PCI vs. CABG for Multi-Vessel CAD

Same or Different Findings From Registry to RCT

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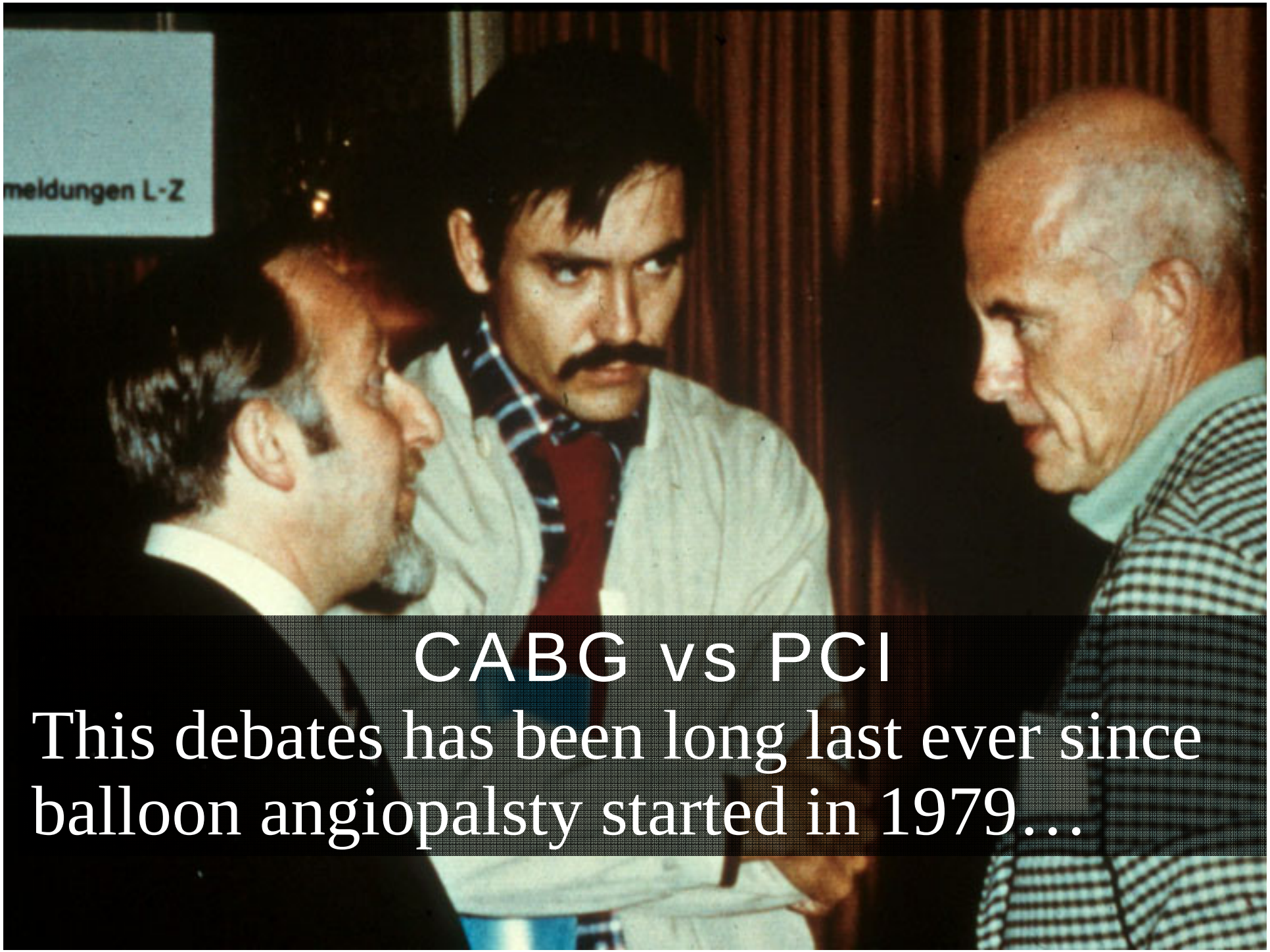


CABG vs PCI

This debates has been long last ever since balloon angiopalsty started in 1979…

Multi-vessel Disease PCI

-Where We Are-

Summary of

Old PCI (PTCA or BMS) vs. CABG

From RCT to Registry

PCI (PTCA or BMS) *vs* CABG in multi-vessel diseases

From Network Systemic Review Data

Annals of Internal Medicine | REVIEW

Systematic Review: The Comparative Effectiveness of Percutaneous Coronary Interventions and Coronary Artery Bypass Graft Surgery

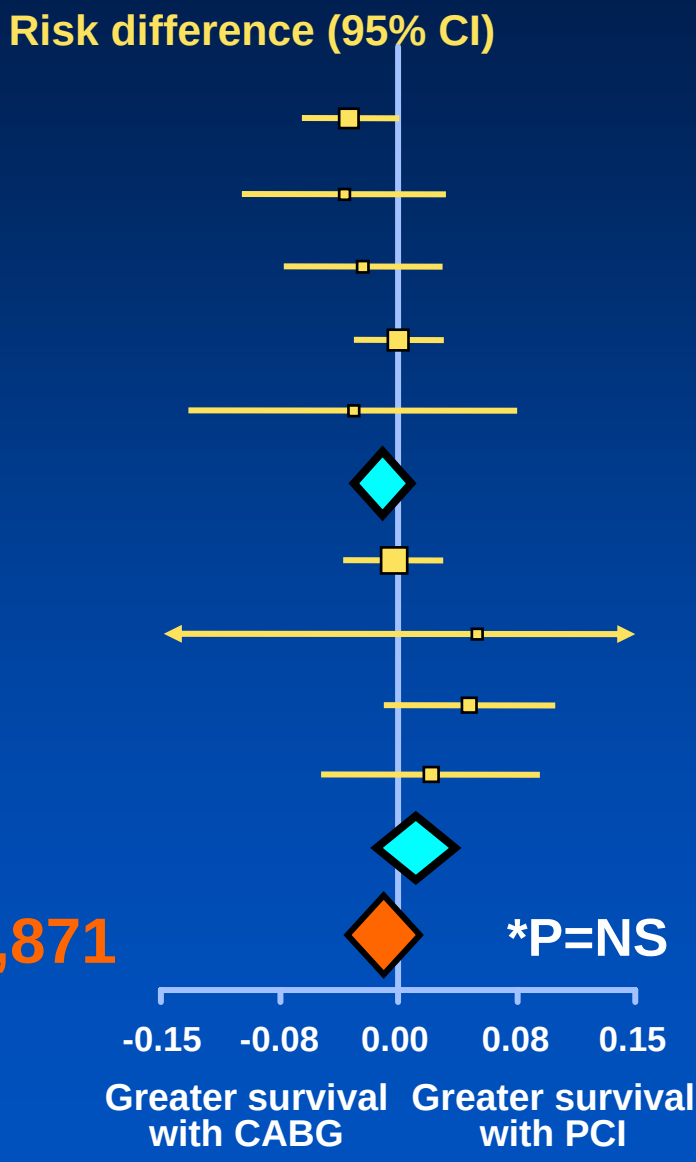
Dena M. Bravata, MD, MS; Allison L. Gienger, BA; Kathryn M. McDonald, MM; Vandana Sundaram, MPH; Marco V. Perez, MD; Robin Varghese, MD, MS; John R. Kapoor, MD, PhD; Reza Ardehali, MD, PhD; Douglas K. Owens, MD, MS; and Mark A. Hlatky, MD

- **23 randomized clinical trials**
- **5,019 patients assigned PCI with balloon or BMS in MVD**
- **4,944 patients assigned CABG in MVD**
- **Outcomes of interest**
  Death, MI, stroke, angina, additional revascularization

Bravata: Ann Intern Med 147:703, 2007

5-Year Survival PCI vs CABG

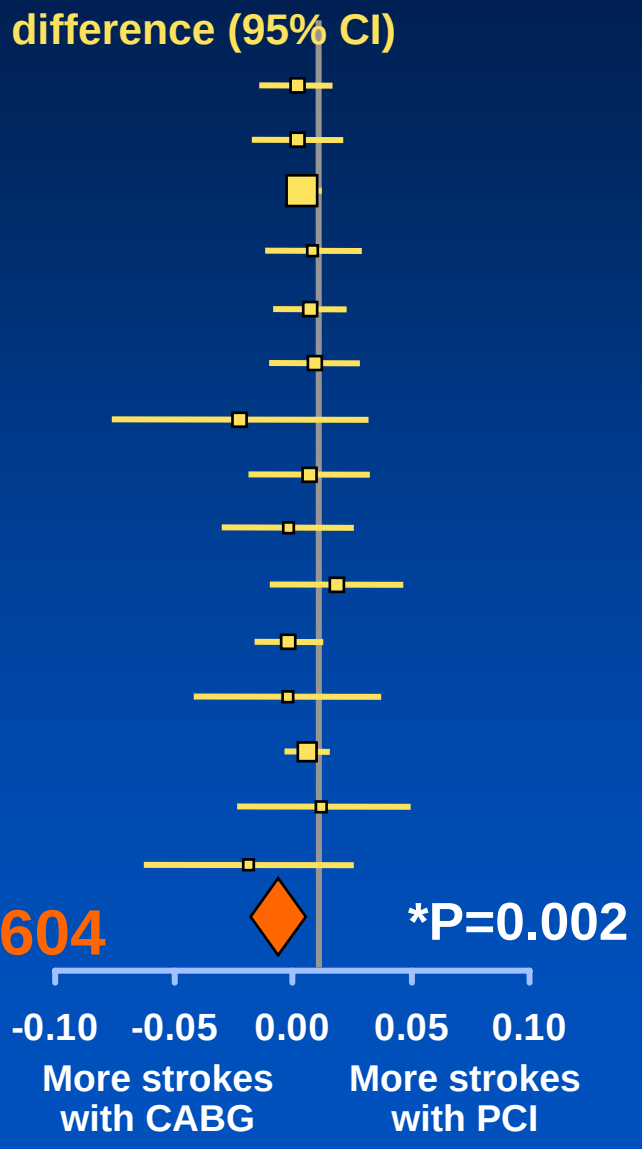
Study, year	Surviving patients/all patients PCI	CABG
BARI, 1996	790/915	816/914
EAST, 2000	153/174	161/177
GABI, 2005	164/177	157/165
RITA, 1998	483/510	474/501
French Monocentric Study, 199766/76		68/76
Balloon overall	1,656/1,852	1,676/1,833
ARTS, 2005	542/590	538/584
AWESOME, 2001	30/38	19/26
ERACI II, 2005	209/225	199/225
MASS II, 2006	177/205	171/203
BMS overall	958/1,058	927/1,038
MVD overall	**2,614/2,910**	**2,603/2,871**



Ann Int Med 147:708, 2007

Procedural Stroke Risk

Study, year	Surviving patients/all patients	
Procedural stroke	**PCI**	**CABG**
ARTS, 2001	590/600	592/605
AWESOME, 2001	220/222	229/232
BARI, 1996	913/915	907/914
EAST, 1994	197/198	191/194
ERACI II,2001	225/225	223/225
GABI, 1994	182/182	175/177
Drenth et al, 2002	50/51	51/51
Diegeler et al, 2002	110/110	109/110
MASS, 1995	72/72	70/70
MASS II, 2004	203/205	197/203
Octostent, 2003	138/138	142/142
Cisowski et al, 2002	50/50	50/50
RITA, 1992	509/510	496/501
Hong et al, 2005	119/119	69/70
SIMA, 2000	62/63	60/60
Overall	**3,640/3,660**	**3,561/3,604**



Ann Int Med 147:708, 2007

Multi-vessel Disease PCI
-Where We Are-

Summary of **Meta-Analysis of RCTs (PTCA/BMS vs CABG)**

Bravata: Ann Intern Med 147:703, 2007

- In 23 RCTs, over 10 years of follow-up :
  No statistical difference in cumulative survival rate between PCI and CABG. Survival did not differ even in patients with diabetes
- Angina relief greater after CABG than PCI
  Risk differences 5-8% at 1-5 yr (P<0.001)
- Procedural-related strokes are more common after CABG than after PCI (1.2% vs 0.6%) (P=0.002)
- Repeat revascularization are more common after PCI

PCI (PTCA or BMS) *vs* CABG in multi-vessel diseases

From Patients-Level Data

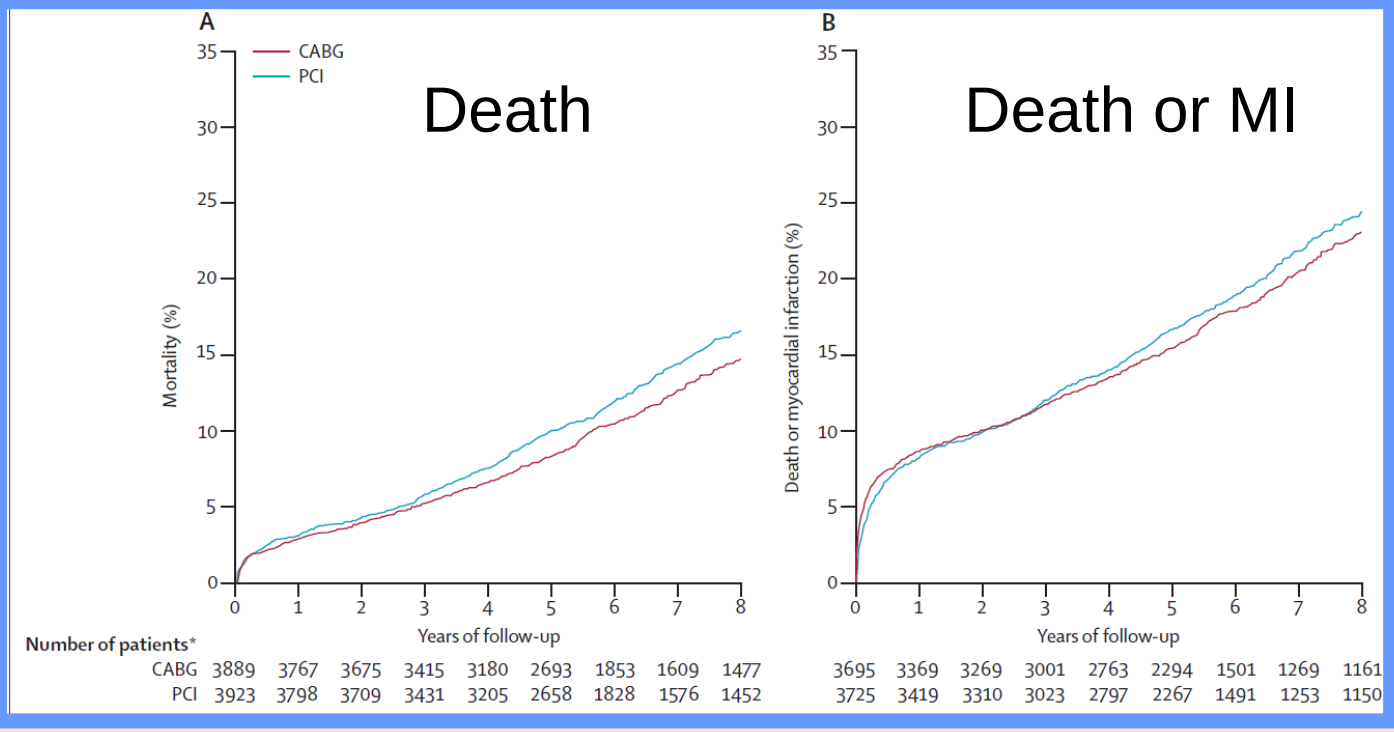
Coronary artery bypass surgery compared with percutaneous coronary interventions for multivessel disease: a collaborative analysis of individual patient data from ten randomised trials

Mark A Hlatky, Derek B Boothroyd, Dena M Bravata, Eric Boersma, Jean Booth, Maria M Brooks, Didier Carrié, Tim C Clayton, Nicolas Danchin, Marcus Flather, Christian W Hamm, Whady A Hueb, Jan Kähler, Sheryl F Kelsey, Spencer B King, Andrzej S Kosinski, Neuza Lopes, Kathryn M McDonald, Alfredo Rodriguez, Patrick Serruys, Ulrich Sigwart, Rodney H Stables, Douglas K Owens, Stuart J Pocock

Total 7812 patients (3889 CABG, 3923 PCI)
10 RCT (6 CABG vs. PTCA, 4 CABG vs. BMS)
Median Follow-Up of 5.9 Years

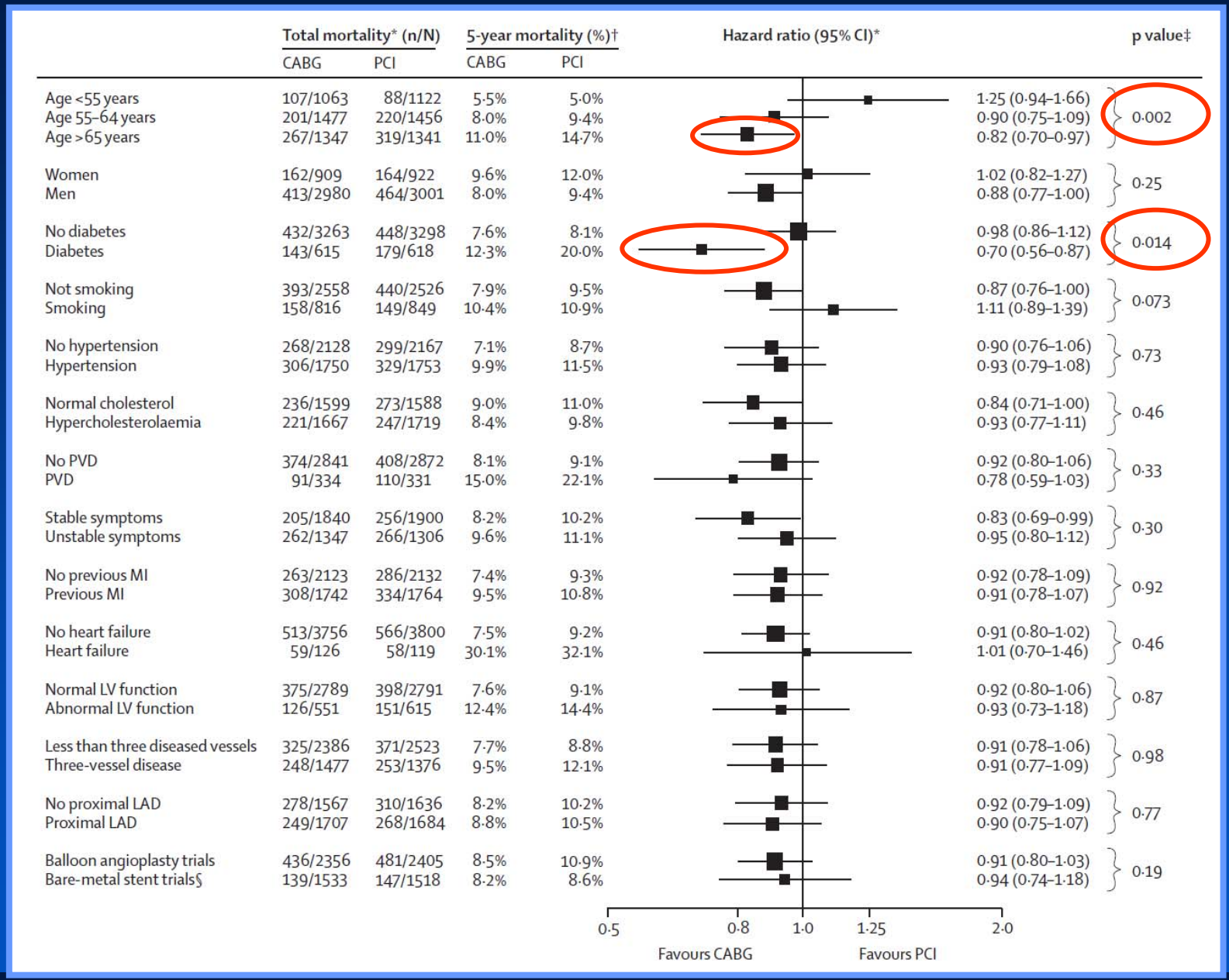
Hlatky MA et al. Lancet 2009;373:1190

Overall Treatment Effect



	5-year event rate (% [95% CI])		Hazard ratio (95% CI)*	p value
	CABG	PCI		
Death	8·4% (7·4–9·2)	10·0% (9·0–10·9)	0·91 (0·82–1·02)	0·12
Death or myocardial infarction†	15·4% (14·2–16·6)	16·7% (15·4–17·9)	0·97 (0·88–1·06)	0·47
Death or repeat revascularisation‡	9·9% (8·9–10·9)	24·5% (23·0–26·0)	0·41 (0·37–0·45)	<0·0001
Death, myocardial infarction, or repeat revascularisation§	20·1% (18·7–21·4)	36·4% (34·8–38·0)	0·52 (0·49–0·57)	<0·0001

Treatment Effect in Subgroups



Summary of Long-term (5YR) outcomes of 10 Patients-Level Data **Meta-Analysis of RCTs (PTCA/BMS vs CABG)**

Hlatky MA, et al. Lancet 2009;373:1190

- Long-term mortality was similar after CABG and PCI in overall patients and most patient subgroups with multivessel CAD.
- CABG might be a better option for patients with diabetes and patients aged 65 years or older because we found mortality to be lower in these subgroups.

BMS *vs* CABG
in multi-vessel diseases

Meta-Analysis of RCTs

Mercado, et al. J Thorac Cardiovasc Surg 2005;130:512-9

Daemen J, et al. Circulation 2008;118:1146-54

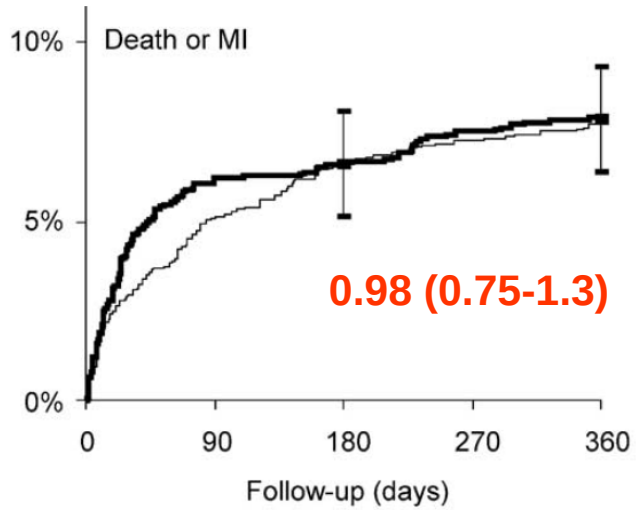
4 CABG vs. Stent Assisted PCI trials

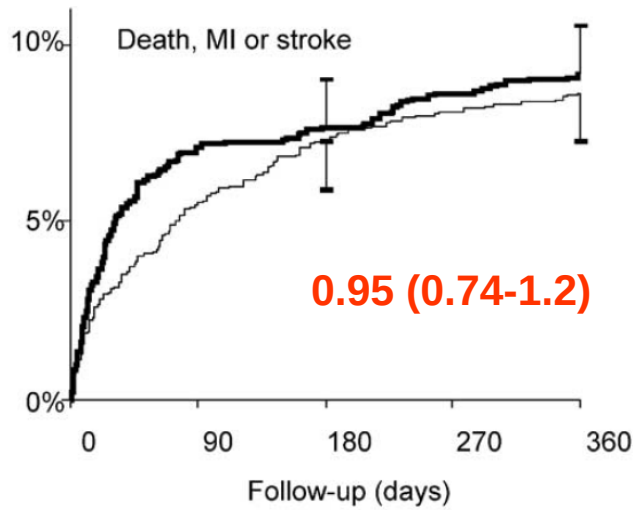
	ARTS	SoS	ERACI-II	MASS-II
Enrollment period	1997-1998	1996-1999	1996-1998	1995-2000
Number of screened pts	NA	NA	2,759	18,692
Number of eligible pts	NA	NA	1,076	2,076
Numb… r…				
I…				…Ischemia
Exclusion criteria	• LMCA stenosis • Transmural MI within previous week	• MI within 48 hours	• MI within 48 hours	• LMCA stenosis
Primary endpoint	• 12-month MACCE free survival	• Repeat revascularization	• MACE within 30 days and need for repeat revascularization at 30 days	• Composite of cardiac death, MI, and angina requiring revascularization

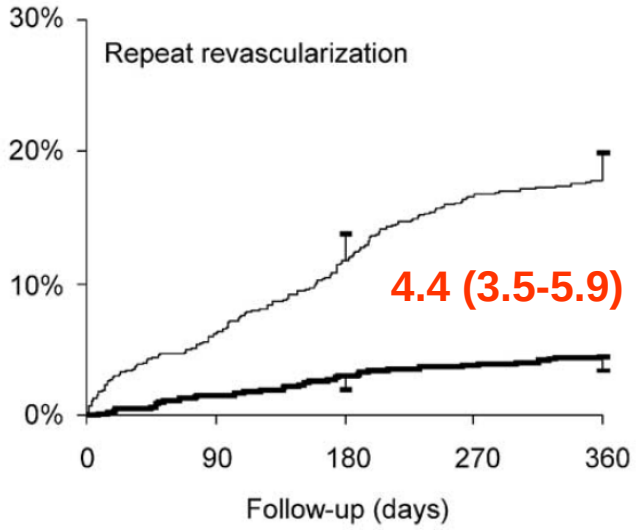
3,051 patients were randomized

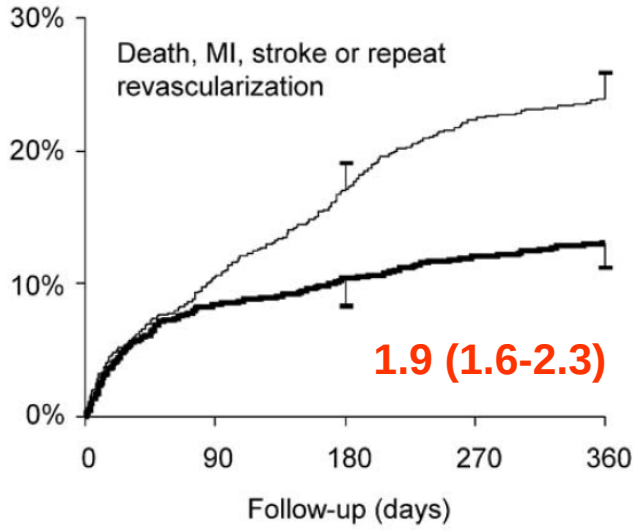
Mercado et al, J thoracic Cardiovasc Surg, 2005

1 Year Treatment Effect









BMS *vs* CABG in multi-vessel diseases **From Patients-Level Data**

What About Long-Term Outcomes?

Long-Term Safety and Efficacy of Percutaneous Coronary Intervention With Stenting and Coronary Artery Bypass Surgery for Multivessel Coronary Artery Disease

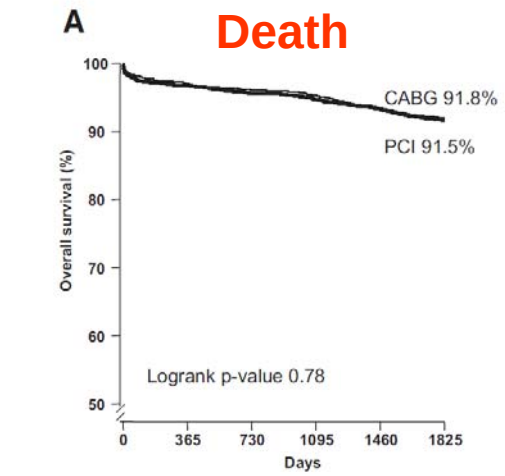
A Meta-Analysis With 5-Year Patient-Level Data From the ARTS, ERACI-II, MASS-II, and SoS Trials

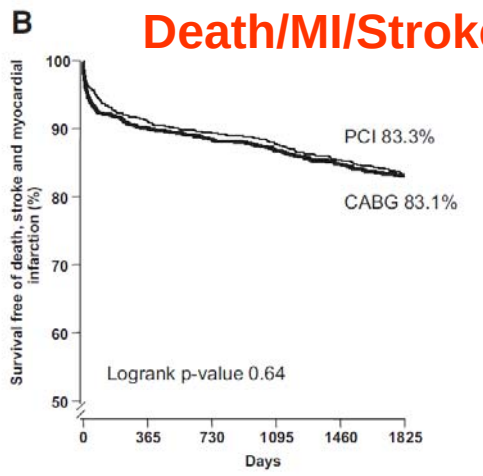
Joost Daemen, MD; Eric Boersma, PhD; Marcus Flather, MBBS; Jean Booth, MSc; Rod Stables, MA, DM, FRCP; Alfredo Rodriguez, MD; Gaston Rodriguez-Granillo, MD, PhD; Whady A. Hueb, MD; Pedro A. Lemos, MD, PhD; Patrick W. Serruys, MD, PhD

Total 3051 patients (1533 CABG, 1518 BMS)
4 RCT (ARTS, ERACI-II, MASS-II, SoS)
5 Years Outcomes

Daemen et al. Circulation 200;118:1146

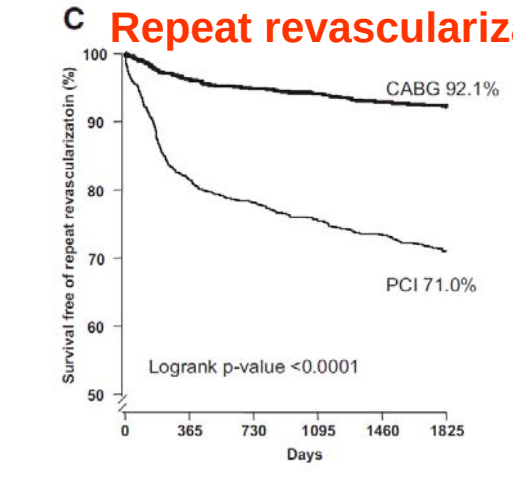
5 Year Treatment Effect

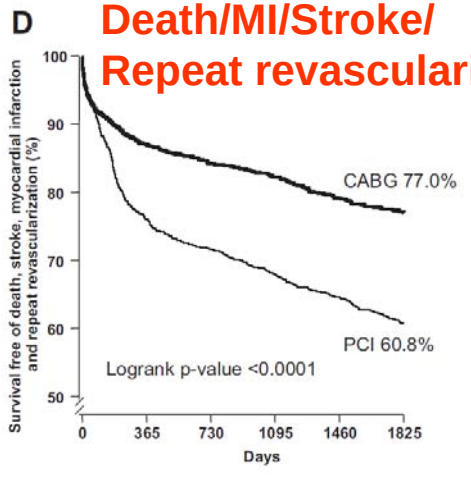




Group	0	365	730	1095	1460	1825
PCI	1518	1472	1456	1440	1406	1347
CABG	1533	1479	1457	1439	1412	1349

Group	0	365	730	1095	1460	1825
PCI	1518	1381	913	896	872	846
CABG	1533	1377	908	891	868	845





Group	0	365	730	1095	1460	1825
PCI	1518	1204	772	740	707	665
CABG	1533	1428	927	911	882	855

Group	0	365	730	1095	1460	1825
PCI	1518	1153	729	691	657	616
CABG	1533	1332	867	846	812	785

Multi-vessel Disease PCI
-Where We Are-

Summary of
Meta-Analysis of RCTs (BMS vs CABG)

Mercado, et al. J Thorac Cardiovasc Surg 2005;130:512-9
Daemen J, et al. Circulation 2008;118:1146-54

- At one and five years, there was no difference in mortality, MI, or stroke between the two groups.
- However, overall MACCE was higher in the stent group, driven by the increased need for repeat revascularization.
- Repeat revascularization was higher in diabetic patients randomized to the stent arm versus CABG compared with non-diabetic patients.

BMS *vs* CABG
in multi-vessel diseases

Registry Data

Brener, et al. Circulation 2004;109:2290-95
Hannan, et al. NEJM 2005; 352:2174-83
Bair et al. Circulation 2007;116:I-226
Kimura, et al. Circulation 2008;118:S119

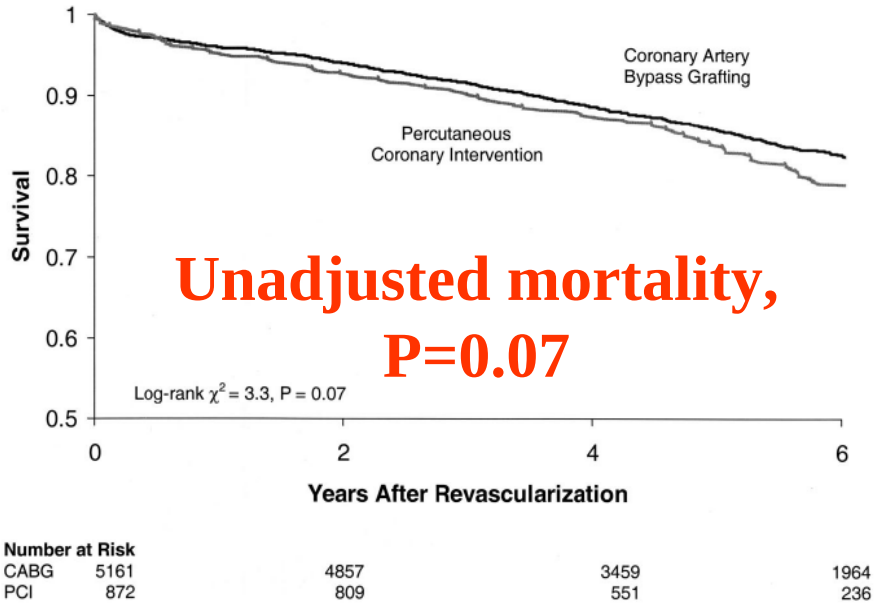
Propensity Analysis of Long-Term Survival After Surgical or Percutaneous Revascularization in Patients With Multivessel Coronary Artery Disease and High-Risk Features

Sorin J. Brener, MD; Bruce W. Lytle, MD; Ivan P. Casserly, MD; Jakob P. Schneider, RN; Eric J. Topol, MD; Michael S. Lauer, MD

Cleveland Clinic Registry Analysis of 5161 CABG and 872 PCI patients with multivessel disease from 1995 to 1999.

Death and subsequent revascularization within median 5.2 years

Circulation 2004;109:2290-95



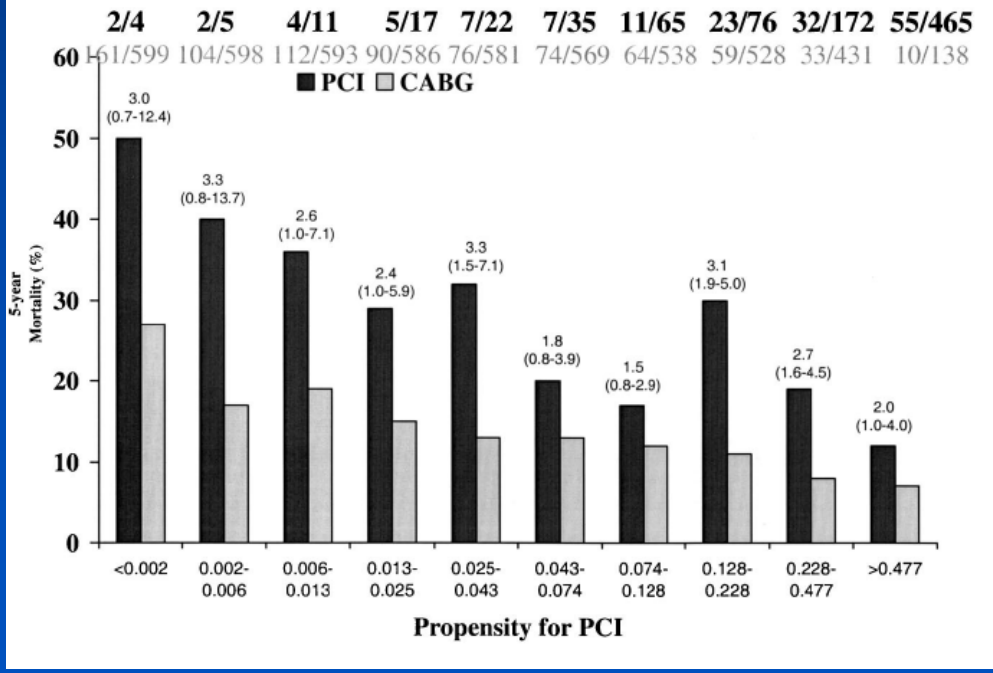
Unadjusted mortality, P=0.07

Mortality higher in PCI than CABG in each propensity-deciles

Hazard Ratios for Mortality (PCI to CABG)

Multivariable-adjusted : 2.12 (1.74-2.58), P<0.001

Propensity-adjusted : 2.30 (1.85-2.86), P<0.001



ORIGINAL ARTICLE

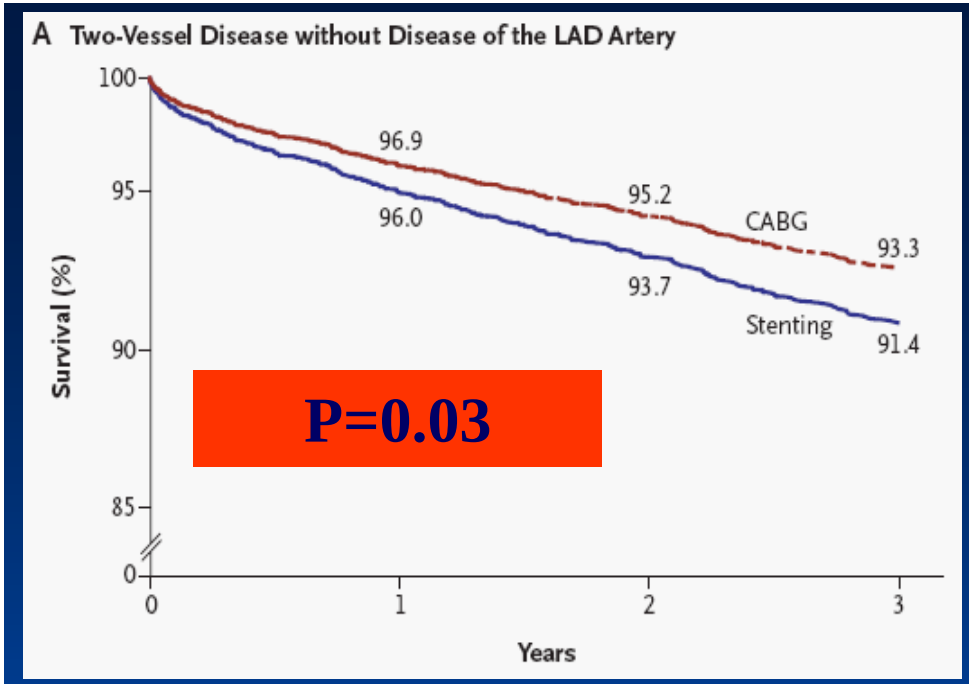
Long-Term Outcomes of Coronary-Artery Bypass Grafting versus Stent Implantation

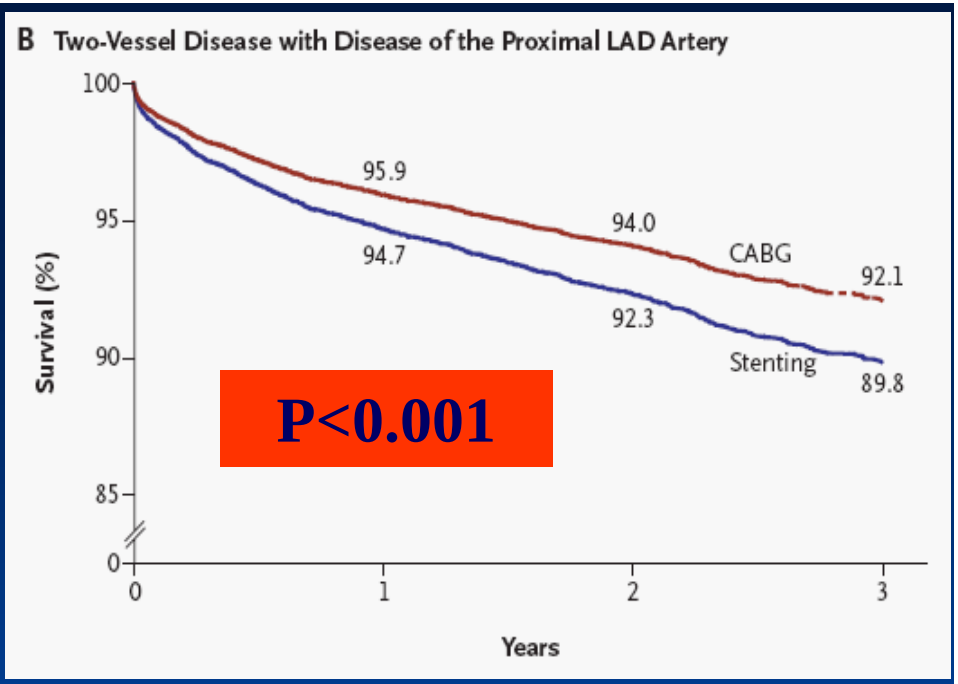
Edward L. Hannan, Ph.D., Michael J. Racz, Ph.D., Gary Walford, M.D., Robert H. Jones, M.D., Thomas J. Ryan, M.D., Edward Bennett, M.D., Alfred T. Culliford, M.D., O. Wayne Isom, M.D., Jeffrey P. Gold, M.D., and Eric A. Rose, M.D.

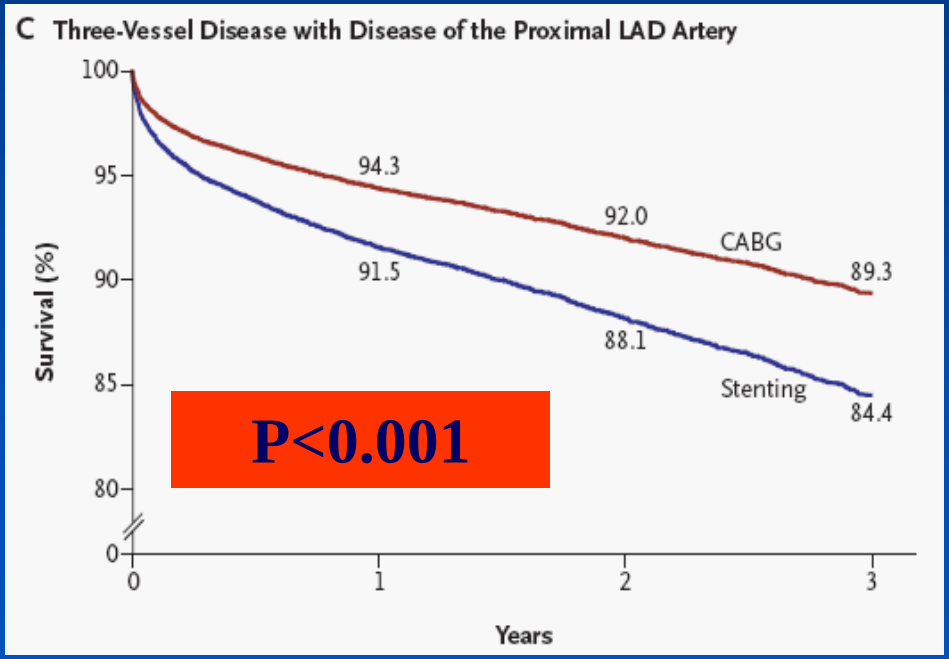
New York's Cardiac Registries Analysis of 37,212 CABG and 22,102 PCI patients with multivessel disease from 1997 to 2000.

Death and subsequent revascularization within three years according to the number of diseased vessels and the LAD involvement.

NEJM 2005;352:2174-83







CABG was consistently associated with higher adjusted rates of long-term survival than BMS stenting in patients with multivessel disease

Surgical Revascularization Is Associated With Improved Long-Term Outcomes Compared With Percutaneous Stenting in Most Subgroups of Patients With Multivessel Coronary Artery Disease

Results From the Intermountain Heart Registry

Tami L. Bair, BS; Joseph B. Muhlestein, MD; Heidi T. May, MSPH; Kent G. Meredith, MD; Benjamin D. Horne, PhD, MPH; Robert R. Pearson, PharmD; Qunyu Li, MD; Kurt R. Jensen, MS; Jeffrey L. Anderson, MD; Donald L. Lappé, MD

Intermountain Heart Registry Analysis of 6369 patients (4581 CABG and 1788 PCI patients with BMS) with multivessel disease from 1992 to 2000.

Death/MI/revascularization for an average of 7.0 years

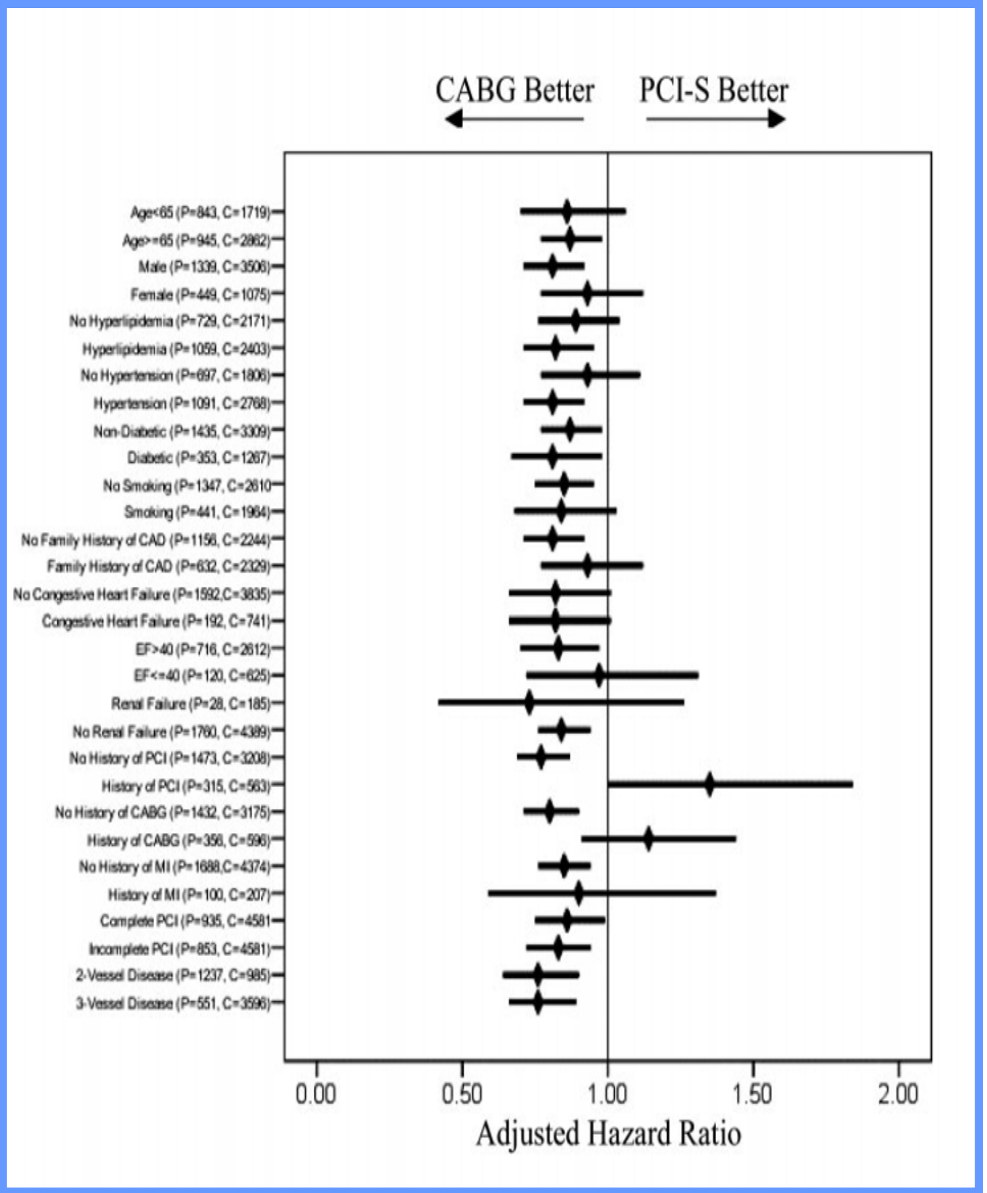
Circulation 2007;116:I-226-231

Adjusted HR for events

Outcome (outcome frequency)	Univariable (HR; 95% CI; *P* Value)	Multivariable (HR; 95% CI; *P* Value)
Death (n=2118)	1.09; 0.99–1.21; 0.08	0.85; 0.76–0.94; 0.001
MI (n=940)	0.52; 0.45–0.59; <0.0001	0.46; 0.40–0.53; <0.0001
Revascularization (n=1056)	0.26; 0.23–0.30; <0.0001	0.25; 0.22–0.29; <0.0001
MACE (n=3278)*	0.59; 0.55–0.64; <0.0001	0.51; 0.47–0.55; <0.0001

*MACE is the composite point of death, MI, and repeat revascularization.

CABG is associated with higher adjusted rates of long-term survival in overall and most subgroup patients.



Long-Term Outcomes of Coronary-Artery Bypass Graft Surgery Versus Percutaneous Coronary Intervention for Multivessel Coronary Artery Disease in the Bare-Metal Stent Era

Takeshi Kimura, MD; Takeshi Morimoto, MD; Yutaka Furukawa, MD; Yoshihisa Nakagawa, MD; Satoshi Shizuta, MD; Natsuhiko Ehara, MD; Ryoji Taniguchi, MD; Takahiro Doi, MD; Kei Nishiyama, MD; Neiko Ozasa, MD; Naritatsu Saito, MD; Kozo Hoshino, MD; Hirokazu Mitsuoka, MD; Mitsuru Abe, MD; Masanao Toma, MD; Toshihiro Tamura, MD; Yoshisumi Haruna, MD; Yukiko Imai, MpH; Satoshi Teramukai, PhD; Masanori Fukushima, MD; Toru Kita, MD

CREDO-Kyoto Registry Analysis of 5420 patients (3712 CABG and 1708 PCI patients with BMS) with multivessel disease from 2000 to 2002.

Death/MI/Stroke/revascularization at 3 years

Circulation 2008;118:S119-209

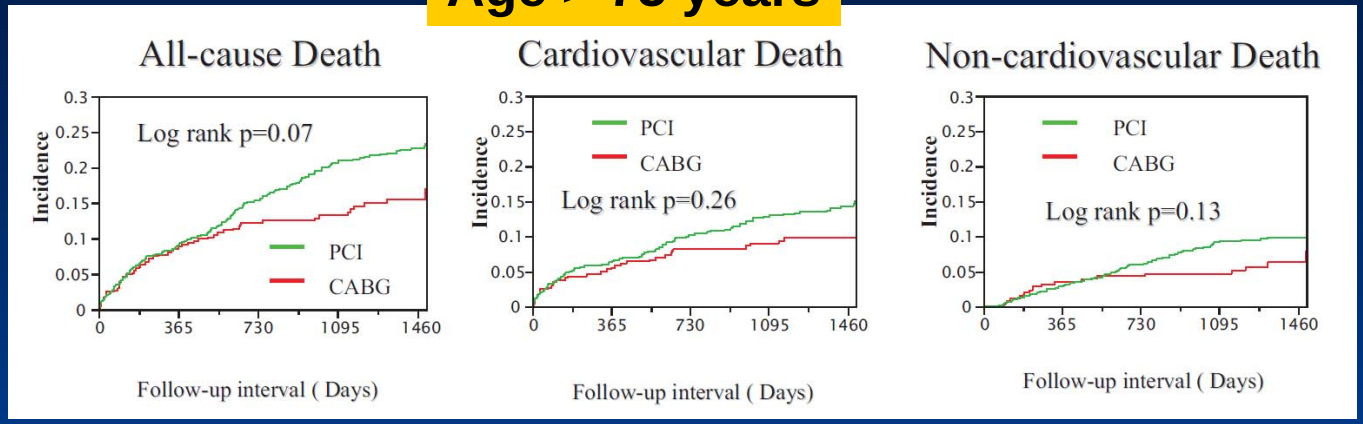
Overall Mortality

Table 3. Hazard Ratios for Death After PCI as Compared With That After CABG in Prespecified Subgroups

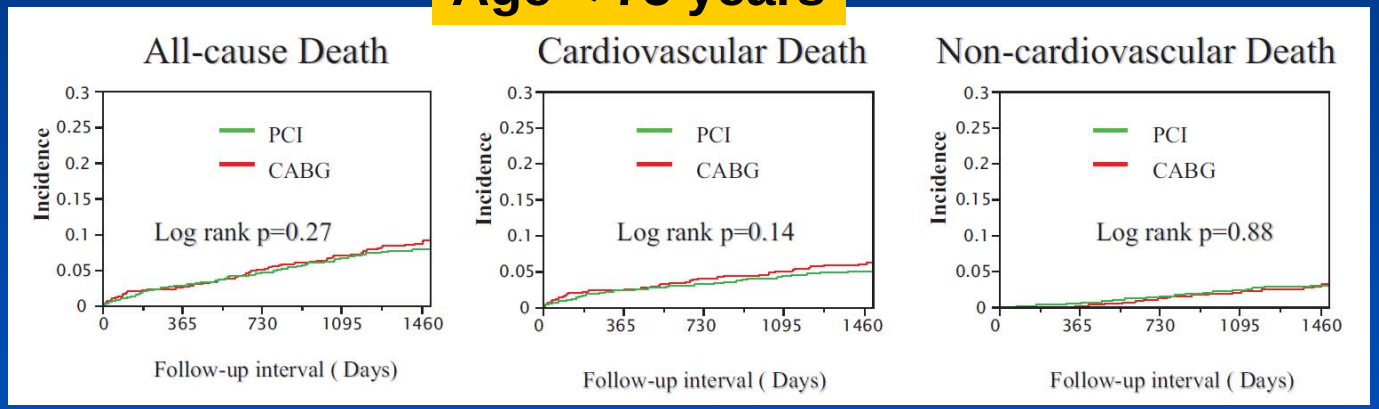
	No. of Patients (Event/Total)		Hazard Ratio (95% CI)		Interaction
	CABG	PCI	Unadjusted *P*	Adjusted *P*	*P* Value
All patients	181/1708	423/3712	1.11 (0.93–1.32) 0.26	1.23 (0.99–1.53) 0.06	
Triple vessel disease	153/1366	195/1412	1.29 (1.04–1.59) 0.02	1.09 (0.85–1.41) 0.5	0.7
Double vessels disease	28/342	228/2300	1.23 (0.83–1.83) 0.29	1.37 (0.89–2.12) 0.15	
Diabetes	95/824	227/1592	1.3 (1.02–1.65) 0.03	1.38 (1.02–1.86) 0.04	0.003
Nondiabetes	86/883	196/2117	0.96 (0.75–1.24) 0.77	1.09 (0.8–1.49) 0.6	
Diabetes/Insulin	36/243	61/338	1.28 (0.85–1.94) 0.24	1.18 (0.7–2.0) 0.53	0.57
Diabetes/Noninsulin	59/581	166/1254	1.37 (1.01–1.85) 0.04	1.46 (1.0–2.14) 0.05	
Diabetes/Triple vessel disease	83/693	108/667	1.44 (1.08–1.92) 0.01	1.14 (0.8–1.63) 0.46	0.41
Diabetes/Double vessel disease	12/131	119/925	1.45 (0.8–2.62) 0.22	1.88 (0.95–3.74) 0.07	
LVEF ≤40%	31/195	60/273	1.56 (1.01–2.41) 0.046	1.94 (1.12–3.34) 0.02	0.054
LVEF >40%	140/1430	286/3050	0.97 (0.8–1.19) 0.8	1.16 (0.91–1.47) 0.24	
Proximal LAD	173/1608	324//2729	1.14 (0.95–1.37) 0.17	1.21 (0.96–1.52) 0.11	0.8
No proximal LAD	8/100	99/983	1.3 (0.63–2.67) 0.48	1.31 (0.58–2.95) 0.51	
Age ≥75	65/367	222/1003	1.29 (0.98–1.7) 0.07	1.37 (0.98–1.92) 0.07	0.61
Age <75	116/1341	201/2709	0.88 (0.7–1.1) 0.27	1.09 (0.82–1.46) 0.55	

Mortality according to Age group

Age > 75 years



Age < 75 years



(1) Age > 75 years with significant comorbidities tend to received less invasive PCI ➔ Serious patients selection bias.

(2) In the CREDO-Kyoto registry, survival outcomes among patients < 75 years of age were similar after PCI and CABG.

Multi-vessel Disease PCI
-Where We Are-

Summary of
Registry data (BMS vs CABG)

Brener, et al. Circulation 2004;109:2290-95
Hannan, et al. NEJM 2005; 352:2174-83
Bair et al. Circulation 2007;116:I-226
Kimura, et al. Circulation 2008;118:S119

- CABG is consistently associated with higher adjusted rates of long-term survival than stenting in patients with multivessel disease

CABG vs PCI (PTCA + BMS) Trials

	Trial	Clinical Parameters: Mortality & MI	Clinical Parameters: Angina Relief	Clinical Parameters: Repeat Revascularization
PTCA	GABI	PCI	PCI	Significant decrease of revascularization expected with DES
PTCA	EAST	No difference	CABG	
PTCA	RITA	No difference	CABG	
PTCA	ERACI	No difference	CABG	
PTCA	CABRI	No difference	CABG	
PTCA	BARI	No difference	n/a	
BMS	MASS-2	CABG (MI)	n/a	
BMS	AWESOME	No difference	No difference	
BMS	ERACI-2	PCI	CABG	
BMS	SoS	CABG (Mortality)	CABG	
BMS	ARTS	No difference	CABG	

PCI *CABG better* **CABG** *PCI better* **n/a** *: not available*

Multi-vessel Disease PCI

-Where We Are-

DES *vs.* CABG

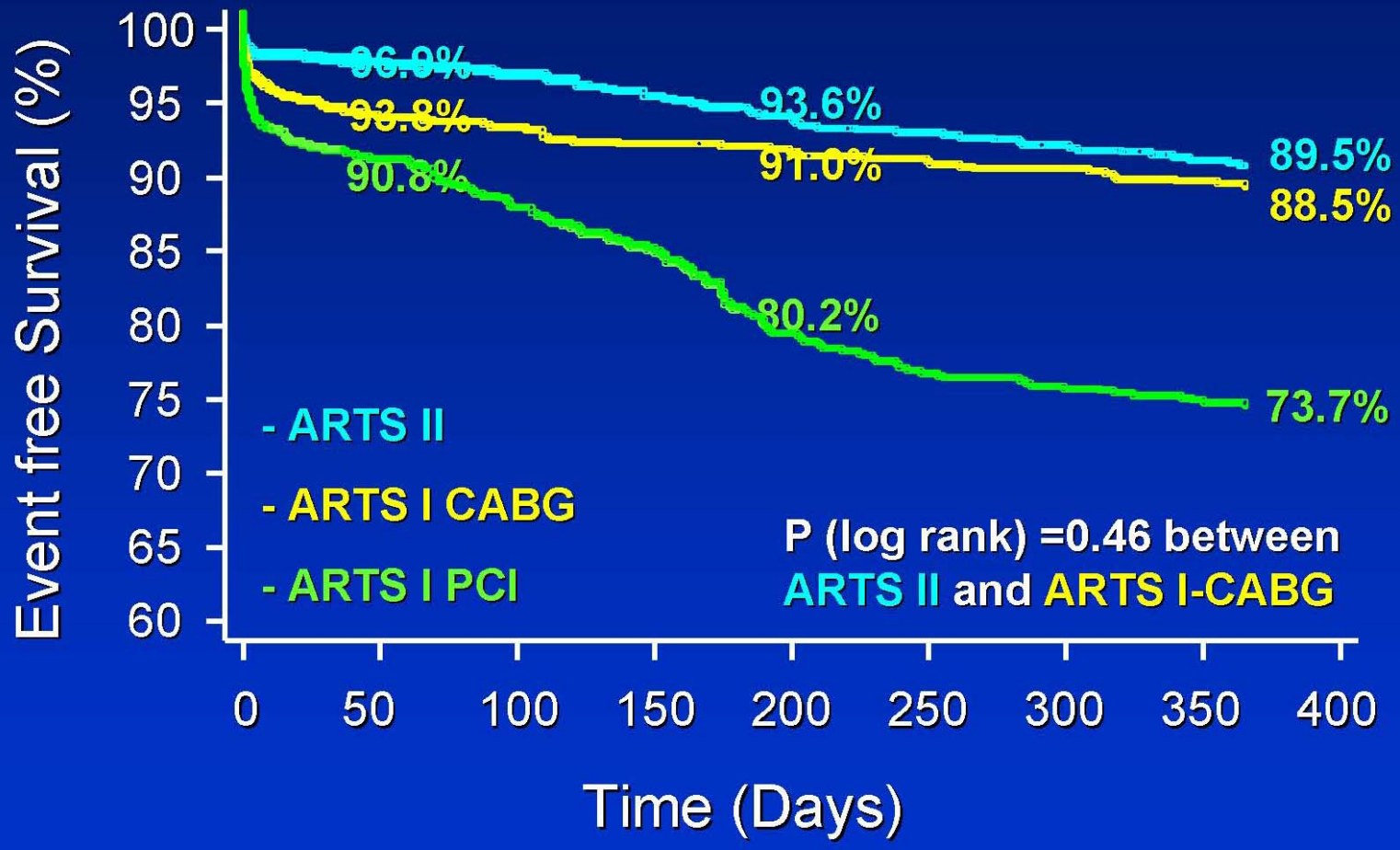
From RCT to Registry

PCI (DES) *vs* CABG
in multi-vessel diseases

RCTs

ART II
ERACI II, III
SYNTAX

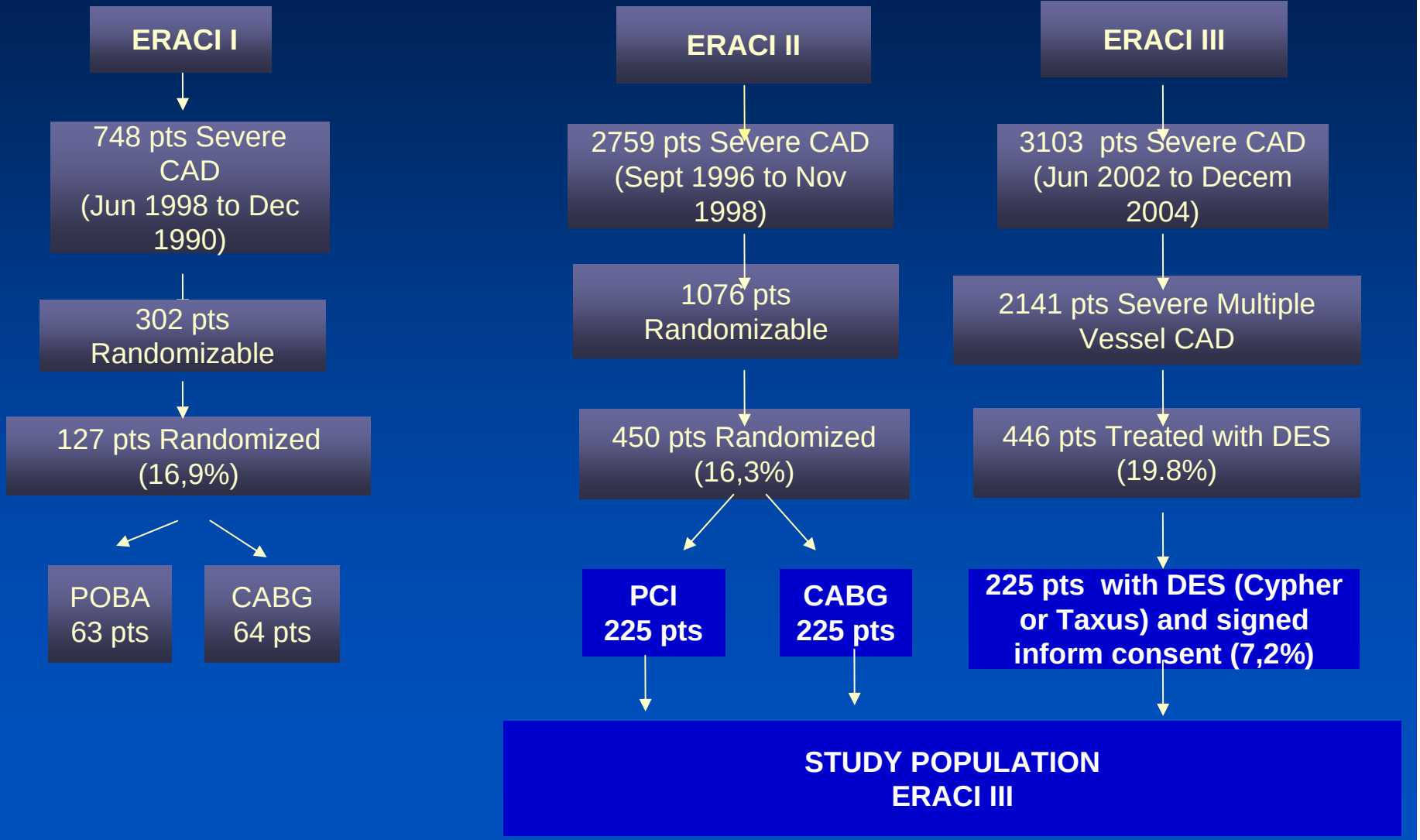
ARTS II; MACCE free Survival up to 1 year



Serruys PW et al. Eurointervention 2005;1:147

ERACI II and ERACI III

Study Population of ERACI Trials: 1988-2004



Rodriguez et al, EuroInterv 2006

ERACI II and ERACI III

Results at 3-year

	CABG (n=225)	BMS (n=225)	DES (n=225)	*p value*
DEATH	9.8% (22)	4.8% (11)	5.7% (13)	0.12
MI	6.3 %(14)	2.7% (6)	6.2% (14)	0.21
STROKE	1.3% (3)	1.8 %(4)	3.1 %(7)	0.4
TVR	5.8% (13)	24.4% (55)	14.2% (32)	0.0001
MACCE	22.7% (51)	33.3% (75)	22.7% (51)	0.081
ST	--	1.3%(3)	4.4 %(10)	0.089

Rodriguez et al, Eurointervention 2006;2:53

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 5, 2009 VOL. 360 NO. 10

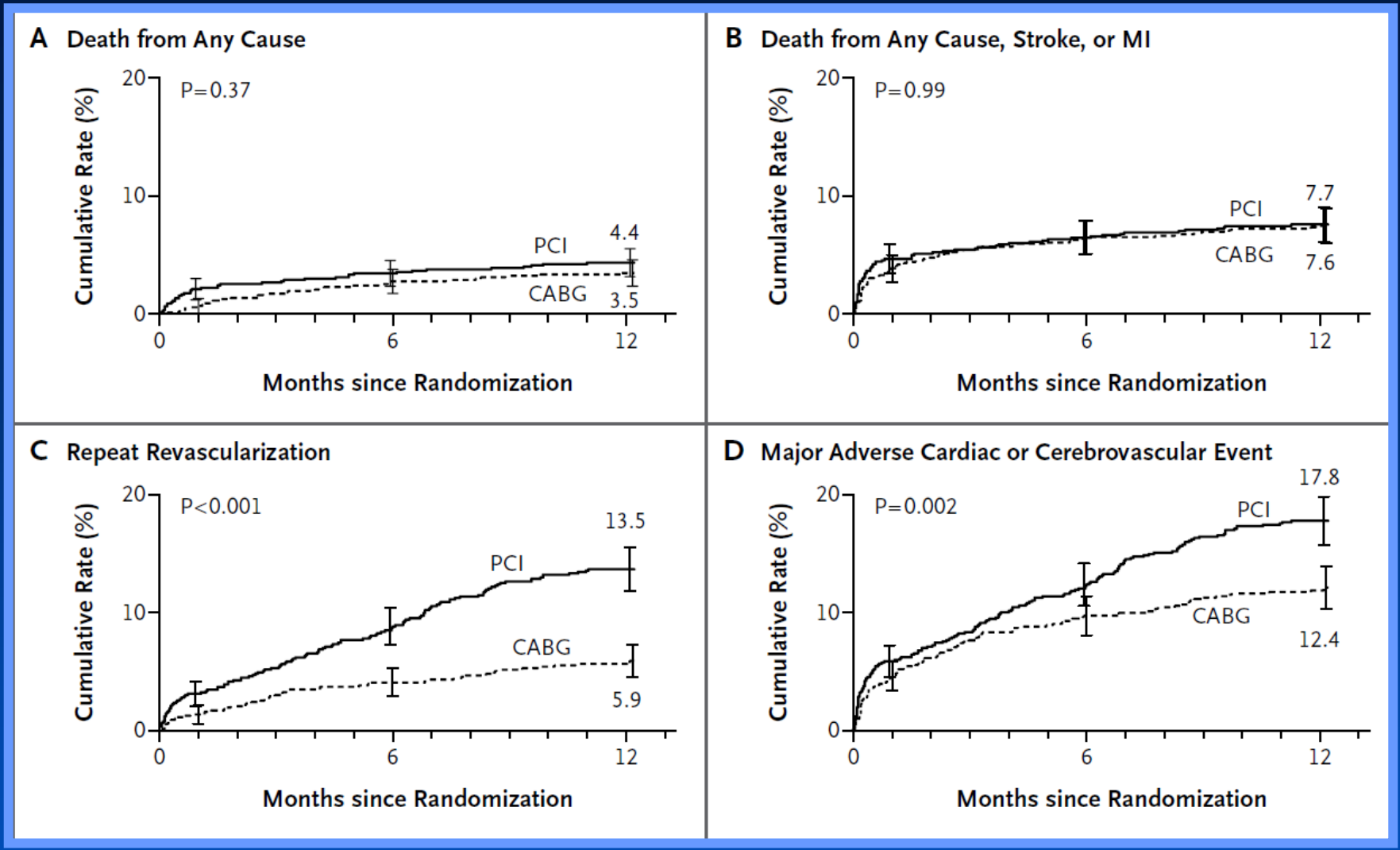
Percutaneous Coronary Intervention versus Coronary-Artery Bypass Grafting for Severe Coronary Artery Disease

Patrick W. Serruys, M.D., Ph.D., Marie-Claude Morice, M.D., A. Pieter Kappetein, M.D., Ph.D., Antonio Colombo, M.D., David R. Holmes, M.D., Michael J. Mack, M.D., Elisabeth Ståhle, M.D., Ted E. Feldman, M.D., Marcel van den Brand, M.D., Eric J. Bass, B.A., Nic Van Dyck, R.N., Katrin Leadley, M.D., Keith D. Dawkins, M.D., and Friedrich W. Mohr, M.D., Ph.D., for the SYNTAX Investigators*

SYNTAX Trial: 1800 patients with 3VD or LMCA disease randomized to CABG (n=897) or PCI with Taxus (n=903).

Primary end-points: MACCE (death, stroke, MI, or repeat revascularization) at 12-monhts

NEJM 2009;360:961-72



CABG resulted in lower rates of MACCE as compared with PCI with DES among patients with multivessel or LMCA disease

Multi-vessel Disease PCI
-Where We Are-

Summary of
Meta-Analysis of RCTs (DES vs CABG)

ART II
ERACI II, III
SYNTAX

- There was no difference in mortality and death or myocardial infarction between the two group.
- TVR is still higher in PCI (DES) group.

PCI (DES) *vs* CABG
in multi-vessel diseases

Registry Data

Washington Hospital – Single center, Circulation 2007
New York Registry – Multicenter, NEJM 2008
Asan Medical Center – Single center, Circulation 2008
Fuwai Hospital – Single center, Circulation 2009

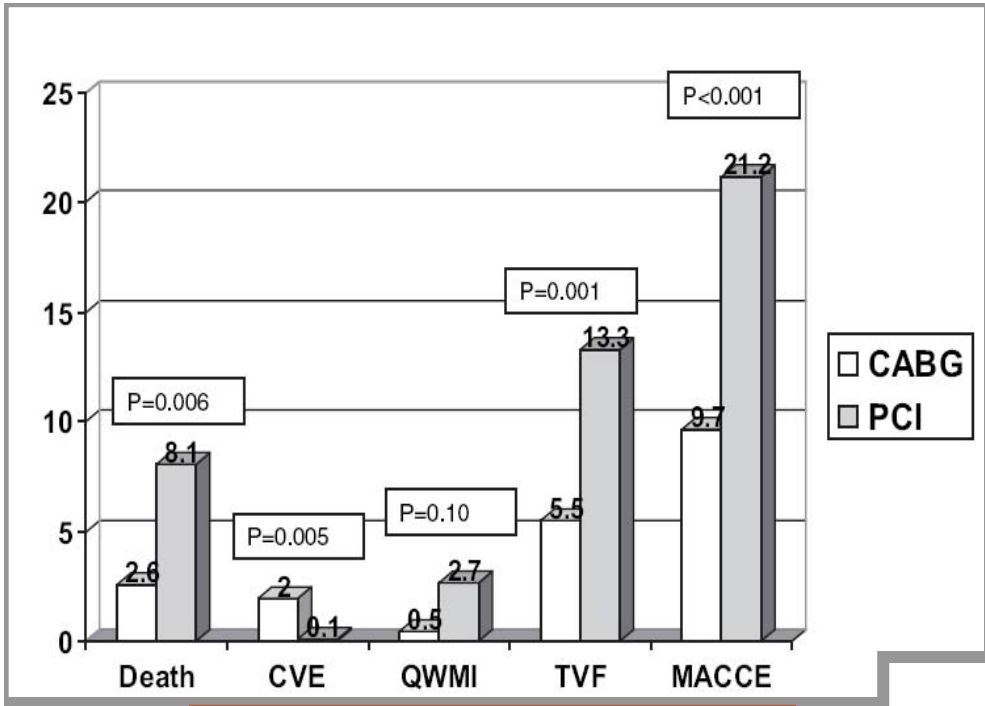
Outcomes of Coronary Artery Bypass Grafting Versus Percutaneous Coronary Intervention With Drug-Eluting Stents for Patients With Multivessel Coronary Artery Disease

Aamir Javaid, MD; Daniel H. Steinberg, MD; Ashesh N. Buch, MBChB; Paul J. Corso, MD; Steven W. Boyce, MD; Tina L. Pinto Slottow, MD; Probal K. Roy, MD; Peter Hill, MD; Teruo Okabe, MD; Rebecca Torguson, MPH; Kimberly A. Smith, BS; Zhenyi Xue, MS; Natalie Gevorkian, MD; William O. Suddath, MD; Kenneth M. Kent, MD; Lowell F. Satler, MD; Augusto D. Pichard, MD; Ron Waksman, MD

Washington Hospital Registry Analysis of 701 CABG and 979 PCI patients with multivessel disease

Death, MACE, and subsequent revascularization within 1 years

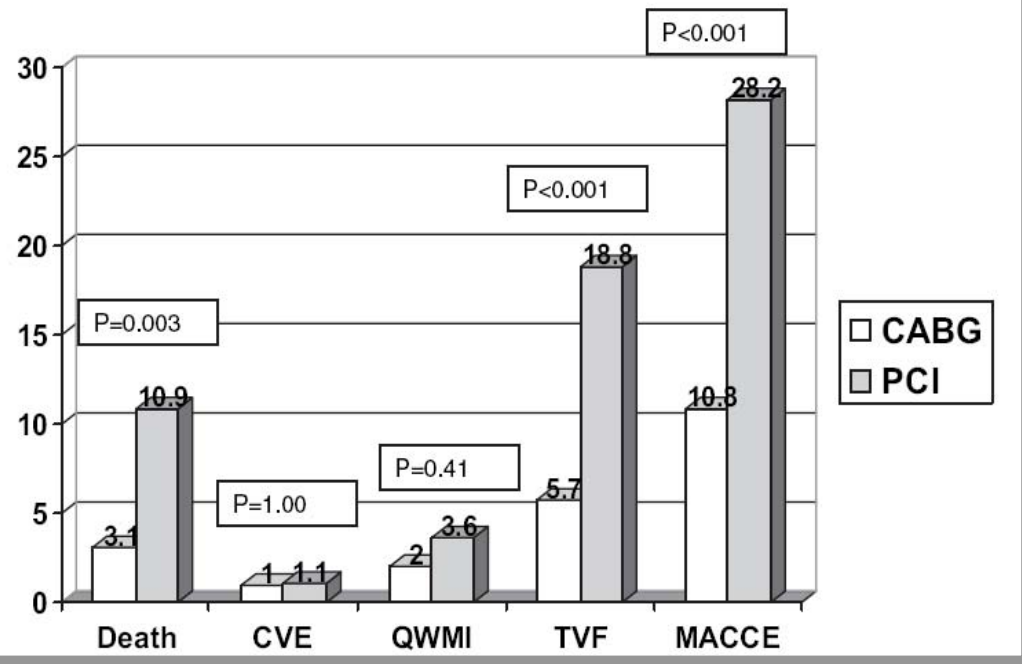
Circulation 2007;116:suppl I: 206



CABG is associated with higher adjusted rates of one-year survival than stenting in patients with multivessel disease

3-vessel CAD

2-vessel CAD



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 24, 2008 VOL. 358 NO. 4

Drug-Eluting Stents vs. Coronary-Artery Bypass Grafting in Multivessel Coronary Disease

Edward L. Hannan, Ph.D., Chuntao Wu, M.D., Ph.D., Gary Walford, M.D., Alfred T. Culliford, M.D., Jeffrey P. Gold, M.D., Craig R. Smith, M.D., Robert S.D. Higgins, M.D., Russell E. Carlson, M.D., and Robert H. Jones, M.D.

New York's Cardiac Registries Analysis of 7437 CABG and 9963 PCI patients with multivessel disease from Oct, 2003 to Dec, 2004.

Death and subsequent revascularization within 18 months according to the number of diseased vessels and clinical subsets.

NEJM 2008;358:331-41

Adjusted Hazard Ratios for Death and Death or MI after CABG and DES

	Death Adjusted HR (95% CI)	P value	Death or MI Adjusted HR (95% CI)	P value
3-Vessel Disease				
CABG (n=5,202)	0.80 (0.65-0.97)	0.03	0.75 (0.63-0.89)	<0.001
DES (n=2,481)	Reference		Reference	
2-Vessel Disease				
CABG (2,235)	0.71 (0.57-0.89)	0.003	0.71 (0.59-0.87)	<0.001
DES (n=7,482)	Reference		Reference	

CABG is associated with higher adjusted rates of long-term survival than stenting in patients with multivessel disease

Hannan, et al. NEJM 2008;358:331-41

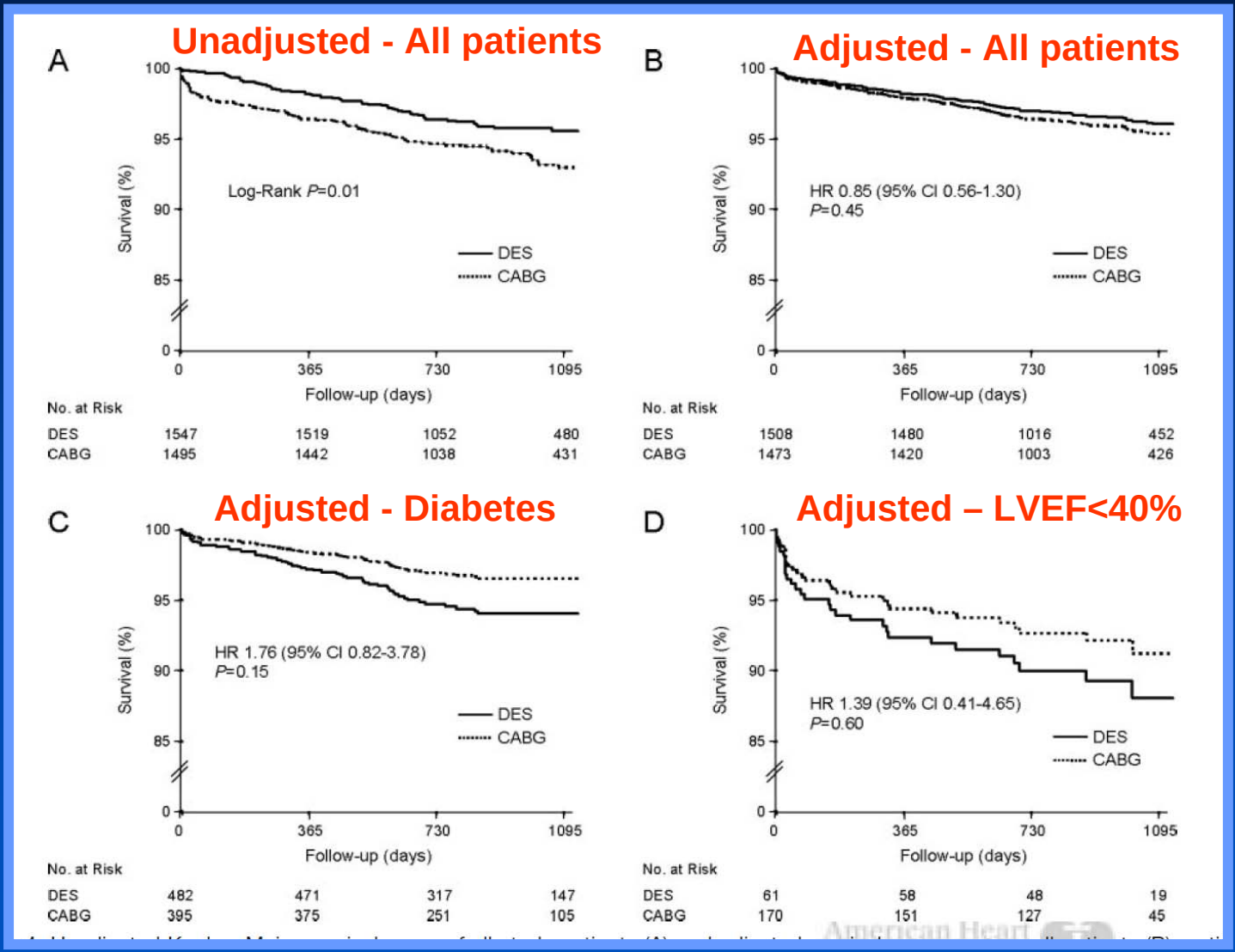
Long-Term Mortality After Percutaneous Coronary Intervention With Drug-Eluting Stent Implantation Versus Coronary Artery Bypass Surgery for the Treatment of Multivessel Coronary Artery Disease

Duk-Woo Park, MD; Sung-Cheol Yun, PhD; Seung-Whan Lee, MD; Young-Hak Kim, MD; Cheol Whan Lee, MD; Myeong-Ki Hong, MD; Jae-Joong Kim, MD; Suk Jung Choo, MD; Hyun Song, MD; Cheol Hyun Chung, MD; Jae-Won Lee, MD; Seong-Wook Park, MD; Seung-Jung Park, MD

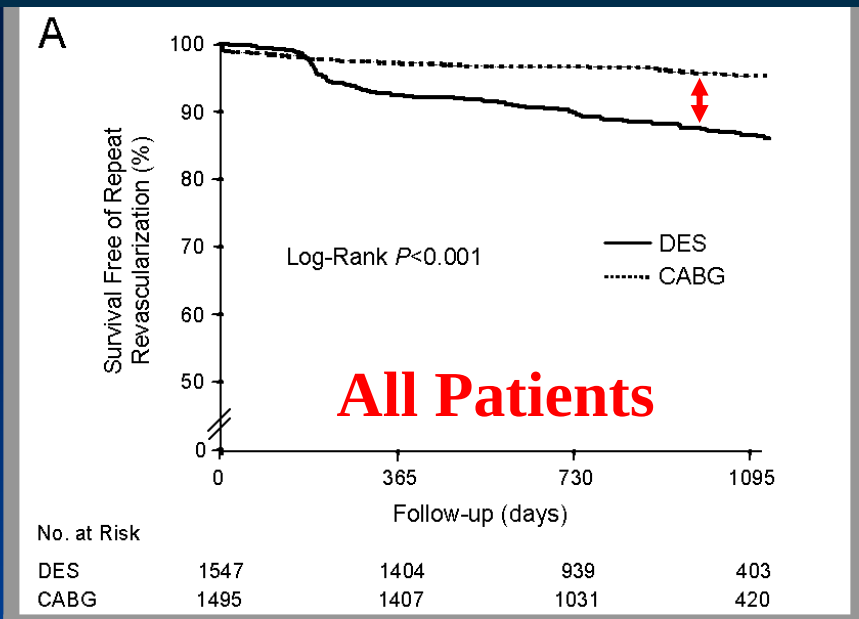
Asan Medical Center Registry ;
Analysis of 3042 patients (1495 CABG and 1547 PCI) with multivessel disease
Death, MACE, and subsequent revascularization within 3 years

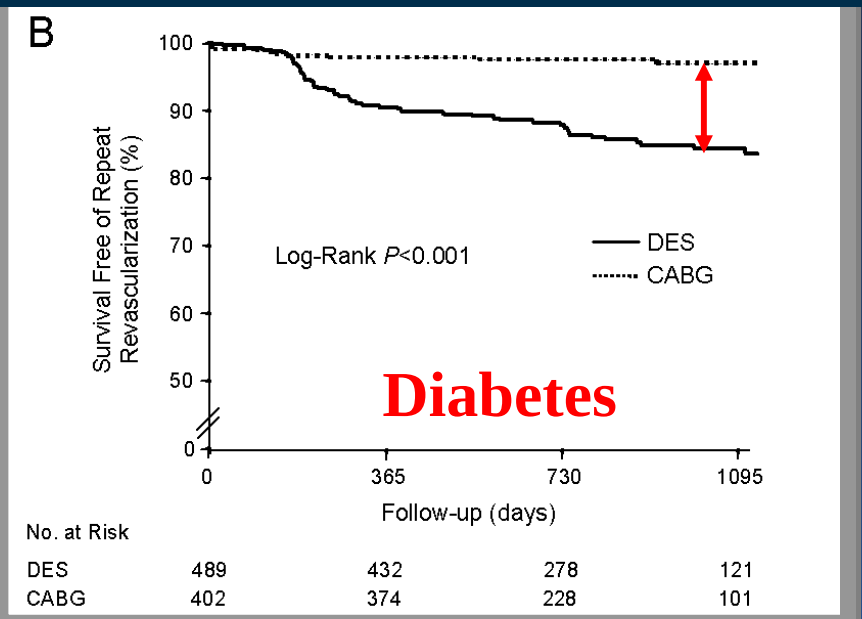
Park DW, et al. Circulation. 2008;117:2079-2086

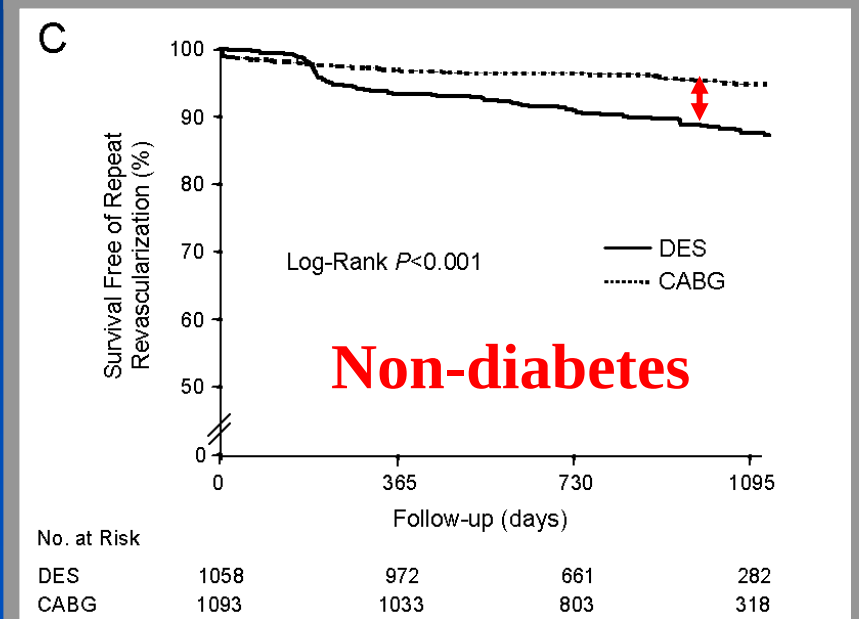
All-cause mortality



Repeat Revascularization







"The rates of repeat revascularization was significantly higher in the DES group and these difference was more prominent in diabetic patients"

Comparison of Drug-Eluting Stents and Coronary Artery Bypass Surgery for the Treatment of Multivessel Coronary Disease

Three-Year Follow-Up Results From a Single Institution

Yan Li, MD*; Zhe Zheng, MD, PhD*; Bo Xu, MD*; Shiju Zhang, MD, PhD; Wei Li, PhD; Runlin Gao, MD, PhD; Shengshou Hu, MD, PhD

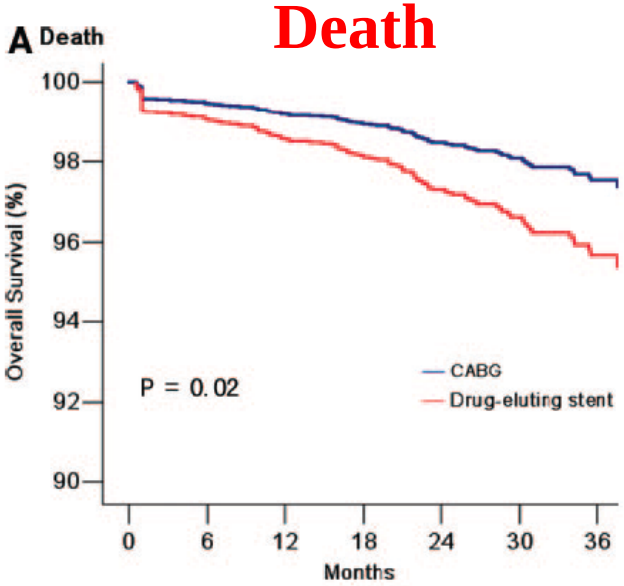
Fuwai Hospital Registry in China: Analysis of 3720 (1886 CABG and 1834 PCI) patients with multivessel disease

Death, MI, stroke, and TVR at 3 years

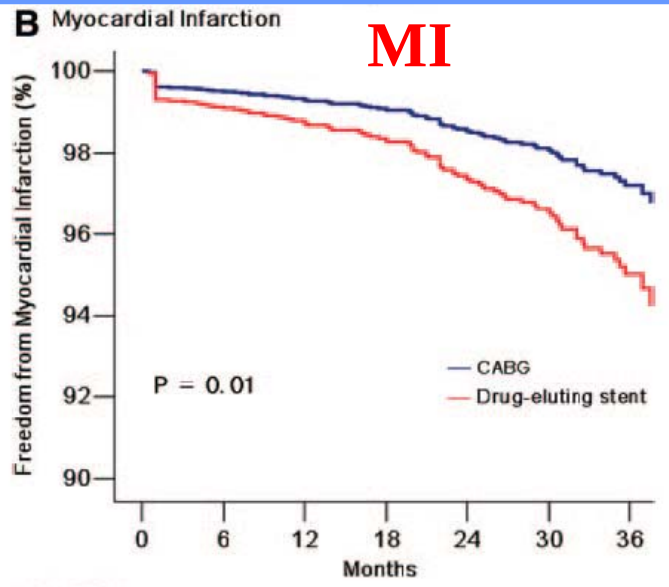
Circulation 2009;119:2040

Adjusted Events

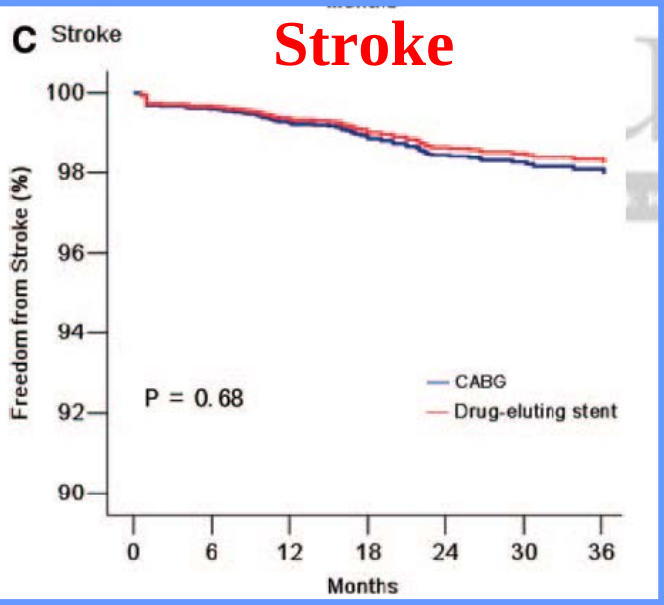
Death



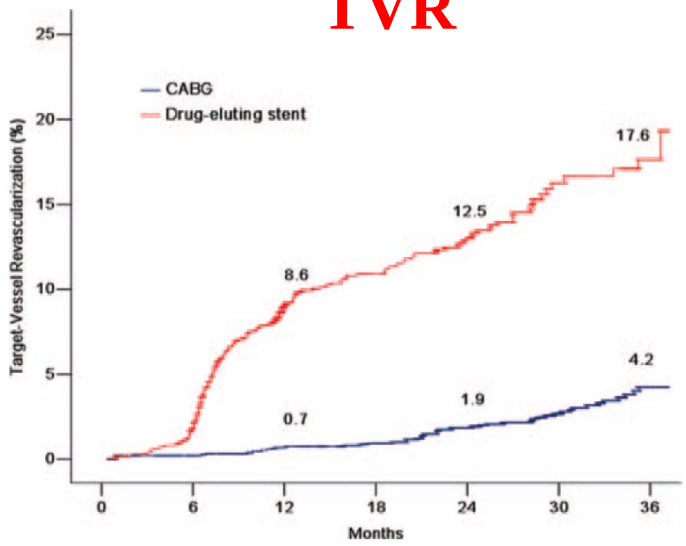
MI



Stroke



TVR



Multi-vessel Disease PCI
-Where We Are-

Summary of **Registry Data (DES vs CABG)**

Washington Hospital Center
New York Registry
Asan Medical Center
Fuwai Hospital

- The risk of mortality was discordant among registries data.
- TVR is still higher in PCI (DES) group.

Good or Bad RCT Data?

- Pure treatment effect

- Very selected low-risk patients

➔ limits the ability to generalize conclusions to many high-risk patient categories in real-world clinical practice.

Good or Bad Registry Data ?

- Reflect real clinical practice.

- Risk adjustment will not do good

  ➔ The judgment of treating physicians is uncorrectable by adjusting process.

  ➔ Profound patient selection bias: poor population (elderly or severe comorbidities) tend to be more often referred for PCI due to its less invasive nature.

  ➔ CABG patients are more likely to be subjected to extensive scrutiny for comorbidities: underestimation of comorbidities in PCI patients.

Why Different among RCT and Registry

- Conflicting observations between RCT and registries have raised much controversy, and the reasons for this discrepancy have not yet been well addressed
- No doubt about the necessity of large RCT to evaluate true treatment effect.
- Degree of adjustment in registry data may yield inconsistent results.
- **Another Important Fact** lasting past 30 years in registry data.
  - ➔ Surgeon Writer: CABG always better
  - ➔ Interventionist Writer: PCI always equivalent

Stent *vs* CABG

No one claim that PCI can replace all patients with multi-vessel disease.

I believe that we will find some selected patients group who will do absolutely fine or even better with PCI with DES and some subsets of patients who will do better with bypass surgery.


Thank You !!
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