



# HOT TOPICS IN CARDIOLOGIA 2024

**27 e 28 Novembre 2024**

Villa Doria D'Angri - Via F. Petrarca 80,  
Napoli

INFARTO MIOCARDICO E  
MALATTIA MULTIVASALE  
CORONARICA

RELATORE:  
Gianmaria Scherillo  
Università degli studi della Campania  
"Luigi Vanvitelli"

## ***Caso Clinico***

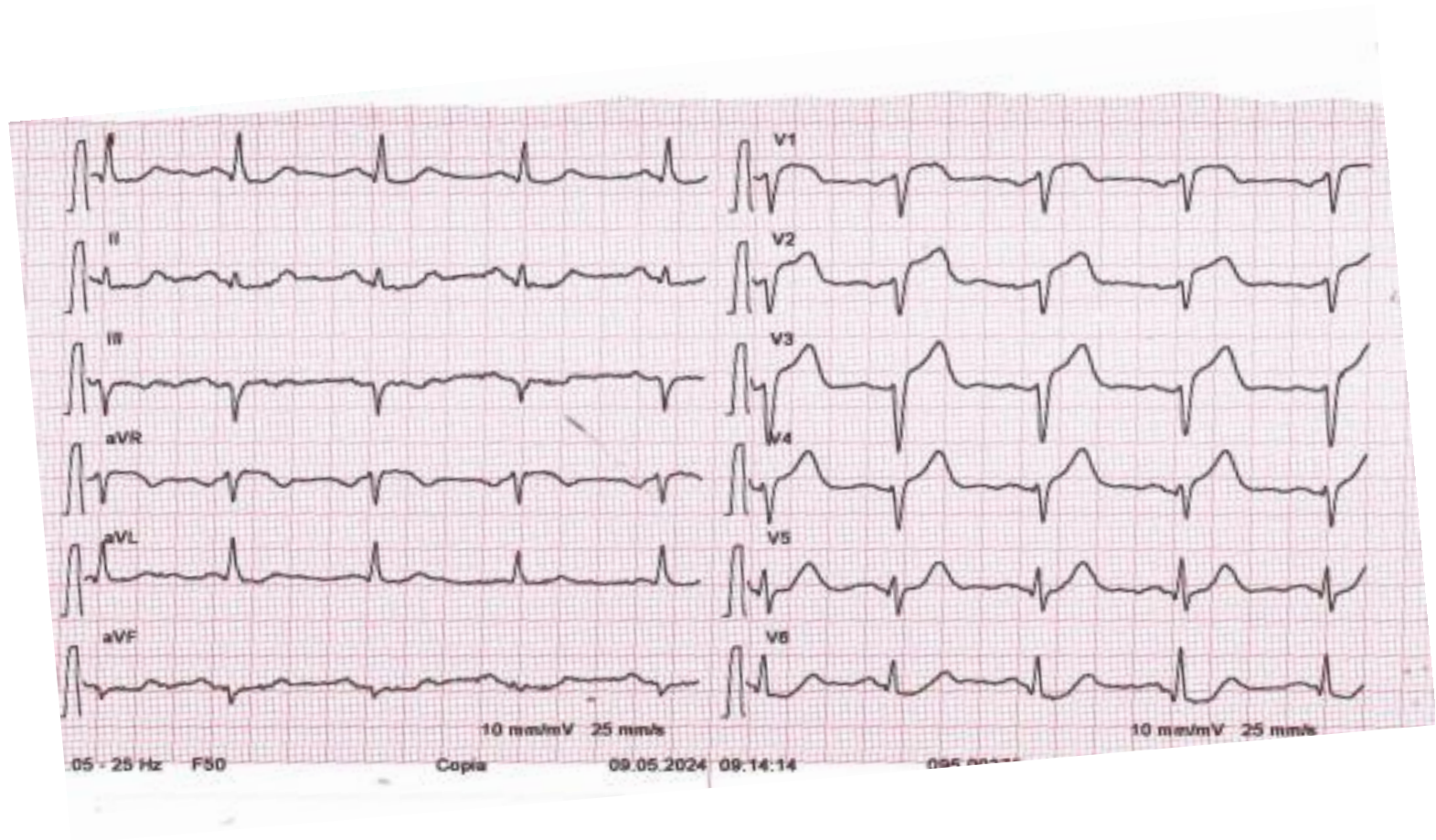
- **64 anni, Maschio**
- **H 178cm, W 85kg (BMI 26.53 Kg/m<sup>2</sup>)**
- **Fumatore, Iperteso, Pregresso TIA (2022)**
- **PA: 140/90, FC 75bpm**
- **Angor tipico a riposo**



Università  
degli Studi  
della Campania  
*Luigi Vanvitelli*

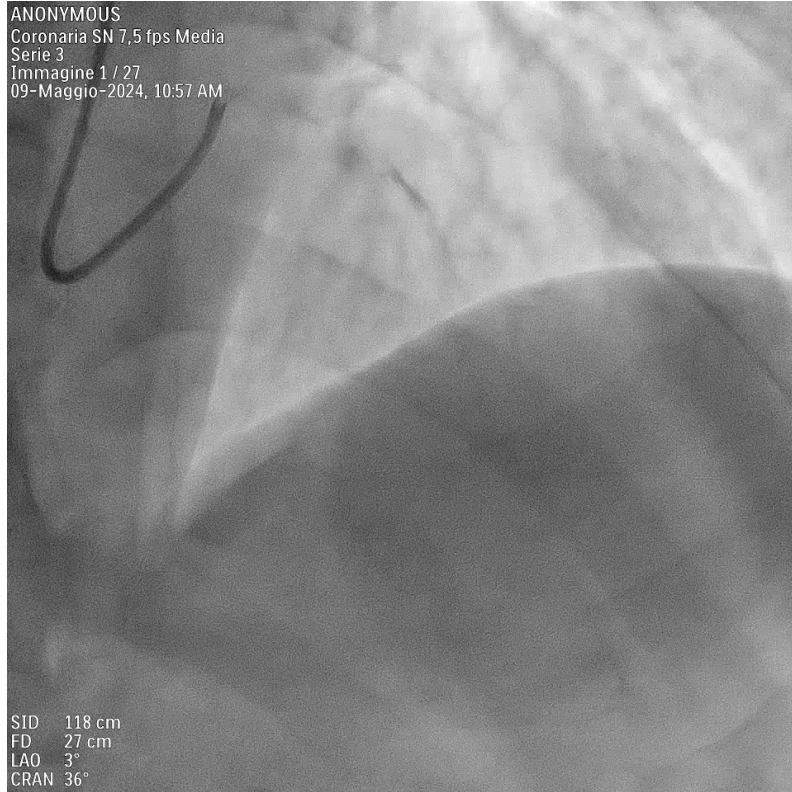


# ECG

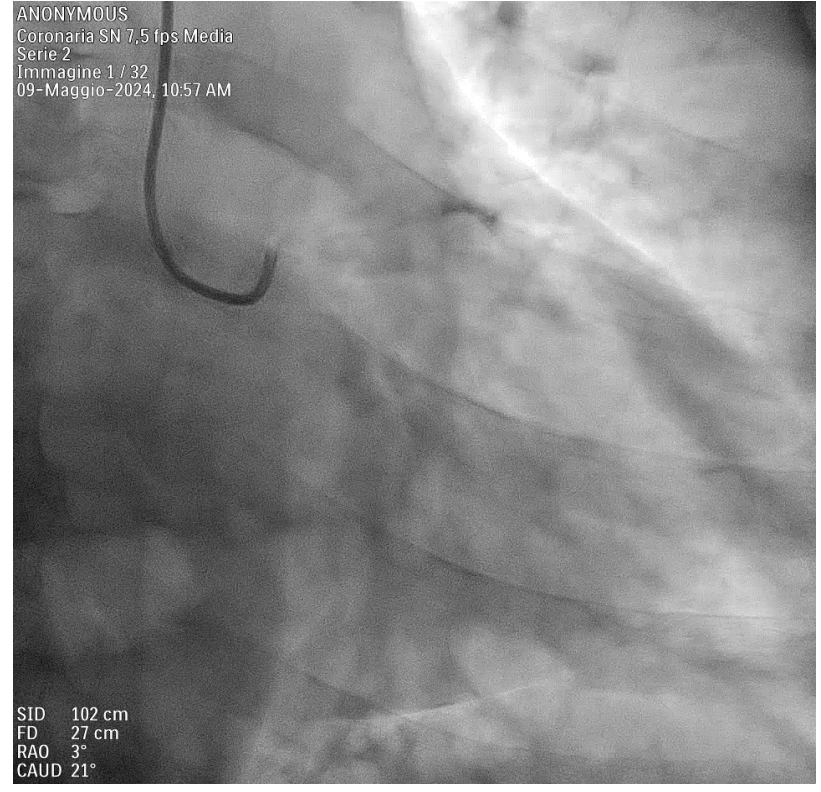


# CORONAROGRAFIA

ANONYMOUS  
Coronaria SN 7,5 fps Media  
Serie 3  
Immagine 1 / 27  
09-Maggio-2024, 10:57 AM

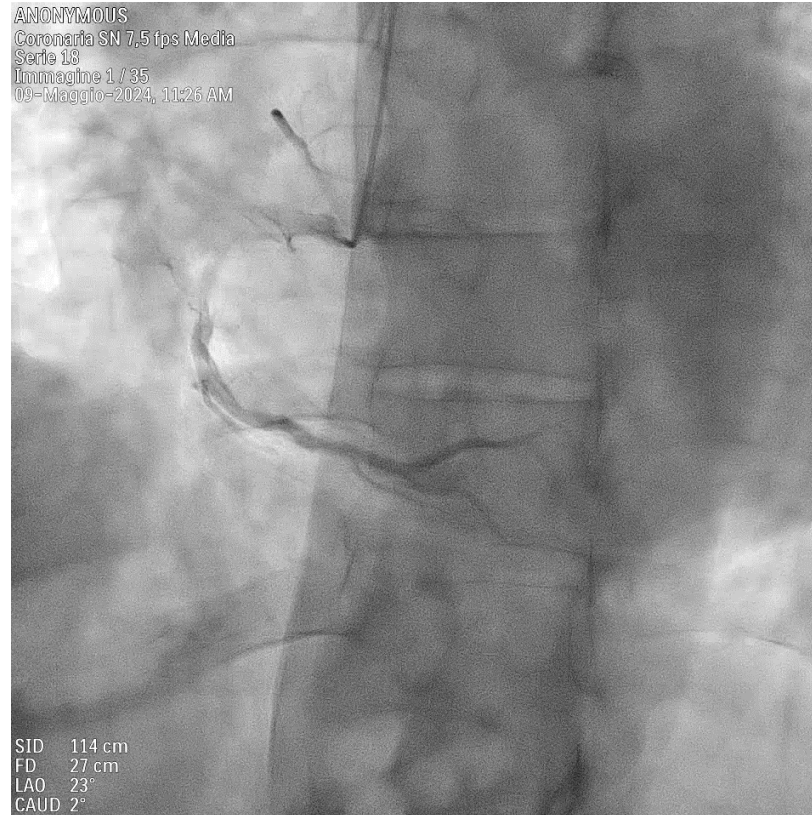


ANONYMOUS  
Coronaria SN 7,5 fps Media  
Serie 2  
Immagine 1 / 32  
09-Maggio-2024, 10:57 AM



# CORONAROGRAFIA

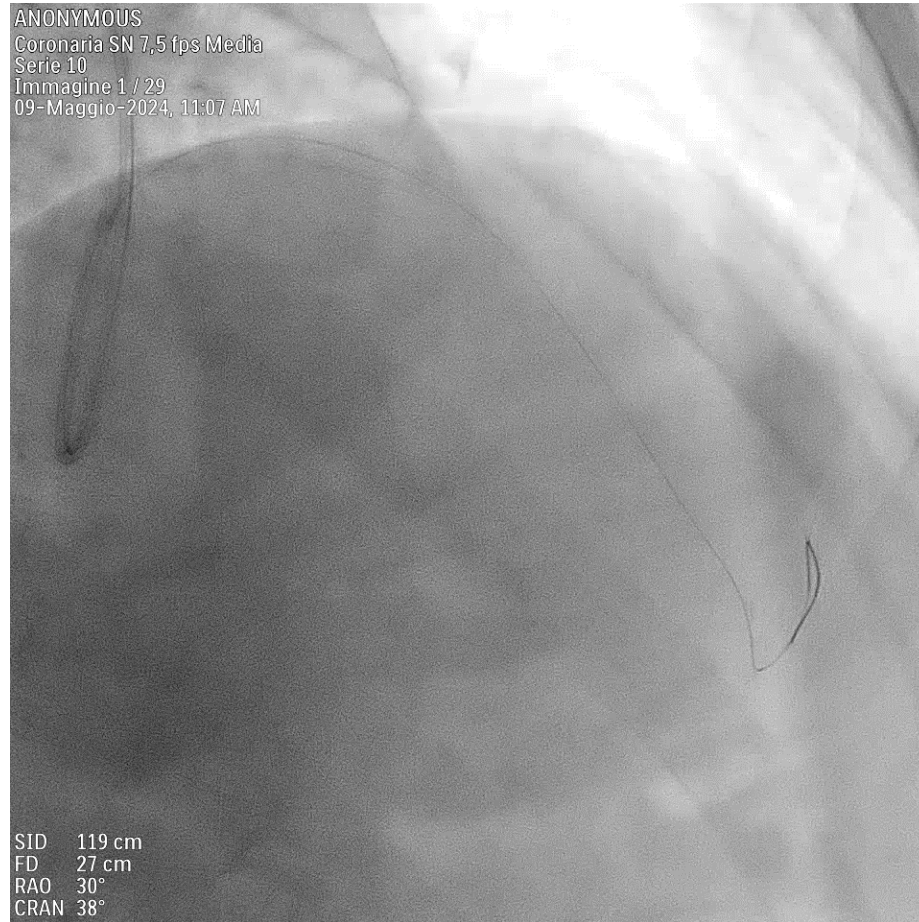
ANONYMOUS  
Coronarica SN 7,5 fps Media  
Serie 13  
Immagine 1 / 35  
09-Maggio-2024, 11:26 AM



SID 114 cm  
FD 27 cm  
LAO 23°  
CAUD 2°

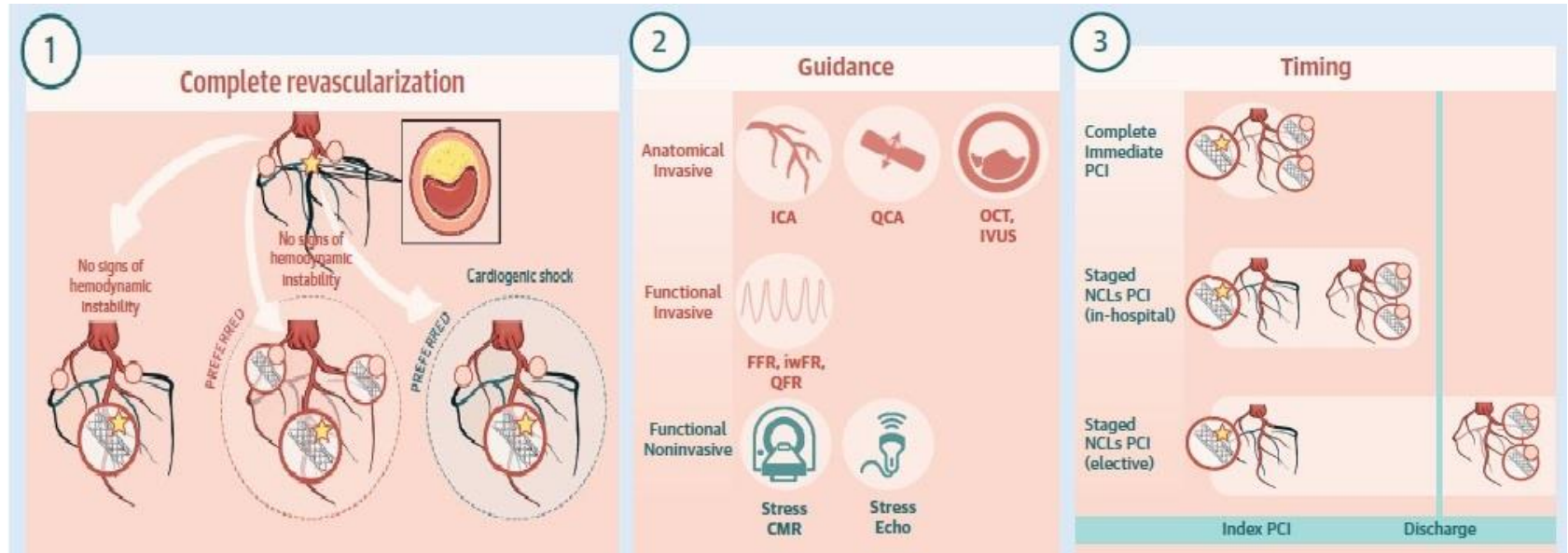
# LAD PCI

ANONYMOUS  
Coronaria SN 7,5 fps Media  
Serie 10  
Immagine 1 / 29  
09-Maggio-2024, 11:07 AM



SID 119 cm  
FD 27 cm  
RAO 30°  
CRAN 38°

# DOMANDE



1. **Rivascolarizzazione completa (= Preventive PCI): YES or NO**
2. **Significatività delle lesioni non culprit: PHYSIOLOGY vs ANATOMY**
3. **Timing del completamento: INDEX PCI vs STAGED PCI**

The NEW ENGLAND JOURNAL of MEDICINE

EDITORIALS



**2007**

**Does Preventive PCI Work?**

Judith S. Hochman, M.D., and P. Gabriel Steg, M.D.

**Risposta: NO.**  
(nel paziente Cronico...)

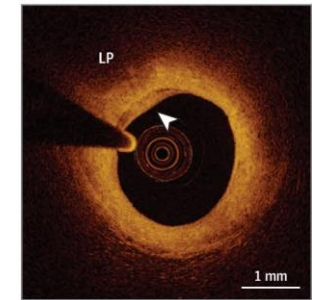
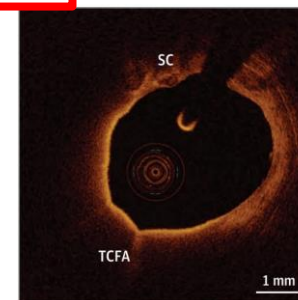


# RIVASCOLARIZZAZIONE COMPLETA (PREVENTIVE PCI)

OCT findings	rACS (n = 30)	Is-SAP (n = 37)	sAMI (n = 38)	P Value		
				rACS vs Is-SAP	rACS vs sAMI	Is-SAP vs sAMI
Qualitative analysis, count (%)						
Lipid-rich plaque	24 (80.0)	14 (37.8)	29 (76.3)	.001	.72	.001
TCFA	12 (40.0)	3 (8.1)	13 (34.2)	.002	.62	.006
Fibrous plaque	21 (70.0)	34 (91.9)	27 (71.1)	.02	.93	.021
Calcification	20 (66.7)	33 (89.2)	25 (65.8)	.02	.94	.02
Spotty calcification	21 (70.0)	15 (40.5)	17 (44.7)	.02	.04	.71
Macrophage accumulation	16 (53.3)	7 (18.9)	7 (18.4)	.003	.003	.96
Intimal vasculature	17 (56.7)	25 (67.6)	22 (57.9)	.36	.92	.39

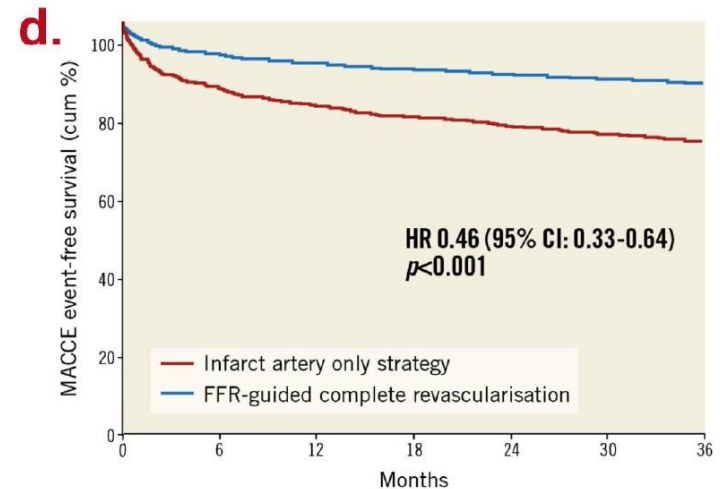
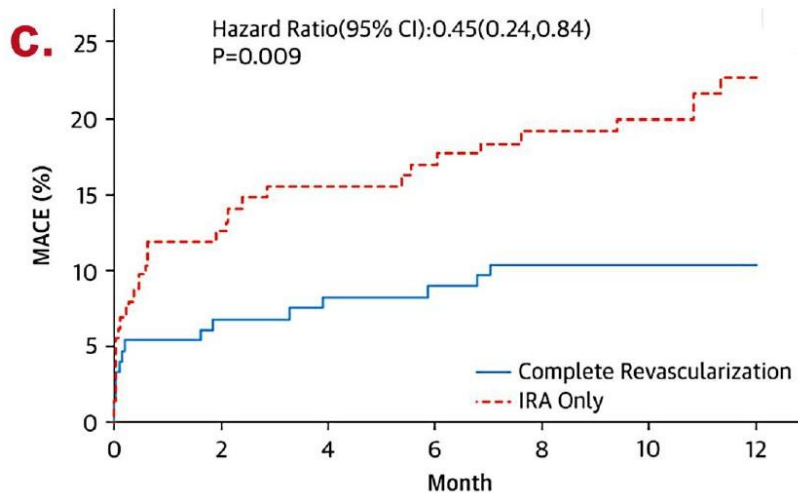
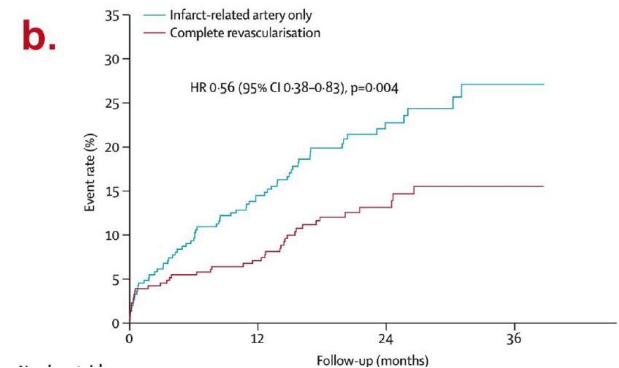
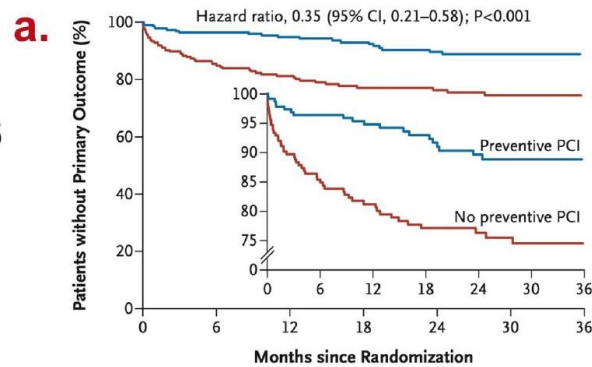
**ACS ≠ CCS**

**Vulnerable Plaque  
(Lipid-Rich Plaque, TCFA, Macrophages)  
is common in ACS!**



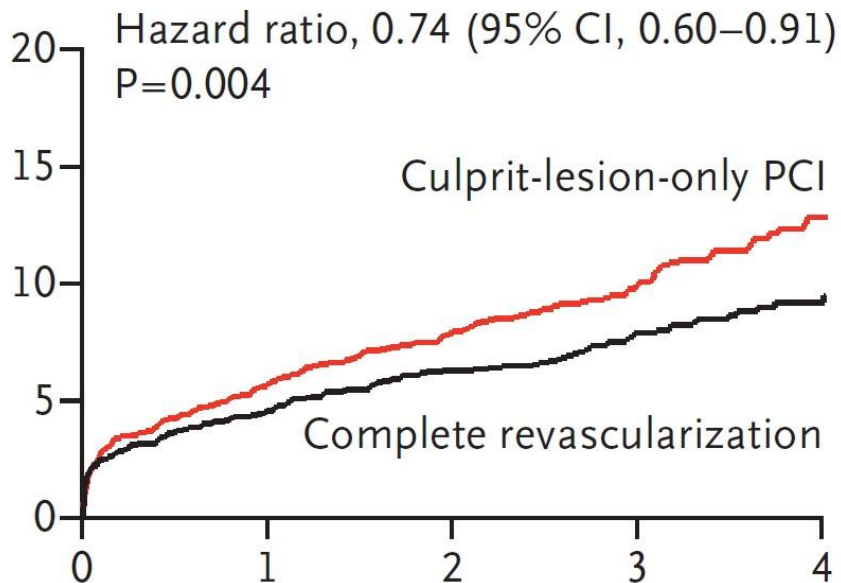
# RIVASCOLARIZZAZIONE COMPLETA

- a. PRAMI, 2013
- b. DANAMI-PRIMULTI, 2015
- c. CvLPRIT, 2014
- d. COMPARE-ACUTE, 2017

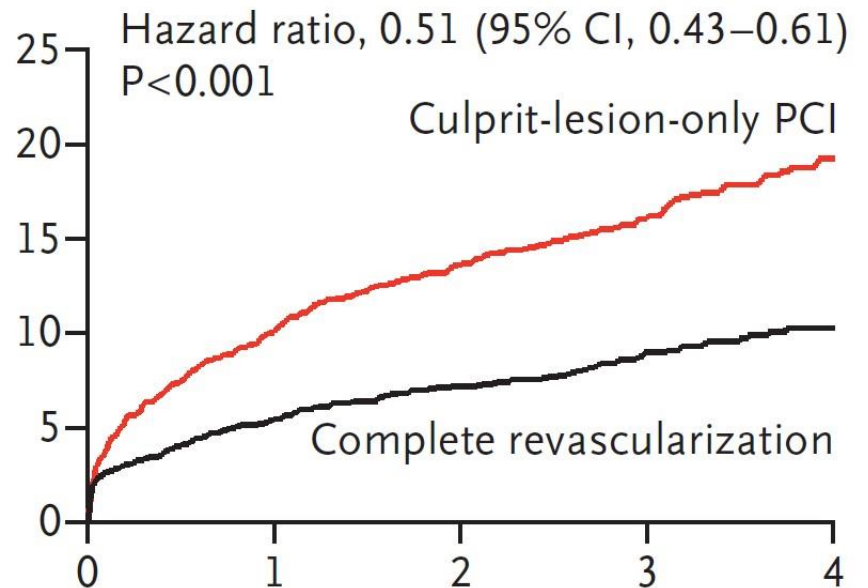


# COMPLETE TRIAL (2019)

Primary Endpoint: CV Death, MI



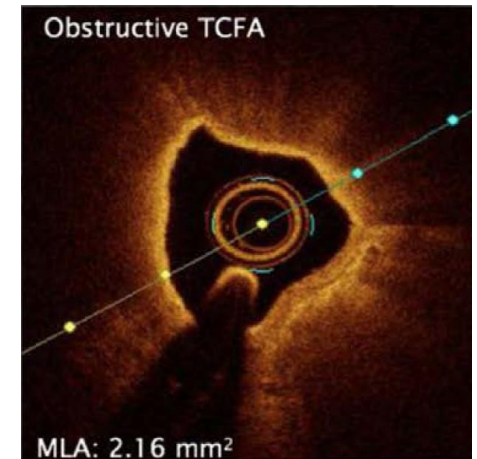
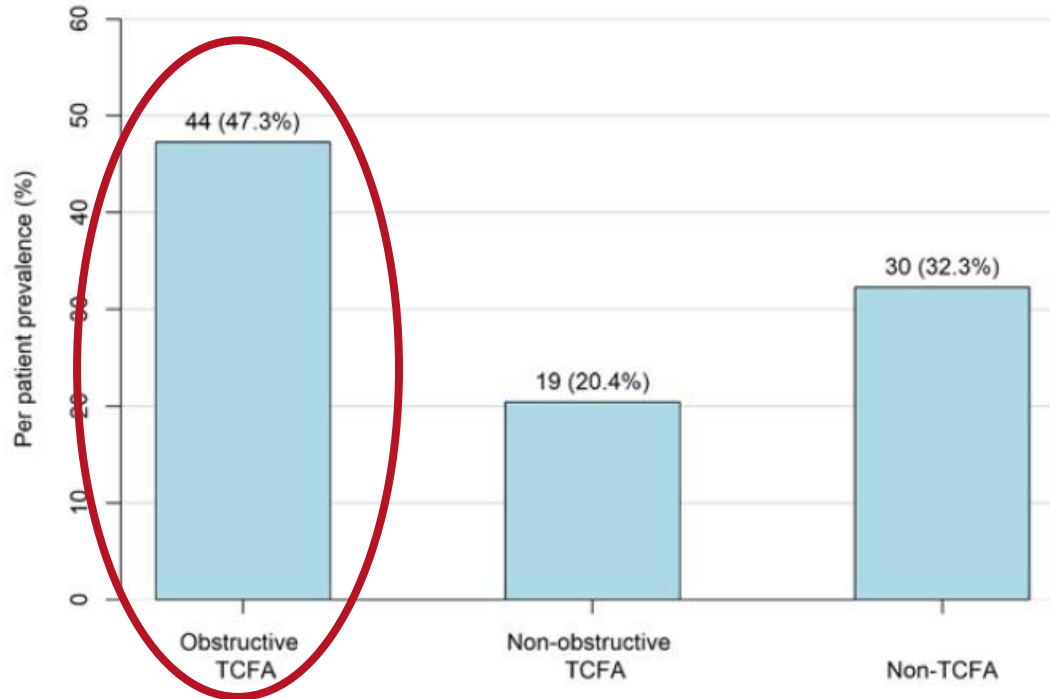
Secondary Endpoint: CV Death, MI, TLR



- **N=4041**
- **Guidance:** >70% by visual estimation OR >50% & FFR < 0.80
- **Timing:** No later than 45 days

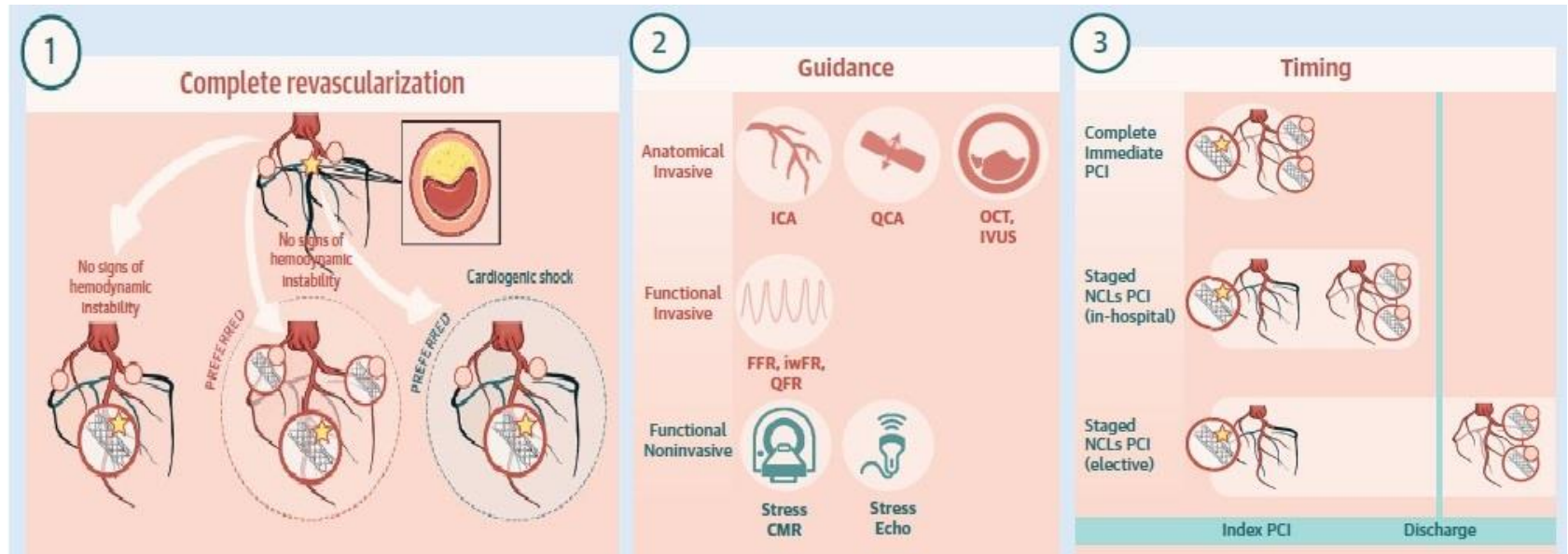


# COMPLETE-OCT SUBSTUDY (2020)



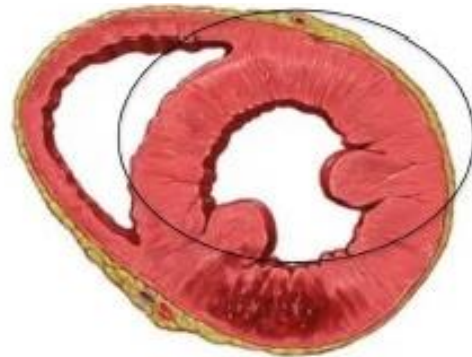
Half of patients had **Vulnerable Plaque**

# DOMANDE



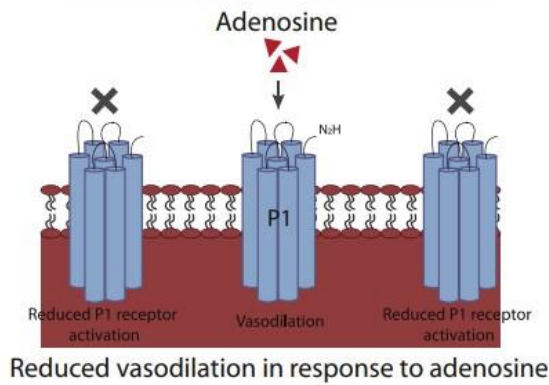
1. **La Rivascolarizzazione Completa riduce CV DEATH & MI**
2. **Significatività delle lesioni non culprit: PHYSIOLOGY vs ANATOMY**
3. **Timing del completamento: INDEX PCI vs STAGED PCI**

# RIVASCOLARIZZAZIONE FFR-GUIDATA

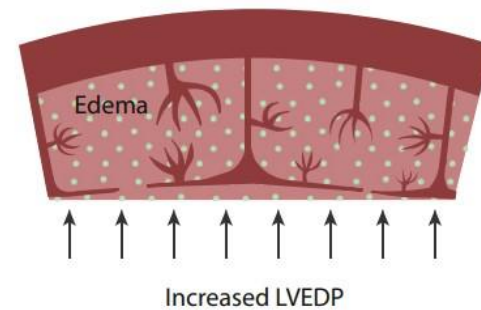


↑ Resting flow  
↓ Hyperemic flow

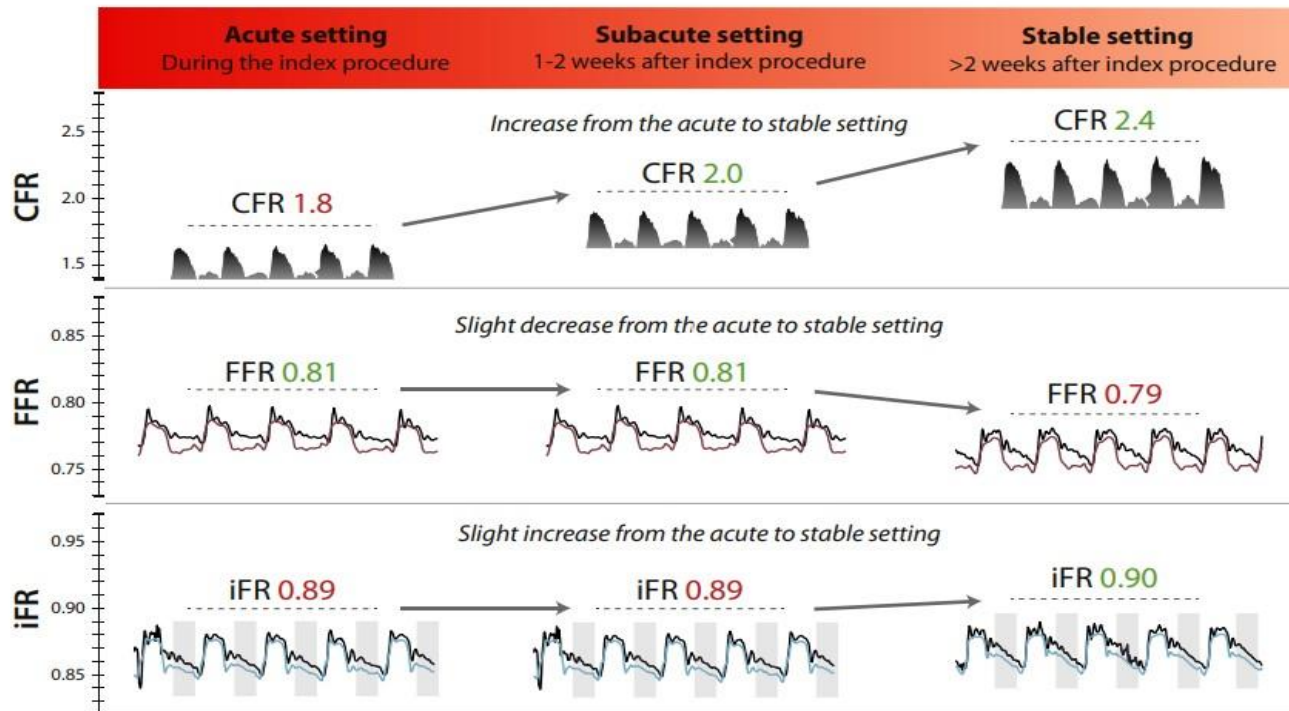
Blunted Hyperemic response



Microvascular compression by remote Edema and increased LVEDP



# RIVASCOLARIZZAZIONE FFR-GUIDATA



**FFR sottostima**  
(di circa 0.03)

**iFR sovrastima**  
(di circa 0.03)

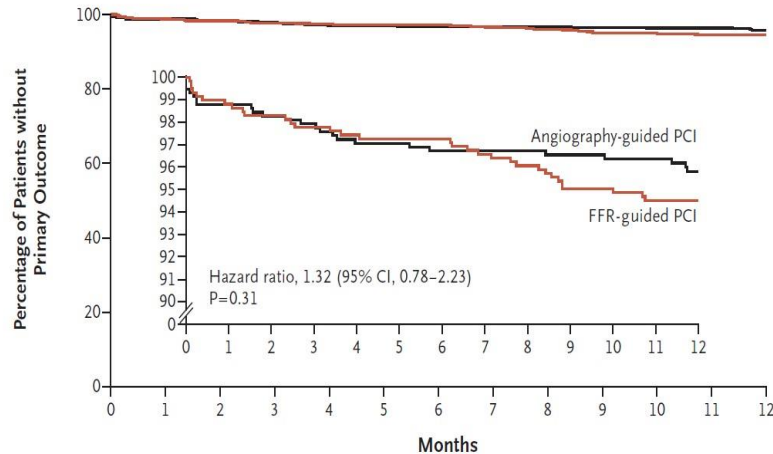
I valori si normalizzano entro **2 settimane** dall'evento acuto



# RIVASCOLARIZZAZIONE FFR-GUIDATA

## Angio vs. FFR-guided STEMI:

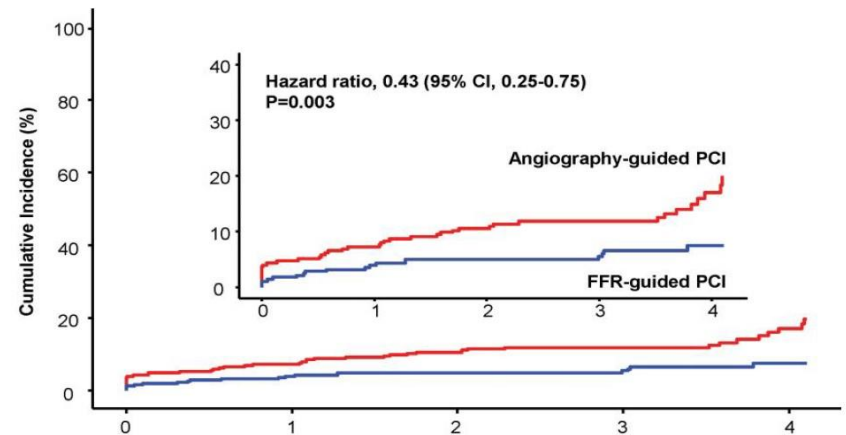
### a. FLOWER MI (2021)



**Primary Endpoint (Death, MI, TVR): 5.5% vs 4.2%, HR 1.32; 95% CI, 0.78 to 2.23; P = 0.31.**

## Angio vs. FFR-guided STEMI & NSTEMI

### b. FRAME-AMI (2022)



**Primary Endpoint (Death, MI, TVR): 7.4% vs. 19.7%; HR 0.43; 95% CI, 0.25-0.75; P=0.003.**

**FRAME: Outcome driven mostly by the *NSTEMI* population (27 events vs. 9 events). Little difference in the *STEMI* population (13 vs. 9 events).**



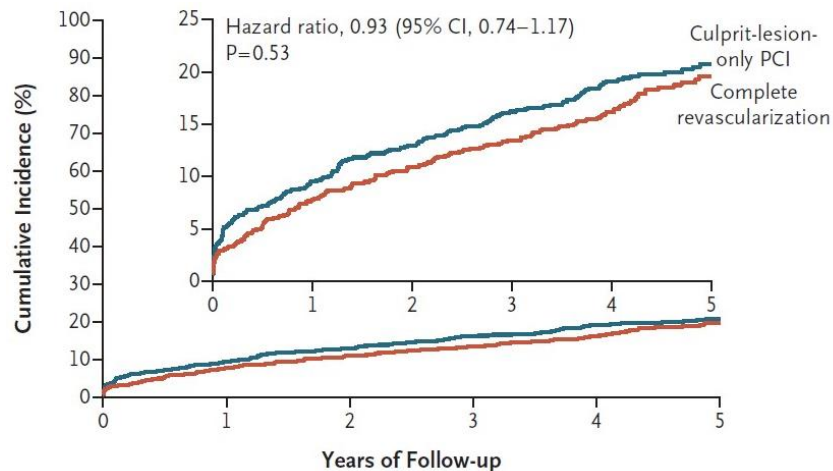


# RIVASCOLARIZZAZIONE FFR-GUIDATA

## Culprit-only vs. FFR Guided STEMI

## Culprit-only vs. FFR Guided STEMI & NSTEMI:

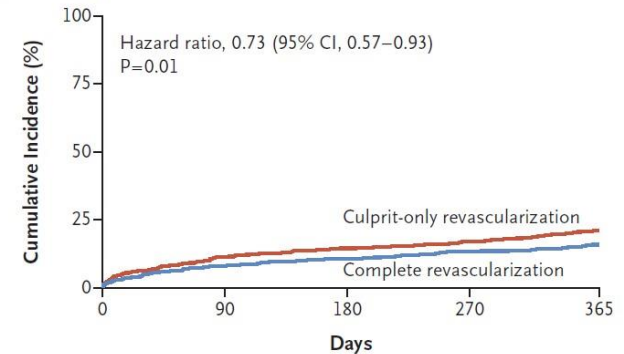
### d. Full Revasc (2024)



**Primary Endpoint (Death, MI, TVR):**  
19.0% vs. 20.4%, HR 0.93; 95% CI 0.74 to 1.17; P = 0.53.

### c. FIRE (2023) (>75 y.o.)

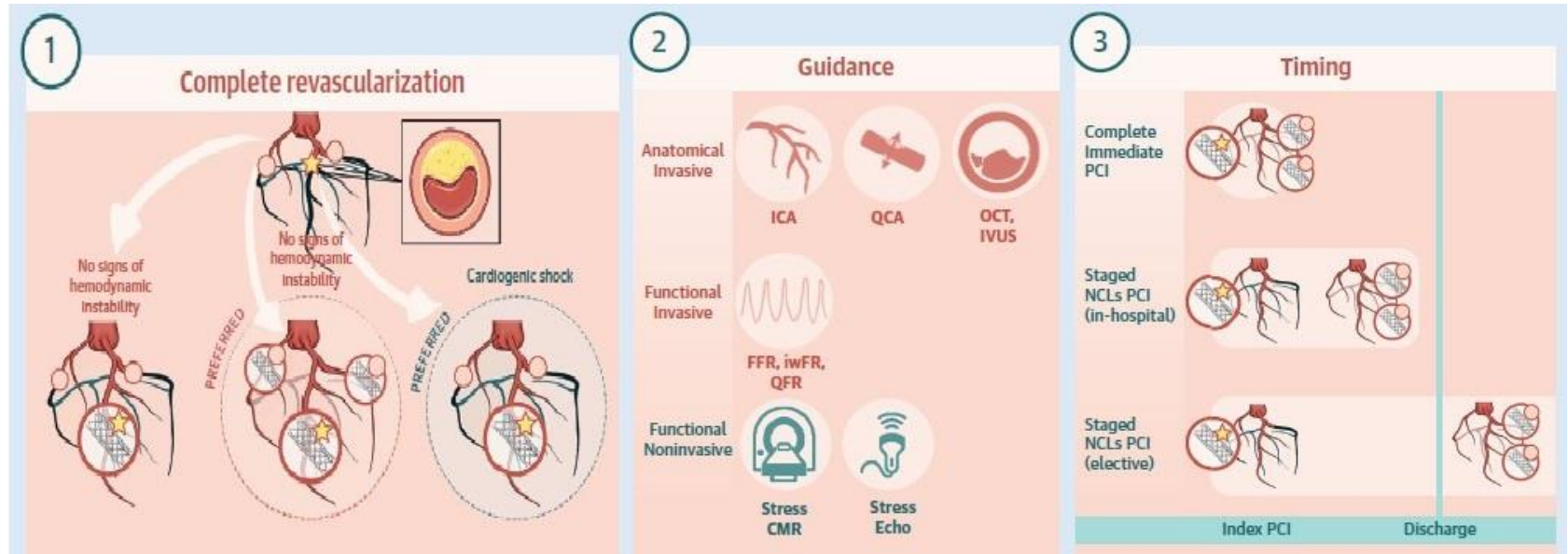
A Death, Myocardial Infarction, Stroke, or Coronary Revascularization (Primary Outcome)



**Primary Endpoint (Death, MI, Stroke TVR):**  
15.7% vs. 21.0%, HR 0.73; 95% CI 0.57 to 0.93; P = 0.01.

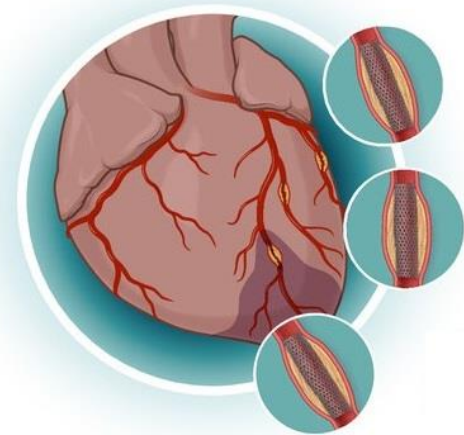
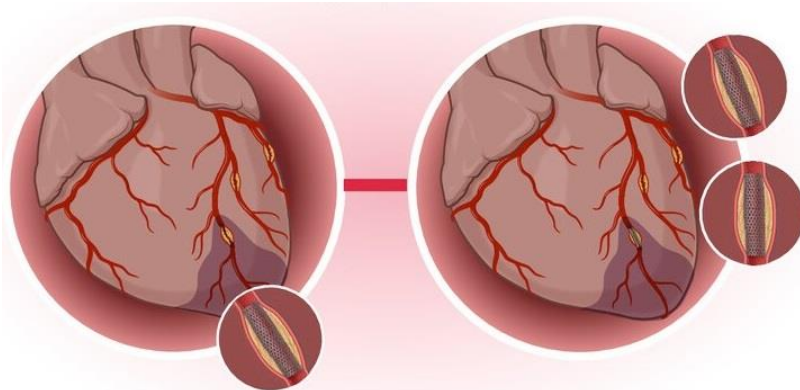
**FIRE: Outcome more consistent in *NSTEMI* population (Cocco M. et al., JACC 2024).**

# DOMANDE



1. **La Rivascolarizzazione Completa riduce CV DEATH & MI**
2. **Significatività: FFR-based per NSTEMI & Elderly (FIRE trial); ANGIO-BASED per STEMI & Young**
3. **Timing del completamento: INDEX PCI vs STAGED PCI**

## PCI STAGED VS. INDEX



### Against Staged PCI

- Longer in-hospital stay

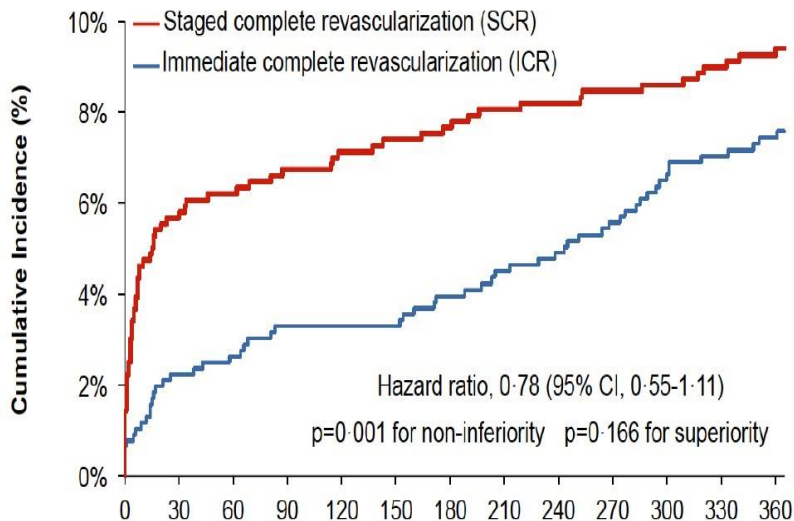
### Against Index PCI

- Vasoconstriction of the acute phase (unclear angiographic significance)
- Suboptimal DAPT

# RIVASCOLARIZZAZIONE DURANTE INDEX PCI: STEMI

## Staged CR vs. Immediate CR (STEMI & NSTEMI)

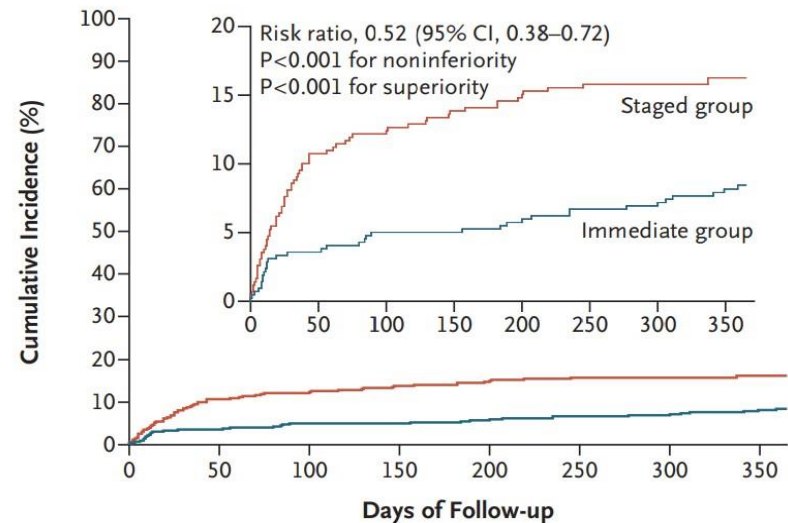
### a. BIOVASC (2023)



**Primary Endpoint (Death, MI, TVR, Stroke):**  
7.6% vs 9.4% (HR 0.78, 95% CI 0.55–1.11, p=0.0011 for non inferiority).

## Staged CR vs. Immediate CR (STEMI)

### b. MULTISTARS-AMI (2023)



**Primary Endpoint (Death, MI, TVR, Stroke, HFH):**  
8.5% vs. 16.3% (RR 0.52; 95% CI , 0.38 to 0.72; P<0.001 for noninferiority and P<0.001 for superiority)

# RIVASCOLARIZZAZIONE DURANTE INDEX PCI: STEMI

Number of stents used per patient	..	..	..
Index procedure	3 (2-4)	1 (1-2)	<0.0001
Index plus staged procedure	3 (2-4)	3 (2-4)	0.014
Length of stents, mm			
Index procedure	61 (44-85)	30 (22-47)	<0.0001
Index plus staged procedure	61 (44-85)	67 (45-93)	0.015

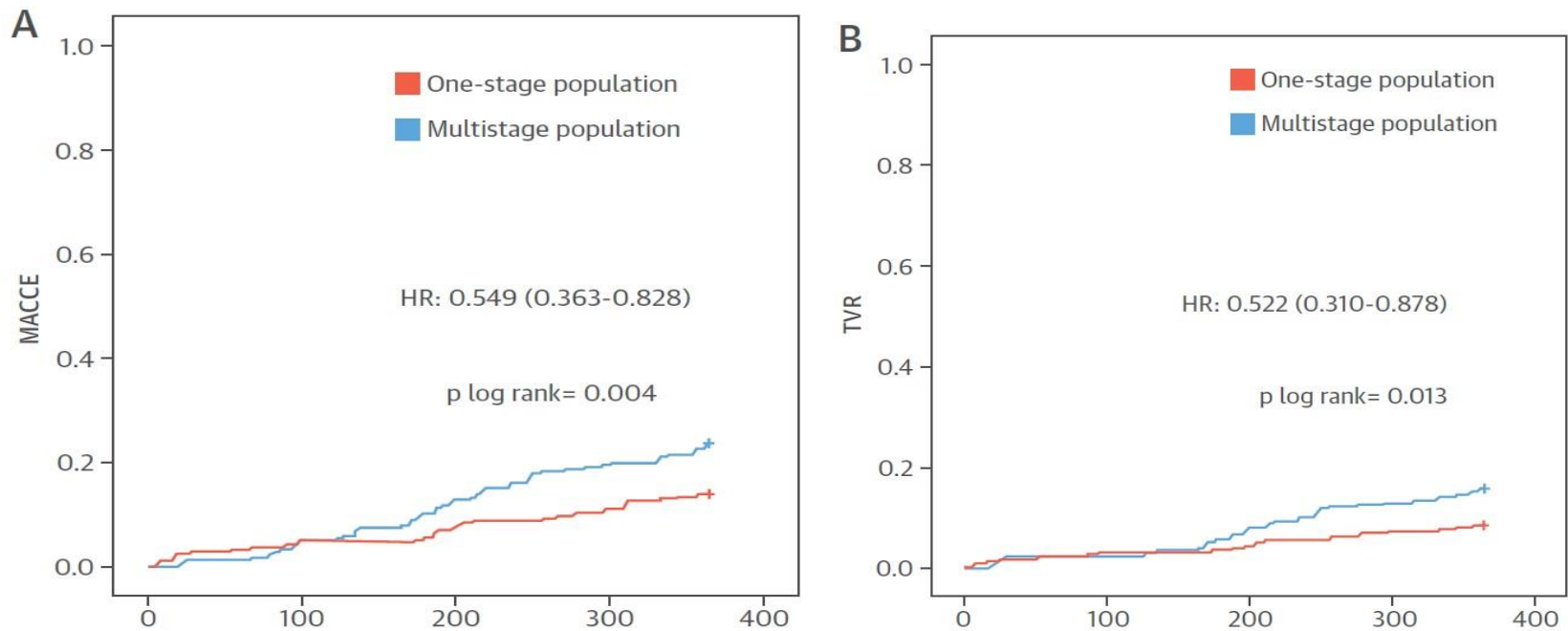
**BIOVASC (2023):**  
**3 stents**  
**Median: 61mm**

Stents used per patient			
Index procedure			
Median (IQR) — no.	3 (2-4)	1 (1-2)	
Index plus staged procedures			
Median (IQR) — no.	—	3 (2-4)	
Total stent length			
Index procedure			
Median (IQR) — mm	64 (44-90)	32 (24-48)	
Index plus staged procedures			
Median (IQR) — mm	—	72 (52-102)	

**MULTISTARS (2023):**  
**3 stents**  
**Median: 64mm**

**No Left Main, No CTOs, No CABG, No Cardiogenic Shock**

# RIVASCOLARIZZAZIONE DURANTE INDEX PCI: NSTEMI SMILE (2016):

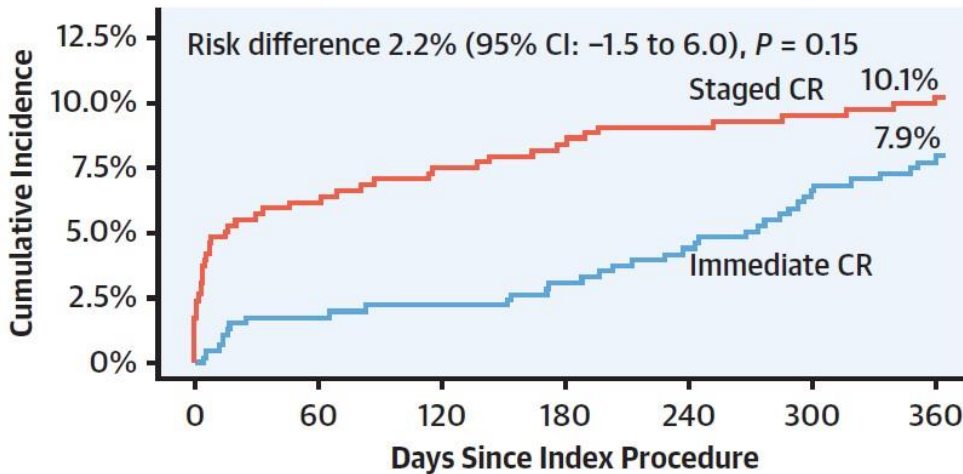


**Primary Endpoint (CV Death, Death, MI, TVR, Stroke):**

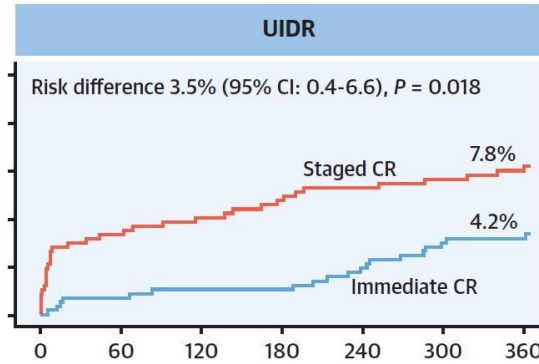
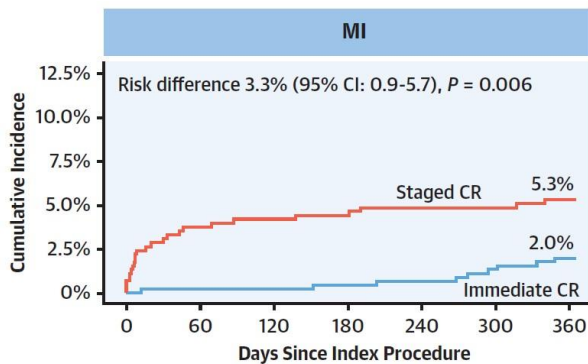
**13.63% vs. 23.19%; HR 0.549; 95% CI: 0.363 to 0.828 p<0.01**

**Driven by TVR: 8.33% vs 15.20%; HR: 0.522 95% CI: 0.310 to 0.878, p<0.01**

# RIVASCOLARIZZAZIONE DURANTE INDEX PCI: NSTEMI BIOVASC Subgroup (2024):

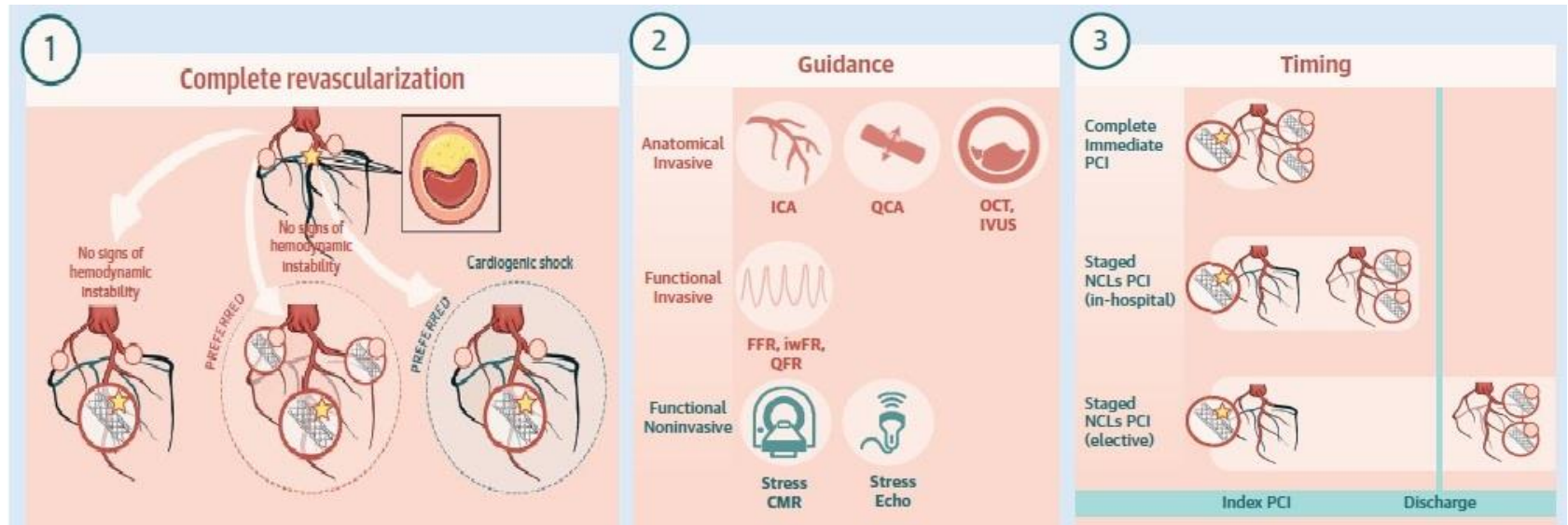


**Primary Endpoint (Death, MI, TVR, Stroke):**  
 7.9% vs 10.1%; RR 2.2%; 95% CI: 1.5 to 6.0; P=0.15).



- **Spontaneous MI (2.0% vs 5.3%; RR 3.3%; 95% CI: 0.9 to 5.7; P = 0.006)**
- **TVR (4.2% vs 7.8%; RR 3.5%; 95% CI: 0.4 to 6.6; P=0.018).**

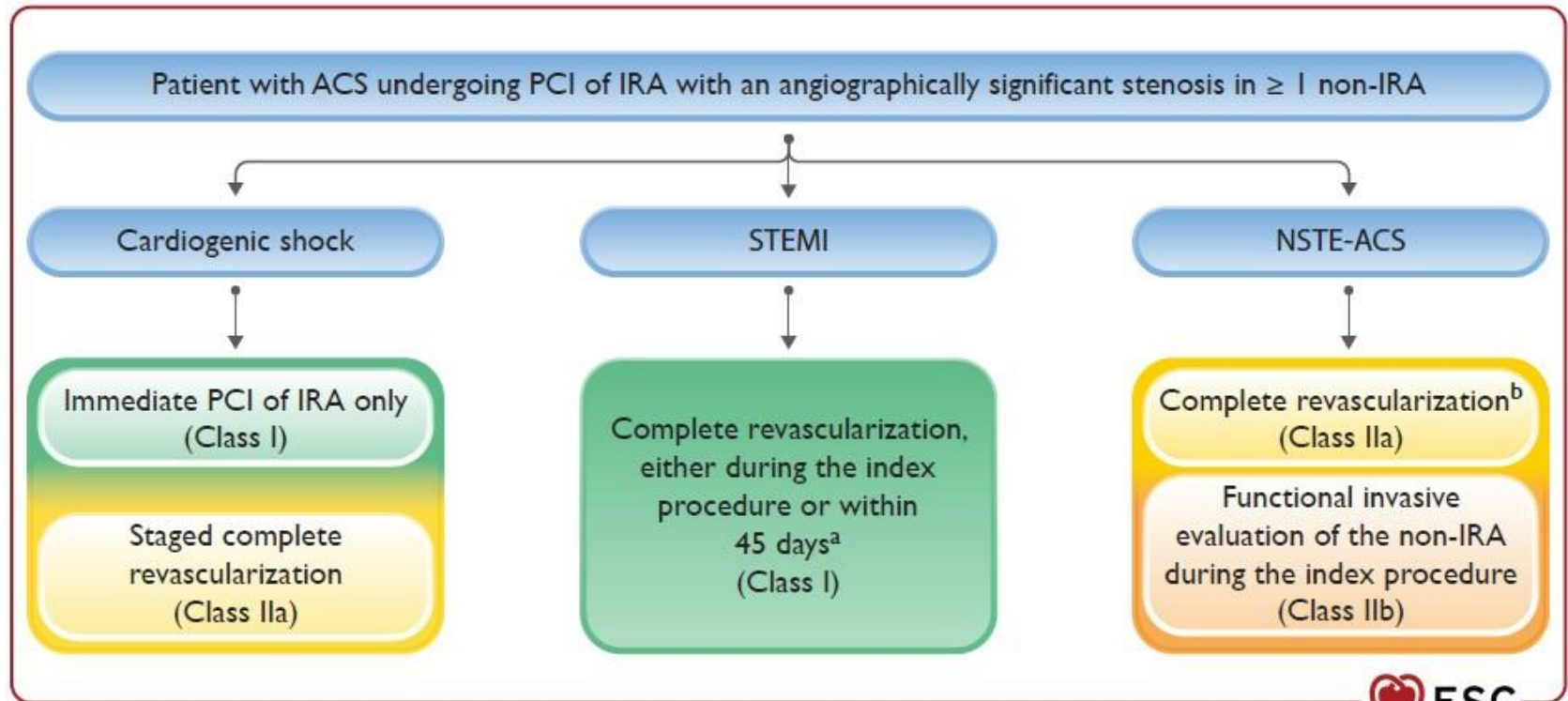
# DOMANDE



1. **Rivascolarizzazione completa: YES**
2. **Significatività delle lesioni non culprit:**
  - **PHYSIOLOGY:** ragionevole in NSTEMI & Elderly (FIRE trial)
  - **ANATOMY:** ragionevole in STEMI & Young
3. **Timing del completamento:**
  - **INDEX PCI** (Simple Lesion)
  - **STAGED PCI** (Complex Lesion)



# LINEE GUIDA ACS 2023



# LINEE GUIDA ACS 2023

## Multivessel disease in haemodynamically stable STEMI patients undergoing PPCI

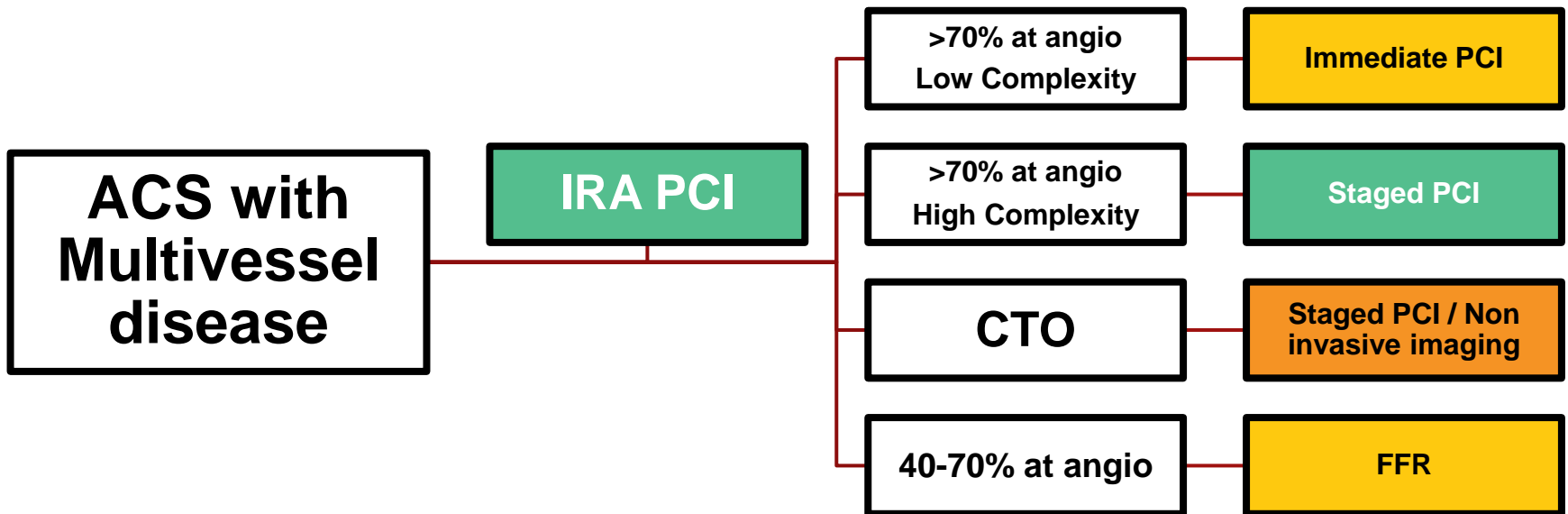
Complete revascularization is recommended either during the index PCI procedure or within 45 days. <sup>508-511,531</sup>	I	A
It is recommended that PCI of the non-IRA is based on angiographic severity. <sup>511,524</sup>	I	B
Invasive epicardial functional assessment of non-culprit segments of the IRA is not recommended during the index procedure.	III	C

## Multivessel disease in haemodynamically stable NSTEMI-ACS patients undergoing PCI

In patients presenting with NSTEMI-ACS and MVD, complete revascularization should be considered, preferably during the index procedure. <sup>513,514</sup>	IIa	C
Functional invasive evaluation of non-IRA severity during the index procedure may be considered. <sup>518,527,528,532</sup>	IIb	B

- **CR:**  
**Classe IA (STEMI), Classe IIa (NSTEMI)**
- **GUIDANCE:**
  - **Nessun Ruolo per FFR in STEMI (almeno durante la Index Procedure)**
  - **Possibile utilizzo di FFR in NSTEMI**
- **TIMING:**  
**During the Index PCI or within 45 days**

# POSSIBILE FLOWCHART



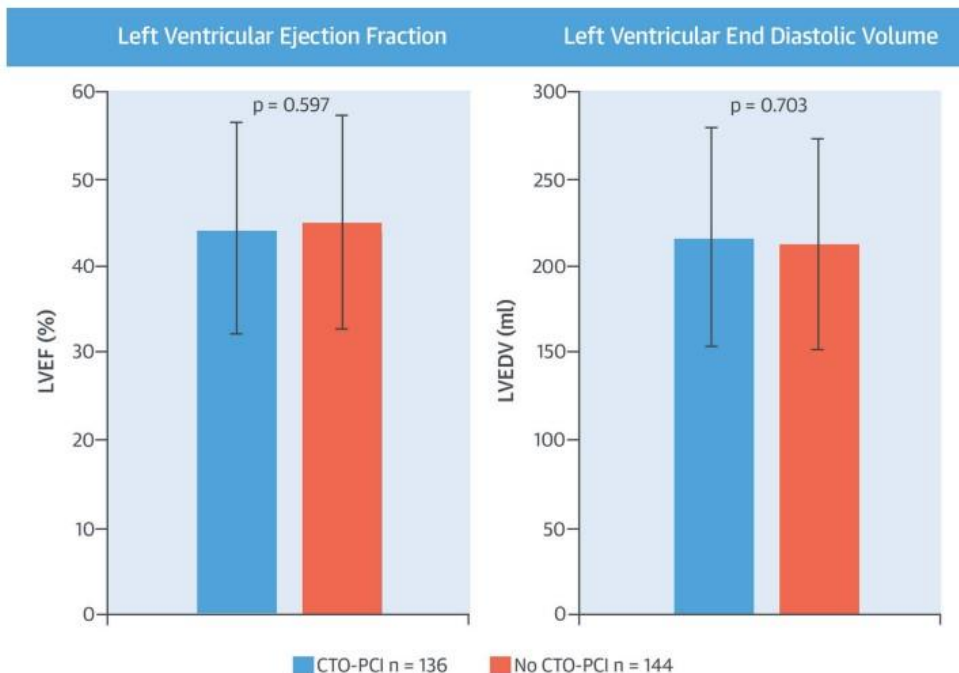
# GRAZIE PER L'ATTENZIONE





# HOW ABOUT CHRONIC TOTAL OCCLUSIONS

- 1/10 of STEMI
- Higher Mortality
- Exclusion criteria in most trials
- **CTO-PCI does not prevent MI**



## EXPLORE (2016)

- CTO-PCI after pPCI for STEMI
- **No improvement of LVEF or LV EDV**