FFR is the Gold Standard

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Sound Scientific Basis

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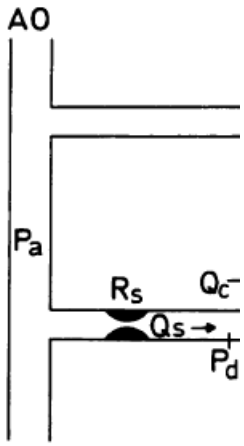

FIGURE 1. *Sch*
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$$\frac{P_a - P_v}{P_w - P_v} = 1$$

As explained later, Equa
with Equation 2 in case *F*

FFR_{cor}=

FFR_{myo}=

Q=

or

Q_c=

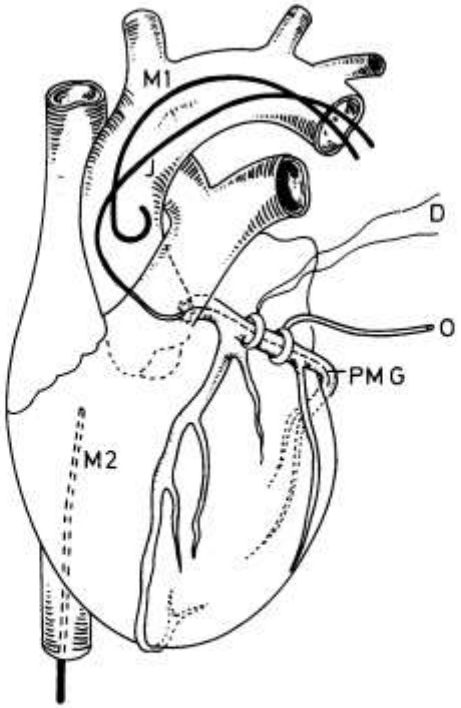
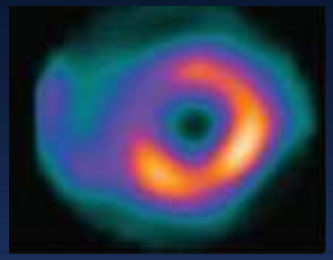


FIGURE 2. *Schematic of animal instrumentation. D, Doppler probe; J, 6F left Judkins catheter; M_1, Millar catheter in ascending aorta: M_2, Millar catheter in right atrium; O, balloon occluder; PMG, pressure-monitoring guide wire with its tip 3–5 cm distal to the balloon occluder.*

Pijls, et al. Circulation 1993;86:1354-67.

How To Detect Objective Ischemia

- Decreased Coronary Blood Flow +



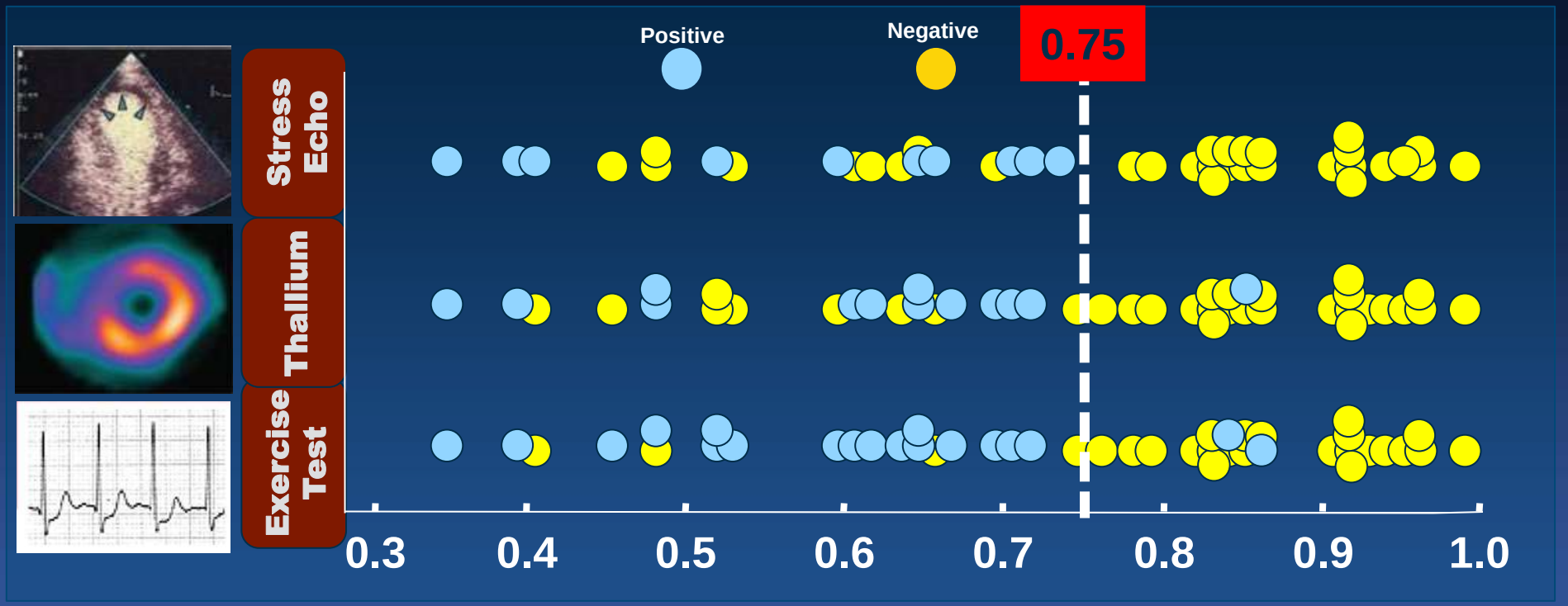
Myocardial Perfusion Abnormality

Contractile Abnormality

Electrical Abnormality

Non-Invasive Study In Cath Lab

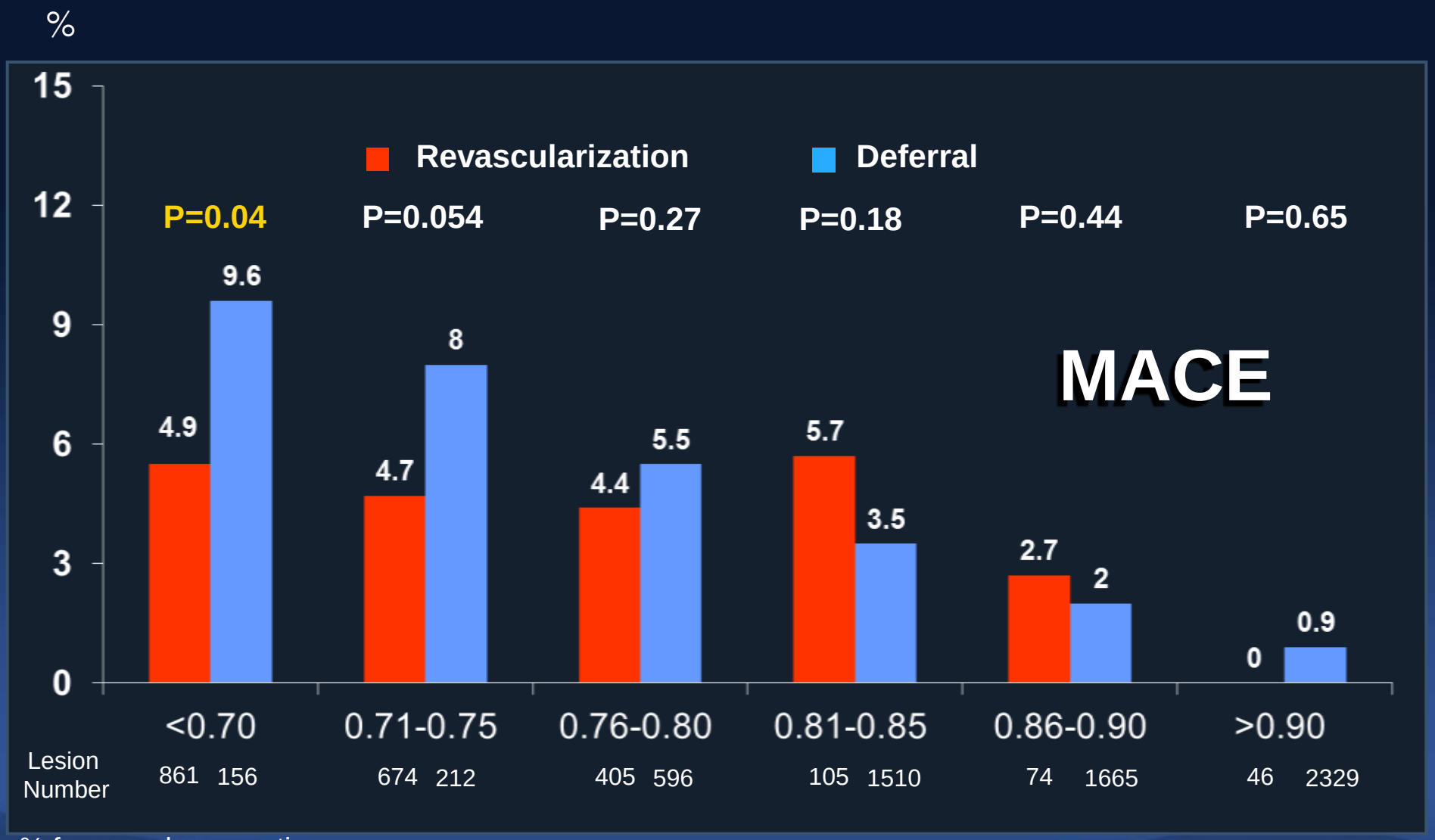
Comparison with 3 non-invasive functional studies



- N = 45 patients
- Sensitivity 88%, Specificity 100%, PPV 100%, NPV 88%

N Engl J Med 1996;334:1703-8

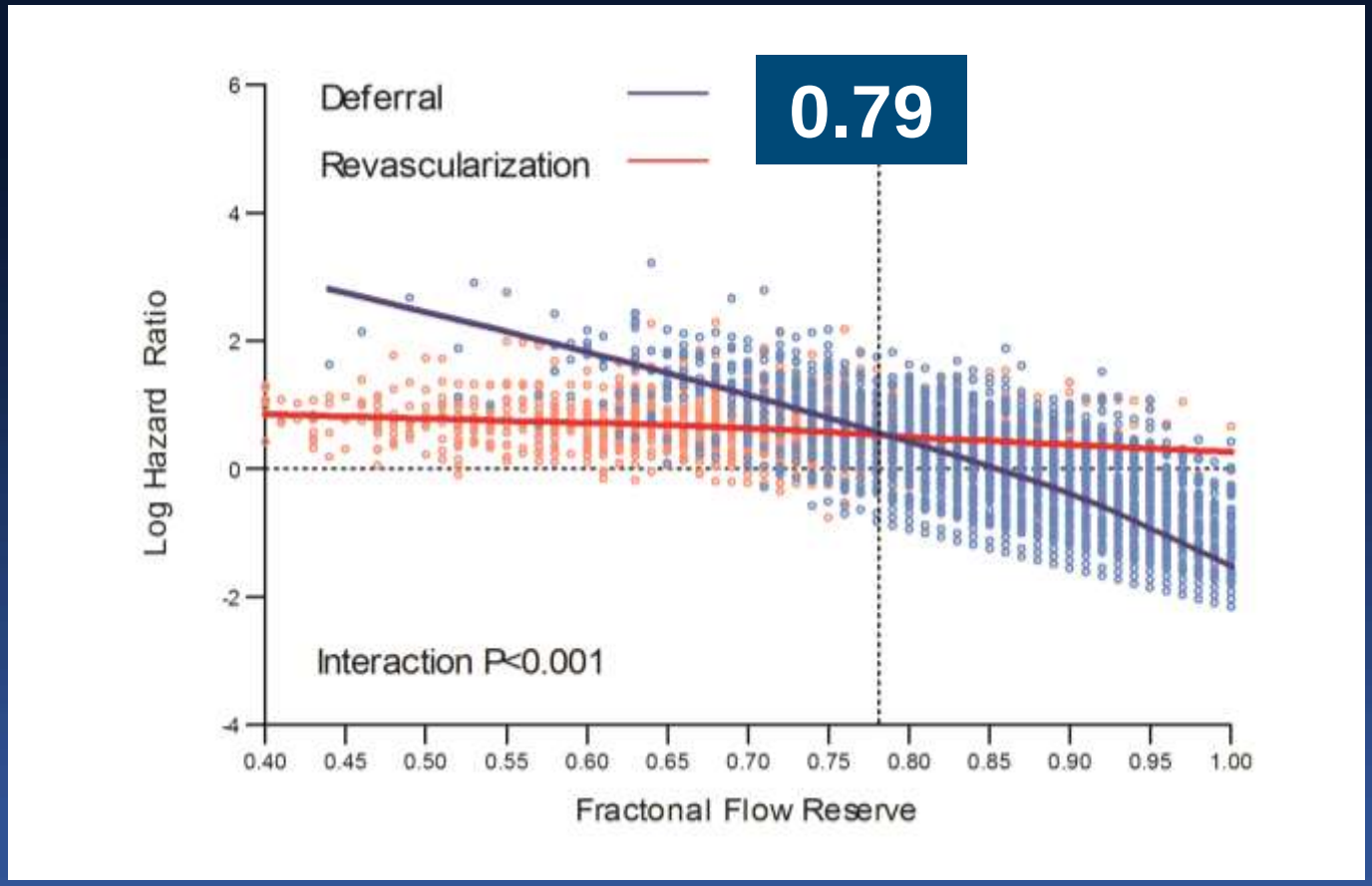
Outcome Derived Revascularization Threshold



% from crude proportion

Ahn JM, Park SJ et al. Circulation. 2017 Mar 29

Outcome Derived Revascularization Threshold



Ahn JM, Park SJ et al. Circulation. 2017 Mar 29

FFR Guided PCI

≤ 0.80

- ✓Myocardial Ischemia producing
- ✓Stenting

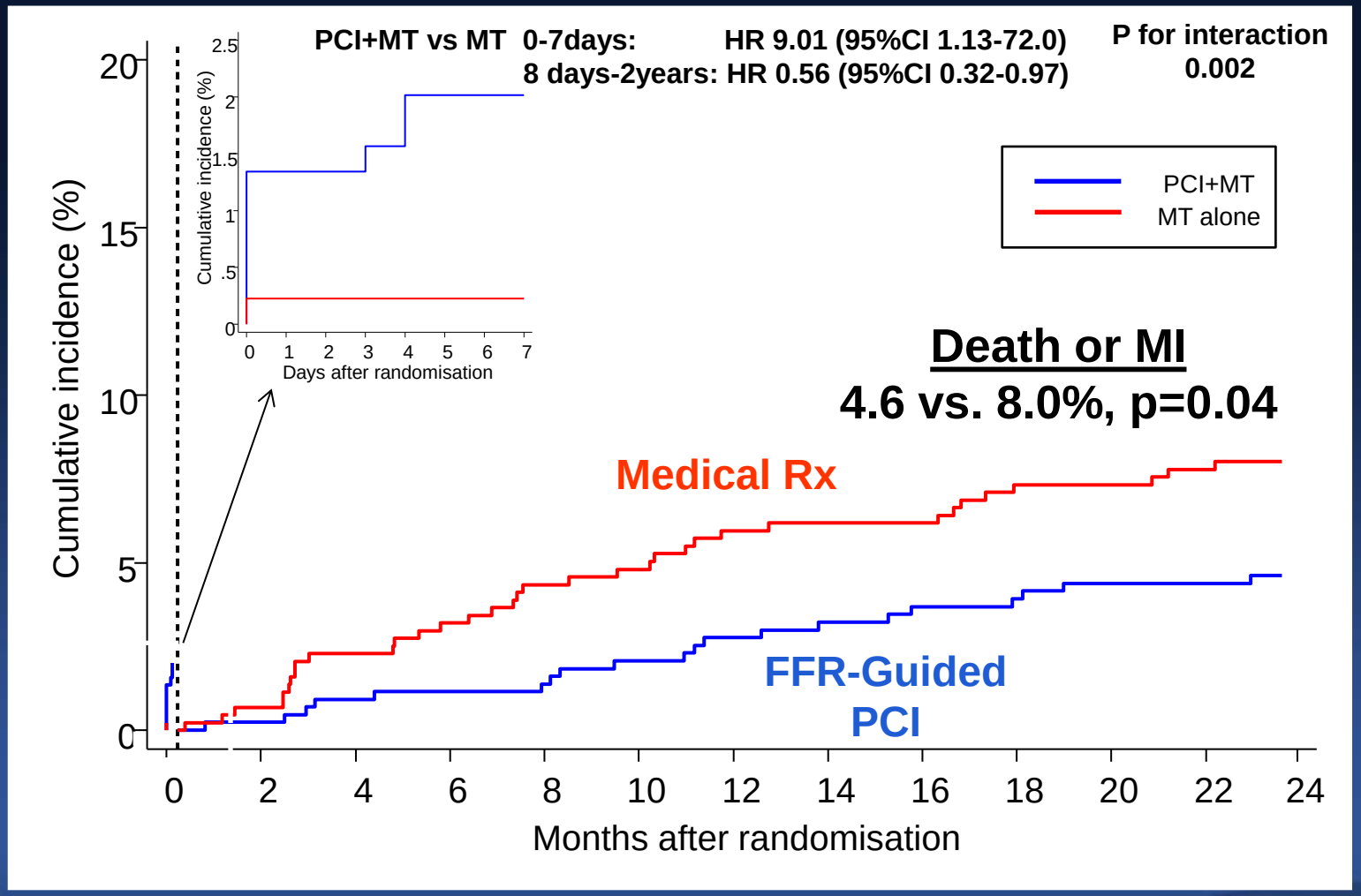
>0.80

- ✓**Not** Myocardial Ischemia producing
- ✓Optimal Medical Treatment
- ✓Deferral of Stenting

Lokien X van Nuen et al. LANCET 7–13 November 2015, Pages 1853–1860

FFR ≤ 0.80: Stenting Justified

FAME 2



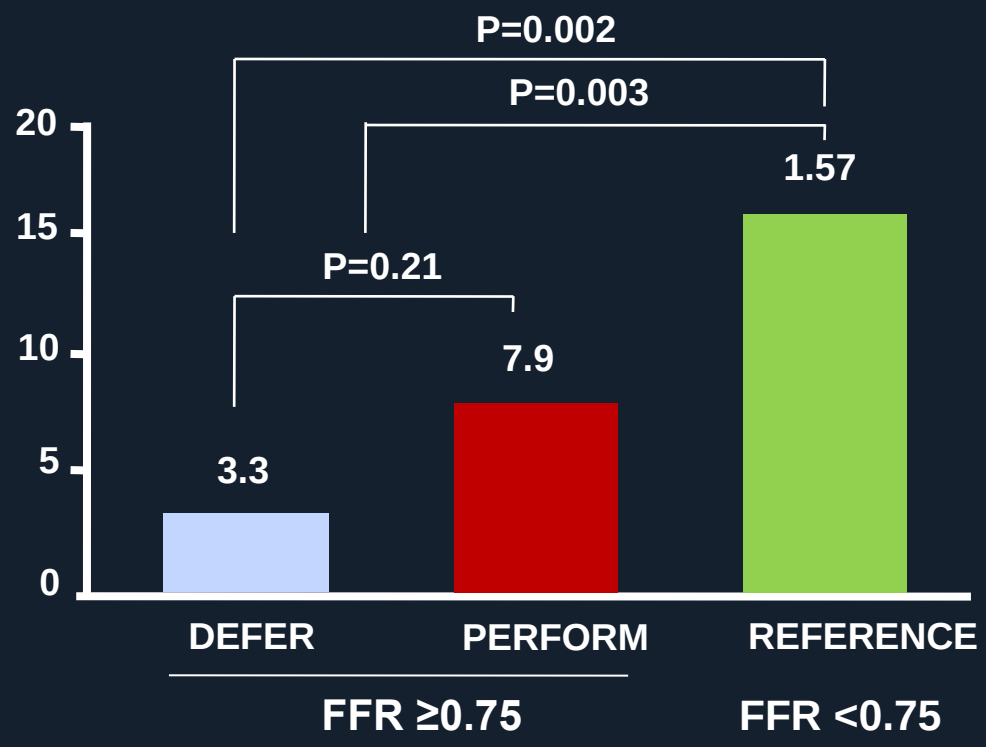
De Bruyne, et al. New Engl J Med 2014;371:1208-17.

FFR > 0.80: DEFER

Cardiac Death and MI

In 325 patients

- FFR≥0.75
  - R → DEFER (n=91)
  - R → PERFORMANCE (N=90)
- FFR<0.75
  - REFERENCE (N=144)

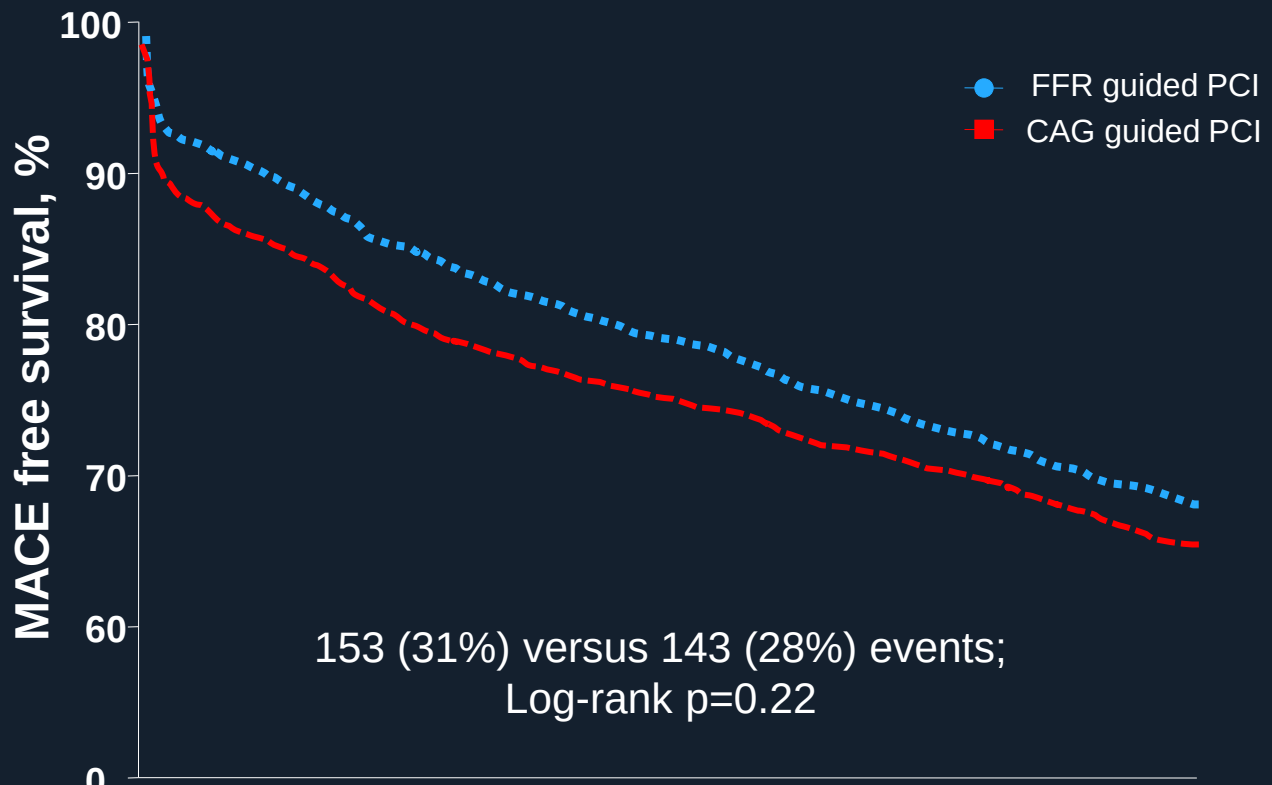


- The risk of CD or MI related to this stenosis is <1%/year and not decreased by stenting.

J Am Coll Cardiol 2007;49:2105–11

FFR Guided PCI: FAME I

MACE

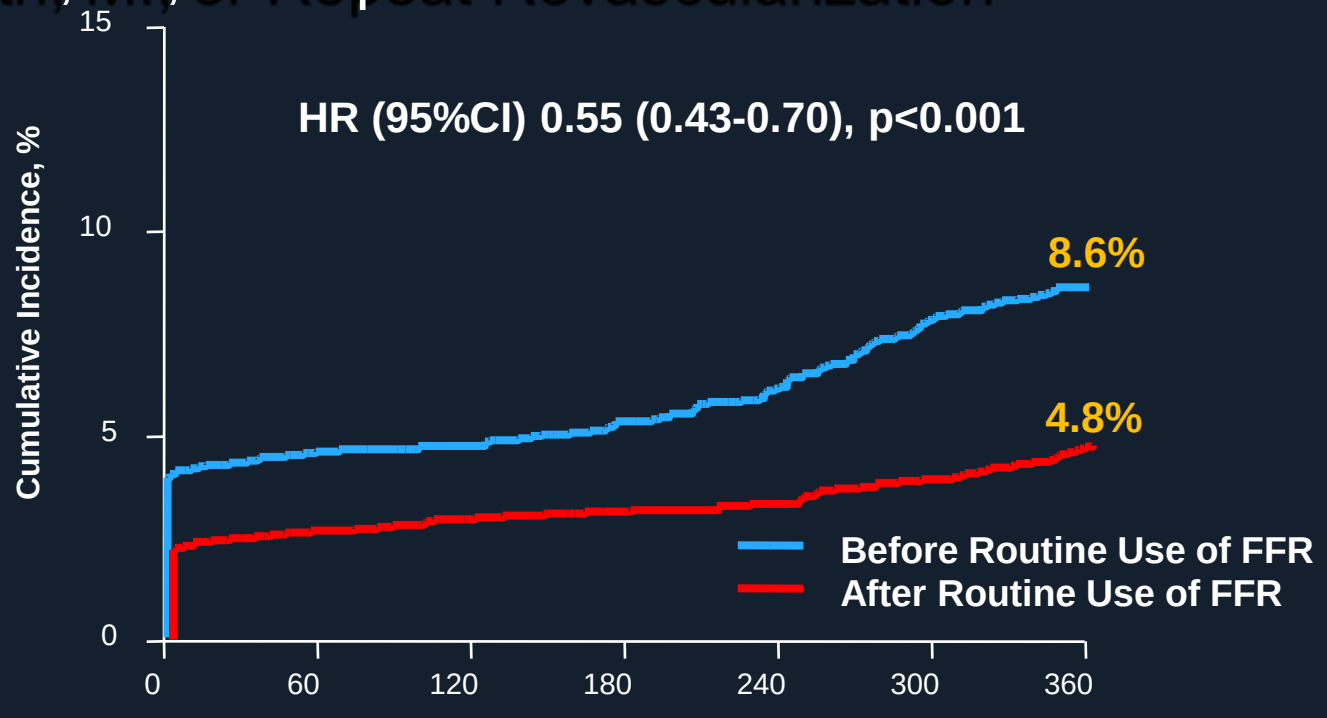


No. at Risk		1	2	3	4	5
CAG guided	496	393	350	319	293	257
FFR guided	509	434	389	341	310	263

Lokien X van Nuen et al. LANCET 7–13 November 2015, Pages 1853–1860

Routine FFR Use in Real World Practice
ASAN PCI Registry

Death, MI, or Repeat Revascularization

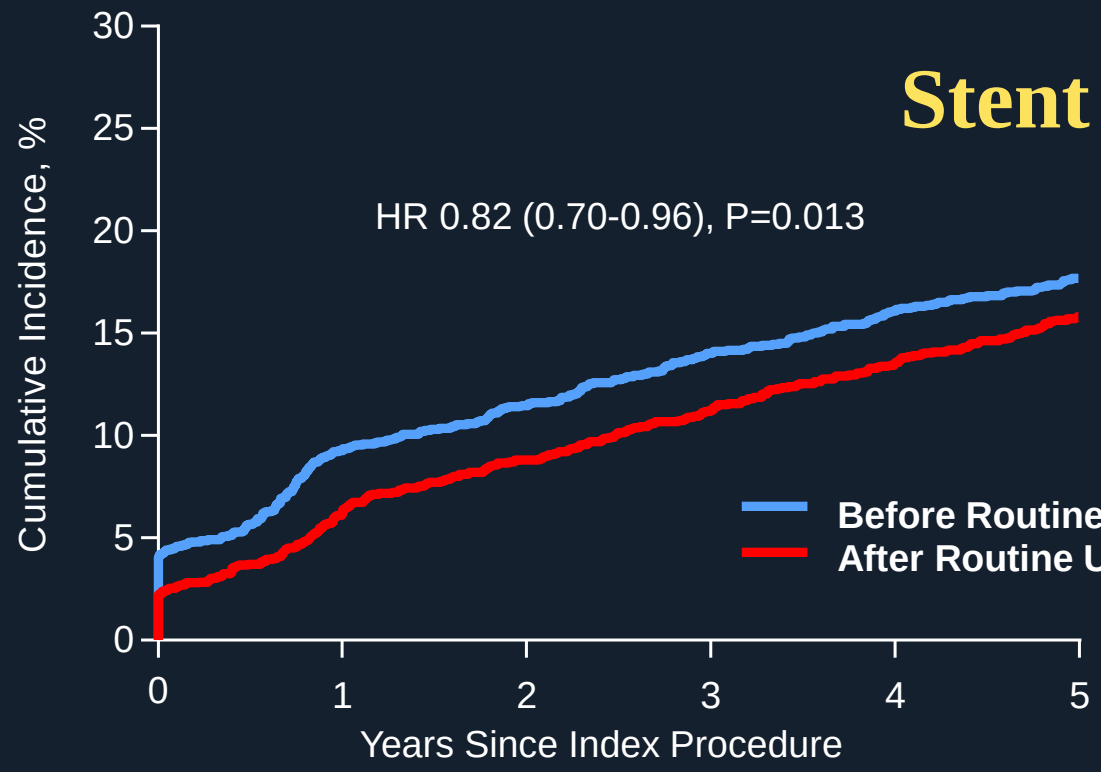


No. at Risk				
Before Routine Use	2178	2066	2011	1960
After Routine Use	2178	2092	2067	2037

Park SJ, Ahn JM et al. Eur Heart J. 2013 Nov;34(43):3353-61

Real World Practice In ASAN PCI Registry
5 Year follow-up

Death, MI, or Repeat Revascularization



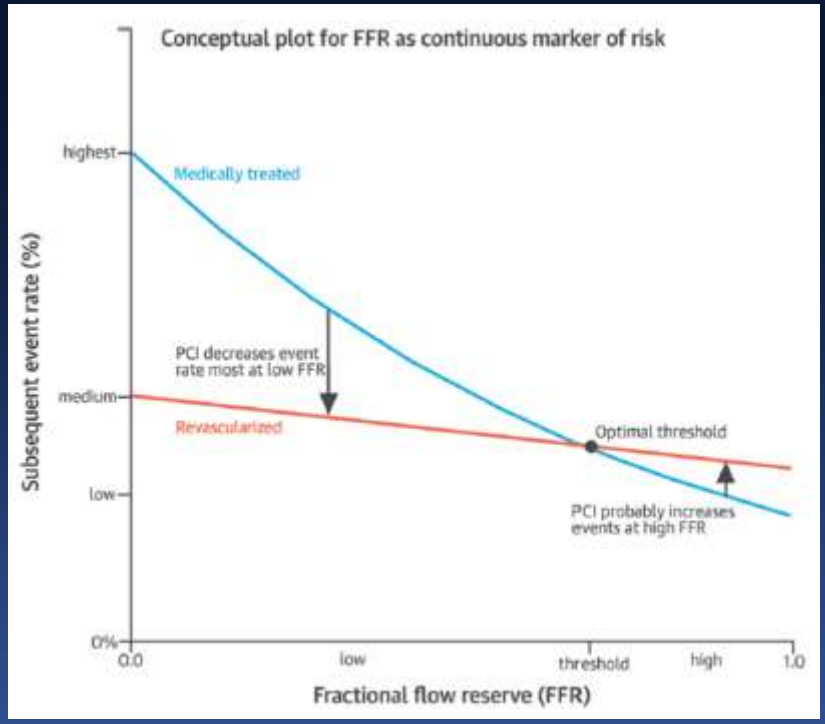
Stent Number

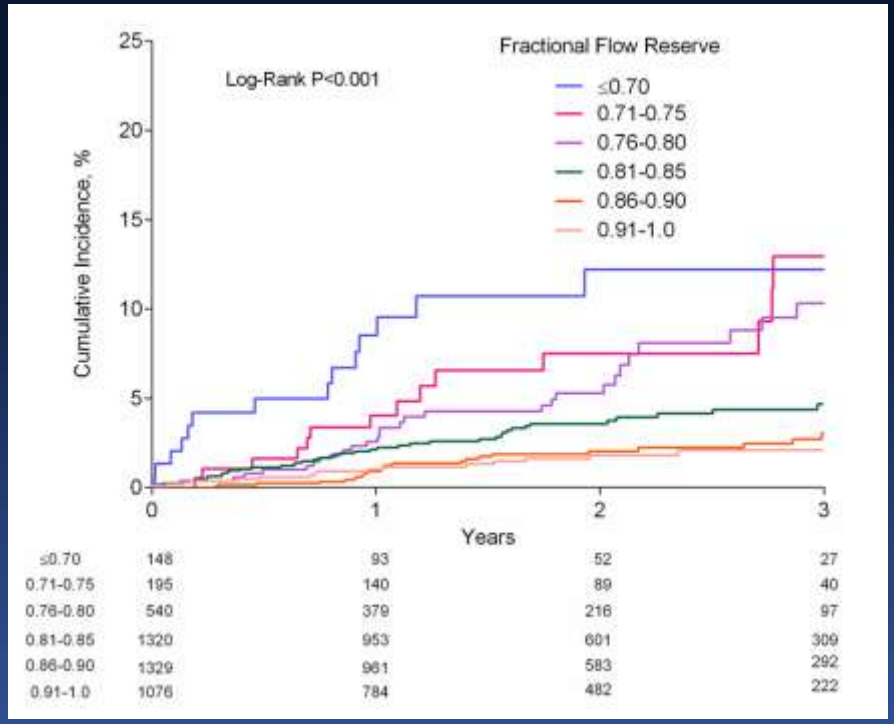
2.2
1.6

No. at Risk

Before Routine Use	2178	1965	1827	1735	1596	940
After Routine Use	2178	2035	1826	1722	1606	966

Risk Continuum of FFR

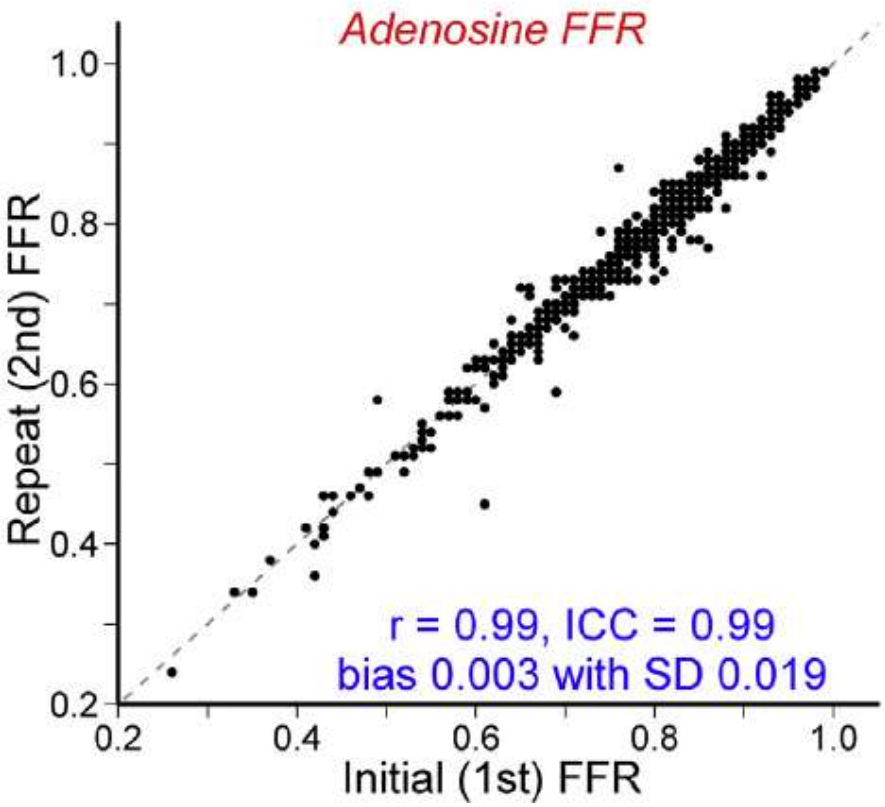




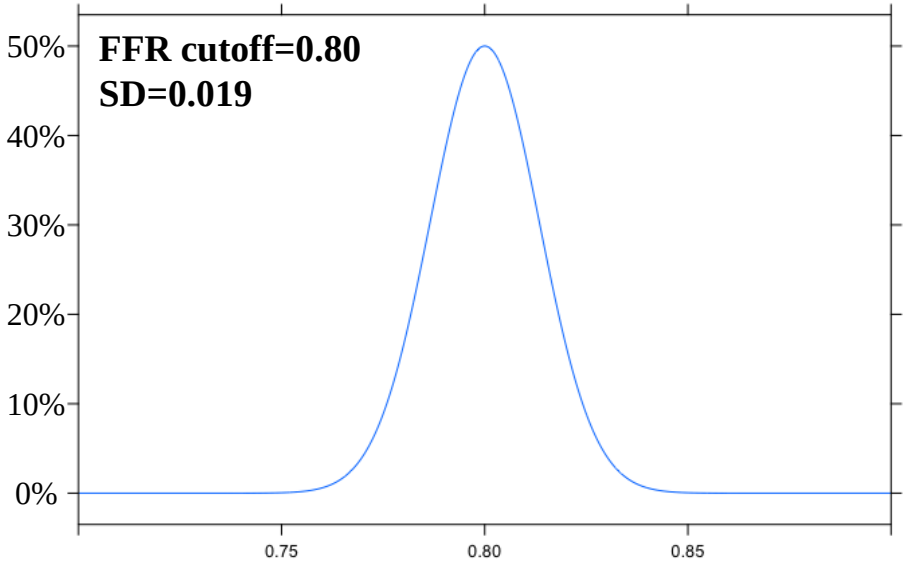
Johnson, et al. J Am Coll Cardiol 2014;64:1641-54

Ahn JM, Park SJ et al. Circulation. 2017 Mar 29

Measurement

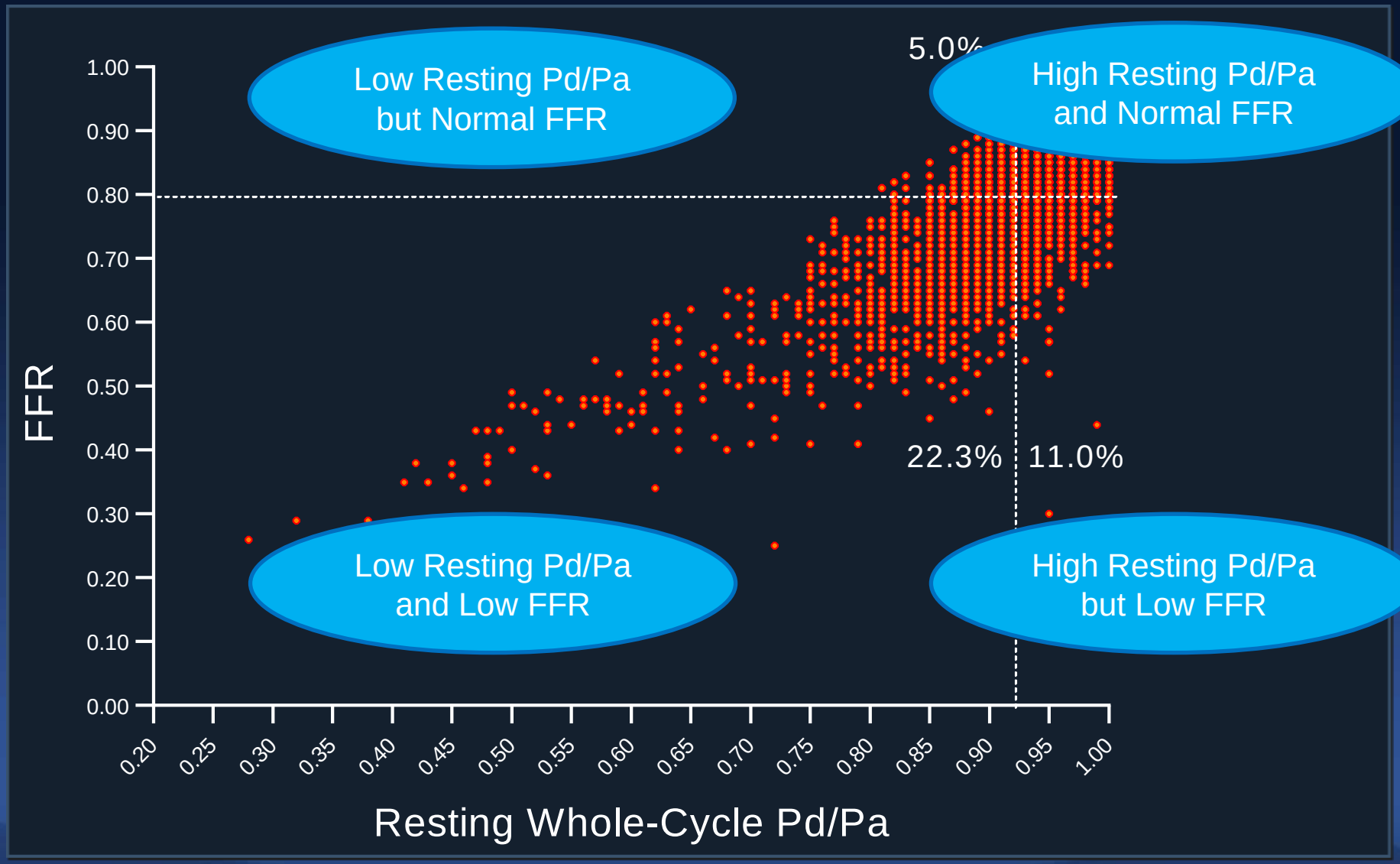


Probability that revascularization decision will change if measurement is repeated



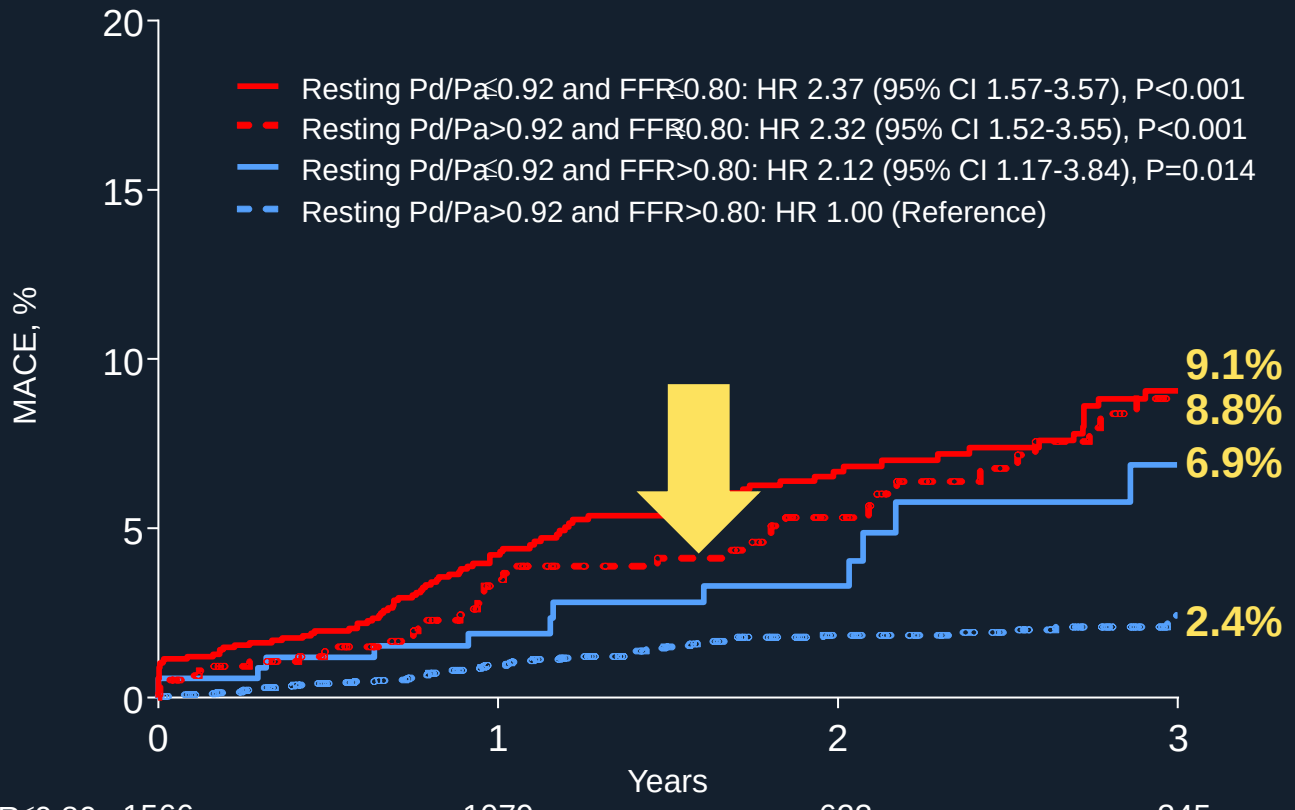
Johnson, et al. J Am Coll Cardiol Intv 2016;9:757-67.

Resting Pd/Pa and FFR



Without hyperemia, clinically important subsets with moderately but significantly increased risk of cardiac events could not be identified

For Cardiac Death, MI, RR



Lesion at risk				
Pd/Pa ≤0.92 and FFR≤0.80	1566	1079	623	345
Pd/Pa>0.92 and FFR ≤0.80	772	527	324	183
Pd/Pa ≤0.92 and FFR>0.80	351	244	151	71
Pd/Pa>0.92 and FFR>0.80	4325	3099	1730	864

Unpublished Data

Summary

1. Sound scientific basis.
2. Cut-off value was validated against *ischemia test* and *clinical outcome.*
3. FFR guided PCI was validated in randomized trials and real world registry: *favorable outcomes* with *less stent use*.
4. FFR has a prognostic value.
5. Highly reproducible.
6. Induction of hyperemia can identify unique clinical, physiologic, and prognostic phenotype of patients.