STEMI vs. NSTEMI vs. STABLE CAD – Post PCI Optimal DAPT Duration:

Scoring the Complexity of Stenting and Disease

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DAPT Guidelines

Stable CAD

Antiplatelet therapy after stenting			
DAPT is indicated for at least 1 month after BMS implantation.	I	A	791,799–801
DAPT is indicated for 6 months after DES implantation.	I	B	799,802,803
Shorter DAPT duration (<6 months) may be considered after DES implantation in patients at high bleeding risk.	IIb	A	804,805
Life-long single antiplatelet therapy, usually ASA, is recommended.	I	A	776,794
Instruction of patients about the importance of complying with antiplatelet therapy is recommended.	I	C	-
DAPT may be used for more than 6 months in patients at high ischaemic risk and low bleeding risk.	IIb	C	-

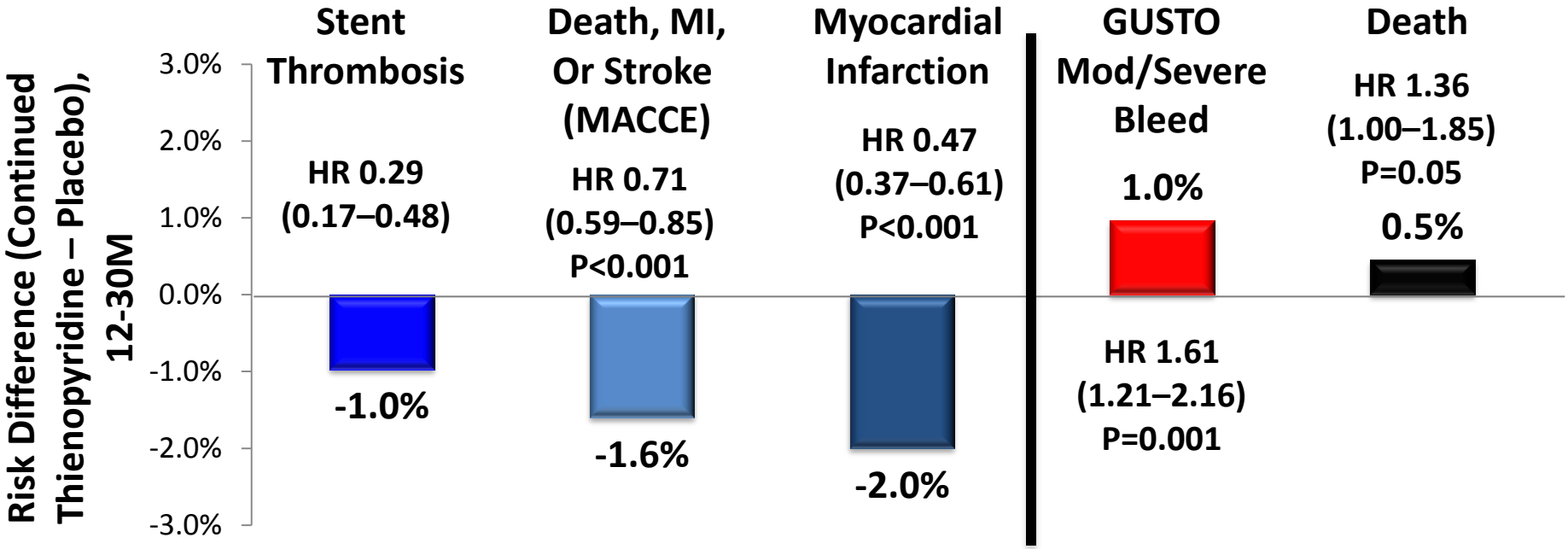
ACS

IIb A SR	In patients with ACS treated with coronary stent implantation who have tolerated DAPT without bleeding complication and who are not at high bleeding risk (e.g., prior bleeding on DAPT, coagulopathy, oral anticoagulant use) continuation of DAPT for longer than 12 months may be reasonable (16,22–26,28,30,40,41,43,53,54,72).
IIb C-LD	In patients with ACS treated with DAPT after DES implantation who develop a high risk of bleeding (e.g., treatment with oral anticoagulant therapy), are at high risk of severe bleeding complication (e.g., major intracranial surgery), or develop significant overt bleeding, discontinuation of $P2Y_{12}$ therapy after 6 months may be reasonable (17–21,34,36,37).

2014 ESC/EACTS Guidelines on Myocardial Revascularization
2016 ACC/AHA Updated Guidelines on Dual Antiplatelet Therapy

The DAPT Study Results

- In the DAPT Study, continuation of dual antiplatelet therapy beyond 12 months reduced ischemic complications after coronary stenting compared with aspirin alone, yet increased moderate or severe bleeding.

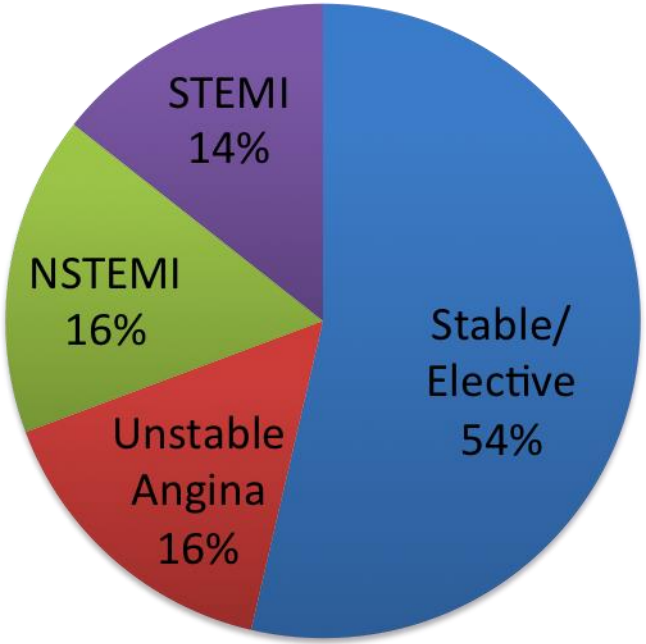


Mauri, Kereiakes, Yeh et al. NEJM. 2014 Dec 4:371:2155-66.

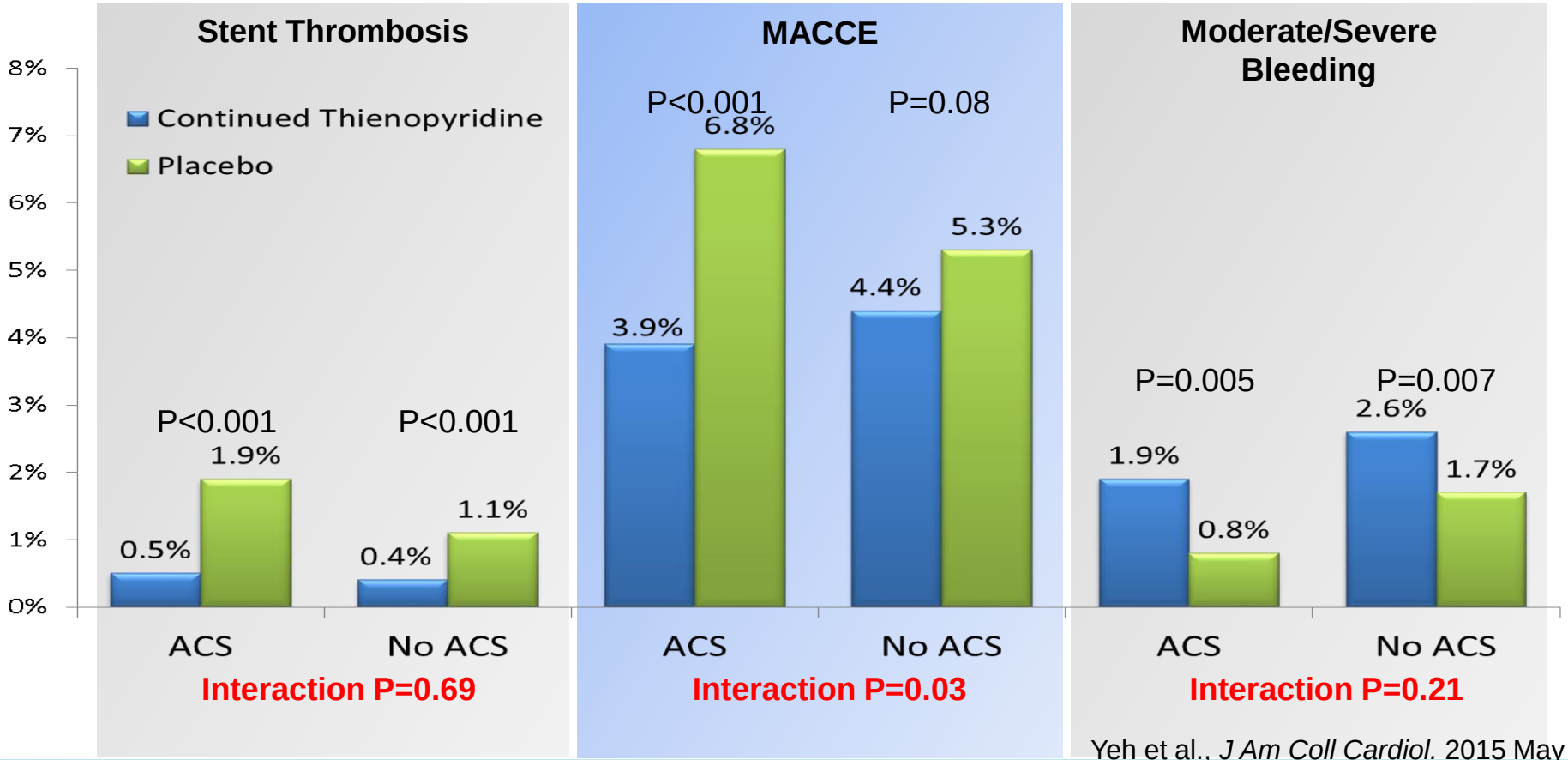
DAPT Study Randomized Population

30% of randomized DAPT Study patients presented initially with myocardial infarction.

46% with ACS.

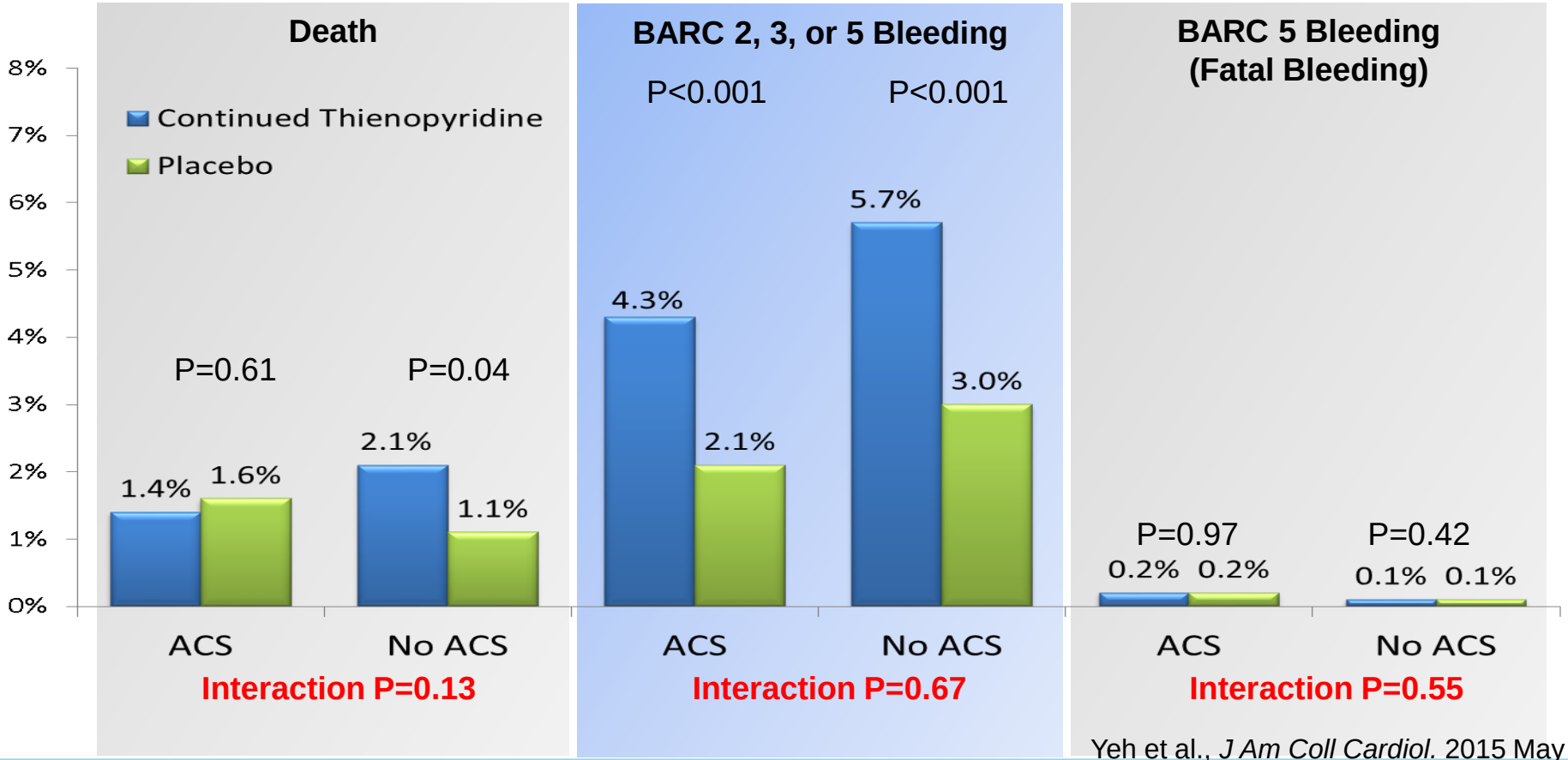


DAPT Study Results Among Patients with vs. without Myocardial infarction



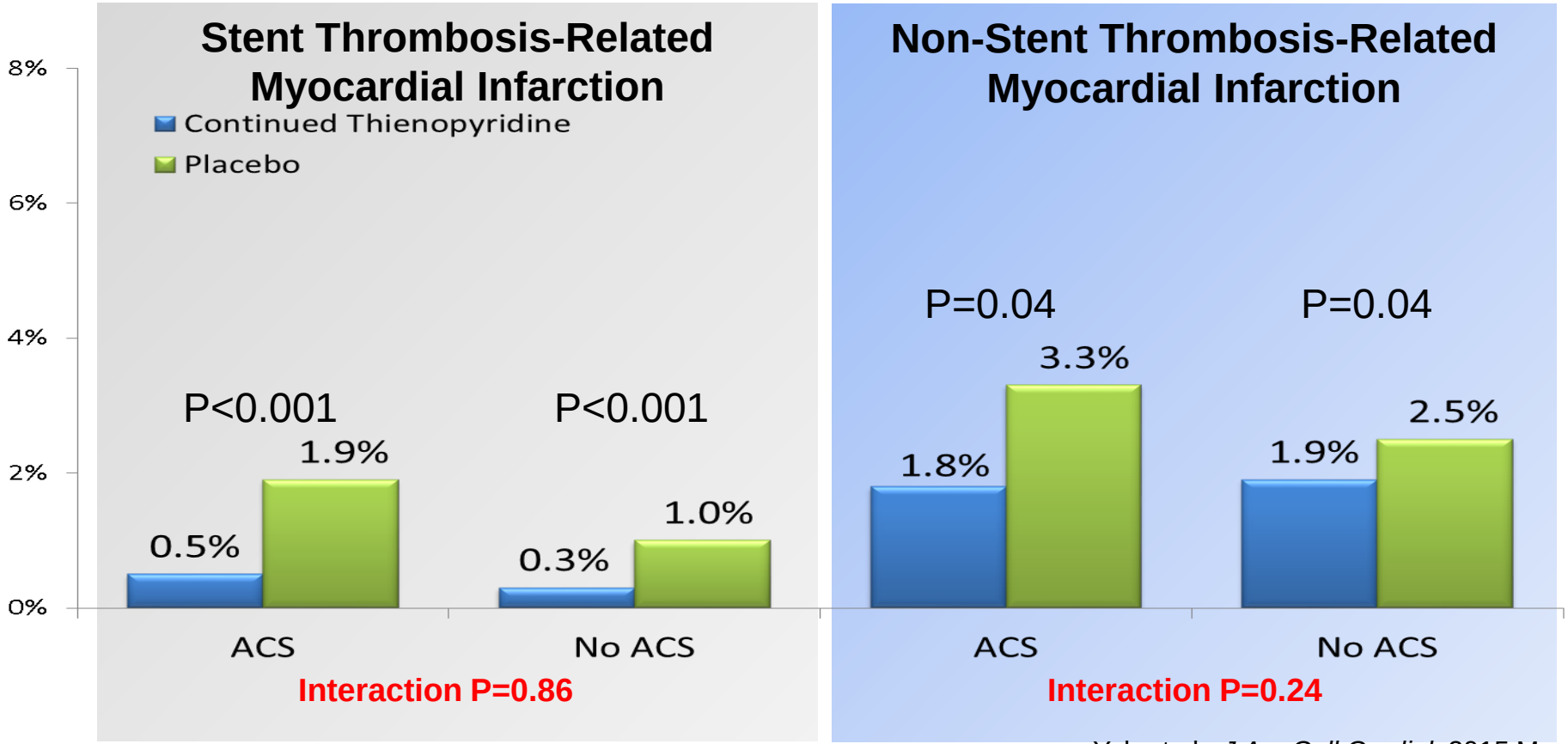
Yeh et al., *J Am Coll Cardiol.* 2015 May 26.

DAPT Study Results Among Patients with vs. without MI



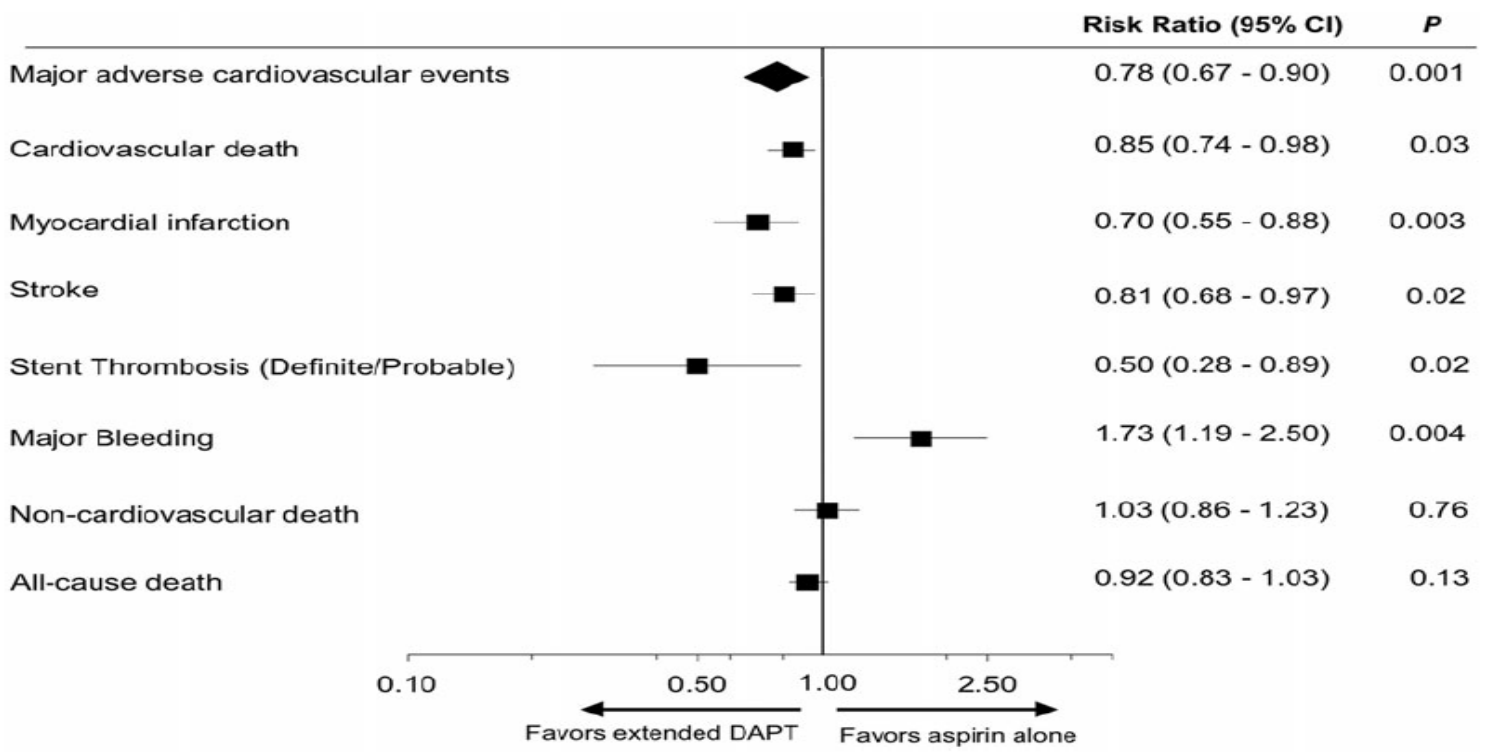
Yeh et al., *J Am Coll Cardiol.* 2015 May 26.

Treatment Effect According to MI Status
Myocardial Infarction Type, 12-30 M follow-up



Yeh et al., *J Am Coll Cardiol.* 2015 May 26.

Meta-analysis in Prior MI patients



Udell et al. European Heart Journal 2015.

NNT/NNH for MI Patients

- NNT to prevent an MI patients = 33
- NNH to cause a mod/sev bleed = 90.

- For non-MI patients, NNT = 72. NNH = 111.

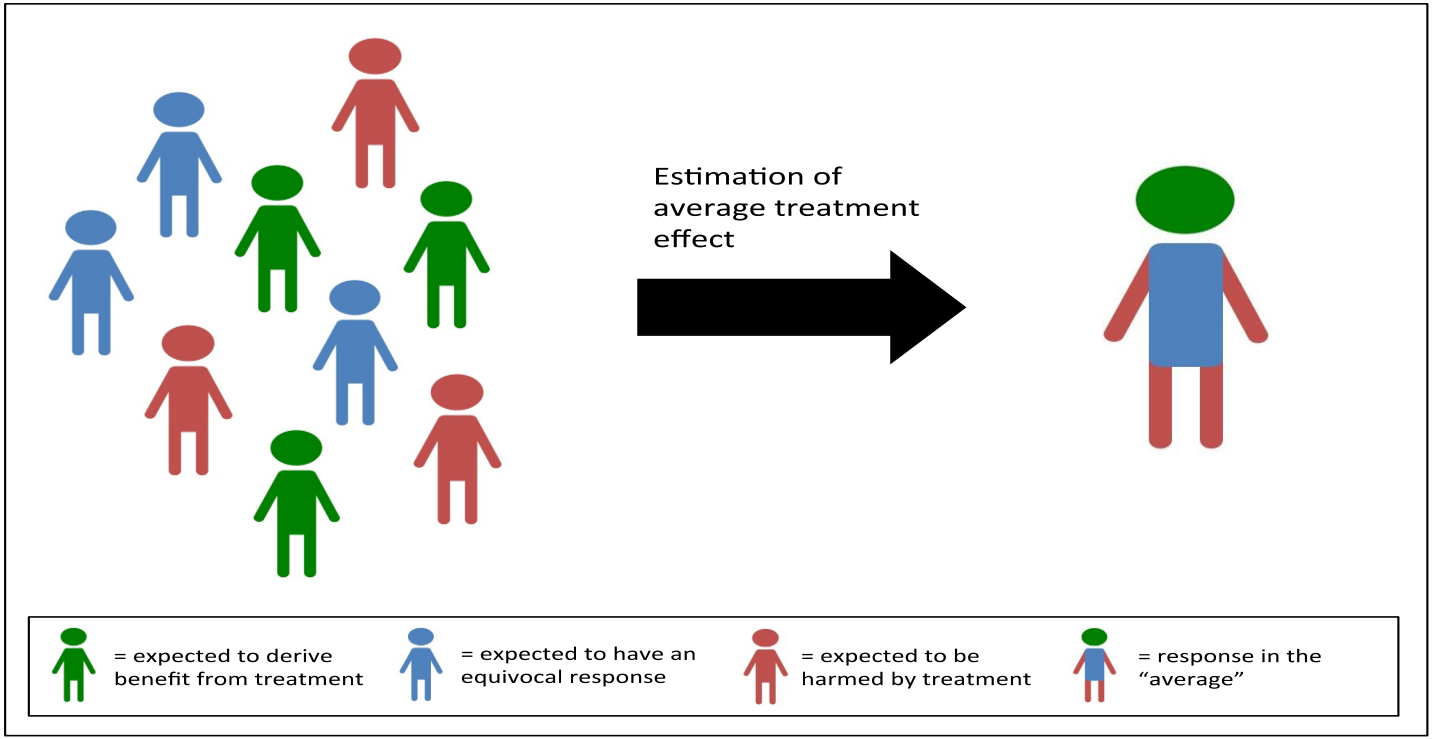
Conclusion: The benefits of long term DAPT outweigh the risks in ACS patients

One size does not fit all

"Long DAPT is Best" Vs. "Short DAPT is Best"

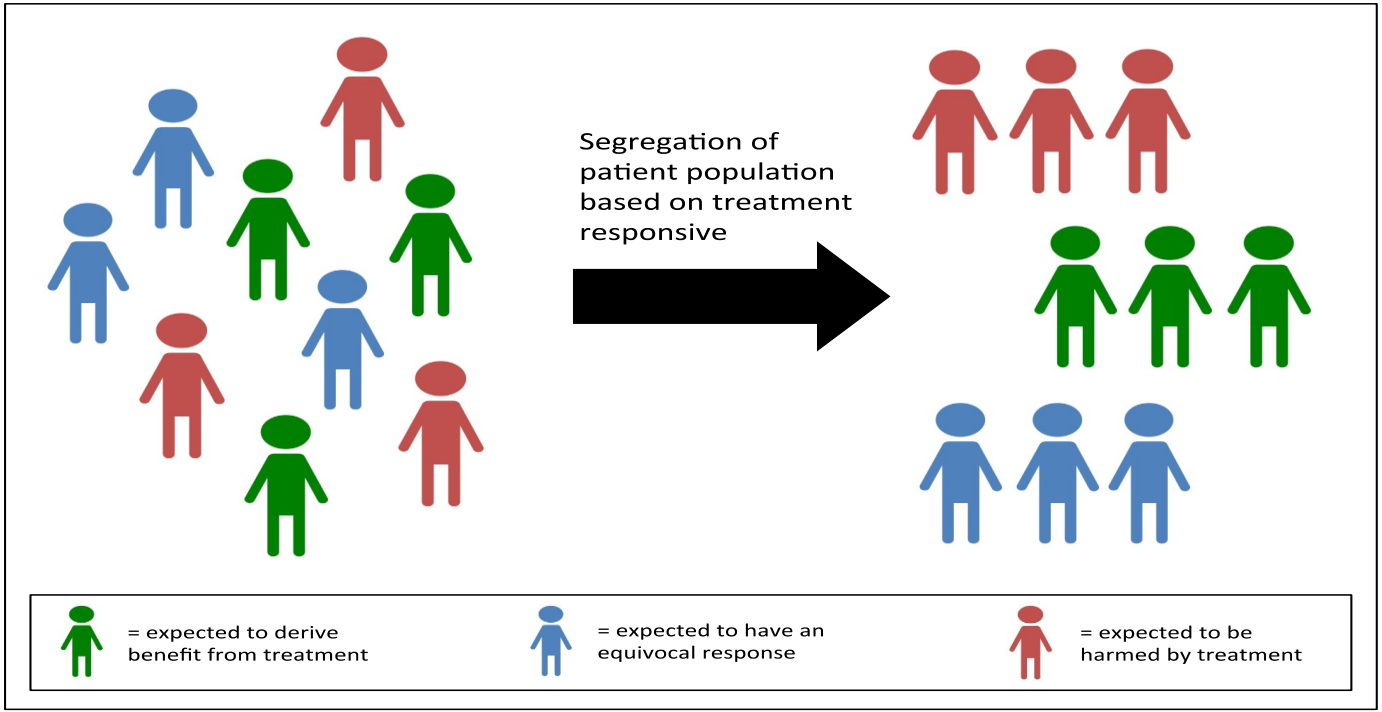
Sometimes long DAPT is better, sometimes shorter DAPT is better

Who is the Average Patient?



Yeh and Kramer, Circulation 2017. Adapted from J. Spertus, with permission

Identifying individual patients with the most to gain or lose from treatment



How Can We Distinguish Risk of Bleeding from Risk of Thrombotic Events?

TABLE 4 Clinical and Procedural Factors Associated With Increased Ischemic Risk (Including Stent Thrombosis) or Increased Bleeding Risk (62-70)

Increased Ischemic Risk/Risk of Stent Thrombosis (may favor longer-duration DAPT)	Increased Bleeding Risk (may favor shorter-duration DAPT)
Increased ischemic risk	History of prior bleeding
Advanced age	Oral anticoagulant therapy
ACS presentation	Female sex
Multiple prior MIs	Advanced age
Extensive CAD	Low body weight
Diabetes mellitus	CKD
CKD	Diabetes mellitus
Increased risk of stent thrombosis	Anemia
ACS presentation	Chronic steroid or NSAID therapy
Diabetes mellitus	
Left ventricular ejection fraction <40%	
First-generation drug-eluting stent	
Stent undersizing	

Is it possible to separate ischemic and bleeding risk in patients with non-ST segment elevation acute coronary syndromes?

Albert Ariza-Solé *, José C. Sánchez-Salado, Victoria Lorente, Guillermo Sánchez-Elvira, Guillem Muntané, Joel Salazar-Mendiguchía, Ángel Cequier.

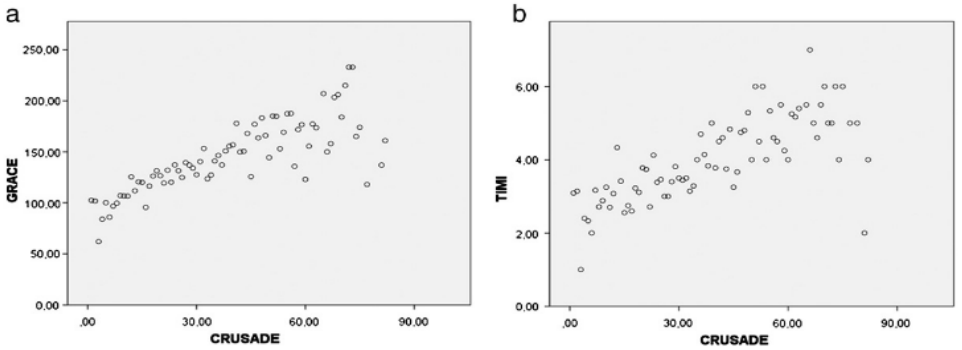


Fig. 1. Relationship between GRACE and CRUSADE scores (a) and TIMI and CRUSADE scores (b).

Levine et al. Focused Update on Duration of DAPT. JACC 2016.

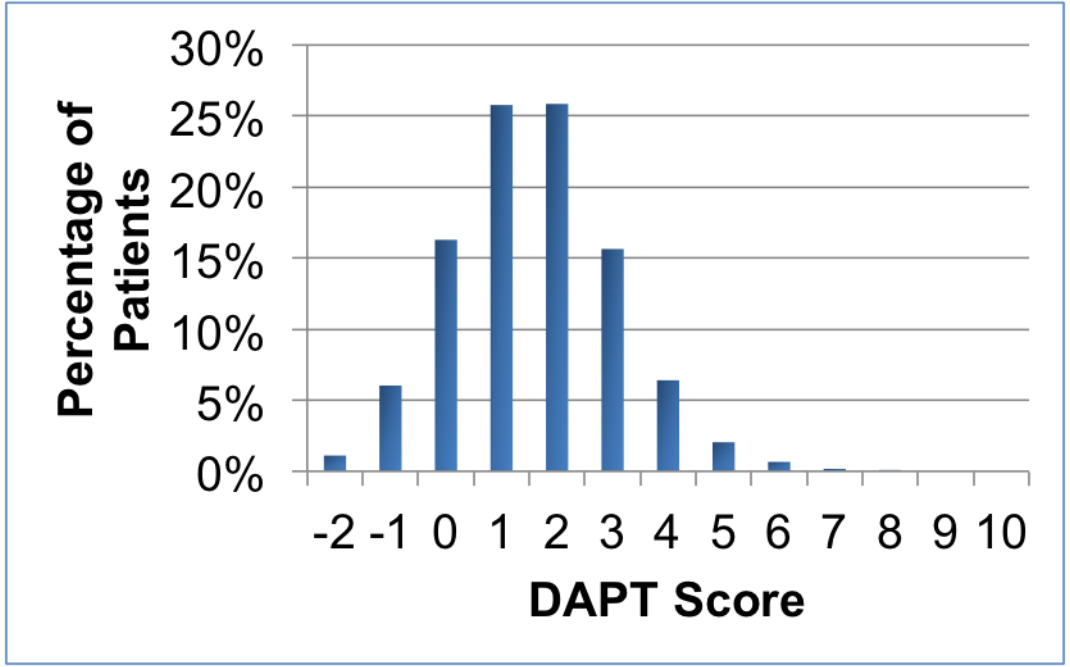
How to Balance Ischemia vs. Bleeding

- We need a decision tool to identify whether an individual patient is more likely to derive benefit or harm from continuation of dual antiplatelet therapy beyond 1 year.
  - *Simultaneously* accounting for risks of ischemia AND bleeding with continued therapy.

The DAPT Score

Variable	Points
Patient Characteristic	
Age	
≥ 75	-2
65 - <75	-1
< 65	0
Diabetes Mellitus	1
Current Cigarette Smoker	1
Prior PCI or Prior MI	1
CHF or LVEF < 30%	2
Index Procedure Characteristic	
MI at Presentation	1
Vein Graft PCI	2
Stent Diameter < 3mm	1

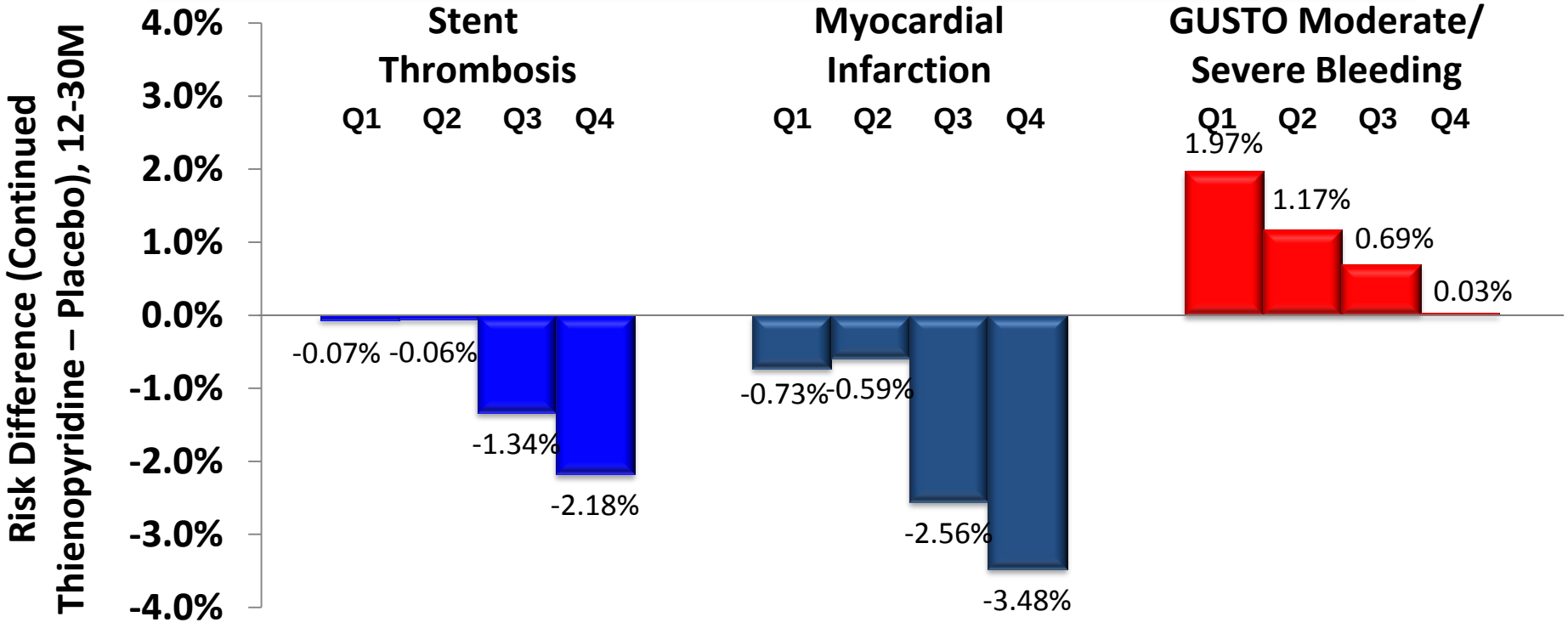
Distribution of DAPT Scores among all randomized subjects in the DAPT Study



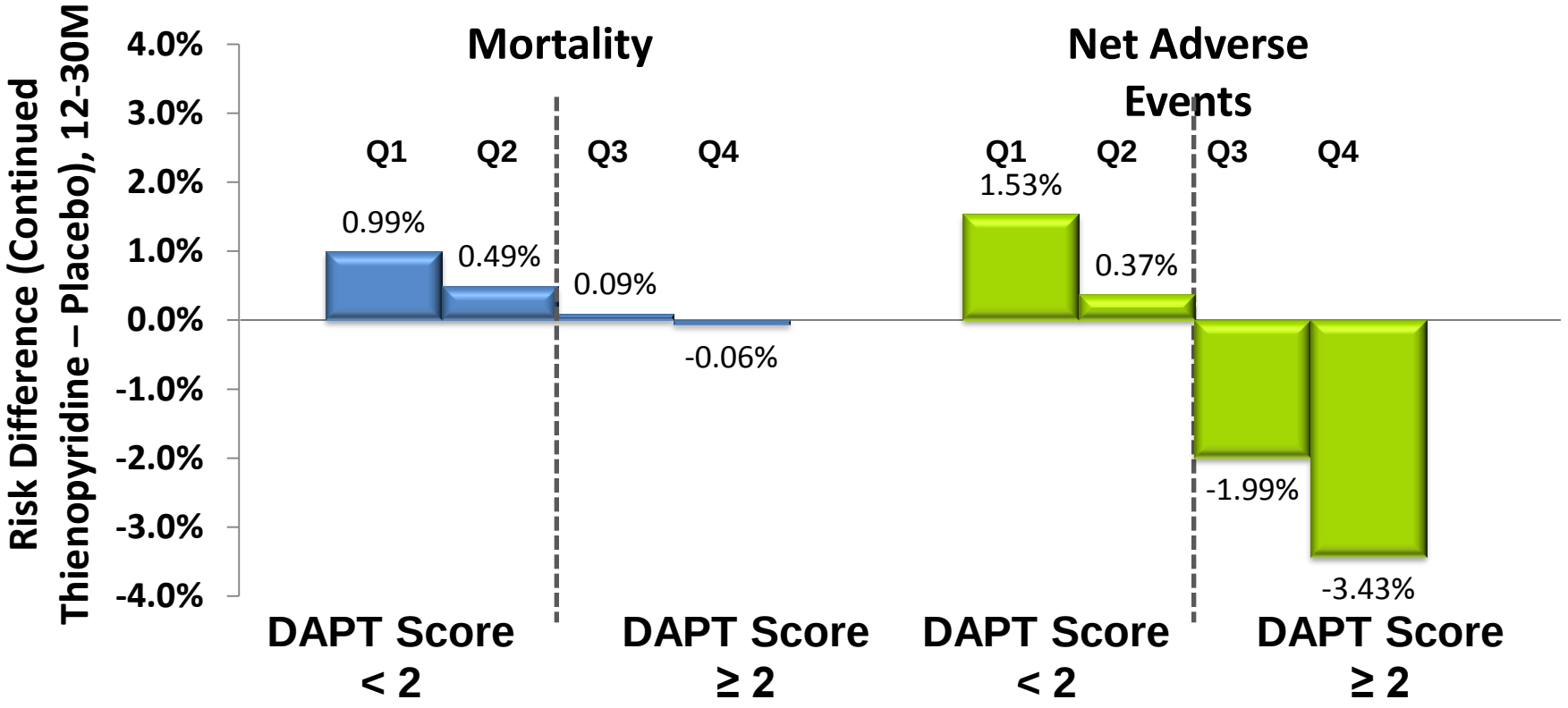
Continued Thienopyridine vs. Placebo
Treatment Effect by DAPT Score Quartile

DAPT STUDY

Q1 = DAPT Score -2 to 0
Q2 = DAPT Score 1
Q3 = DAPT Score 2
Q4 = DAPT Score > 2



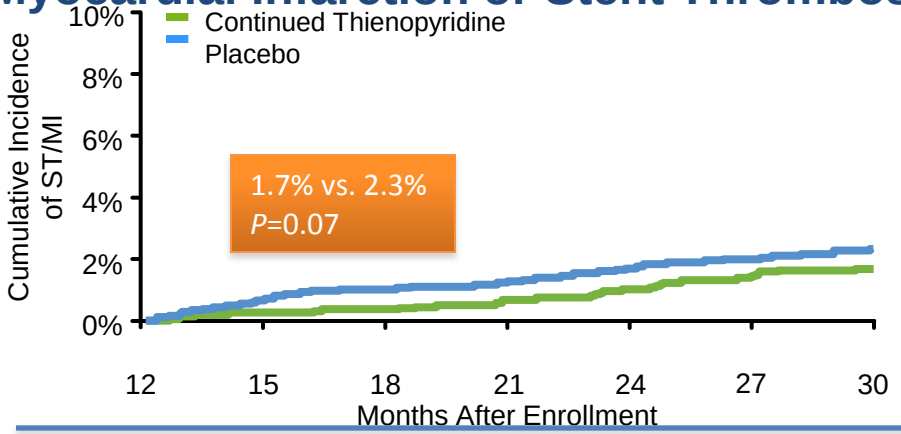
Continued Thienopyridine vs. Placebo Treatment Effect by DAPT Score Quartile



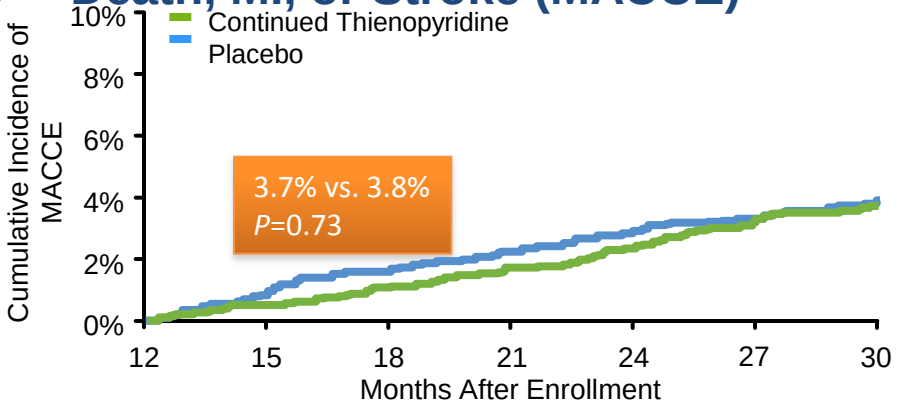
Continued Thienopyridine vs. Placebo
DAPT Score <2 (Low); N=5731

DAPT STUDY

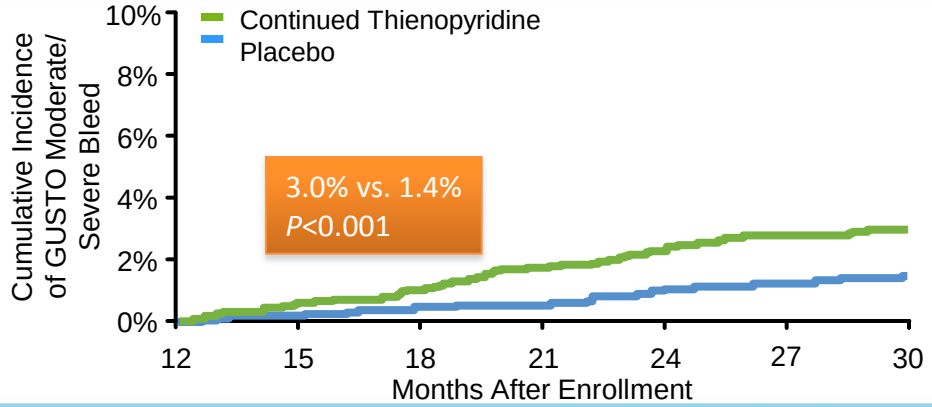
Myocardial Infarction or Stent Thrombosis



Death, MI, or Stroke (MACCE)



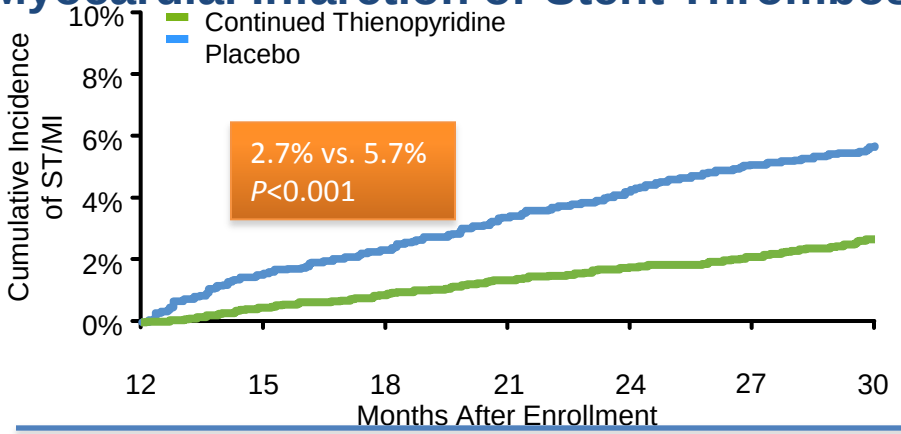
GUSTO Moderate/ Severe Bleeding



Continued Thienopyridine vs. Placebo
DAPT Score ≥ 2 (High); N=5917

DAPT STUDY

Myocardial Infarction or Stent Thrombosis



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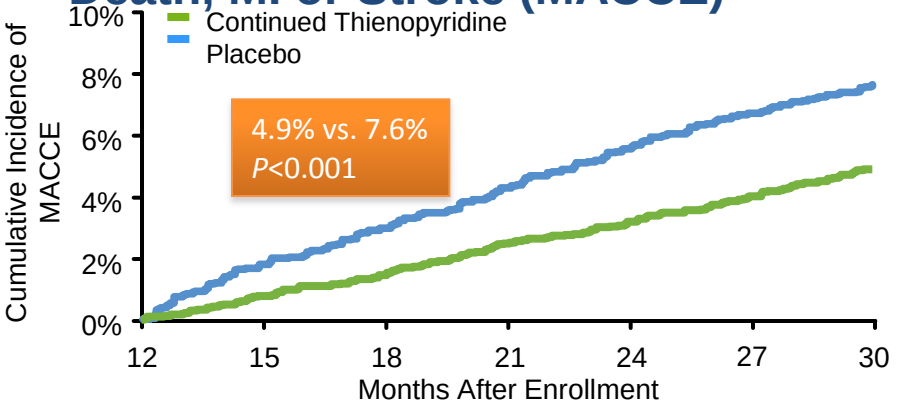
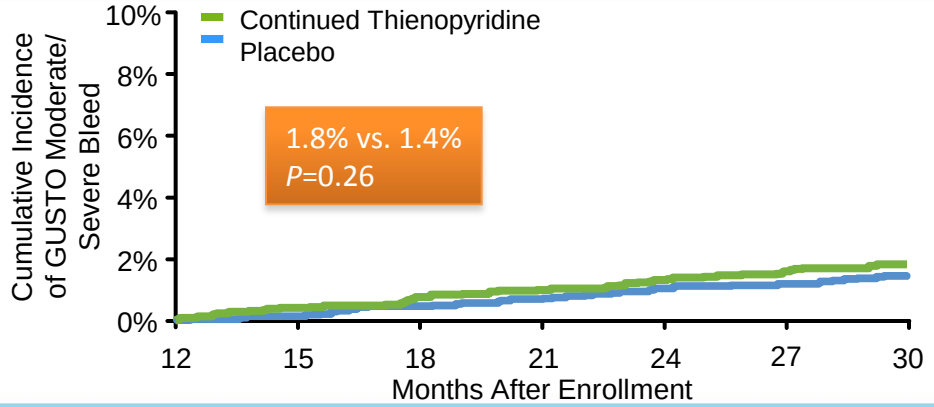
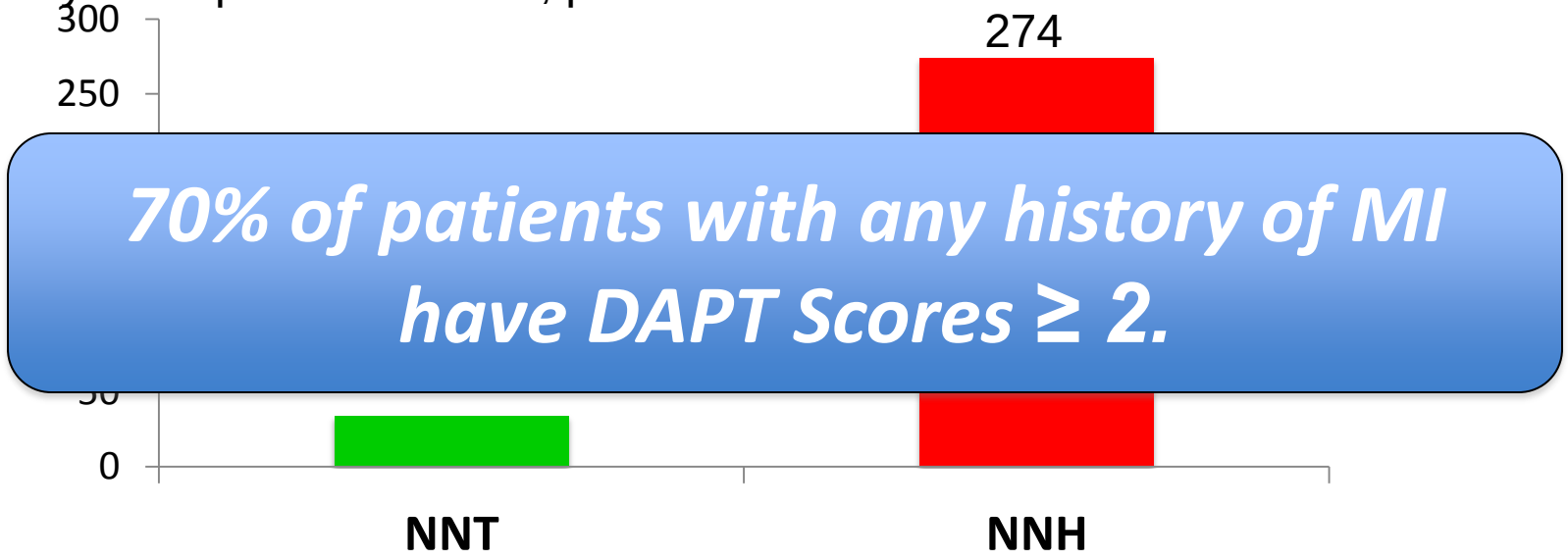


GUSTO Moderate/ Severe Bleeding



NNT/NNH for High DAPT Score Patients

For every 1000 patients treated, prevent 30 MIs and cause < 4 bleeds



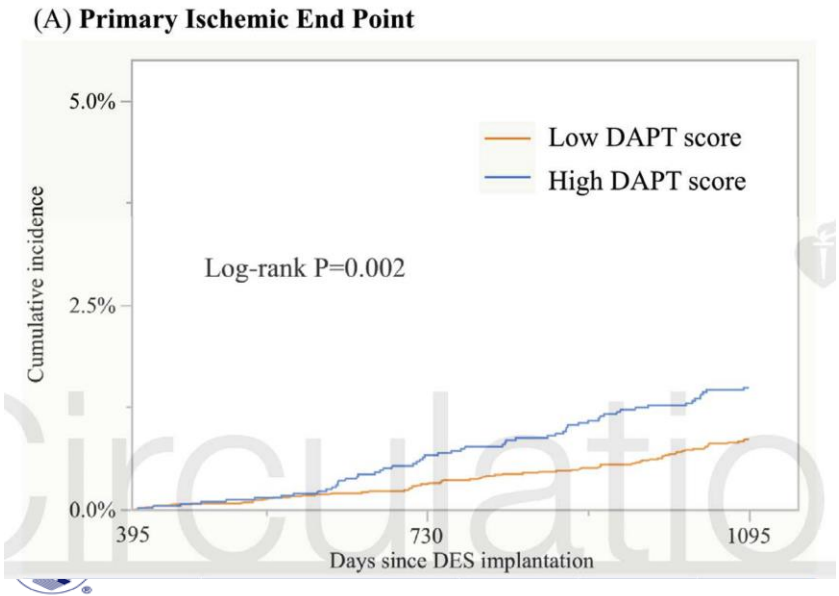
70% of patients with any history of MI have DAPT Scores ≥ 2.

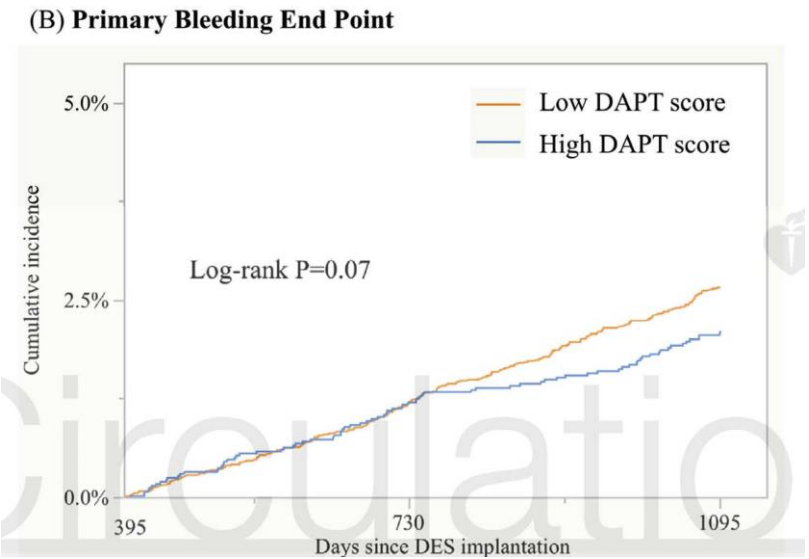
External Validation

ORIGINAL RESEARCH ARTICLE

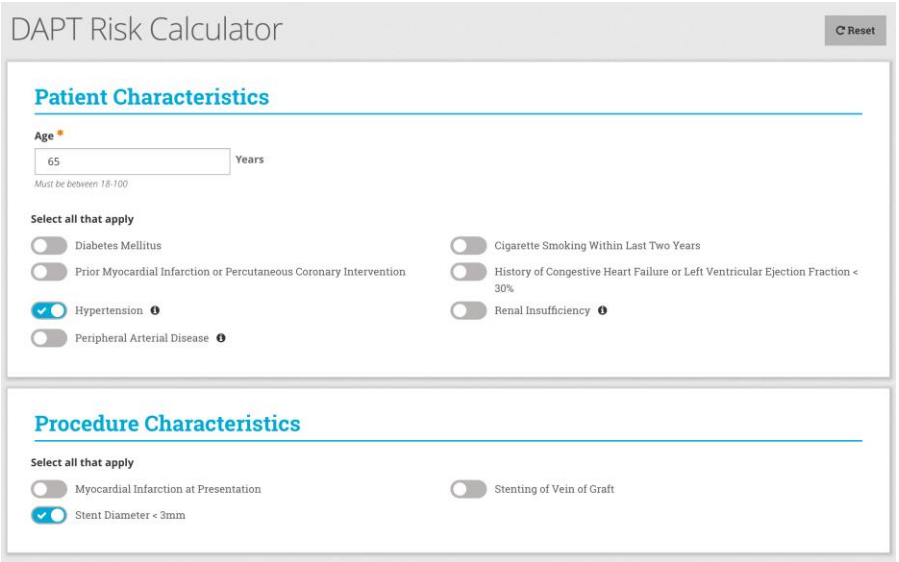
Validating Utility of DAPT Score in a Large Pooled Cohort from Three Japanese PCI Studies

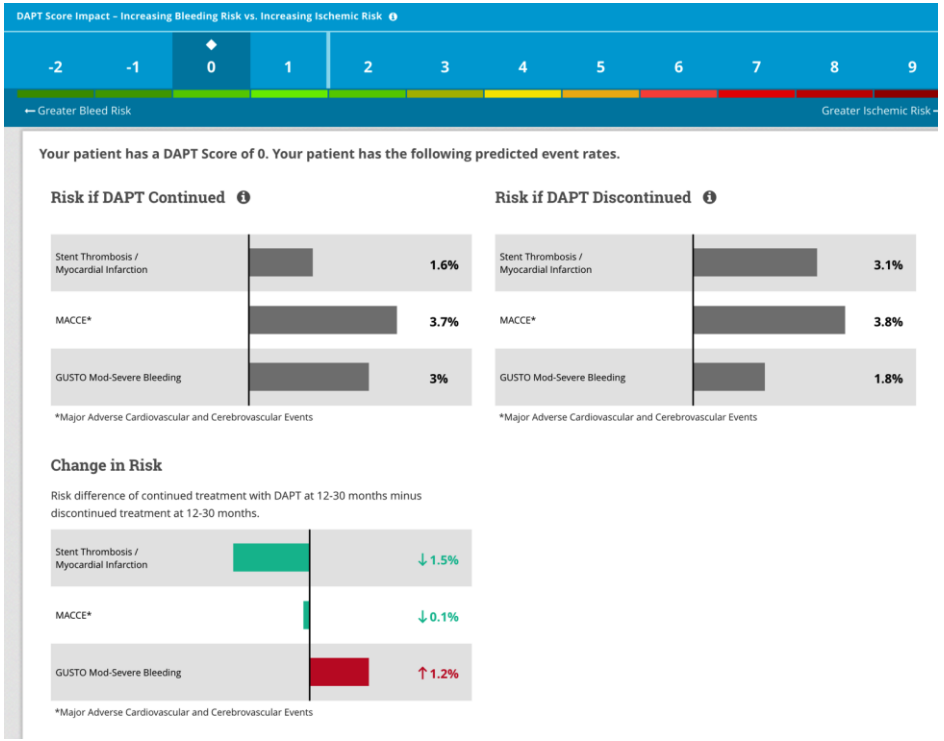
Yusuke Yoshikawa, Hiroki Shiomi, Hirotoshi Watanabe, Masahiro Natsuaki, Hirokazu Kondo, Toshihiro Tamura, Yoshihisa Nakagawa, Takeshi Morimoto, Takeshi Kimura





ACC Phone-Based Application



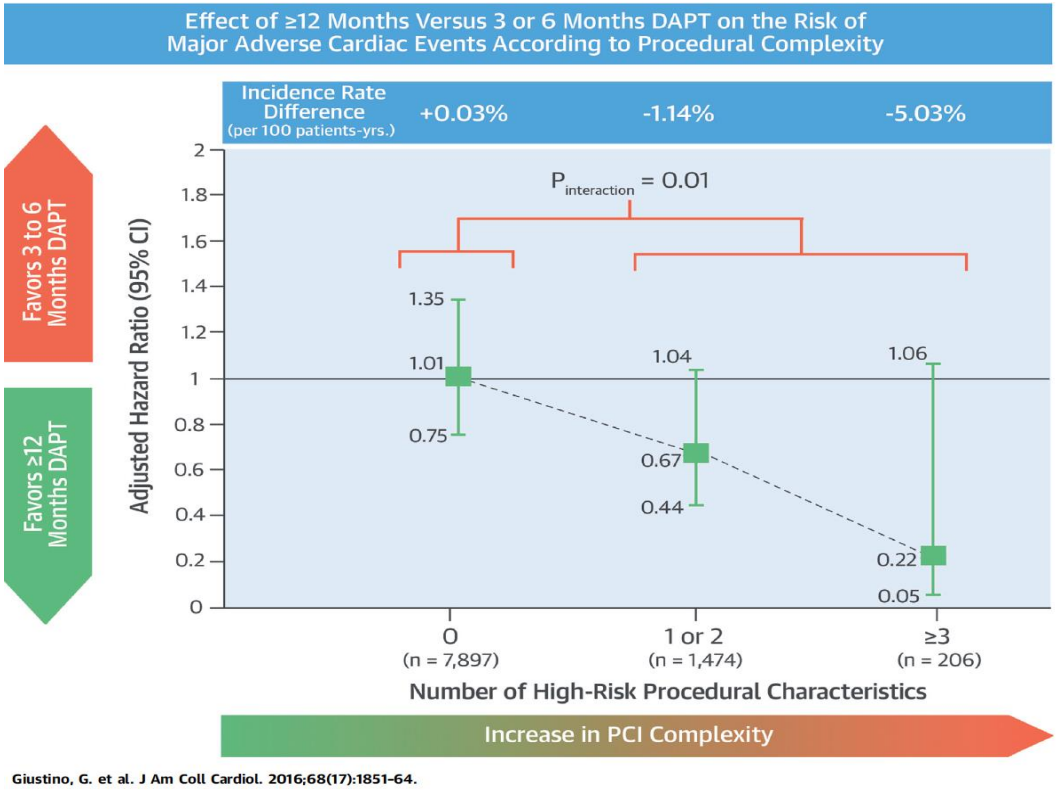


http://www.acc.org/tools-and-practice-support/mobile-resources/features/dapt-risk-calculator

Coronary Complexity

Pooled analysis of 6 RCTs
Comparing 3 to 6 months DAPT
Vs. ≥ 12 months DAPT

<u>Complex Features:</u>
3 vessels treated
≥ 3 stents placed
≥ 3 lesions treated
Bifurcation with 2 stents
Total stent length > 60 mm
CTO

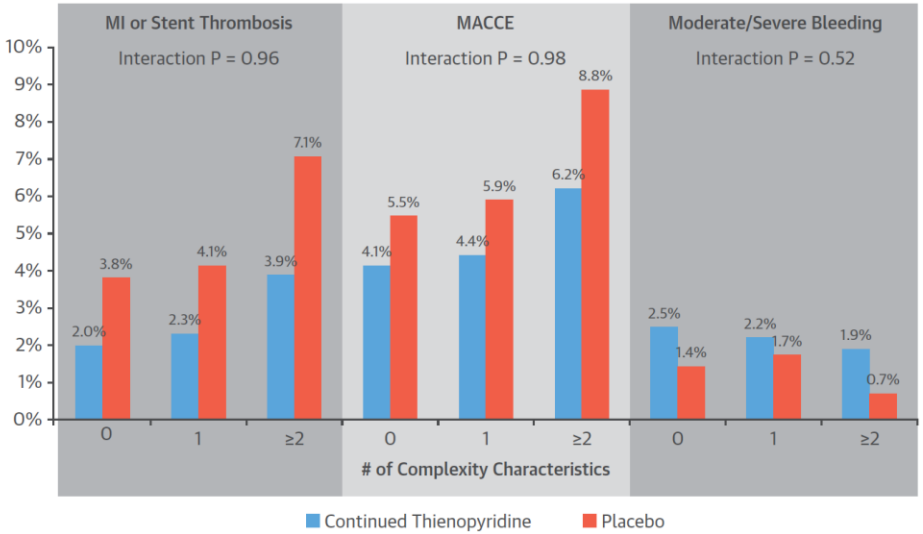


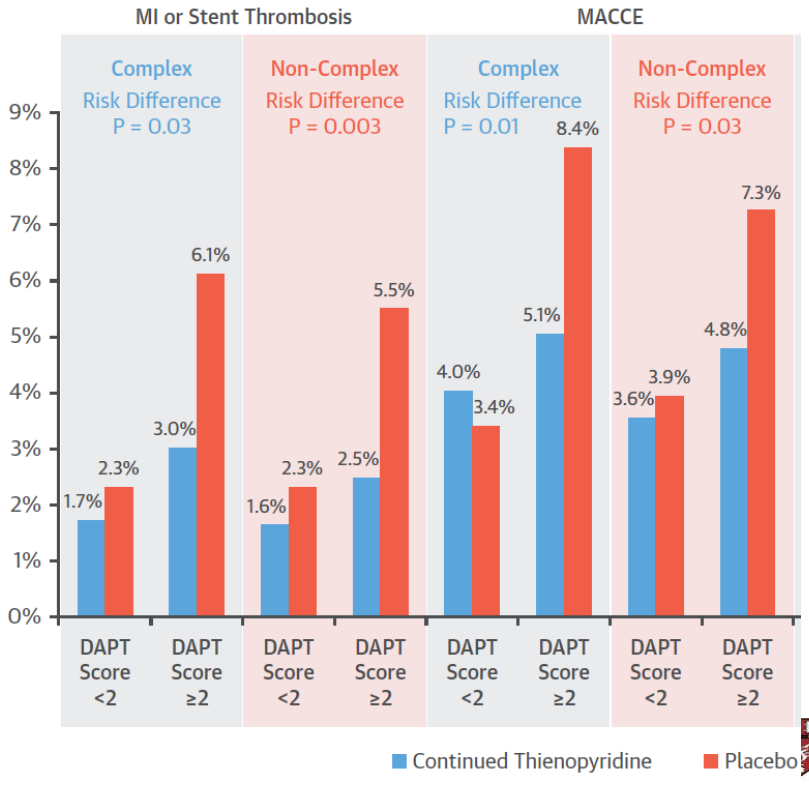
Giustino, G. et al. J Am Coll Cardiol. 2016;68(17):1851-64.

Coronary Complexity (continued)

Lesion Complexity and Outcomes of Extended Dual Antiplatelet Therapy After Percutaneous Coronary Intervention

Robert W. Yeh, MD, MSc,[a,b] Dean J. Kereiakes, MD,[c] P. Gabriel Steg, MD,[d,e,f] Donald E. Cutlip, MD,[a,b] Kevin J. Croce, MD, PhD,[g] Joseph M. Massaro, PhD,[b,h] Laura Mauri, MD, MSc,[b,g] on behalf of the DAPT Study Investigators





Anticoagulated Patients – drop the aspirin

- WOEST – clopidogrel plus warfarin
- PIONEER – rivaroxaban 15 mg daily plus clopidogrel; or rivaroxaban 2.5 BID+ clopidogrel + ASA
- REDUAL PCI – Dabigatran 150 or 110 BID plus clopidogrel

All regiments without aspirin resulted in significantly less bleeding without penalty of increased ischemic events

Very High Risk Bleeding Populations

- Prior hx of bleeding
- Active bleeding
- Active malignancy
- Upcoming surgery
- Frail Elderly

Ongoing studies evaluated safety of 3-months of DAPT after DES vs historical controls for current DES.

(The “Short DAPT” Studies)

Drug-eluting stents in elderly patients with coronary artery disease (SENIOR): a randomised single-blind trial

Olivier Varenne, Stéphane Cook, Georgios Sideris, Sasko Kedev, Thomas Cuisset, Didier Carrié, Thomas Hovasse, Philippe Garot, Rami El Mahmoud, Christian Spaulding, Gérard Helft, José F Diaz Fernandez, Salvatore Brugaletta, Eduardo Pinar-Bermudez, Josepa Mauri Ferre, Philippe Commeau, Emmanuel Teiger, Kris Bogaerts, Manel Sabate, Marie-Claude Morice, Peter R Sinnaeve, for the SENIOR investigators

Population: 1200 pts age 75 or older AF undergoing PCI for stable, silent ischemia, or acute CAD.

Primary Endpoint at 1 year

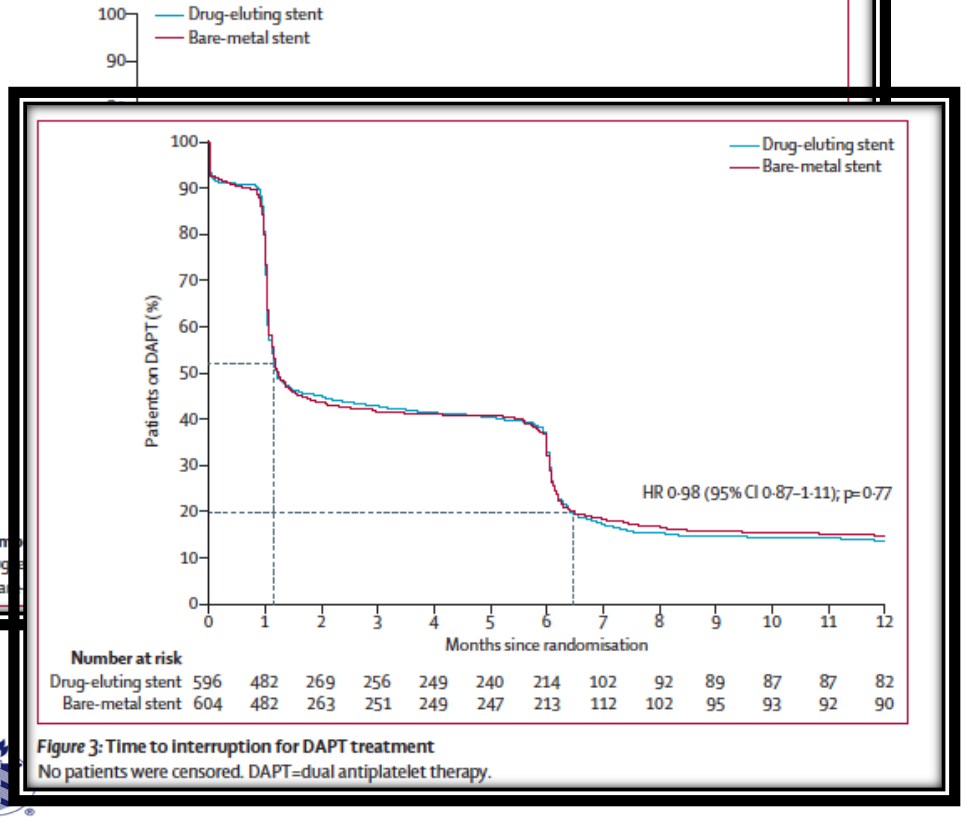


Figure 3: Time to interruption for DAPT treatment
No patients were censored. DAPT=dual antiplatelet therapy.

<u>Death, MI, stroke or ID-TLR</u>

16% BMS vs. 12% DES

HR 0.71 (0.52-0.94)

~50% stopped DAPT at 1 month, 30% between 1 and 6, and 20% continued for year

Conclusions

- Continuing long-term DAPT entails a tradeoff of risk and benefit, among all patients independent of presentation.
  - Prior and presenting ACS is a factor that influences the benefit of DAPT.
  - However, among elective, NSTEMI and STEMI pts, some patients likely to be harmed by long-term DAPT, others likely to benefit.
  - Coronary complexity appears to be more important early after PCI, but less important after 1 year.
- Tool like the DAPT Score may by useful in conjunction with clinical judgment and other coronary complexity factors to help individualize therapy.

Conclusions

- For anticoagulated patients, omitting aspirin reduces bleeding and appears to be safe on average.
- Very short durations of DAPT are currently being evaluated, in combination with current generation DES in stable non-complex patients.

Thank you!

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