The Case for PCI as the Preferred Therapy in Most Patients with Chronic Stable Angina

Ajay J. Kirtane, MD

Columbia University Medical Center
The Cardiovascular Research Foundation

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Conflict of Interest Disclosure

- **Ajay J. Kirtane**
  - **Past honorarium from Boston Scientific Corporation (modest)**
  - **Consultant/Speaker: Medtronic Vascular, Abbott Vascular (modest), St. Jude Medical (modest)**

The Term “Stable Angina” Can Be Confusing

- **“Stable Angina” is a Term Describing Symptoms, not a Diagnosis!!!**
  - ***“Stable Angina” encompasses a range of patient /disease characteristics (including patients with NO angina!)****
- **Not only are the symptoms of “stable angina” diverse, but so is the prognosis**
- **The risk of the specific population being studied is of paramount importance**

*2002 ACC/AHA Guidelines

Two Goals of Therapy in Patients with Stable Angina

1. Improve Symptoms and Quality of Life
   - Measured by “soft endpoints” (i.e. angina/QOL scales)
2. Improve Prognosis
   - Measured by “hard endpoints” (i.e. death, MI)

Therapies for “Stable Angina”

- Medical Therapy (ALL Patients)
  - Antiplatelet Therapy (Aspirin, ADP-antagonists)
  - Disease Modification (Statins, anti-DM, anti-HTN)
  - Lifestyle Modification (Diet, Smoking Cessation, Exercise)
  - Anti-Anginals (Beta-blockers*, Nitrates, Calcium-Channel Blockers)
- Revascularization (Selected Patients?)
  - PCI
  - CABG

Med Rx vs. PCI: Angina/QOL at ≥1 Year
9 randomized trials

Trial	QOL	Angina	ETT
ACME	PCI better	PCI better	PCI better
ACME 2	↔	↔	↔
MASS		PCI better	
ACIP		PCI better	PCI better
RITA 2	PCI better	PCI better	
AVERT	PCI better	PCI better	PCI better
MASS II	PCI better	PCI better	
TIME	PCI better	PCI better	PCI better
COURAGE	PCI better	PCI better	

Effect of Optimal Medical Therapy

Freedom From Angina in COURAGE

	PCI + OMT	OMT	p
Baseline	12%	13%	NS
1 Year	66%	58%	0.001
3 Years	72%	67%	0.02
5 Years	74%	72%	NS

But The Baseline Population is Critical!

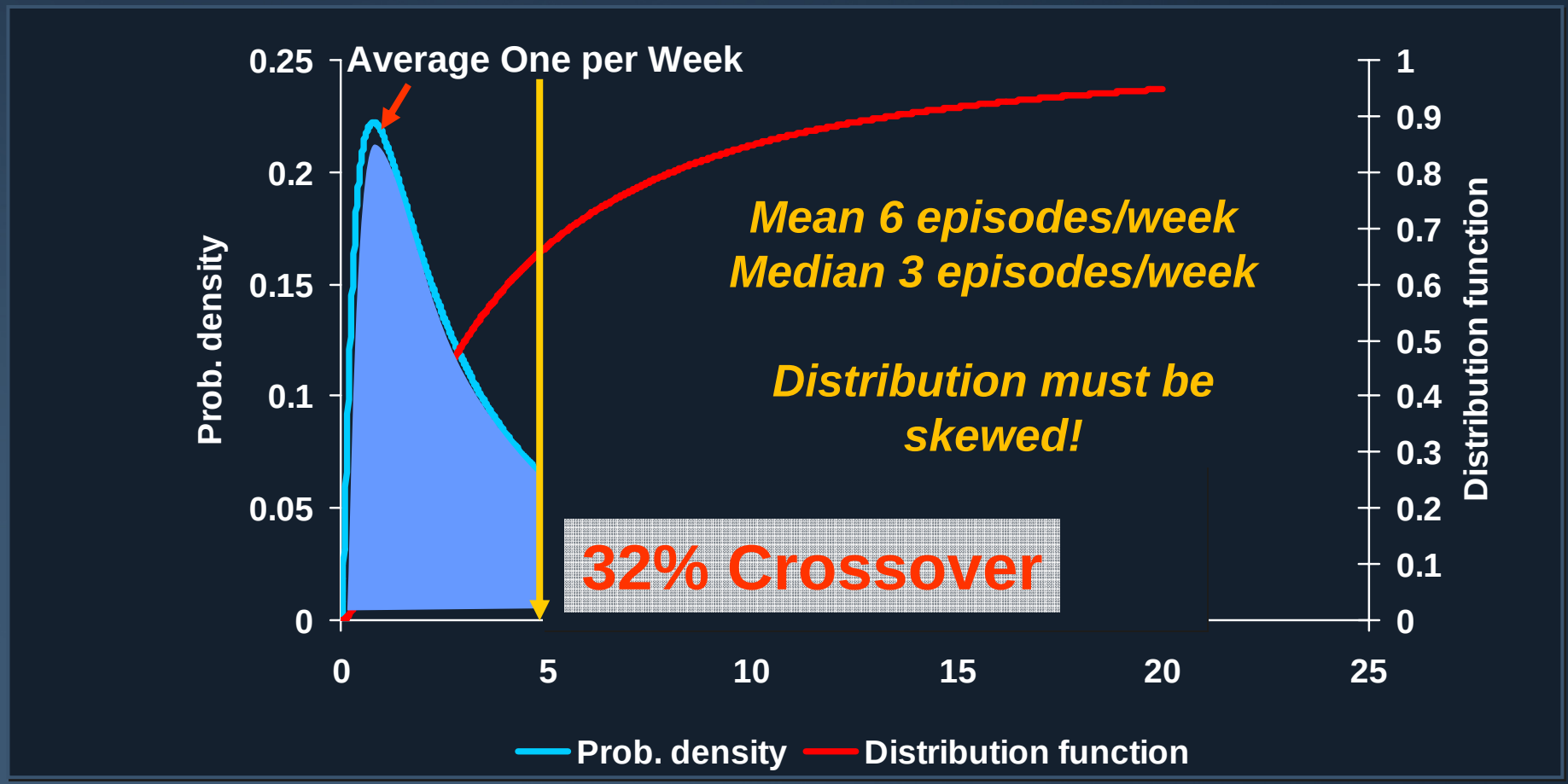
43% Class 0-1 (+32% PCI) ≈ 72% Angina Free

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Model of Angina Distribution in COURAGE

Log-normal Distribution



CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Secondary Prevention Performance Measures are Implemented More Frequently After PCI in CAD Patients

Perform. Measure	CABG	PCI	None	p
ACE Inhibitor	57.3	74.0	66.3	<0.0001
Aspirin	97.1	99.4	94.5	<0.0001
Beta Blocker	90.8	91.0	88.2	<0.0001
Smoking Advice	82.4	84.8	73.9	<0.0001
Lipid Drug	77.4	89.2	72.3	<0.0001
Defect-Free 100% Compliance	65.1	71.5	62.1	<0.0001

Hiratska et al for the Get With The Guidelines Steering Committee, Circulation. 2007;116:I-207–I-212

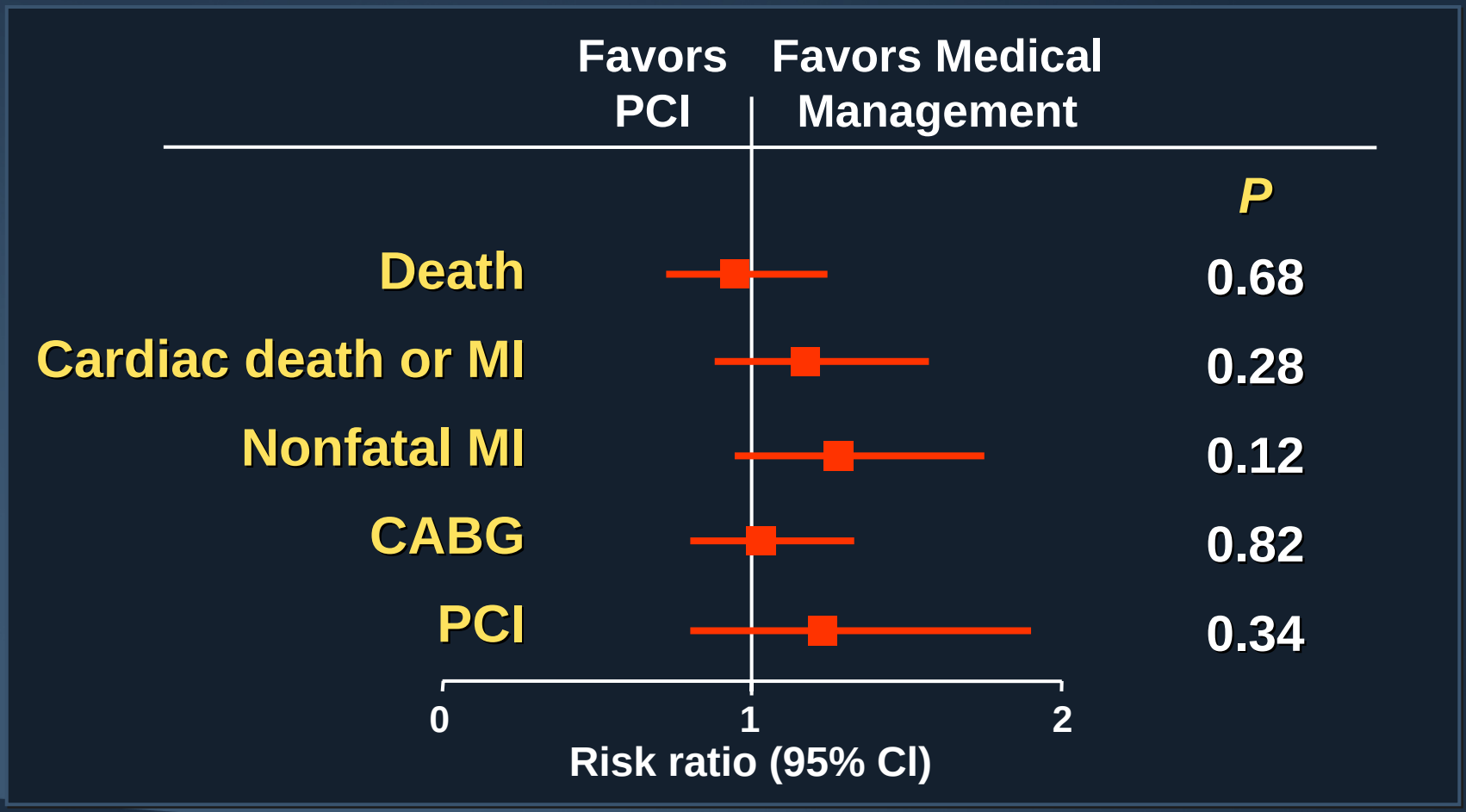
Med Rx vs. PCI: Angina/QOL at ≥1 Year

9 randomized trials

Trial	QOL	Angina	ETT
ACME	PCI better	PCI better	PCI better
ACME 2	↔	↔	↔
MASS		PCI better	
ACIP		PCI better	PCI better
RITA 2	PCI better	PCI better	
AVERT	PCI better	PCI better	PCI better
MASS II	PCI better	PCI better	
TIME	PCI better	PCI better	PCI better
COURAGE	PCI better	PCI better	

Pre-COURAGE: Stable CAD
PTCA/BMS vs. Medical Therapy

Meta-analysis of 11 randomized trials; N = 2,950

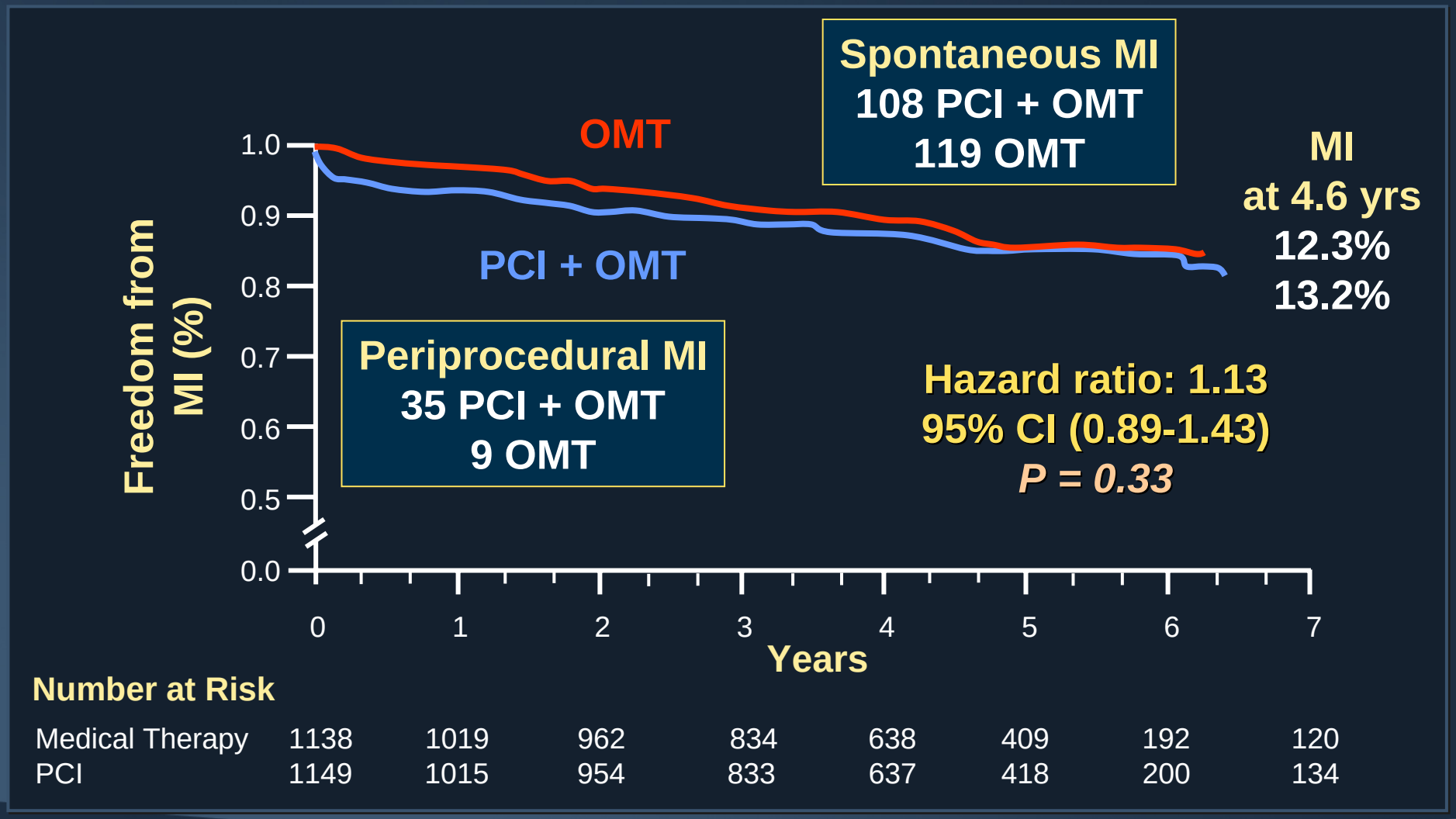


CARDIOVASCULAR RESEARCH FOUNDATION

Katritsis DG et al. *Circulation.* 2005;111:2906-12.

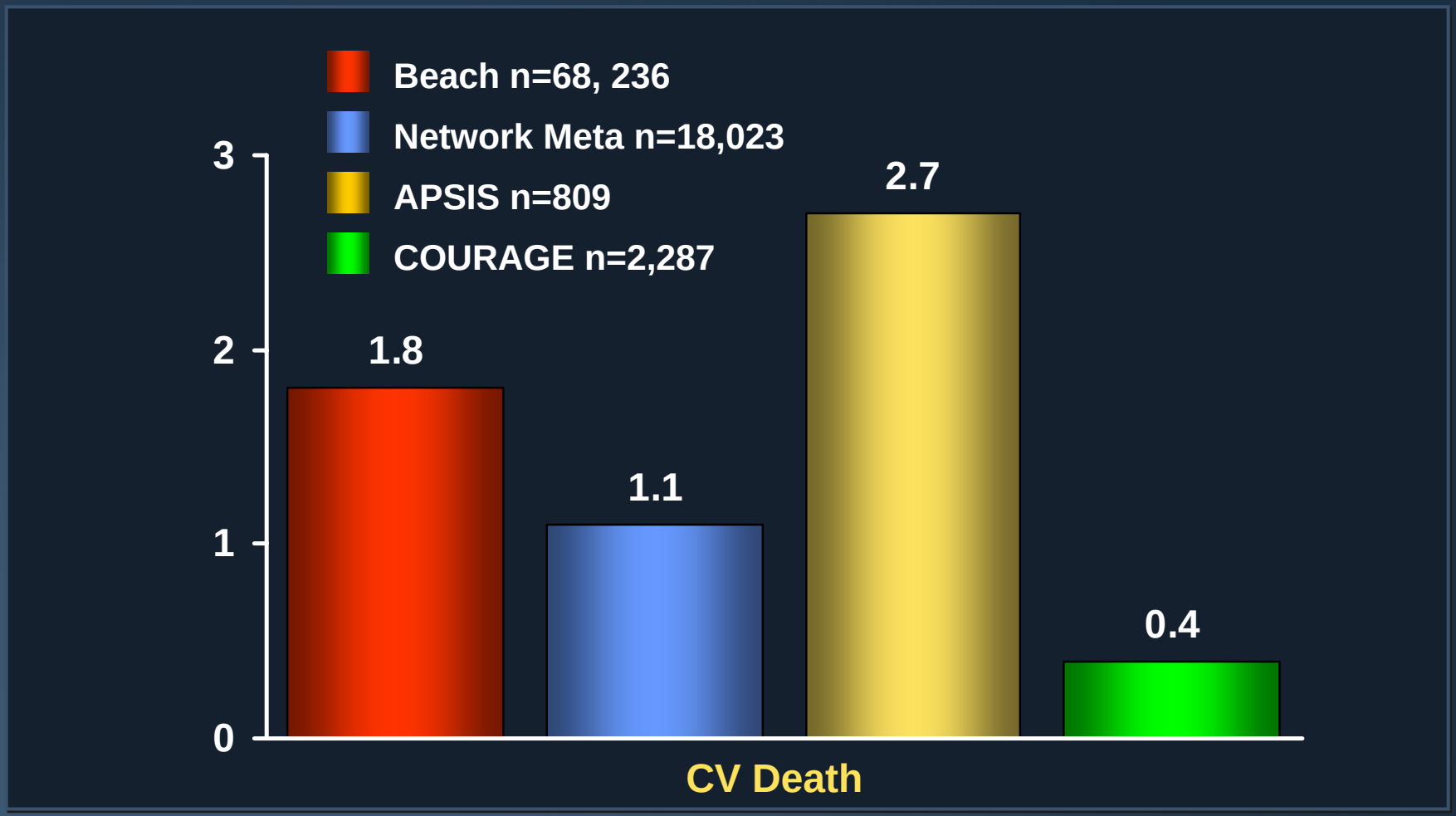
COLUMBIA UNIVERSITY MEDICAL CENTER

Freedom from MI (any biomarker elevation) (median FU 4.6 yrs)



COURAGE: A Very Low Risk Group

Annual CV Death Rates in "Stable" CAD

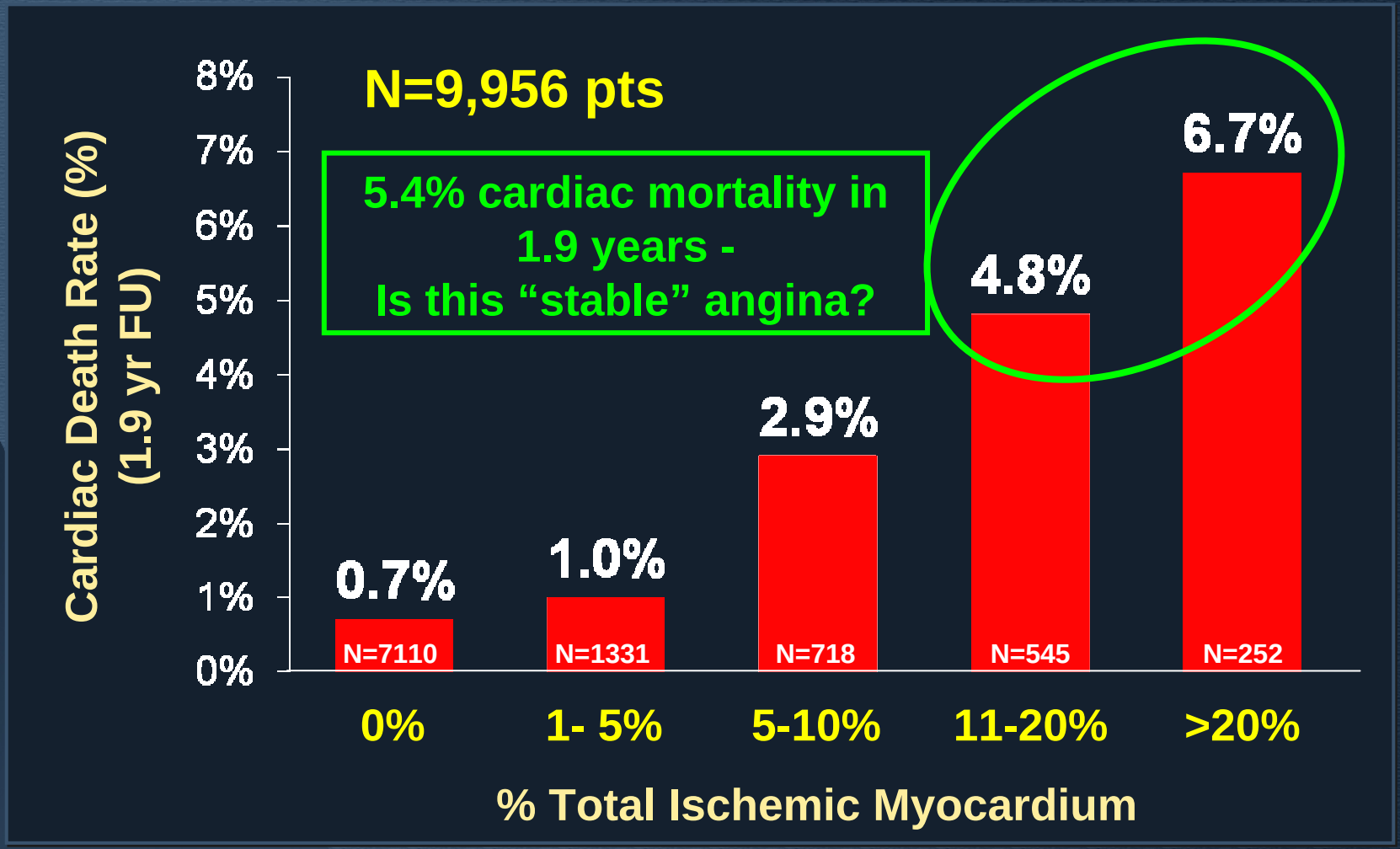


Steg JAMA;297;1197; Stettler Lancet 2007;370:937;
Hjemdahl Heart 206;92:177

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

There is a Wide-Range of Morbidity/Mortality among "Stable Angina" Patients

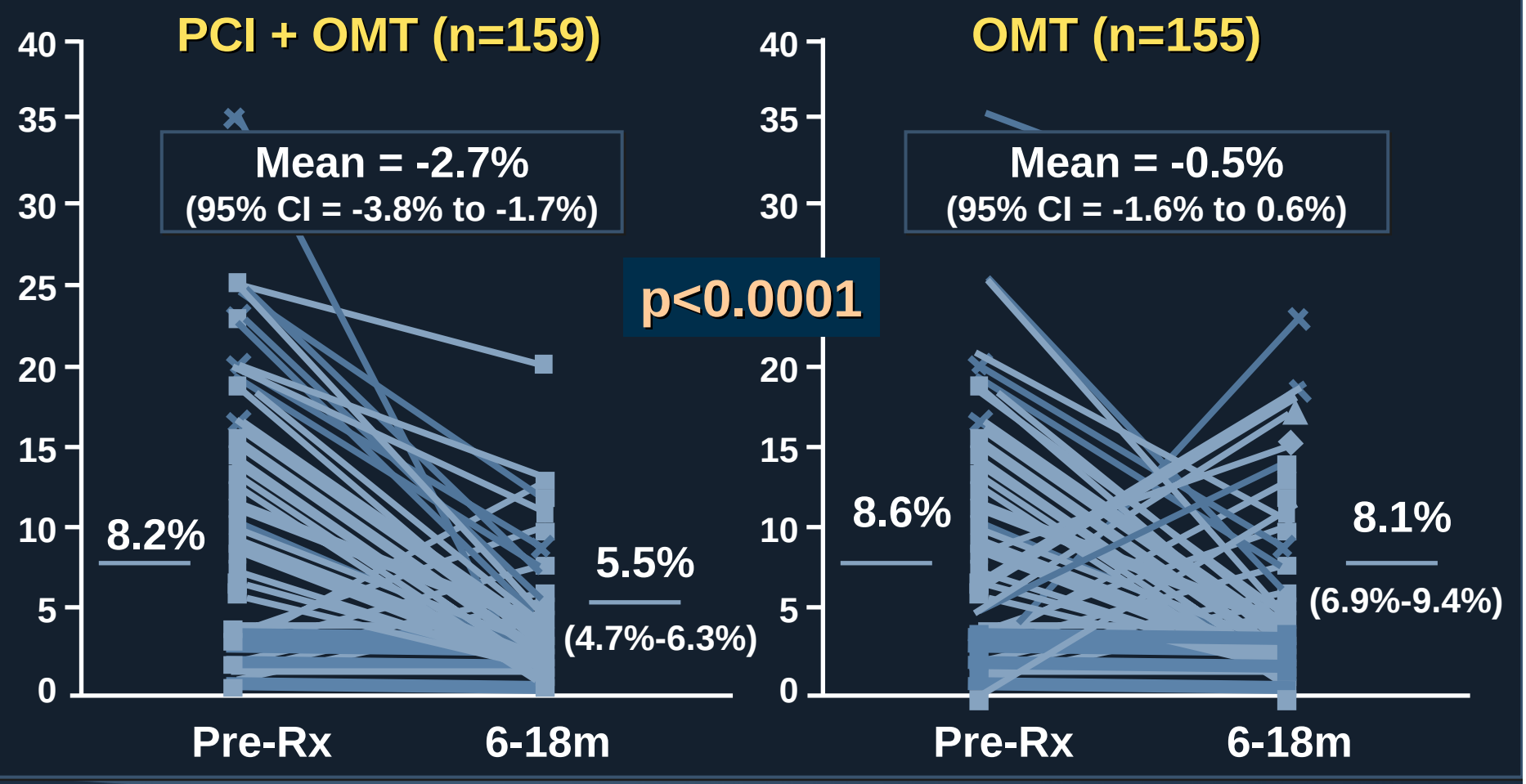


CARDIOVASCULAR RESEARCH FOUNDATION

Hachamovitch et al, Circulation 2003;107:2900-07

COLUMBIA UNIVERSITY MEDICAL CENTER

MPS % Ischemic Myocardium (95% CI) Pre-Rx & 6-18 Months

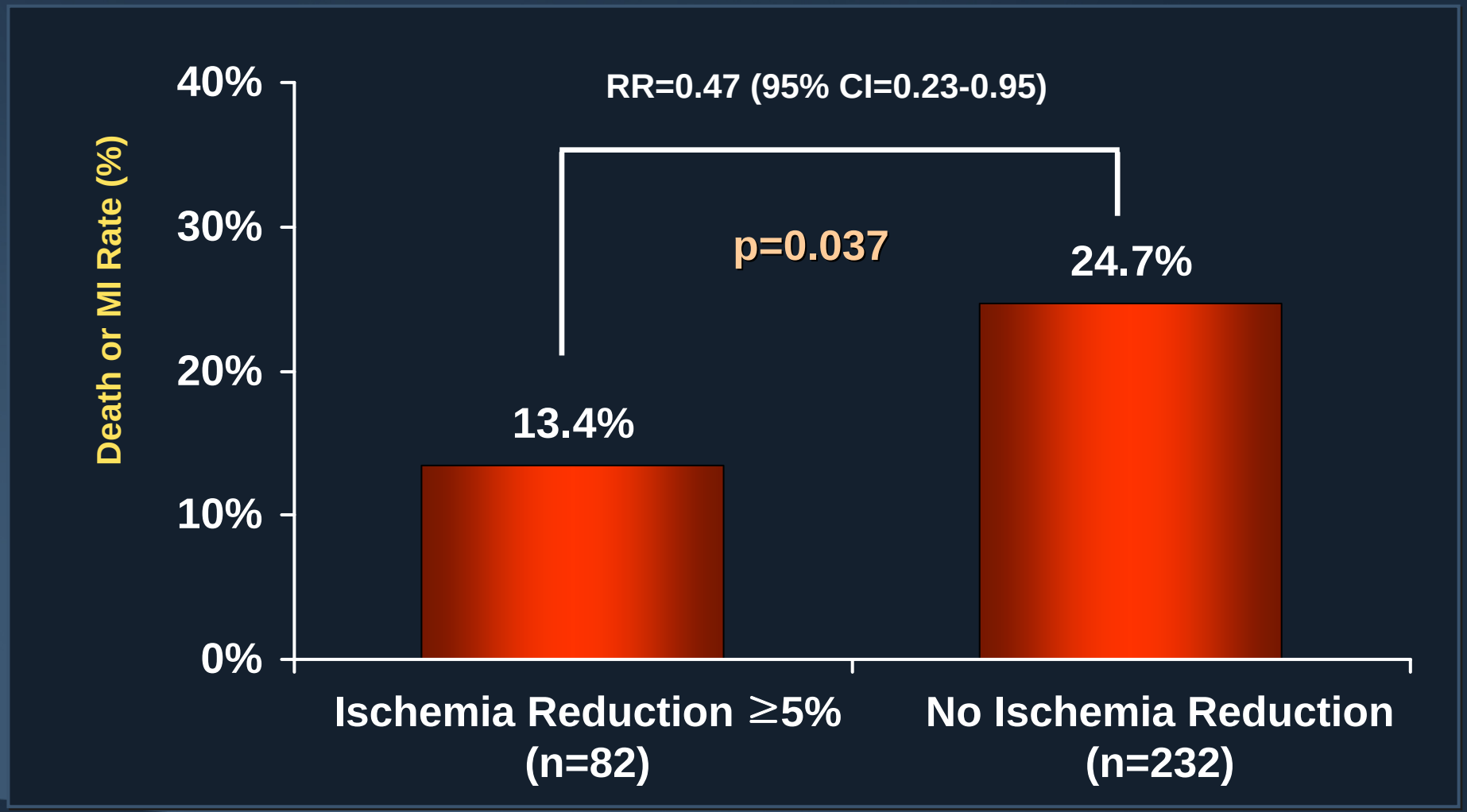


Shaw, et al, AHA 2007 and Circulation 2008

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Rates of Death or MI by Ischemia Reduction

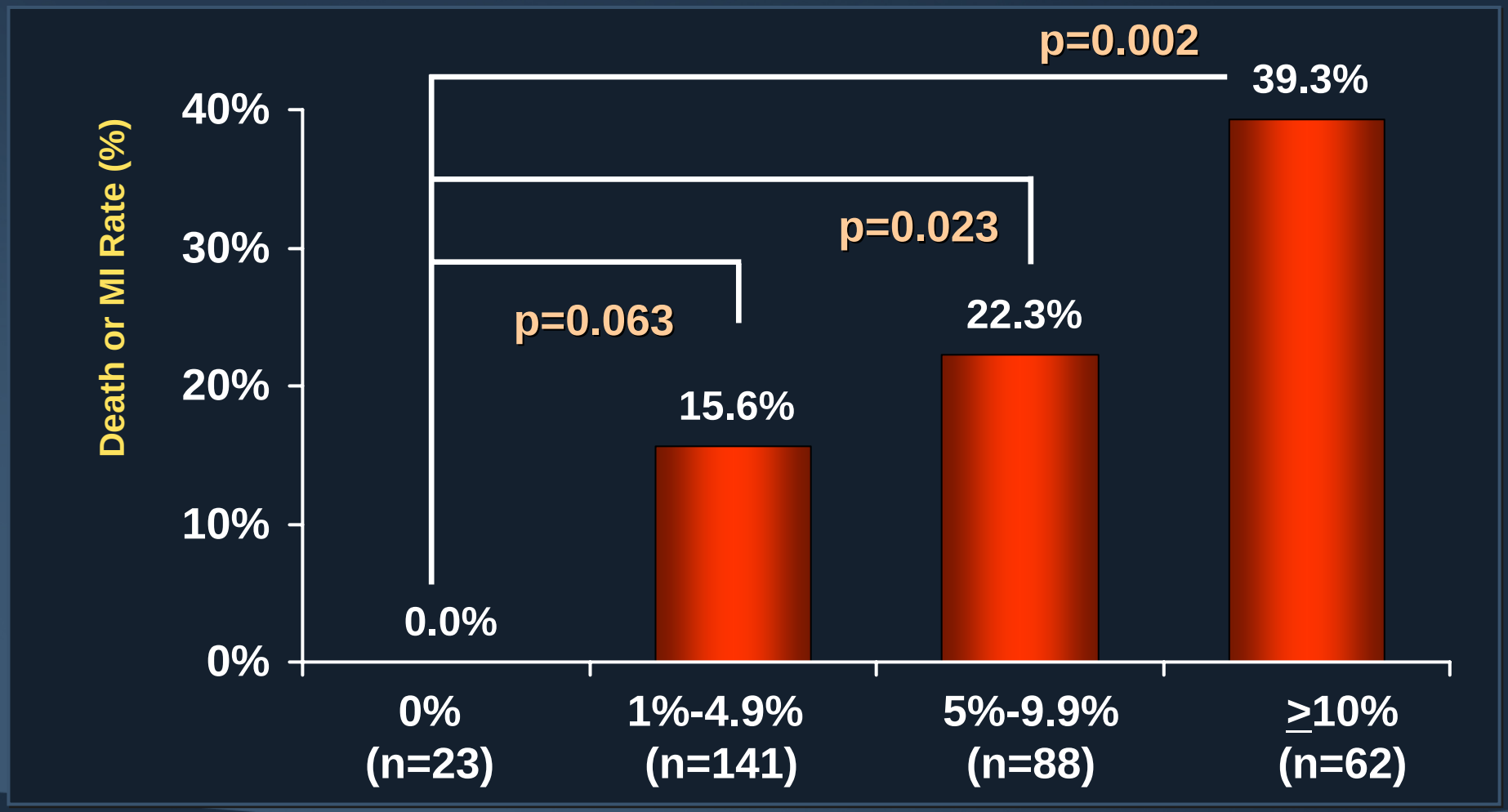


Shaw, et al, AHA 2007 and Circulation 2008

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Rates of Death or MI by Residual Ischemia on 6-18m MPS

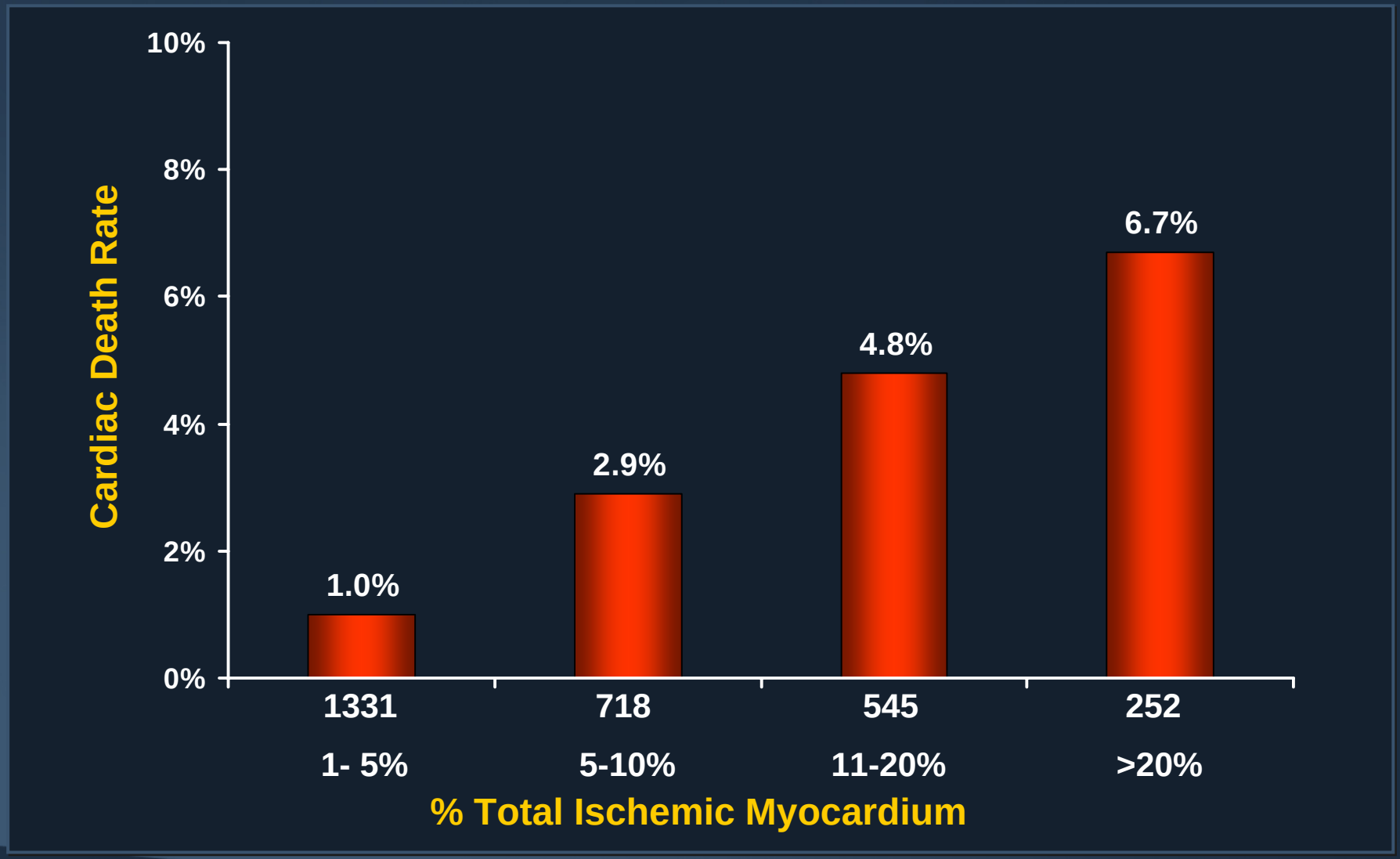


Shaw, et al, AHA 2007 and Circulation 2008

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Gradient of risk according to ischemic burden 1.9 yrs of Follow-up with Medical Therapy

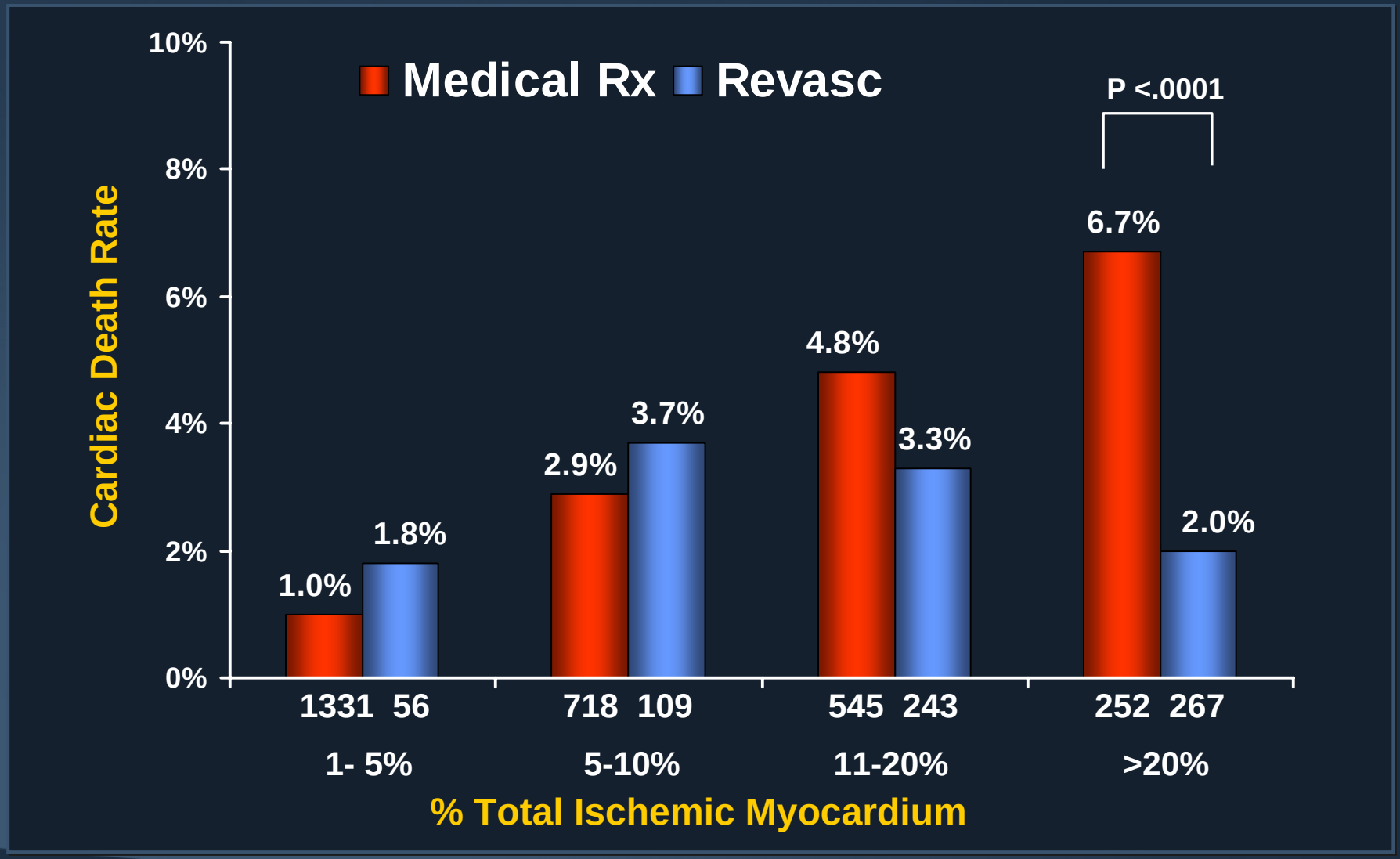


Hachamovitch et al Circulation 2003; 107:2900-2907

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Mitigatated Gradient with Revasuclarization

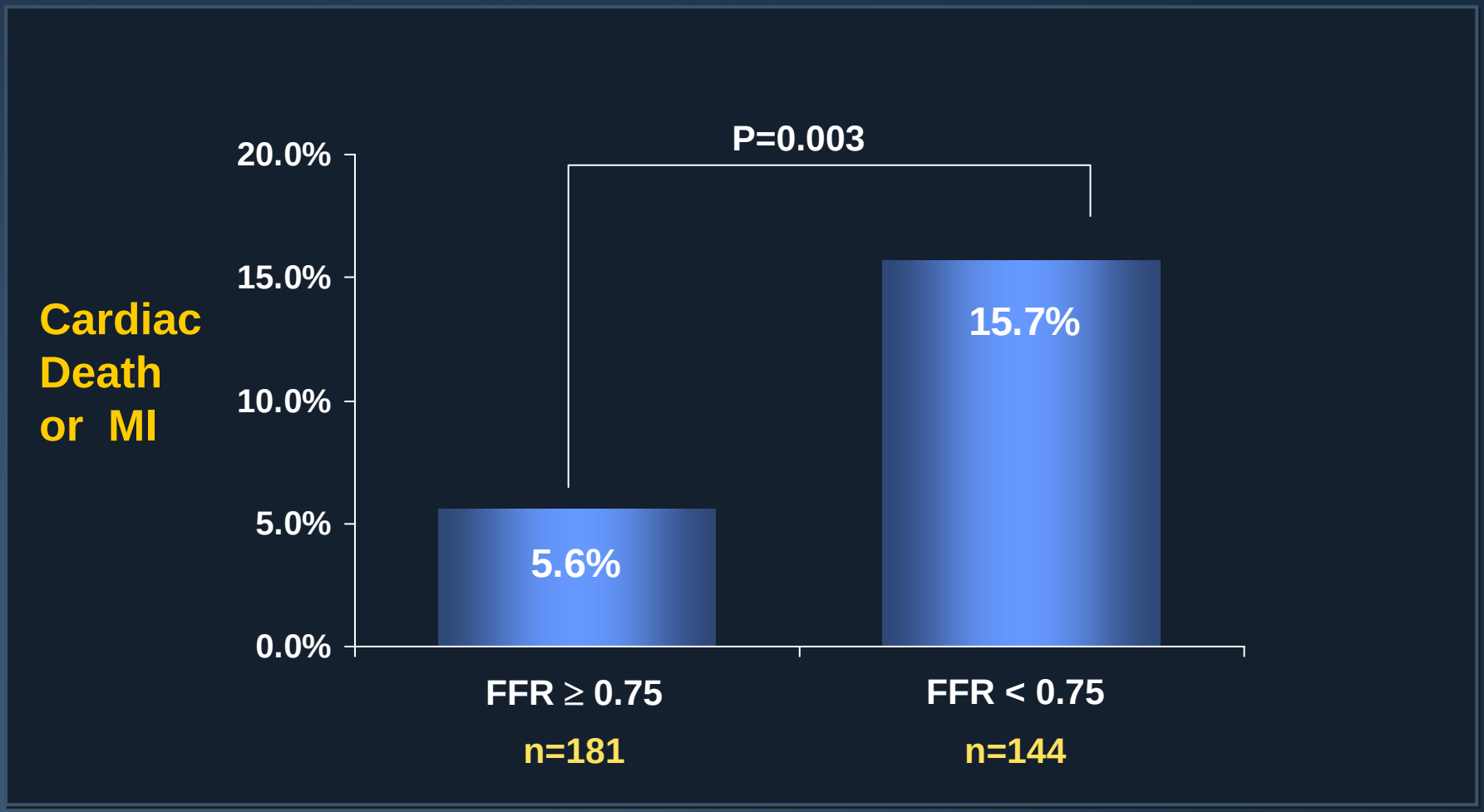


Hachamovitch et al Circulation 2003;
107:2900-2907

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

Hemodynamics Predict Prognosis: DEFER Study 5 year follow-up



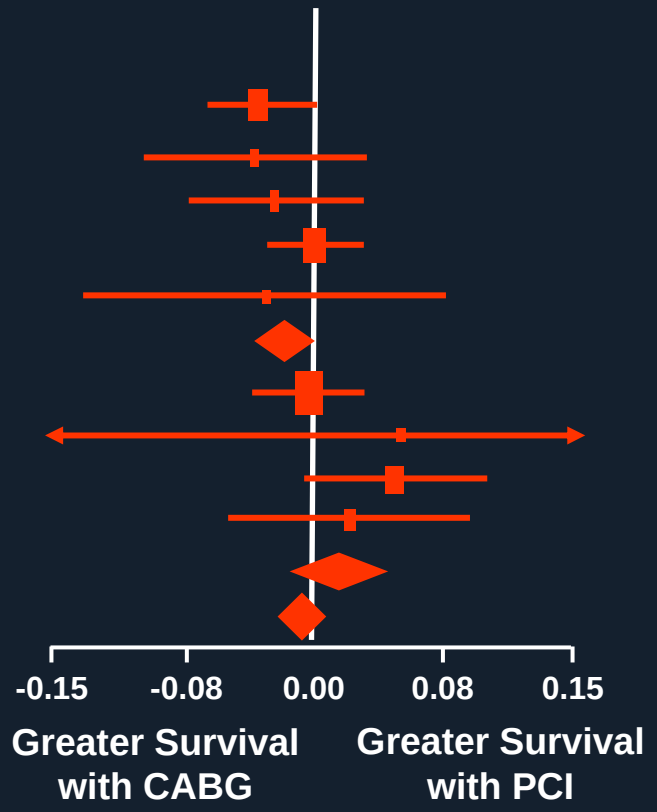
CARDIOVASCULAR RESEARCH FOUNDATION

Pijls et al. JACC 49, 2007;2105–11

COLUMBIA UNIVERSITY MEDICAL CENTER

Five-year Survival with Balloon Angioplasty or Stents vs. Coronary Artery Bypass Grafting in Patients with Multivessel Disease

Study, Year (Reference)	Surviving Patients/All Patients, n/n	
	PCI	CABG
BARI, 1996 (64)	790/915	816/914
EAST, 2000 (80)	153/174	161/177
GABI, 2005 (88)*	164/177	157/165
RITA, 1998 (110)	483/510	474/501
French Monocentric Study, 1997 (126)	66/76	68/76
Balloon overall	1656/1852	1676/1833
ARTS, 2005 (23)	542/590	538/584
AWESOME, 2001 (28)	30/38	19/26
ERACIII, 2005 (86)	209/225	199/225
MASS II, 2006 (103)	177/205	171/203
BMS overall	958/1058	927/1038
MVD overall	2614/2910	2603/2871

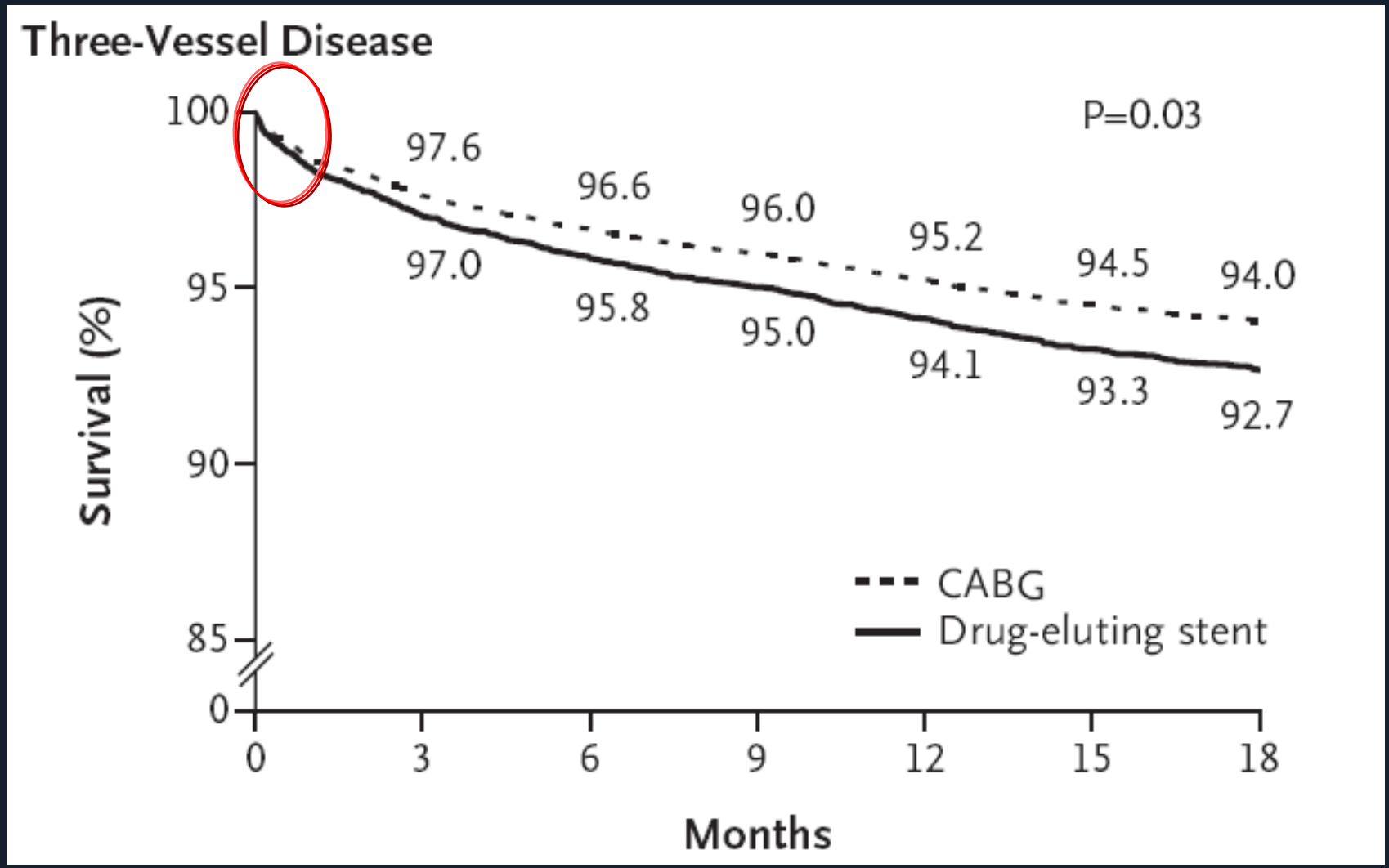


Bravata et al, *Ann Intern Med.* 2007;147.

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

NY State CABG vs. DES (Adjusted)



Hannan et al, N Engl J Med 2008;358:331-41

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

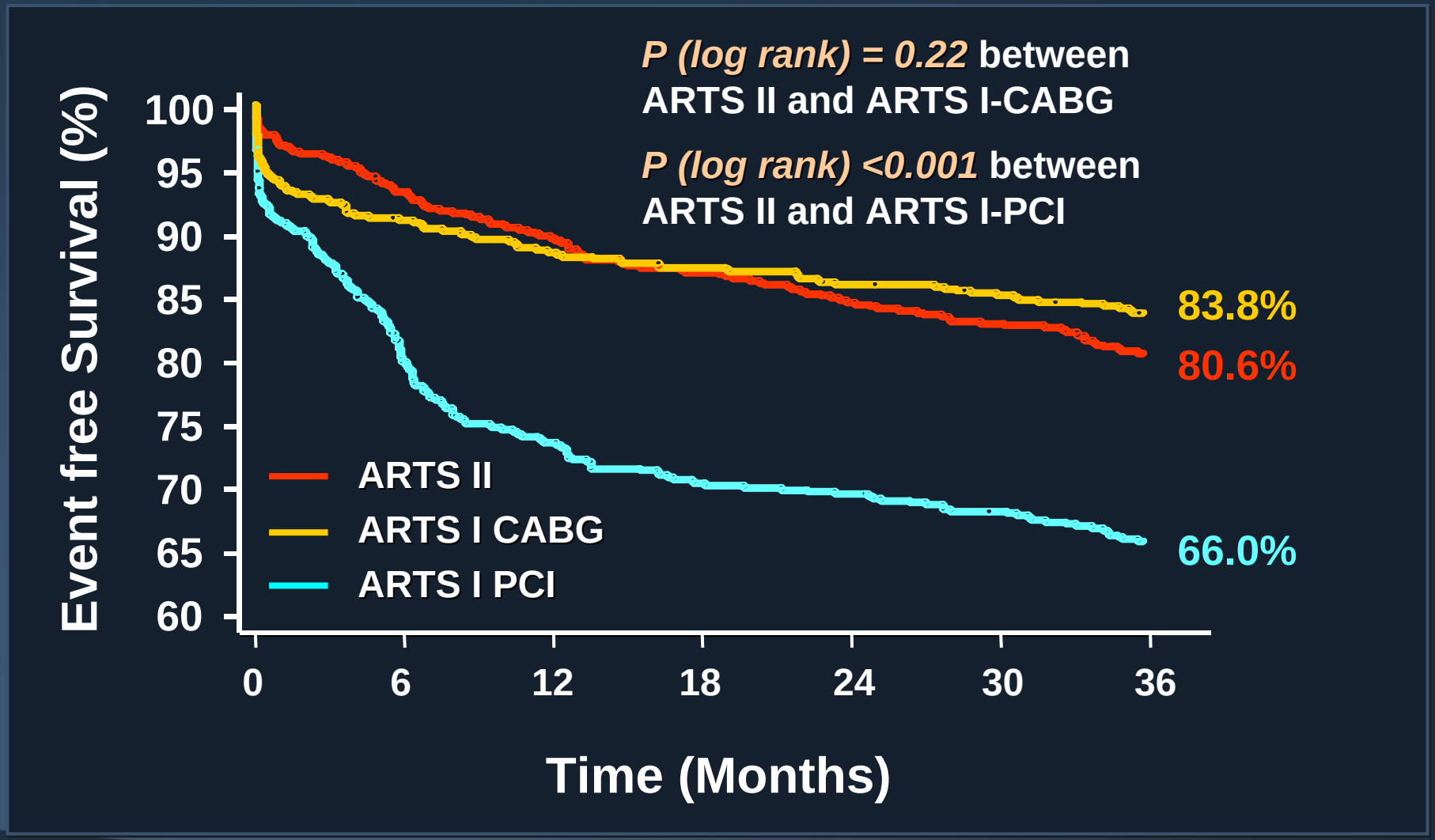
AMC Experience (Korea)
PCI vs. CABG for Multivessel Disease

Mortality Estimate	Hazard Ratio (95% CI)	p
Crude	0.65 (0.47–0.90)	0.01
MV-Adjusted	0.85 (0.56–1.30)	0.45
Prop-Adjusted	0.95 (0.72–1.53)	0.68
Prop-Stratified	0.90 (0.59–1.37)	0.63

Registry series of all-cause mortality to 3 yrs in 3042 patients treated with PCI or CABG

Park et al, Circulation 2008; 117:2079-2086

ARTS II – MACCE up to 3 Years



From P. Serruys
Eurointervention 2007; 3: 450-459

CARDIOVASCULAR RESEARCH FOUNDATION

COLUMBIA UNIVERSITY MEDICAL CENTER

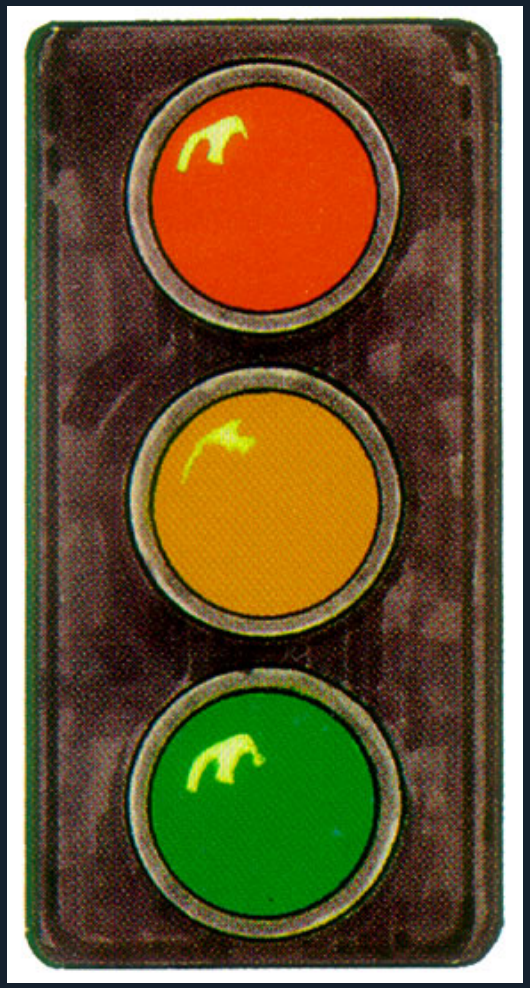
Take-Home Points

- **The Measured Benefit of any Therapy over Another Depends on:**
  - **Relative effectiveness of the therapy**
  - **Baseline Risk (event rate)**
  - **Measured goal of therapy (outcome)**
- **To measure risk in Stable CAD, we need to look at severity of symptoms, extent of ischemia, and absolute event rates**
  - ***Non-novel finding*: In symptomatic or "higher-risk pts", revasc will be beneficial**

Summary: Who Should NOT Get PCI?

- **I favor Medical Therapy in:**
  - Asymptomatic or mildly symptomatic patients with no or very little ischemia
  - Patients in whom revasc. is too risky
- **I favor CABG in:**
  - Patients/disease subsets who are poor candidates for PCI, but we need more trial results to better define this population (we will soon have these)

Where Do We Go From Here?



2006-2007	**PCI Under Attack**
2007-2008	**Critical Reappraisal / Emerging Data**
2008-????	***Let's RESUME Moving Forward!***