
Post-PCI FFR:

What does it mean and should we measure it?

William F. Fearon, MD

Professor of Medicine

Director, Interventional Cardiology

Stanford University Medical Center



Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest /arrangement or affiliation with the organization(s) listed below

Affiliation/Financial Relationship

Grant/ Research Support:

Company

**St. Jude Medical
Medtronic
Acist Medical
CathWorks**

Consulting Fees/Honoraria:

HeartFlow

Major Stock Shareholder/Equity Interest:

Royalty Income:

Ownership/Founder:

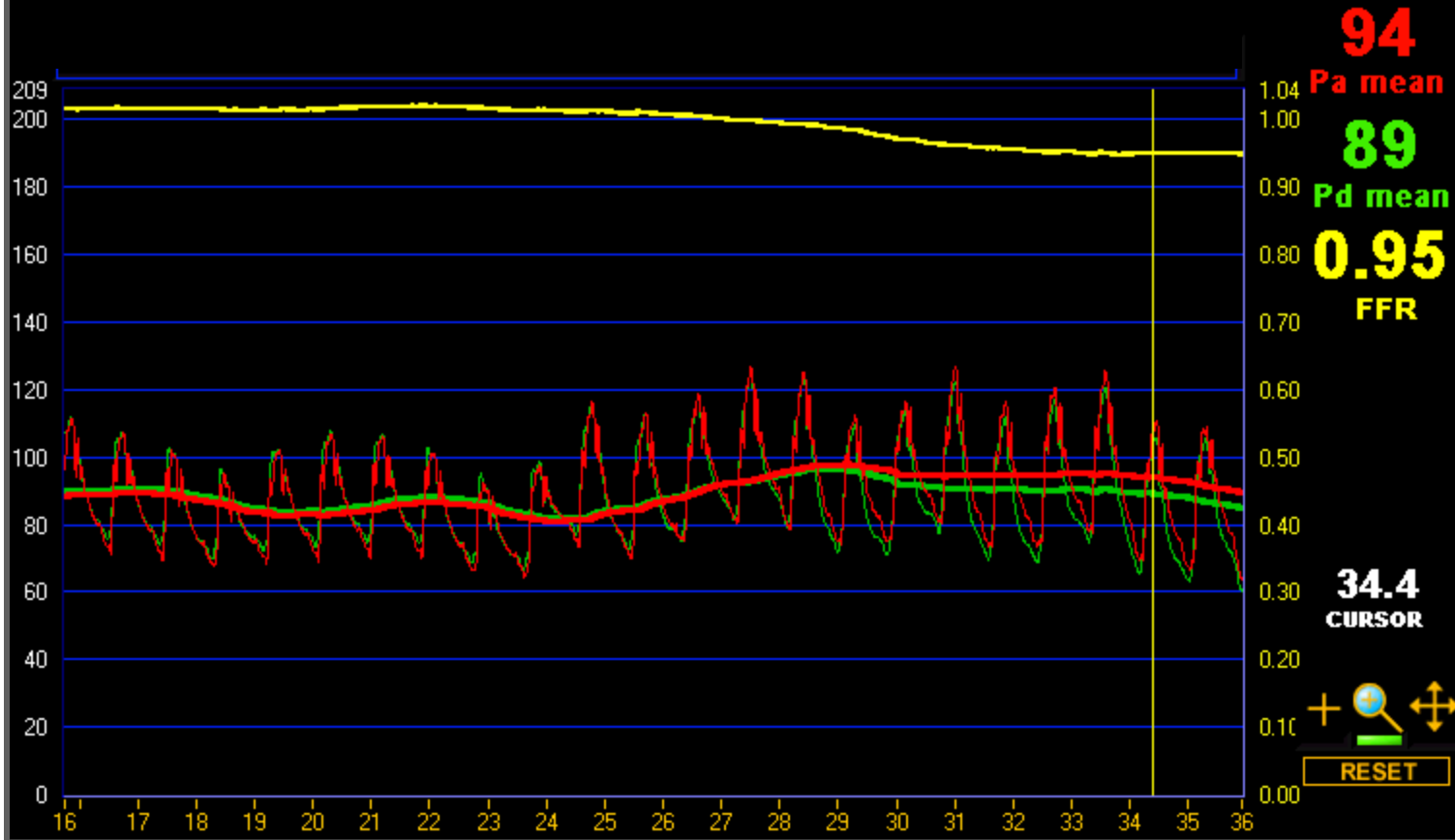
Salary:

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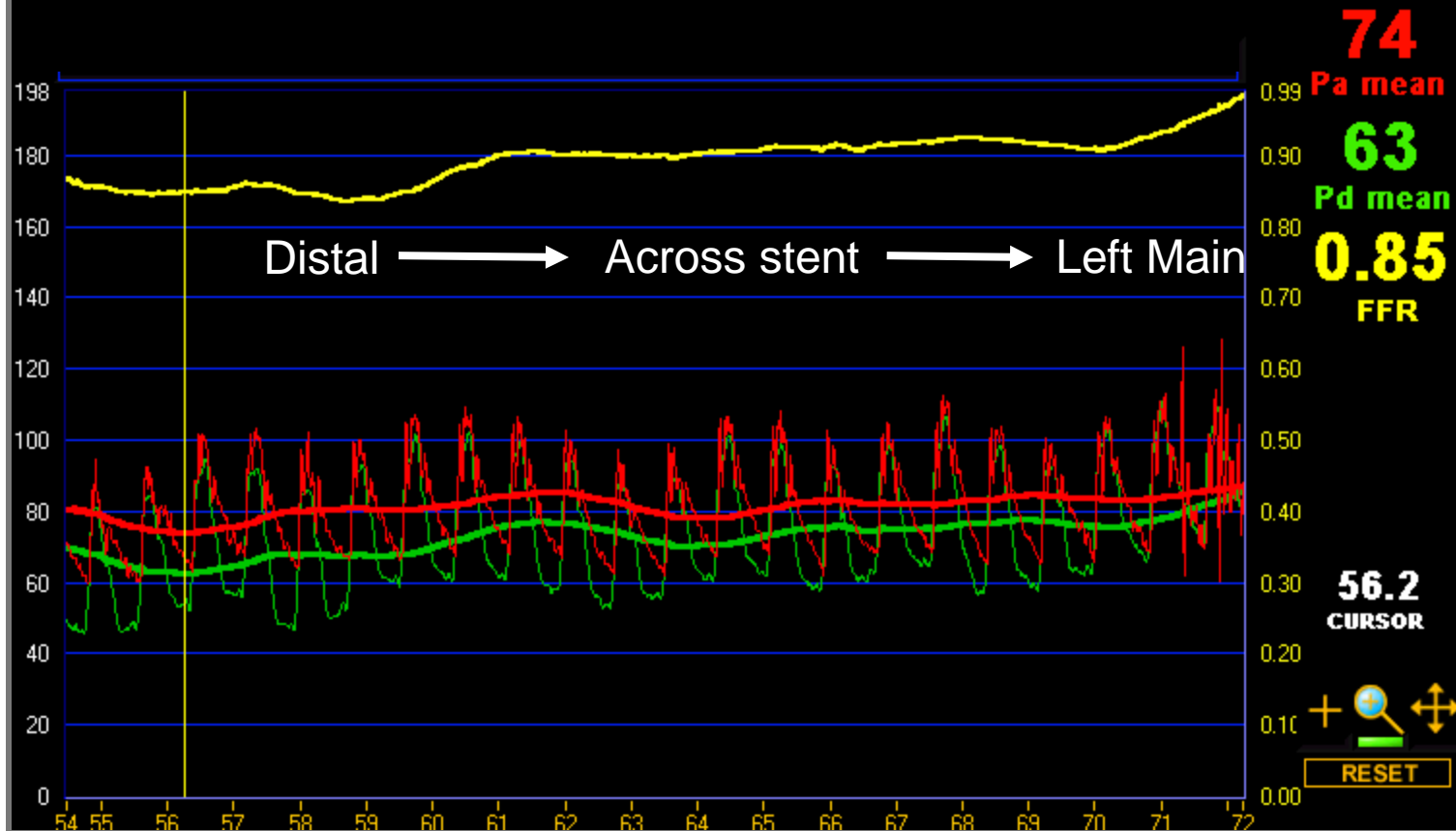
Other Financial Benefit:



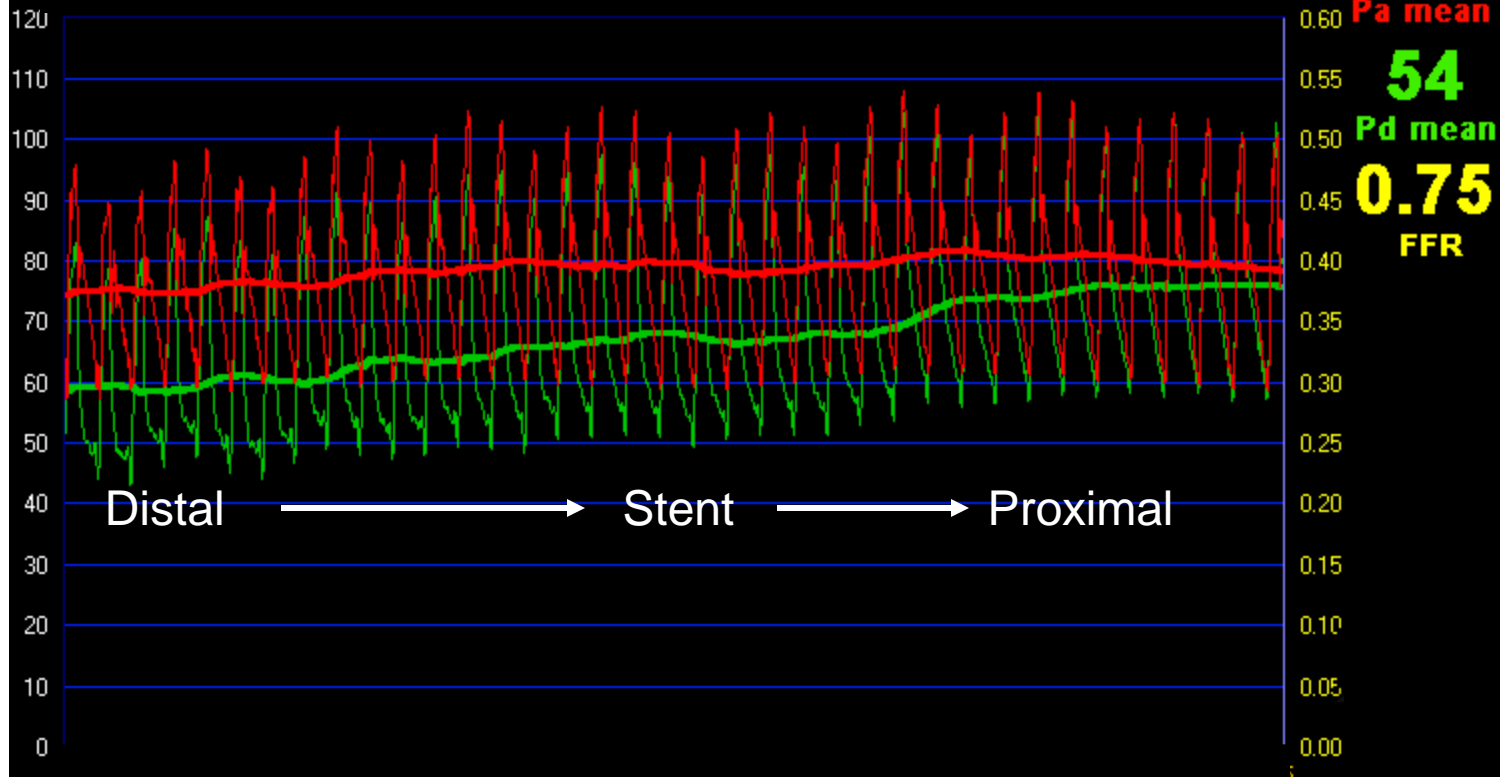
FFR of RCA post PCI



Pullback of Pressure Wire after PCI



Pressure wire pullback post PCI of LAD



Why should we measure FFR post-PCI and what does it mean?

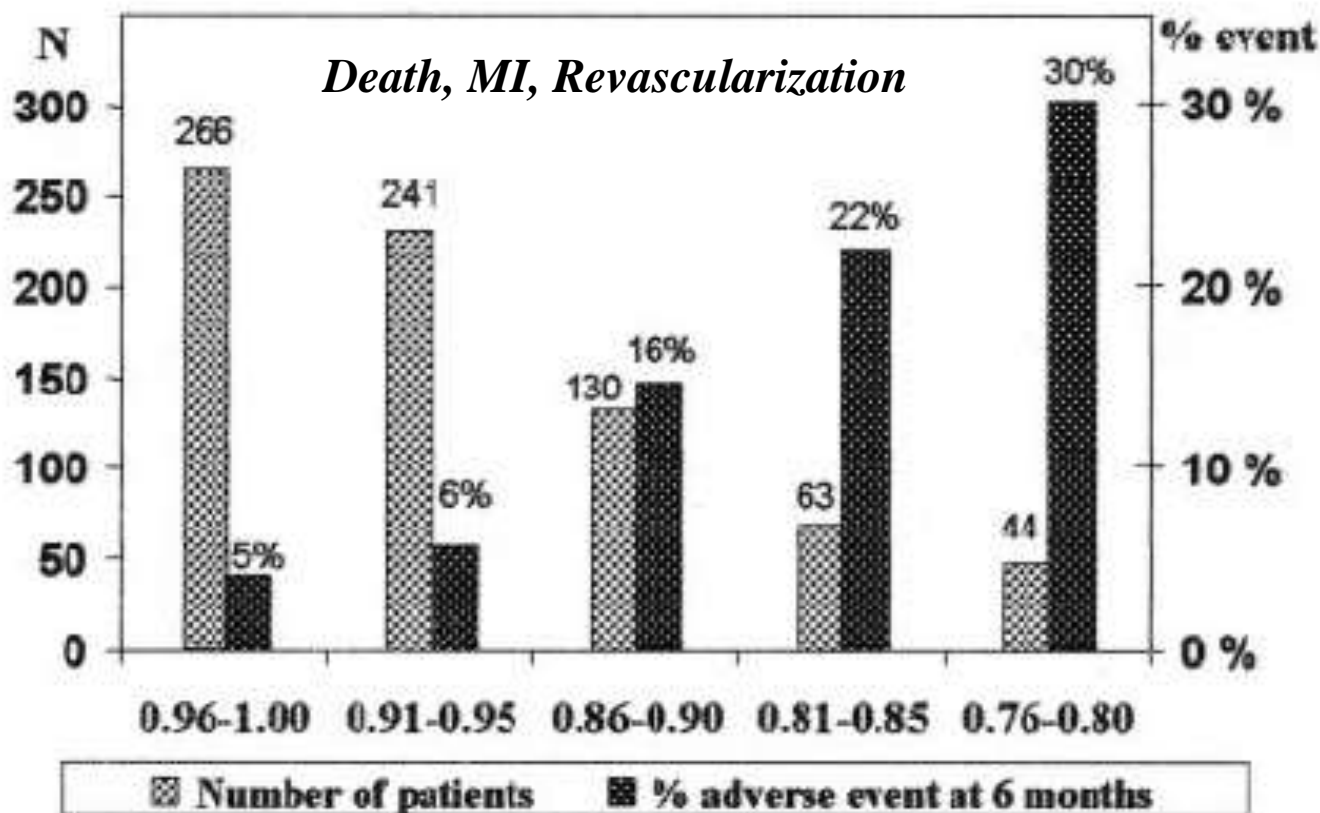
- Optimize PCI?
- Predict adverse outcomes?



FFR post Bare Metal Stenting

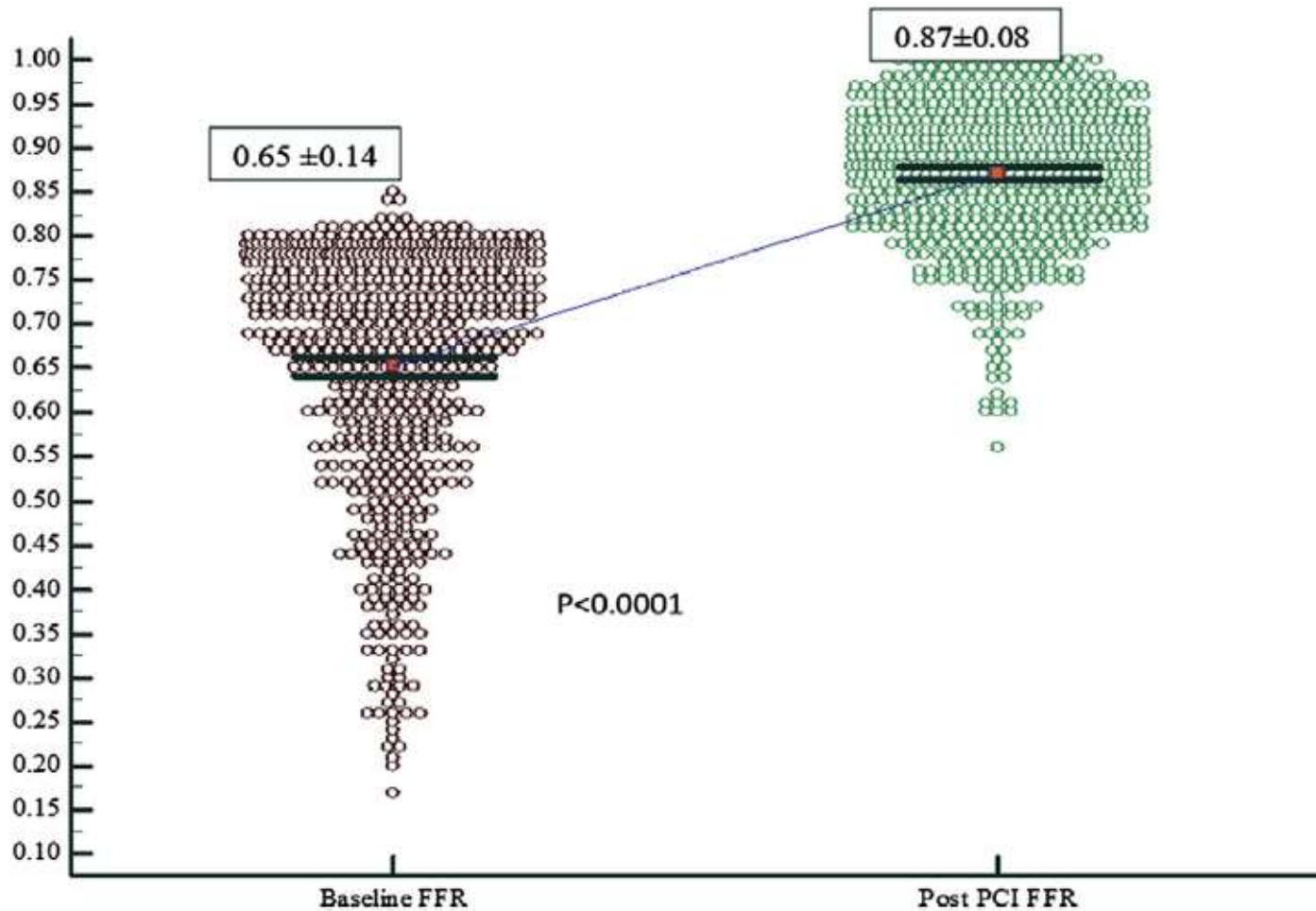
FFR Measured in 750 patients after Bare Metal Stenting

% ADVERSE EVENTS AT 6 MONTHS



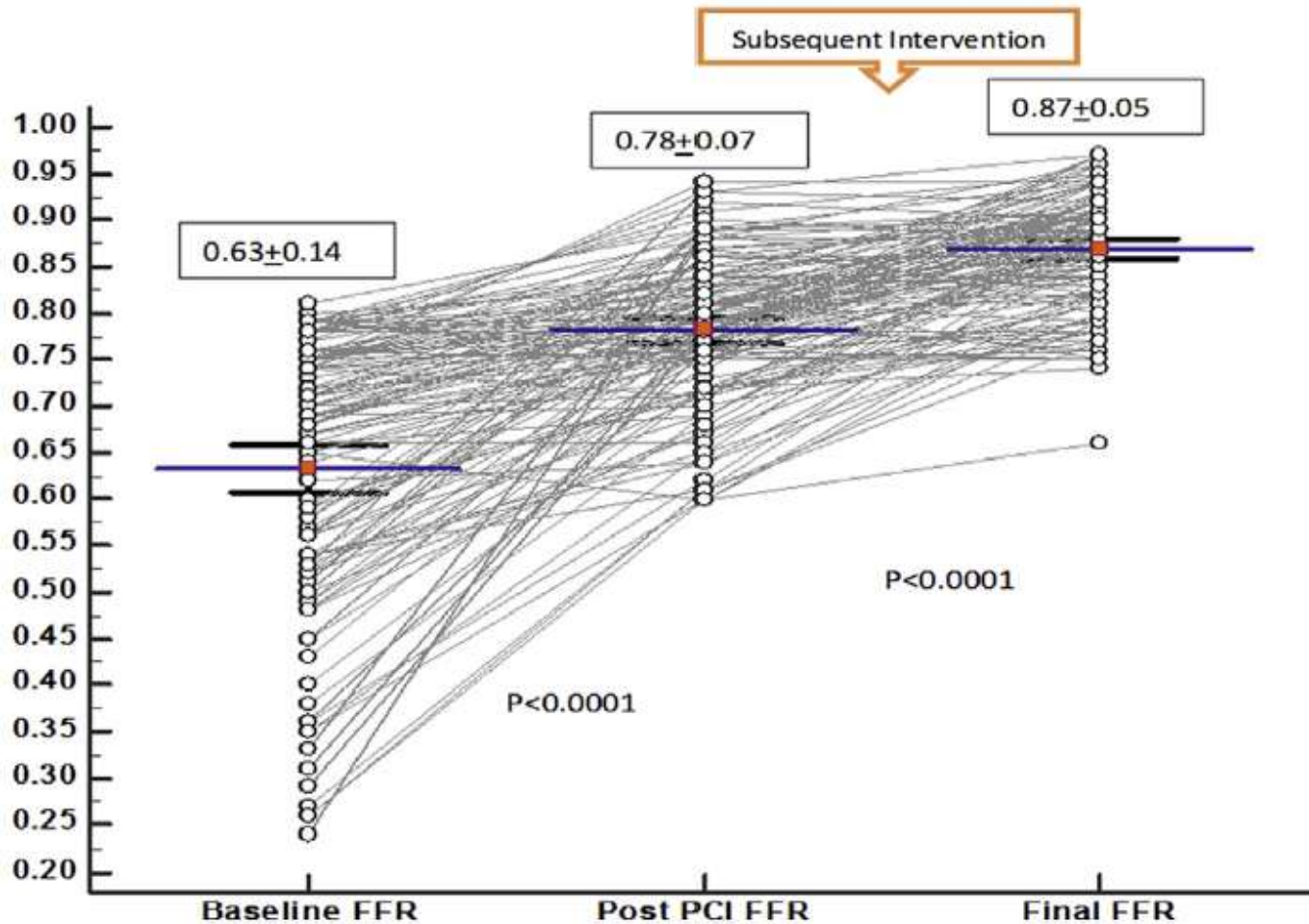
FFR post Drug Eluting Stenting

FFR Measured in 574 patients before and after Drug-Eluting Stenting



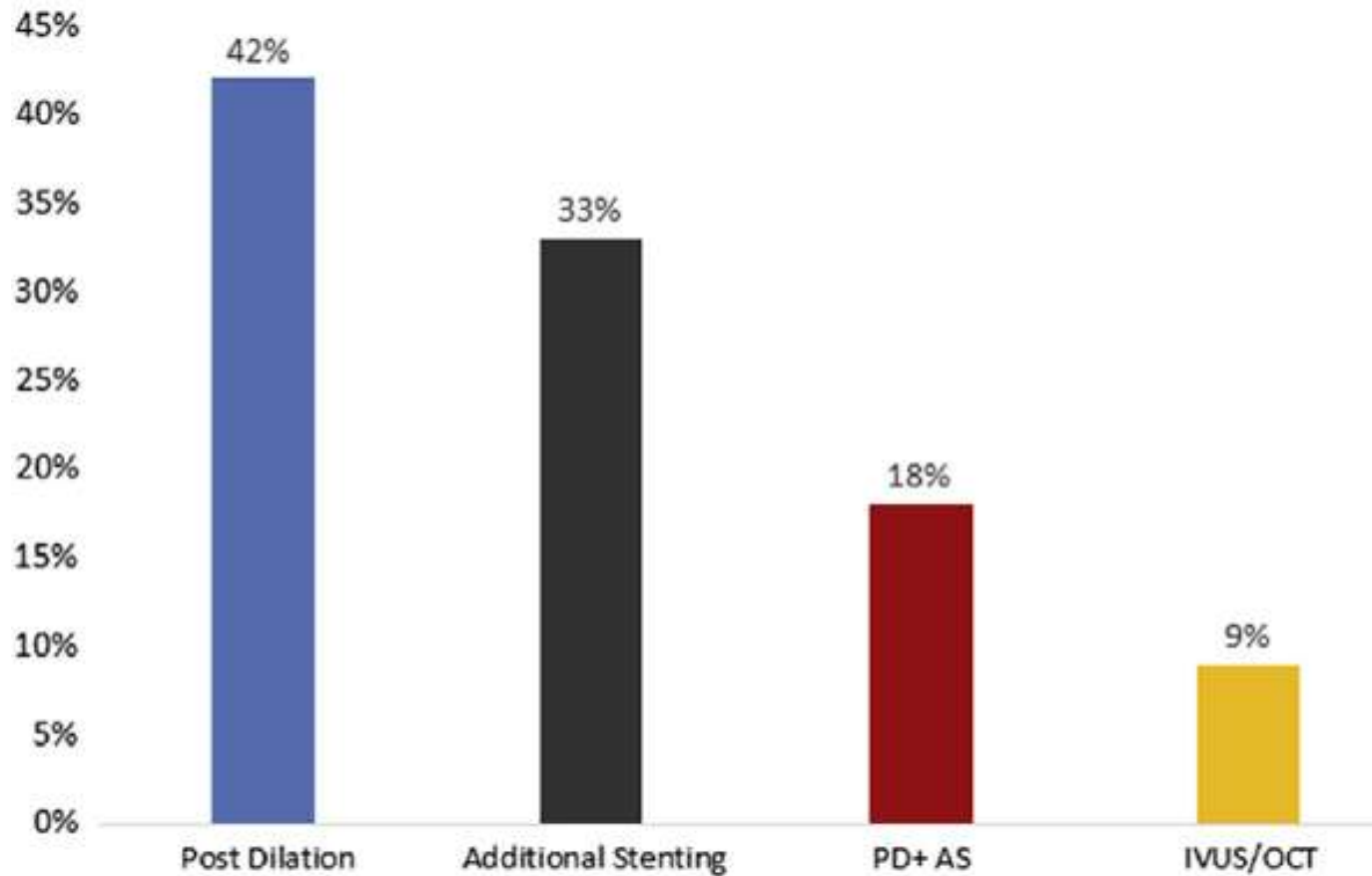
FFR post Drug Eluting Stenting

Further intervention was performed in 20% of lesions due to suboptimal FFR



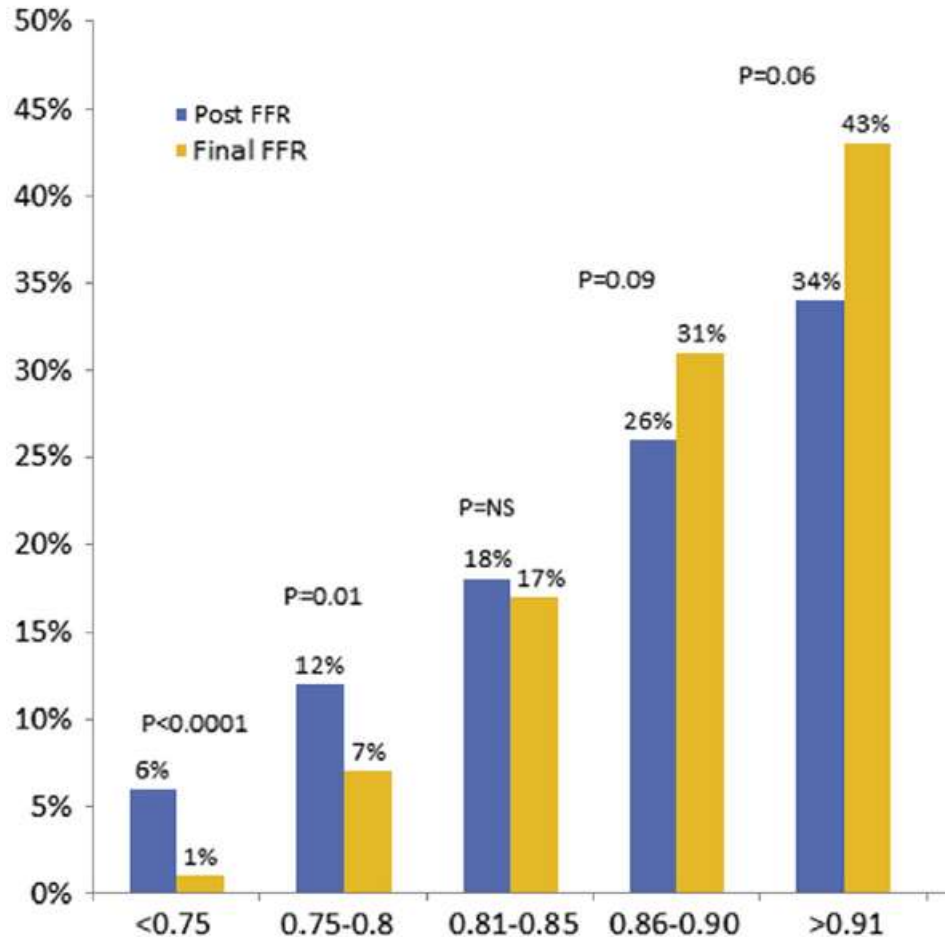
FFR post Drug Eluting Stenting

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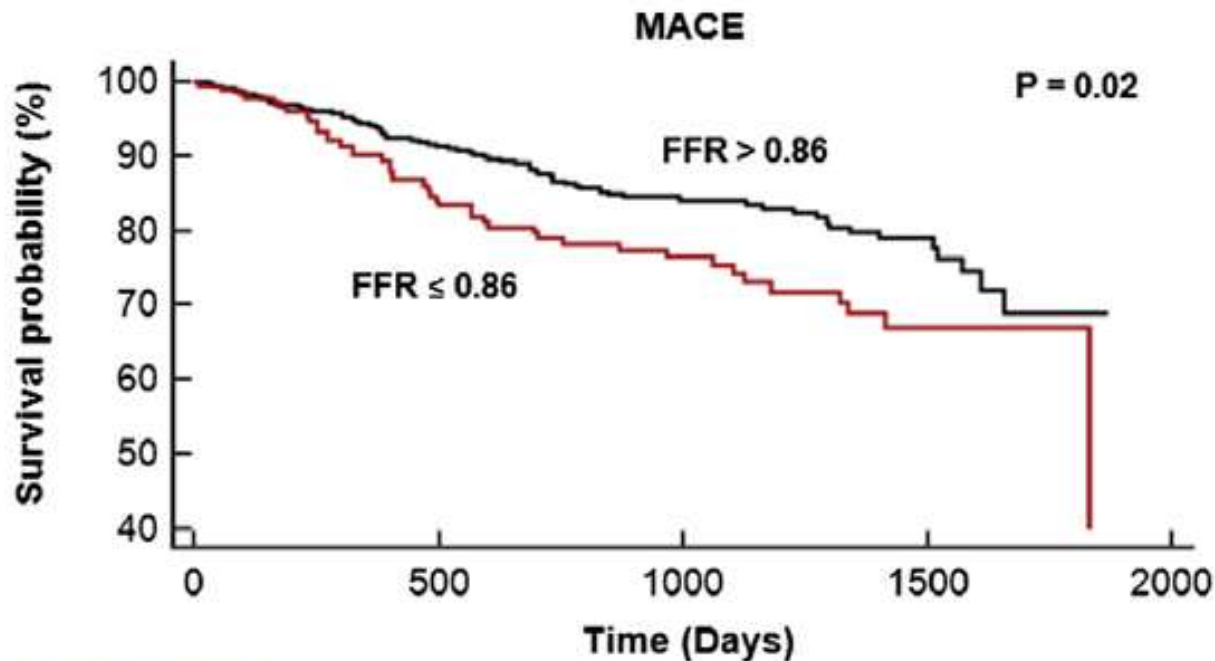
FFR post Drug Eluting Stenting

Further intervention was performed in 20% of lesions due to suboptimal FFR



FFR post Drug Eluting Stenting

FFR Measured in 574 patients after Drug-Eluting Stenting



Number at risk

FFR > 0.86

387 313 175 66 0

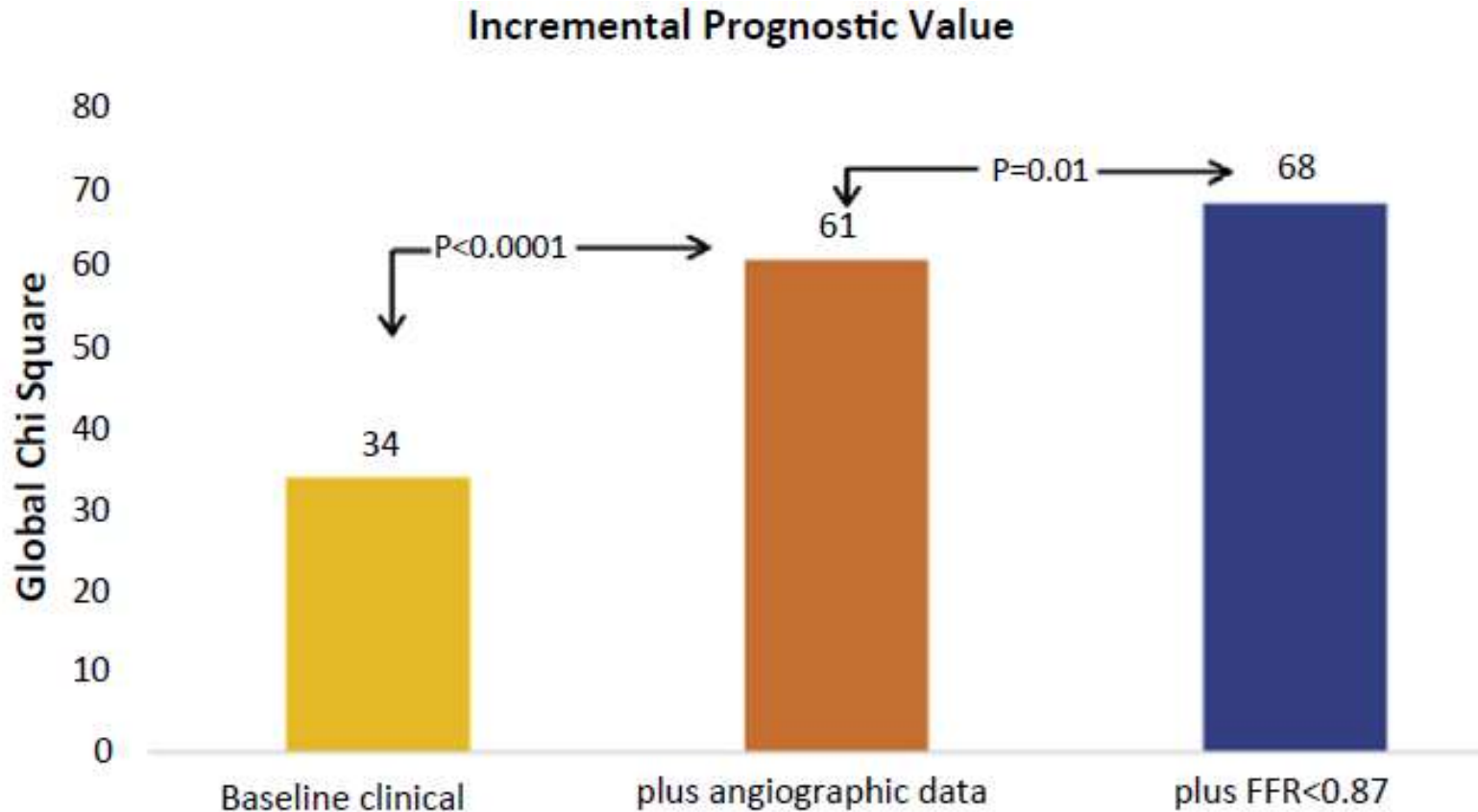
FFR ≤ 0.86

184 123 76 24 0



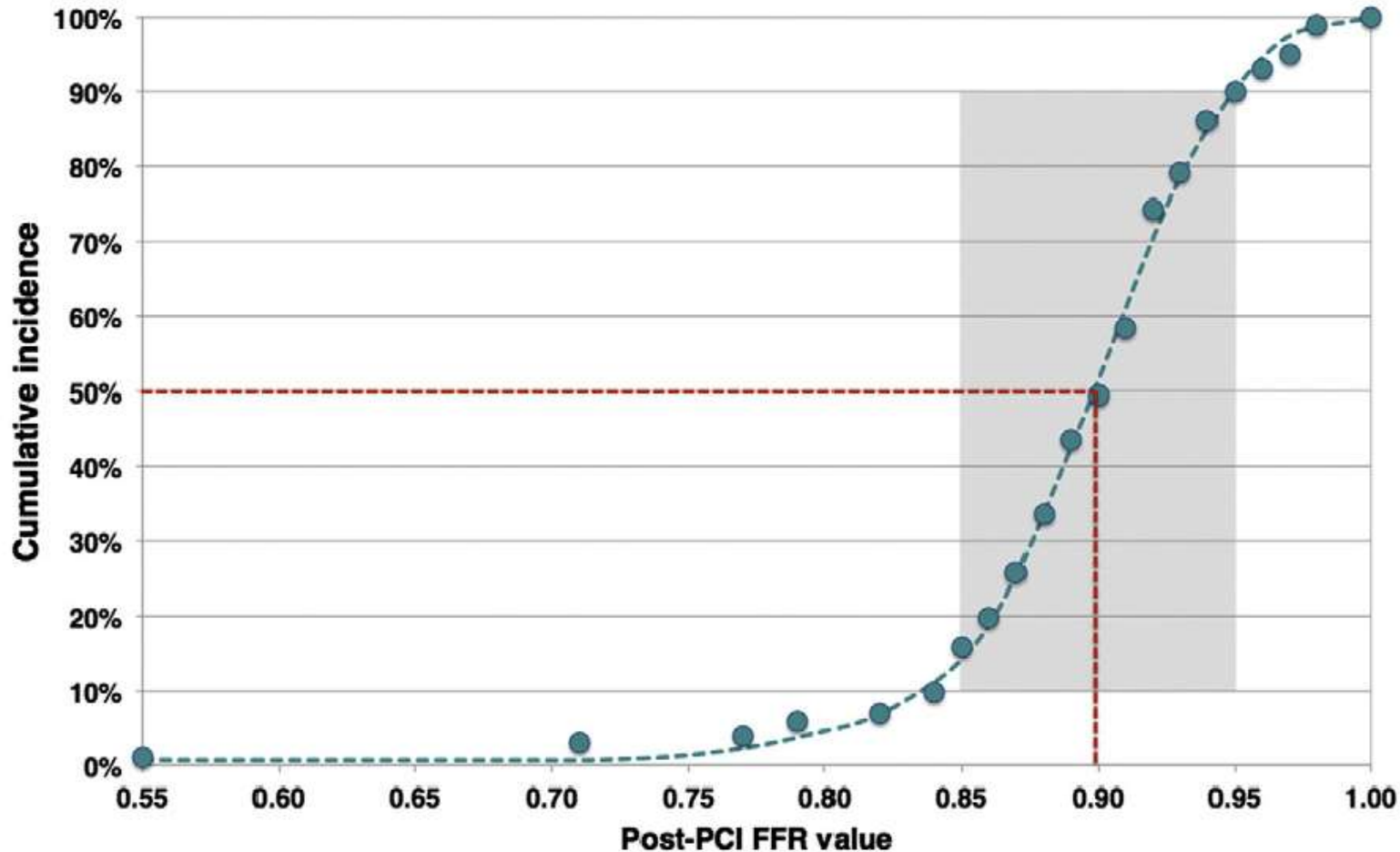
FFR post Drug Eluting Stenting

FFR Measured in 574 patients after Drug-Eluting Stenting



FFR post-PCI Meta-Analysis

105 studies (7,470 patients) evaluating FFR post PCI

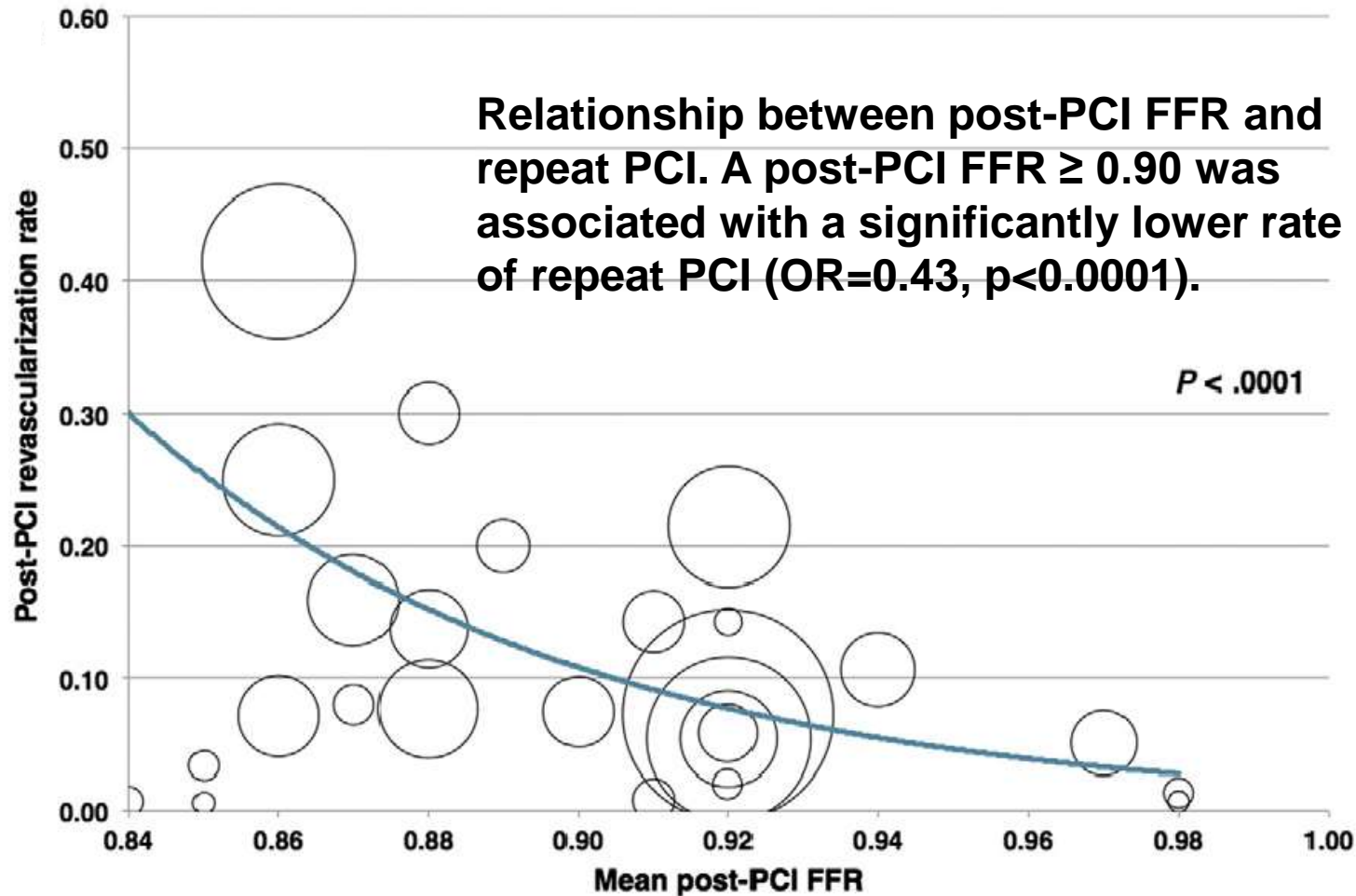


Rimac G, et al. AM Heart J 2017;183:1-9.



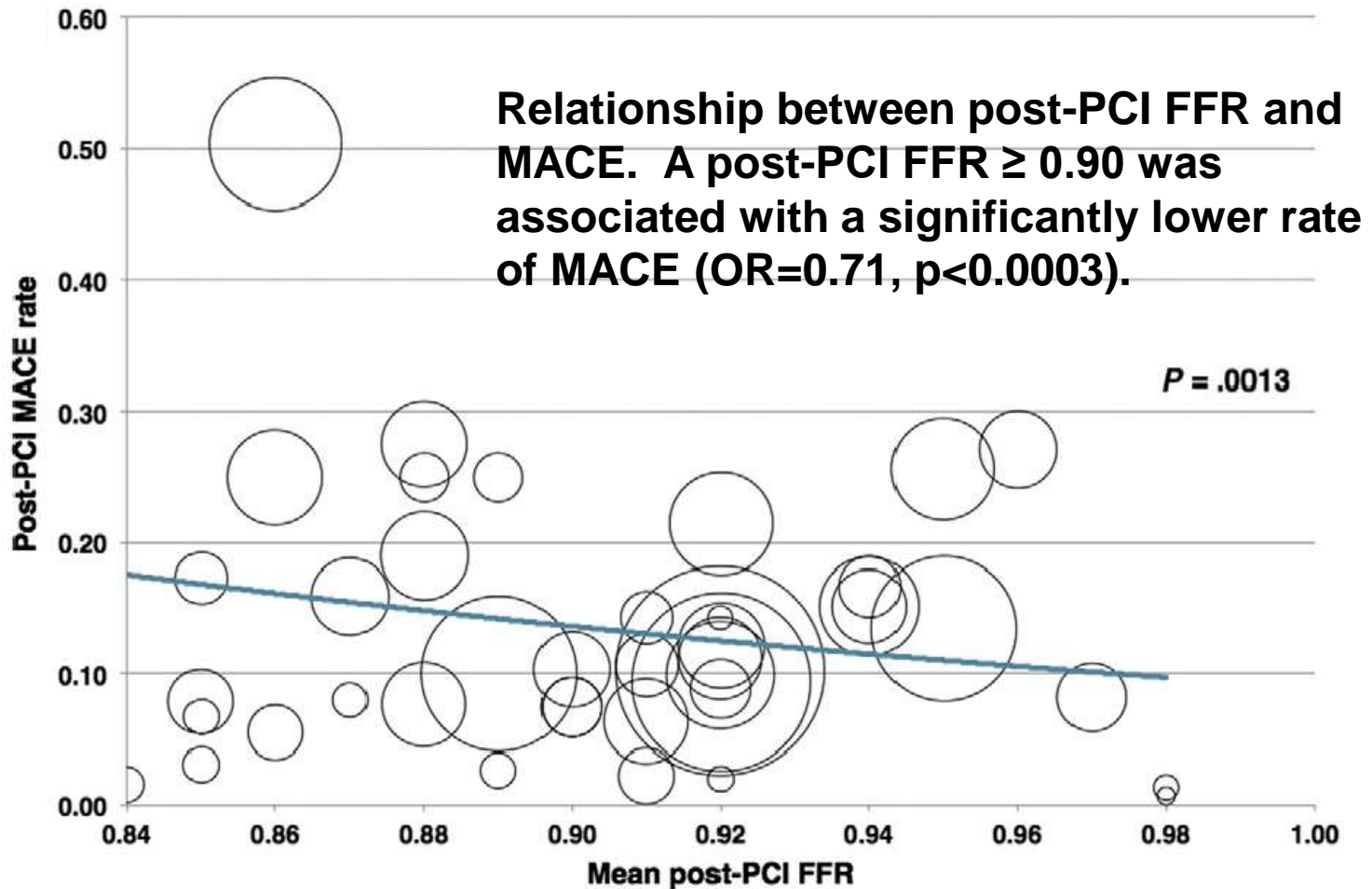
FFR post-PCI Meta-Analysis

105 studies (7,470 patients) evaluating FFR post PCI



FFR post-PCI Meta-Analysis

105 studies (7,470 patients) evaluating FFR post PCI



FUSION Study

If post-PCI FFR is > a certain cutpoint, does that indicate an optimal stent result?

Stent deployment at 10 Atm



Measure FFR \Rightarrow if ≥ 0.94 , IVUS and stop



if < 0.94



Progressive dilatations in 2 Atm increments



Measure FFR after each dilatation



**IVUS and stop once FFR ≥ 0.94
or 16 Atm achieved**



FUSION Study

Diagnostic characteristics of $FFR \geq 0.96$ for predicting optimal IVUS

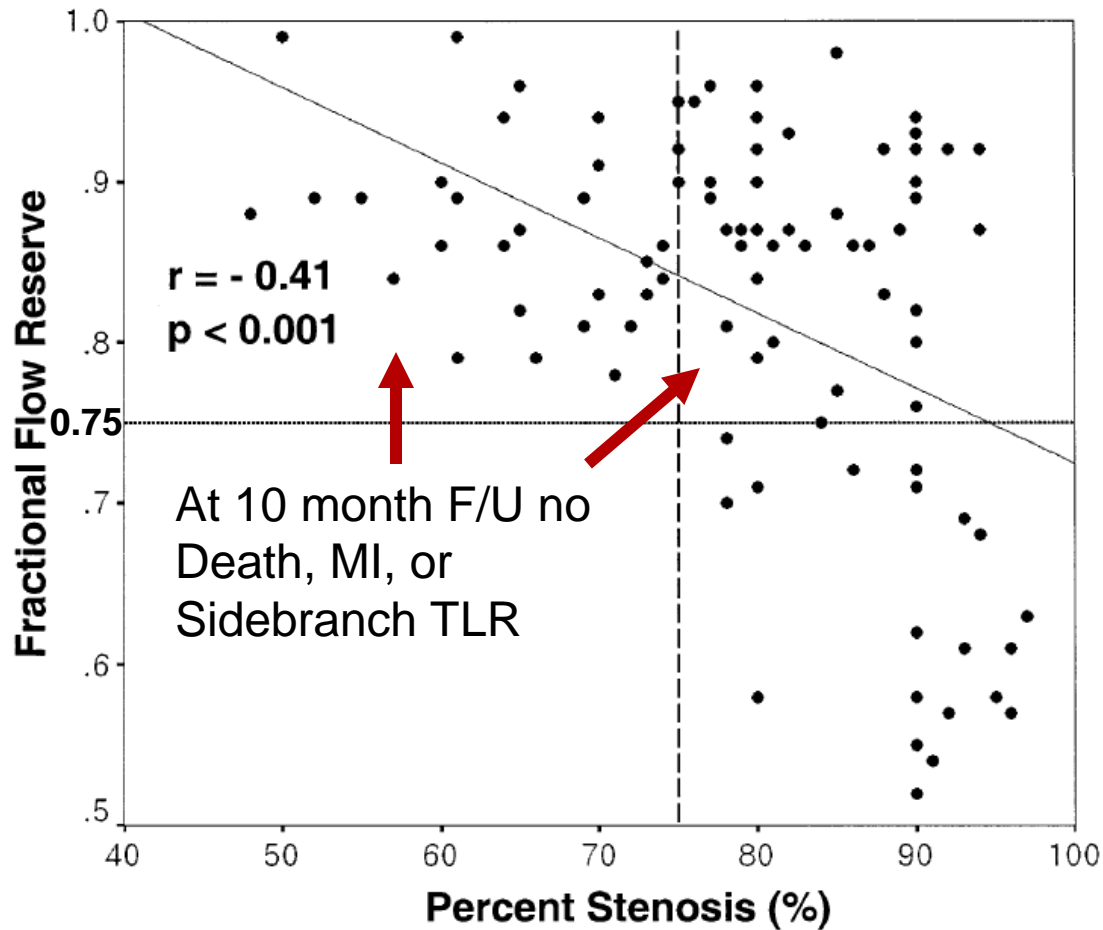
IVUS Cut Point	Sensitivity, %	Specificity, %	NPV, %	PPV, %	Predictive Accuracy, %	Likelihood Ratio
MSA ≥ 6 mm ²	56	56	60	52	56	1.3
MSA ≥ 7 mm ²	75	58	88	36	62*	1.8
MSA ≥ 8 mm ²	73	55	90	26	58	1.6
% AE ≥ 70	49	48	62	36	49	0.94
% AE ≥ 80	47	48	60	36	48	0.90
% AE ≥ 90	61	53	83	26	55	1.3
MSA ≥ 6 or %AE ≥ 70	51	53	26	76	51	1.1
MSA ≥ 7 or %AE ≥ 90	69	60	79	48	63†	1.7

FFR can normalize before a stent has been optimally expanded



Jailed Side Branches and FFR

FFR in 97 "Jailed" Side Branches



Jailed Side Branches and FFR

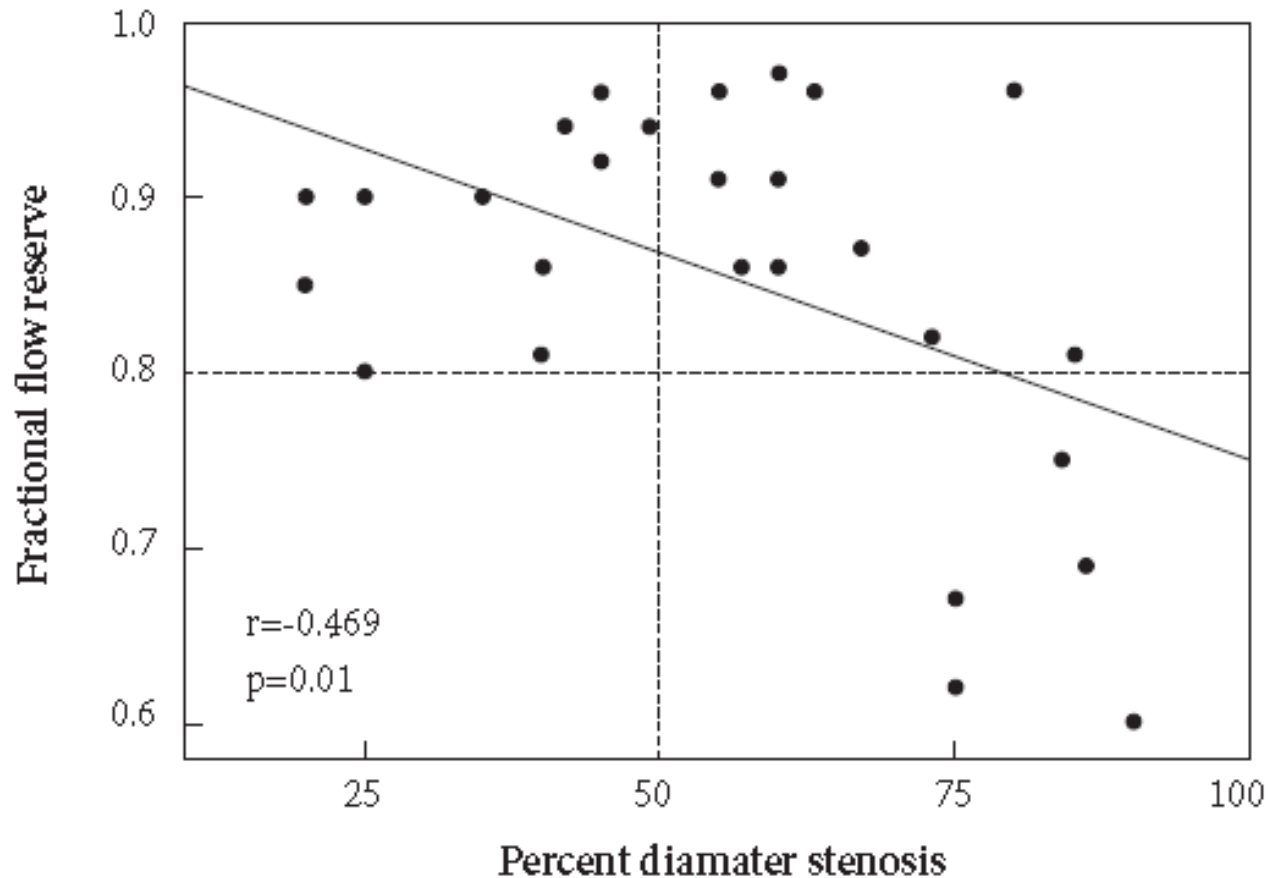
FFR in 91 “Jailed” Side Branches, Repeated at 6 Months

	Post-intervention	Follow-up	P-value^a
Main branch	0.96 ± 0.04	0.96 ± 0.04	0.9
Jailed side branch	0.87 ± 0.06	0.87 ± 0.09	0.7
KB group	0.86 ± 0.05	0.84 ± 0.11	0.4
Non-KB group	0.87 ± 0.06	0.89 ± 0.07	0.1



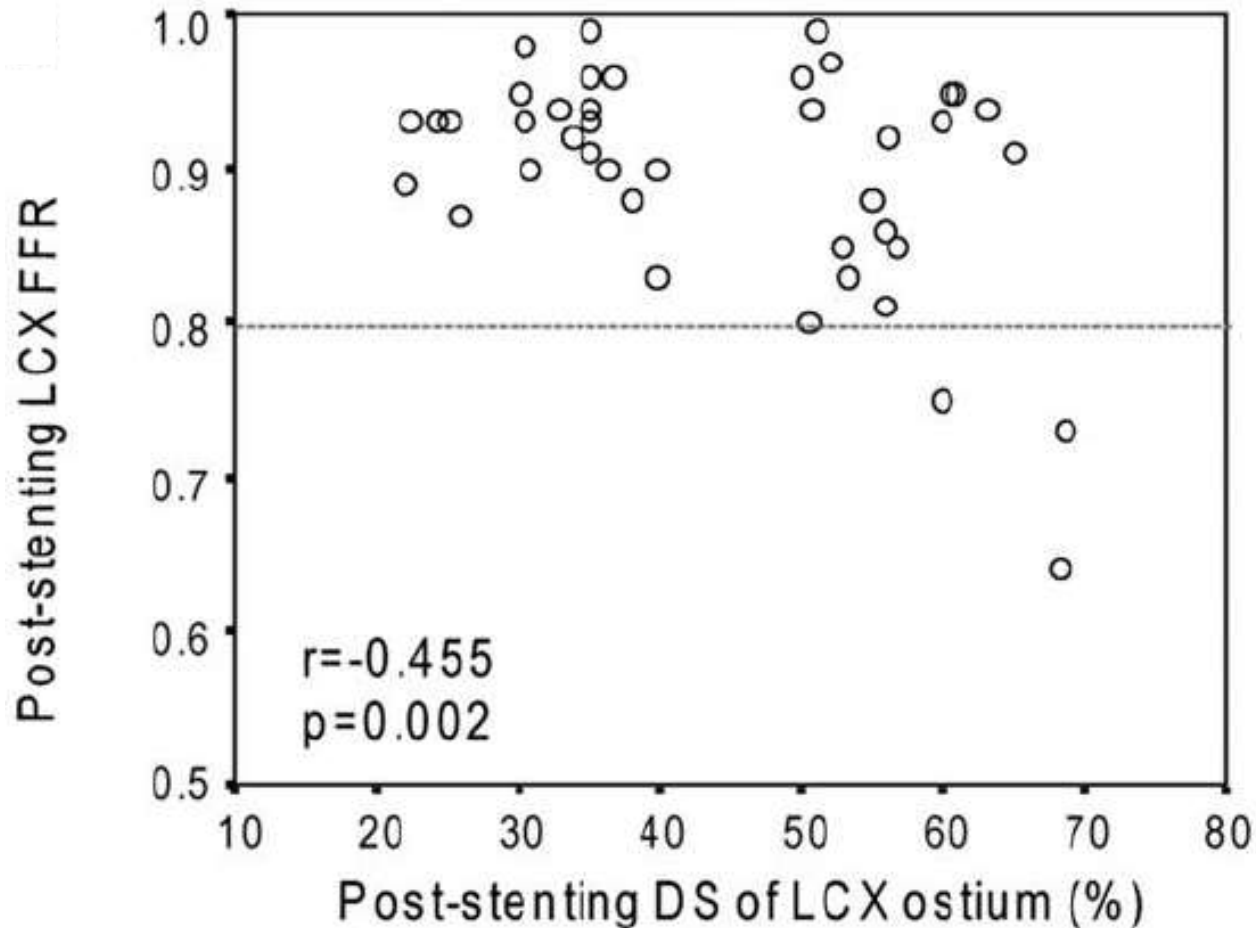
FFR of “Jailed” Left Circumflex

29 patients with LM/LAD crossover stenting with FFR of “jailed” Cx



FFR of “jailed” Circumflex

43 patients with cross-over LM to LAD PCI and post PCI FFR of L Cx



Conclusions:

- FFR post-PCI can help optimize the PCI result
- A residual low FFR post PCI can help with follow-up management
- Post-PCI FFR does predict adverse outcomes (may be related to burden of atherosclerosis)



Conclusions:

- A high FFR post-PCI may not guarantee an optimal stent result
- Jailed sidebranches often are not functionally significant based on FFR assessment
- Whether FFR post-PCI guidance improves outcomes compared with angiography guidance alone awaits further study

