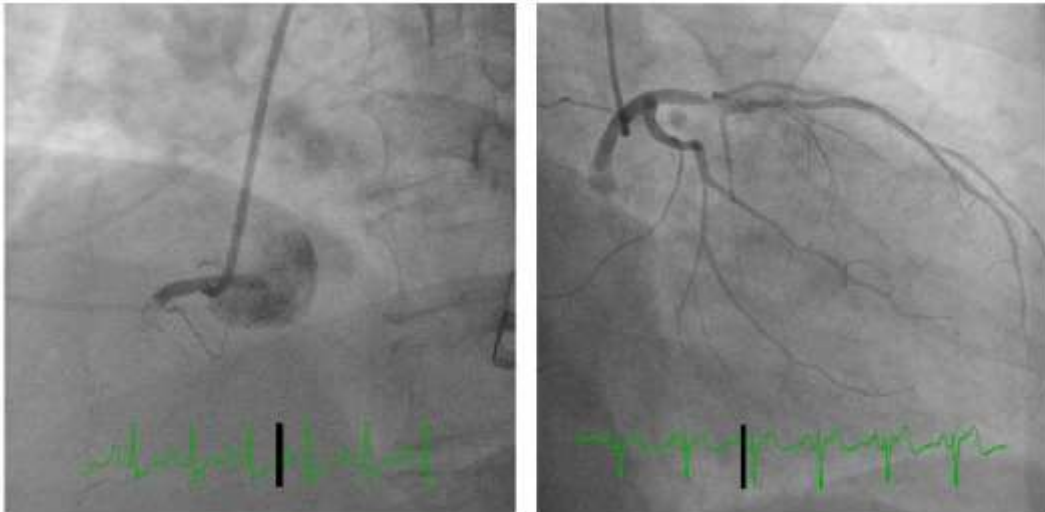


# Complete Revascularization of **STABLE** patients in Acute MI

Mpiko Ntsekhe MD PhD FACC  
University of Cape Town  
&  
Groote Schuur Hospital



- 40-60% of pts with STEMI have multi-vessel disease
- Most had no preceding angina

## **Multivessel coronary artery disease: A key predictor of short-term prognosis after reperfusion therapy for acute myocardial infarction**

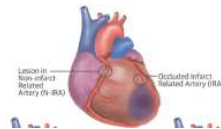
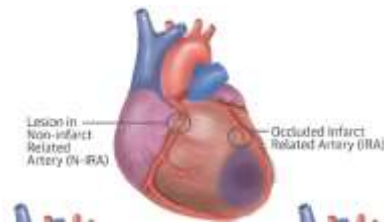
Muller et al Am Heart J 1991;121:1042

Compared to those with STEMI who only have single vessel disease outcomes are worse.....

- non fatal re-infarction
- CVD related mortality
- All cause mortality

Whether this is simply a reflection of burden of disease or because other disease remained untreated is not clear

Multi-vessel PCI for **acute MI** has been an attractive proposition since PPCI .....



### PROS

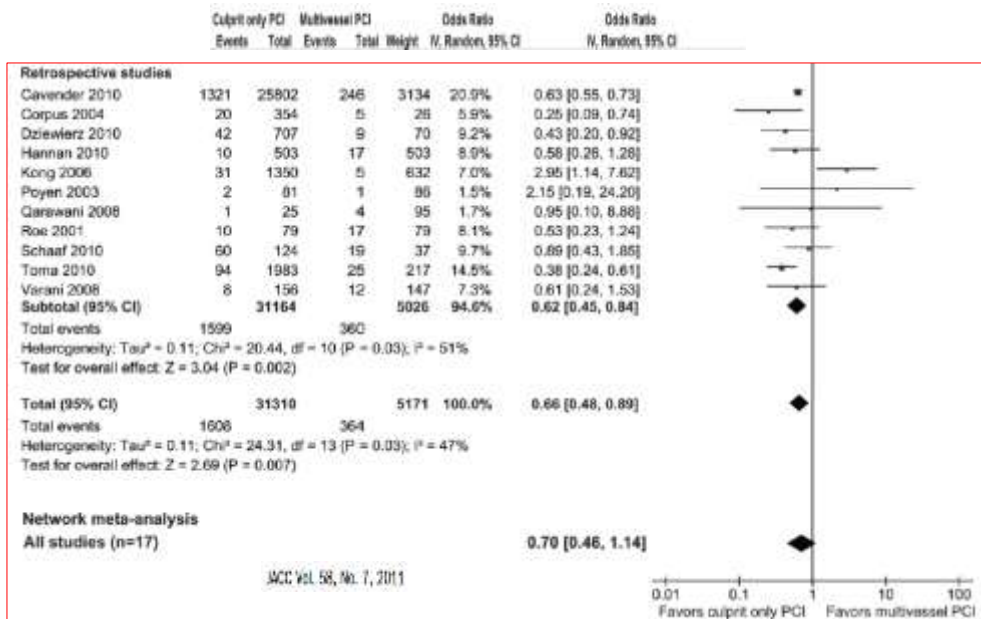
- Reduce short and long term MACE
- Reduce watershed ischemia % improve LVEF
- Cost

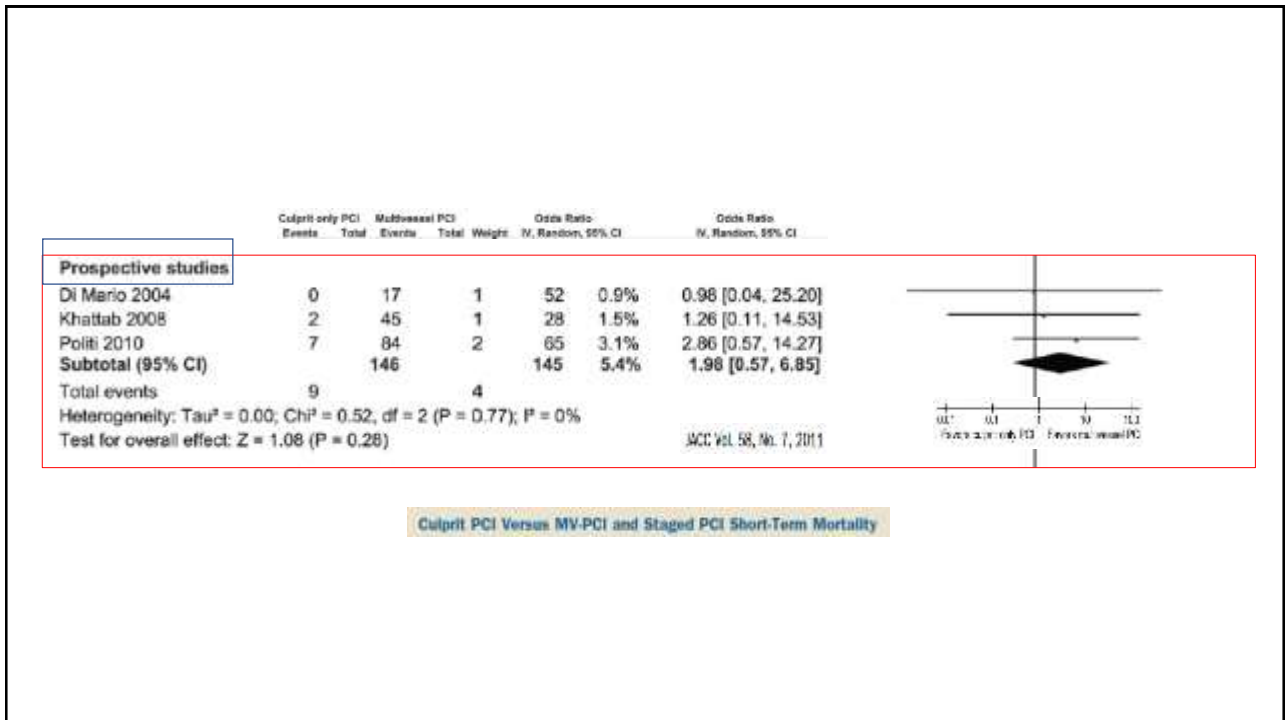
### CONS

- Increased Contrast Induced Nephropathy (9-fold increase is mortality risk)
- Ischemia to and compromise of stable non-culprit territory
- Absence of knowledge about comorbidities, bleeding risk planned procedures (DAPT)

**Table 11 Primary PCI: indications and procedural aspects**

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
<b>Indications for primary PCI</b>			
Primary PCI is the recommended reperfusion therapy over fibrinolysis if performed by an experienced team within 120 min of FMC.	I	A	69, 99
Primary PCI is indicated for patients with severe acute heart failure or cardiogenic shock, unless the expected PCI related delay is excessive and the patient presents early after symptom onset.	I	B	100
<b>Procedural aspects of primary PCI</b>			
Stenting is recommended (over balloon angioplasty alone) for primary PCI.	I	A	101, 102
Primary PCI should be limited to the culprit vessel with the exception of cardiogenic shock and persistent ischaemia after PCI of the supposed culprit lesion.	IIa	B	75, 103–105

**Culprit PCI Versus MV-PCI and Staged PCI Short-Term Mortality**

**Culprit PCI Versus MV-PCI and Staged PCI Short-Term Mortality**



Culprit PCI Versus MV-PCI and Staged PCI Short-Term Mortality

## ORIGINAL ARTICLE

## Randomized Trial of Preventive Angioplasty in Myocardial Infarction

David S. Wald, M.D., Joan K. Morris, Ph.D., Nicholas J. Wald, F.R.S., Alexander J. Chase, M.B., B.S., Ph.D., Richard J. Edwards, M.D., Liam O. Hughes, M.D., Colin Berry, M.B., Ch.B., Ph.D., and Keith G. Oldroyd, M.D., for the PRAMI Investigators\*

## ORIGINAL ARTICLE

## Fractional Flow Reserve–Guided Multivessel Angioplasty in Myocardial Infarction

Peter C. Smits, M.D., Ph.D., Mohamed Abdel-Wahab, M.D., Franz-Josef Neumann, M.D., Bianca M. Boxxma-de Klerk, Ph.D., Ketil Lunde, M.D., Carl E. Schotborgh, M.D., Zsolt Piroth, M.D., David Horak, M.D., Adrian Wlodarczak, M.D., Paul J. Ong, M.D., Rainer Hambrecht, M.D., Oskar Angerås, M.D., Gert Richardt, M.D., Ph.D., and Elmira Omerovic, M.D., for the Compare-Acute Investigators\*

**Complete revascularisation versus treatment of the culprit lesion only in patients with ST-segment elevation myocardial infarction and multivessel disease (DANAMI-3—PRIMULTI): an open-label, randomised controlled trial**

**Fractional Flow Reserve–Guided Complete Revascularization Improves the Prognosis in Patients With ST-Segment–Elevation Myocardial Infarction and Severe Nonculprit Disease**  
A DANAMI 3-PRIMULTI Substudy (Primary PCI in Patients With ST-Elevation Myocardial Infarction and Multivessel Disease: Treatment of Culprit Lesion Only or Complete Revascularization)

**Randomized Trial of Complete Versus Lesion-Only Revascularization in Patients Undergoing Primary Percutaneous Coronary Intervention for STEMI and Multivessel Disease**



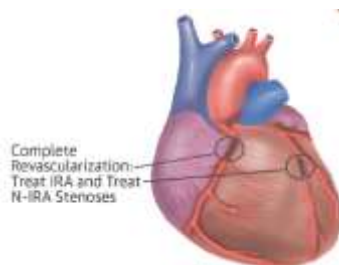
(J Am Coll Cardiol 2015;65:963-72)

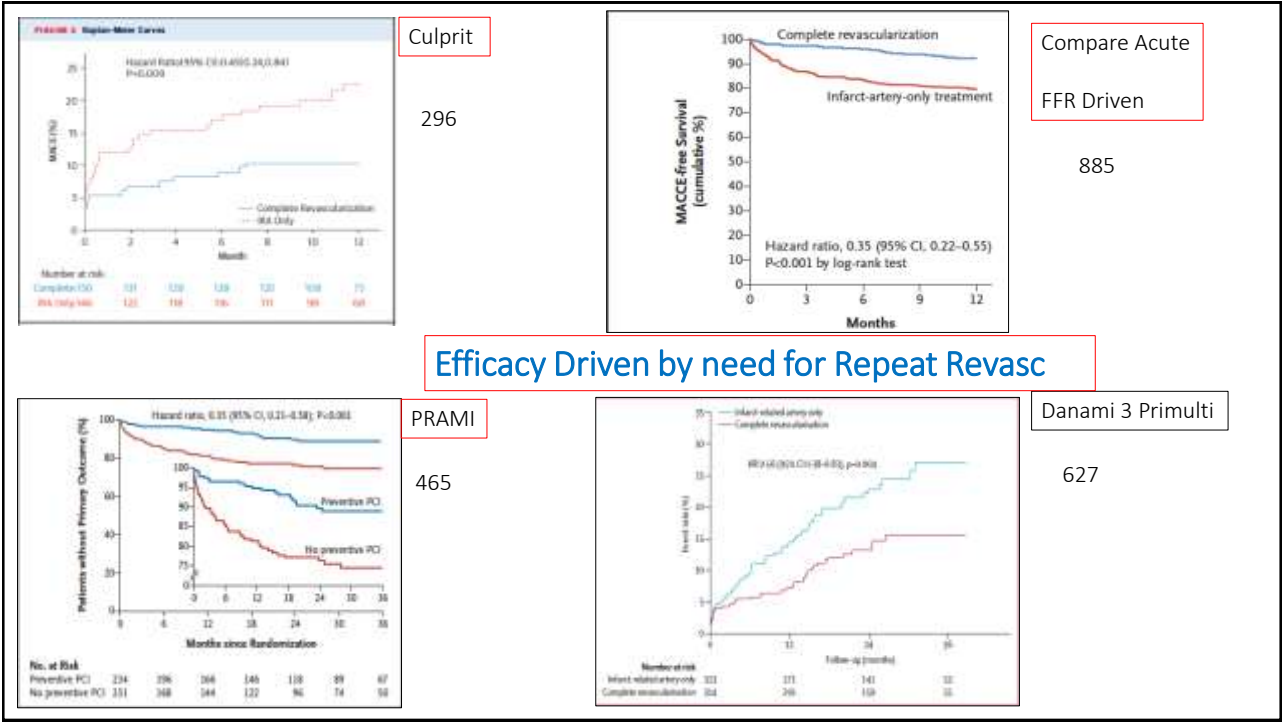
The CvLPRIT Trial

## 3 important questions

1. Does multi-vessel PCI for STEMI improve short and long term MACE compared to culprit only PCI
2. What should the timing of any multi-vessel PCI be?
  - Symptom or Ischemia Driven
  - During Index procedure
  - Prior to discharge
3. How should the non-culprit lesions/vessels be evaluated and selected for PCI

Does multi-vessel PCI for STEMI improve short and long term MACE compared to **culprit only PCI**





Culprit

296

Compare Acute  
FFR Driven

885

Efficacy Driven by need for Repeat Revasc

PRAMI

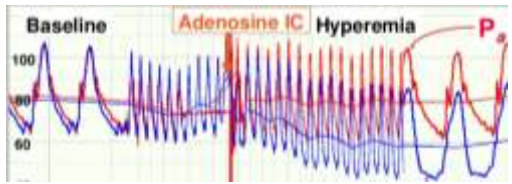
465

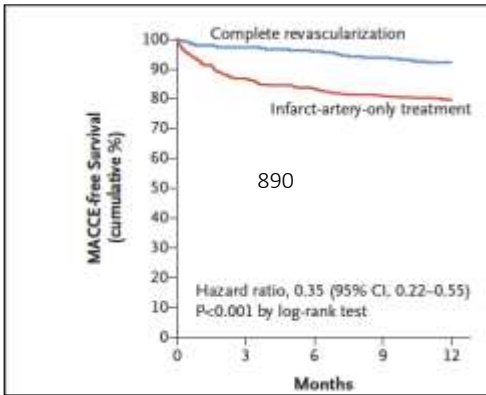
Danami 3 Primulti

627

How should the non-culprit lesions/vessels be evaluated and selected for PCI

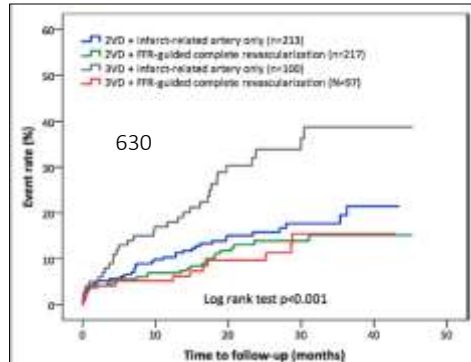
- Angiographically? Potential for over-diagnosis?
- FFR/iFR driven ? How good in acute setting?





Compare Acute  
FFR Driven

Efficacy Driven by need for Repeat Revasc

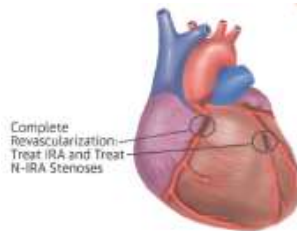


Danami 3 Primulti  
FFR substudy

Only in those with  
3 vessel disease

What should the timing of any multi-vessel PCI be?

- During Index procedure?
- Prior to discharge ?





## TIMING of NON IRA PCI

PCI of the NON IRA was performed during the index procedure in 2 trials  
(PRAMI & COMPARE MI)

- None of the trials reduced total mortality
- Only PRAMI reduce non-fatal MI but numbers were small

• All of the studies have been underpowered to answer any of the questions definitively

• Repeat revascularization>>>MI>>>>Death

- Exclusion Criteria
  - Abnormal renal function
  - CTO
  - Left main
  - Elderly
  - Hemodynamically unstable

# HOW HAVE THE GUIDELINES CHANGED?

## CHANGE IN RECOMMENDATIONS 2012 2017

<b>Radial access<sup>a</sup></b> MATRIX <sup>153</sup>	
<b>DES over BMS</b> EXAMINATION <sup>158,151</sup> COMFORTABLE-AMI <sup>160</sup> , NORSTENT <sup>155</sup>	
<b>Complete Revascularization<sup>b</sup></b> PRAMI <sup>166</sup> , DANAMI-3-PRIMULTI <sup>170</sup> , CYLPRIT <sup>167</sup> , Compare-Acute <sup>171</sup>	
<b>Thrombus Aspiration<sup>c</sup></b> TOTAL <sup>159</sup> , TASTE <sup>157</sup>	
<b>Bivalirudin</b> MATRIX <sup>159</sup> , HEAT-PPCI <sup>155</sup>	
<b>Enoxaparin</b> ATOLL <sup>200,201</sup> , Meta-analysis <sup>202</sup>	
<b>Early Hospital Discharge<sup>d</sup></b> Small trials & observational data <sup>219–242</sup>	
Oxygen when SaO <sub>2</sub> <95% AVOID <sup>164</sup> , DETO2X <sup>164</sup>	Oxygen when SaO <sub>2</sub> <90% STREAM <sup>221</sup>
Dose i.V. TNK-tPA same in all patients	Dose i.V. TNK-tPA half in Pts ≥75 years



European Heart Journal (2018) 39, 119–177  
doi:10.1093/eurheartj/ehy393

ESC GUIDELINES

2018

## Procedural aspects of the primary percutaneous coronary intervention strategy

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>
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### Non-IRA strategy

Routine revascularization of non-IRA lesions should be considered in STEMI patients with multivessel disease before hospital discharge.<sup>167–173</sup>

**IIa**

**A**

European Heart Journal (2018) 39, 119–177

## Summary and conclusions

The evidence of MV PCI in Stable patients with STEMI growing but not compelling

To date only need for **repeat REVASC** is reduced

### A PRUDENT INDIVIDUALIZED APPROACH BEST

- What is risk of Contrast Nephropathy and AKI
- What is bleeding risk?
- Is a non-cardiac procedure planned for near future?
- What is the complexity of the anatomy?
- Is it the middle of the night and am I tired?
- Are there significant co-morbidities such as Diabetes?

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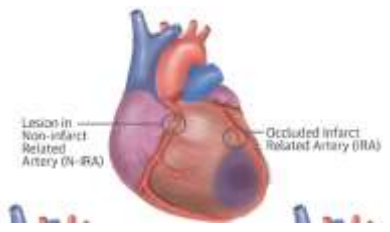
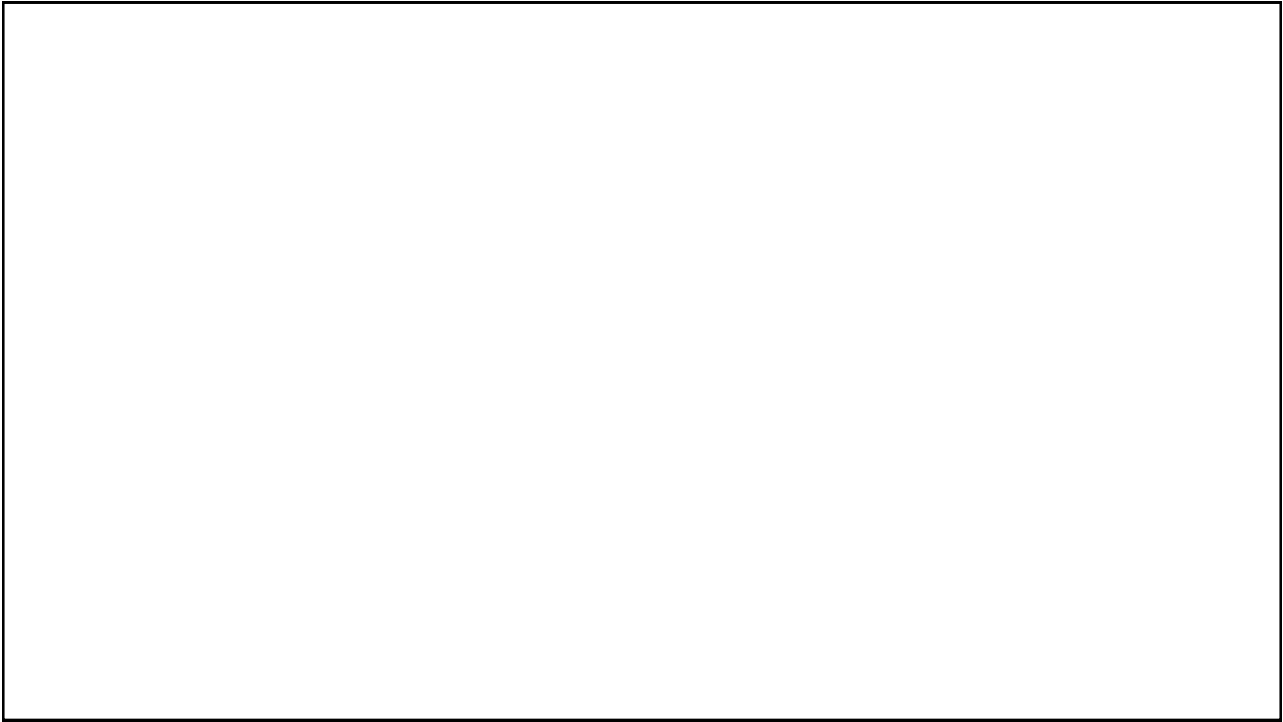


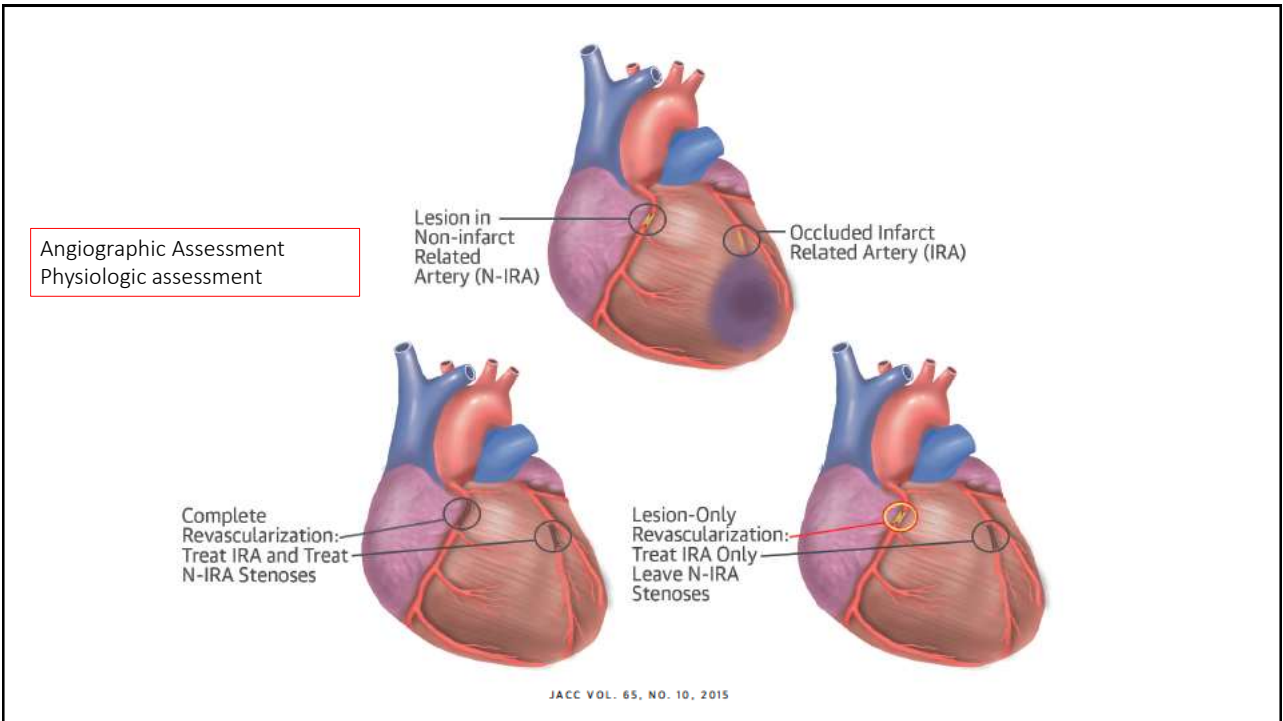
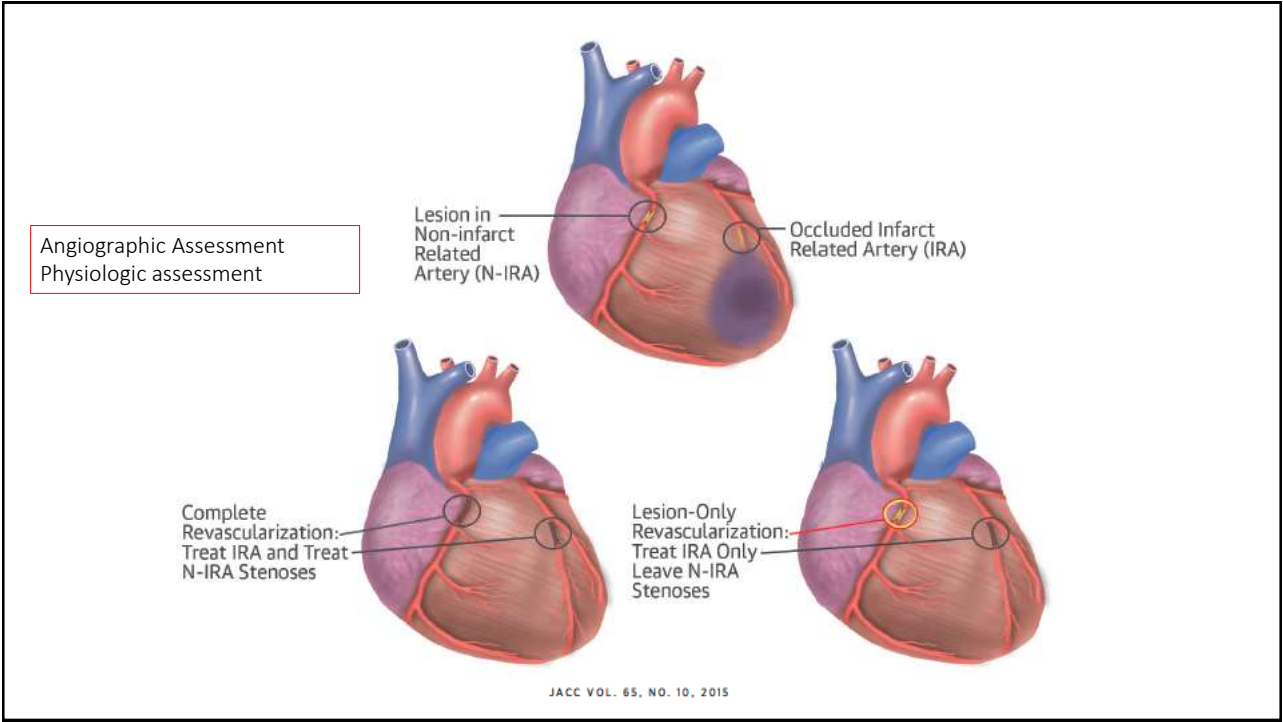
### **AfricaPCR 2018**



**A Course By and For the African cardiovascular community**

*A collaborative initiative of PCR, SASCI, SA Heart and PASCAR*





## **Complete Immediate Revascularization of the Patient With ST-Segment–Elevation Myocardial Infarction Is the New Standard of Care**

*Circulation. 2017;135:1571–1573.*

## **Not So Fast**

**Complete Revascularization of the ST-Segment–Elevation Myocardial Infarction Patient Is Not Yet Proven**

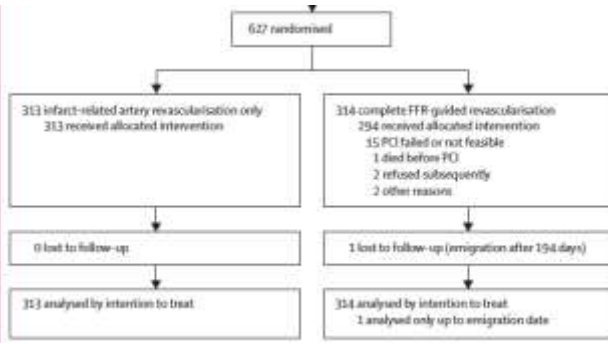
*Circulation. 2017;135:1574–1576.*

## **Complete revascularisation versus treatment of the culprit lesion only in patients with ST-segment elevation myocardial infarction and multivessel disease (DANAMI-3—PRIMULTI): an open-label, randomised controlled trial**

*Thomas Engstrøm, Henning Kelbæk, Steffen Helqvist, Dan Eik Høfsten, Lene Kløvgaard, Lene Holmvang, Erik Jørgensen, Frants Pedersen, Kari Saunamäki, Peter Clemmensen, Ole De Backer, Jan Ravkilde, Hans-Henrik Tilsted, Anton Boel Villadsen, Jens Aarøe, Svend Eggert Jensen, Bent Raungaard, Lars Køber, for the DANAMI-3—PRIMULTI Investigators\**

*Lancet 2015; 386: 665-71*

Lancet 2015; 386: 665-71



Research question

Will FFR driven revascularization improve composite Mortality  
Re-infarction  
Ischemia driven revasc

	Infarct-related artery only (n=313)	Complete revascularisation (n=314)	Hazard ratio (95% CI)	p
Primary endpoint*	68 (22%)	40 (13%)	0.56 (0.38-0.83)	0.004
All-cause mortality	11 (4%)	15 (5%)	1.41 (0.63-3.08)	0.43
Non-fatal reinfarction	16 (5%)	15 (5%)	0.94 (0.47-1.90)	0.87
Ischemia-driven revascularisation	53 (17%)	17 (5%)	0.31 (0.18-0.53)	<0.0001

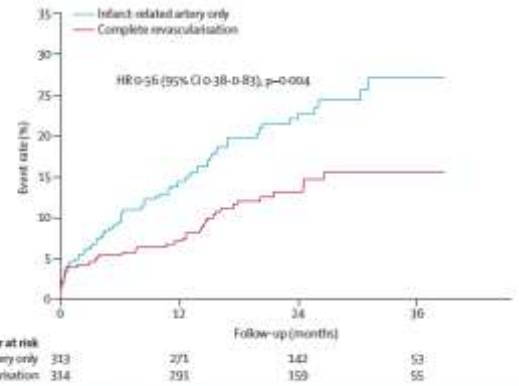
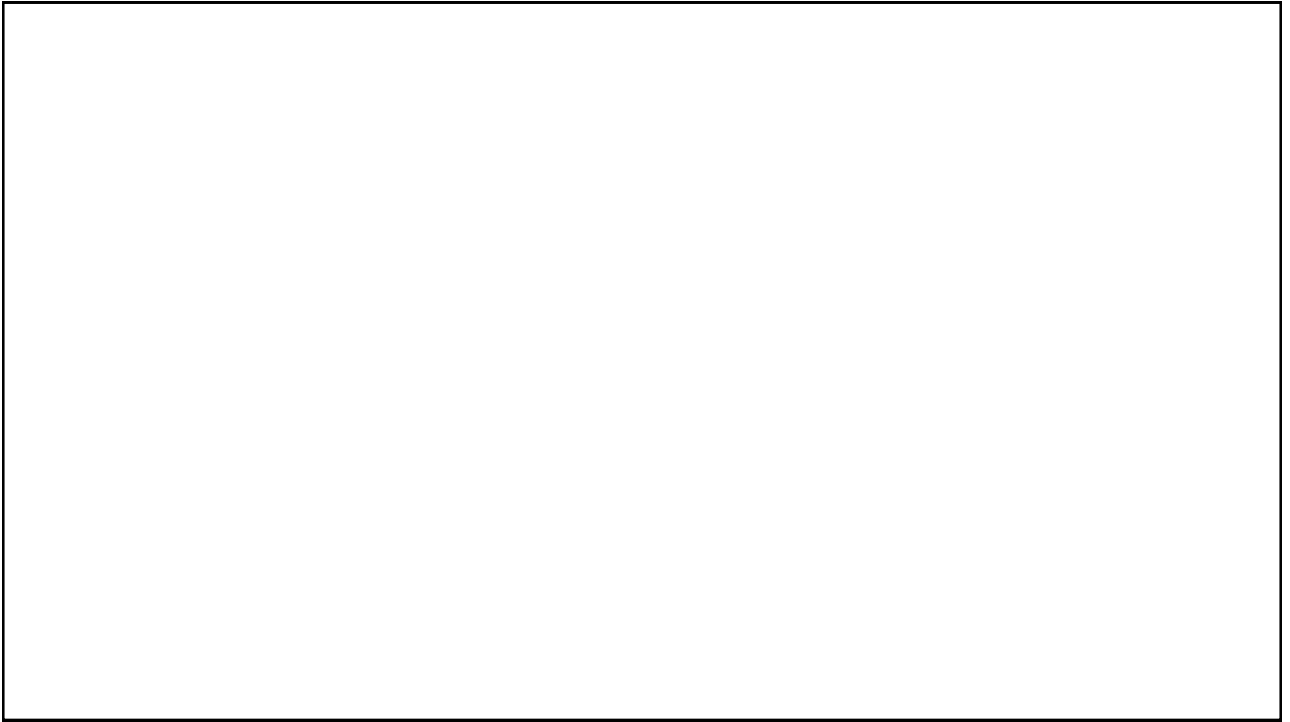


Figure 2: Event rates of the combined primary endpoint

## How and When to Evaluate Nonculprit Lesions in ST-Segment Elevation Myocardial Infarction\*

J. Dawn Abbott, MD



CHANGE IN RECOMMENDATIONS		
2012	2017	
<b>Radial access<sup>a</sup></b>	<b>Radial access<sup>a</sup></b> MATRIX <sup>143</sup>	
<b>DES over BMS</b>	<b>DES over BMS</b> EXAMINATION <sup>156,151</sup> COMFORTABLE-AMI <sup>149</sup> , NORSTENT <sup>152</sup>	
<b>Complete Revascularization<sup>b</sup></b>	<b>Complete Revascularization<sup>b</sup></b> PRAMI <sup>148</sup> , DANAMI-3-PRIMULTI <sup>173</sup> , CVLPRIT <sup>145</sup> , Compare-Acute <sup>171</sup>	
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