



VI CONGRESSO NAZIONALE DI
**ECOCARDIO
CHIRURGIA**

MILANO 15-17 OTTOBRE 2012

PRESIDENTE ONORARIO

Antonio Pezzano

PRESIDENTI

Cesare Fiorentini

Ettore Vitali

DIRETTORI

Antonio Mantero

Giuseppe Tarelli

**ECO stress e studio della riserva coronarica nella
valutazione della patologia coronarica.
La valutazione fisiopatologica
della ischemia inducibile nella cardiopatia
ischemica.**

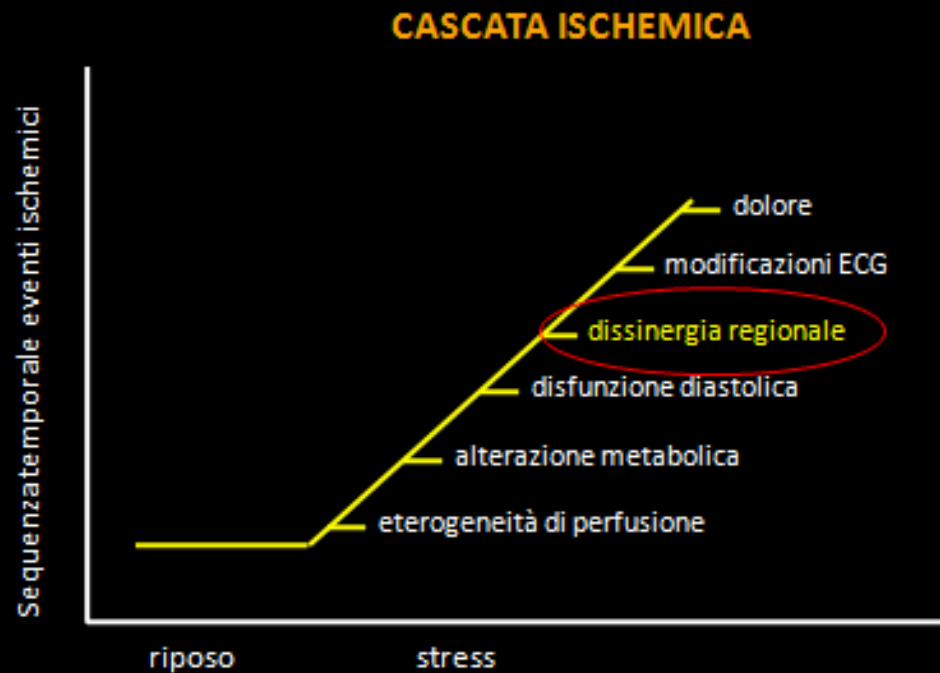
***Come utilizzare le metodiche di imaging ed i risultati
dello studio.***

Laura Massironi

Azienda Ospedaliera San Paolo
Università degli Studi di Milano

definizione

Combinazione dell'ecocardiografia con uno **stress** fisico, farmacologico (dobutamina / dipiridamolo) o elettrico al fine di indurre un'ischemia miocardica che si manifesta con un transitorio peggioramento della funzione regionale durante stress:



**IPOCINESIA
ACINESIA**



Guidelines on the management of stable angina pectoris: executive summary

The Task Force on the Management of Stable Angina Pectoris of the European Society of Cardiology

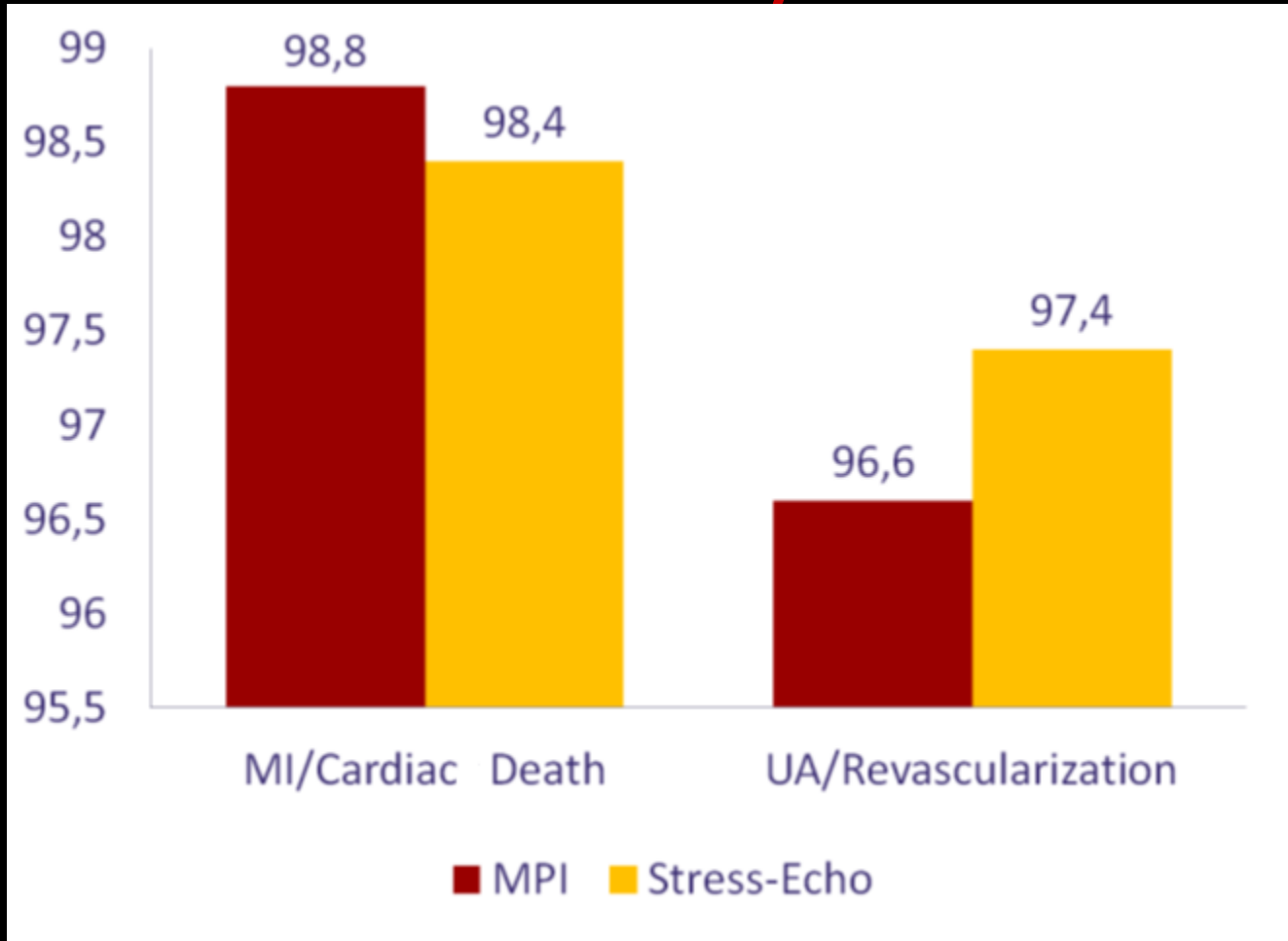
Authors/Task Force Members, Kim Fox, Chairperson*, Maria Angeles Alonso Garcia, Madrid (Spain), Diego Ardissino, Parma (Italy), Pawel Buszman, Katowice (Poland), Paolo G. Camici, London (UK), Filippo Crea, Roma (Italy), Caroline Daly, London (UK), Guy De Backer, Ghent (Belgium), Paul Hjelm Dahl, Stockholm (Sweden), José Lopez-Sendon, Madrid (Spain), Jean Marco, Toulouse (France), João Morais, Leiria (Portugal), John Pepper, London (UK), Udo Sechtem, Stuttgart (Germany), Maarten Simoons, Rotterdam (The Netherlands), and Kristian Thygesen, Aarhus (Denmark)

... on the whole, **stress echo and stress perfusion scintigraphy**, whether using exercise or pharmacological stress (inotropic or vasodilator), have very similar applications. **The choice as to which is employed depends largely on local facilities and expertise.**

Advantages of stress echocardiography over stress perfusion scintigraphy include a **higher specificity**, the possibility a more extensive **evaluation of the cardiac anatomy and function**, and **greater availability** and **lower cost**, in addition to being **free of radiation**

NPV for primary and secondary cardiac events:

a Meta-Analysis



Accuratezza diagnostica

- ecostress da SFORZO
- ecostress con DOBUTAMINA
- ecostress con DIPIRIDAMOLO

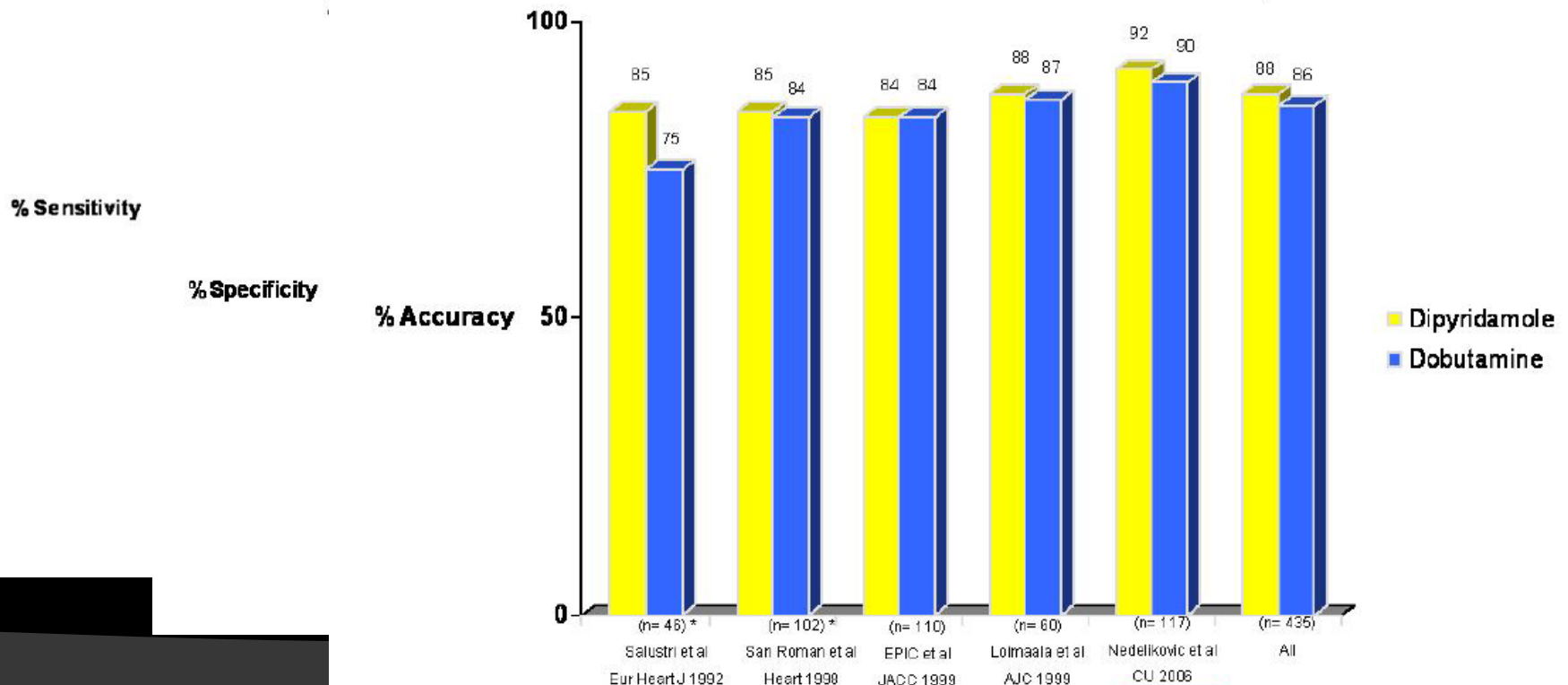
**SOVRAPPONIBILE SENSIBILITA', SPECIFICITA'
ACCURATEZZA DIAGNOSTICA**

*Stress Echocardiography Expert Consensus Statement
European Heart Journal 2009; 30: 278 - 289*

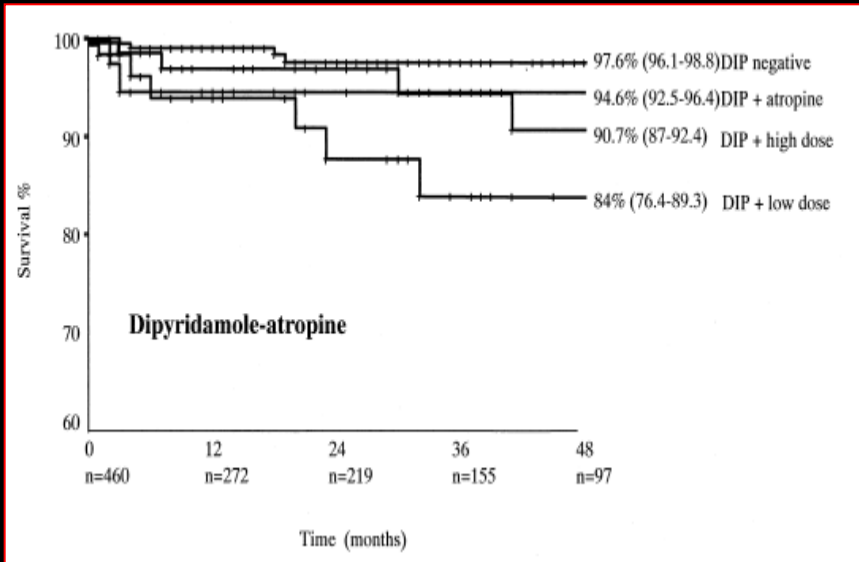
The diagnostic accuracy of pharmacological stress echocardiography for the assessment of coronary artery disease: a meta-analysis

Eugenio Picano*, Sabrina Molinaro and Emilio Pasanisi

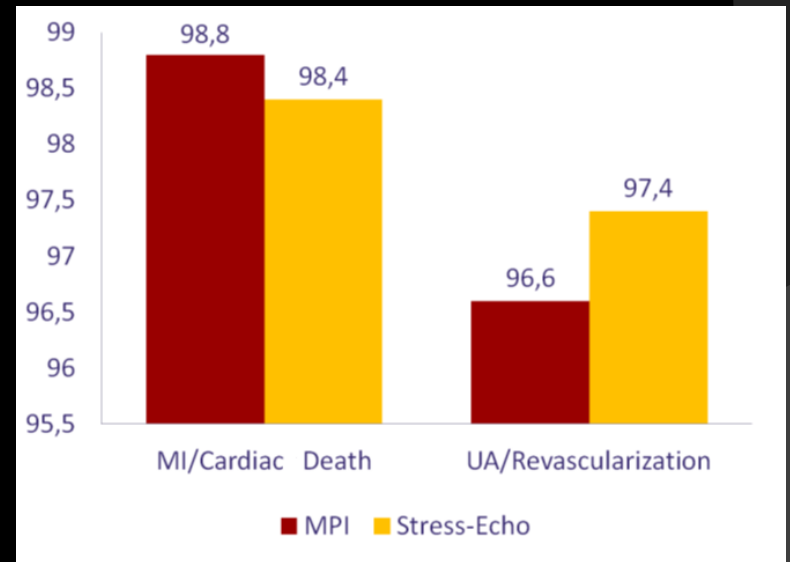
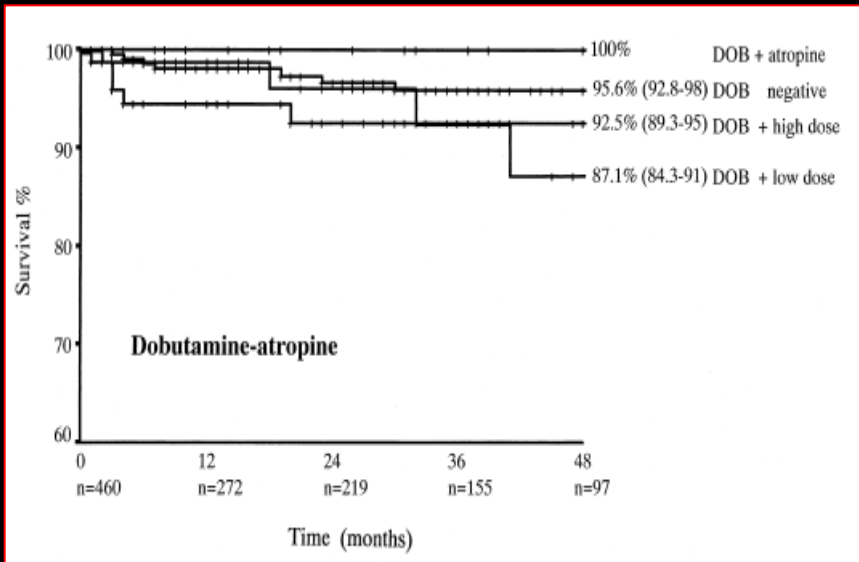
0.84 in 6' * or 0.84 in 10' + atropine



Accuratezza prognostica



La presenza (assenza) di ischemia inducibile (in > 2 segmenti contigui) identifica pz con prognosi differente



quando?

- ✓ Ecostress è un test di imaging di II livello non sostitutivo dell' ECG da Sforzo
- ✓ E' indicato:
 - Pazienti con ECG da sforzo ambiguo, non diagnostico, non conclusivo, non eseguibile
 - dolore toracico /sospetta CAD
 - prognosi e stratificazione del rischio nel post-infarto
 - stenosi di art.coronaria di non chiaro significato (TAC o angio)
 - pre-chirurgia non cardiaca ad alto rischio
 - Pazienti rivascolarizzati (PCI/CABG) se sintomatici
 - Pazienti con valvulopatie
 - Ricerca di vitalità miocardica: vitalità in almeno 5 segmenti

Risposta contrattile durante ecostress

Riposo

Bassa dose

Alta dose



Normale



ISCHEMIA



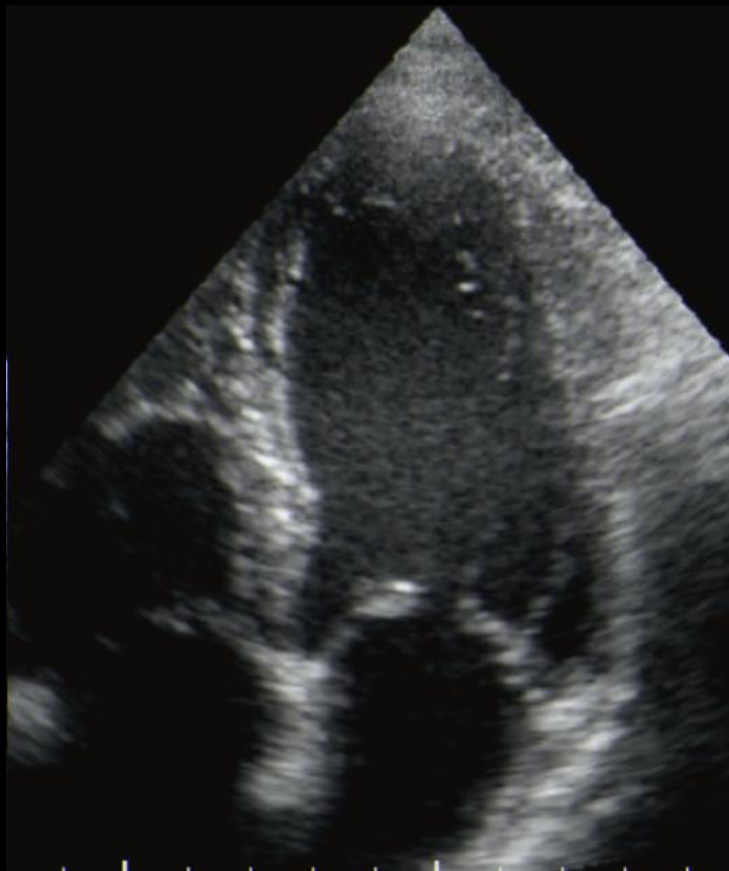
NECROSI



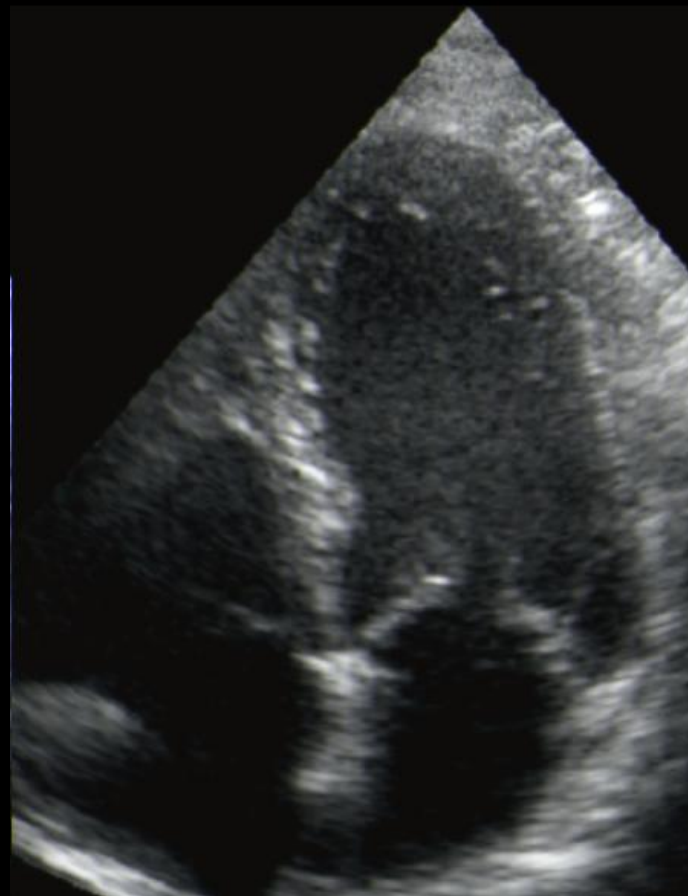
VITALITA'



**Risposta bifasica.
VITALE E ISCHEMICO**



Riposo



Picco (dip 0.84mg/kg)

Stress Eco: solo 2D o con aggiunta dello studio della riserva coronarica?



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

SPECIAL ARTICLE

Stress Echocardiography Expert Consensus Statement—Executive Summary

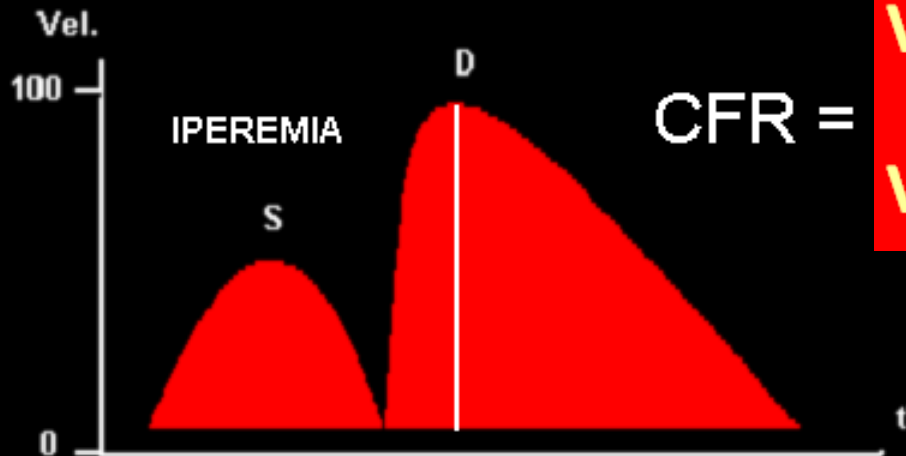
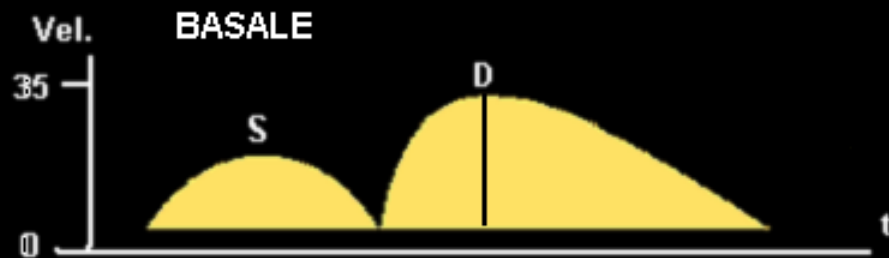
European Association of Echocardiography (EAE) (a registered branch of the ESC)

... Among different stresses of comparable diagnostic and prognostic accuracy ... *dipyridamole* is the safest and simplest pharmacological stress and the most suitable for **combined wall motion – coronary flow reserve** assessment

... the possibility of performing coronary flow reserve evaluation of left anterior descending coronary artery by transthoracic Doppler echocardiography **adds another potentially important dimension to stress echocardiography**

RISERVA CORONARICA ed ECOSTRESS

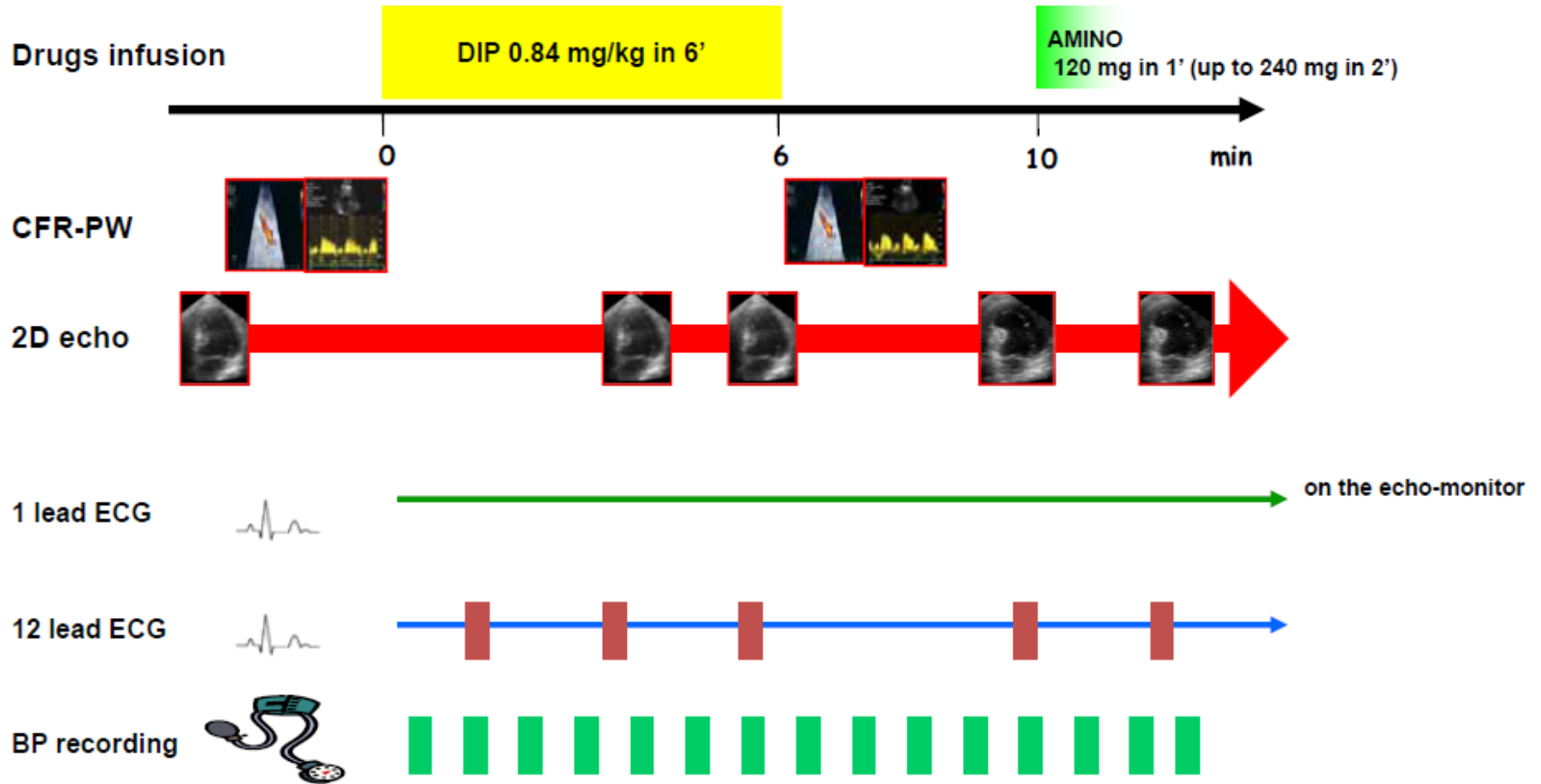
Riserva Coronarica (CFR) è la massima capacità del microcircolo coronarico di dilatarsi in risposta ad una aumentata domanda di O₂ (stimolo metabolico) o a uno stimolo farmacologico (potente vasodilatatore).



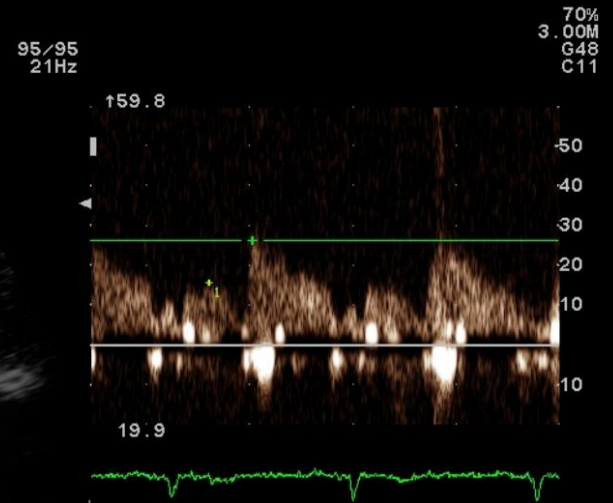
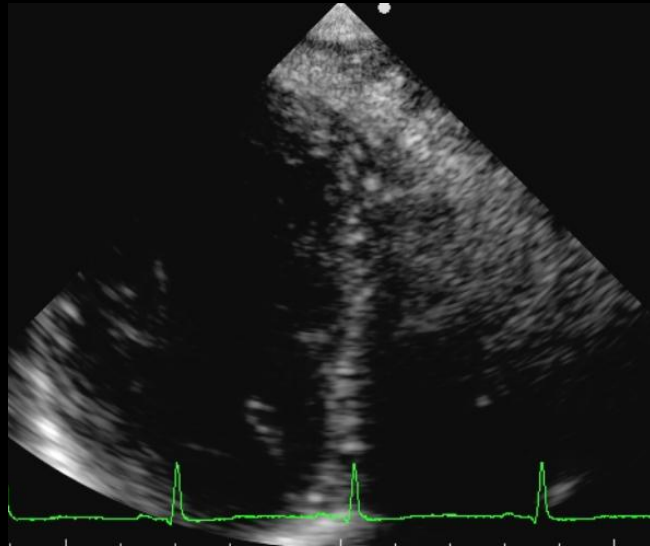
Valore normale > 2.5
Valore patologico < 2

Protocollo di studio

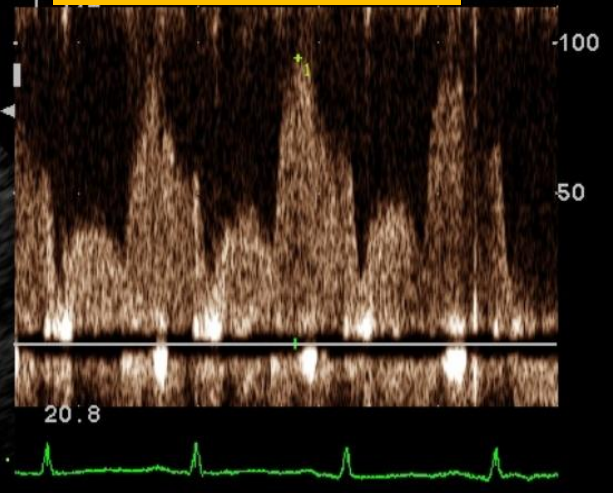
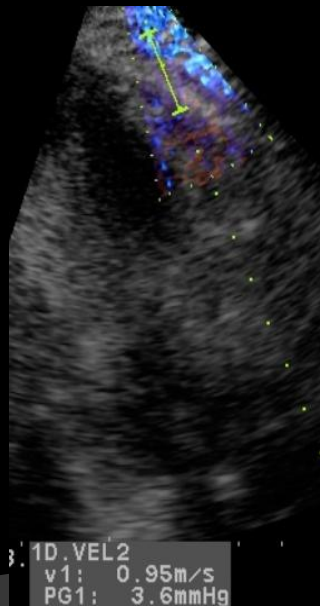
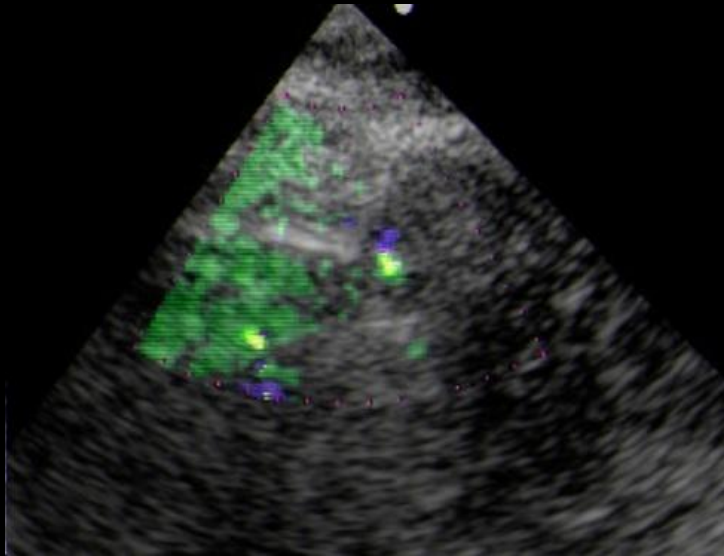
*Stress Echocardiography Expert Consensus Statement
European Heart Journal 2009; 30: 278 - 289*



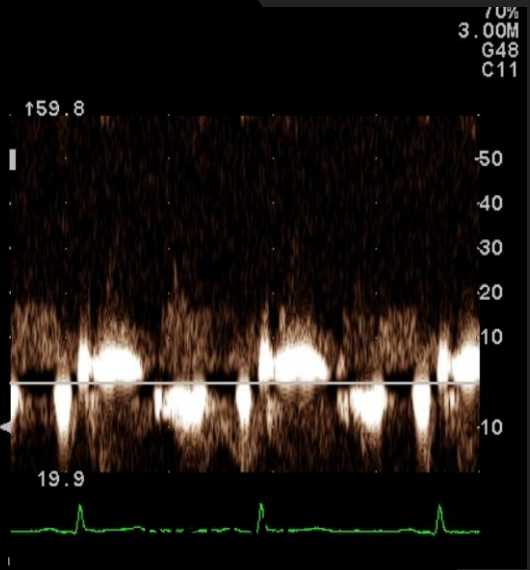
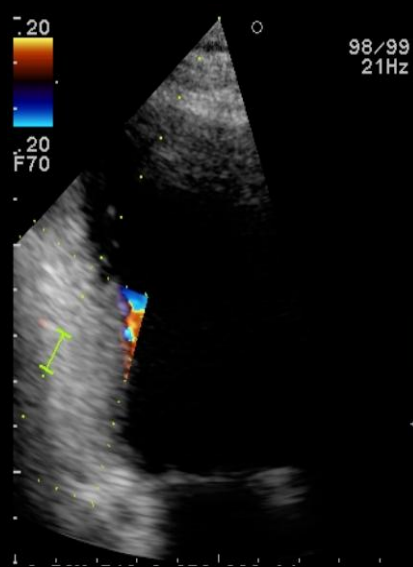
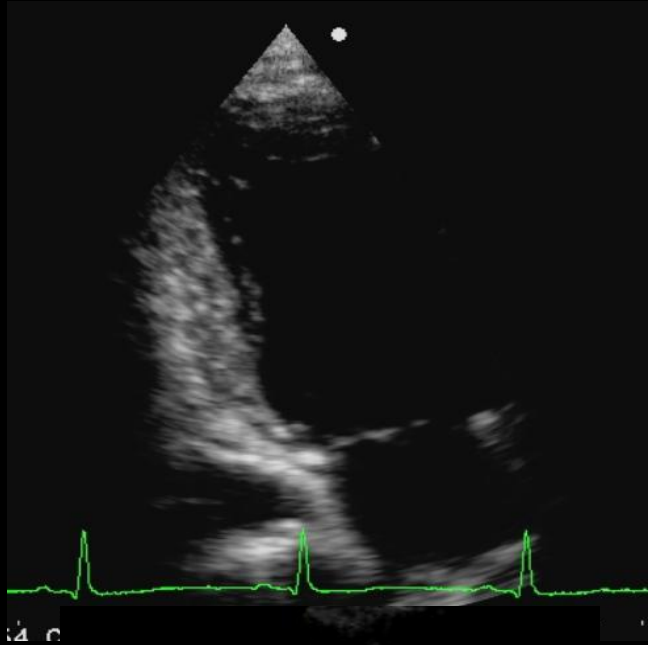
CORONARIA ANTERIORE



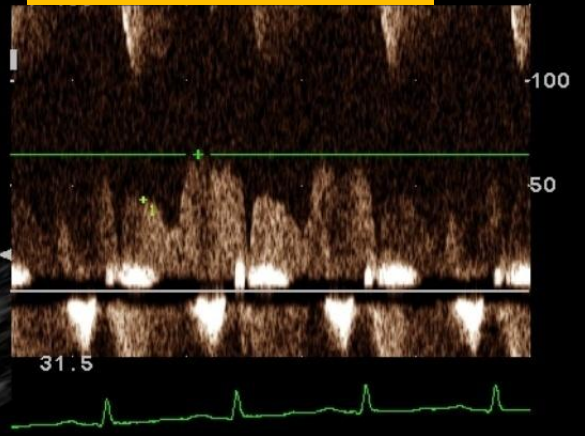
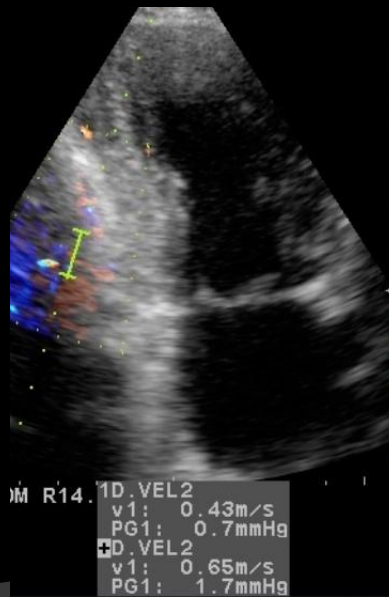
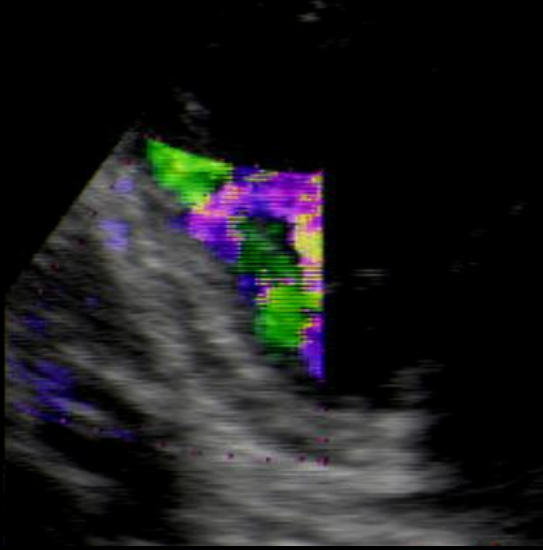
CFR = 3.6



CORONARIA POSTERIORE



CFR = 2.8



RC < 2

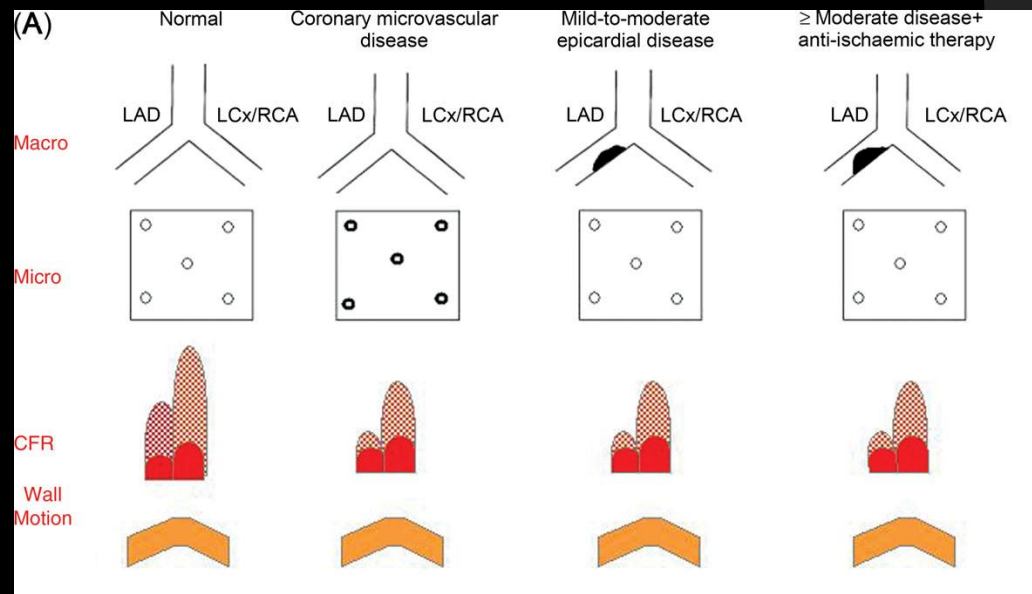
☐ Stenosi art. coronarica epicardica > 70% → Stress POS x cinesi

Stress NEG x cinesi

☐ Stenosi angiograficamente intermedie 50-70%

☐ Stenosi angiograficamente critiche in TP antiischemica

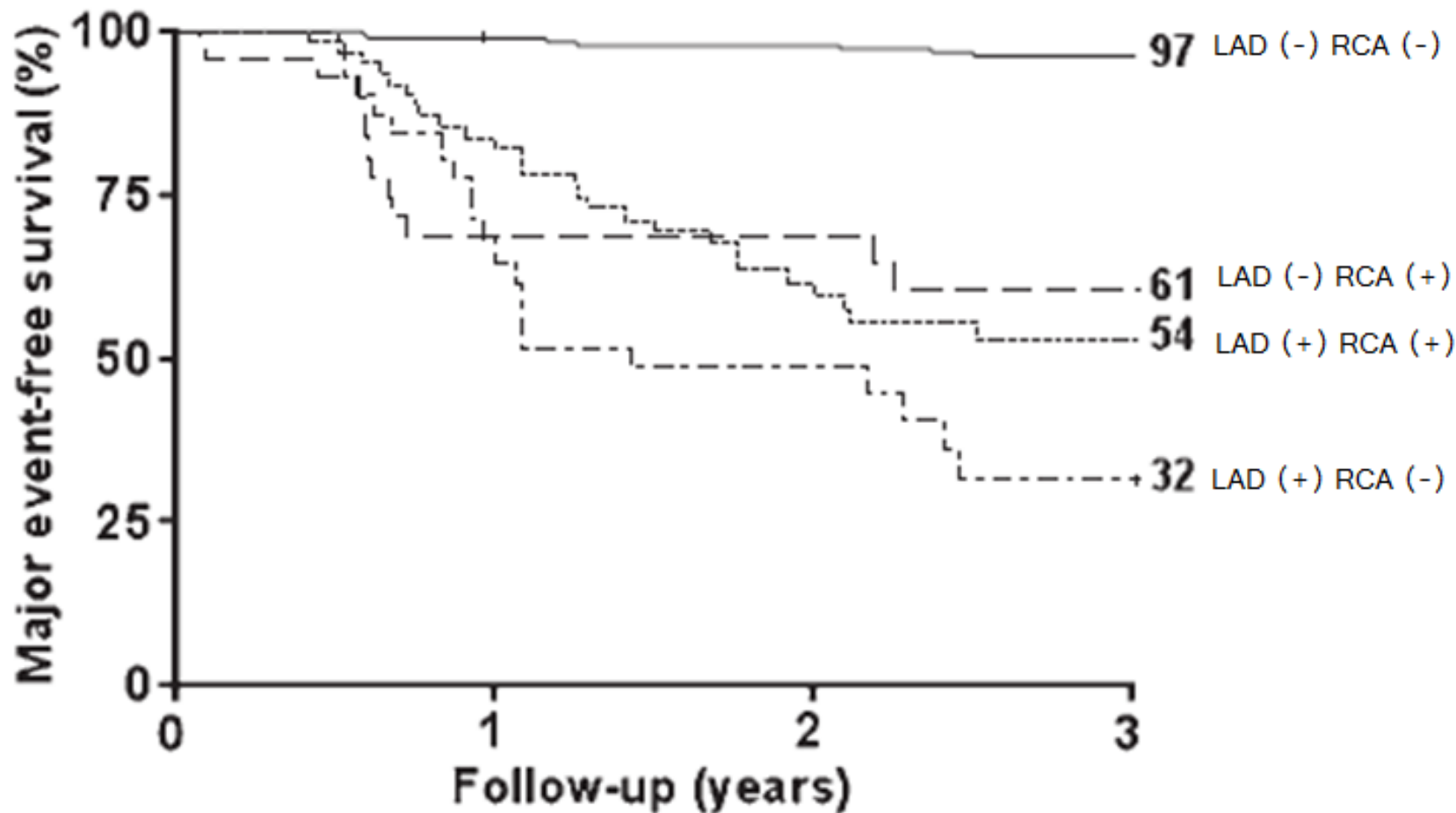
☐ Patologia del microcircolo



Prognostic correlates of combined coronary flow reserve assessment on left anterior descending and right coronary artery in patients with negative stress echocardiography by wall motion criteria

L Cortigiani, F Rigo, R Sicari, S Gherardi, F Bovenzi and E Picano

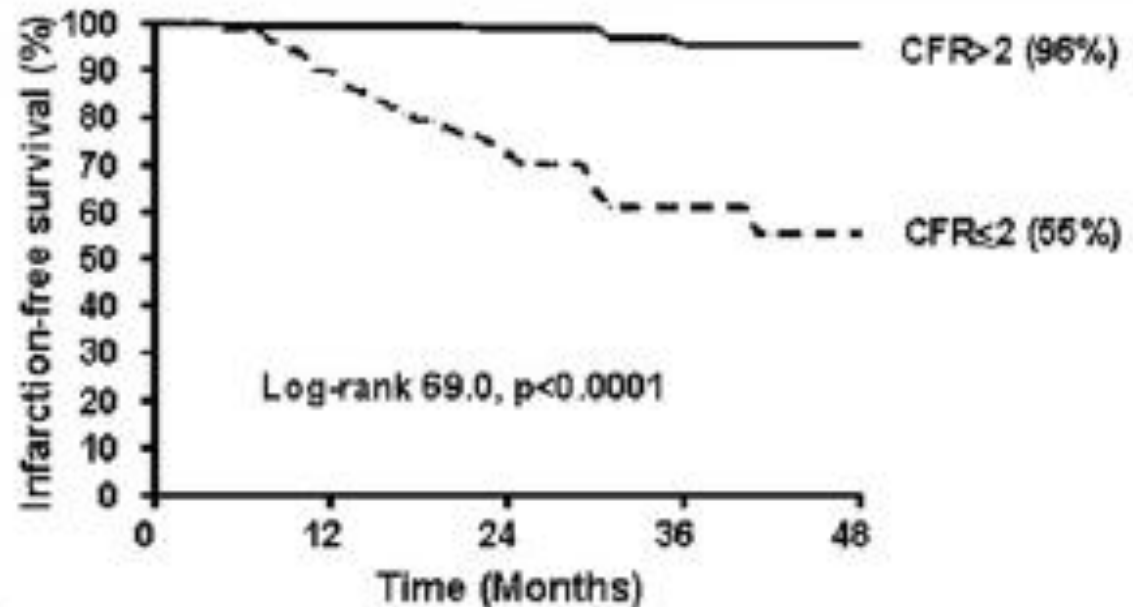
Heart 2009;95;1423-1428;



Additive Prognostic Value of Coronary Flow Reserve in Patients With Chest Pain Syndrome and Normal or Near-Normal Coronary Arteries

Rosa Sicari, MD, PhD^{a,*}, Fausto Rigo, MD^b, Lauro Cortigiani, MD^c, Sonia Gherardi, MD^d, Maurizio Galderisi, MD^e, and Eugenio Picano, MD, PhD^a

Am.J.Cardiol. 2009; 103: 626-631

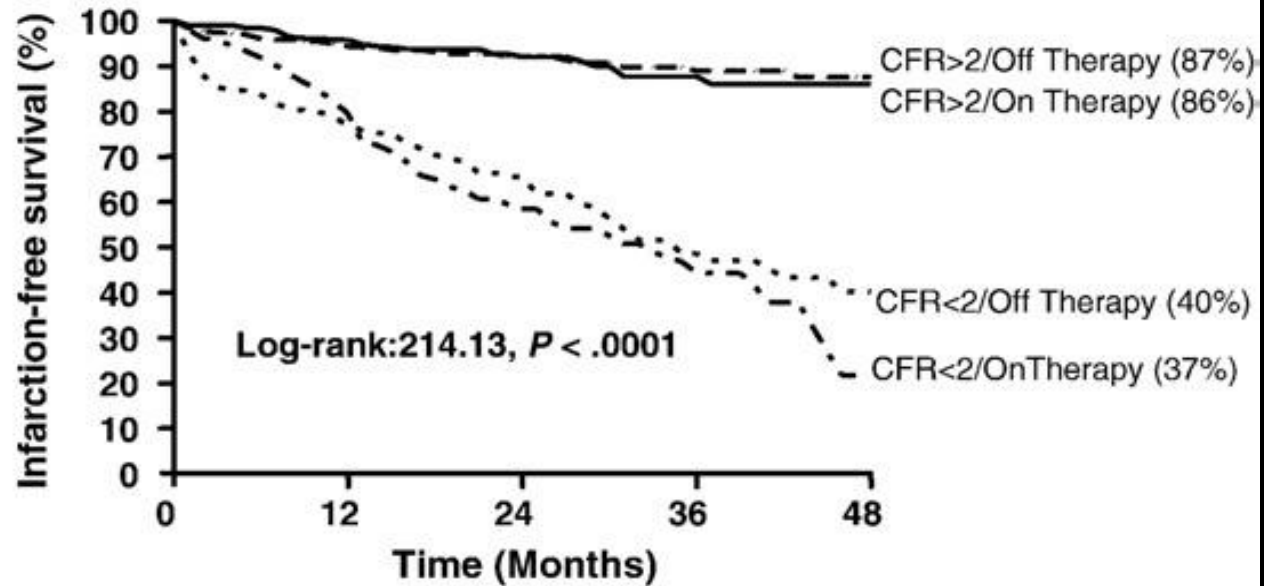


Subjects at risk

CFR > 2	307	268	156	66	13
CFR ≤ 2	87	68	37	15	5

The prognostic value of Doppler echocardiographic-derived coronary flow reserve is not affected by concomitant antiischemic therapy at the time of testing

Rosa Sicari, MD, PhD, FESC,^a Fausto Rigo, MD, FESC,^b Sonia Gherardi, MD,^c Maurizio Galderisi, MD,^d Lauro Cortigiani, MD,^c and Eugenio Picano, MD, PhD, FESC^a *Pisa, Mestre-Venice, Cesena, Naples, and Lucca, Italy*



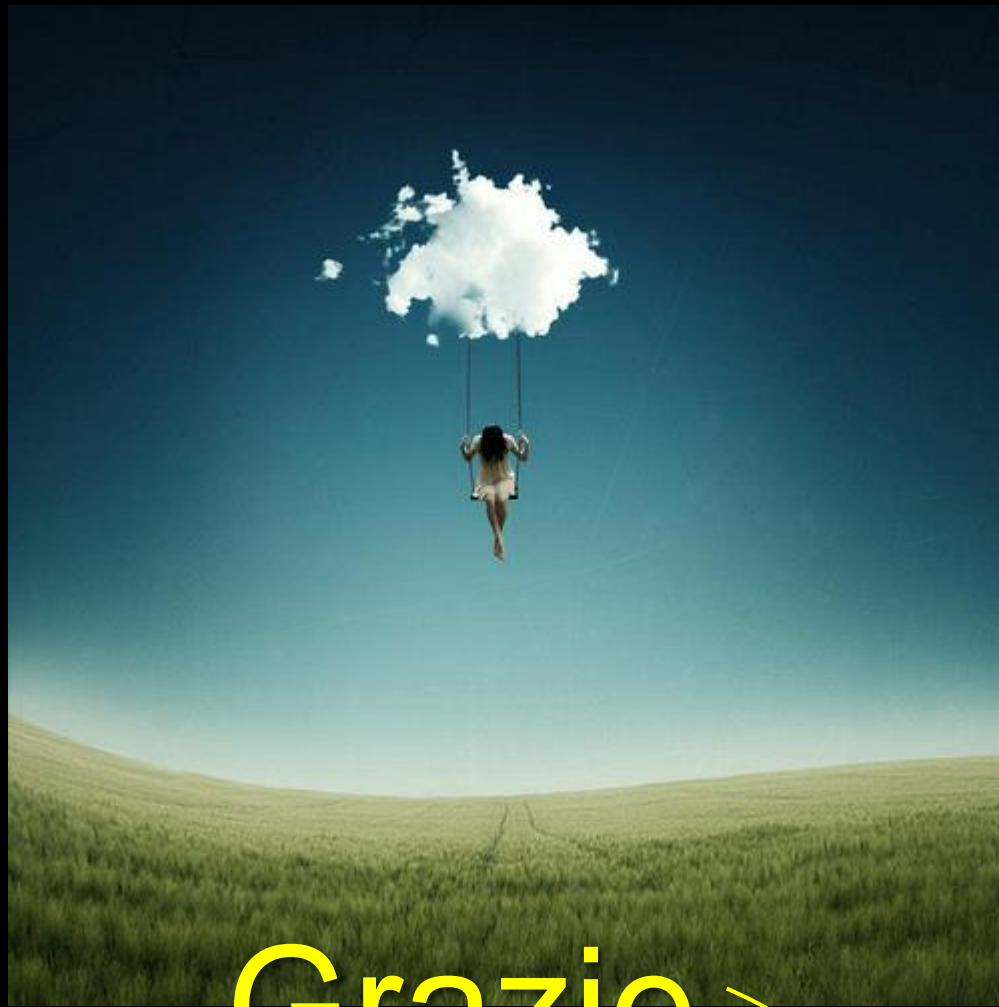
Subjects at risk

CFR > 2/Off Therapy	733	478	258	114	34
CFR > 2/On Therapy	408	296	148	63	12
CFR ≤ 2/Off Therapy	313	135	72	32	9
CFR ≤ 2/On Therapy	325	131	53	19	4

The Code of Stress Echo Severity



RISK	High	Intermediate-Low
Dose/Load	Low	High
Resting Ejection Fraction	<40%	>50%
Recovery	Slow	Prompt
Site	Heterozonal	Homozonal
WMSI	High	Low
Anti-ischemic Therapy	+	-
Coronary Territory	LAD	Cx/RCA
Coro Flow Reserve	<2	>2
Hard events/year	>20%	<2%



Grazie