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Disclosure

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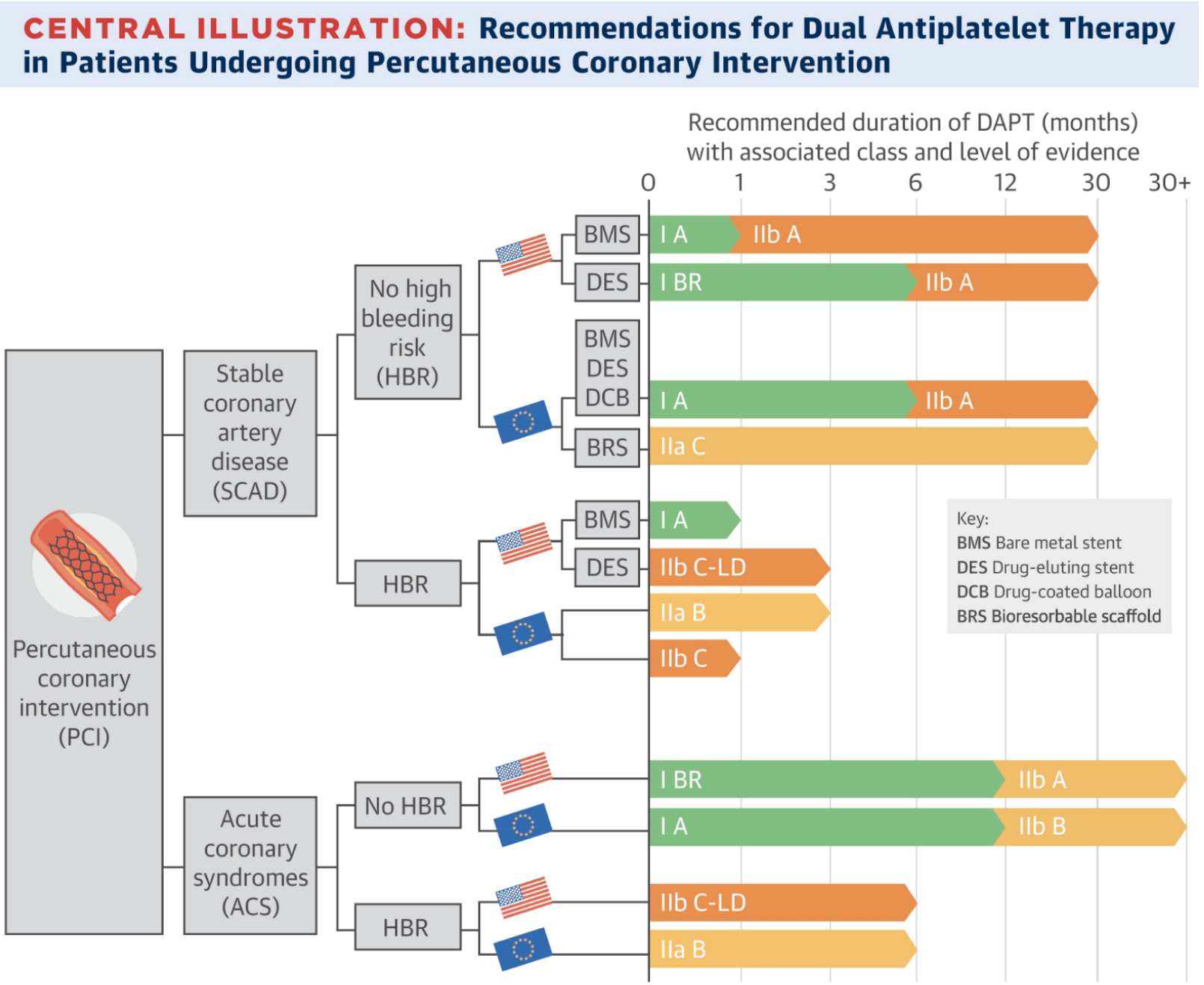
DAPT Guidelines Are Mainly Based on; (1) ACS vs. Stable, (2) HBR



Capodanno, D. et al. J Am Coll Cardiol. 2018;72(23PA):2915-31.

Complex High-Risk PCI: High Ischemic Risk

High-risk Patient

- Previous NSTEMI or STEMI
- Recurrent ischemic event on DAPT
- History of stent thrombosis
- Chronic inflammatory disease
- Diabetes
- Chronic renal dysfunction

High-risk PCI

- Complex PCI: Left main, CTO, complex bifurcation, multivessel PCI, severe calcification, diffuse long
- >3 Stents
- Total stent length >60 mm

Lancet 2017;390:810-20.

Complex High-Risk PCI

Prolonged (i.e. >6 months) DAPT duration[d] may be considered in patients who underwent complex PCI.[247]	IIb	B

"Optimal *DAPT duration* of *complex high-risk PCI* is still unknown"

2017 ESC Guideline

IDEAL-LM

Improved Drug Eluting stent for All-comers Left Main: *IDEAL-LM*

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On Behalf of the IDEAL-LM investigators

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EuroIntervention 2022;17:1467-1476.

Rationale and Aims I

IDEAL-LM

- The use of PCI for LMCA disease is increasing worldwide
  - SYNTAX, EXCEL, NOBLE
  - European and US Guidelines
- The optimal duration of post-procedural DAPT after LM PCI remains undetermined
  - Ischemia vs bleeding

A novel DES design with a bioabsorbable polymer and thin struts may facilitate faster healing and allow a shorter duration of DAPT without compromising clinical outcomes

EuroIntervention 2022;17:1467-1476.

IDEAL-LM

Patients with LMCA disease who are accepted by the Heart Team for PCI

All-comers:
- Syntax > 32
- ACS
- All EF

29 sites, 5 Countries Dec 2014-Sept 2016

818 patients randomized to LM PCI with either BP-PtCr-EES or PP-CoCr-EES

Synergy + 4 months DAPT

Xience + 12 months DAPT

3 months OCT (n=50) and clinical follow-up (all patients)

3 months OCT (n=50) and clinical follow-up (all patients)

PCR 2017

Strut coverage (>20 µm): 97.7 vs 98.0%

Clinical follow-up: 6,12,24 months

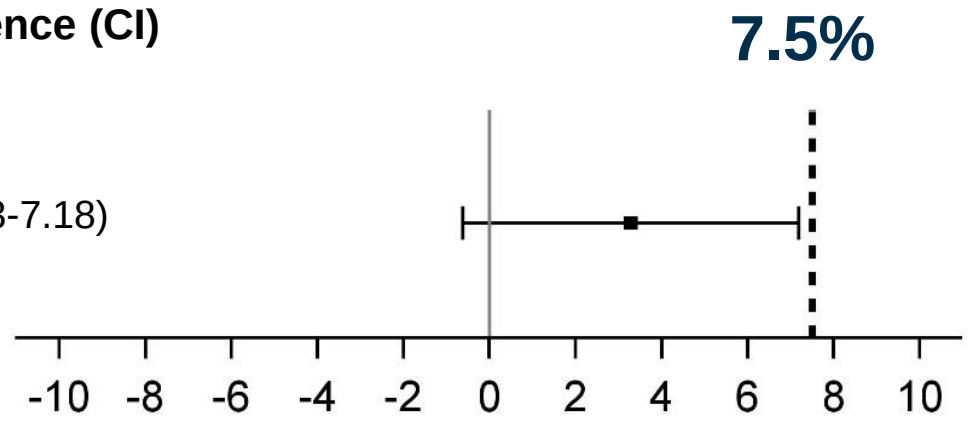
Primary Endpoint: 2 year MACE (death, MI, ischemic driven TVR)

EuroIntervention 2022;17:1467-1476.

Primary Outcome Measure

IDEAL-LM

Confidential Interval	Synergy + 4 months DAPT	Xience + 12 months DAPT	Risk Difference (CI)
	Events/N (%)	Events/N (%)	
90% CI	**59/403 (14.6)**	**45/396 (11.4)**	3.28 (-0.63-7.18)



Area left of reference line representative of Non Inferiority

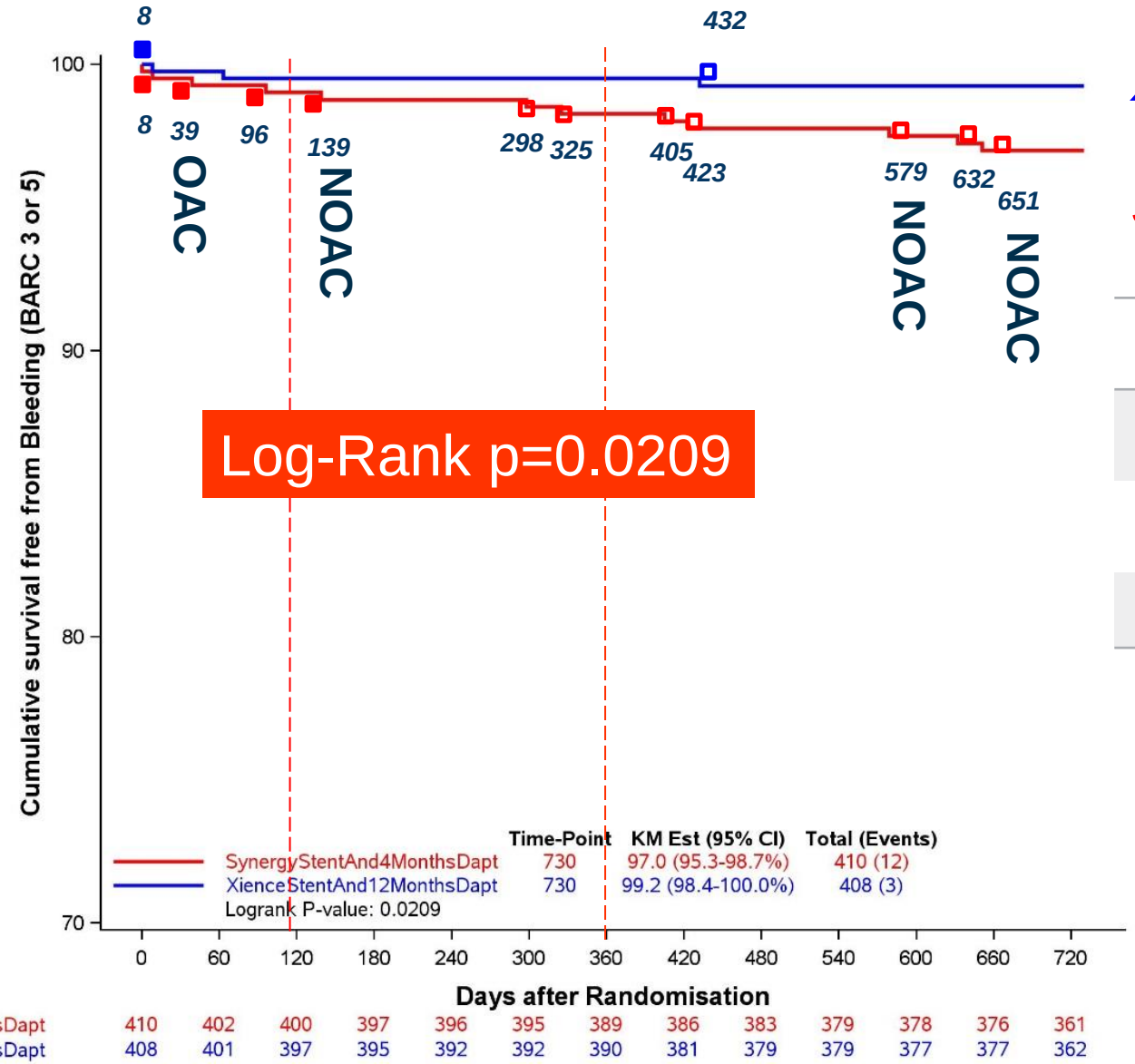
Non-inferiority confirmed

Primary Endpoint: 2 year MACE (death, MI, ischemic driven TVR)

EuroIntervention 2022;17:1467-1476.

BARC 3 or 5 bleeding

IDEAL-LM



Xience plus 12 months DAPT

Synergy plus 4 months DAPT

	Synergy	Xience
On DAPT	4	1
Off DAPT	7	1
Total	11	2

- **Synergy on**
- **Synergy off**
- **Xience on**
- **Xience off**

Conclusions

IDEAL-LM

- After 2 years, in patients undergoing LM-PCI, a Bioabsorbable Polymer Everolimus-Eluting Platinum Chromium stent (*Synergy*) followed by 4 months DAPT was **non-inferior** to a Permanent Polymer Everolimus-Eluting Cobalt Chromium stent (*Xience*) followed by 12 months DAPT with respect to the composite end point of death from any cause or MI or ischemia-driven target vessel revascularization.
- No difference in ischemic events up to 24 months
  - No difference in definite/probable stent thrombosis
  - No stent thrombosis in either group from 4 to 12 months (Synergy off DAPT)
- Excess BARC 3 or 5 bleeding in short DAPT group but…
  - 4/11 were on OAC/NOAC (2 on triple Rx) and 7/11 were off DAPT
  - Trial not powered for bleeding events

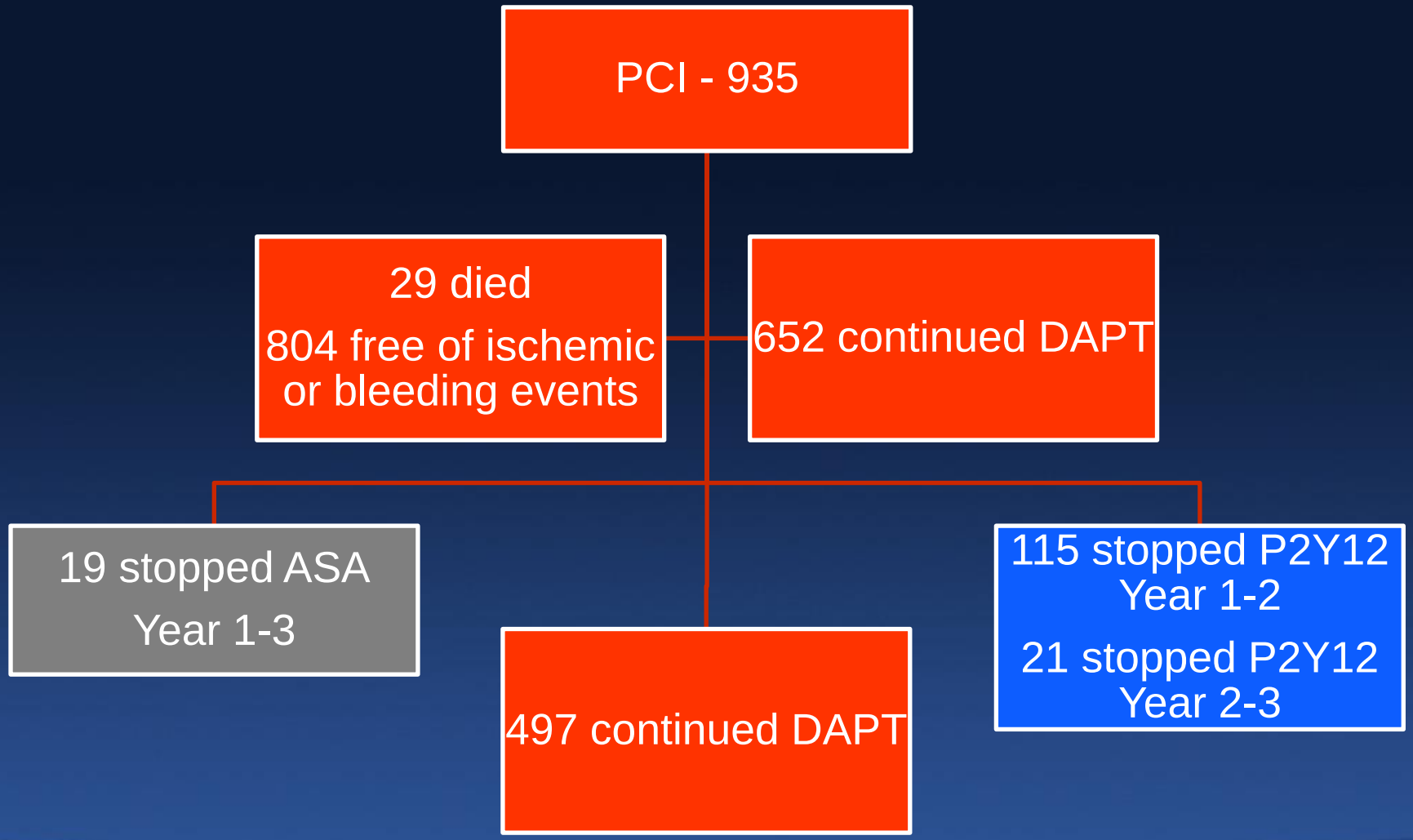
EuroIntervention 2022;17:1467-1476.

Optimal Duration of Dual Antiplatelet Therapy After Left Main Stenting: The EXCEL Trial

SJ Brener; PW Serruys; MC Morice; R Mehran; AP Kappetein; JF Sabik III; Y Liu; O Dressler, O Ben-Yehuda and GW Stone

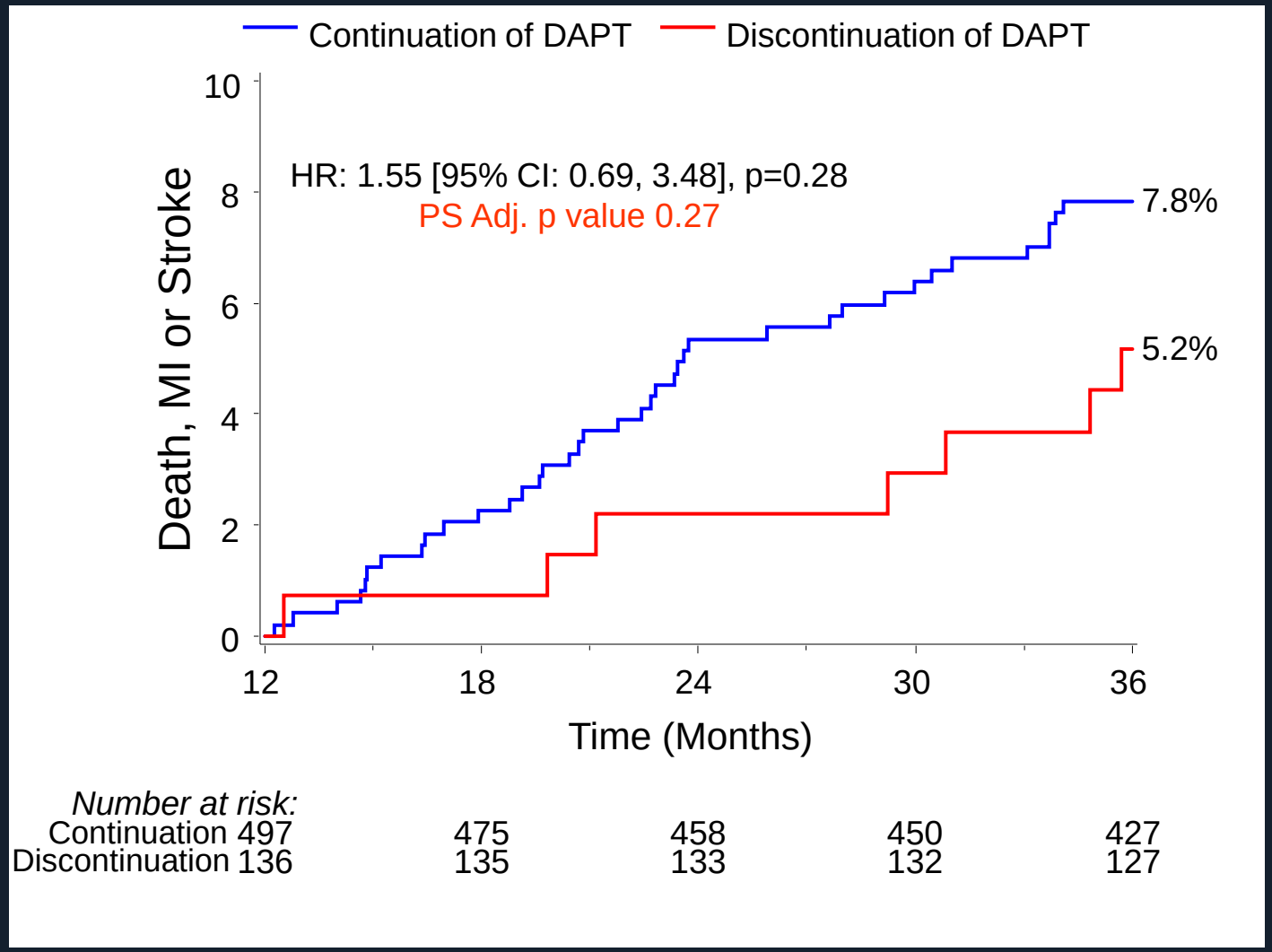
J Am Coll Cardiol . 2018;72:2086-2087

Adherence to DAPT



J Am Coll Cardiol . 2018;72:2086-2087

Primary endpoint between 1-3 years



Primary endpoint: a composite of death, MI, or stroke

Conclusions

- In the EXCEL trial, continuation of DAPT beyond 1 year was not associated with improved event-free survival after PCI with everolimus-eluting stents in patients with LMCA disease.
  - ACS patients also did not derive benefit from prolonged DAPT
- MI and ST were not reduced by prolonged DAPT
- Significant bleeding was not increased by prolonged DAPT

J Am Coll Cardiol . 2018;72:2086-2087

Fu Wai Left Main PCI Registry in China

Circulation: Cardiovascular Interventions

ORIGINAL ARTICLE

New Insights Into Long- Versus Short-Term Dual Antiplatelet Therapy Duration in Patients After Stenting for Left Main Coronary Artery Disease: Findings From a Prospective Observational Study

Hao-Yu Wang, MD; Ke-Fei Dou, MD; Changdong Guan, MSc; Lihua Xie, MSc; Yunfei Huang, PhD; Rui Zhang, MD; Weixian Yang, MD; Yongjian Wu, MD; Yuejin Yang, MD; Shubin Qiao, MD; Runlin Gao, MD; Bo Xu, MBBS

BACKGROUND: The appropriate duration of dual antiplatelet therapy (DAPT) and risk-benefit ratio for long-term DAPT in patients with left main (LM) disease undergoing percutaneous coronary intervention remains uncertain.

METHODS: Four thousand five hundred sixty-one consecutive patients with stenting of LM disease at a single center from January 2004 to December 2016 were enrolled. Decision to discontinue or remain on DAPT after 12 months was left to an individualized decision-making based on treating physicians by weighing the patient's risks of ischemia versus bleeding and considering patient preference. The primary outcome was a composite of death, myocardial infarction, stent thrombosis, or stroke at 3 years. Key safety outcome was 3-year rate of Bleeding Academic Research Consortium 2, 3, or 5 bleeding.

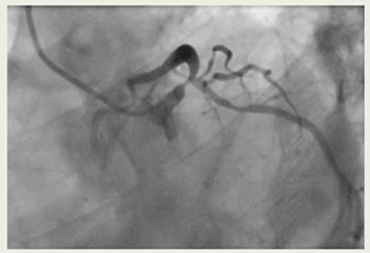
Circ Cardiovasc Interv. 2022;15:e011536

Circulation: Cardiovascular Interventions

New Insights into Long- versus Short-Term Dual Antiplatelet Therapy Duration in Patients After Stenting for Left Main Coronary Artery Disease: Findings From a Prospective Observational Study

Study Population

3865 patients undergoing LMCA PCI



Data from all consecutive patients undergoing unprotected left main coronary artery (LMCA) PCI between January 2004 and December 2016 were prospectively collected

Mean (SD) age, 60.0 (10.3) y
Sex: 3052 Men, 813 Women
Diabetes: 28.2%
ACS: 56.6%
LVEF (%): 63.1 ± 7.3
Mean SYNTAX score: 22.5 ± 7.2
LM distal bifurcation disease: 80.5%
Left main plus 2 or 3 vessels: 48.8%
IVUS use: 42.4%
Second-generation DES: 67.0%

Settings/Locations

Fu Wai Hospital, National Center for Cardiovascular Diseases, CAMS&PUMC, Beijing, China

Treatment

Decision to discontinue or remain on DAPT after 12 months was left to an individualized decision-making based on patient's treating physician by weighing the risks of ischemia versus bleeding for each patient and consideration of patients' values and preferences.

Consider clinical characteristics, laboratory variables, and procedural characteristics

DAPT>12-month
N=1,727

DAPT≤12-month
N=2,138

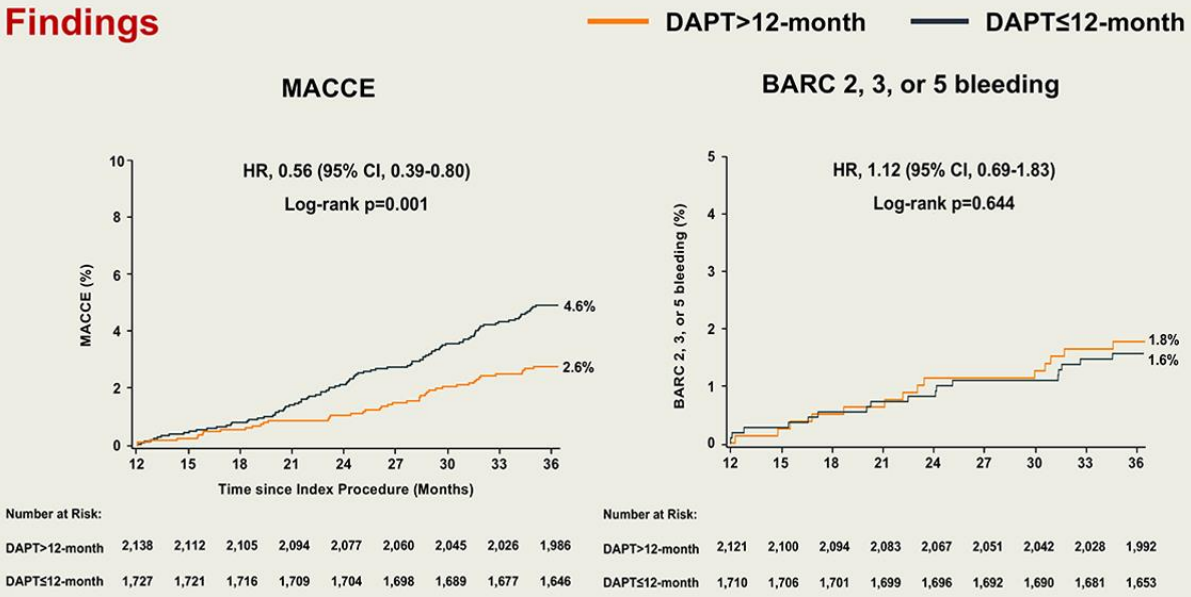
At 12-month visit:

- DAPT>12-month group: Aspirin 100%; Clopidogrel 97.7%; Ticagrelor 2.3%
- DAPT≤12-month group: Aspirin 93.9%; Clopidogrel 31.0%; Ticagrelor 2.7%

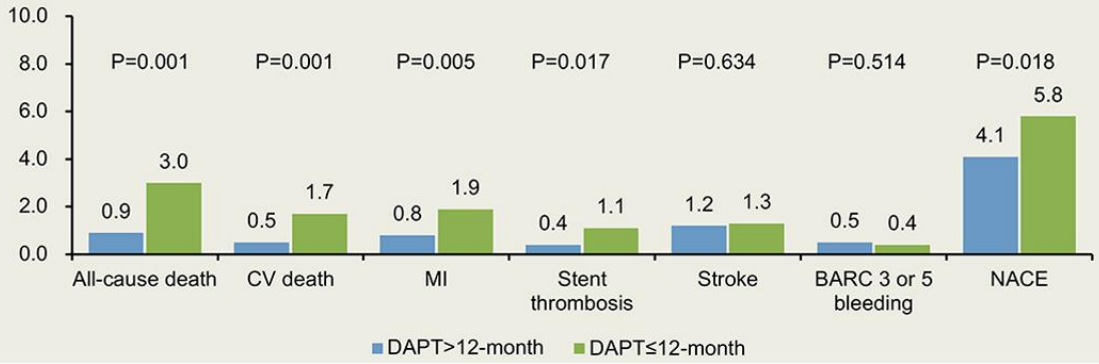
Primary endpoint

- **Primary endpoint**: 3-year major adverse cardiac and cerebrovascular events (MACCE; death, myocardial infarction, stent thrombosis, or stroke)
- **Key safety outcome**: BARC 2, 3, or 5 bleeding at 3 years.

Findings



In a large cohort of consecutive patients who had no major adverse events during the first year after an index LMCA PCI and were at low apparent future bleeding risk, an individualized patient-tailored approach to longer duration (>12 months) of DAPT with aspirin plus a $P2Y_{12}$ inhibitor (mostly clopidogrel) was associated with a lower risk for MACCE compared with ≤12-month DAPT, without a concomitant increase in clinically relevant bleeding



Circ Cardiovasc Interv. 2022;15:e011536

Rev Esp Cardiol. 2023;76(4):245–252

Original article

Dual antiplatelet therapy after percutaneous coronary intervention for left main coronary artery disease

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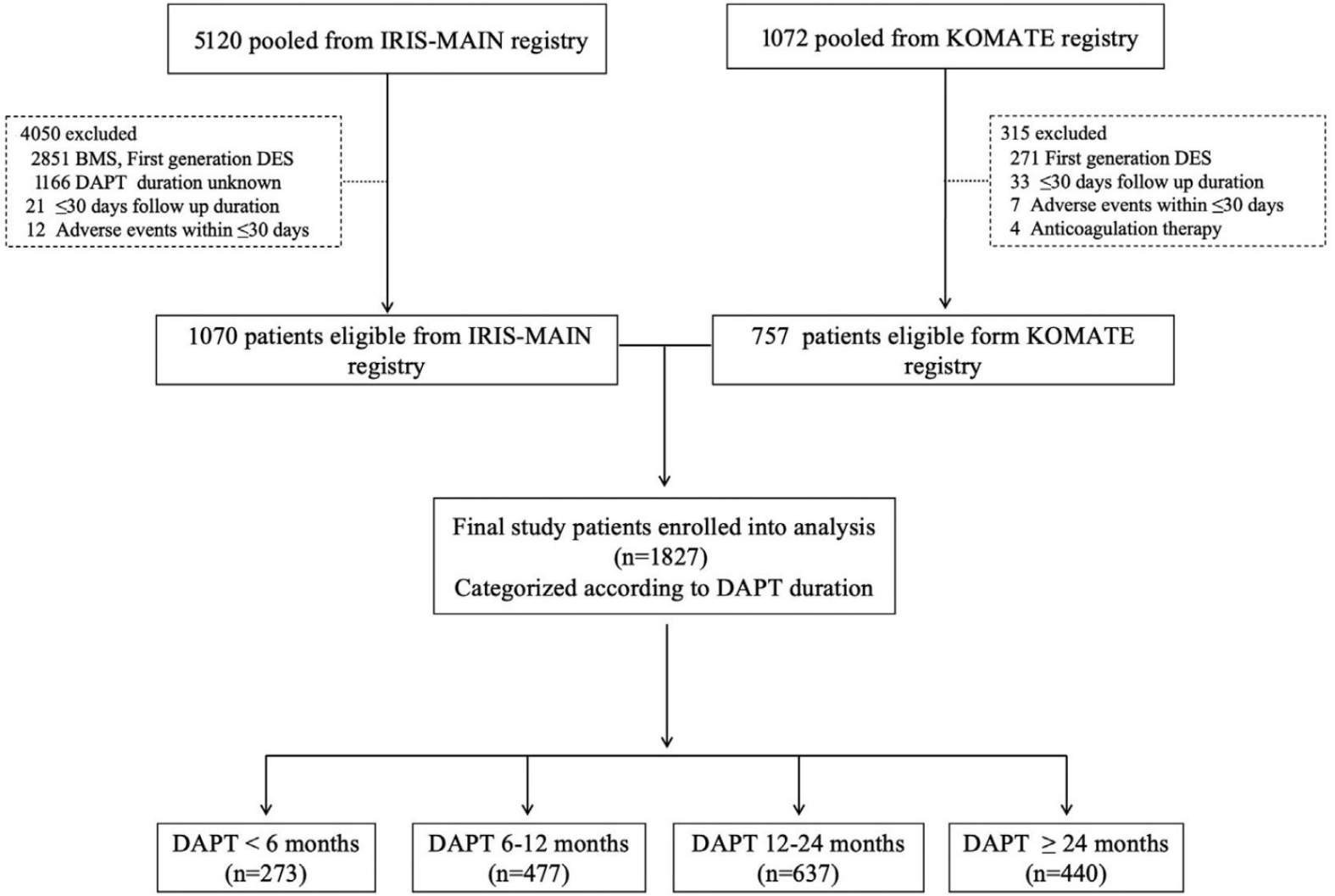
ABSTRACT

Introduction and objectives: There are scarce data on the optimal duration and prognostic impact of dual antiplatelet therapy (DAPT) after percutaneous coronary intervention (PCI) with second-generation drug-eluting stents for left main coronary artery (LMCA) disease. The aim of this study was to investigate the practice pattern and long-term prognostic effect of DAPT duration in patients undergoing PCI with second-generation drug-eluting stents for LMCA disease.

Methods: Using individual patient-level data from the IRIS-MAIN and KOMATE registries, 1827 patients undergoing PCI with second-generation drug-eluting stents for LMCA disease with valid information on DAPT duration were included. The efficacy outcome was major adverse cardiovascular events (MACE, a composite of cardiac death, myocardial infarction, and stent thrombosis) and the safety outcome was TIMI major bleeding.

Results: DAPT duration was $<$ 6 months (n = 273), 6 to 12 months (n = 477), 12 to 24 months (n = 637), and $\geq$ 24 months (n = 440). The median follow-up duration was 3.9 [interquartile range, 3.01-5.00] years. Prolonged DAPT duration was associated with lower incidences of MACE. In multigroup propensity score analysis, adjusted HR for MACE were significantly higher for DAPT $<$ 6 months and DAPT 6 to 12 months than for DAPT 12 to 24 months (HR, 4.51; 95%CI, 2.96-6.88 and HR 1.92; 95%CI, 1.23-3.00). There was no difference in HR for major bleeding among the assessed groups.

Conclusions: DAPT duration following PCI for LMCA disease is highly variable. Although the duration of DAPT should be considered in the context of the clinical situation of each patient, $<$ 12 months of DAPT was associated with higher incidence of MACE. Registration identifiers: NCT01341327; NCT03908463.



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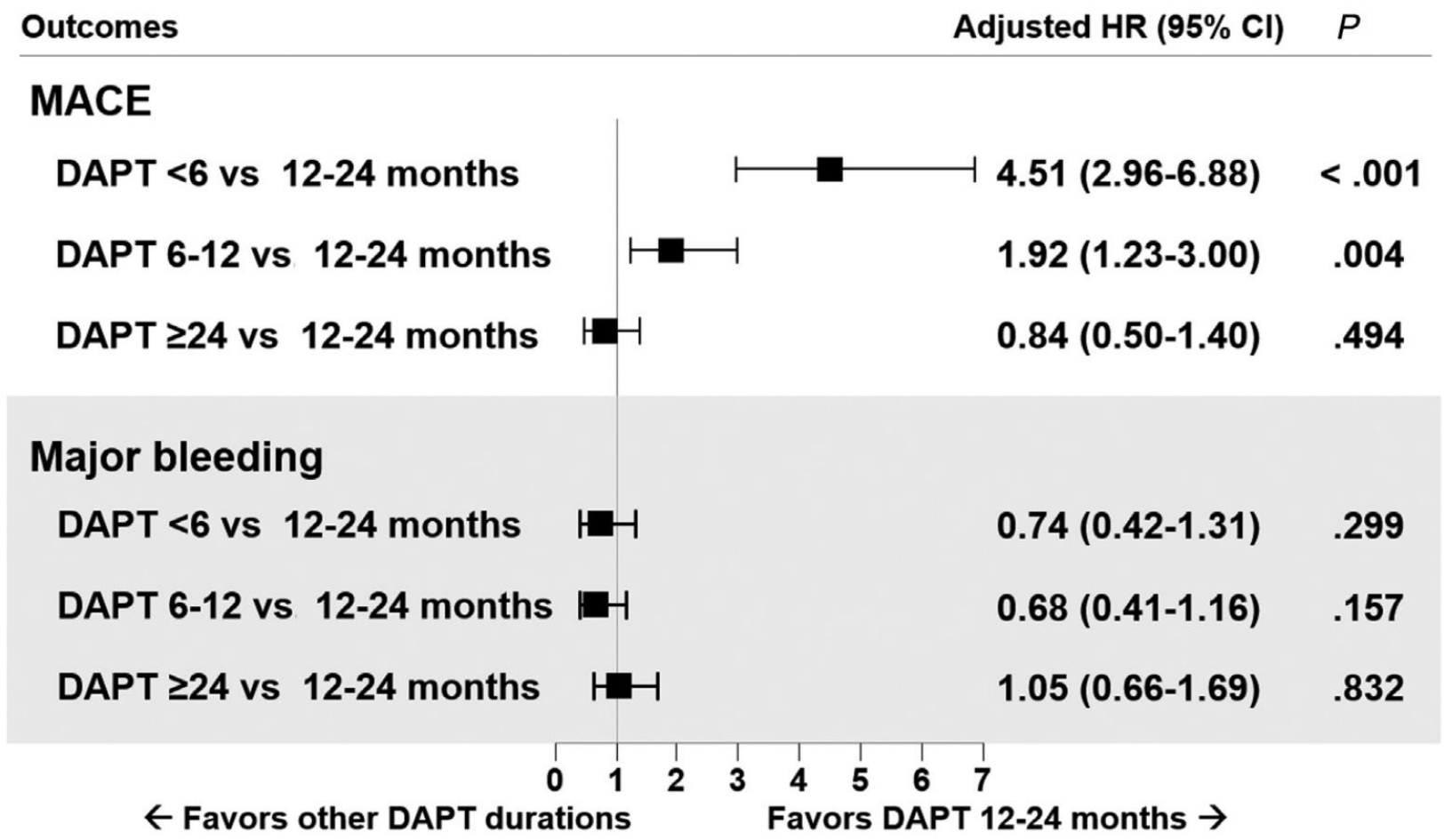
Multi-Group PS Analysis

Comparisons between outcomes of different DAPT durations (after PS weighting)



Rev Esp Cardiol. 2023;76(4):245–252

Key Messages

- Presently, DAPT is recommended for 6 months after PCI in stable CAD and for 12 months after PCI in ACS, with allowances to shorten or prolong DAPT duration depending on the relative risks of ischemia vs bleeding.
- Optimal duration of DAPT and antithrombotic strategy for complex LM or bifurcation PCI still controversial.
- Current trend has proposed that shorter DAPT would be OK with smarter DES and improved complex PCI techniques.