

# “COURAGE” to Leave Diseased Arteries Alone

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Conflict: I am an Interventionalist

# Angioplasty's golden era may be fading

Risk concerns, rise of drugs could signal major shift

By Steve Sternberg  
USA TODAY

WASHINGTON — One day last week, three doctors here reached inside a man's leaky heart and plugged a hole that threatened his life.

They did it without slicing open his chest or splitting his breastbone. They did it without touching him much at all.

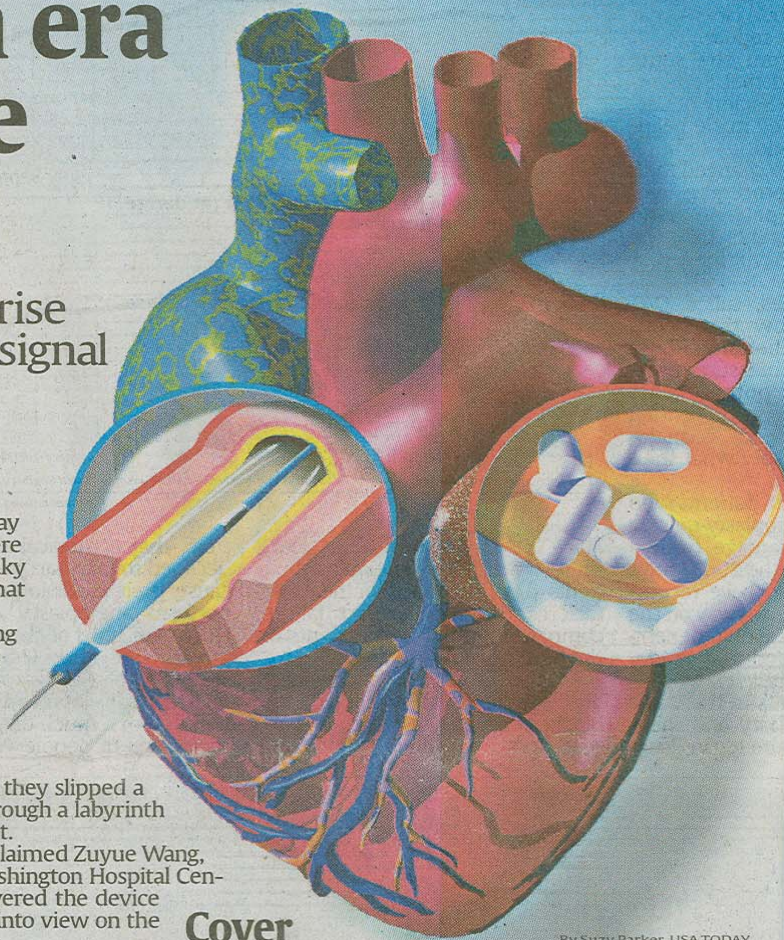
The 87-year-old patient was too frail to risk open-heart surgery. Instead, they slipped a patch on the tip of a wire through a labyrinth of blood vessels into his heart.

"Very nice. Good job," exclaimed Zuyue Wang, an echocardiographer at Washington Hospital Center as a cardiologist maneuvered the device into place and it blossomed into view on the 3-D ultrasound monitor.

The approach the doctors used is derived from one of the most common procedures in medicine, coronary angioplasty, which is performed 650,000 to 1 million times a year in the USA alone.

But for the first time, independent analyses performed at the request of USA TODAY suggest the meteoric rise of angioplasty during the past three decades has ended.

"The rise of angioplasty procedures has leveled off and appears to be on the decline," says Duke University's Eric Peterson, who reviewed results of the analysis by the National Cardiovascular Data Registry.



**Cover  
story**

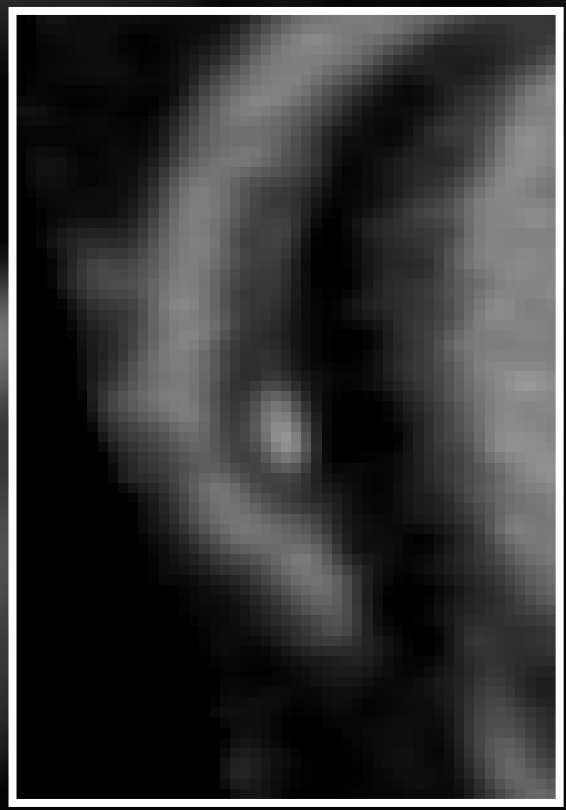
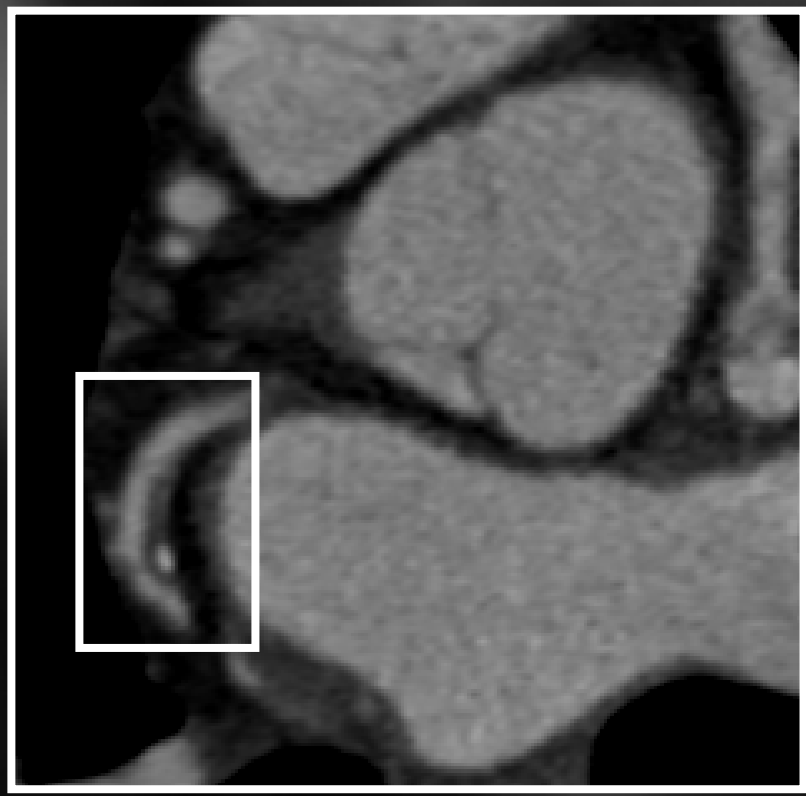
By Suzy Parker, USA TODAY

Three major studies published in the past two years indicate that using the procedure to open blocked arteries to treat chest pain, or angina, may be riskier and no more beneficial than medication.

The research suggests angioplasty is used too often, and in many cases, the modest benefits don't justify the procedure's cost, which ranges from \$10,000 to \$12,000. The topic will be debated at the annual scientific session of the American College of Cardiology starting this weekend in Chicago:

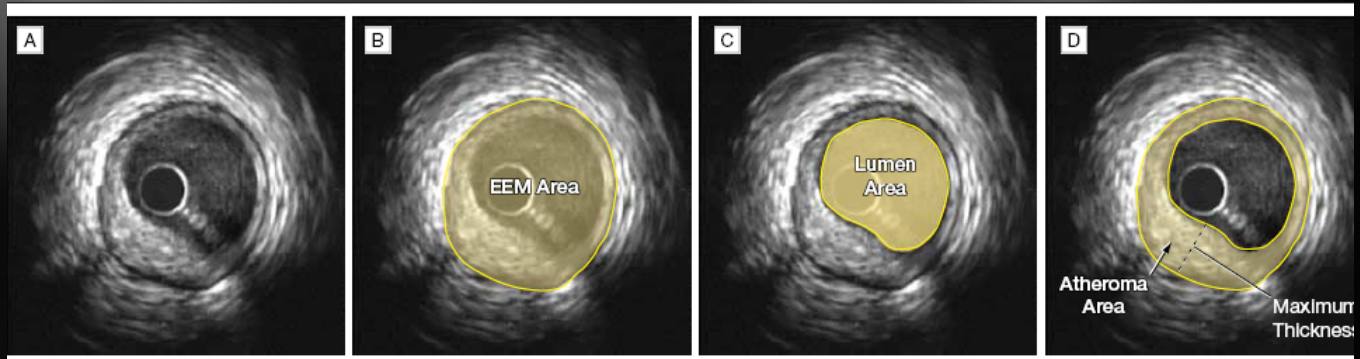
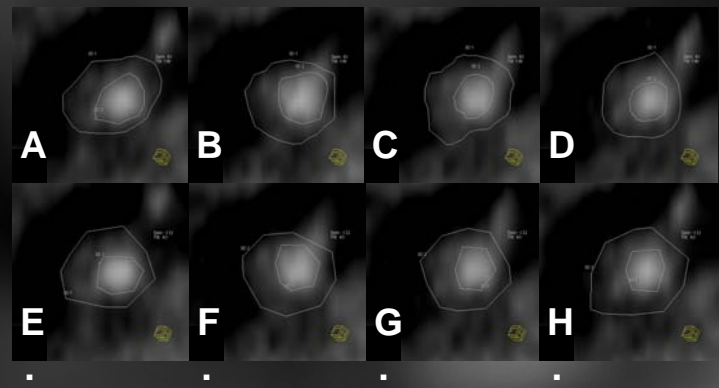
Please see COVER STORY next page ▶

# CTA Characterization



# Plaque Geometry

## Features: General Morphology



# Plaque Composition

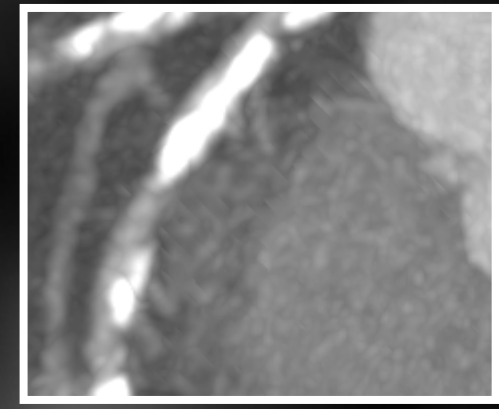
## Qualitative Analysis



Non-Calcified  
Plaque



Mixed  
Plaque

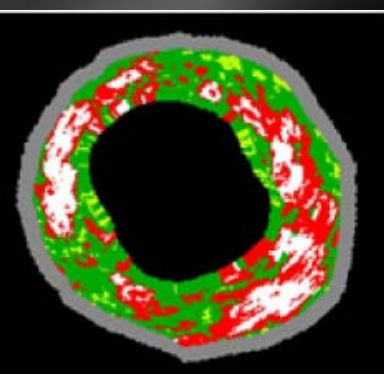
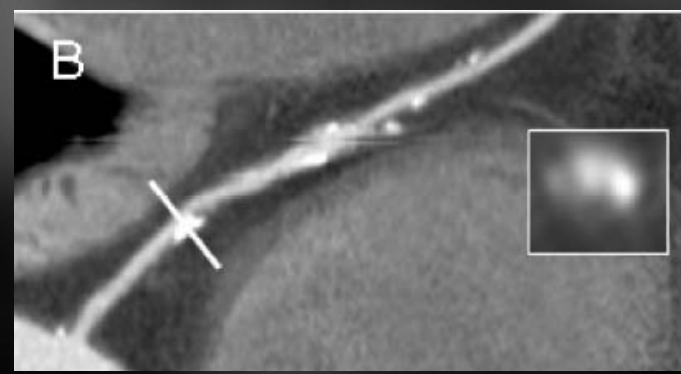
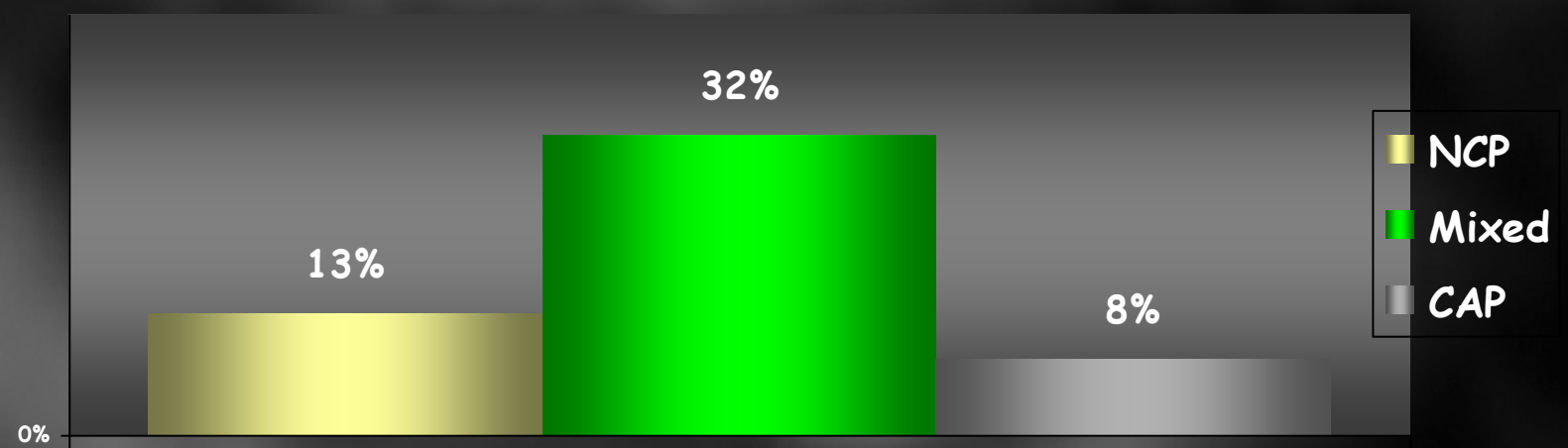


Calcified  
Plaque

...No standardized definition at this time...

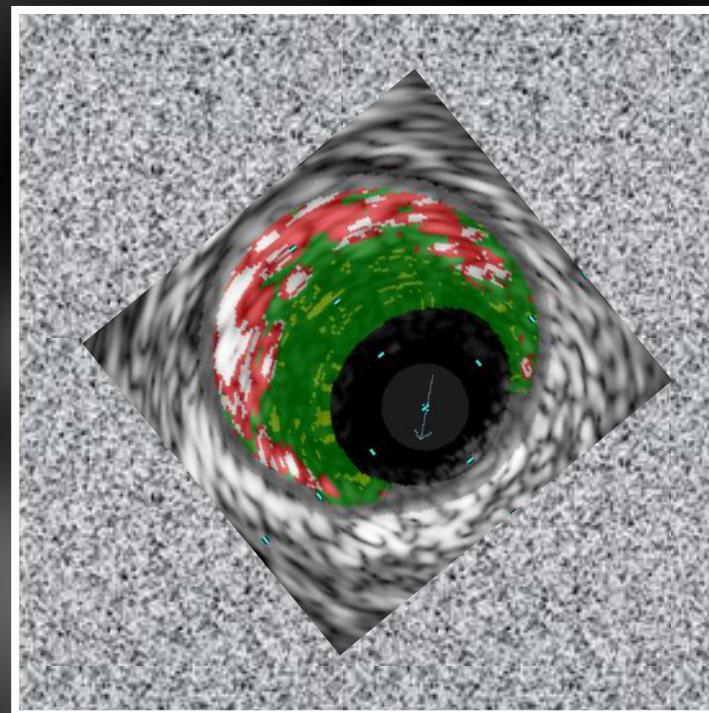
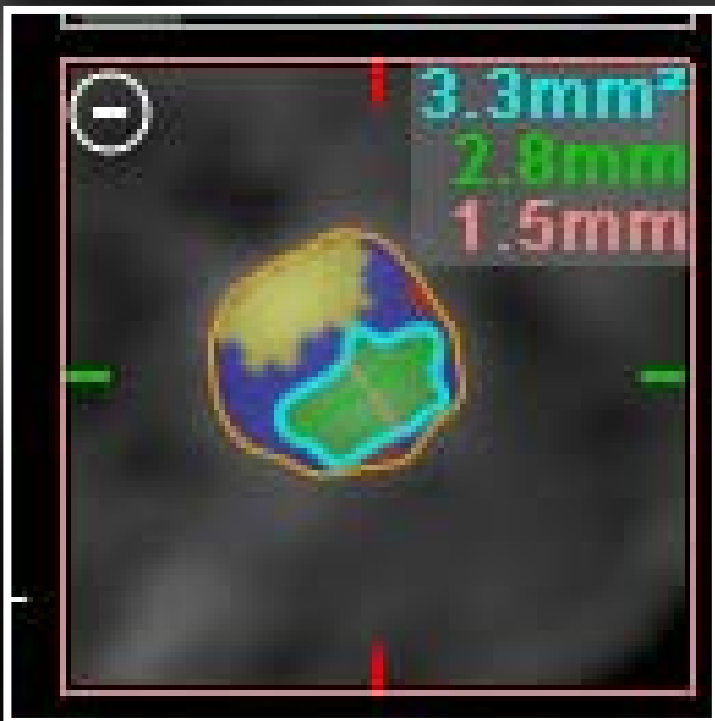
# Plaque Composition

## Qualitative Analysis



# Correlation

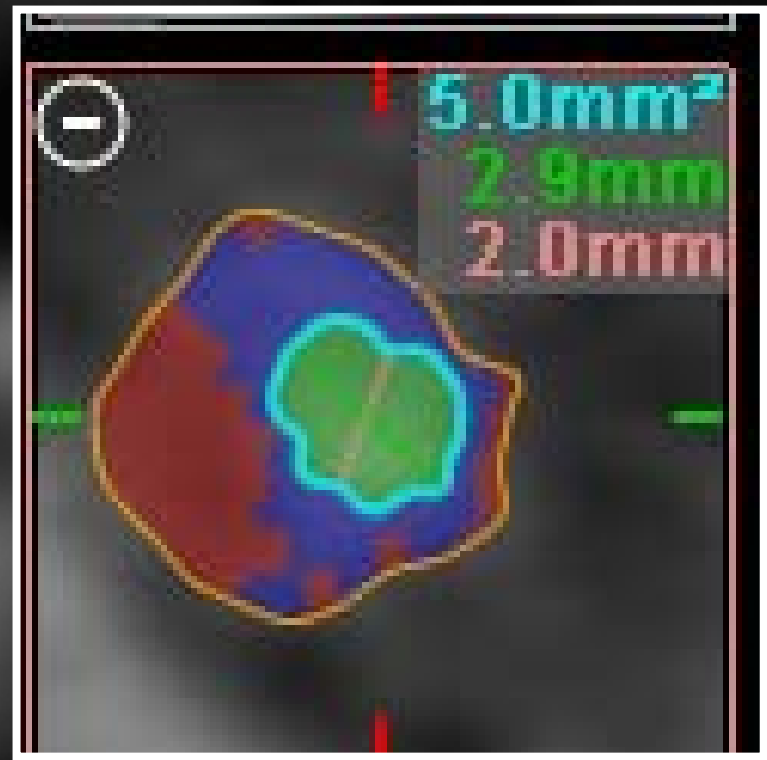
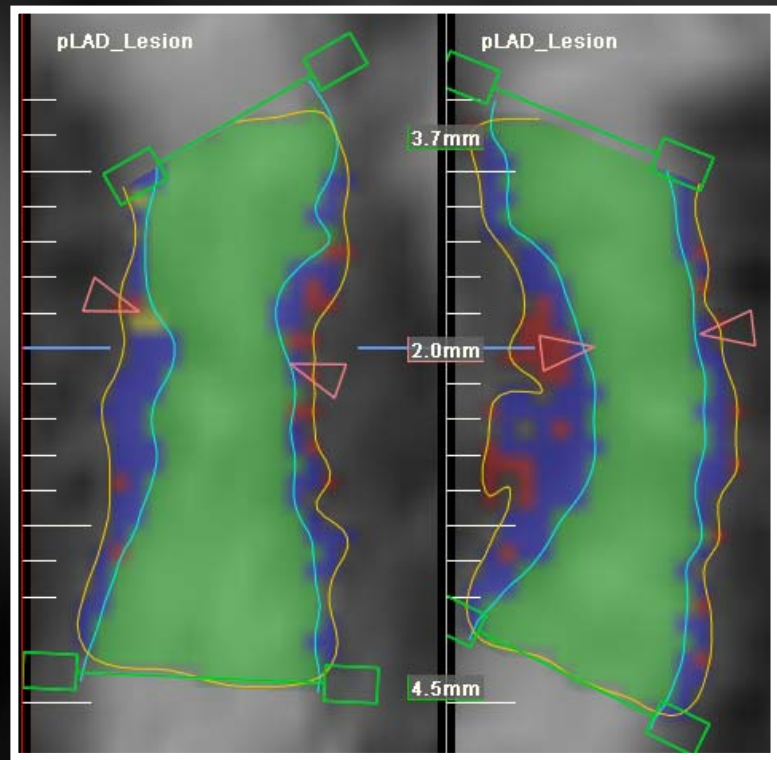
Fuqua Heart Center of Atlanta



Fuqua Heart Center of Atlanta

# ATLANTA QCTA

## Lesion-Based Analysis





# Coronary Heart Disease: Clinical Presentations

ST Elevation MI----- Stents

Acute Coronary Syndromes---- Stents ?Meds  
?CABG

Stable Symptoms----- Medical  
(or stents)  
(or CABG)

# PCI or Medical Therapy

# Acute Coronary Syndromes

**PCI FOCUSED UPDATE**

## **2007 Focused Update of the ACC/AHA/SCAI 2005 Guideline Update for Percutaneous Coronary Intervention**

A Report of the American College of Cardiology/American  
Heart Association Task Force on Practice Guidelines

**2007 Writing Group to Review New Evidence and Update the  
ACC/AHA/SCAI 2005 Guideline Update for Percutaneous Coronary Intervention,  
Writing on Behalf of the 2005 Writing Committee**

Spencer B. King III, MD, MACC, FAHA,  
FSCAI, *Co-Chair*\*†

Sidney C. Smith, JR, MD, FACC, FAHA,  
*Co-Chair*\*†

John W. Hirshfeld, JR, MD, FACC, FAHA,  
FSCAI‡

Alice K. Jacobs, MD, FACC, FAHA, FSCAI

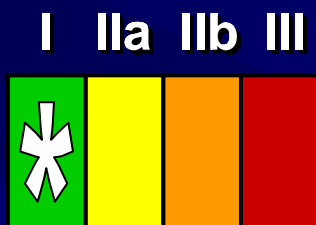
Douglass A. Morrison, MD, PhD, FACC,  
FSCAI‡

David O. Williams, MD, FACC, FAHA,  
FSCAI§

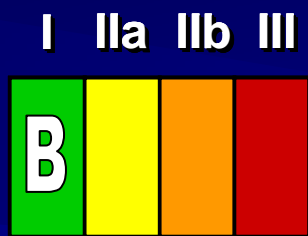
\*Chair of 2005 Writing Committee; †Recused from voting on Section 7:  
Antiplatelet Therapy; ‡Society for Cardiovascular Angiography and Inter-  
ventions Representative; §Recused from voting on Section 8: Bare-Metal and  
Drug-Eluting Stents

# Recommendations for PCI in Patients With UA/NSTEMI

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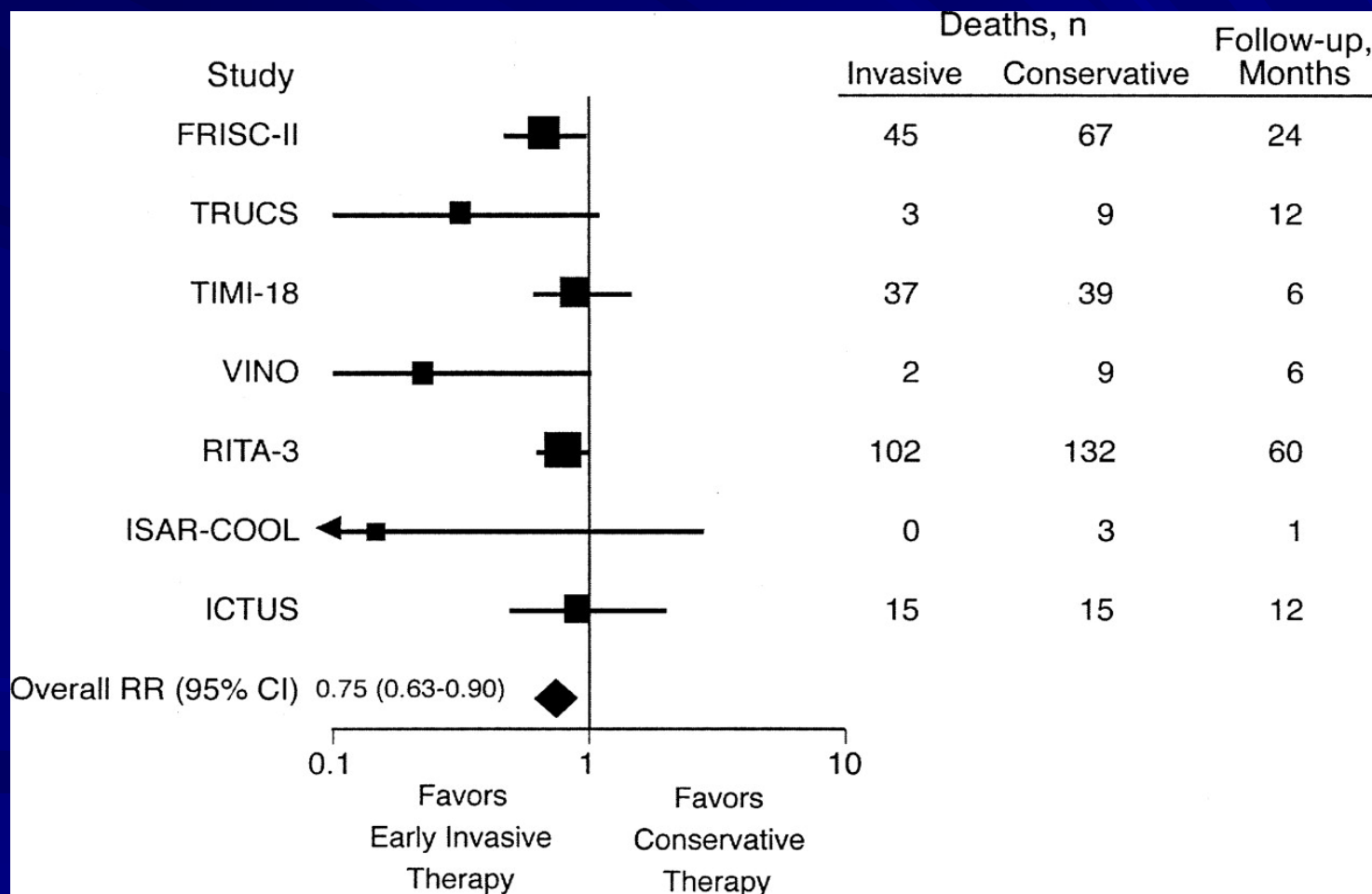


An early invasive PCI strategy is indicated for patients with UA/NSTEMI who have no serious comorbidity and who have coronary lesions amenable to PCI and any of the high-risk features listed in the previous section.



PCI (or CABG) is recommended for UA/NSTEMI patients with 1- or 2-vessel CAD with or without significant proximal left anterior descending (LAD) CAD but with a large area of viable myocardium and high-risk criteria on noninvasive testing.

# Relative Risk of All-Cause Mortality for Early Invasive Therapy Compared With Conservative Therapy at a Mean Follow-Up of 2 y



# Early Invasive vs. Selective Invasive Management for Acute Coronary Syndromes

1200 NSTEMI pts with + troponin T

Recommended medical therapy:

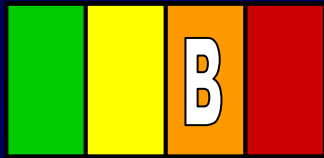
ASA and clopidogrel 300, enoxaparin x 48 h,  
atorvastatin 80 mg

Outcomes:

MACE 22.7% invasive vs. 21.2% selective  
Mortality 2.5% in both groups

# Initial Conservative Versus Initial Invasive Strategies

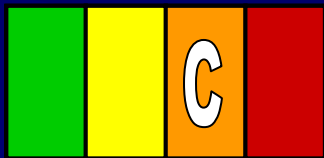
I IIa IIb III



*New*

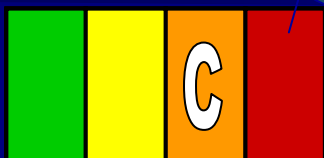
In initially stabilized patients, an initially conservative (i.e., a selectively invasive) strategy may be considered as a treatment strategy for UA/ NSTEMI patients (without serious comorbidities or contraindications to such procedures) who have an elevated risk for clinical events including those who are troponin positive.

I IIa IIb III



The decision to implement an initial conservative (vs. initial invasive) strategy in these patients may be made by considering physician and patient preference.

I IIa IIb III



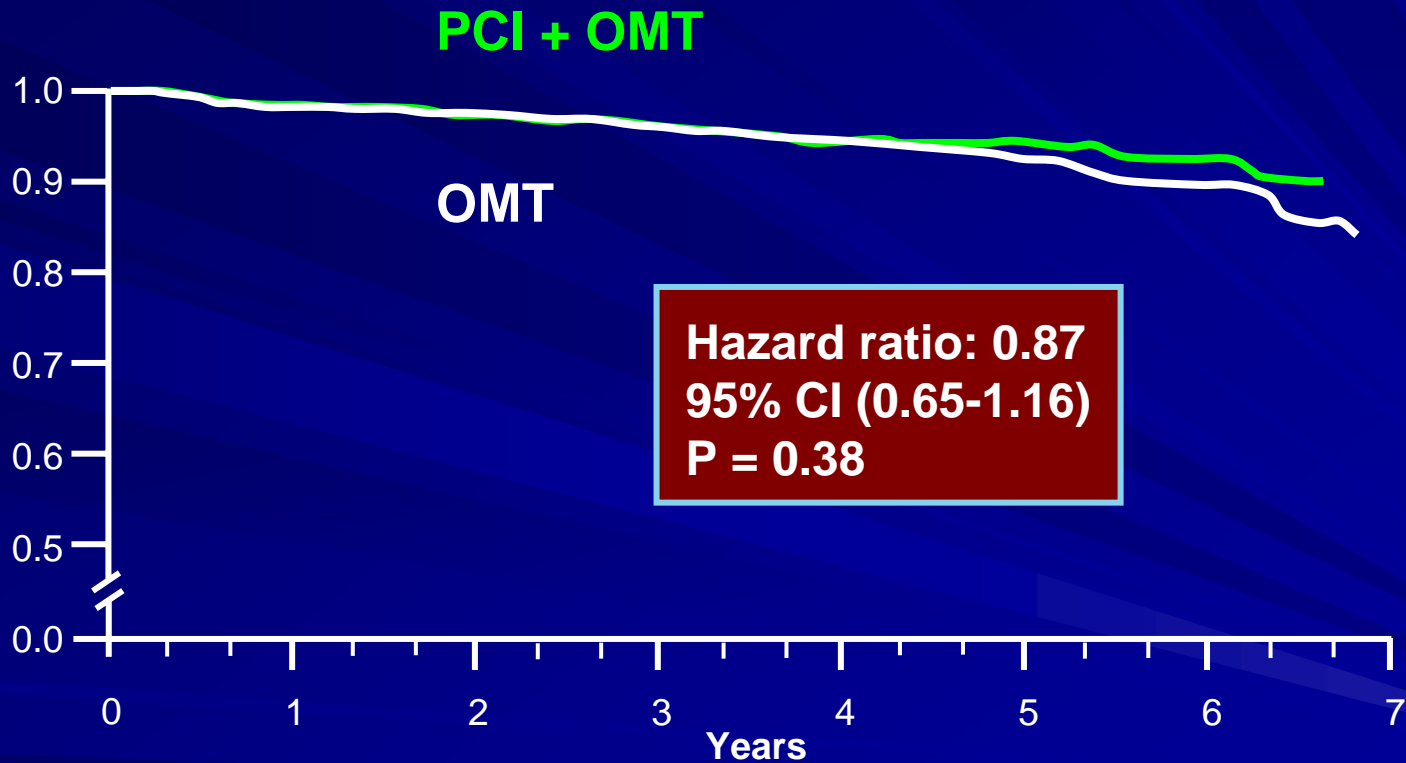
*New*

An invasive strategy may be reasonable in patients with chronic renal insufficiency.



# Stable Ischemic Heart Disease

# Overall Survival



## Number at Risk

	0	1	2	3	4	5	6	7	8
Medical Therapy	1138	1073	1029	917	717	468	302	3	3
PCI	1149	1094	1051	929	733	488	312	4	4

# Long-Term Improvement in Treatment Targets (Group Median $\pm$ SE Data)

Treatment Targets	Baseline		60 Months	
	PCI +OMT	OMT	PCI +OMT	OMT
SBP	131 $\pm$ 0.77	130 $\pm$ 0.66	124 $\pm$ 0.81	122 $\pm$ 0.92
DBP	74 $\pm$ 0.33	74 $\pm$ 0.33	70 $\pm$ 0.81	70 $\pm$ 0.65
Total Cholesterol mg/dL	172 $\pm$ 1.37	177 $\pm$ 1.41	143 $\pm$ 1.74	140 $\pm$ 1.64
LDL mg/dL	100 $\pm$ 1.17	102 $\pm$ 1.22	71 $\pm$ 1.33	72 $\pm$ 1.21
HDL mg/dL	39 $\pm$ 0.39	39 $\pm$ 0.37	41 $\pm$ 0.67	41 $\pm$ 0.75
TG mg/dL	143 $\pm$ 2.96	149 $\pm$ 3.03	123 $\pm$ 4.13	131 $\pm$ 4.70
BMI Kg/M <sup>2</sup>	28.7 $\pm$ 0.18	28.9 $\pm$ 0.17	29.2 $\pm$ 0.34	29.5 $\pm$ 0.31
Moderate Activity (5x/week)	25%	25%	42%	36%

Annual cardiac mortality was  
less than 0.5%

# Current Concepts

- Coronary artery lesions are progressive and the fear is they may lead to myocardial infarction and death
- PCI and CABG alleviate coronary obstructions and prevent myocardial infarction and death

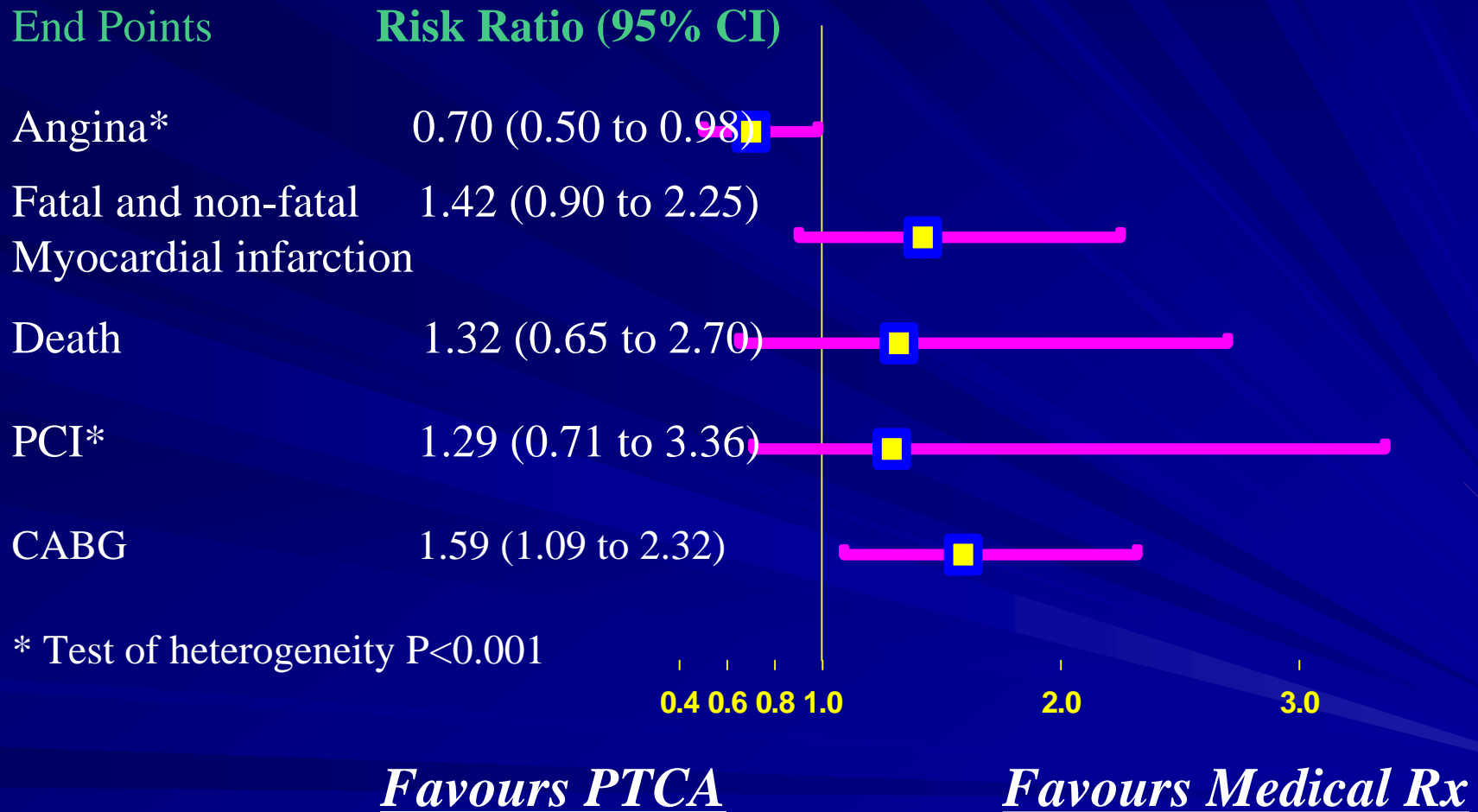
# What PCI has actually been documented to do as of 2008?

- Relieve angina
- In STEMI, to reduce mortality

# What does medical therapy do?

- Reduce angina
- Reduce myocardial infarction
- Prolong life

# PCI vs Medical Therapy in Stable CAD: Meta-Analysis

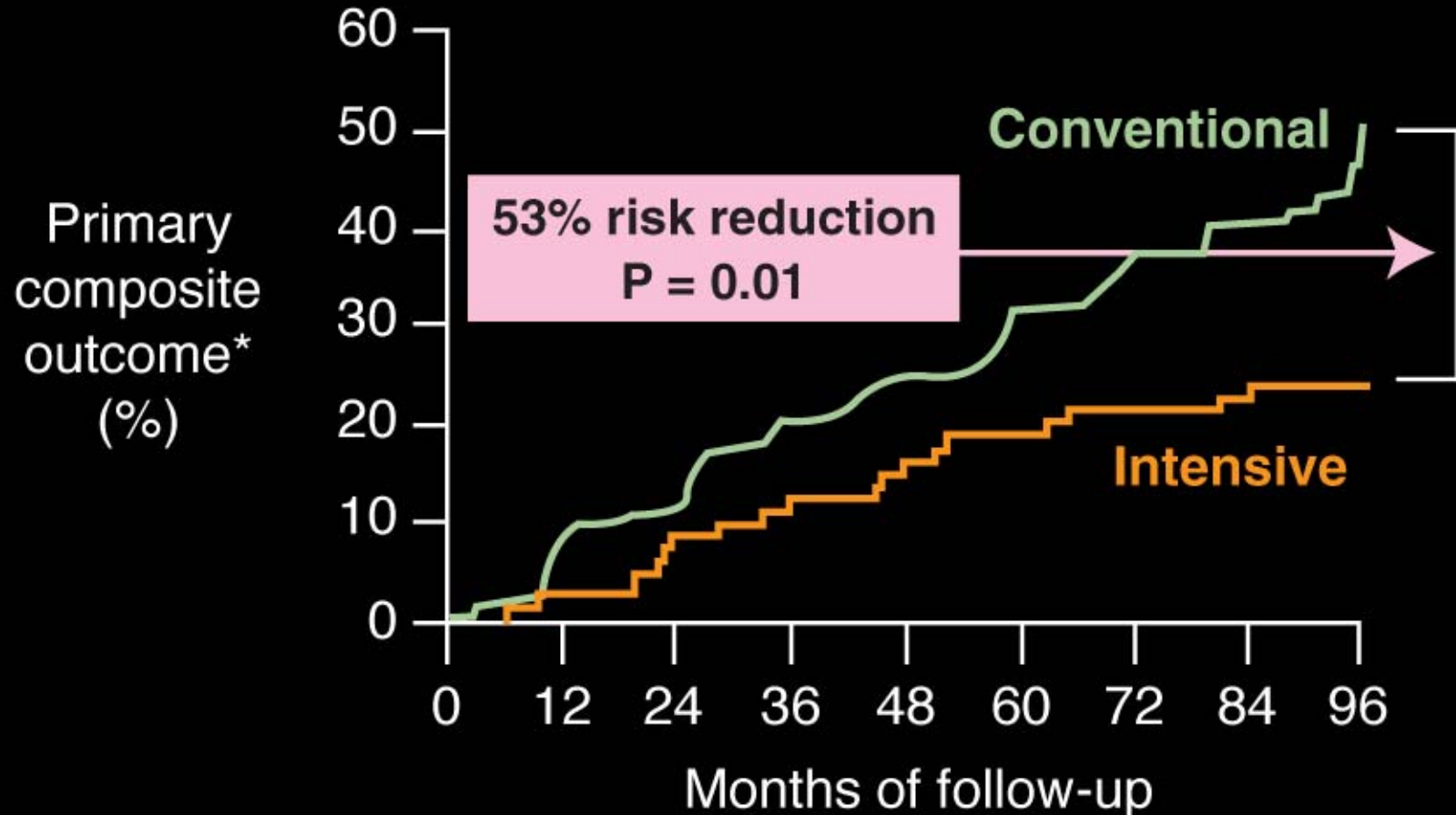


Pooled risk ratios for various end points from six randomized controlled trials comparing percutaneous transluminal coronary angioplasty (PTCA) with medical treatment in patients with non-acute coronary heart disease: (CABG: coronary artery bypass grafting; n=953 for PTCA and 951 for medical treatment)



# Steno-2: Effects of multifactorial intervention on CV outcomes

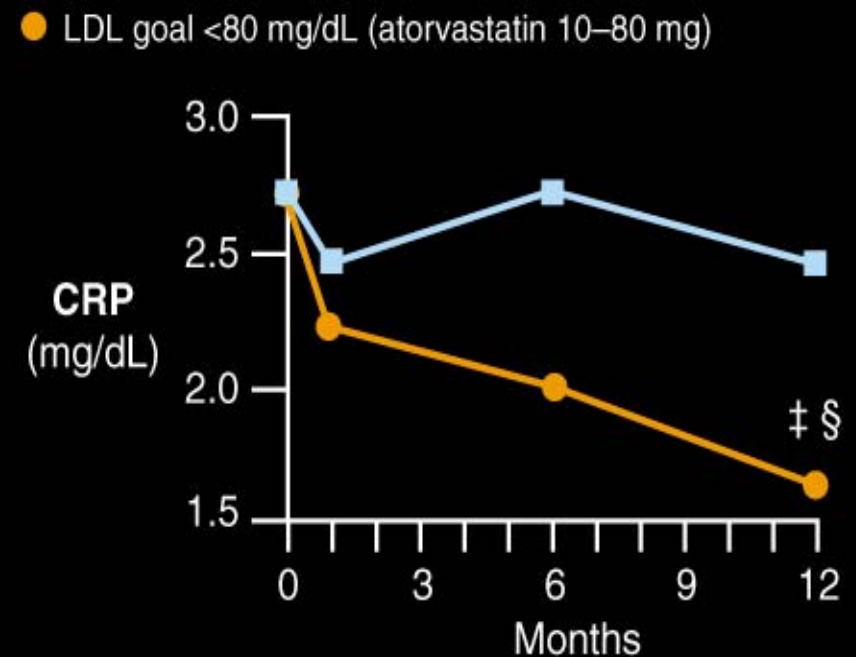
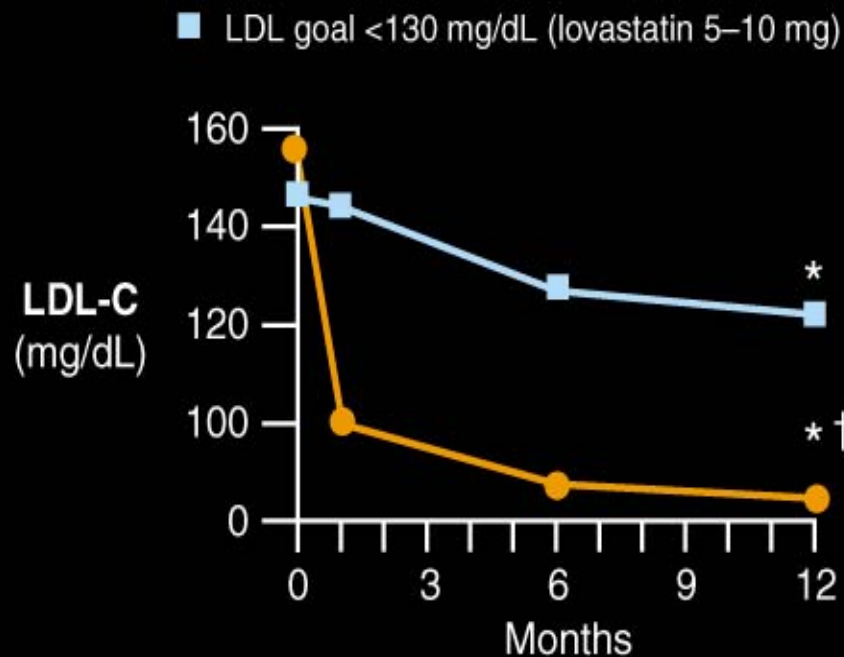
160 patients with type 2 diabetes and microalbuminuria



\*CV death, MI, stroke, revascularization, amputation

# LDL-lowering: Important anti-inflammatory mechanism of statins

110 patients with stable angina



\*P < 0.01 vs baseline

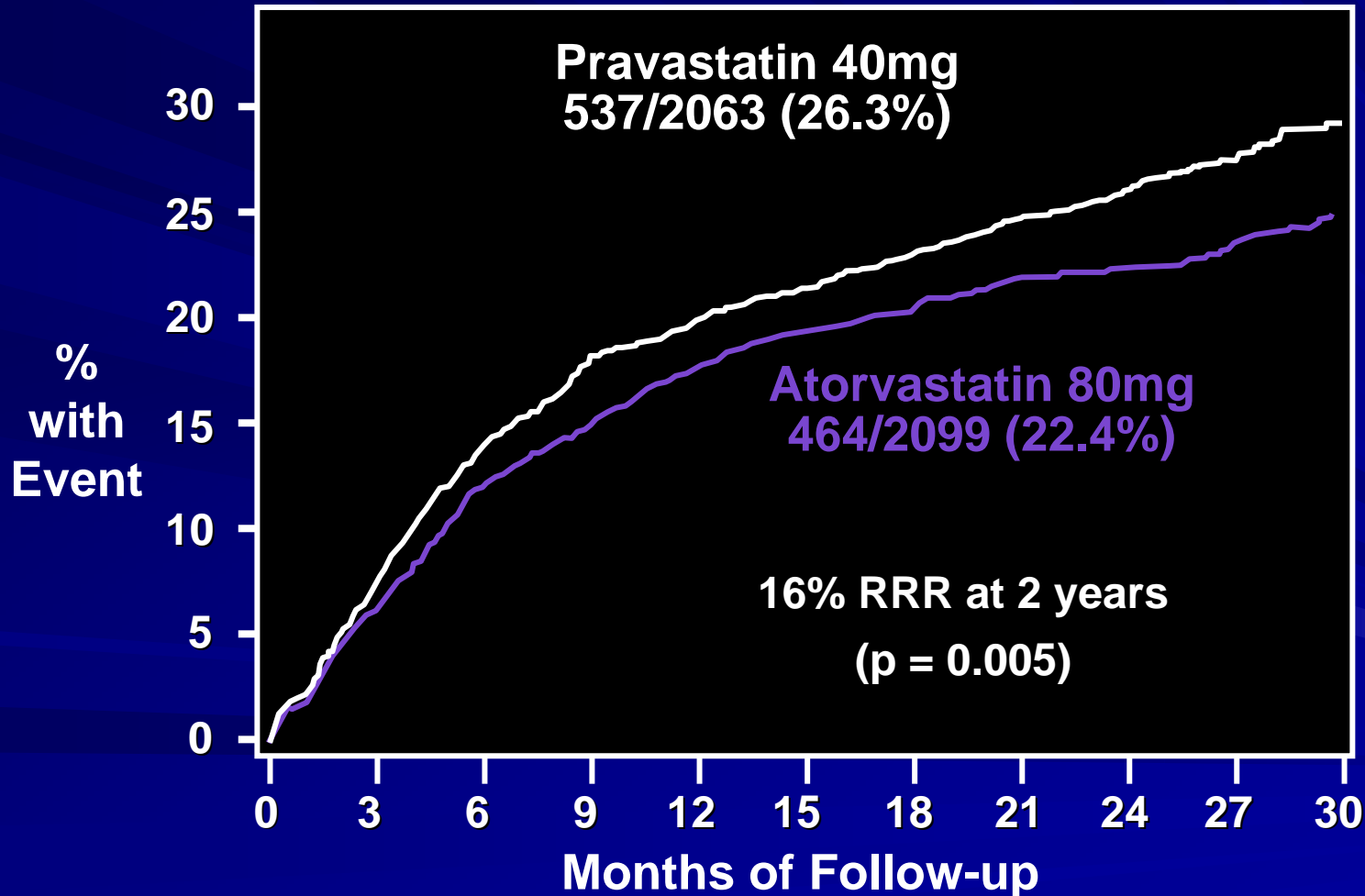
†P < 0.001 intensive vs less intensive LDL lowering

‡P = 0.002 vs baseline

§P = 0.09 intensive vs less intensive LDL lowering

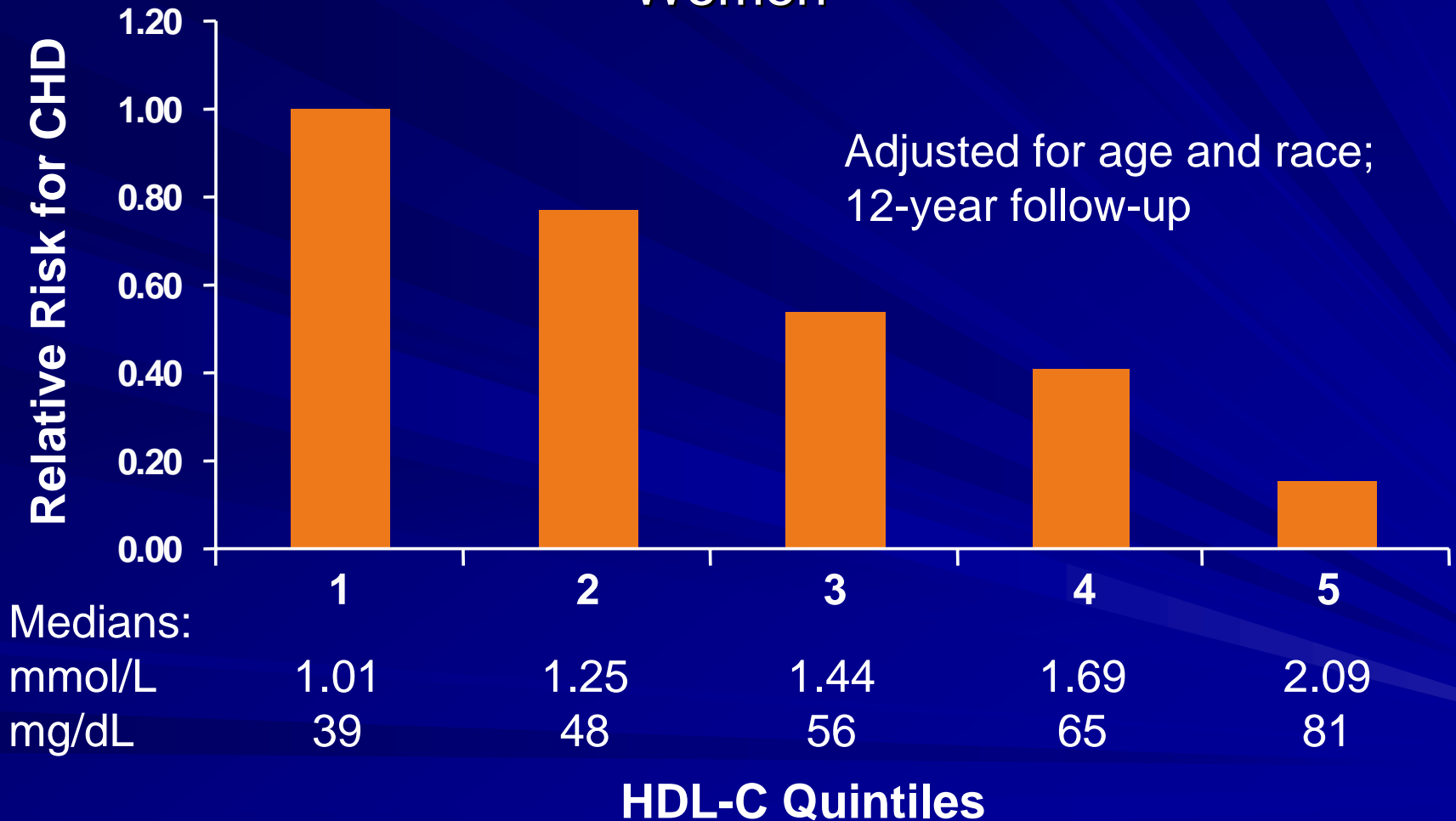
Kinlay S, et al. *Am J Cardiol.* 2002;89:1205-1207.

# PROVE IT RESULTS: All-Cause Death or Major CV Events in All Randomized Subjects



# What is the Optimal HDL-C?

## Atherosclerosis Risk in Communities (ARIC) Study Women

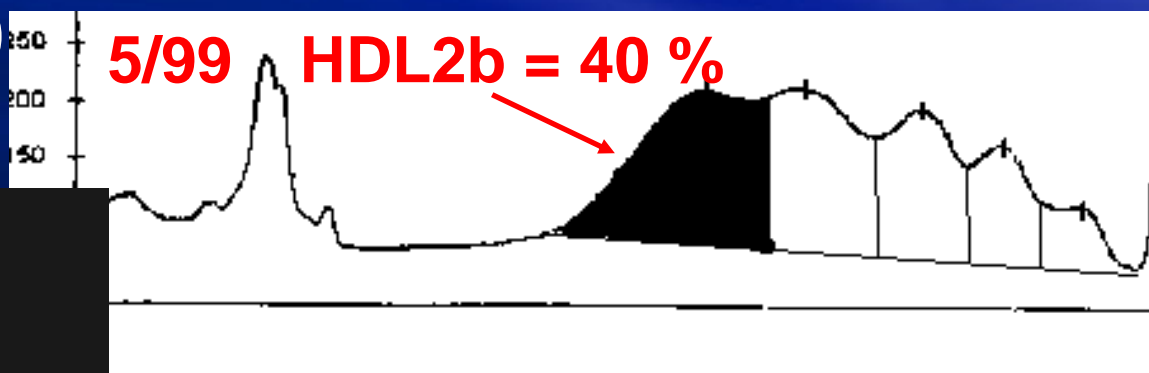
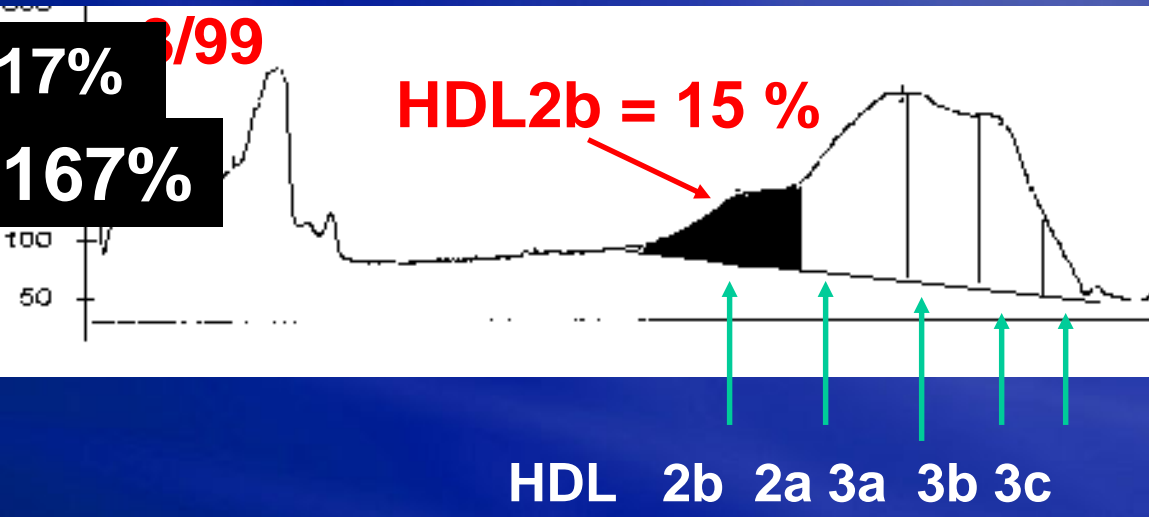


# HDL Subclass Change T14303

	3/99	5/99
HDLC	48	56
<b>HDL2b</b>	<b>15 %</b>	<b>40 %</b>
HDL2a	32 %	28 %
HDL3a	34 %	18 %
HDL3b	16 %	9 %
HDL3c	3 %	5 %
Niaspan	0	1,000

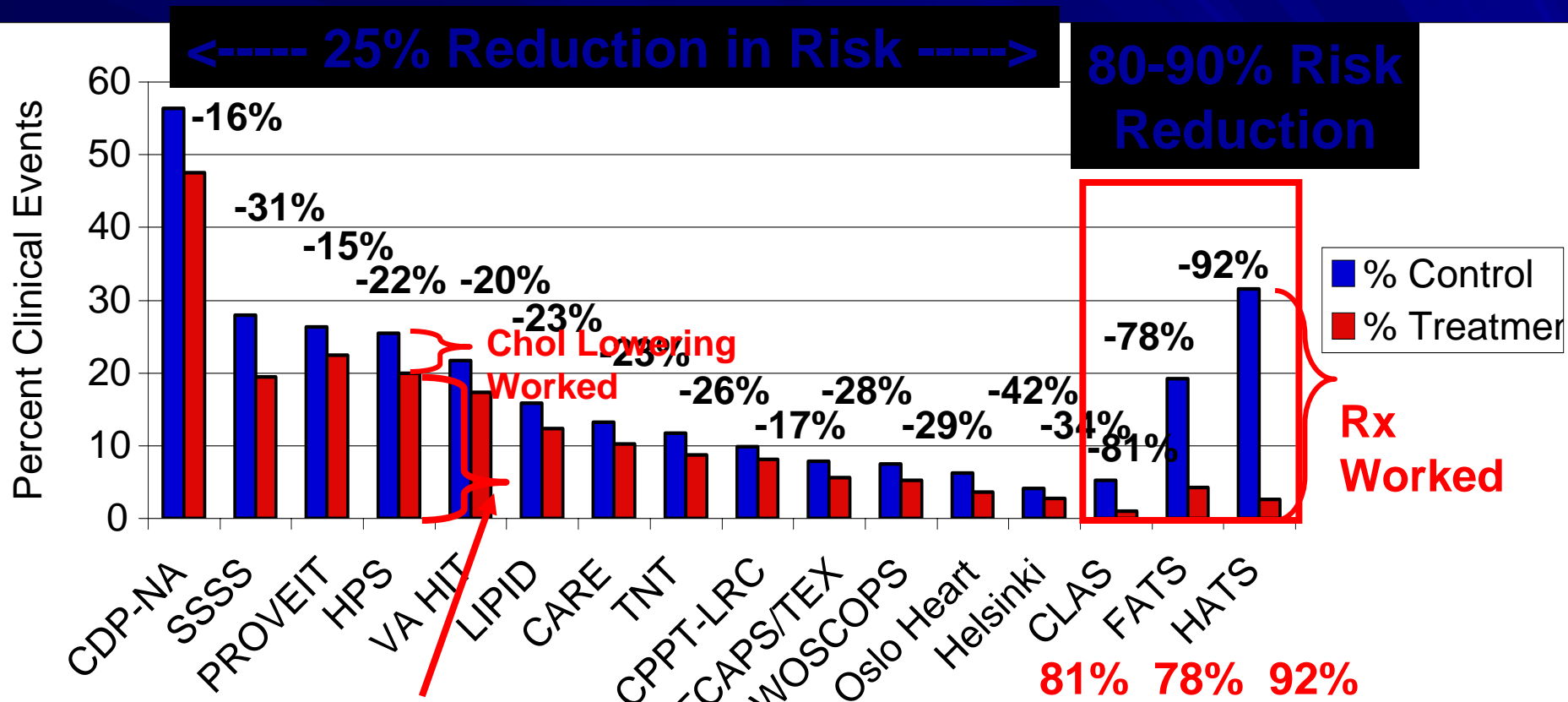
**+17%**  
3/99

**+167%**



**Statins do NOT do this.**

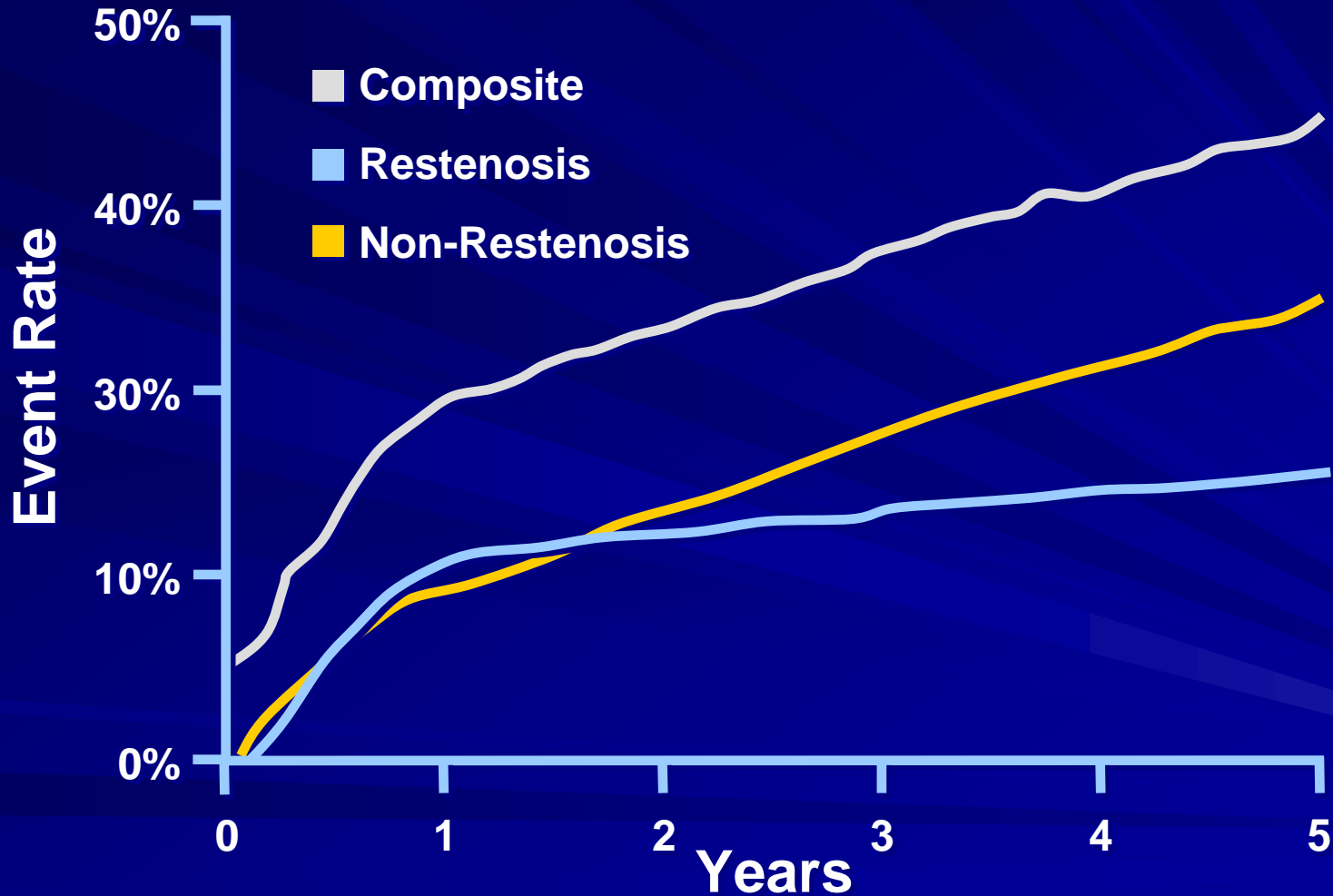
# CV Events & Clinical Trials 25% vs. 90% RR Reduction



Chol Lowering Did **NOT** Work

81% 78% 92%

# Second Generation Stent Trials



*Cutlip DE, Circulation, 2004*

# What is the Future of medical therapy?

## INDIVIDUALIZED THERAPY

Gene Chips

Reverse Cholesterol Transport

LCAT immunization

rHDL

AI Milano

Gene transfection

CETP

ABCA1

SRB1



# Future Concepts

- Atherosclerosis is stabilized
- Coronary events become rare
- MI and death from acute coronary occlusion no longer feared
  
- Therefore coronary PCI may be limited to STEMI and angina relief
- Interventional cardiologists should prepare for this possibility



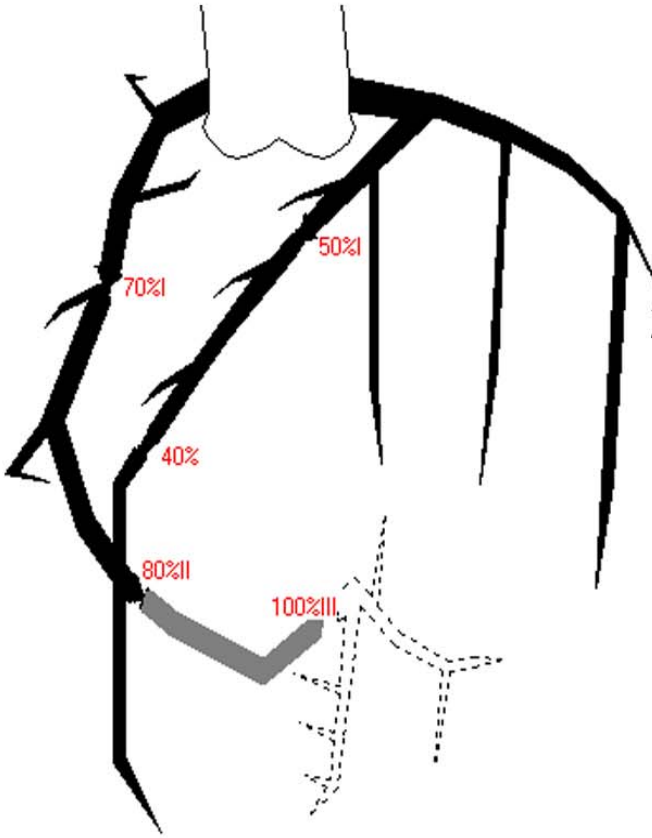
# **BARI 2D**

## **Current Status**

BARI 2D

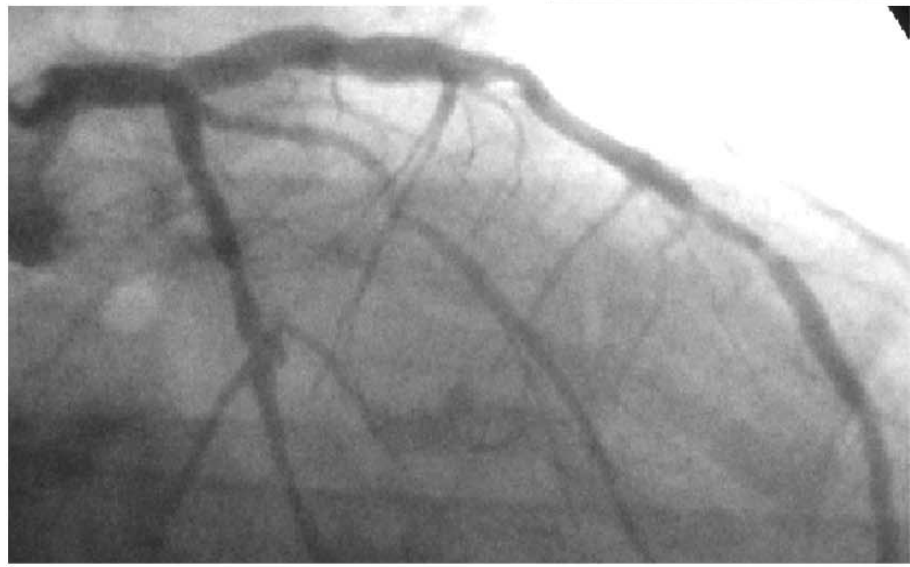
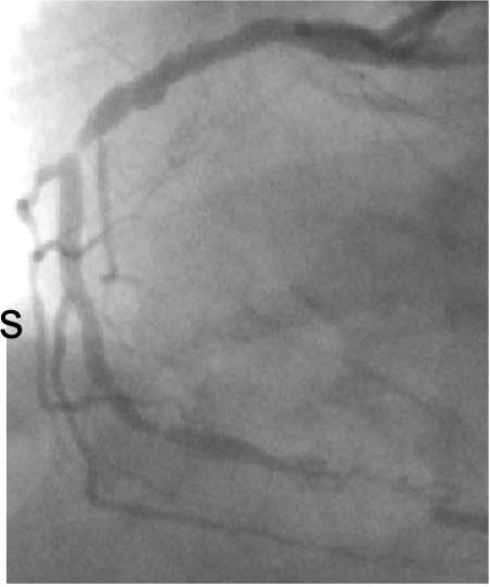


2 VD & infero-apical akinesis



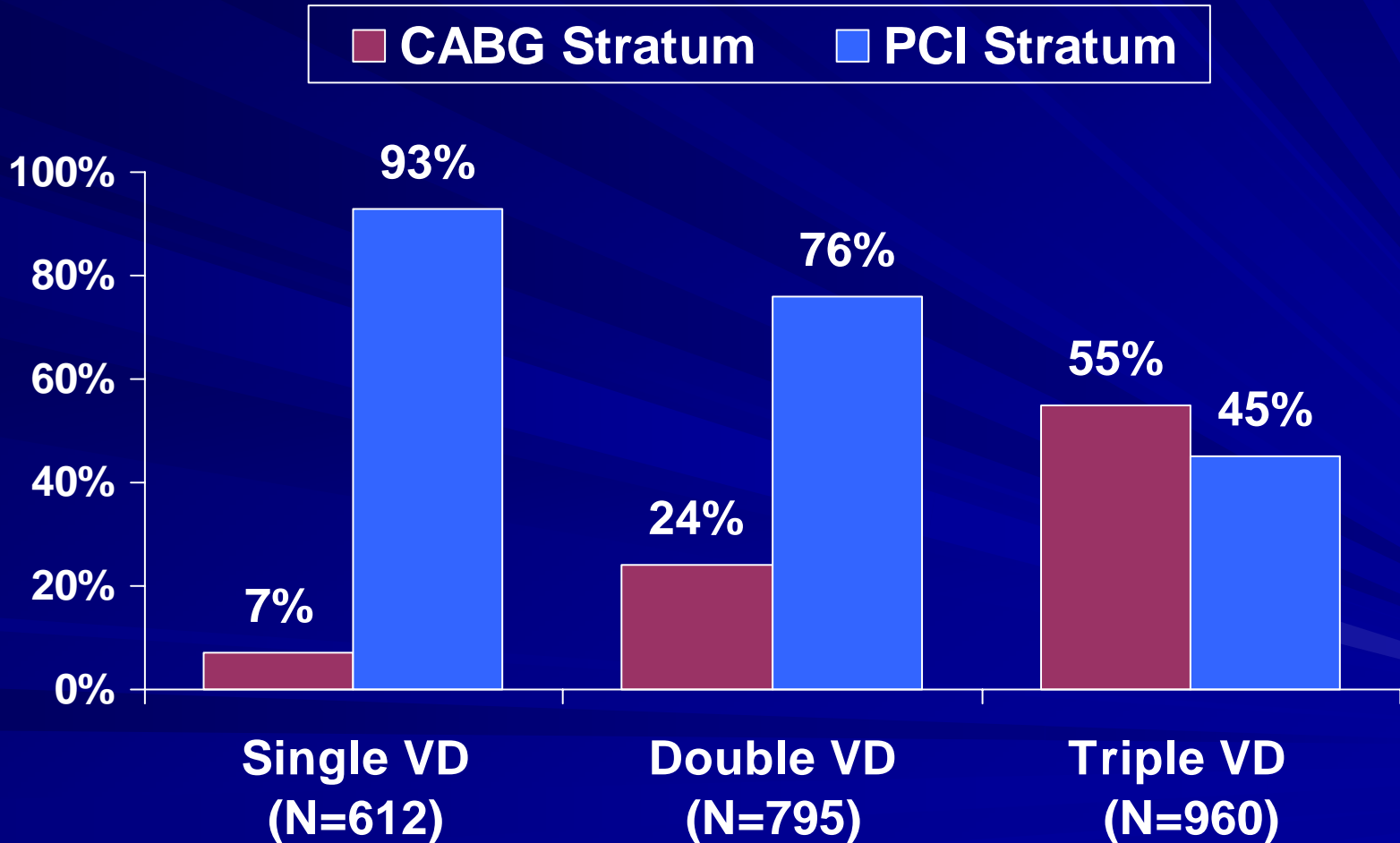
LV Wall Motion

Antero-basal	Antero-lateral	Apical	Diaphragmatic	Postero-basal
NI	Mod	Akinetic	NI	Akinetic



# Randomization Strata

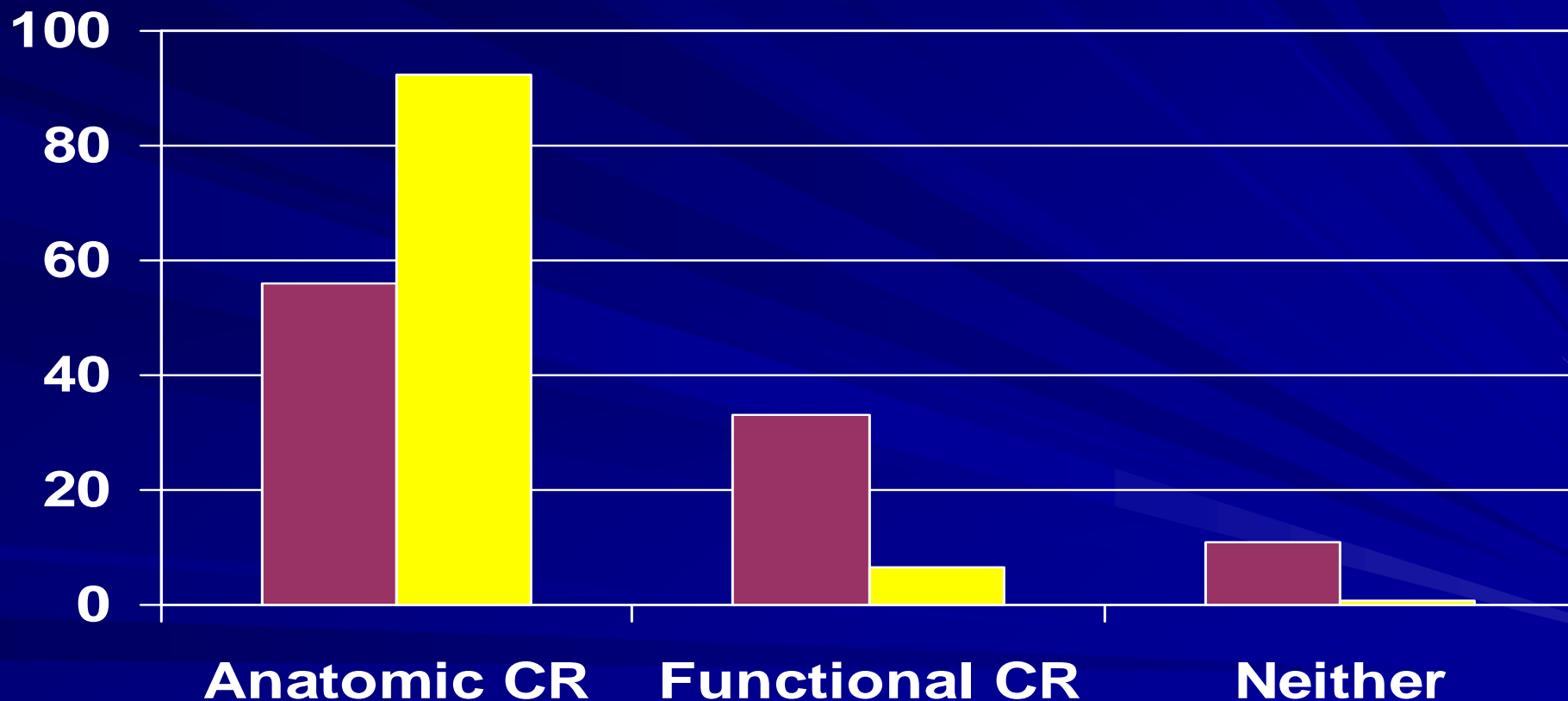
by Site Determined Number of Diseased Vessels



# Intended Completeness of Revascularization by Mode of Revascularization (if randomized to revascularization)

% of pts.

■ PCI Intended ■ CABG Intended



# Intervention vs. Medical Tx

- This is now the wrong question
- Medical therapy is now recognized as essential
- The new question is : Is revascularization in addition to medical therapy needed and in which patients?
- Are statins enough?

Interventional Cardiologists  
have a major opportunity  
and responsibility to provide  
or facilitate optimal care of  
patients they stent