UPDATE IN STEMI CARE

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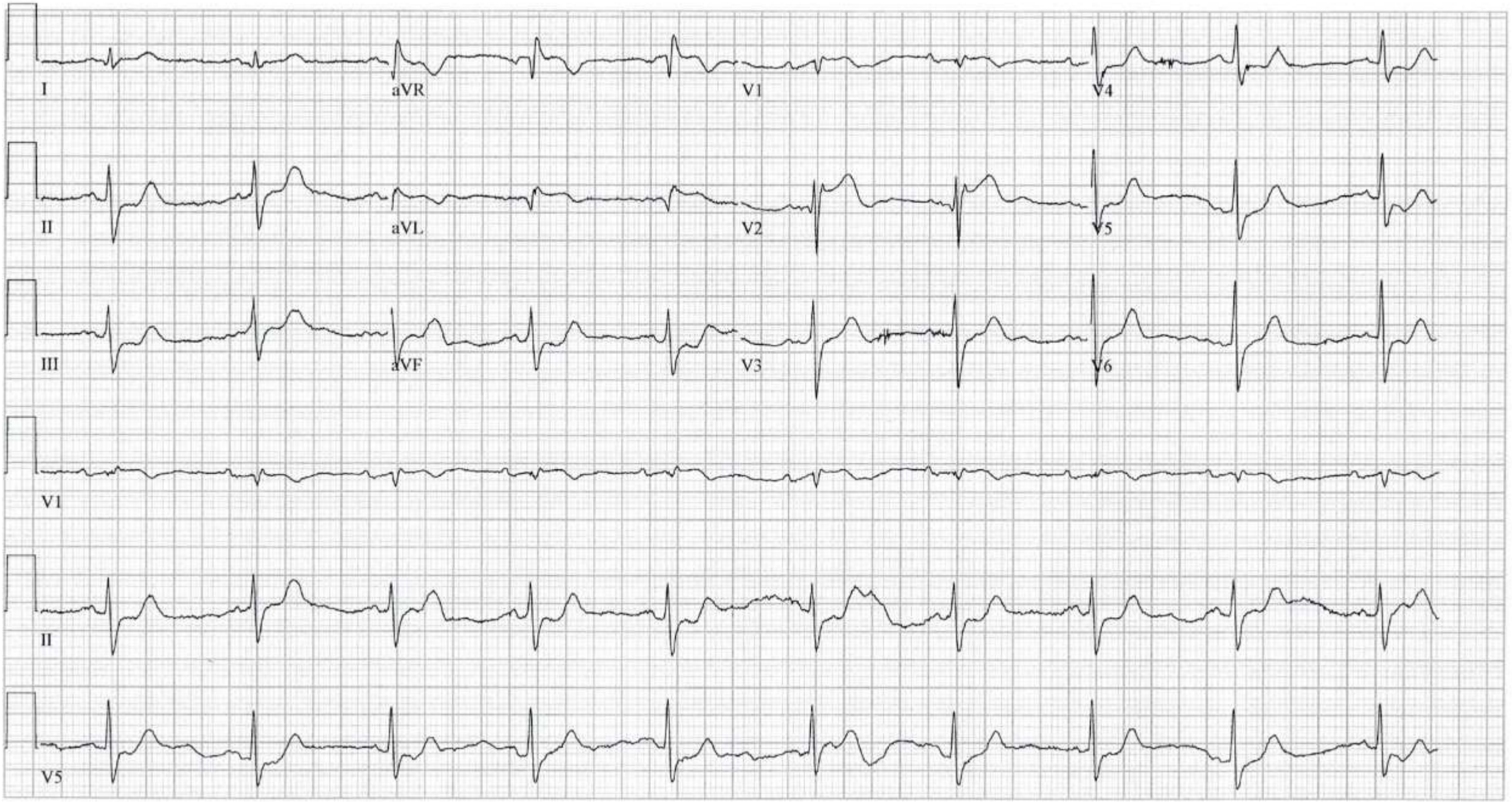
- When and What to Treat
  - Stable Patients
  - Shock Patients
- How to Treat
  - Pharmacotherapy
  - Technical Considerations
- Systems of Care
  - Primary PCI
  - Fibrinolysis and Pharmacoinvasive Strategy

56 year old male presents with 2 hours onset of chest pain.

Ekg is significant for ST elevations in the anterolateral leads.

His blood pressure is stable 150/90 and his heart rate is 89

He is a past smoker and his past medical history is significant for hypertension



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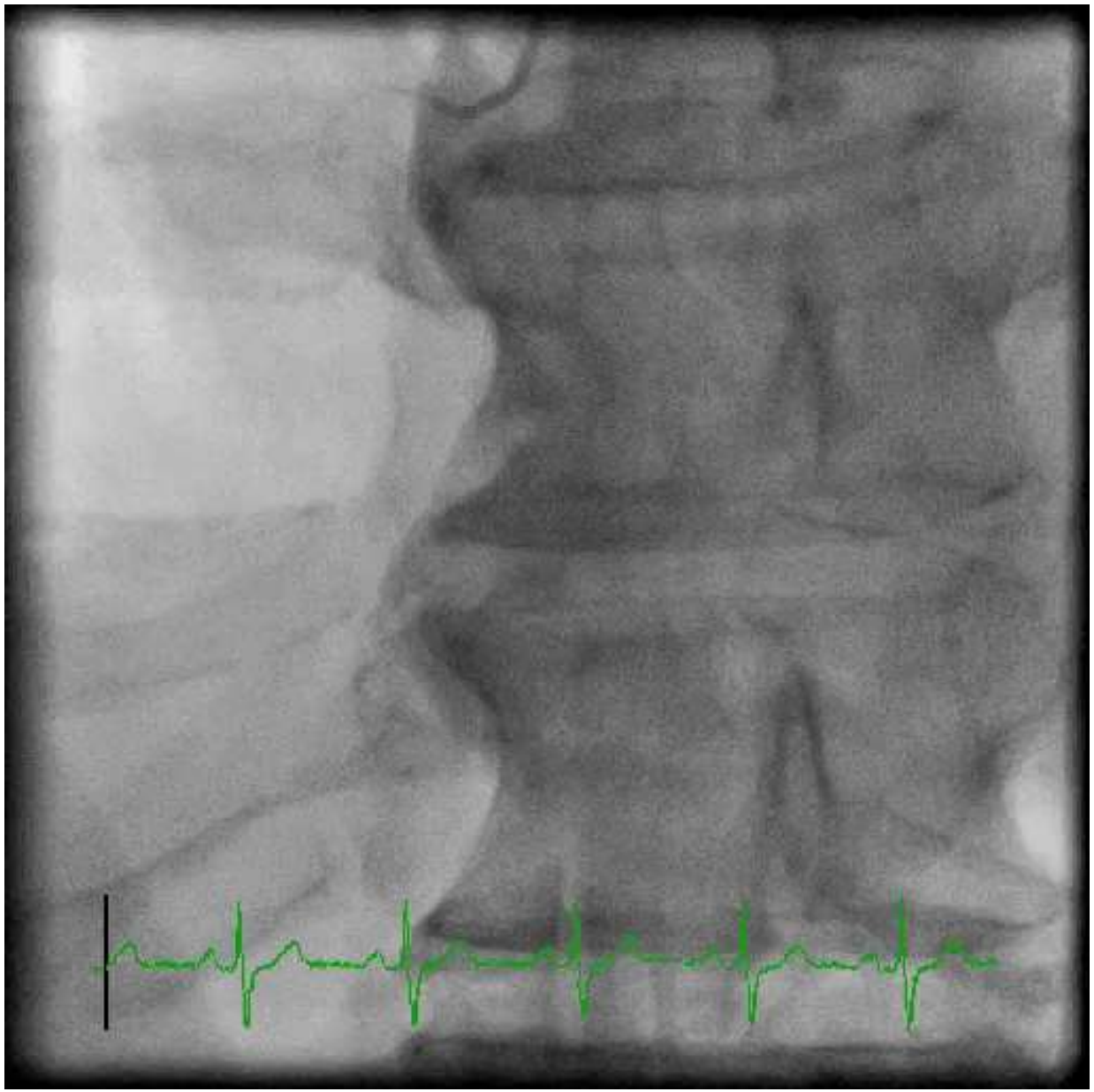
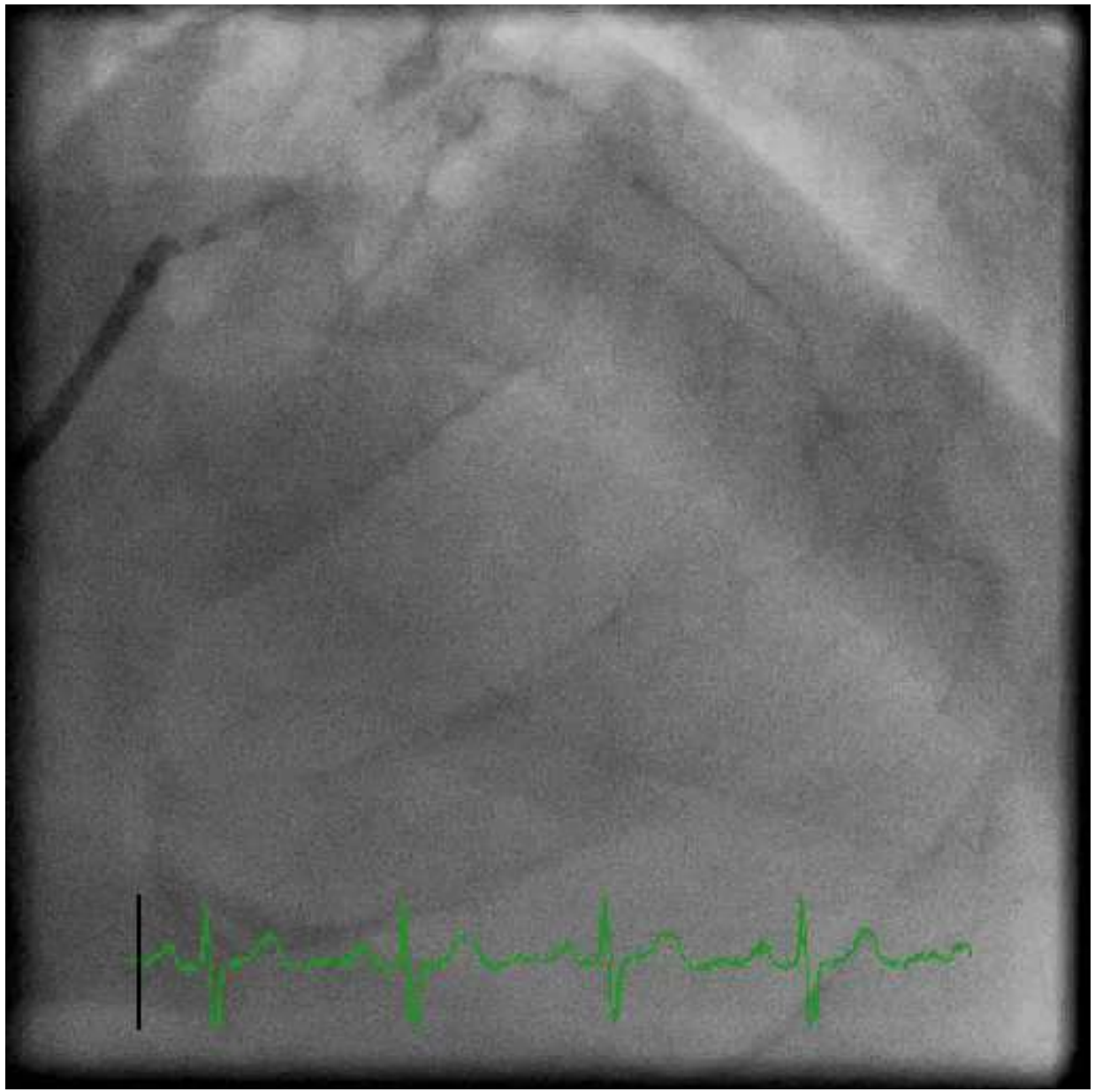




What to treat?

- LAD Only?
- Both LAD and RCA?

Anti-platelet Therapy

- Plavix? Ticagrelor? Prasugrel?
- How Long? 12 months? ≥ 12 months?

2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction

Class I

1. **Primary PCI should be performed in patients with STEMI and ischemic symptoms of less than 12 hours' duration.[17,50,51] (*Level of Evidence: A*)**

Class IIa

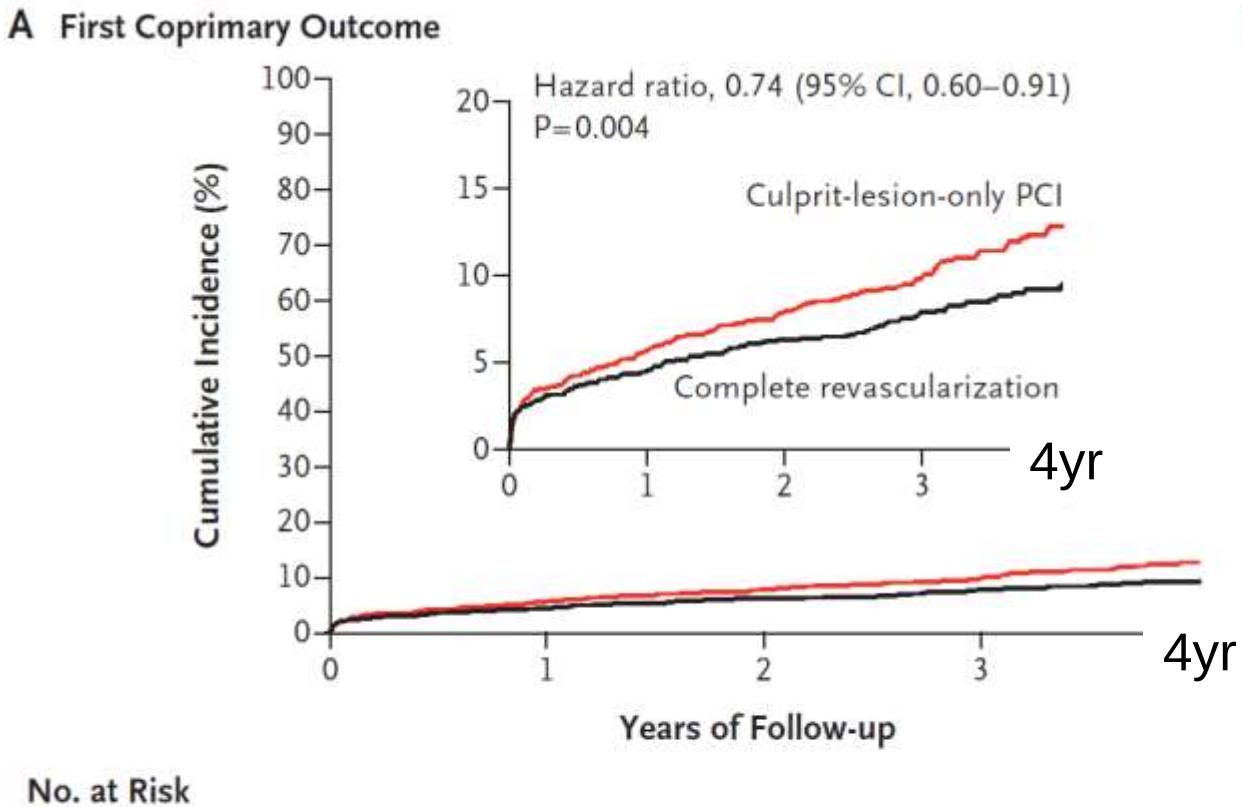
1. PCI is reasonable in a noninfarct artery at a time separate from primary PCI in patients with intermediate- or high-risk findings on noninvasive testing.[58,141,142] (*Level of Evidence: B*)

Class III: Harm

1. PCI should not be performed in a noninfarct artery at the time of primary PCI in patients with STEMI who are hemodynamically stable.[58–60] (*Level of Evidence: B*)

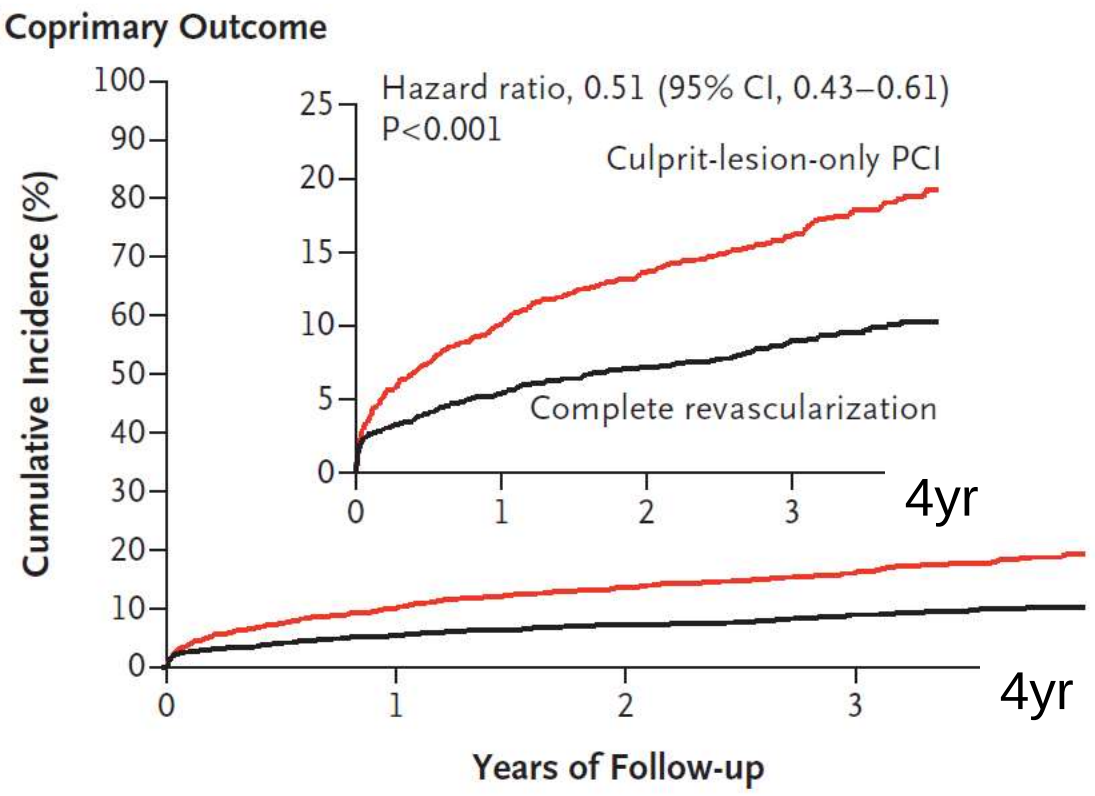
Complete Revascularization with Multivessel PCI for Myocardial Infarction (COMPLETE TRIAL)

Cardiovascular death or myocardial infarction



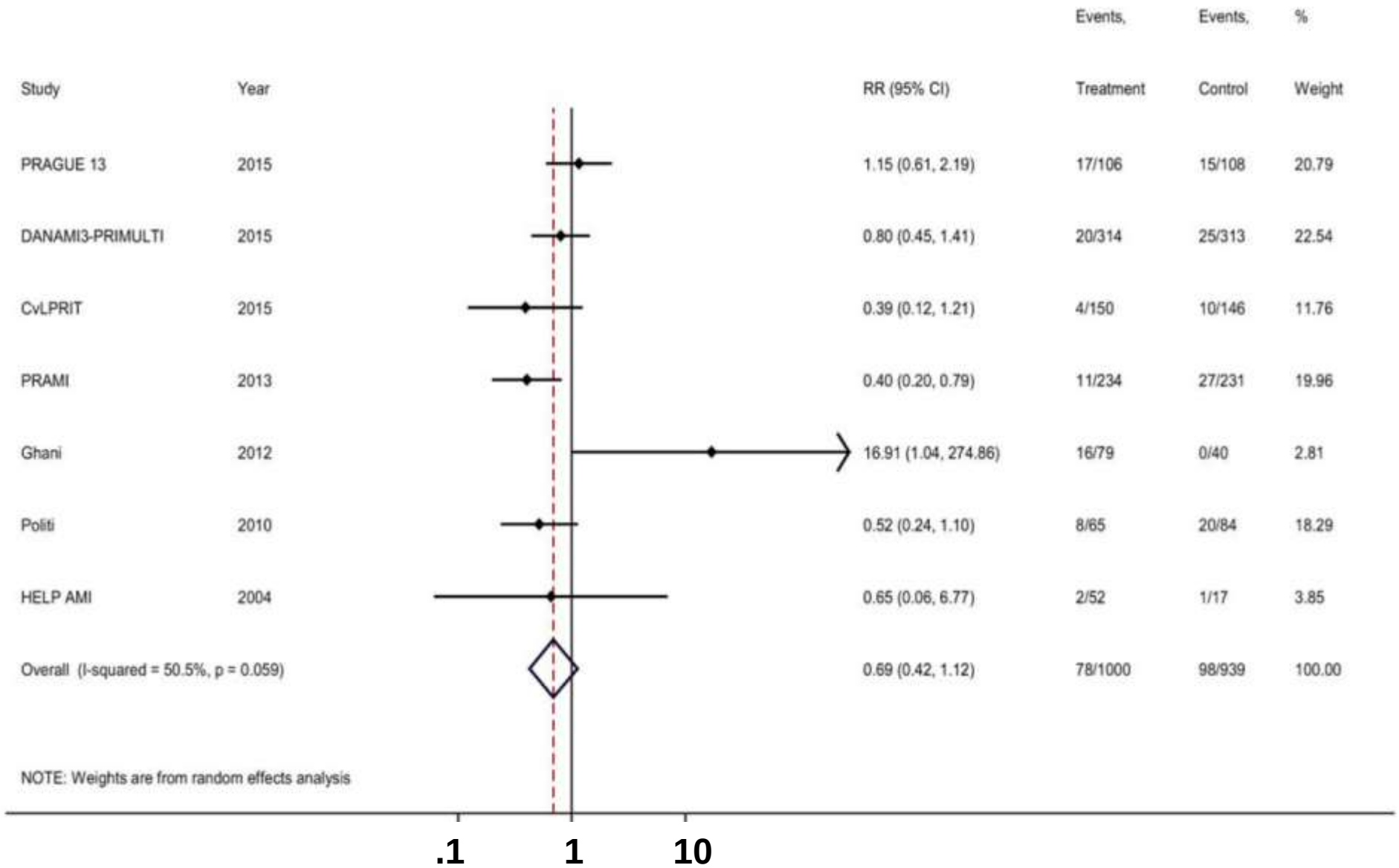
No. at Risk					
Culprit-lesion-only PCI	2025	1897	1666	933	310
Complete revascularization	2016	1904	1677	938	337

Cardiovascular death, Myocardial infarction, or Ischemia-driven revascularization



No. at Risk					
Culprit-lesion-only PCI	2025	1808	1559	865	294
Complete revascularization	2016	1886	1659	925	329

N Engl J Med. 2019 Oct 10;381(15):1411-1421.

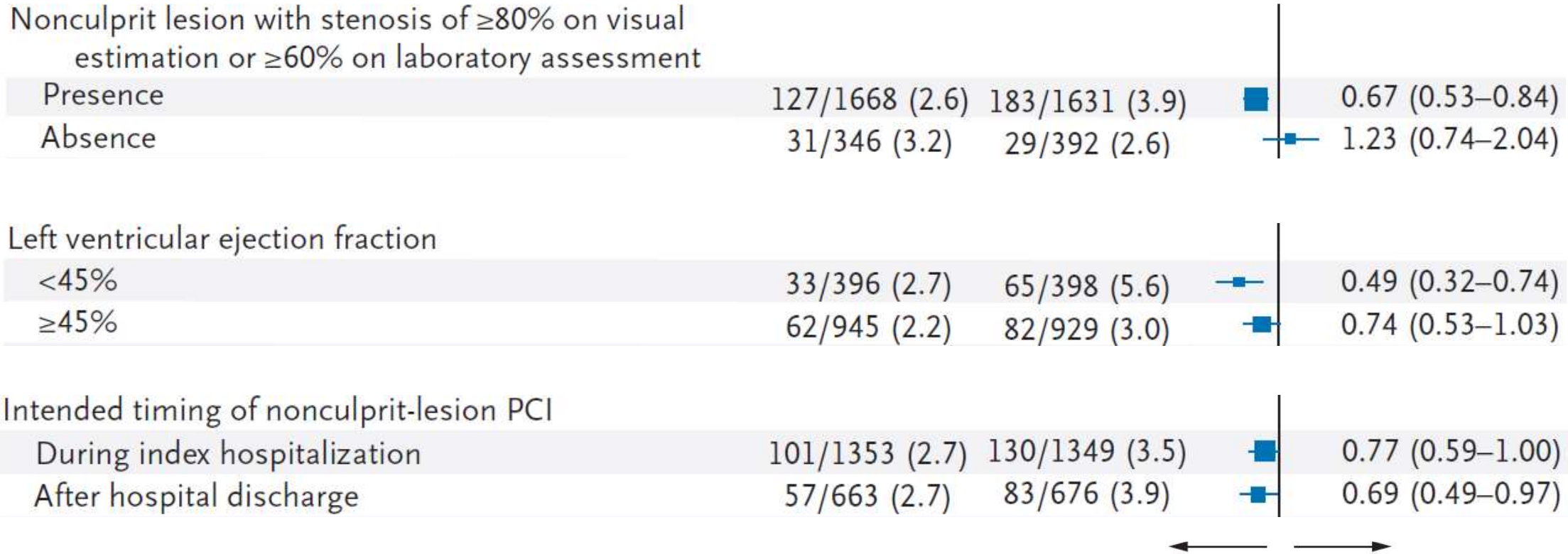


Complete Revasc Associated with Lower Incidence Mortality or MI

Complete Revasc Associated with Increased Incidence Mortality or MI

Catheter Cardiovasc Interv. 2016 Oct;88(4):501-505

Complete Revascularization with Multivessel PCI for Myocardial Infarction (COMPLETE TRIAL)



N Engl J Med. 2019 Oct 10;381(15):1411-1421.

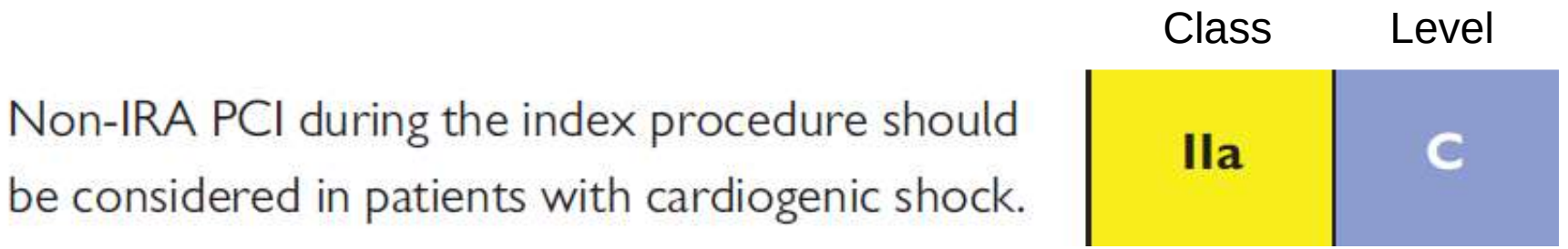
2013 Recommendation	2015 Focused Update Recommendation	Comment
Class III: Harm PCI should not be performed in a noninfarct artery at the time of primary PCI in patients with STEMI who are hemodynamically stable (11–13). (*Level of Evidence: B*)	***Class IIb*** PCI of a noninfarct artery may be considered in selected patients with STEMI and multivessel disease who are hemodynamically stable, either at the time of primary PCI or as a planned staged procedure (11–24). (*Level of Evidence: B-R*)	Modified recommendation (changed class from "III: Harm" to "IIb" and expanded time frame in which multivessel PCI could be performed).

PCI indicates percutaneous coronary intervention; and STEMI, ST-elevation myocardial infarction.

2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction

Class III: Harm
1. PCI should not be performed in a noninfarct artery at the time of primary PCI in patients with STEMI who are hemodynamically stable.[58–60] (*Level of Evidence: B*)

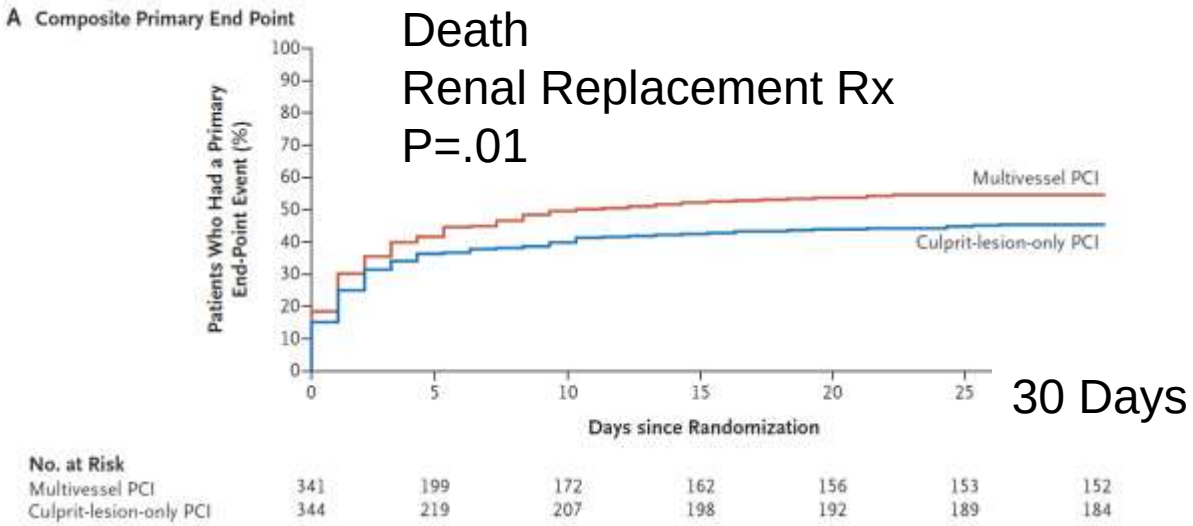
2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation



Integrating the results of the CULPRIT-SHOCK trial in the 2017 ESC ST-elevation myocardial infarction guidelines

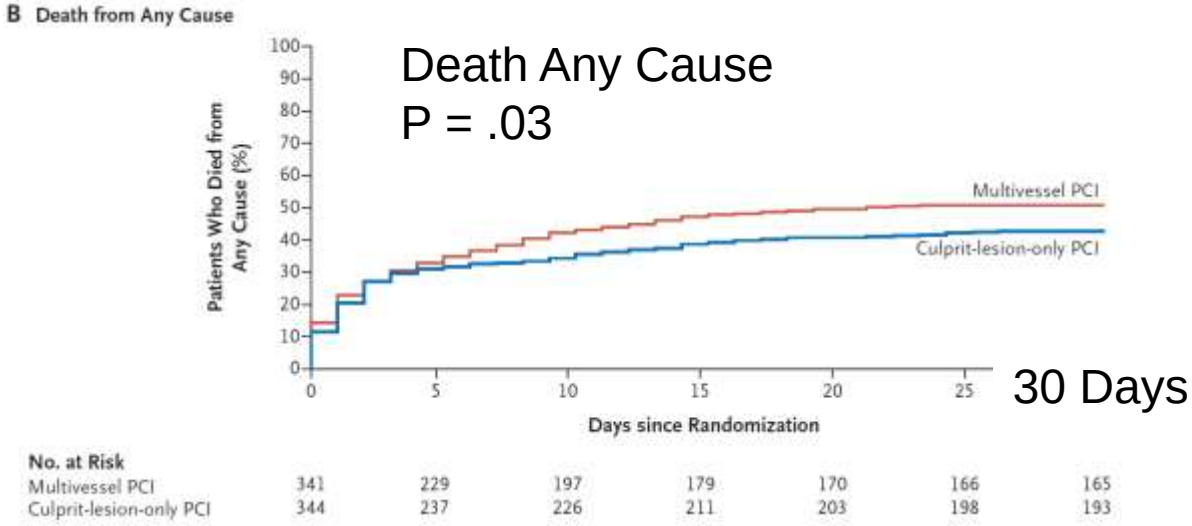
"Based on the new robust evidence from the adequately powered CULPRIT-SHOCK trial, it is now the opinion of the 2017 STEMI TF (Task Force) that in patients with cardiogenic shock complicating STEMI, primary PCI should be restricted to the IRA."

PCI Strategies in Patients with Acute Myocardial Infarction and Cardiogenic Shock



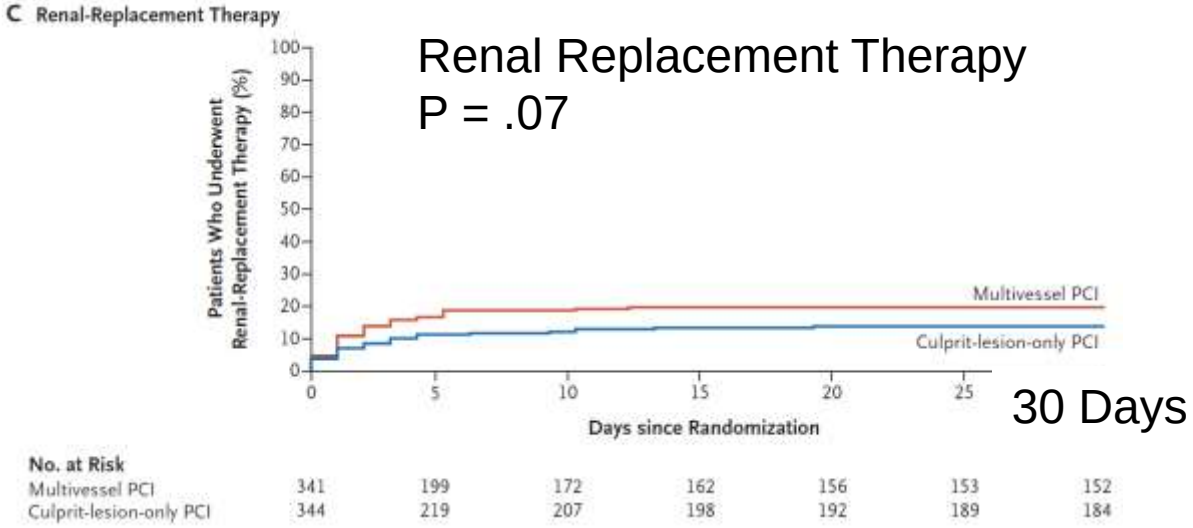
Death
Renal Replacement Rx
P=.01

30 Days



Death Any Cause
P = .03

30 Days



Renal Replacement Therapy
P = .07

30 Days

	Complete	Culprit Only	
Contrast Vol	190ml	250ml	P<.001
Fluoro Time	13min	19min	P<.001

No Difference:

- MCS Use
- Duration of Catecholamine Use
- Days to Stabilization

N Engl J Med. 2017 Dec 21;377(25):2419-2432.

Primary PCI Should be the preferred Treatment for the Culprit Artery in STEMI Patients

In Stable Patients

- ✓ PCI of the Non-Culprit Artery Should Be Considered
- ✓ PCI of the Non-Culprit Artery Can be done during the index procedure or staged

In Shock Patients

- ✓ PCI of only the Culprit Artery is Recommended
- ✓ PCI of the Non-Culprit Artery can be considered in special circumstances

Duration of DAPT Therapy After PCI

Class I Indications

1. Aspirin 162 to 325 mg should be given before primary PCI. (*Level of Evidence: B*)

2. After PCI, aspirin should be continued indefinitely. (*Level of Evidence: A*)

3. A loading dose of a P2Y12 receptor inhibitor should be given as early as possible or at time of primary PCI to patients with STEMI. Options include

- **a. Clopidogrel 600 mg (*Level of Evidence: B*); or**
- **b. Prasugrel 60 mg (*Level of Evidence: B*); or**
- **c. Ticagrelor 180 mg (*Level of Evidence: B*)**

4. P2Y12 inhibitor therapy should be given for 1 year to patients with STEMI who receive a stent (bare-metal or drug-eluting) during primary PCI using the following maintenance doses:

- **a. Clopidogrel 75 mg daily (*Level of Evidence: B);* or**
- **b. Prasugrel 10 mg daily (*Level of Evidence: B*); or**
- **c. Ticagrelor 90 mg twice a day (*Level of Evidence: B*)**

Circulation. 2013 Jan 29;127(4):e362-425.

2016 ACC/AHA Guideline Focused Update on Duration of Dual Antiplatelet Therapy in Patients With Coronary Artery Disease

Recommendations for Duration of DAPT in Patients With ACS Treated With PCI

COR	LOE	Recommendations
I	B-R	In patients with ACS (NSTE-ACS or STEMI) treated with DAPT after BMS or DES implantation, $P2Y_{12}$ inhibitor therapy (clopidogrel, prasugrel, or ticagrelor) should be given for at least 12 months.[16,50–55,72,96–98]
I	B-NR	In patients treated with DAPT, a daily aspirin dose of 81 mg (range, 75 mg to 100 mg) is recommended.[56–60,75–78]
IIa	B-R	In patients with ACS (NSTE-ACS or STEMI) treated with DAPT after coronary stent implantation, it is reasonable to select ticagrelor or clopidogrel for maintenance $P2Y_{12}$ inhibitor therapy.[53,72]
IIa	B-R	In patients with ACS (NSTE-ACS or STEMI) treated with DAPT after coronary stent implantation who present at high risk for bleeding complications and who do not have a history of stroke or TIA, it is reasonable to choose prasugrel over clopidogrel for maintenance $P2Y_{12}$ inhibitor therapy.[54,55]

≥12 Months

ticagrelor

prasugrel

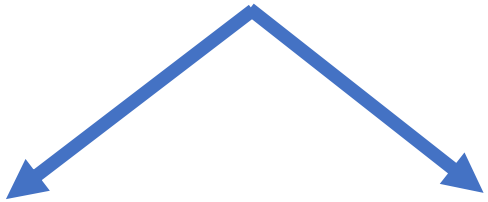
Recommendations for Duration of DAPT in Patients With ACS Treated With PCI

IIb	A[SR]	In patients with ACS (NSTE-ACS or STEMI) treated with coronary stent implantation who have tolerated DAPT without a bleeding complication and who are not at high bleeding risk (eg, prior bleeding on DAPT, coagulopathy, oral anticoagulant use), continuation of DAPT (clopidogrel, prasugrel, or ticagrelor) 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 (eg, treatment with oral anticoagulant therapy), are at high risk of severe bleeding complication (eg, major intracranial surgery), or develop significant overt bleeding, discontinuation of $P2Y_{12}$ inhibitor therapy after 6 months may be reasonable.[17–21,34,36,37]
III: Harm	B-R	Prasugrel should not be administered to patients with a prior history of stroke or TIA.[54]

>12 Months

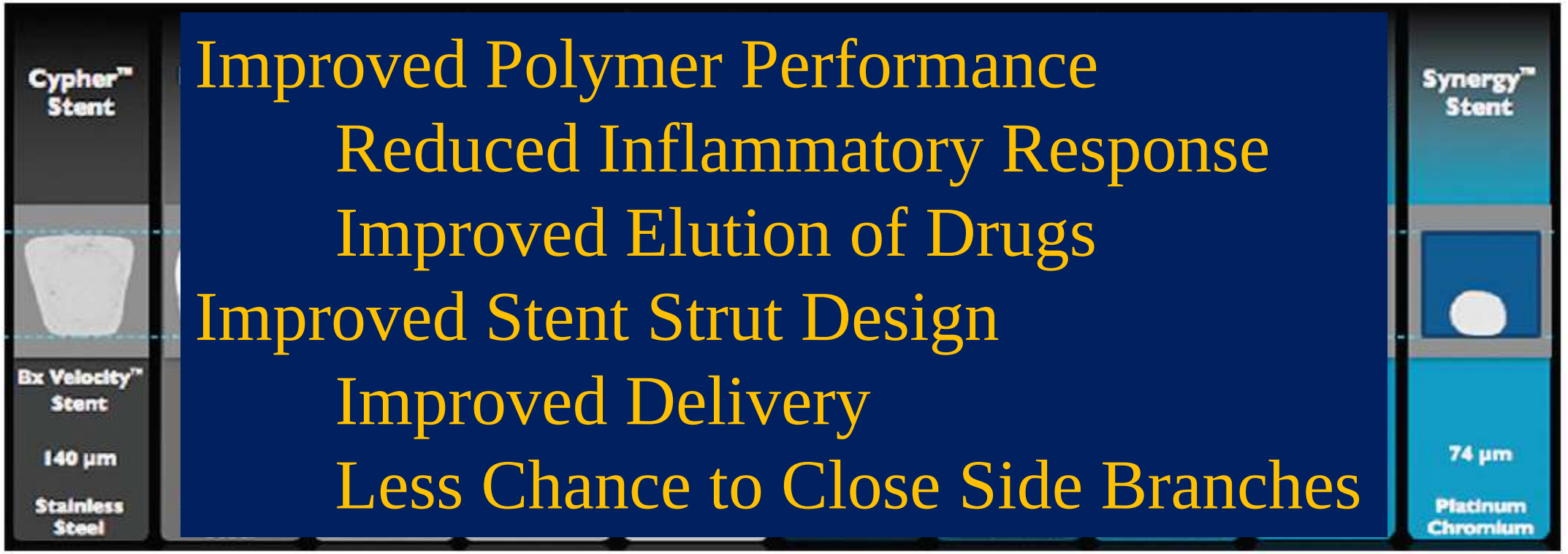
6 Months

Goals for DAPT after PCI in Patients with STEMI



Local Effect at the Stent:
Prevention of In-Stent Thrombosis

Systemic Effect:
Prevention of Ischemic Events
For High Risk Patient



Improved Polymer Performance

Reduced Inflammatory Response

Improved Elution of Drugs

Improved Stent Strut Design

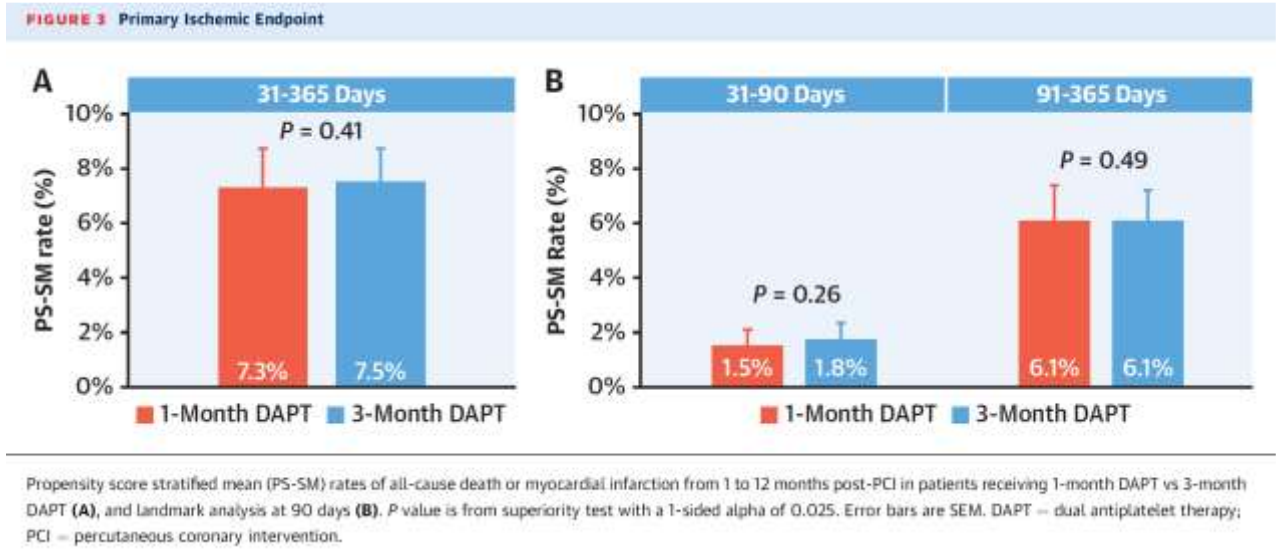
Improved Delivery

Less Chance to Close Side Branches

The drug eluting stent is listed above, with the corresponding bare metal version annotated below. The material that the stents are manufactured from and strut thickness are noted. These are drawn to scale. Strut thickness refers to the axis measured as if from the lumen to the vessel wall.

Duration of Dual Antiplatelet Therapy for Patients at High Bleeding Risk Undergoing PCI

	1-Month DAPT (n = 1,392)	3-Month DAPT (n = 1,972)
High bleeding risk criteria		
Age ≥75 y	950/1,392 (68.2)	1,292/1,972 (65.5)
Chronic anticoagulant therapy	617/1,392 (44.3)	805/1,972 (40.8)
Anemia[a]	201/1,392 (14.4)	313/1,972 (15.9)
History of stroke	145/1,392 (10.4)	223/1,972 (11.3)
Renal insufficiency[b]	116/1,392 (8.3)	157/1,972 (8.0)
Thrombocytopenia[c]	55/1,392 (4.0)	60/1,972 (3.0)
History of major bleeding	46/1,392 (3.3)	57/1,972 (2.9)
Number of HBR criteria	1.5 ± 0.7	1.5 ± 0.7
Clinical presentation		
Chronic coronary syndrome	917/1,392 (65.9)	1,283/1,972 (65.1)
Acute coronary syndrome	475/1,392 (34.1)	689/1,972 (34.9)
NSTEMI	245/1,392 (17.6)	141/1,972 (7.2)
Unstable angina	230/1,392 (16.5)	572/1,972 (29.0)



No difference in outcome 1 month vs 3 months DAPT at 1 year follow up

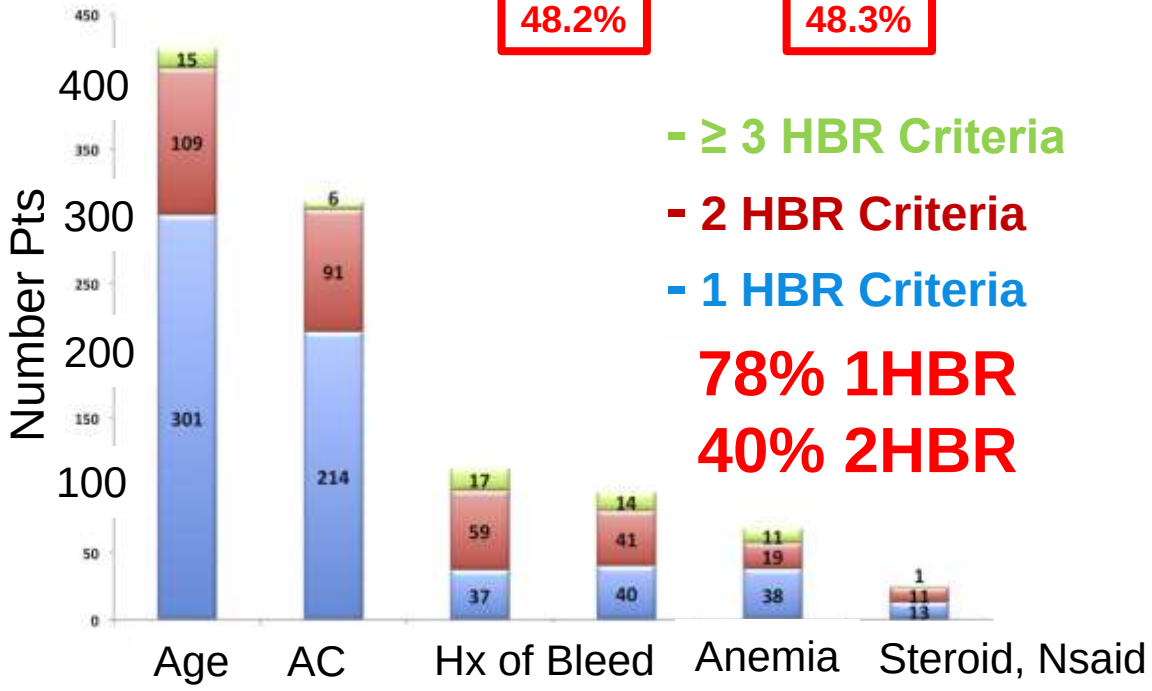
J Am Coll Cardiol. 2021 Nov 23;78(21):2060-2072.

Short DAPT Therapy in Patients with High Bleed Risk

30 Days DAPT: (clopidogrel/prasugrel/ticagrelor) + Aspirin

Baseline Characteristics of Patients at HBR

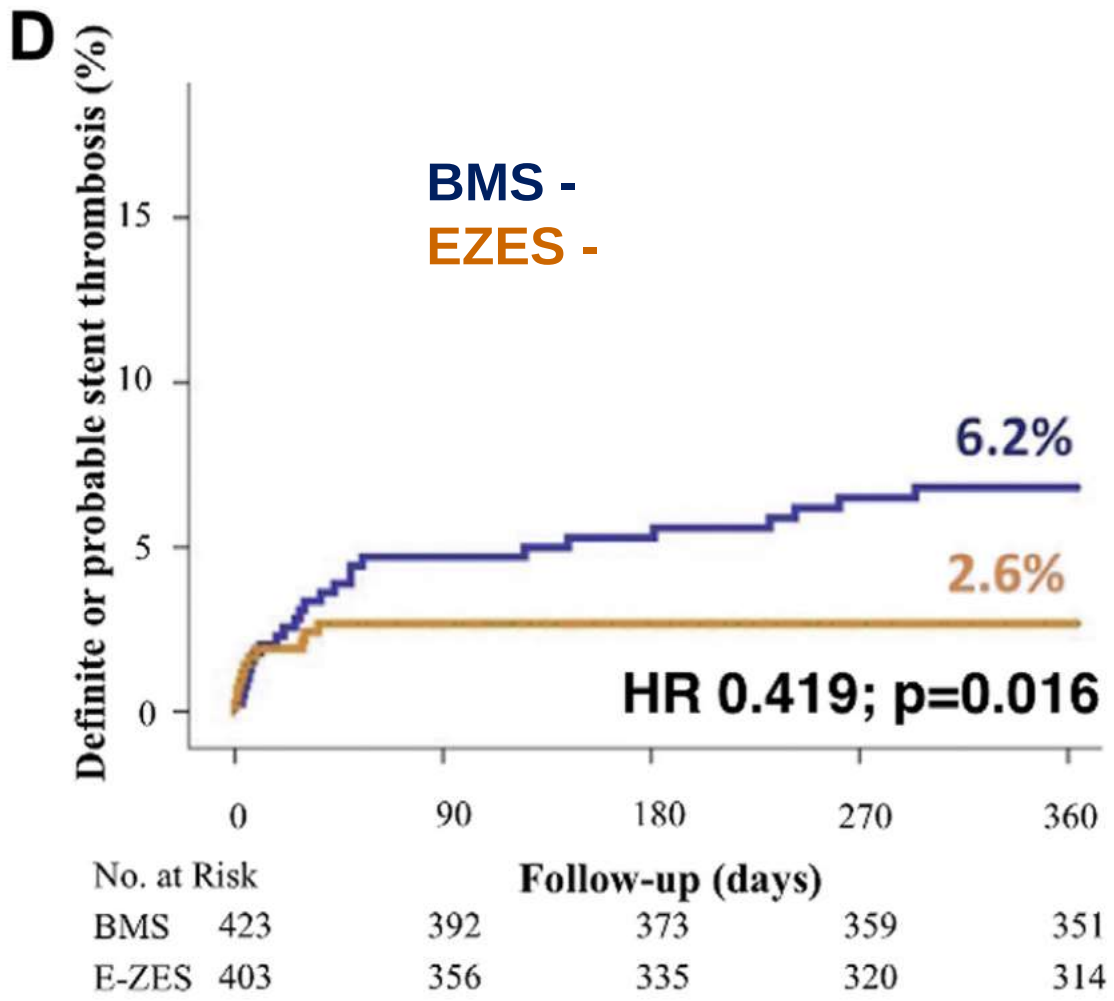
	Bare-Metal Stent (n = 404)	Endeavor Stent (n = 424)	p Value
Clinical presentation			
Stable angina pectoris	140 (34.7)	147 (34.7)	>0.99
Acute coronary syndrome			
Unstable angina	69 (17.1)	72 (17.0)	>0.99
Non-ST-segment elevation MI	133 (32.9)	140 (33.0)	>0.99
ST-segment elevation MI	62 (15.3)	65 (15.3)	>0.99
	48.2%	**48.3%**	



- ≥ 3 HBR Criteria
- 2 HBR Criteria
- 1 HBR Criteria

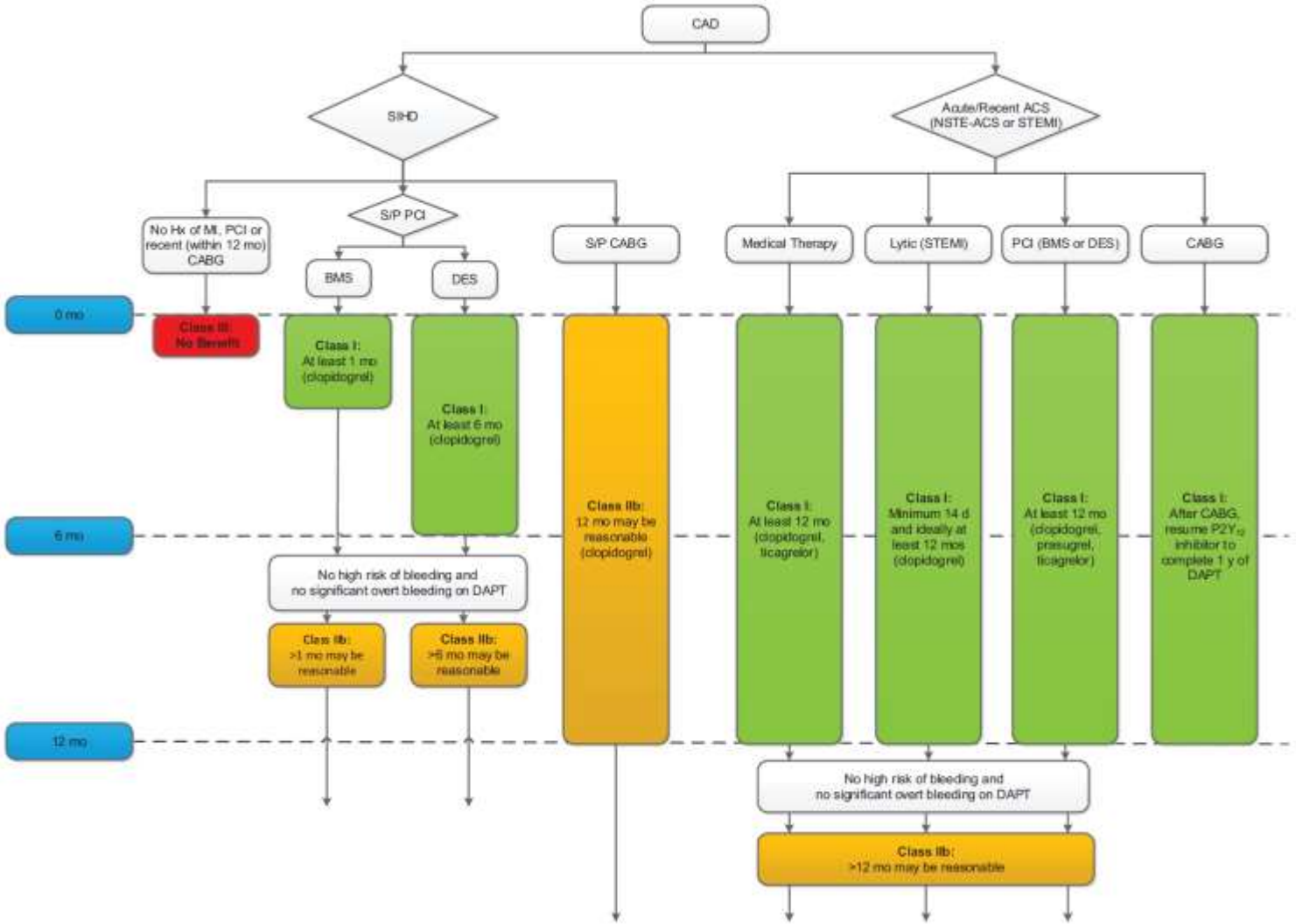
78% 1HBR
40% 2HBR

The number of patients fulfilling each high bleeding risk (HBR) criterion is shown in decreasing order. There was a considerable overlap among HBR criteria, with 643 patients (78%) fulfilling 1, 330 (40%) 2, and 65 (8%) ≥3 HBR qualifying features. NSAID = nonsteroidal anti-inflammatory drugs.



JACC Cardiovasc Interv. 2016 Mar 14;9(5):426-36.

Duration of DAPT Therapy After PCI

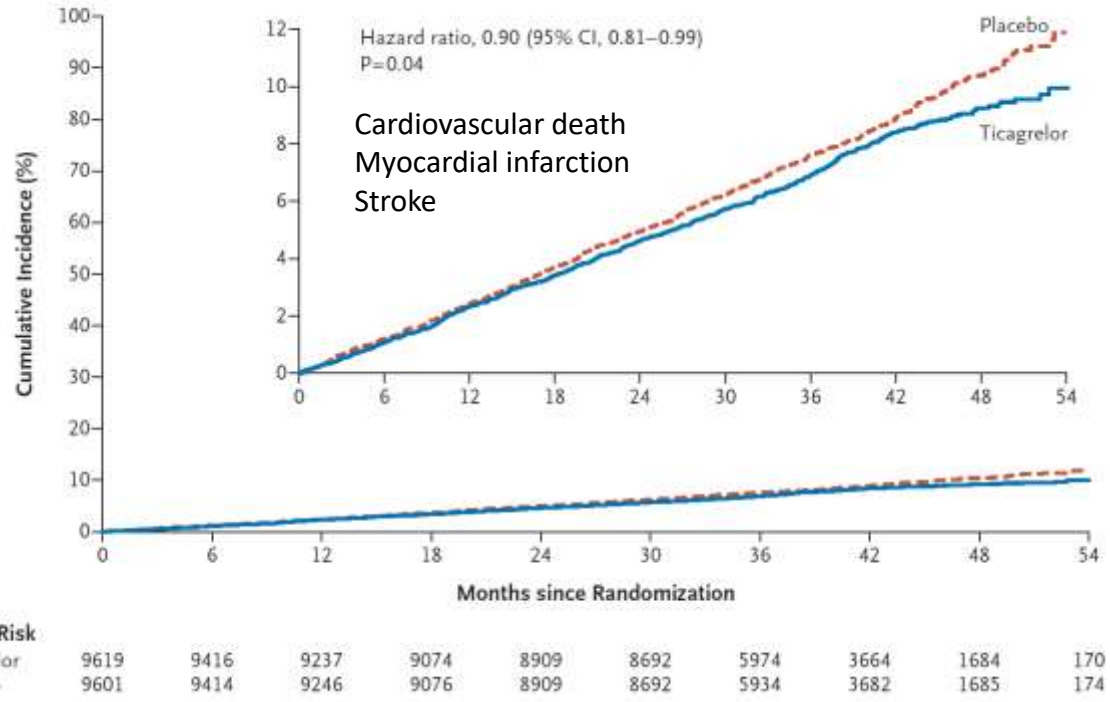


Increased Ischemic Risk/Risk of Stent Thrombosis (may favor longer-duration DAPT)	Increased Bleeding Risk (may favor shorter-duration DAPT)
Increased ischemic risk	History of prior bleeding
Advanced age	Oral anticoagulant therapy
ACS presentation	Female sex
Multiple prior MIs	Advanced age
Extensive CAD	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	
Stent underdeployment	
Small stent diameter	
Greater stent length	
Bifurcation stents	
In-stent restenosis	

ACS indicates acute coronary syndrome; CAD, coronary artery disease; CKD, chronic kidney disease; DAPT, dual antiplatelet therapy; MI, myocardial infarction; and NSAID, nonsteroidal anti-inflammatory drug.

Ticagrelor in Patients with Stable Coronary Disease and Diabetes

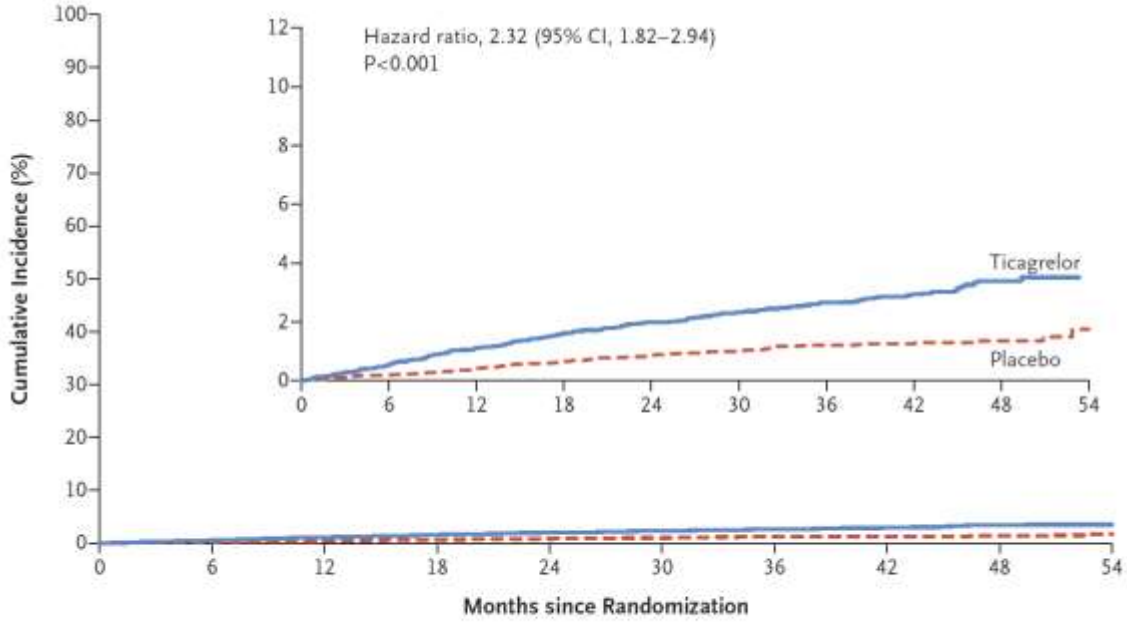
Less Events



No. at Risk

Ticagrelor	9619	9416	9237	9074	8909	8692	5974	3664	1684	170
Placebo	9601	9414	9246	9076	8909	8692	5934	3682	1685	174

More Bleeding



No. at Risk

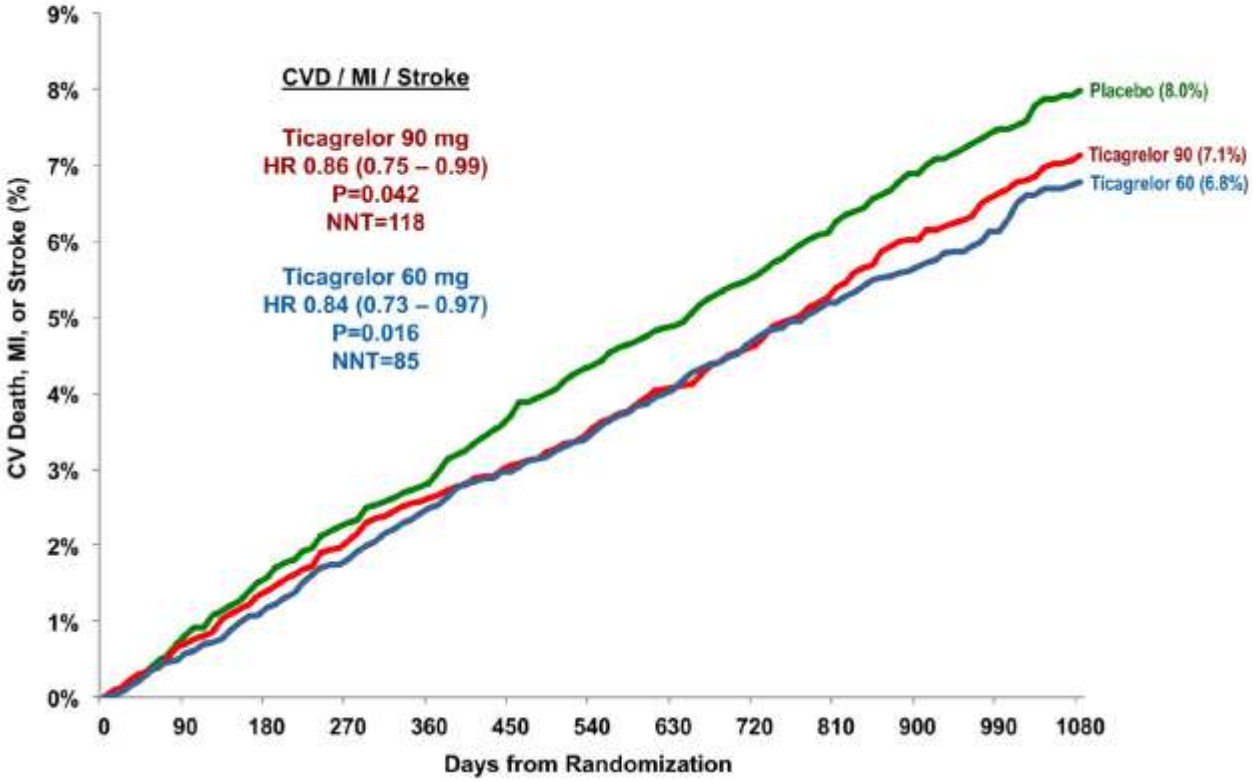
Ticagrelor	9562	7928	7309	6826	6381	5997	4067	2464	1156	168
Placebo	9531	8665	8186	7767	7359	6967	4795	2952	1358	218

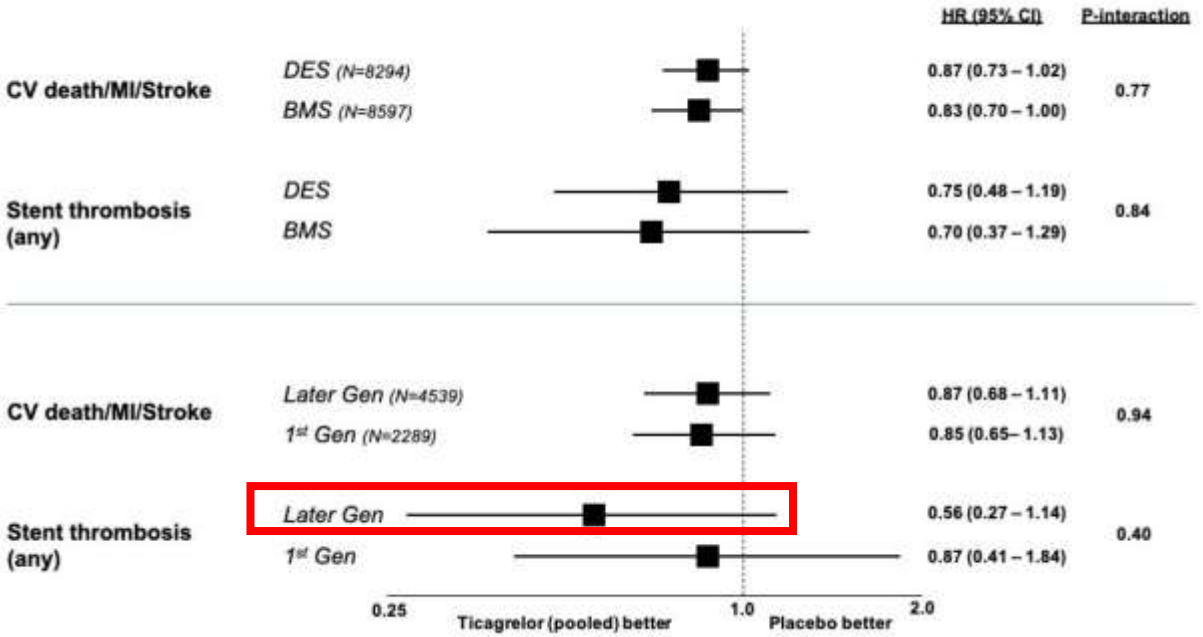
N Engl J Med. 2019 Oct 3;381(14):1309-1320.

Long-Term Ticagrelor in Patients With Prior Coronary Stenting in the PEGASUS-TIMI 54 Trial

Baseline Patient Characteristics by Stent Type

	Prior DES* N=8294	Prior BMS† N=8597	*P* value	First-Generation DES N=2289	Later-Generation DES N=4539	*P* value
Qualifying event						
Months from MI, median (IQR)	20.1 (14.7–27.4)	20.8 (14.8–28.5)	<0.001	23.0 (16.5–29.8)	18.9 (14.2–26.0)	<0.001
ST-segment–elevation MI (%)	4206 (50.8)	5346 (62.2)	<0.001	1185 (51.8)	2270 (50.1)	0.199
Non–ST-segment–elevation MI (%)	3714 (44.9)	2895 (33.7)	<0.001	973 (42.5)	2123 (46.9)	0.001
MI type unknown (%)	361 (4.4)	351 (4.1)	0.397	130 (5.7)	137 (3.0)	<0.001





J Am Heart Assoc. 2021 Sep 7;10(17):e020446.

MASTER DAPT

#ESCCongress

AMERICAN COLLEGE of CARDIOLOGY

Clinical presentation		
Stable angina — no. (%)	922 (40.2)	927 (40.6)
Silent ischemia — no. (%)	245 (10.7)	274 (12.0)
Non–ST-elevation myocardial infarction — no. (%)	595 (25.9)	558 (24.4)
ST-elevation myocardial infarction — no. (%)	273 (11.9)	265 (11.6)
Unstable angina — no. (%)	260 (11.3)	260 (11.4)

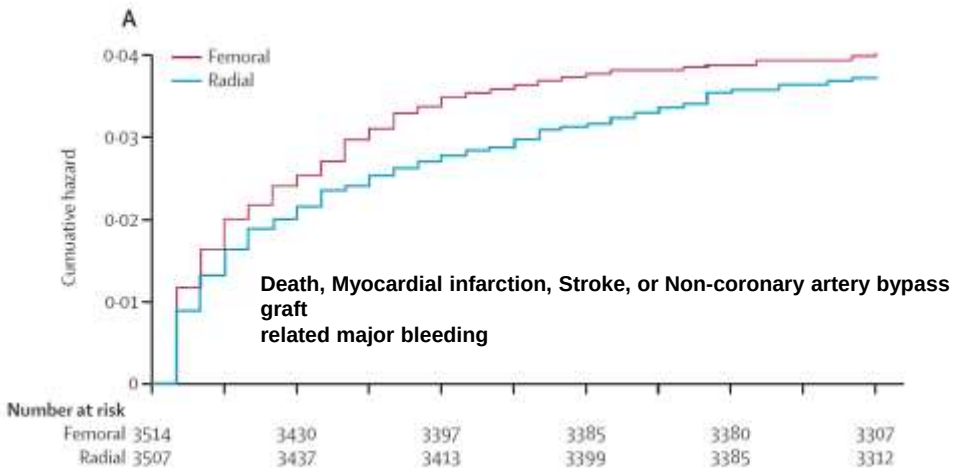
STEMI/NSTEMI 23.2% 23%

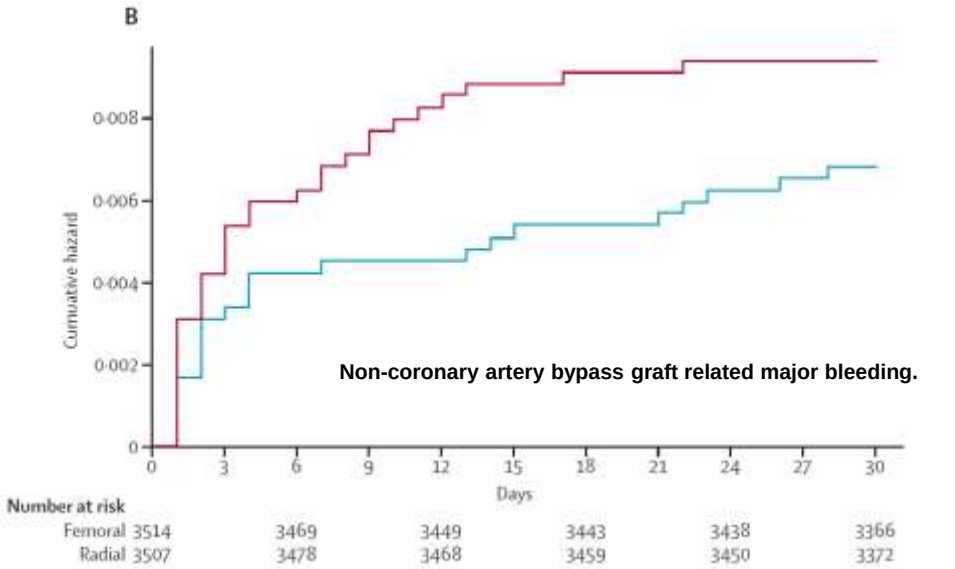
STEMI 11.9% 11.6%

Low percentage of patients who presented STEMI

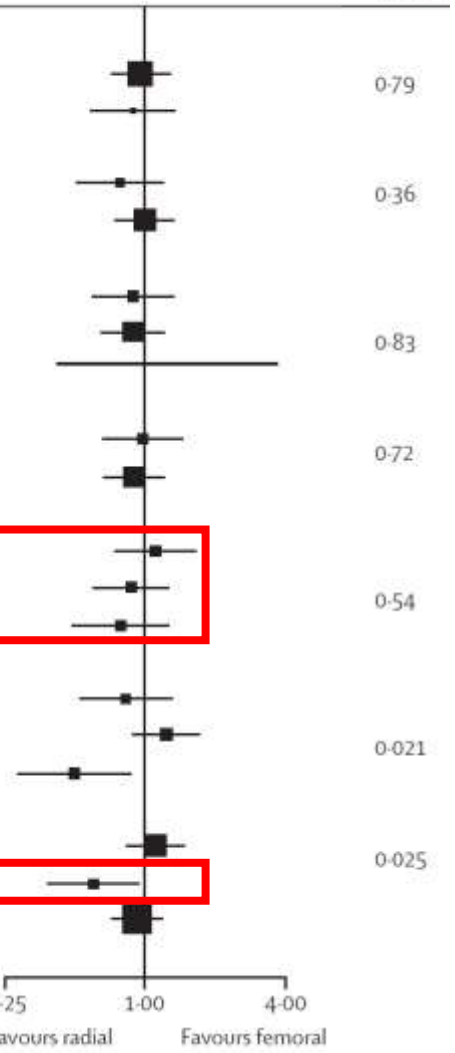
- ✓ Patients should be treated with aspirin and P2Y12 Inhibitor
- ✓ Duration of DAPT therapy should be for at least one year
- ✓ In patients at high risk of bleeding, DAPT therapy can be shortened to six months
- ✓ In patients at high risk for Ischemic Events and Low Risk of Bleeding, DAPT May be Extended Beyond One Year

Radial versus femoral access for coronary angiography and intervention in patients with acute coronary syndromes (RIVAL): a randomised, parallel group, multicentre trial





	Total	Radial (n/N [%])	Femoral (n/N [%])	HR (95% CI)	Primary outcome p value	Interacti
Age (years)						
<75	5986	87/3001 (2·9)	91/2985 (3·0)	0·95 (0·71–1·27)	0·73	0·79
≥75	1035	41/506 (8·1)	48/529 (9·1)	0·89 (0·58–1·34)	0·57	
Sex						
Women	1861	36/908 (4·0)	48/953 (5·0)	0·78 (0·50–1·20)	0·25	0·36
Men	5160	92/2599 (3·5)	91/2561 (3·6)	0·99 (0·74–1·33)	0·97	
BMI (kg/m²)						
<25	2152	44/1067 (4·1)	50/1085 (4·6)	0·89 (0·59–1·33)	0·57	
25–35	4386	73/2205 (3·3)	82/2181 (3·8)	0·88 (0·64–1·20)	0·42	0·83
>35	454	7/219 (3·2)	6/235 (2·6)	1·24 (0·42–3·70)	0·70	
PCI in hospital						
No	2361	49/1196 (4·1)	49/1165 (4·2)	0·97 (0·65–1·44)	0·89	0·72
Yes	4660	79/2311 (3·4)	90/2349 (3·8)	0·89 (0·66–1·20)	0·45	
Radial PCI volume by operator						
≤70	2363	49/1164 (4·2)	46/1199 (3·8)	1·10 (0·74–1·65)	0·63	
71–142	2315	50/1158 (4·3)	57/1157 (4·9)	0·87 (0·60–1·27)	0·48	0·54
>142	2336	29/1182 (2·4)	36/1154 (3·1)	0·79 (0·48–1·28)	0·33	
Radial PCI volume by centre						
Lowest tertile	1920	33/958 (3·4)	40/962 (4·2)	0·83 (0·52–1·31)	0·42	
Middle tertile	2846	77/1420 (5·4)	63/1426 (4·4)	1·23 (0·88–1·72)	0·22	0·021
Highest tertile	2255	18/1129 (1·6)	36/1126 (3·2)	0·49 (0·28–0·87)	0·015	
Clinical diagnosis						
NSTE-ACS	5063	98/2552 (3·8)	87/2511 (3·5)	1·11 (0·83–1·48)	0·49	0·025
STEMI	1958	30/955 (3·1)	52/1003 (5·2)	0·60 (0·38–0·94)	0·026	
Overall	**7021**	**128/3507 (3·7)**	**139/3514 (4·0)**	**0·92 (0·72–1·17)**	**0·50**	



Lancet. 2011 Apr 23;377(9775):1409-20.

Radial Approach is Preferred

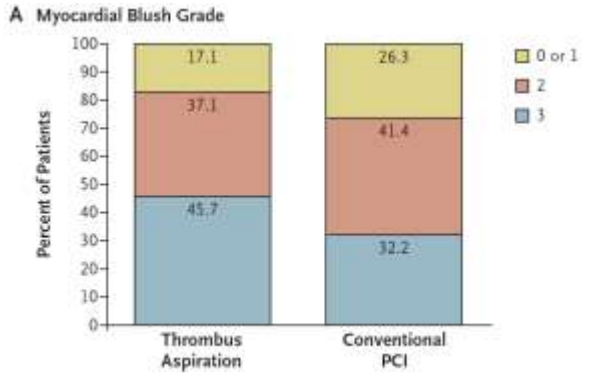
COR	LOE	RECOMMENDATIONS
1	A	1. In patients with ACS undergoing PCI, a radial approach is indicated in preference to a femoral approach to reduce the risk of death, vascular complications, or bleeding (1-4).
1	A	2. In patients with SIHD undergoing PCI, the radial approach is recommended to reduce access site bleeding and vascular complications (4-7).

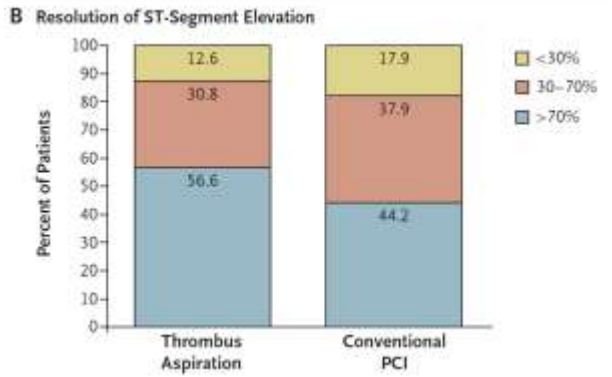
Radial access is recommended over femoral access if performed by an experienced radial operator.[143–145,180]

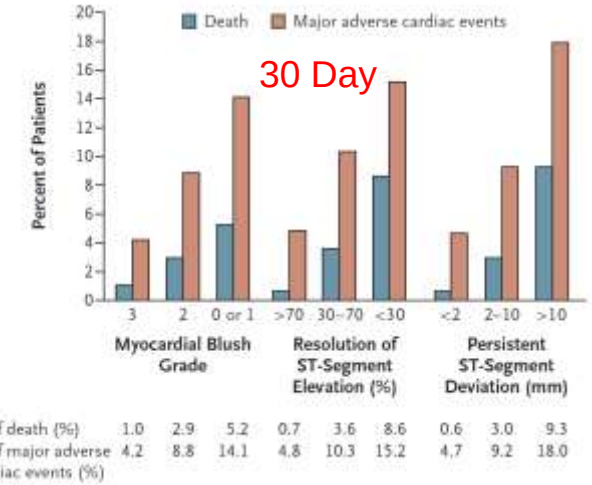
Circulation. 2022 Jan 18;145(3):e4-e17.

Eur Heart J. 2018 Jan 7;39(2):119-177.

TAPAS

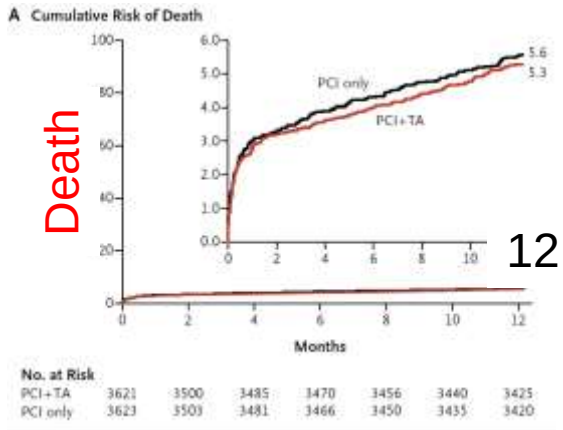




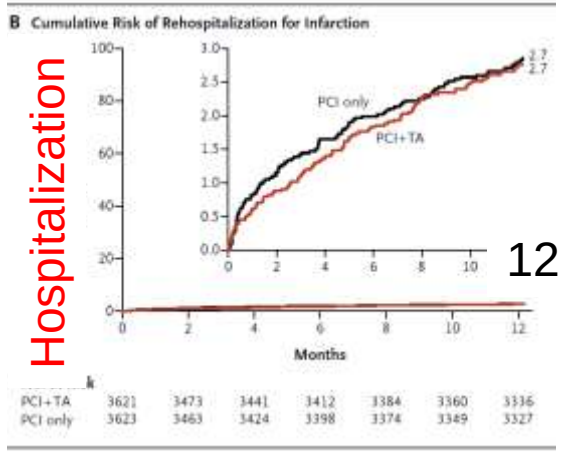


Rate of death (%)	1.0	2.9	5.2	0.7	3.6	8.6	0.6	3.0	9.3
Rate of major adverse cardiac events (%)	4.2	8.8	14.1	4.8	10.3	15.2	4.7	9.2	18.0

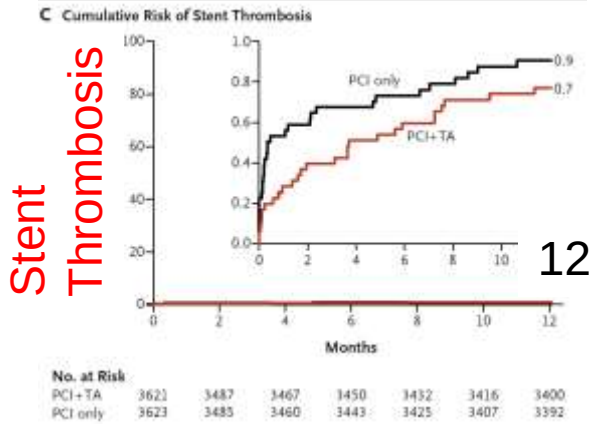
TASTE



12 mths

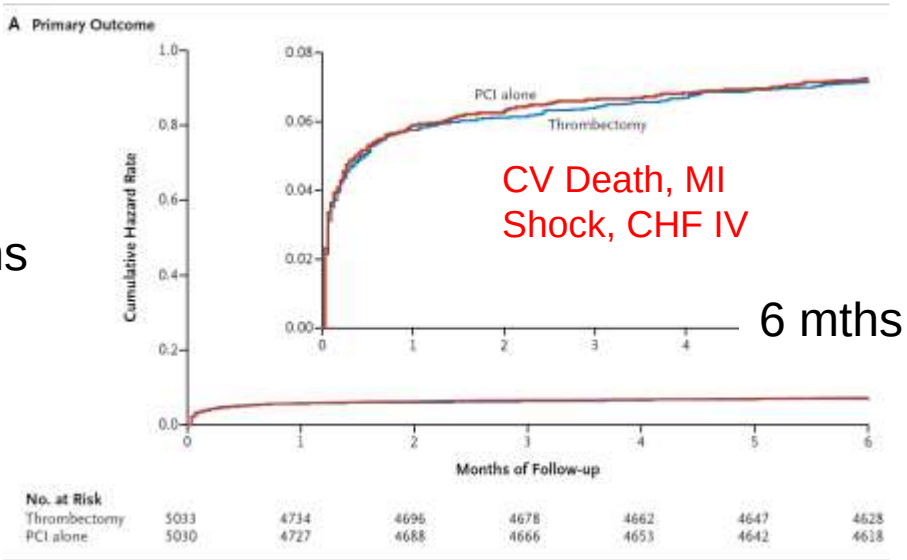


12 mths

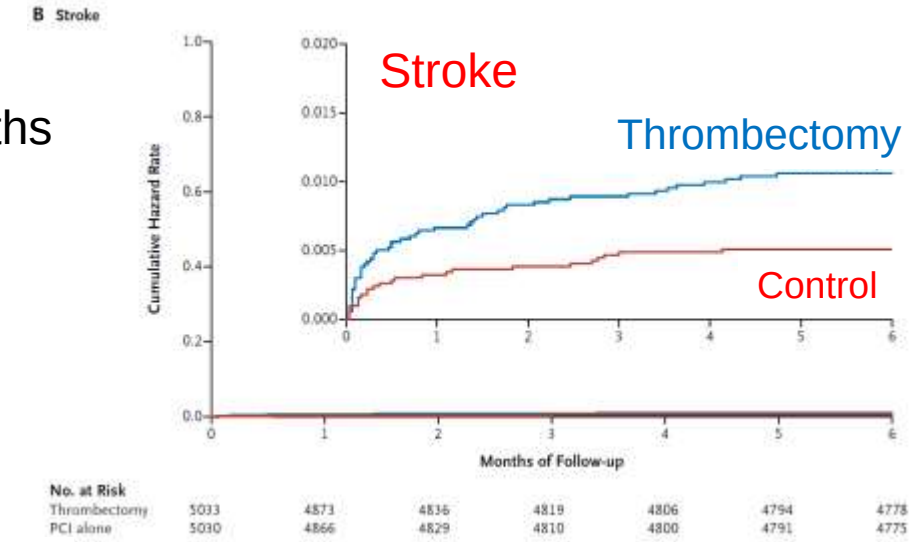


12 mths

TOTAL



6 mths



N Engl J Med. 2008 Feb 7;358(6):557-67.

N Engl J Med. 2014 Sep 18;371(12):1111-20.

N Engl J Med. 2015 Apr 9;372(15):1389-98.

2011/2013 Recommendation	2015 Focused Update Recommendations	Comments
Class IIa	***Class IIb***	
Manual aspiration thrombectomy is reasonable for patients undergoing primary PCI (29-32). (*Level of Evidence: B*)	The usefulness of selective and bailout aspiration thrombectomy in patients undergoing primary PCI is not well established (33-37). (*Level of Evidence: C-LD*)	Modified recommendation (Class changed from "IIa" to "IIb" for selective and bailout aspiration thrombectomy before PCI).
	Class III: No Benefit *Routine* aspiration thrombectomy before primary PCI is not useful (33-37). (*Level of Evidence: A*)	New recommendation ("Class III: No Benefit" added for *routine* aspiration thrombectomy before PCI).

PCI indicates percutaneous coronary intervention; and LD, limited data.

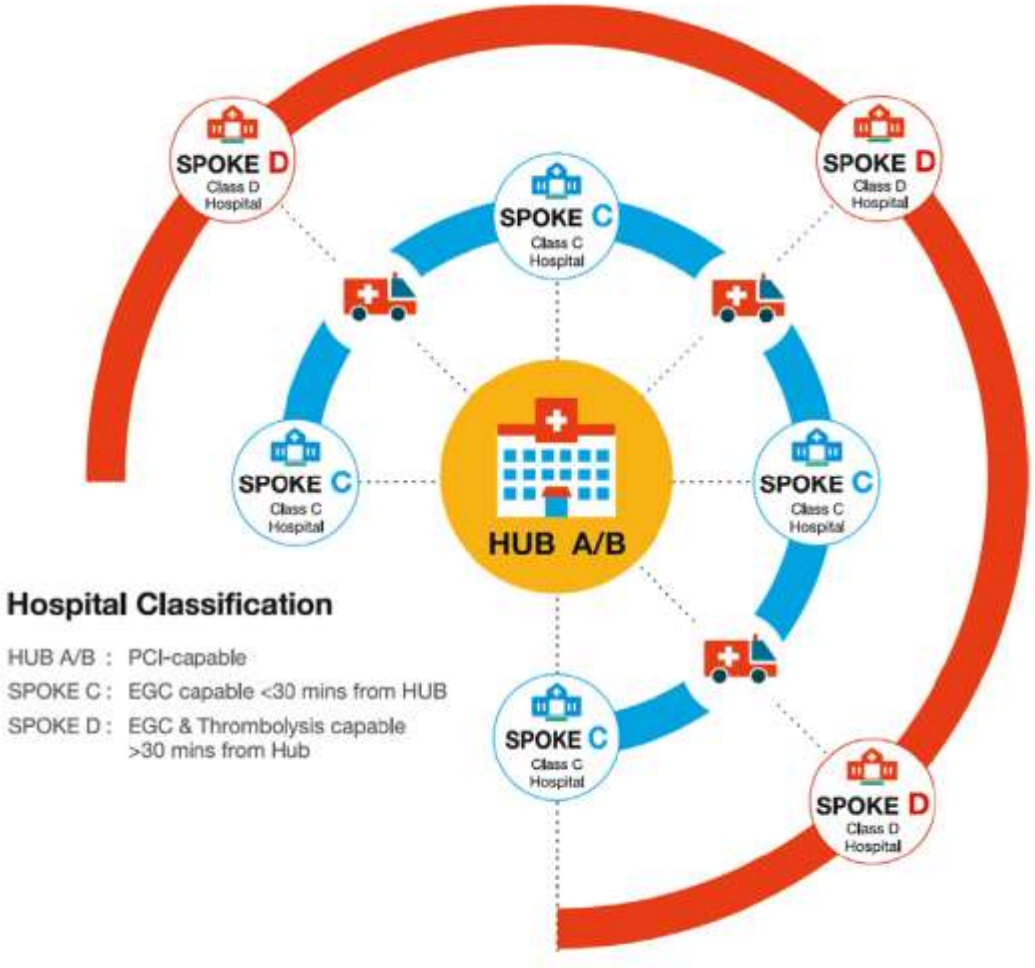
Routine use of thrombus aspiration is not recommended.[157,159]

Circulation. 2022 Jan 18;145(3):e4-e17.

Eur Heart J. 2018 Jan 7;39(2):119-177.

Systems for STEMI Care in India

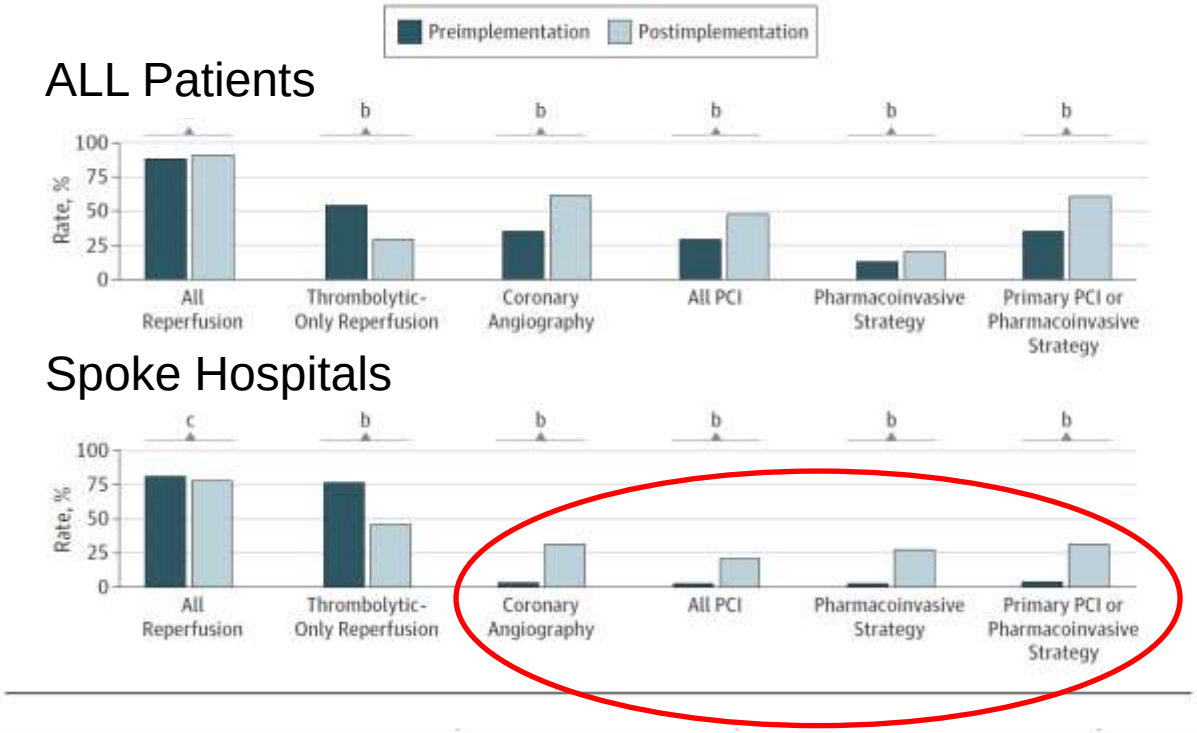
	2009	2010	2011	2012
Total no. of primary PCI	5584	14271	20541	21343
% of Total interventions	9.79%	12.15%	13.48%	12.04%



Hub A: 24/7 Primary PCI Capable
Hub B: PCI During Day
Spoke C: Within 30 Min of PCI Capable Hospital
Spoke D: More than 30 Min Away from PCI Capable Hospital

<table>
<tr><td></td><td colspan="3">Door to Needle < 30 min</td><td colspan="2">Pharmaco-invasive 3-24 hrs</td></tr>
<tr><td>Variable</td><td colspan="2">10 min</td><td>10 min</td><td colspan="2"></td></tr>
<tr><td rowspan="2">Onset of patient symptoms</td><td rowspan="2">Arrival of patient at hospital / ambulance</td><td rowspan="2">EGC</td><td>Lysis</td><td colspan="2"></td></tr>
<tr><td colspan="2">Transport to PCI capable Hospital</td><td>Cath Lab to Balloon</td></tr>
<tr><td>Variable</td><td colspan="2">10 min</td><td colspan="2">20-30 min</td><td>45-60 min</td></tr>
<tr><td></td><td colspan="5">Door to Balloon < 90 min</td></tr>
<tr><td colspan="6">Total Ischemia Time < 120 min</td></tr>
</table>

Indian Heart J. 2015 Sep-Oct;67(5):497-502.



Rates of reperfusion and PCI in all patients and those presenting to spoke hospitals in the preimplementation and postimplementation phases.

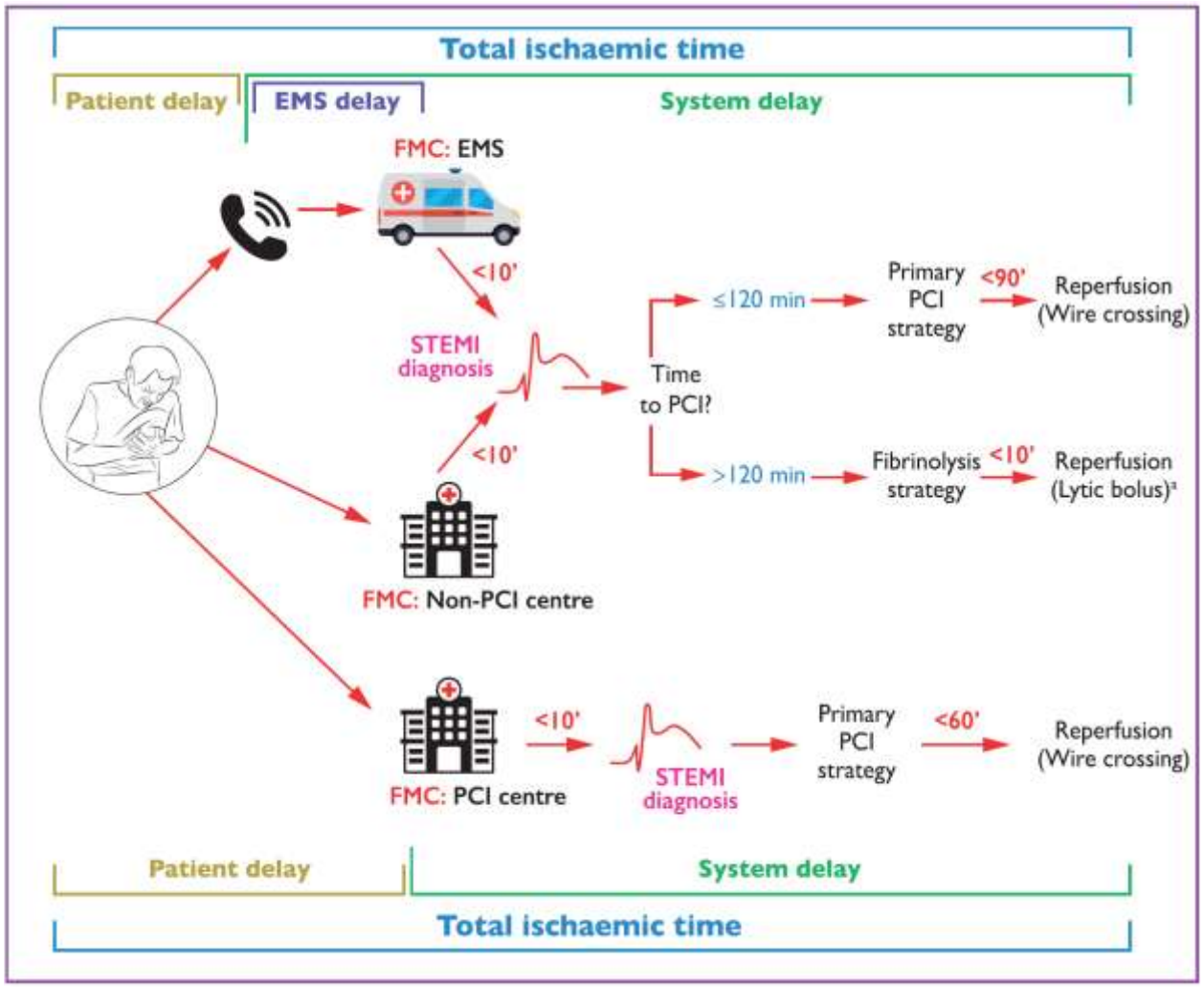
[a] $P = .21$.

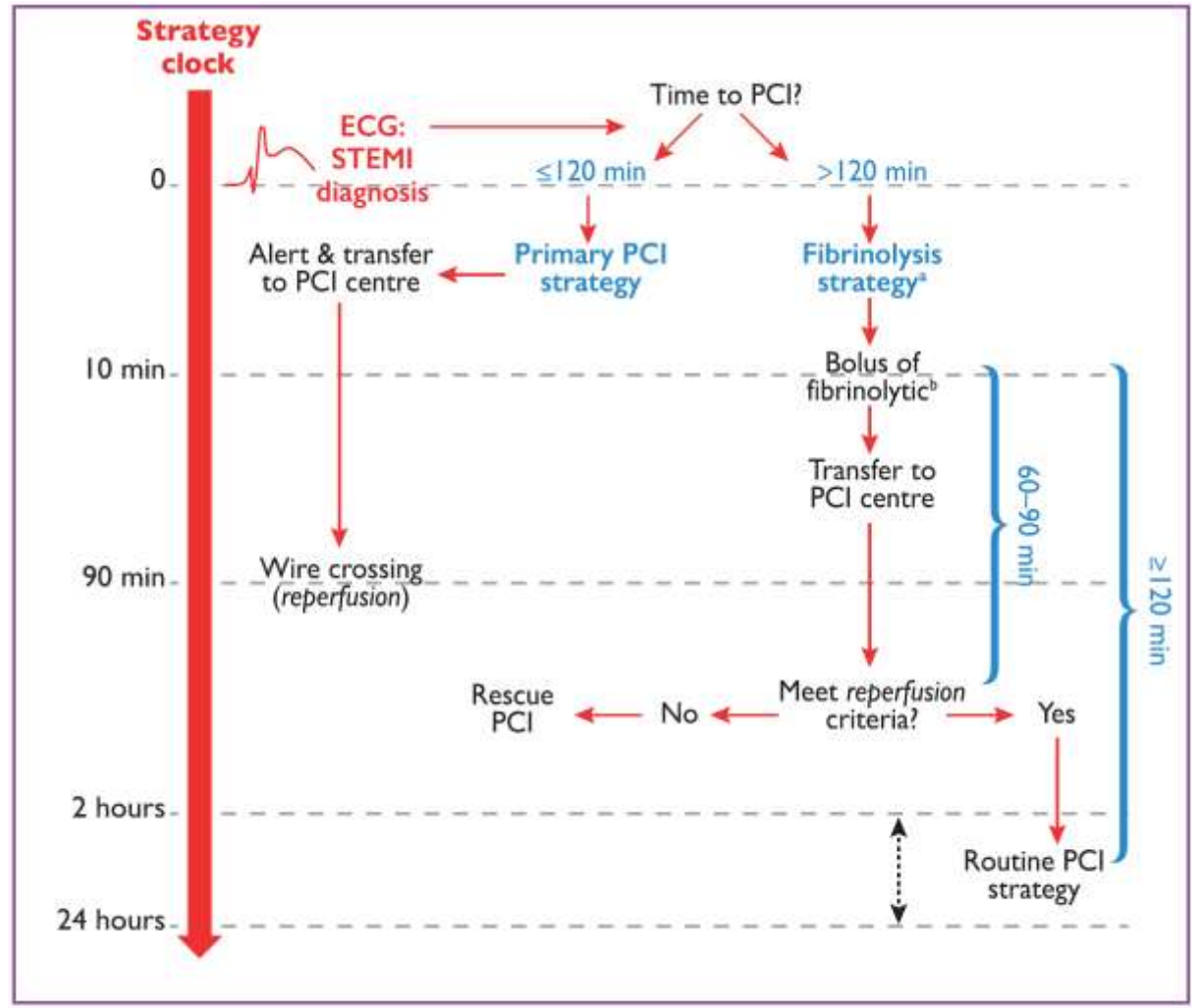
[b] $P < .001$.

[c] $P = .23$.

Outcome	Hub Hospitals, No. (%) (n = 1367)		Spoke Health Centers, No. (%) (n = 1053)		Overall, No. (%)		*P* Value
	Preimplementation Phase (n = 413)	Postimplementation Phase (n = 954)	Preimplementation Phase (n = 485)	Postimplementation Phase (n = 568)	Preimplementation Phase (n = 898)	Postimplementation Phase (n = 1522)	
In-hospital mortality (n = 2420)	15 (3.6)	49 (5.1)	37 (7.6)	36 (6.3)	52 (5.8)	85 (5.6)	.83
Stroke (n = 2420)	1 (0.2)	1 (0.1)	3 (0.6)	2 (0.4)	4 (0.5)	3 (0.2)	.27
Cardiogenic shock (n = 2420)	8 (1.9)	23 (2.4)	27 (5.6)	26 (4.6)	35 (3.9)	49 (3.2)	.38
Symptomatic ischemia (n = 2420)	1 (0.2)	6 (0.6)	15 (3.1)	10 (1.8)	16 (1.8)	16 (1.1)	.13
1-Year mortality (n = 2020)	48 (13.3)	100 (12.1)	86 (21.5)	79 (18.2)	134 (17.6)	179 (14.2)	.04

JAMA Cardiol. 2017;2(5):498-505.



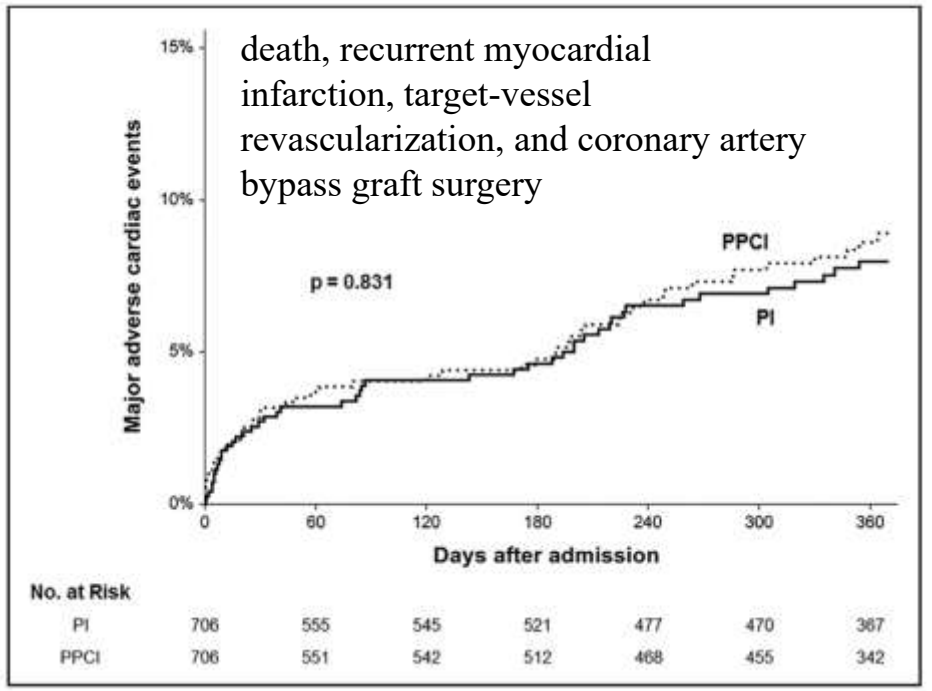


Eur Heart J. 2018 Jan 7;39(2):119-177.

Observational Study: Pharmacoinvasive Strategy in Real Life

	All Patients			Propensity-Matched Patients		
	PI (n=708)	PPCI (n=8878)	*P* Value	PI (n=706)	PPCI (n=706)	*P* Value
Symptom to first medical contact, min	60 (30–132)	80 (30–222)	<0.001	60 (30–132)	60 (30–150)	0.965
Symptom to start of reperfusion therapy, min	165 (92–281)	255 (158–464)	<0.001	165 (92–283)	241 (160–378)	<0.001
First medical contact to start of reperfusion therapy, min	80 (30–145)	132 (77–220)	<0.001	80 (30–145)	145 (88–235)	<0.001
Door to balloon, h	40.1 (8.7–75.9)	1.2 (0.9–1.7)	<0.001	40.1 (8.7–75.8)	1.3 (1.0–1.9)	<0.001
PCI-related delay, min					105 (51–215)	

	All Patients			Propensity-Matched Patients		
	PI (n=708)	PPCI (n=8878)	*P* Value	PI (n=706)	PPCI (n=706)	*P* Value
Fibrinolytic agent						
Tenecteplase	364 (51.4)	NA		364 (51.6)	NA	
Alteplase	290 (41.0)	NA		288 (40.8)	NA	
Urokinase	54 (7.6)	NA		54 (7.6)	NA	
Rescue PCI after fibrinolysis	271 (38.3)	NA		271 (38.4)	NA	
Urgent PCI after fibrinolysis	56 (7.9)	NA		56 (7.9)	NA	
Elective PCI after fibrinolysis	381 (53.8)	NA		379 (53.7)	NA	



Circ Cardiovasc Interv. 2016 Sep;9(9):e003508

Adjuvant Therapy

Fibrinolytic therapy

Recommendations	Class[a]	Level[b]
When fibrinolysis is the reperfusion strategy, it is recommended to initiate this treatment as soon as possible after STEMI diagnosis, preferably in the pre-hospital setting.[96,98,123,222]	I	A
A fibrin-specific agent (i.e. tenecteplase, alteplase, or reteplase) is recommended.[223,224]	I	B
A half-dose of tenecteplase should be considered in patients ≥75 years of age.[121]	IIa	B
Antiplatelet co-therapy with fibrinolysis		
Oral or i.v. aspirin is indicated.[213]	I	B
Clopidogrel is indicated in addition to aspirin.[225,226]	I	A
DAPT (in the form of aspirin plus a $P2Y_{12}$ inhibitor[c]) is indicated for up to 1 year in patients undergoing fibrinolysis and subsequent PCI.	I	C
Anticoagulation co-therapy with fibrinolysis		
Anticoagulation is recommended in patients treated with lytics until revascularization (if performed) or for the duration of hospital stay up to 8 days.[199,224,227–233] The anticoagulant can be:	I	A
• Enoxaparin i.v. followed by s.c. (preferred over UFH).[227–232]	I	A
• UFH given as a weight-adjusted i.v. bolus followed by infusion.[224]	I	B
• In patients treated with streptokinase: fondaparinux i.v. bolus followed by an s.c. dose 24 h later.[199,233]	IIa	B
Transfer after fibrinolysis		
Transfer to a PCI-capable centre following fibrinolysis is indicated in all patients immediately after fibrinolysis.[121,124,126–130,234]	I	A
Interventions following fibrinolysis		
Emergency angiography and PCI if indicated is recommended in patients with heart failure/shock.[124, 235]	I	A
Rescue PCI is indicated immediately when fibrinolysis has failed (<50% ST-segment resolution at 60–90 min) or at any time in the presence of haemodynamic or electrical instability, or worsening ischaemia.[121,124,236]	I	A
Angiography and PCI of the IRA, if indicated, is recommended between 2 and 24 h after successful fibrinolysis.[125–128,234]	I	A
Emergency angiography and PCI if needed is indicated in the case of recurrent ischaemia or evidence of reocclusion after initial successful fibrinolysis.[124]	I	B

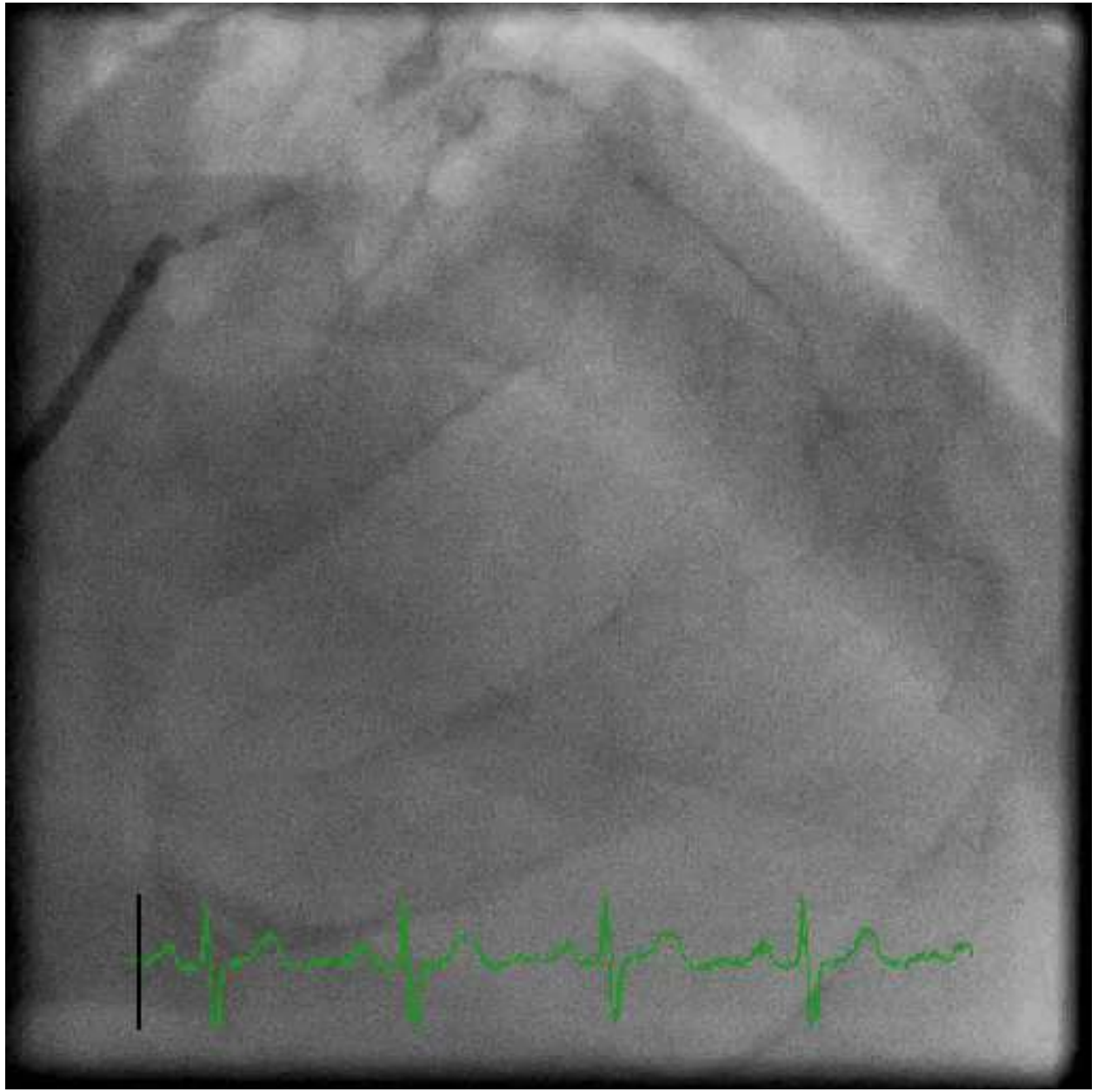
DAPT = dual antiplatelet therapy; IRA = infarct-related artery; i.v. = intravenous; PCI = percutaneous coronary intervention; SBP = systolic blood pressure; s.c. = subcutaneous; STEMI = ST-segment elevation myocardial infarction; UFH = unfractionated heparin.
[a]Class of recommendation.
[b]Level of evidence.
[c]Clopidogrel is the $P2Y_{12}$ inhibitor of choice as co-adjuvant and after fibrinolysis, but 48 h after fibrinolysis, switch to prasugrel/ticagrelor may be considered in patients who underwent PCI.

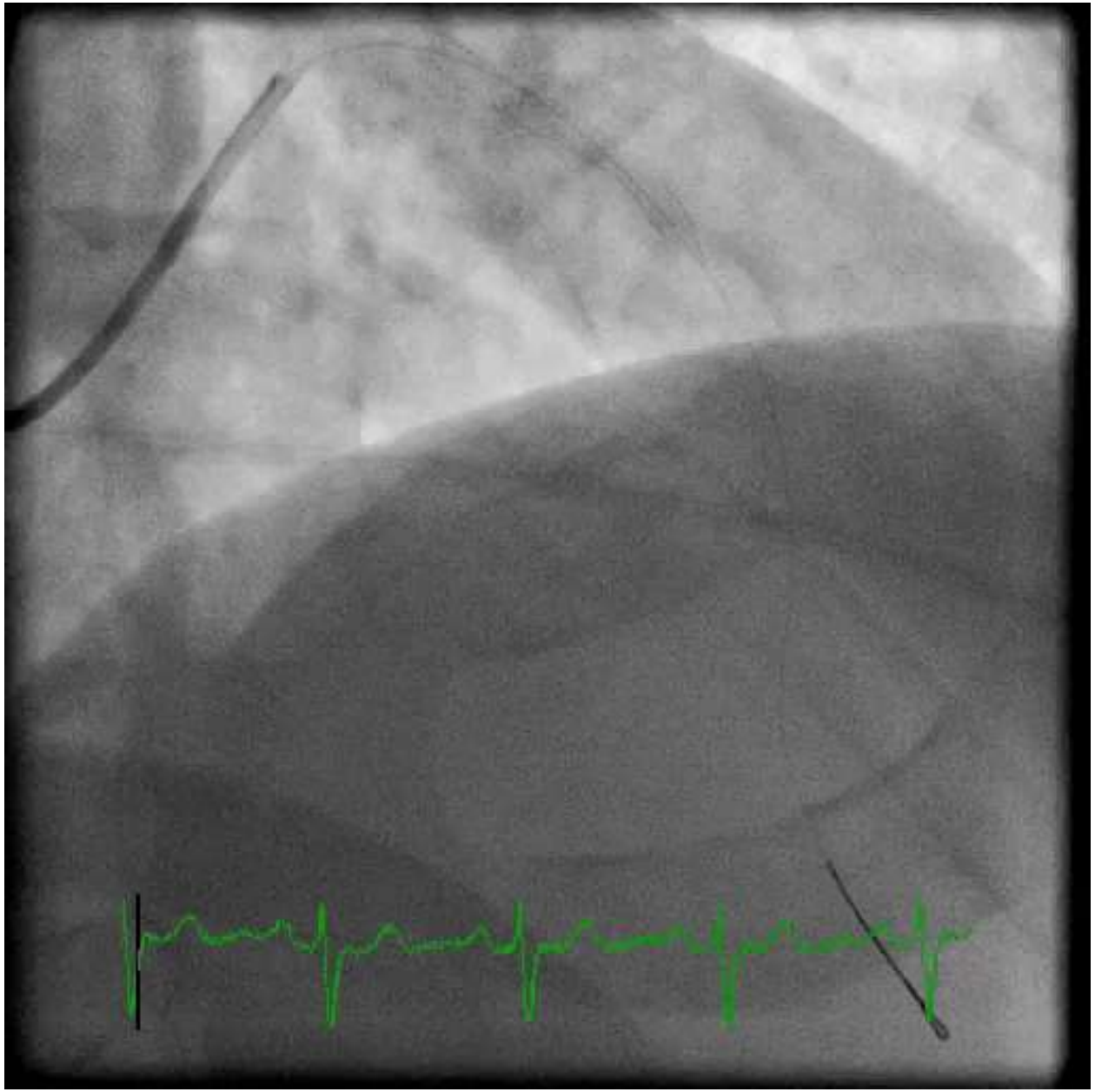
	COR	LOE	References
Antiplatelet therapy			
Aspirin			
• 162- to 325-mg loading dose	I	A	(308,330,331)
• 81- to 325-mg daily maintenance dose (indefinite)	I	A	(308,330,331)
• 81 mg daily is the preferred maintenance dose	IIa	B	(254,257,263,264)
$P2Y_{12}$ receptor inhibitors			
• Clopidogrel:	I	A	(330,331)
• Age ≤75 y: 300-mg loading dose			
• Followed by 75 mg daily for at least 14 d and up to 1 y in absence of bleeding	I	A (14 d)	(330,331)
		C (up to 1 y)	N/A
• Age >75 y: no loading dose, give 75 mg	I	A	(330,331)
• Followed by 75 mg daily for at least 14 d and up to 1 y in absence of bleeding	I	A (14 d)	(330,331)
		C (up to 1 y)	N/A
Anticoagulant therapy			
• UFH:	I	C	N/A
• Weight-based IV bolus and infusion adjusted to obtain aPTT of 1.5 to 2.0 times control for 48 h or until revascularization. IV bolus of 60 U/kg (maximum 4000 U) followed by an infusion of 12 U/kg/h (maximum 1000 U) initially, adjusted to maintain aPTT at 1.5 to 2.0 times control (approximately 50 to 70 s) for 48 h or until revascularization			
• Enoxaparin:	I	A	(332–335)
• If age <75 y: 30-mg IV bolus, followed in 15 min by 1 mg/kg subcutaneously every 12 h (maximum 100 mg for the first 2 doses)			
• If age ≥75 y: no bolus, 0.75 mg/kg subcutaneously every 12 h (maximum 75 mg for the first 2 doses)			
• Regardless of age, if CrCl <30 mL/min: 1 mg/kg subcutaneously every 24 h			
• Duration: For the index hospitalization, up to 8 d or until revascularization			
• Fondaparinux:	I	B	(304)
• Initial dose 2.5 mg IV, then 2.5 mg subcutaneously daily starting the following day, for the index hospitalization up to 8 d or until revascularization			
• Contraindicated if CrCl <30 mL/min			

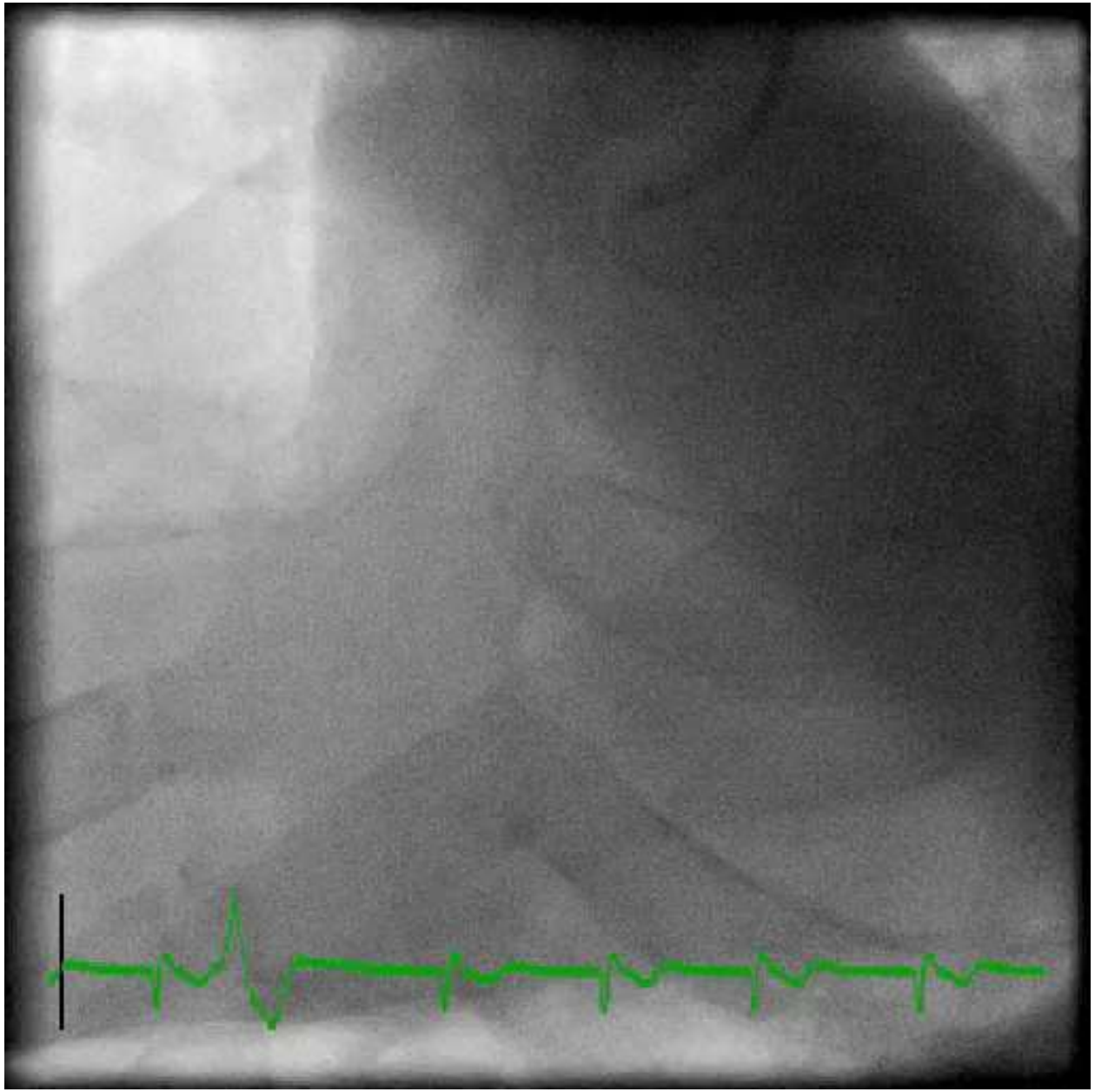
aPTT indicates activated partial thromboplastin time; COR, Class of Recommendation; CrCl, creatinine clearance; IV, intravenous; LOE, Level of Evidence; N/A, not available; and UFH, unfractionated heparin.

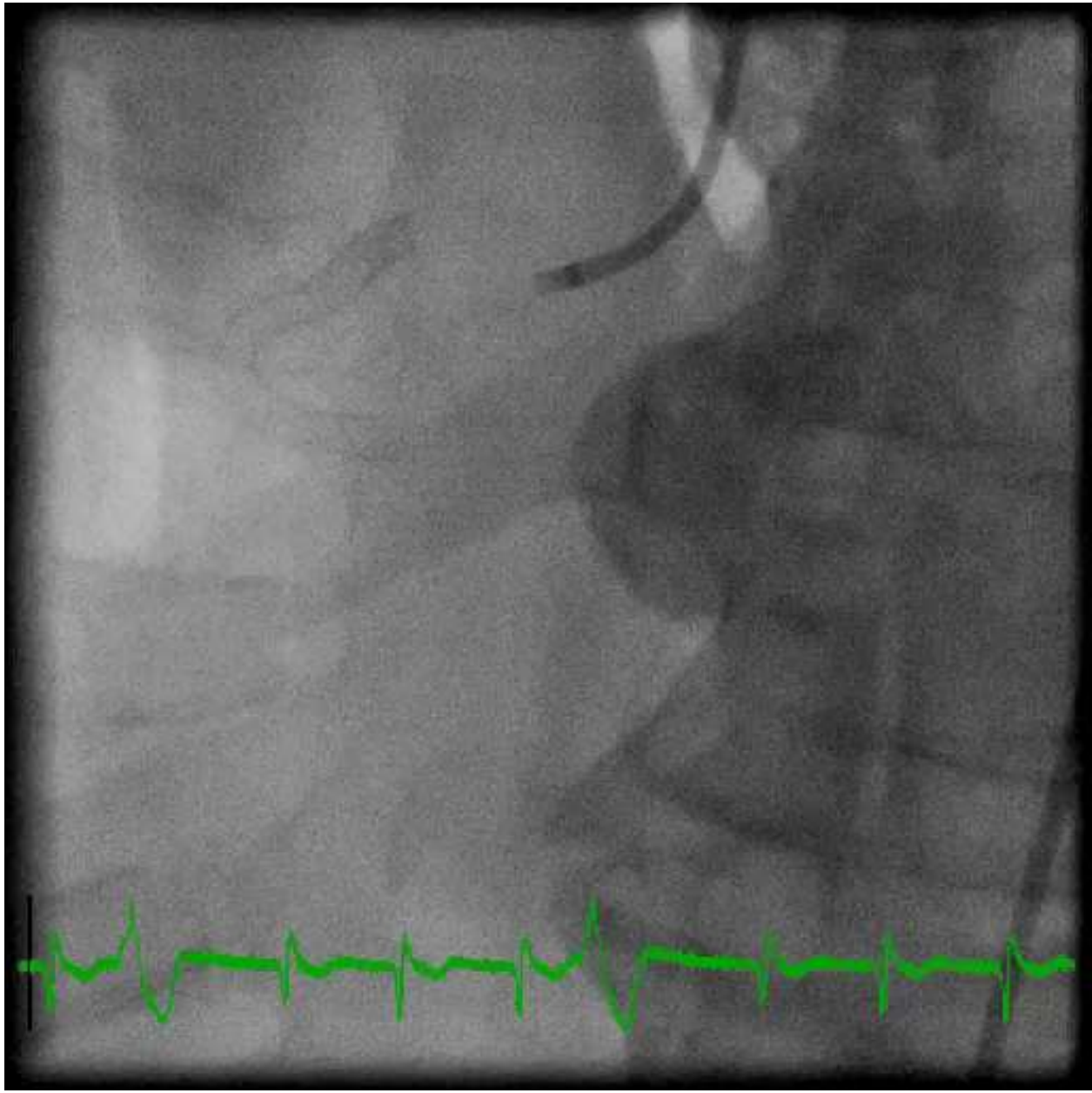
Eur Heart J. 2018 Jan 7;39(2):119-177.

Circulation. 2013 Jan 29;127(4):e362-425.









Echo: LVEF 46%
LDL: 184

Medications on Discharge
Atorvastatin 80
Zetia 10
Losartan 25
Spironolactone 25
Aspirin 81mg
Ticagrelor 90 bid

Questions

The following is true about PCI of non-culprit lesions in patient presenting with STEMI

A. Non-culprit lesions should always be treated during the index procedure

B. Non-culprit lesions should be treated in patients presenting with shock to improve LV Function

C. Non-culprit lesion PCI in an appropriate setting has a Class IIA indication

D. Treating non-culprit lesions in patient with cardiogenic improves LVEF

E. Non-culprit lesion PCI can be performed during the index procedure

The following is true about thrombolysis

A. Lytics can be given in patients with very high risk NSTEMI because of high clot burden

B. Thrombolysis in is contraindicated in patients aged over 80.

C. Administration of lytic is relatively contraindicated in women undergoing menstration

D. Loading dose of clopidogrel should always be given after thrombolytics

E. Patients should undergo angiography immediately after lytic therapy

When using triple, use Plavix
Limit duration to 30 days
PPI

1. priorAF on anticoagulation and the need for PCI
2. new-onset AF requiringanticoagulation in a patient already on antiplatelet therapy for coronary arterydisease (CAD)
3. prior VTE on anticoagulation and the need for PCI
4. new or recurrent VTE requiring anticoagulation in a patient already onantiplatelet therapy for CAD.