National Research Council of Italy

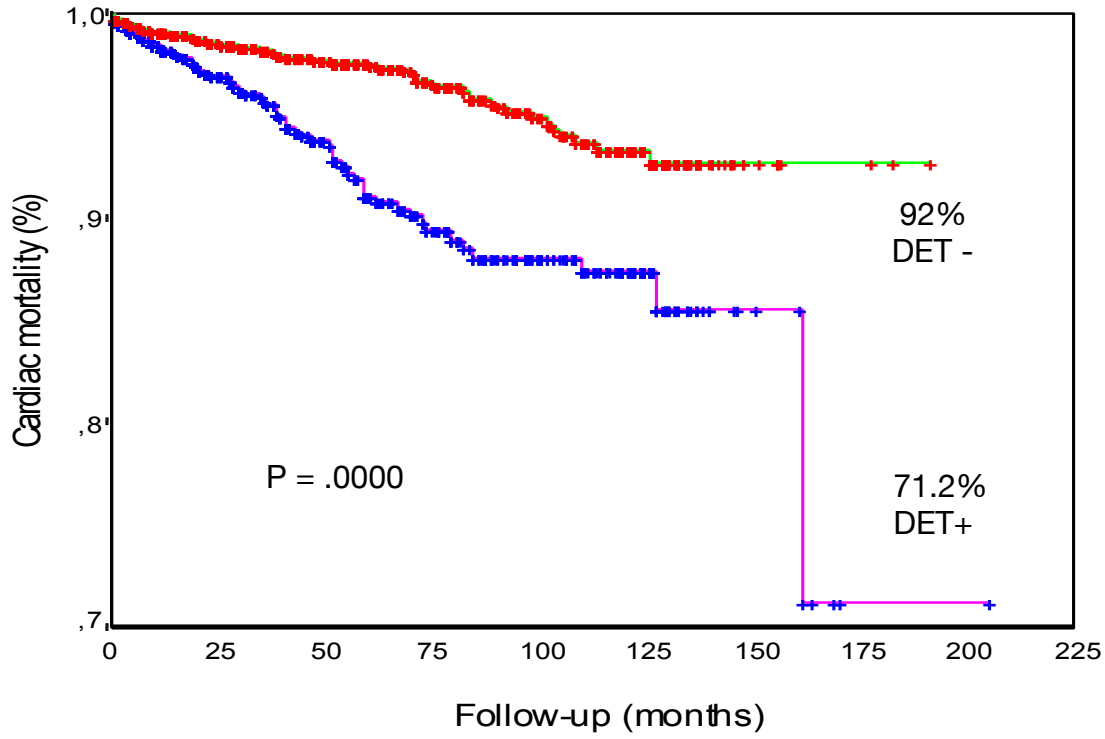
ECOSTRESS 2.0: QUALE STRESS PER QUALE PAZIENTE?

Ischemia: cosa aggiunge lo studio della riserva coronarica?

Rosa Sicari
Istituto di Fisiologia Clinica del CNR, Pisa

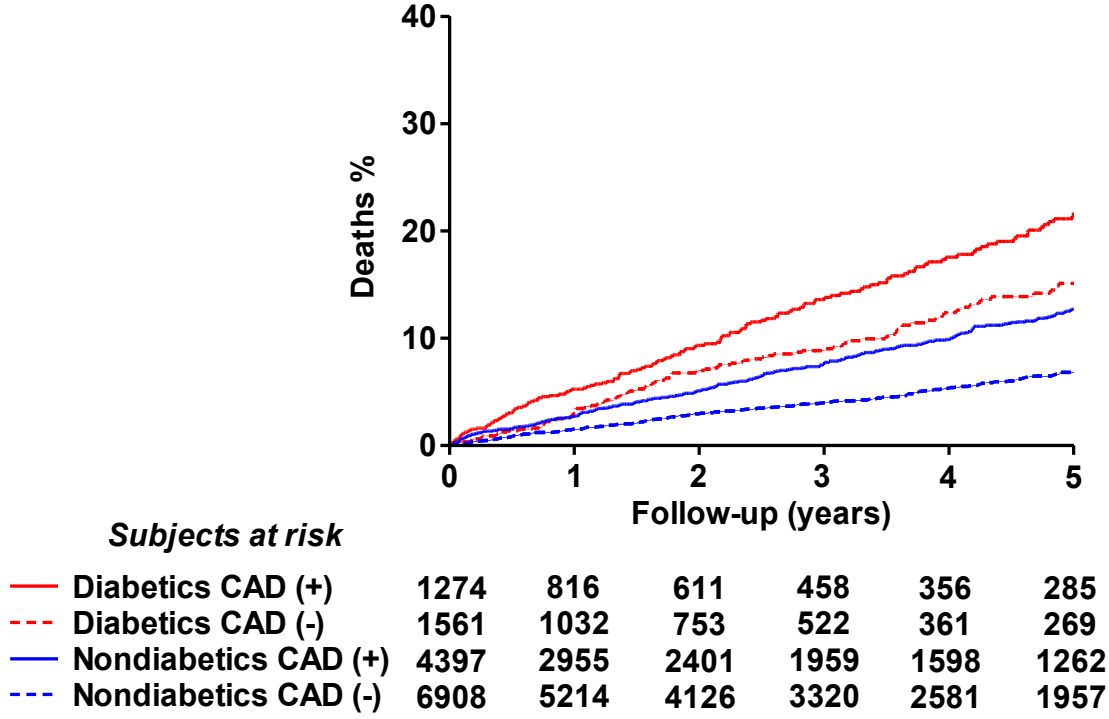
Napoli, 16 Aprile 2015

Stress Echo and Cardiac death



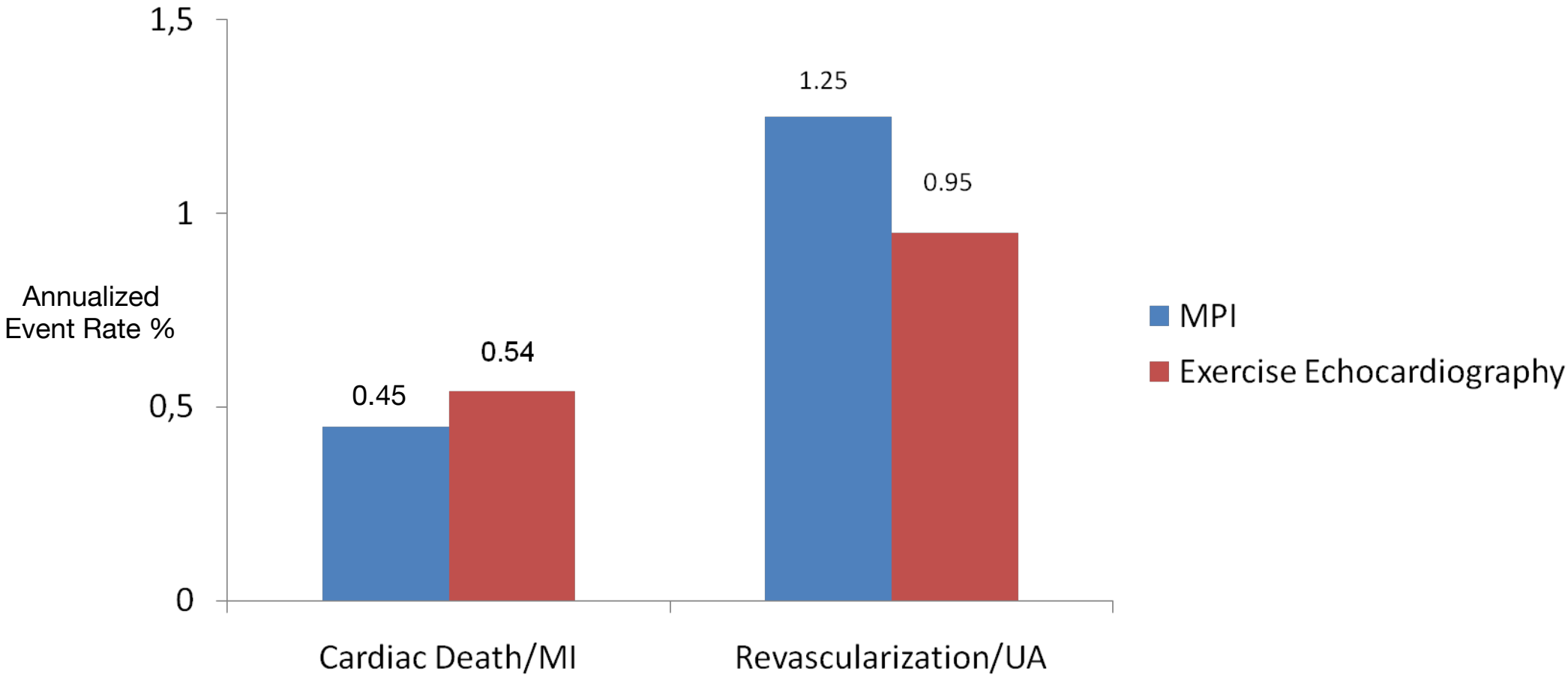
Sicari et al. JACC 2003

Stress Echo and Diabetes



Cortigiani L and Sicari R et Circ CVI 2015 in press

Estimates of Events After a Negative Test: a Meta-Analysis



Metz et al JACC 2007;49:227-237

Stress echo titration of stress echo result

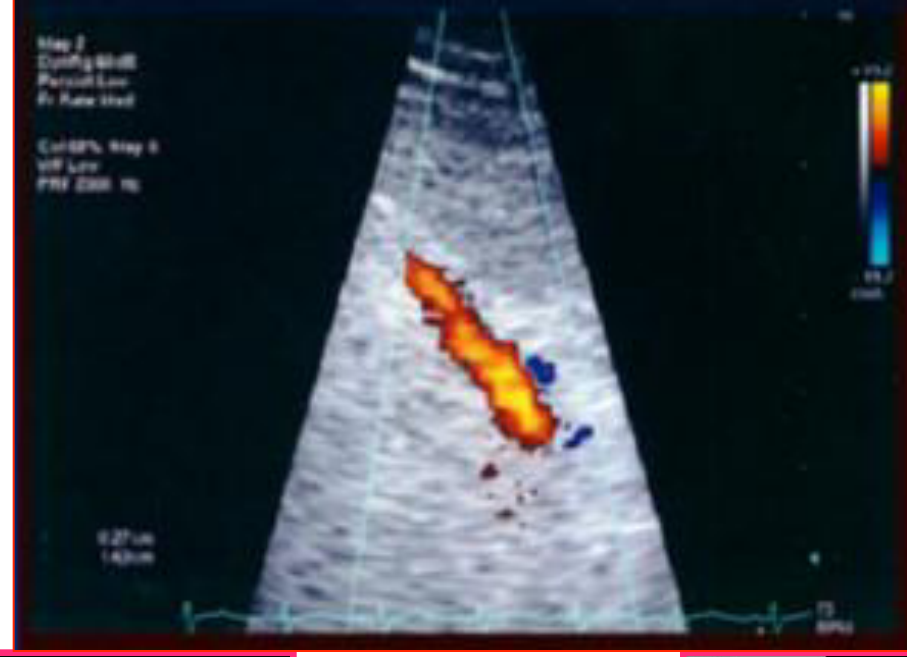
Ischemic test

	Intermediate risk (3-5% year)	High risk (>10% year)
Rest-stress WMSI	Low	High
Dose/workload	High	Low
Anti-ischemic therapy	Off	On
Recovery	Fast	Slow
Coronary territory	LCx/RCA	LAD
Resting LVEF	>50%	<40%
CFR on LAD	>2	≤2

Nonischemic test

	Very low risk (<0.5% year)	Low risk (1-3% year)
Stress	Maximal	Submaximal
Resting LVEF	>50%	<40%
Anti-ischemic therapy	Off	On
CFR on LAD	>2	≤2

Sicari. Eur J Echocardiogr 2008;9:415



European Heart Journal (2009) 30, 278–289
doi:10.1093/eurheartj/ehn492

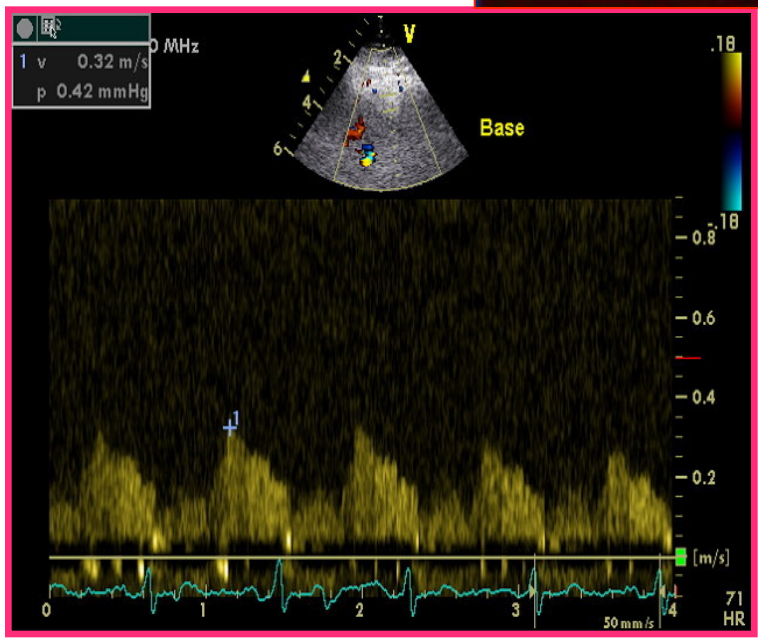
SPECIAL ARTICLE

Stress Echocardiography Expert Consensus Statement—Executive Summary

European Association of Echocardiography (EAE) (a registered branch of the ESC)

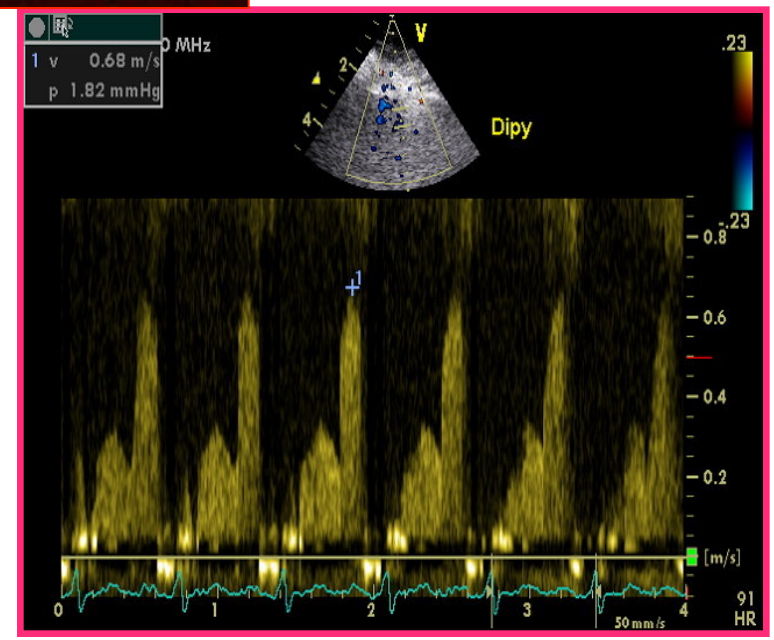
Rosa Sicari[1]*, Petros Nihoyannopoulos[2], Arturo Evangelista[3], Jaroslav Kasprzak[4], Patrizio Lancellotti[5], Don Poldermans[6], Jens-Uwe Voigt[7], and Jose Luis Zamorano[8] on behalf of the European Association of Echocardiography

[1]Institute of Clinical Physiology, Pisa, Italy; [2]Hammersmith Hospital, NHLI, Imperial College, London, UK; [3]Hospital Vall d'Hebron, Barcelona, Spain; [4]Department of Cardiology, Medical University of Lodz, Lodz, Poland; [5]Department of Cardiology, University Hospital Sart Tilman, Liège, Belgium; [6]Erasmus Medical Center, Rotterdam, The Netherlands; [7]Catholic University, Leuven, Belgium; and [8]Instituto Cardiovascular, Hospital Clínico San Carlos, Madrid, Spain



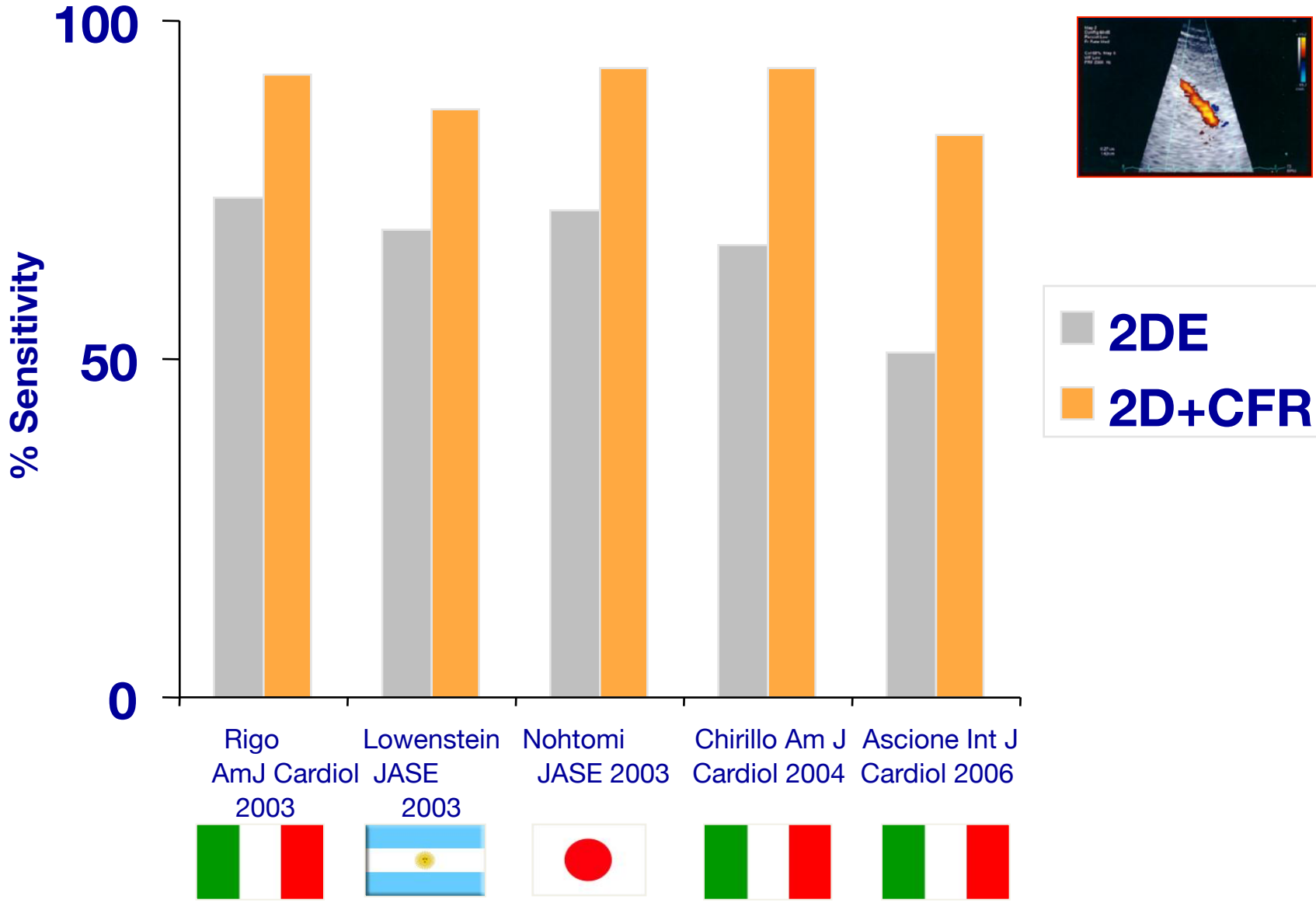
CFR:

68 / 32 = 2.13



"Whenever possible, it is recommended to perform dual imaging vasodilator stress echo"

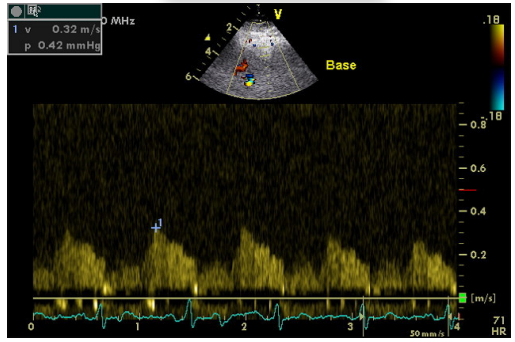
CFR: the boost to sensitivity

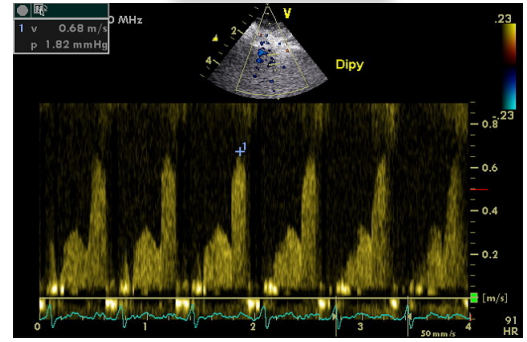


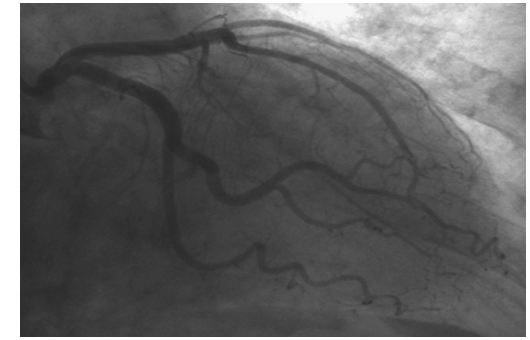
REST

STRESS

Normal finding

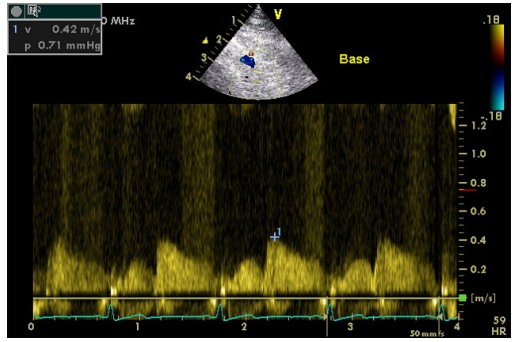


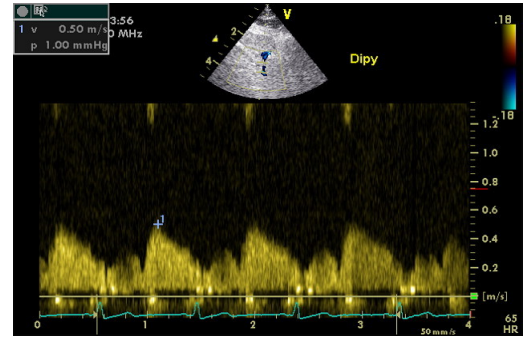




CFR: 2.13

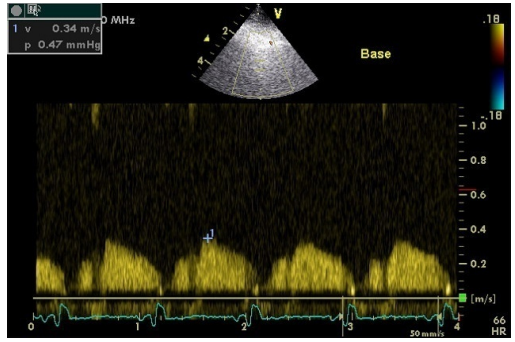
LAD stenosis

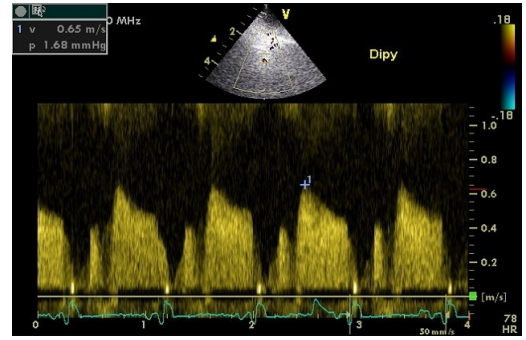


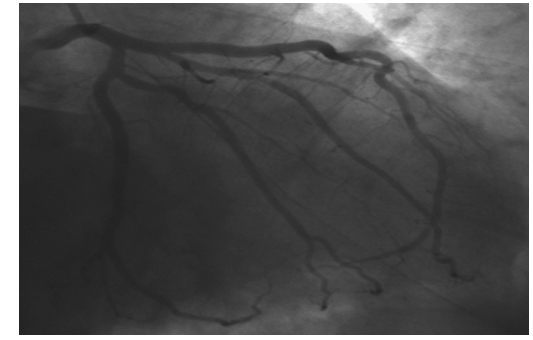


CFR: 1.19

Microvascular disease

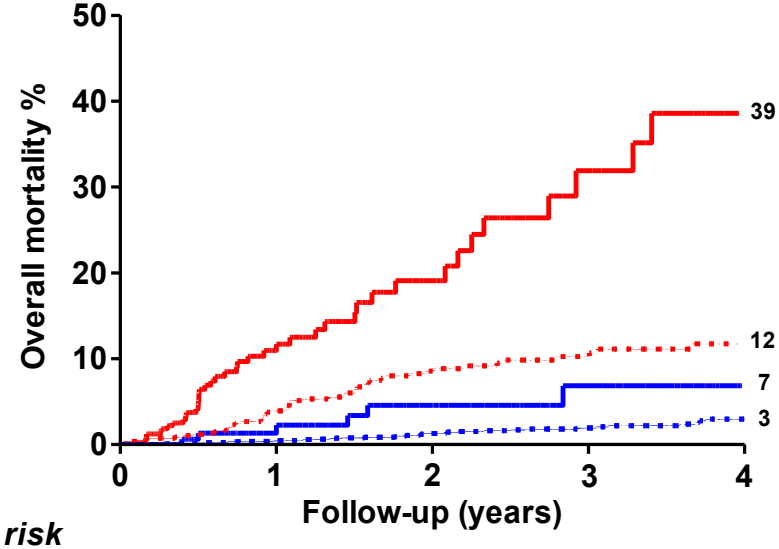






CFR: 1.91

Wall Motion, CFR and Mortality

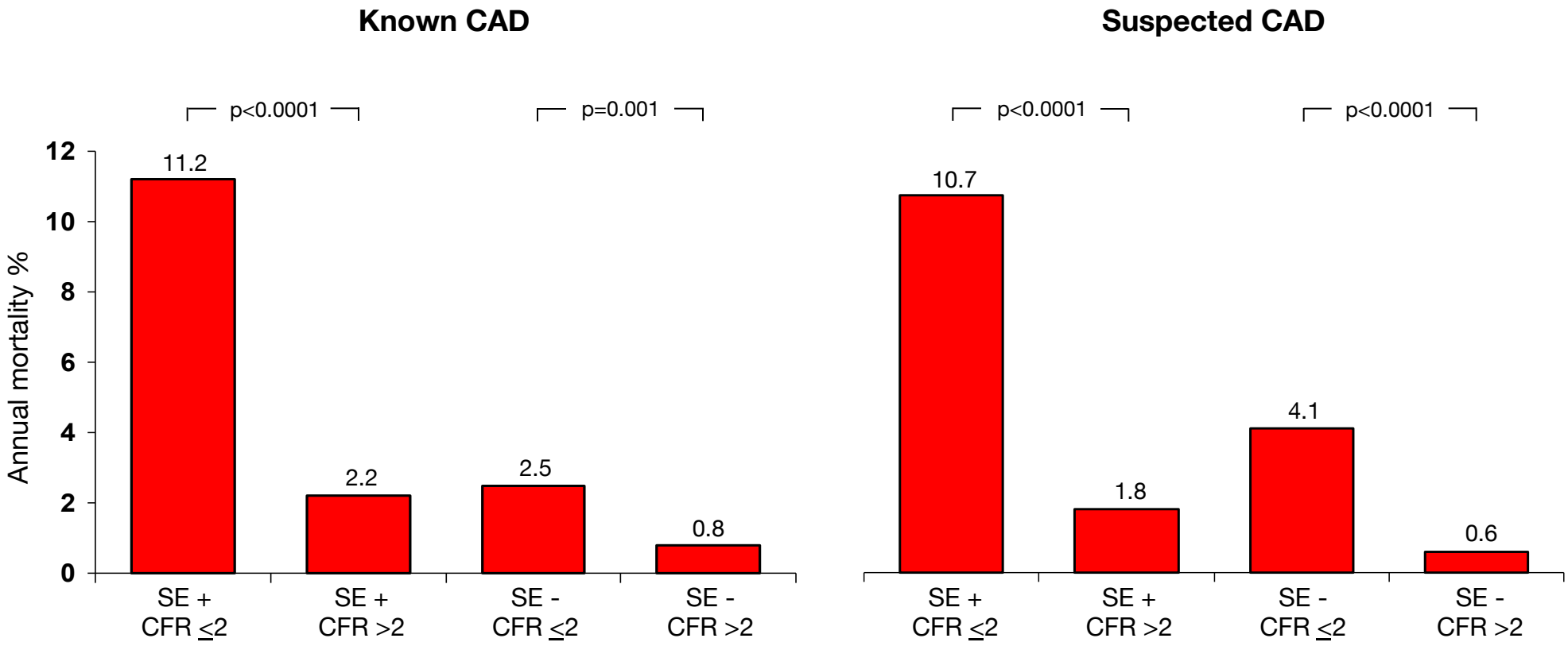


Subjects at risk

SE + / CFR ≤2	516	120	53	24	10
SE + / CFR >2	249	108	69	42	23
SE - / CFR ≤2	903	513	316	209	125
SE - / CFR >2	2645	2018	1292	799	405

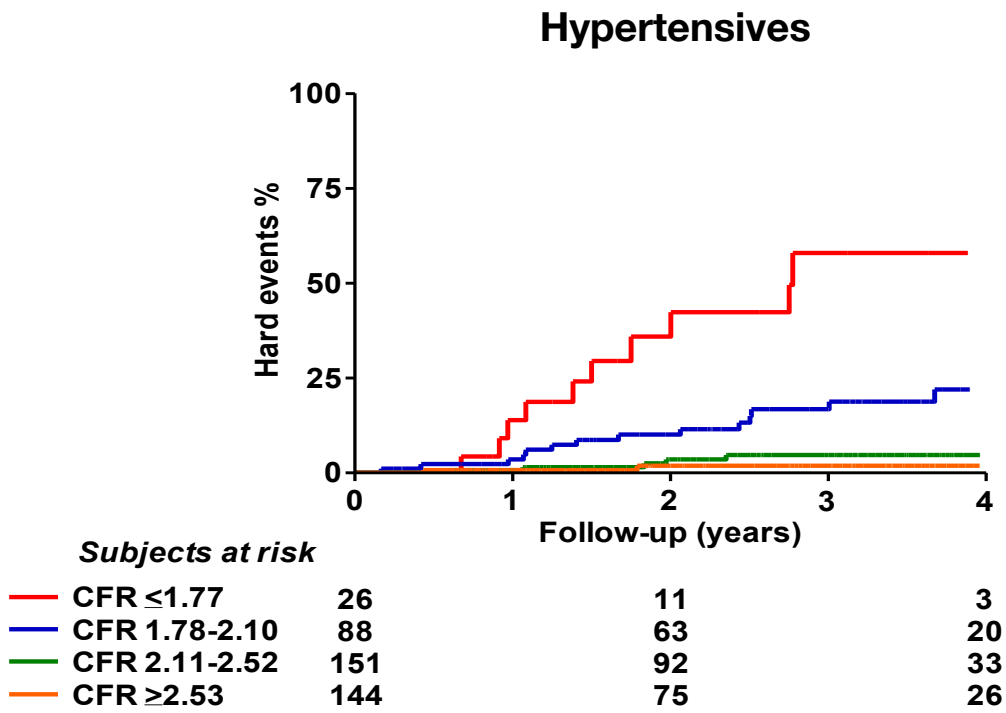
Cortigiani L and Sicari JACC Img 2012

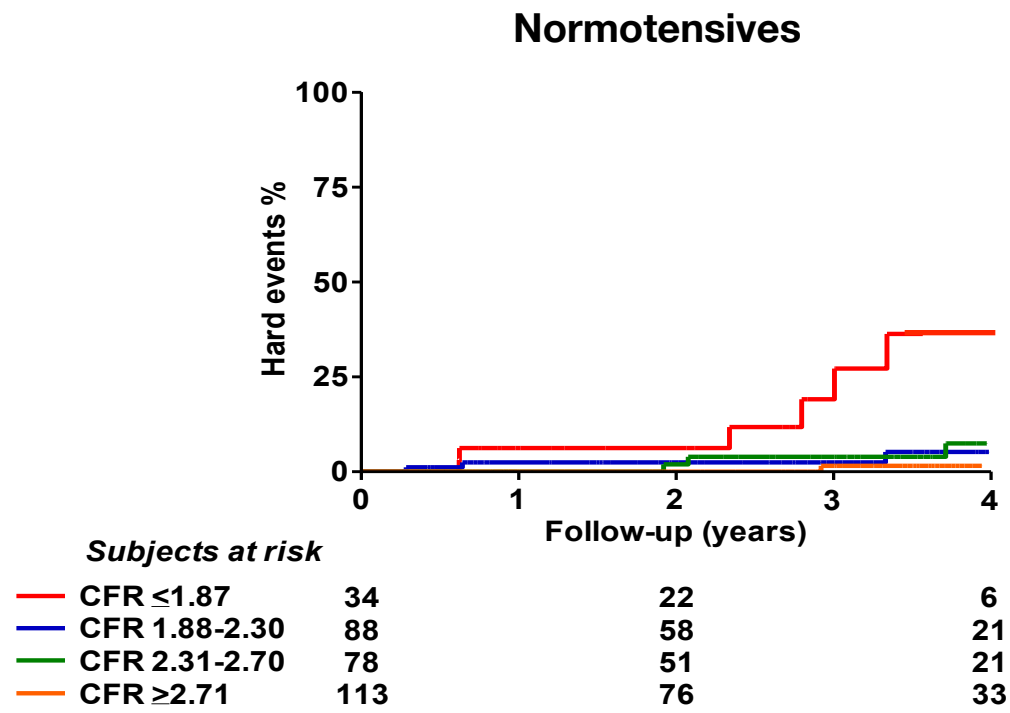
Annual Event Rate in Known or Suspected CAD



Cortigiani L and Sicari JACC Img 2012

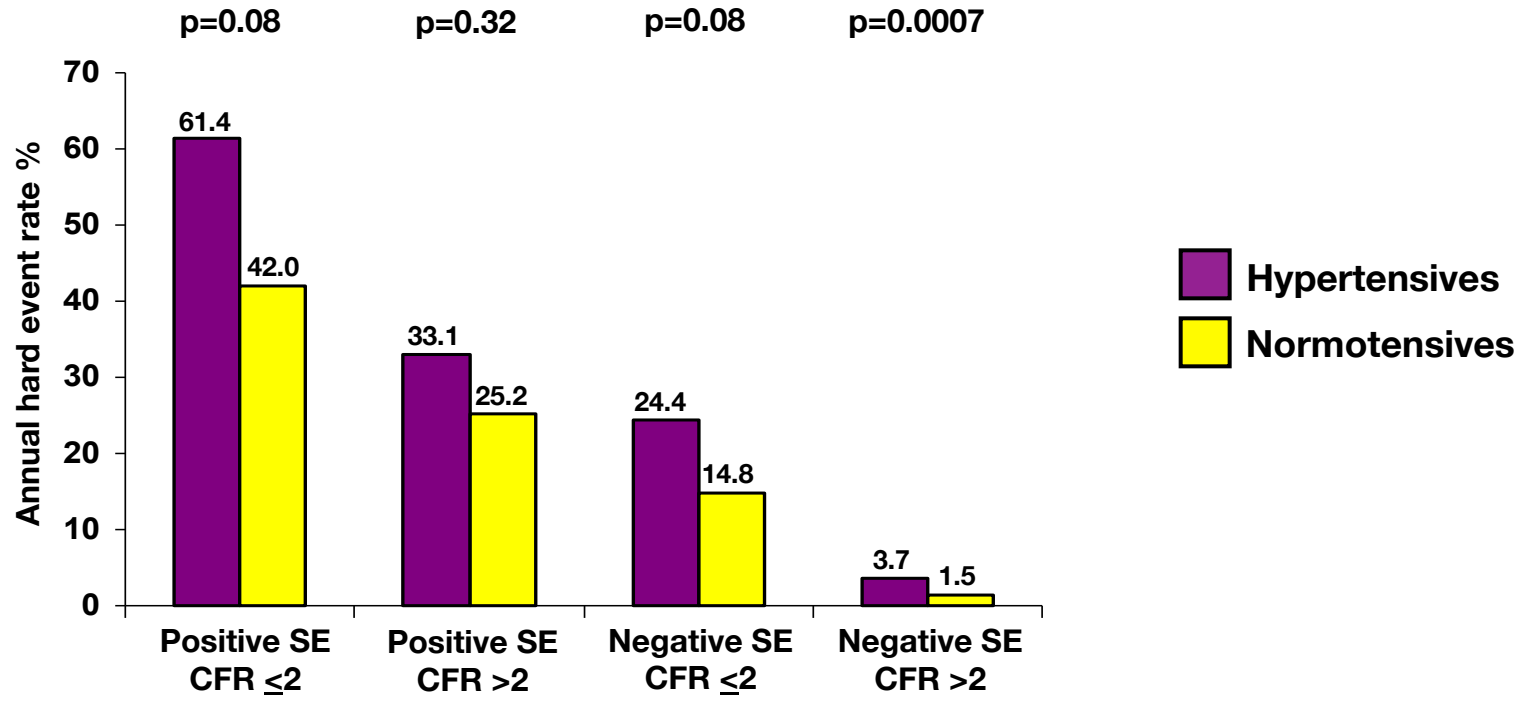
Prognostic value of Doppler-derived CFR on LAD in Hypertensives and normotensives without obstructive CAD





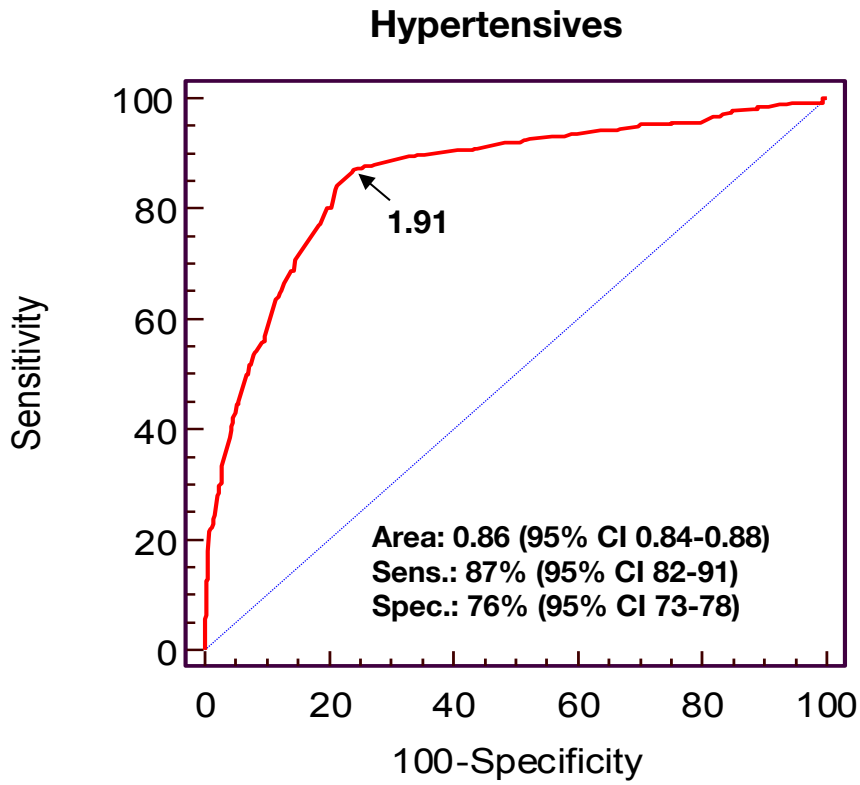
Cortigiani L, Sicari R. Heart 2011;97:1758

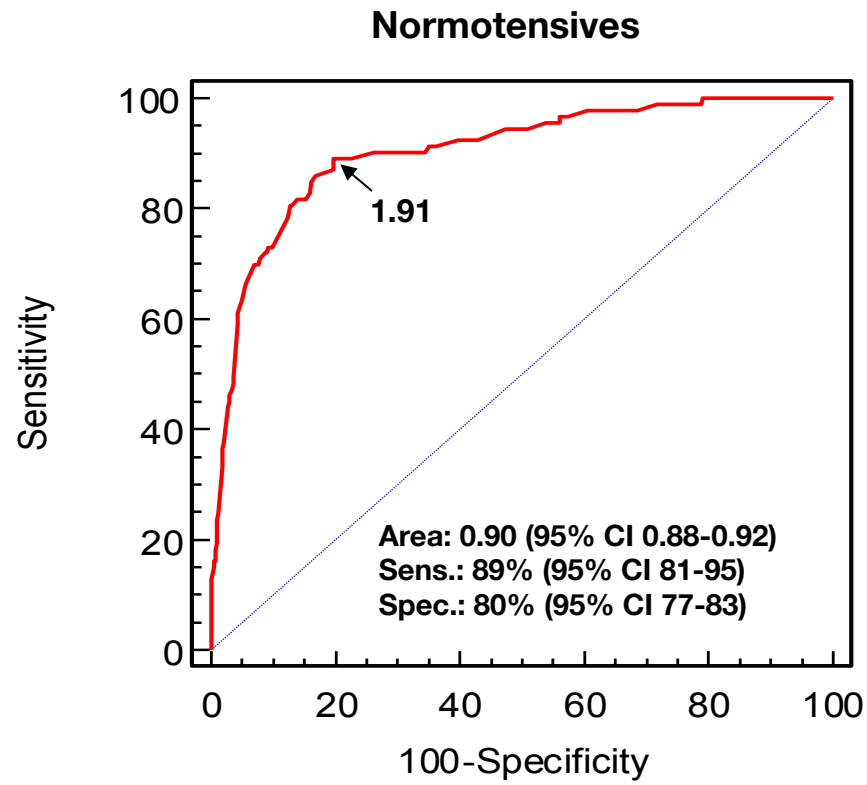
Annual event rate for hypertensive and normotensive patients: ischemia at stress echocardiography and CFR



Cortigiani L, Sicari R. Heart 2011

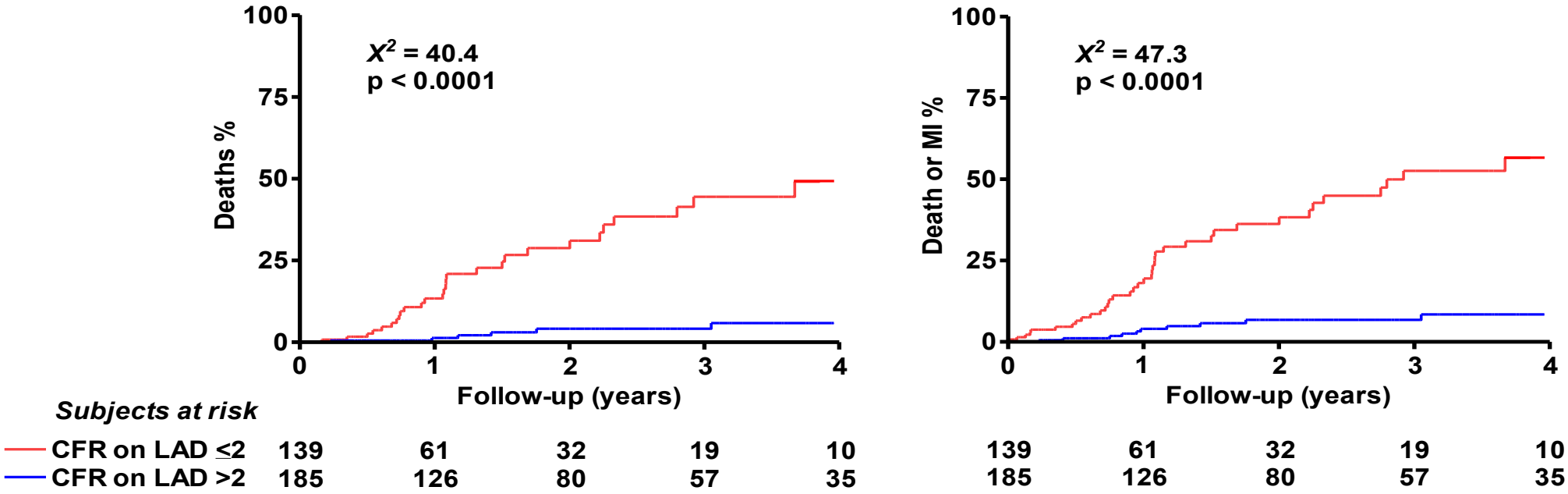
CFR and Hypertension Guidelines





The use of dual echocardiographic imaging of regional wall motion and transthoracic, Doppler-derived coronary flow reserve on the left anterior descending artery has recently been suggested to distinguish obstructive CHD (reduced coronary reserve plus inducible wall motion abnormalities) from isolated coronary microcirculatory damage (reduced coronary reserve without wall motion abnormalities). A coronary flow reserve ≤1.91 has been shown to have an independent prognostic value in hypertension.

CFR and LBBB



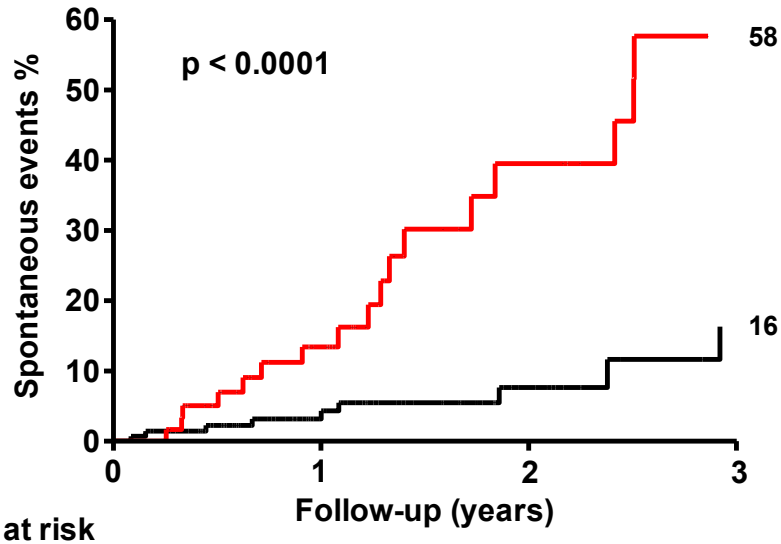
Mortality rate and death or myocardial infarction (MI) rate for the study population separated on the basis of coronary flow reserve (CFR) on left anterior descending artery (LAD) ≤2 or >2

Cortigiani L and Sicari R Eur Heart J 2013

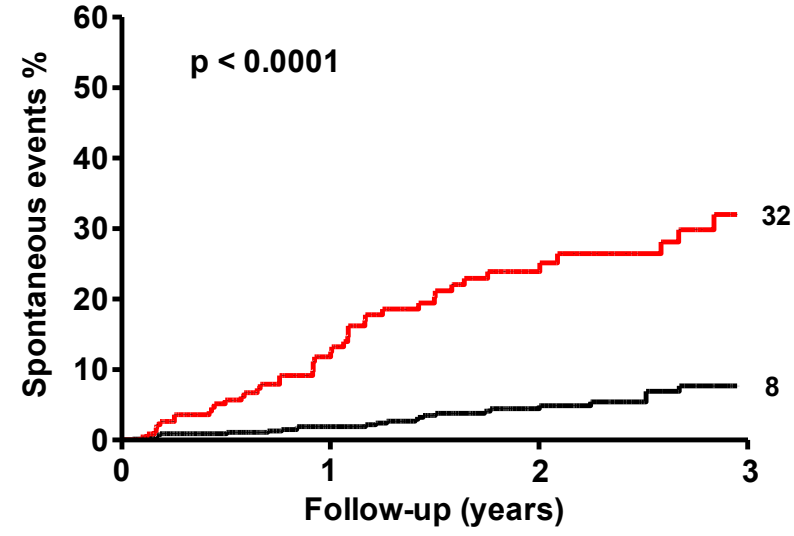
CFR in Negative DET and Diabetes

Hard cardiac events (8 deaths, 24 STEMI, 66 NSTEMI)

Diabetics



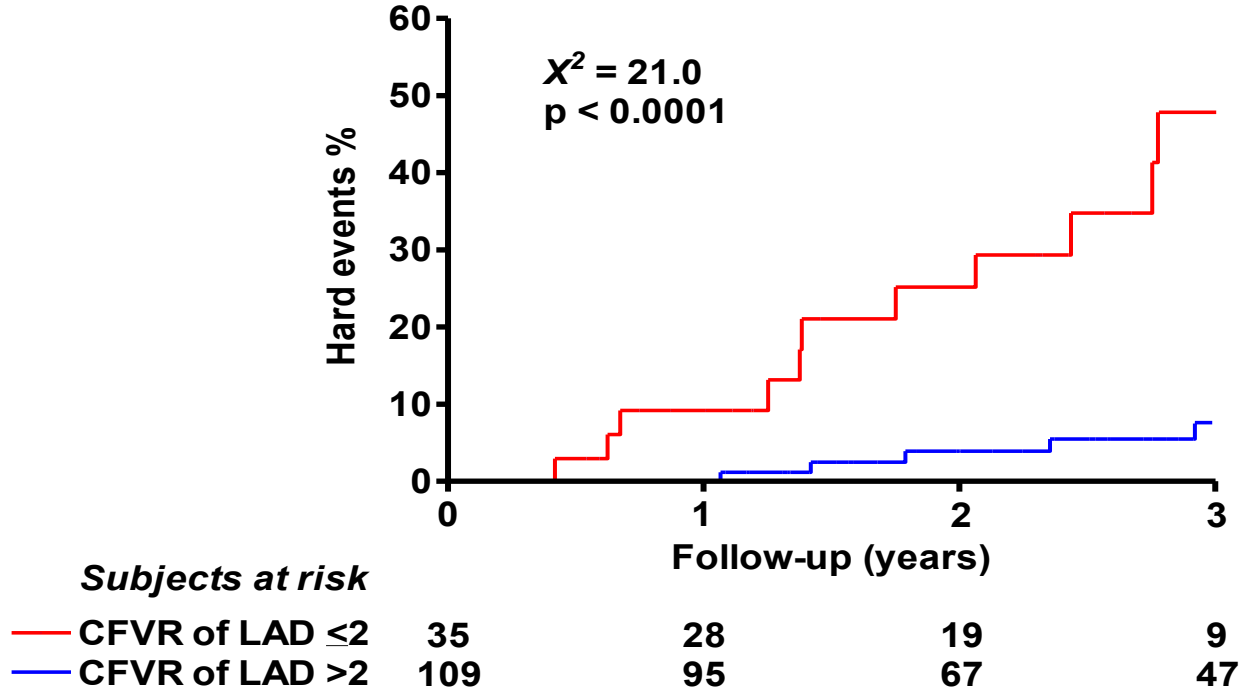
Nondiabetics



Subjects at risk								
CFR ≤ 2	66	37	14	7	243	124	65	29
CFR > 2	141	85	34	19	680	434	228	96

Cortigiani L, Sicari R et al. J Am Coll Cardiol 2007

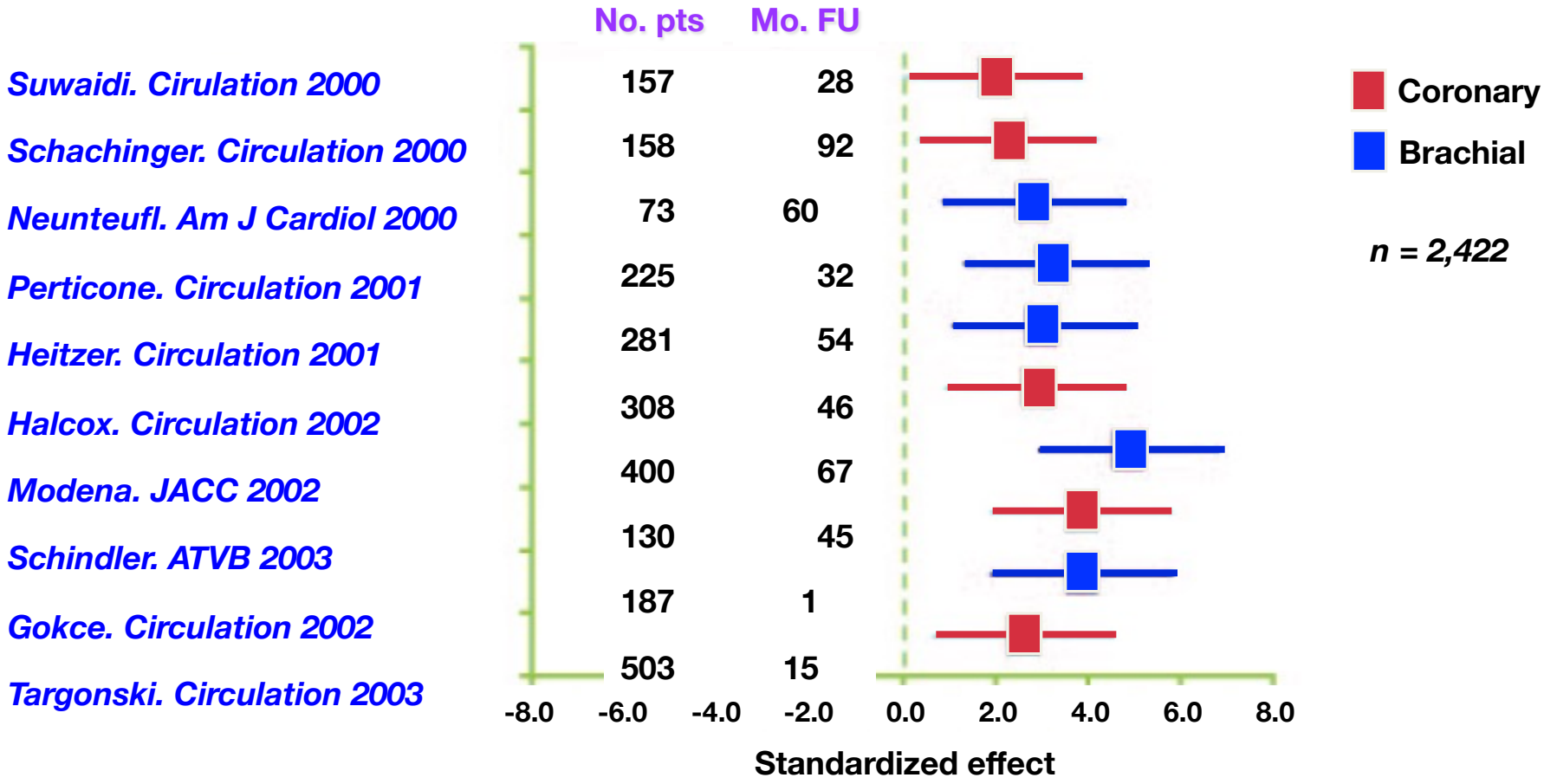
Microvascular Dysfunction and Diabetes



Microvascular dysfunction before the occurrence of coronary arteries involvement is a strong and independent predictor of outcome in patients with type 2 diabetes.

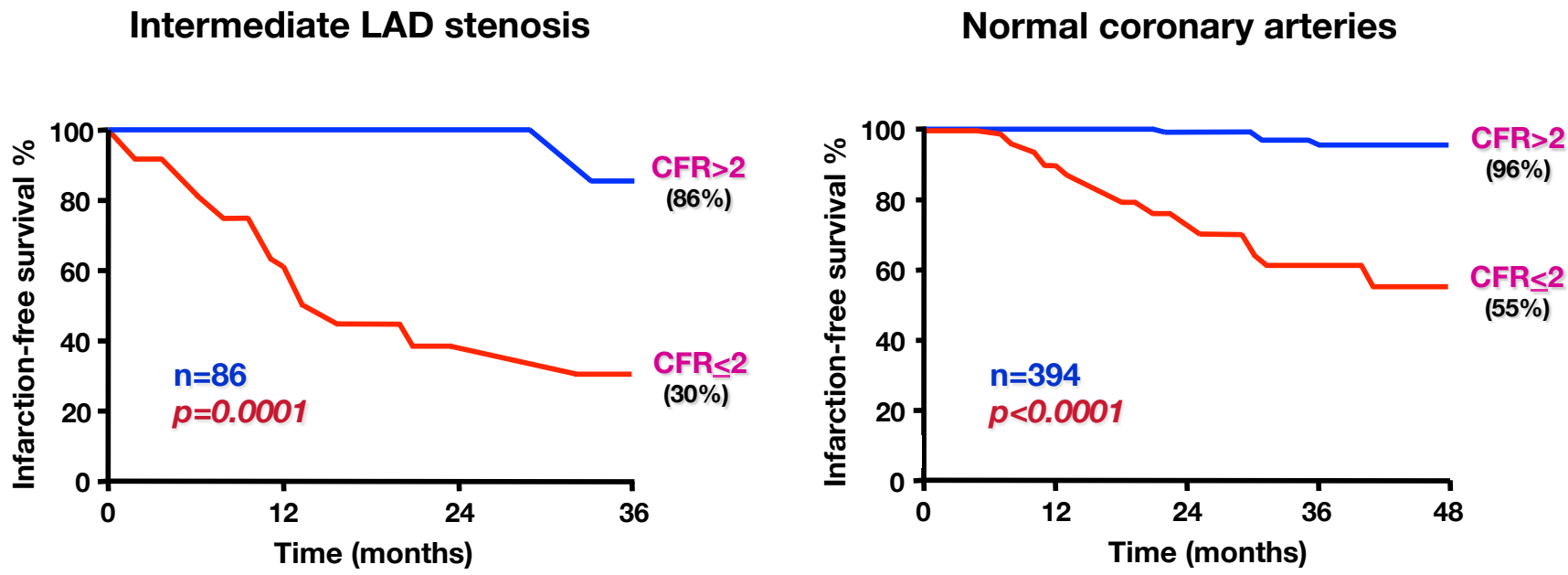
Cortigiani L and Sicari R et al JASE 2014

Prognostic meaning of microvascular disease



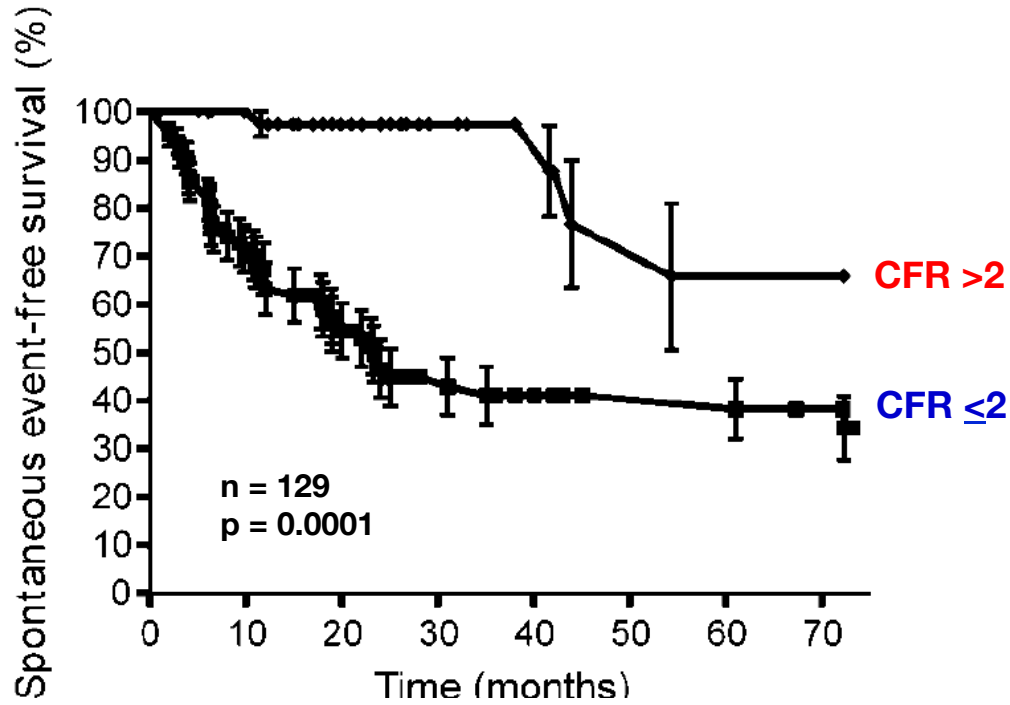
Lerman. Circulation 2005;111:363

Prognostic value of CFR on LAD in pts with no obstructive CAD



Rigo F, Sicari R. Am J Cardiol 2007;100:1527 Sicari. Am J Cardiol 2009;103:626

Prognostic value of Doppler-derived CFR in DCM



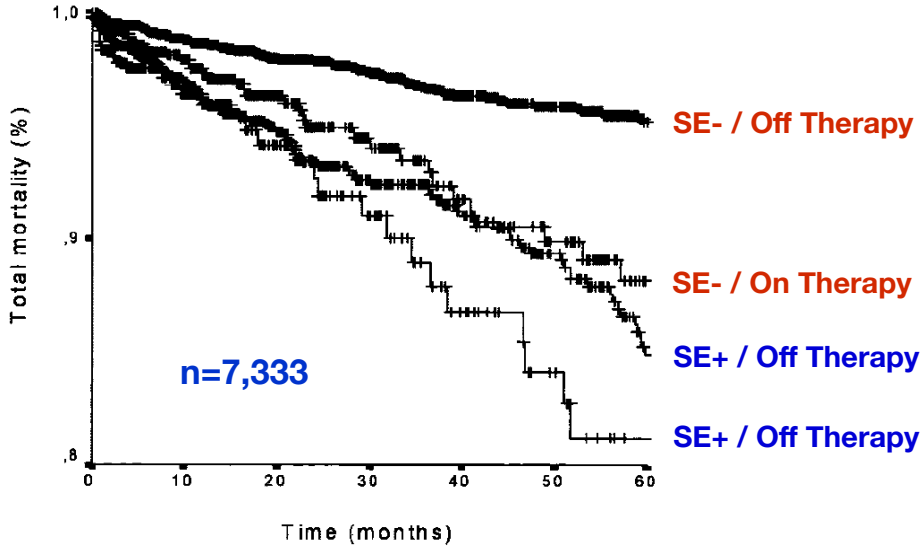
Subjects at risk

CFR>2	46	40	31	18	10	8	7	6
CFR≤2	83	53	38	24	19	16	14	12

Rigo F, Sicari R.. Eur Heart J 2006;27:1319

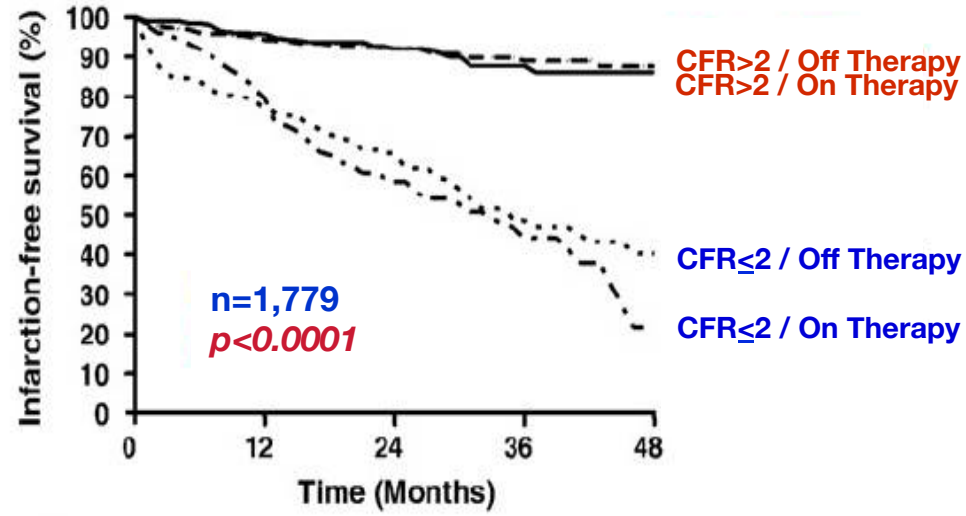
Prognostic implication of anti-ischemic therapy

Stress echo result



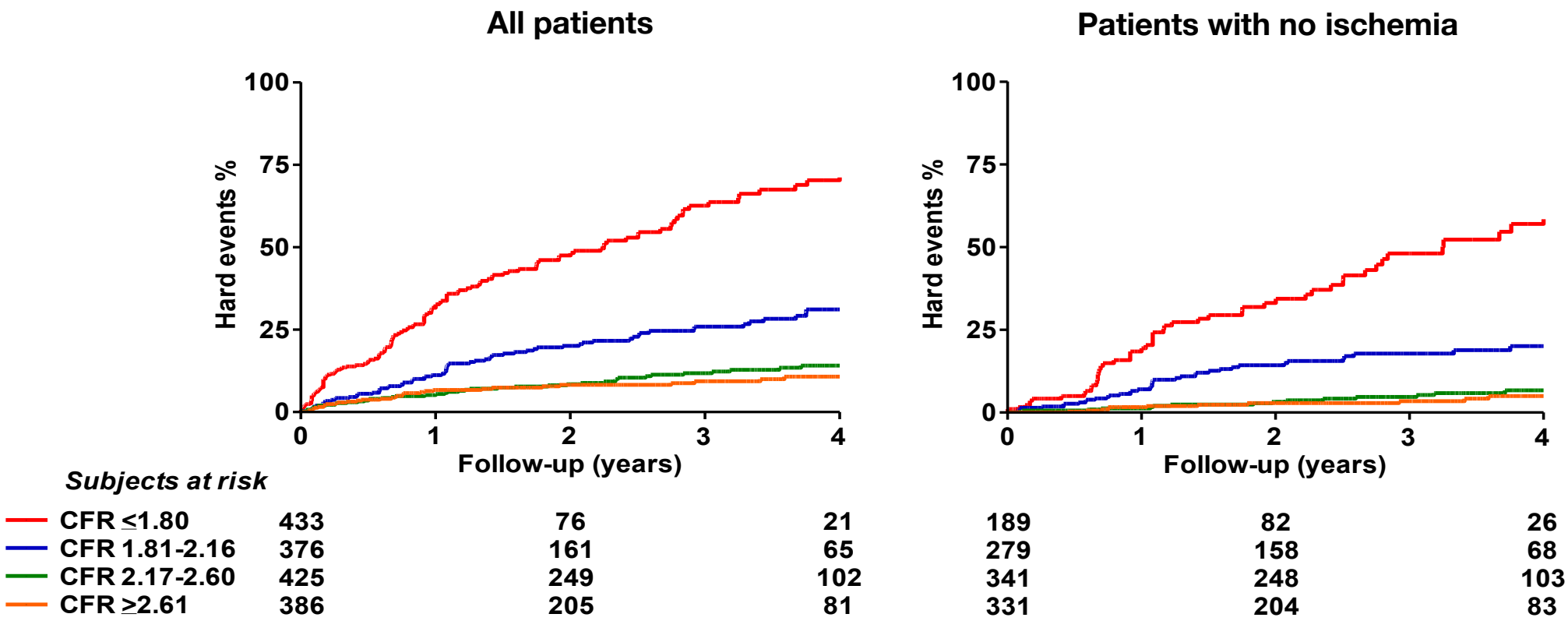
Sicari Circulation 2004;109:2428

CFR on LAD



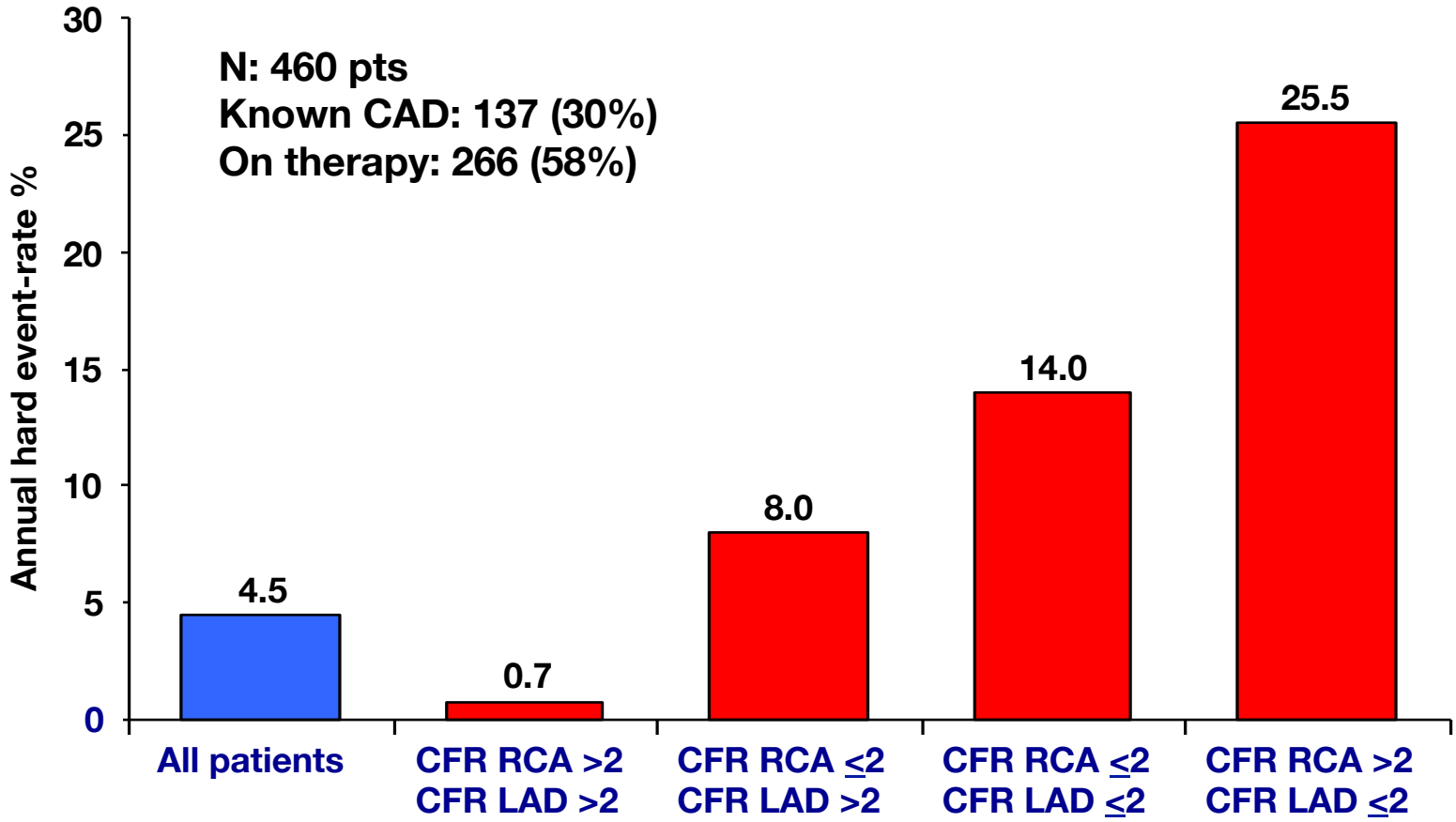
Sicari Am Heart J 2008;156:573

Event-rates according to quartilies of CFR



Cortigiani L Sicari R. Am J Cardiol 2010;105:158

Prognostic value of CFR on LAD and RCA in pts with no ischemia



Cortigiani L, Sicari R. Heart 2009;95:1423-1428

Different coronary anatomic and prognostic CFR conditions underlying wall motion and coronary flow reserve response during stress