# PCI vs. CABG
# In the Era of 2nd Generation DES

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# *Survival* Benefit of CABG Over Medications in Stable Disease

1. Left Main Disease,
2. 3 Vessel Disease with *Mild LV dysfunction (35%<EF<50%)*

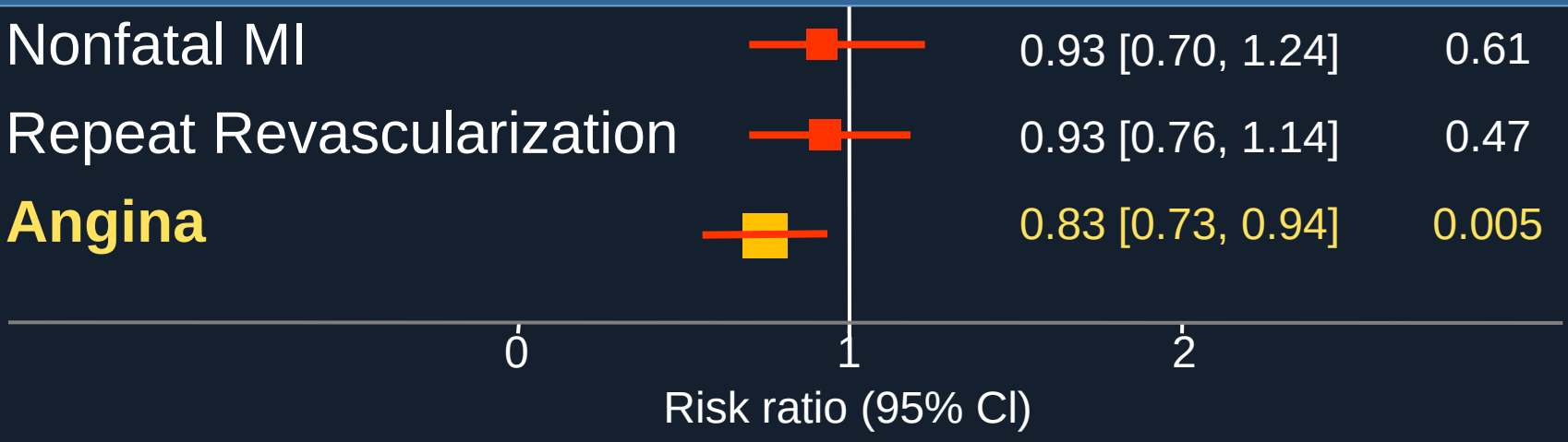
***Conventional Bible !***

Caracciolo E A et al. Circulation 1995;91:2325-2334
CASS Investigators, Circulation 1983;68:939-950,
Velazquez EJ, et al. NEJM 2011;364:1607-16.

# Benefit of PCI
# Over Medications in Stable Disease

*12 RCTs, 7182 participants*

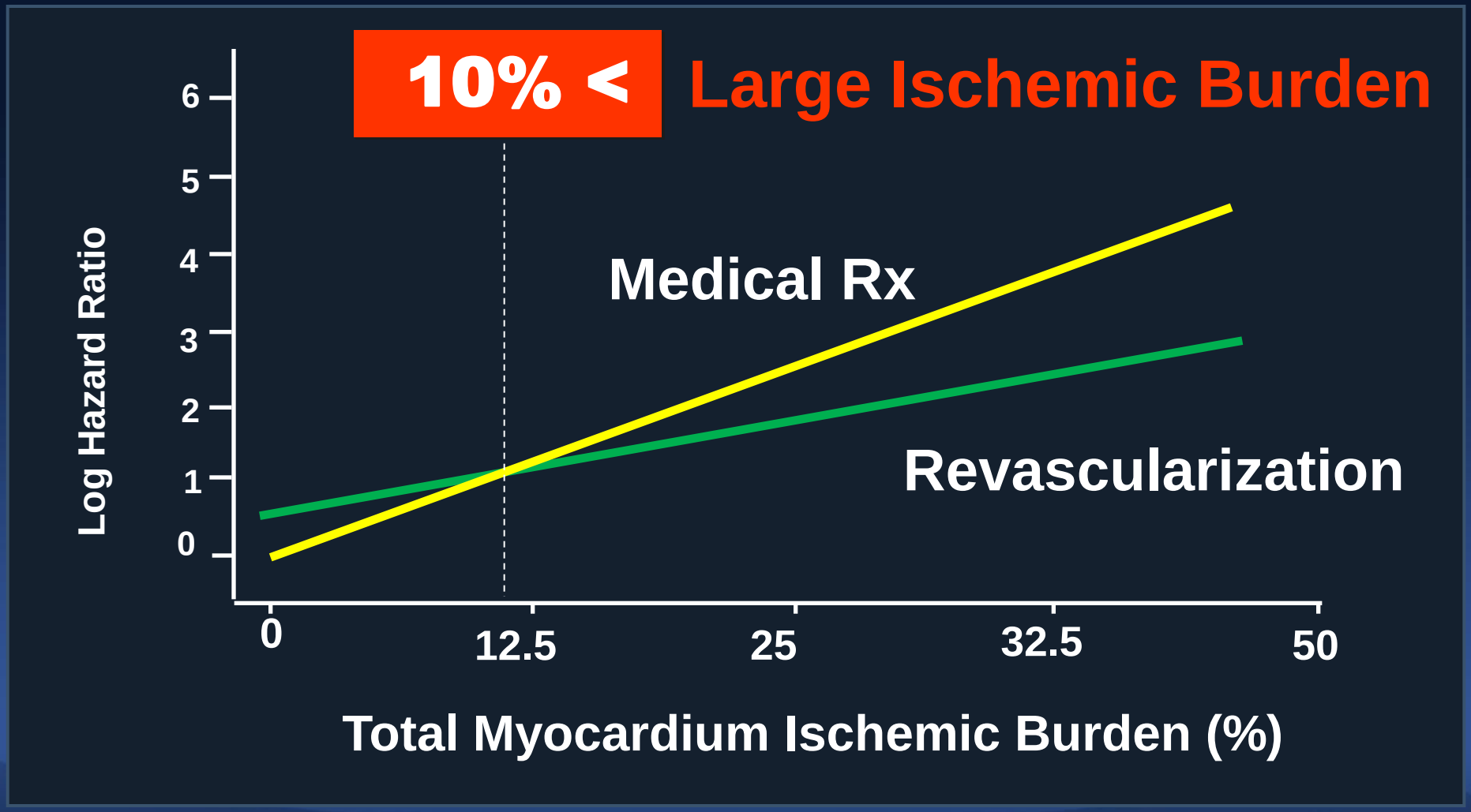
***PCI Has No Survival Benefit Over Medication***






Pursnani et al, Circ CV Intv 2012

# Survival Benefit of Revascularization (CABG and/or PCI) Over Medications






Circulation. 2003;107:2900-2906

# Treatment for Stable Angina

## Medication

Optimal Medical Treatment is Effective.

## PCI

Non-Viable, Asymptomatic Small Myocardium,
***Cosmetic Angioplasty***

Inappropriate Angioplasty (50%)
JAMA 2011;306(1):53-61

## PCI

For Angina Relieve
***Symptomatic Angioplasty***

## CABG

***Surgery Is Better for Large ischemic burden, LM and 3 VD with Mild LV Dysfunction***

## PCI

***Compare to Surgery***

***Survival Angioplasty***

# Treatment for Stable Angina

## CABG

***Surgery Is Better** for Large ischemic burden, LM and 3 VD with Mild LV Dysfunction*

## PCI

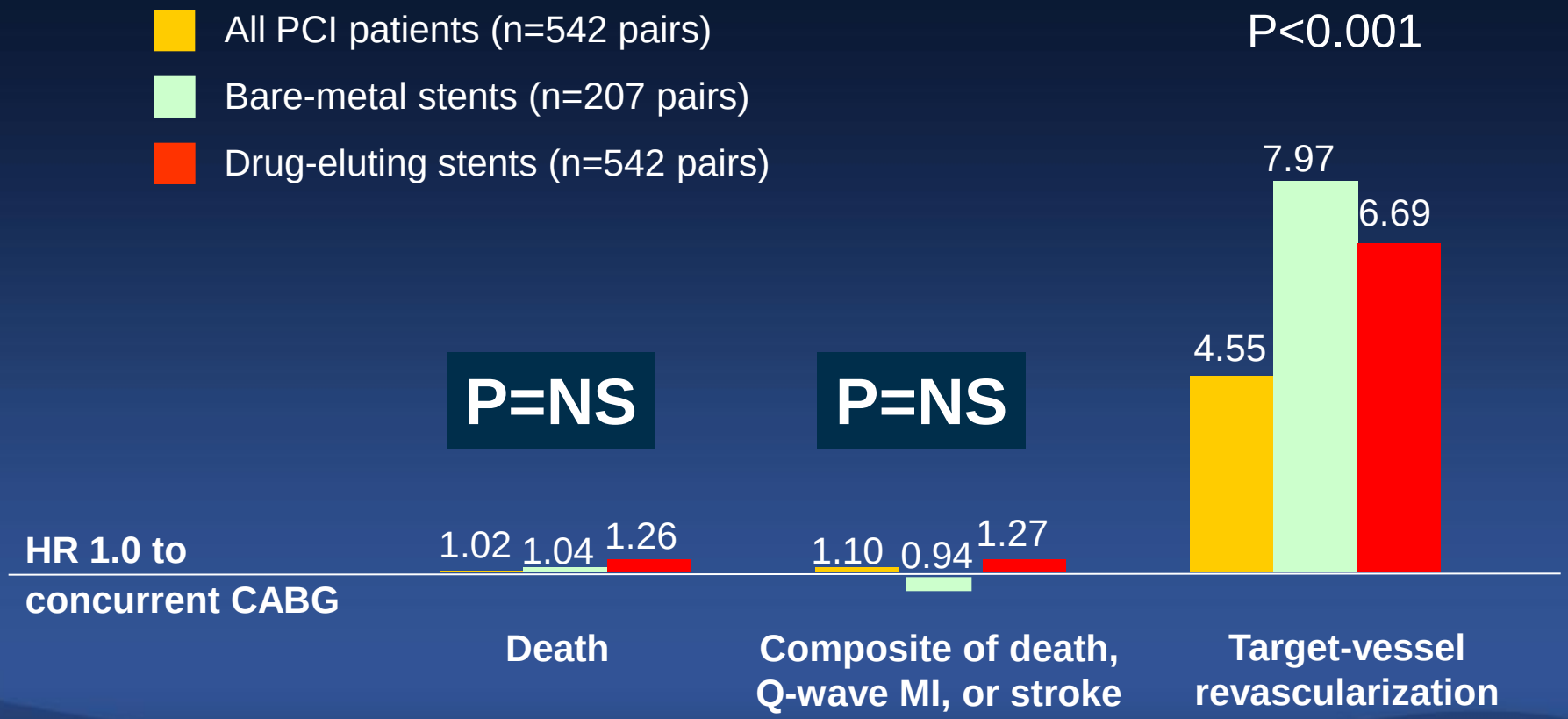
*Compare to Surgery, PCI has Limited Data.*

***To Evaluate the Survival Benefit of PCI for 3 Vessel and Left Main Disease, We Need More Data.***

# DES vs. CABG
## *for LM Disease*

1. MAIN COMPARE Registry
2. SYNTAX, LM subgroup
3. PRECOMBAT
4. Meta-Analysis of RCTs and Registry
5. Temporal Changes of LM Revascularization

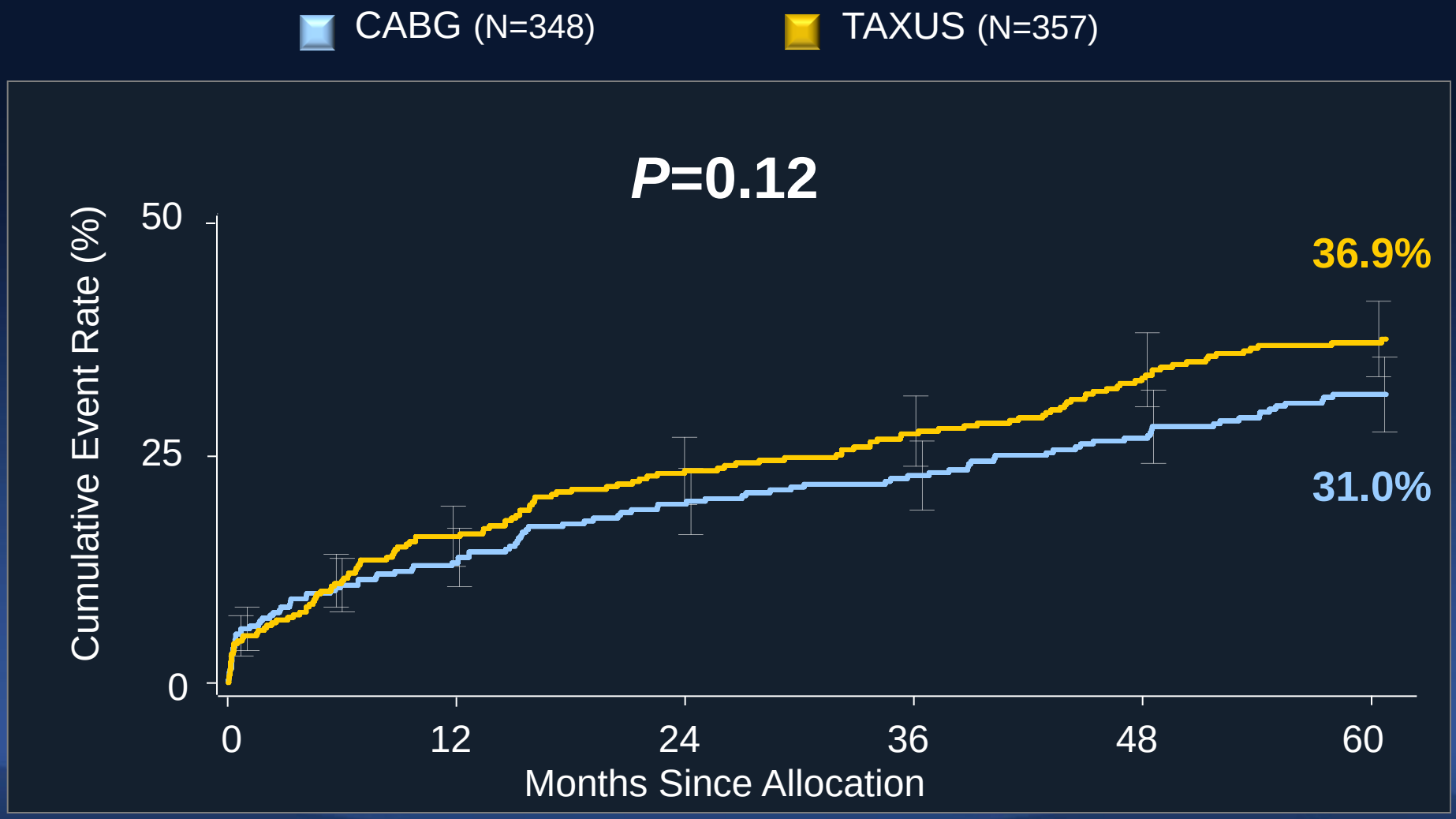
# MAIN COMPARE, 5 Year
## Death /MI /Stroke






Park DW, et al. JACC 2010;56:117-24

# SYNTAX LM Subset, 5 Year
# Death /MI /Stroke /Repeat Revascularization




Cumulative KM Event Rate ± 1.5 SE; log-rank *P* value;*Binary rates

ITT population

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# PRECOMBAT at 5 Year

Ahn JM et al, JACC. 2015 Mar 10.

# Baseline Angiographic Characteristics

| | PCI with Cypher (N=300) | CABG (N=300) | P value |
|---|---|---|---|
| Extent of disease vessel | | | 0.68 |
| LM only | 27 (9.0) | 34 (11.3) | |
| LM plus 1-vessel | 50 (16.7) | 53 (17.7) | |
| LM plus 2-vessel | 101 (33.7) | 90 (30.0) | |
| LM plus 3-vessel | 122 (40.7) | 123 (41.0) | |
| Bifurcation left main involvement | 200 (66.9) | 183 (62.2) | 0.24 |
| Diameter stenosis of left main, % | | | 0.12 |
| $> 50$ and $\leq 70$ | 160 (53.3) | 141 (47.0) | |
| $> 70$ | 140 (46.7) | 159 (53.0) | |
| Right coronary artery disease | 149 (49.7) | 159 (53.0) | 0.41 |
| Restenotic lesion | 1 (0.3) | 2 (0.7) | 0.56 |
| Chronic total occlusion | 2 (0.7) | 2 (0.7) | 1.0 |
| SYNTAX score | 24.4±9.4 | 25.8±10.5 | 0.09 |

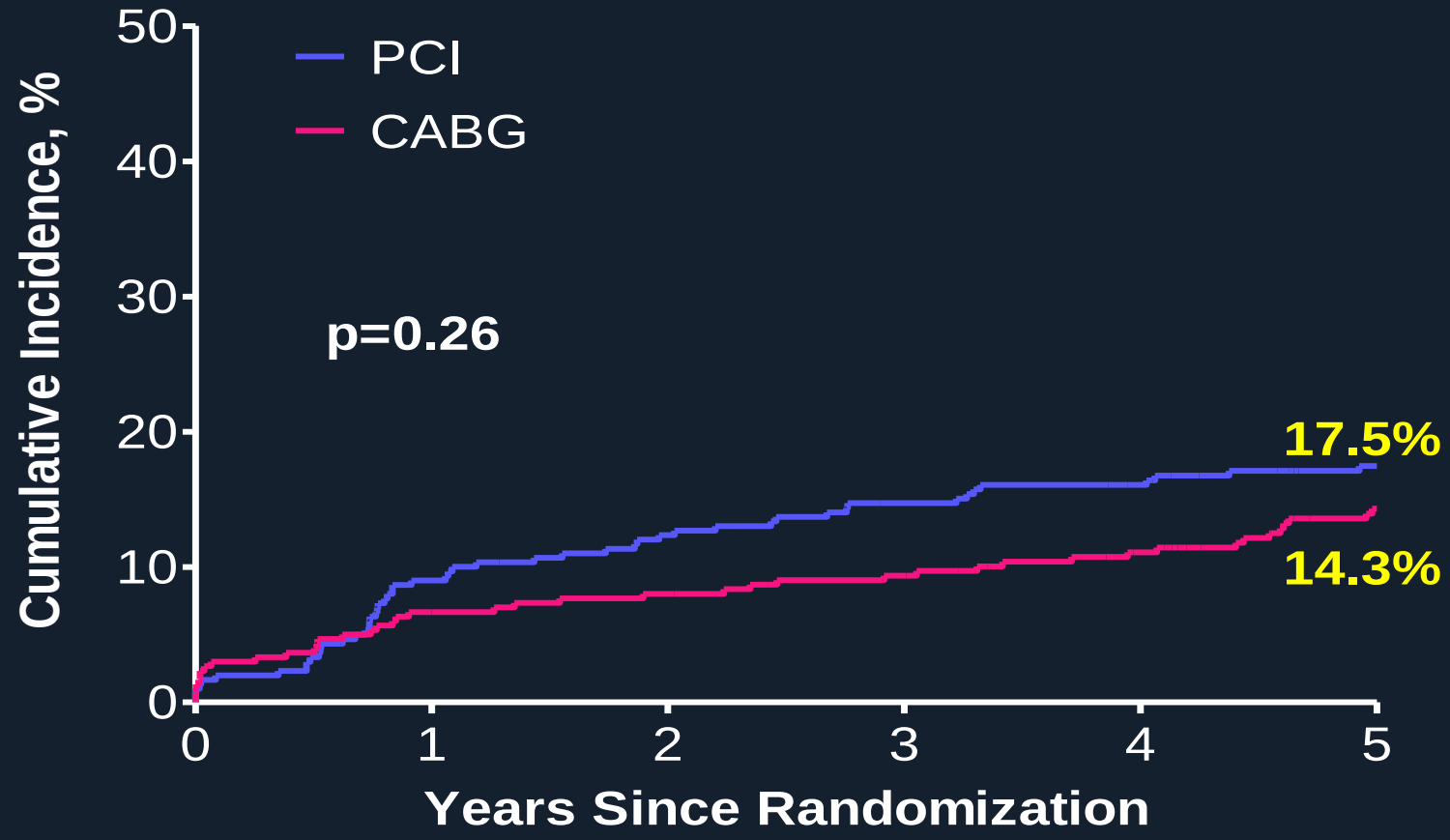
# Procedural Characteristics

| PCI with Cypher (N=300) | |
|---|---|
| Stents number in LM | 1.6±0.8 |
| Stent length in LM, mm | 44.0±31.9 |
| Stents per pt | 2.7±1.4 |
| Stent length per pt, mm | 60.0±42.1 |
| IVUS guidance | 250 (91.2) |
| Bifurcation treatment | |
| 1-stent technique | 87 (46.3) |
| 2-stent technique | |
| Crush | 33 (17.9) |
| Kissing | 33 (17.9) |
| T stent | 25 (13.6) |
| V stent | 4 (2.2) |
| Others | 2 (1.1) |
| Final kissing balloon | 129 (70.1) |

| CABG (N=300) | |
|---|---|
| Grafts per patient | 2.7±0.9 |
| Arterial grafts | 2.1±0.9 |
| Vein graft | 0.7±0.8 |
| Use of LIMA | 233 (93.6) |
| Off-pump surgery | 155 (63.8) |

| | PCI | CABG | P |
|---|---|---|---|
| Complete revascularization | 205 (68.3) | 211 (70.3) | 0.60 |

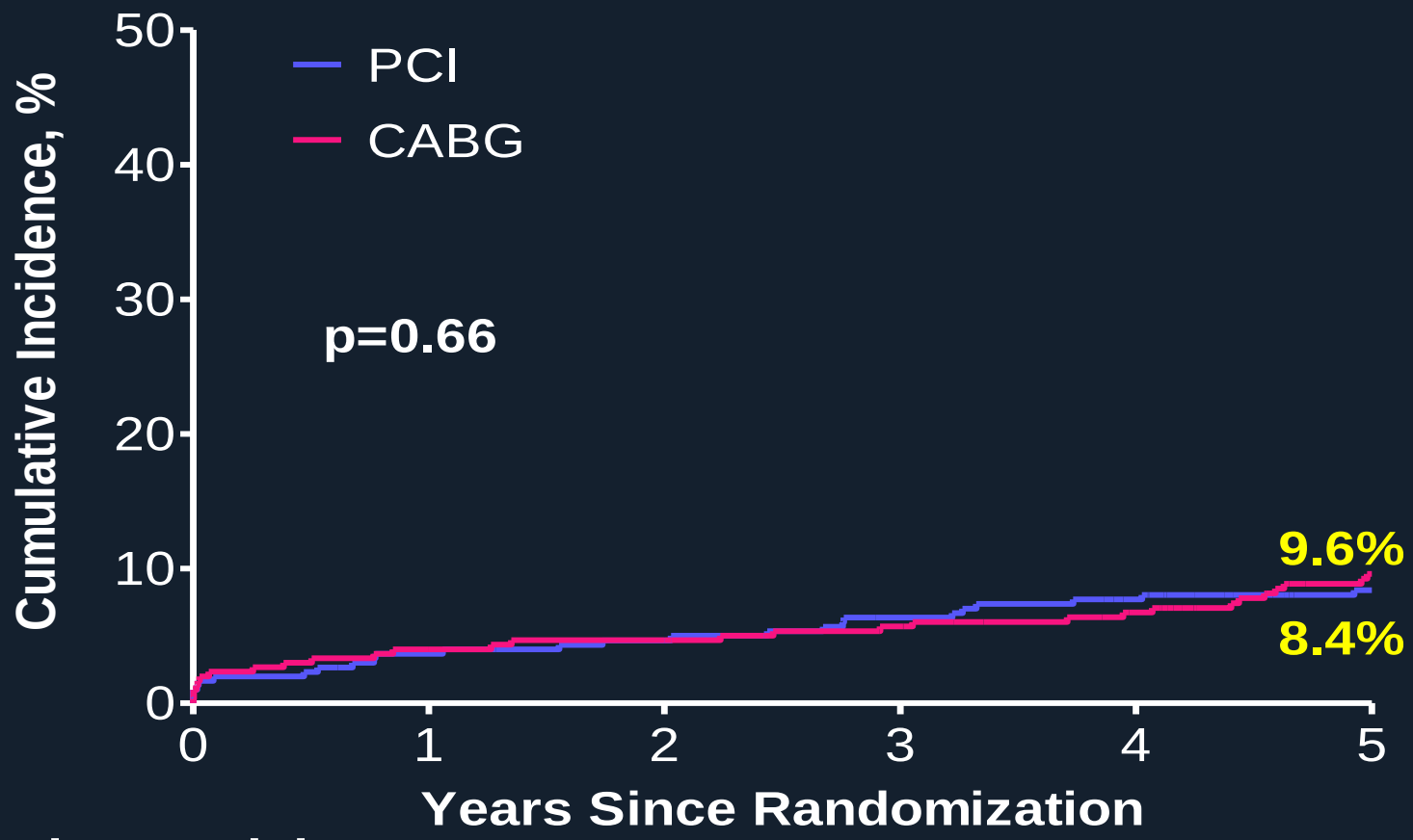
# *Primary End Point*
# Death. MI, Stoke or iTVR




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 272 | 261 | 252 | 246 | 231 |
| **CABG** | 300 | 279 | 274 | 267 | 256 | 235 |

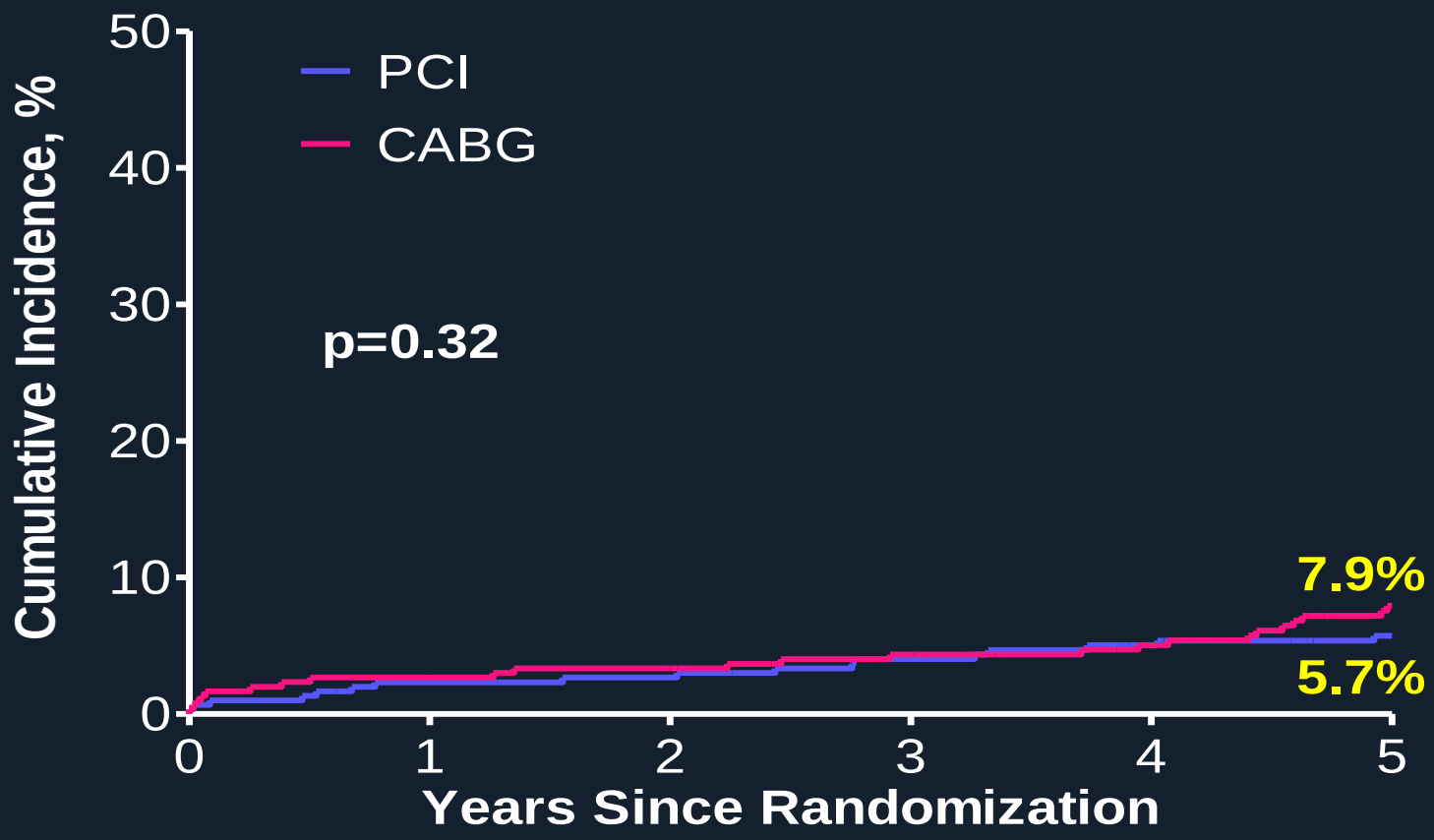
# Death, MI or Stroke




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 288 | 284 | 277 | 270 | 256 |
| **CABG** | 300 | 287 | 284 | 277 | 268 | 247 |

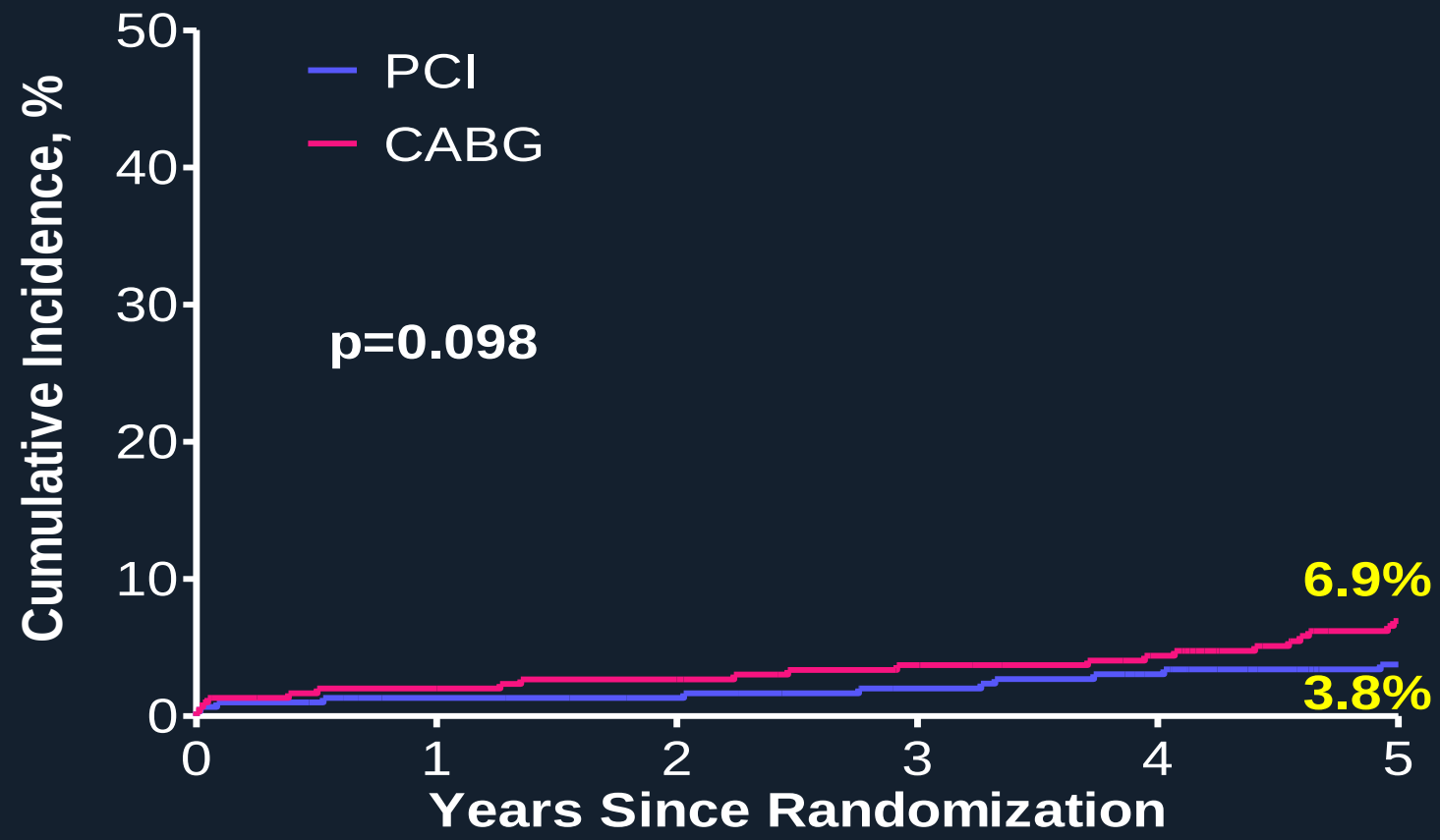
# Death




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 292 | 289 | 283 | 277 | 262 |
| **CABG** | 300 | 291 | 288 | 281 | 273 | 252 |

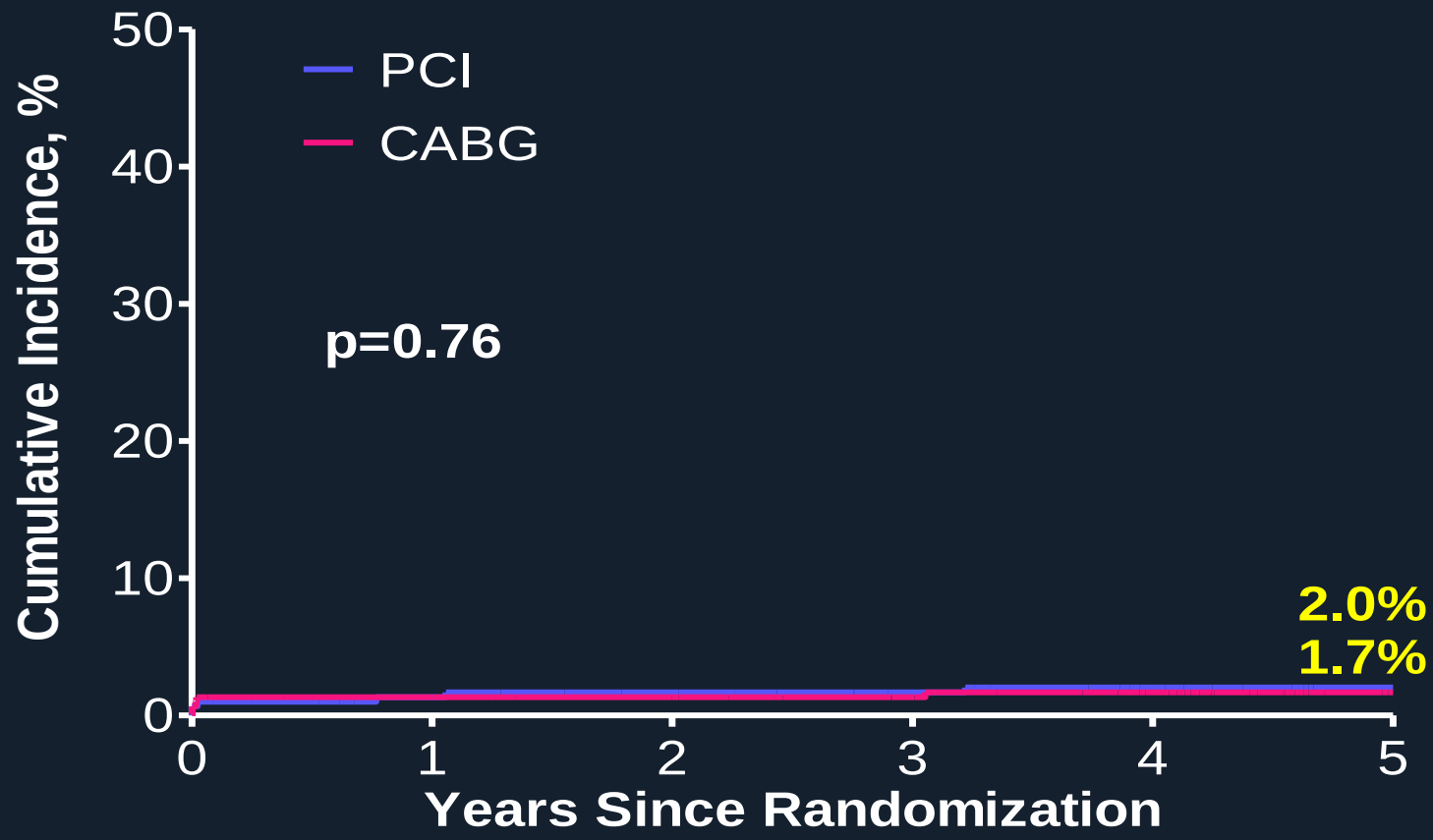
# Cardiac Death




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 292 | 289 | 283 | 277 | 262 |
| **CABG** | 300 | 291 | 288 | 281 | 273 | 252 |

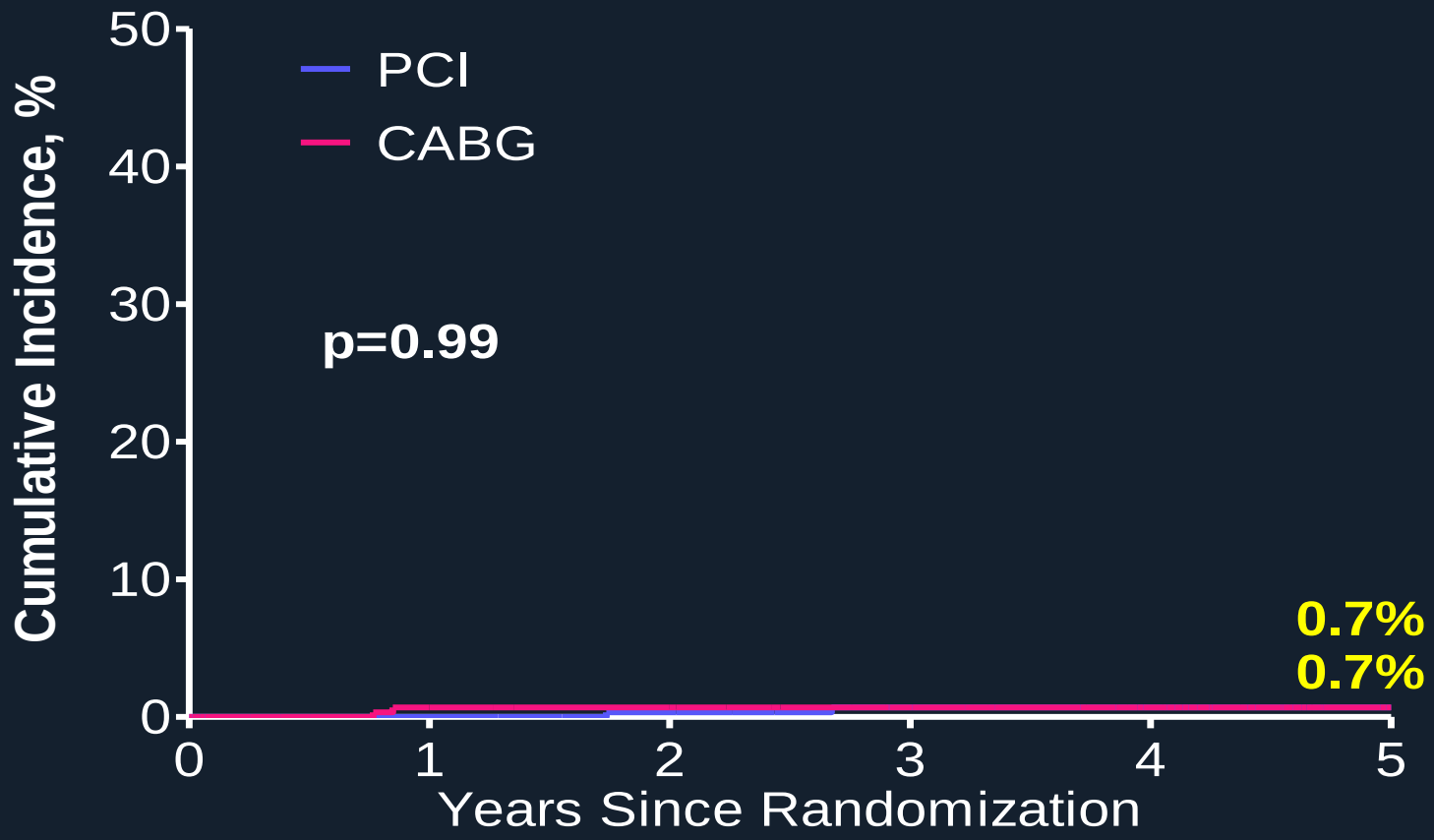
# Myocardial Infarction




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 288 | 284 | 278 | 271 | 257 |
| **CABG** | 300 | 289 | 286 | 279 | 270 | 249 |

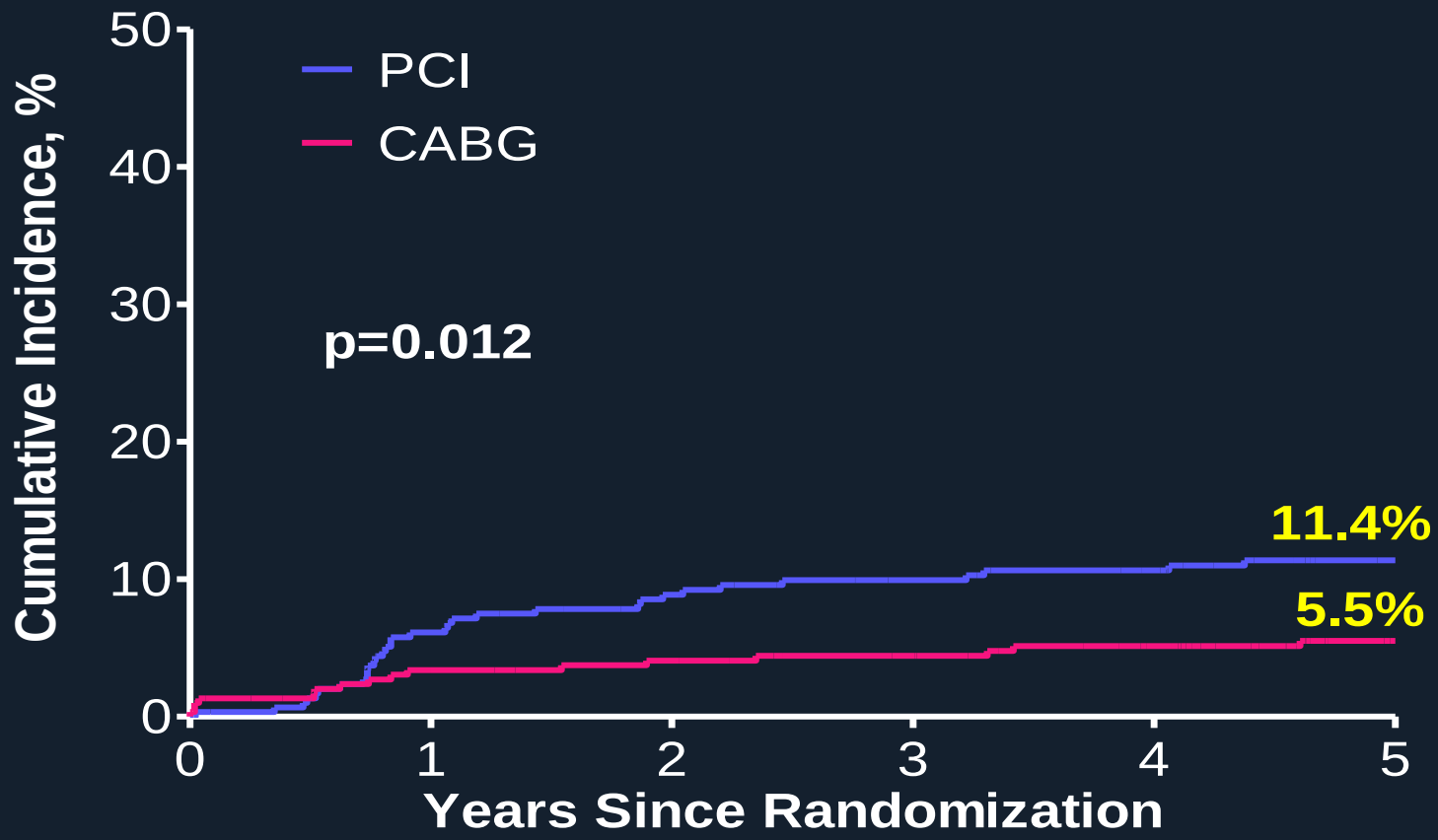
# Stroke




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 292 | 289 | 282 | 276 | 261 |
| **CABG** | 300 | 289 | 286 | 279 | 271 | 250 |

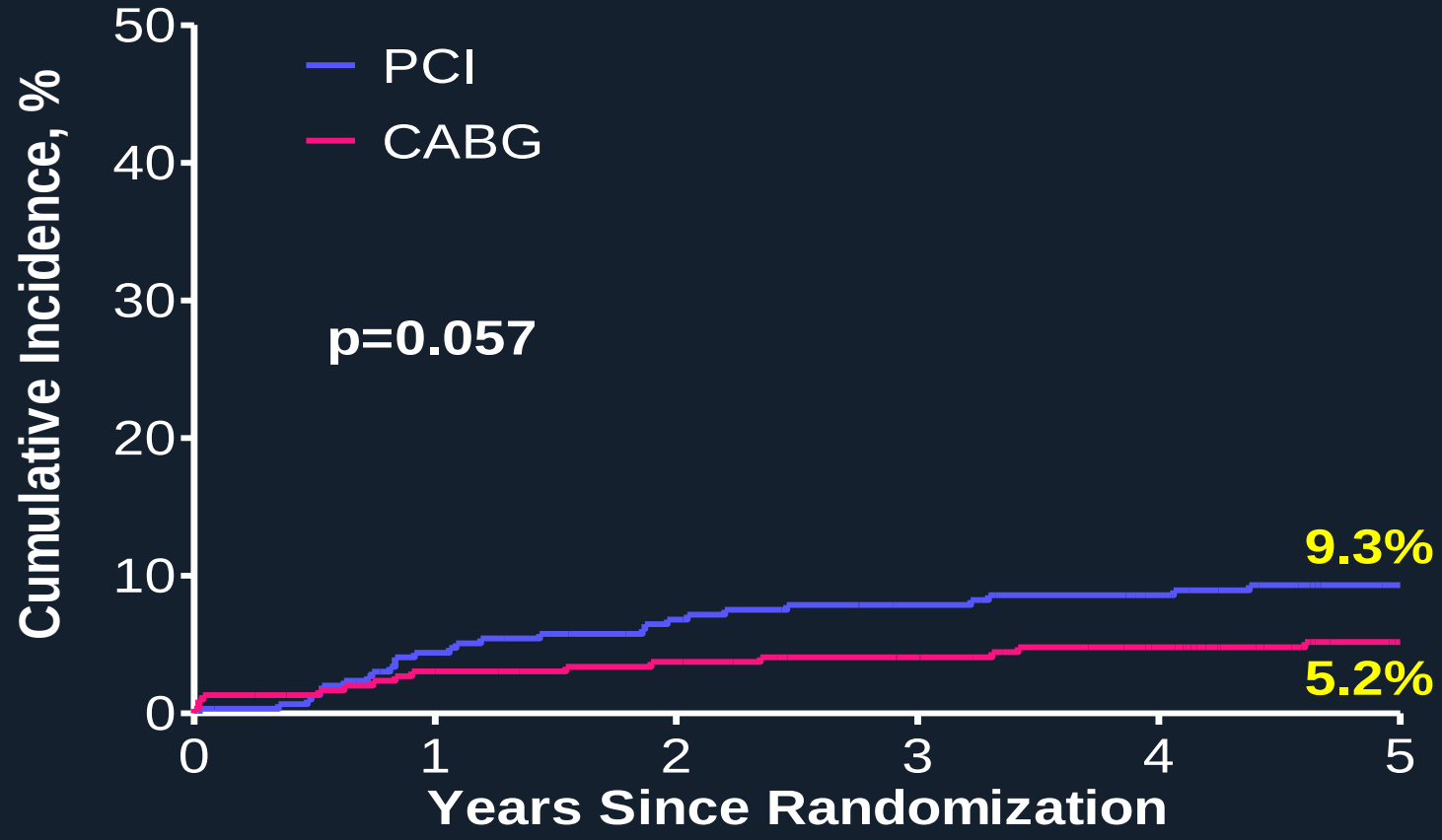
# Ischemia-Driven TVR




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 274 | 263 | 254 | 248 | 232 |
| **CABG** | 300 | 283 | 278 | 271 | 261 | 240 |

# Clinical-driven TVR




**Patient at risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| **PCI** | 300 | 279 | 269 | 260 | 253 | 237 |
| **CABG** | 300 | 284 | 279 | 272 | 262 | 240 |

# DES vs. CABG
## *for LM Disease Consensus*

1. Stoke is Higher in CABG.
2. TVR is Higher in PCI.
3. Outcomes of PCI with DES is Comparable with CABG.

# *Temporal Changes of MACE*

# Meta-analysis, 2009-2012

Favor PCI  Favor CABG

| | | | Odds Ratio (95% Confidence Interval) | | | | |
|---|---|---|---|---|---|---|---|
| Author | Year | FU | Death | MI | Stroke | TVR | D/MI/Stroke |
| Naik et al | 2009 | 1 yr | 1.00 (0.70,1.41) | - | - | 4.36 (2.60,7.32) | 0.84 (0.57,1.22) |
| | | 2 yrs | 1.27 (0.83,1.94) | - | PCI Better | CABG Better | 1.25 (0.81,1.94) |
| | | 3 yrs | 1.11 (0.66,1.86) | - | | | 1.16 (0.68,1.98) |
| Lee et al | 2010 | 1 yr | 0.71 (0.42,1.23) | - | - | 3.23 (1.47,7.14) | 0.80 (0.55,1.16) |
| Capodanno et al | 2011 | 1 yr | 0.74 (0.43,1.29) | 0.98 (0.54,1.78) | 0.15 (0.03,0.67) | 2.25 (1.54,3.29) | - |
| Ferrante et al | 2011 | 1 yr | 0.72 (0.42,1.24) | 0.97 (0.54,1.74) | 0.14 (0.04,0.55) | 2.17 (1.48,3.17) | - |
| Jiang et al | 2012 | ≤2 yrs | 0.82 (0.61,1.11) | - | - | 3.29 (2.39,4.51) | - |
| | | ≤3 yrs | 0.88 (0.57,1.37) | - | - | 3.60 (2.60,4.99) | - |
| | | >3 yrs | 0.72 (0.52,1.00) | - | - | 3.49 (2.19,5.56) | - |
| Jang et al | 2012 | 1 yr | 0.68 (0.45,1.02) | - | - | 3.52 (2.72,4.56) | 0.70 (0.49,1.00) |

# Meta-analysis, 2013-2014

Favor PCI  Favor CABG

| | | | Hazard Ratio (95% Confidence Interval) | | | | |
|---|---|---|---|---|---|---|---|
| Author | Year | FU | Death | MI | Stroke | TVR | D/MI/Stroke |
| Desch et al | 2013 | 2 yrs | 0.74 (0.46,1.19) | 1.19 (0.69, 2.06) | 0.26 (0.10,0.69) | 1.94 (1.43,2.61) | - |
| Sa et al | 2013 | 1 yr | 0.69 (P=0.051) | - | PCI | CABG | 0.83 (P=0.26) |
| | | 5 yrs | 0.79 (0.67,1.08) | 1.38 (0.71,2.70) | 0.27 (0.13,0.55) | 3.77 (2.43,5.87) | 0.64 (0.51,0.80) |
| Alam et al | 2013 | 30days | 0.47 (0.26,1.10) | 1.41 (0.56,3.51) | 0.24 (0.10,0.62) | 0.74 (0.30,1.85) | 0.55 (0.34,0.63) |
| | | 1 yr | 0.71 (0.51,0.92) | 1.32 (0.75,2.31) | 0.22 (0.10,0.49) | 4.20 (3.07,5.75) | 0.71 (0.53,0.92) |
| | | ~ 5 yrs | 0.83 (0.71,0.98) | 1.41 (0.94,2.11) | 0.33 (0.20,0.55) | 3.69 (2.85,4.76) | 0.63 (0.49,0.82) |
| Li et al | 2014 | <30 day | 0.49 (0.30,0.78) | 0.97 (0.68,1.38) | 0.19 (0.08,0.45) | - | 0.53 (0.40,0.70) |
| | | 1-5 yrs | 0.79 (0.61,0.95) | - | - | 3.77 (3.35,4.26) | 0.78 (0.71,0.85) |

PCI Better

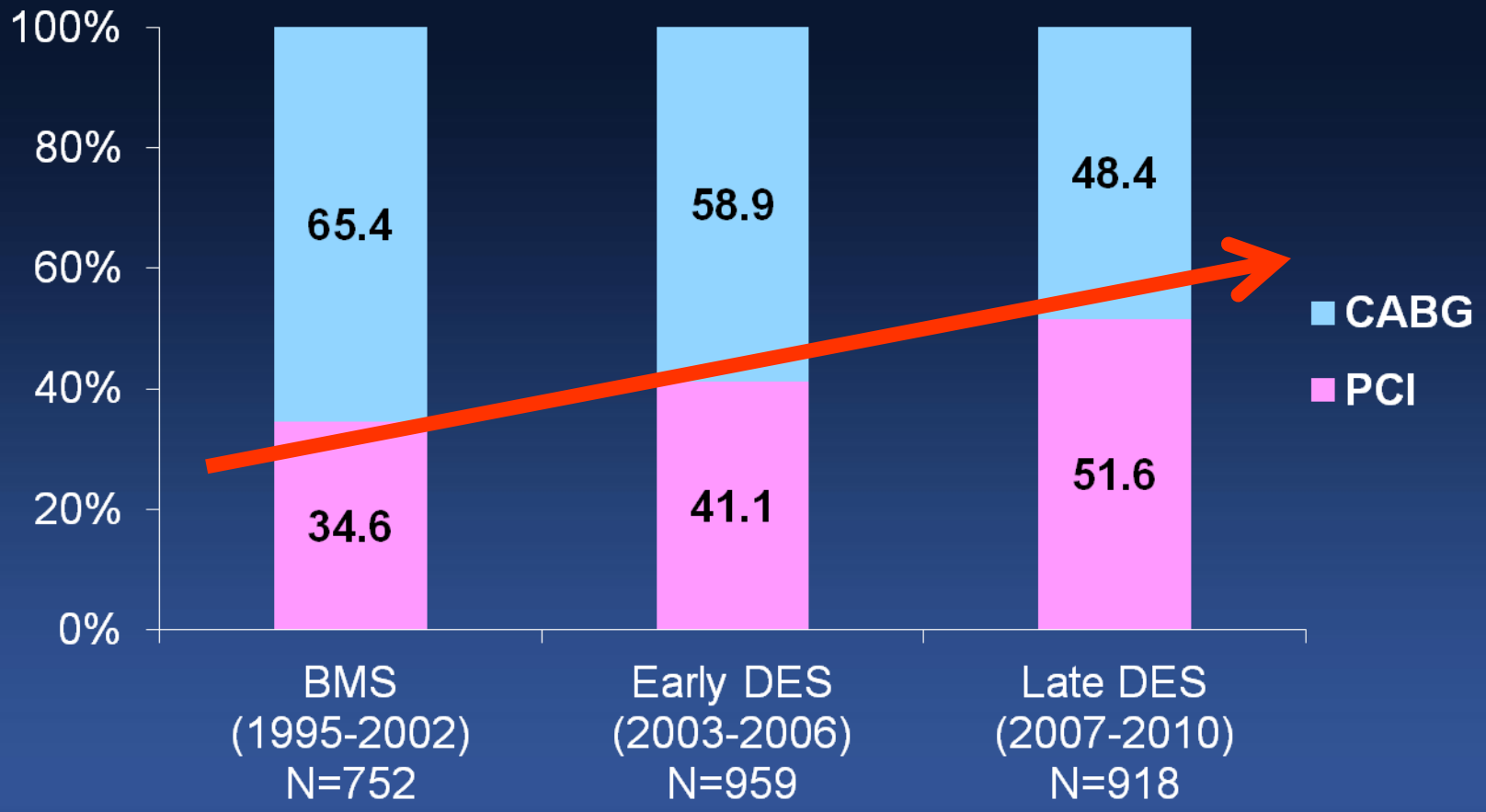
PCI Better

## *Outcomes of LM PCI Is Getting Better Over Time !*

# 20 Years of Temporal Changes In PCI vs. CABG For LM Disease

*Data from ASAN MAIN Registry*

# *Temporal Trends (n=2,360), 2015*
# Outcomes of LM Revascularization

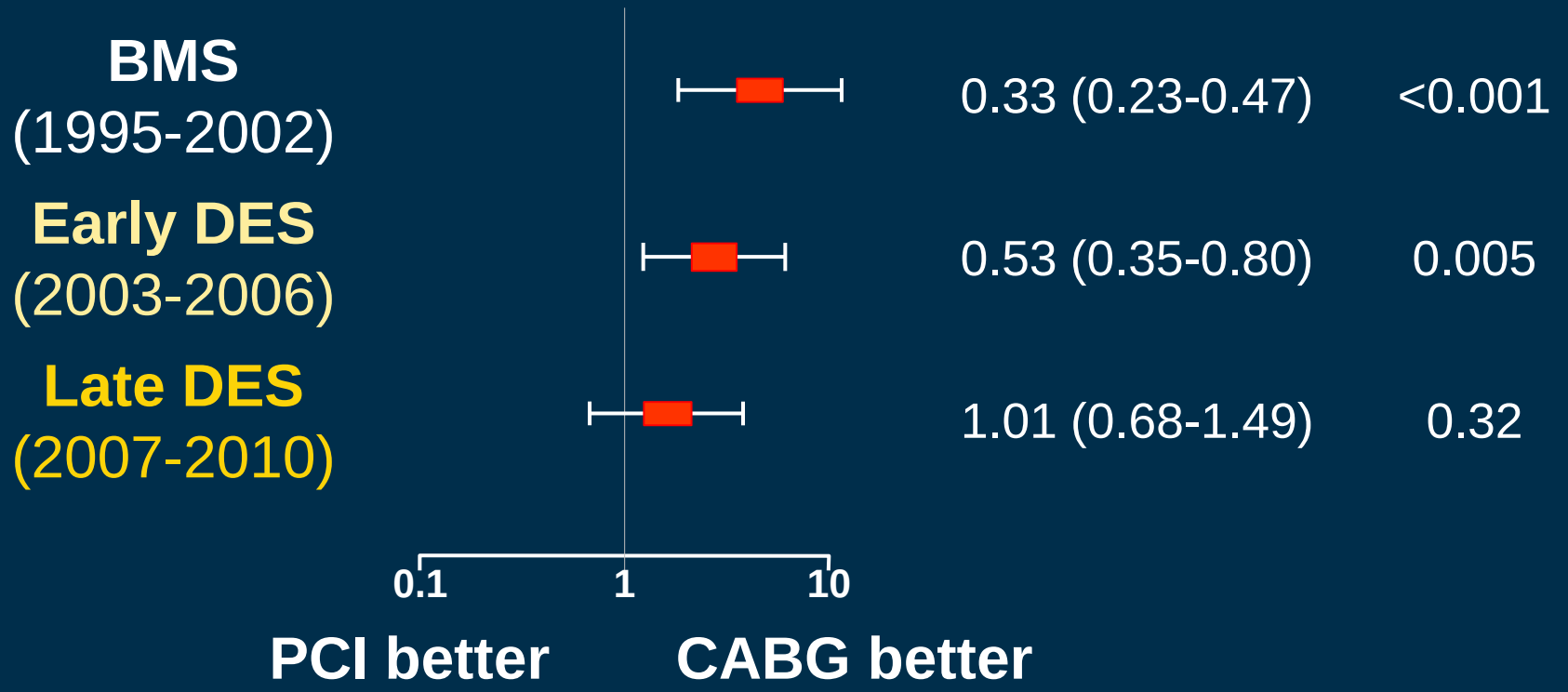





Park SJ, Ahn JM et al, Circ Cardiovasc Interv. 2015;8:e001846.

# Adjusted Hazard Ratios *of MACCE* Between CABG and PCI

P for Interaction = 0.002



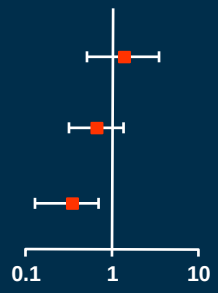



Park SJ, Ahn JM et al, Circ Cardiovasc Interv. 2015;8:e001846.

# Adjusted Hazard Ratios *of MACCE* Between CABG and PCI

## Death

*P for Interaction = 0.011*

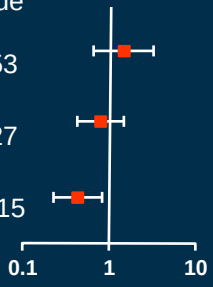



| | HR (95% CI) | P value |
|---|---|---|
| BMS | 1.36 (0.52-3.52) | 0.53 |
| Early DES | 0.66 (0.32-1.37) | 0.27 |
| Late DES | 0.31 (0.13-0.71) | 0.015 |

PCI better | CABG better

## Death, MI or Stroke

*P for Interaction = 0.017*

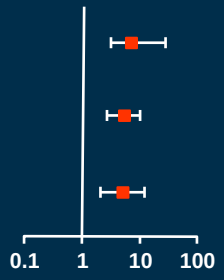



| | HR (95% CI) | P value |
|---|---|---|
| BMS | 1.49 (0.67-3.31) | 0.33 |
| Early DES | 0.80 (0.43-1.50) | 0.49 |
| Late DES | 0.44 (0.23-0.85) | 0.015 |

PCI better | CABG better

## Repeat Revascularization

P for Interaction = 0.20




| | HR (95% CI) | P value |
|---|---|---|
| BMS | 6.88 (3.21-14.7) | <0.001 |
| Early DES | 5.26 (2.73-10.1) | <0.001 |
| Late DES | 5.07 (2.12-12.1) | <0.001 |

PCI better | CABG better



Park SJ, Ahn JM et al, Circ Cardiovasc Interv. 2015;8:e001846.

# DES vs. CABG
## *for LM Disease 2015*

1. Stoke is Higher in CABG.
2. TVR is Higher in PCI.
3. Outcomes of PCI with DES is Comparable with CABG, ***Even Better Survival in the Era of 2nd Generation DES !***

# *ESC Guidelines 2014*
# Elective PCI for LM Stenosis

*LM Disease is*
*Not Surgical Disease Anymore !*

Reference; SYNTAX Study, PRECOMBAT study, MAINCOMPARE registry study and Meta-Analysis. *Patrick, SW et al, NEJM. 2009 March 5;360(10), Park SJ et al, NEJM. 2011 May 5;364(18):1718-27, Levin GN et al. ACC/AHA guidelines. JACC 2011;58:44-122, Capodanno et al, JACC 2011;58:1426-32*

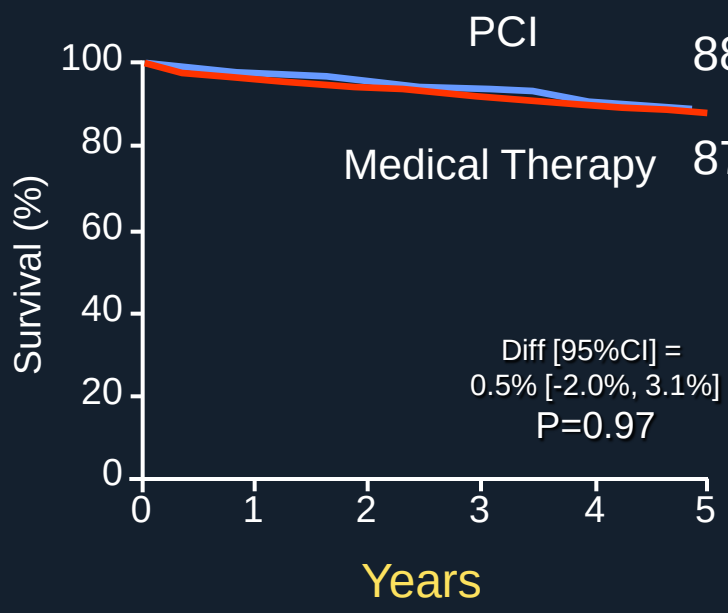
# DES vs. CABG
## *for Multi-Vessel Disease*

1. BARI 2D
2. FREEDOM
3. SYNTAX
4. BEST, 2015

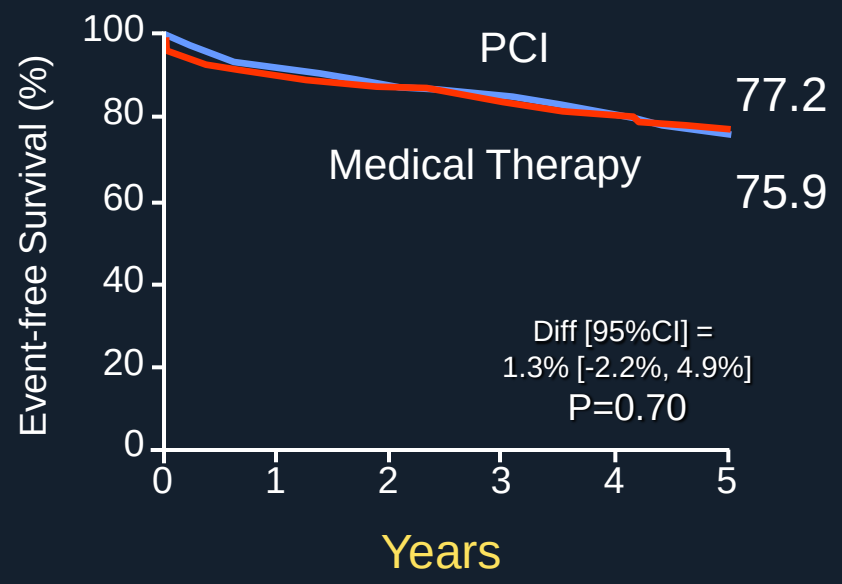
***Limited Data !***

# BARI 2D: PCI vs. Medical Treatment
## (Lower Risk Diabetic Patients)

### Survival

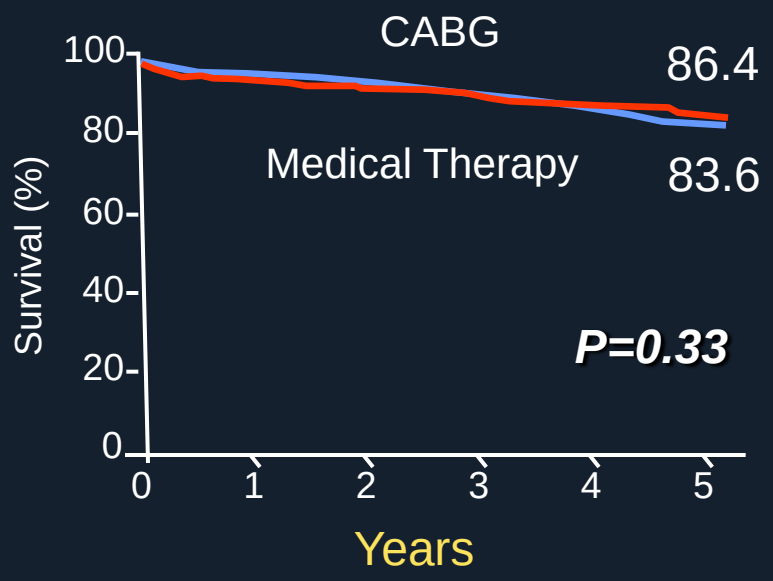



### Freedom from MACE (death, MI, or stroke)

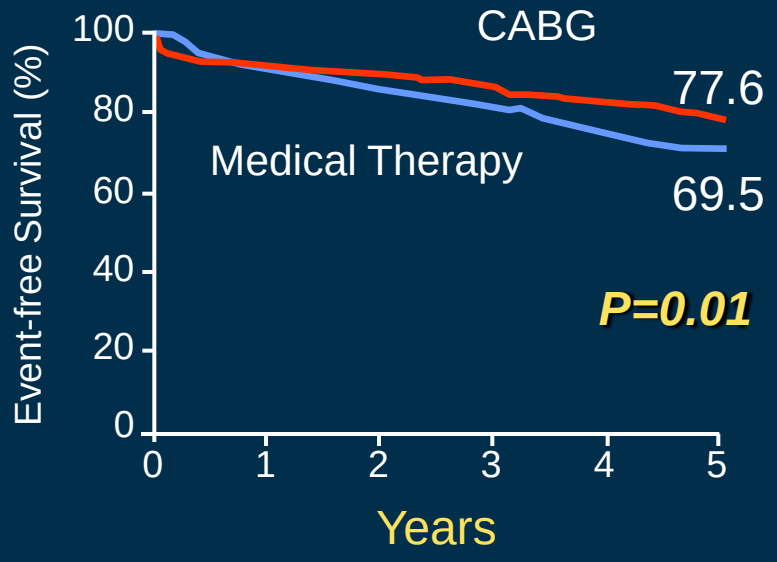


# BARI 2D: CABG vs. Medical Treatment
## (Higher Risk Diabetic Patients)

### Survival




### Freedom from MACE (death, MI, or stroke)




The BARI 2D Study Group. *NEJM* 2009;360:2503-15

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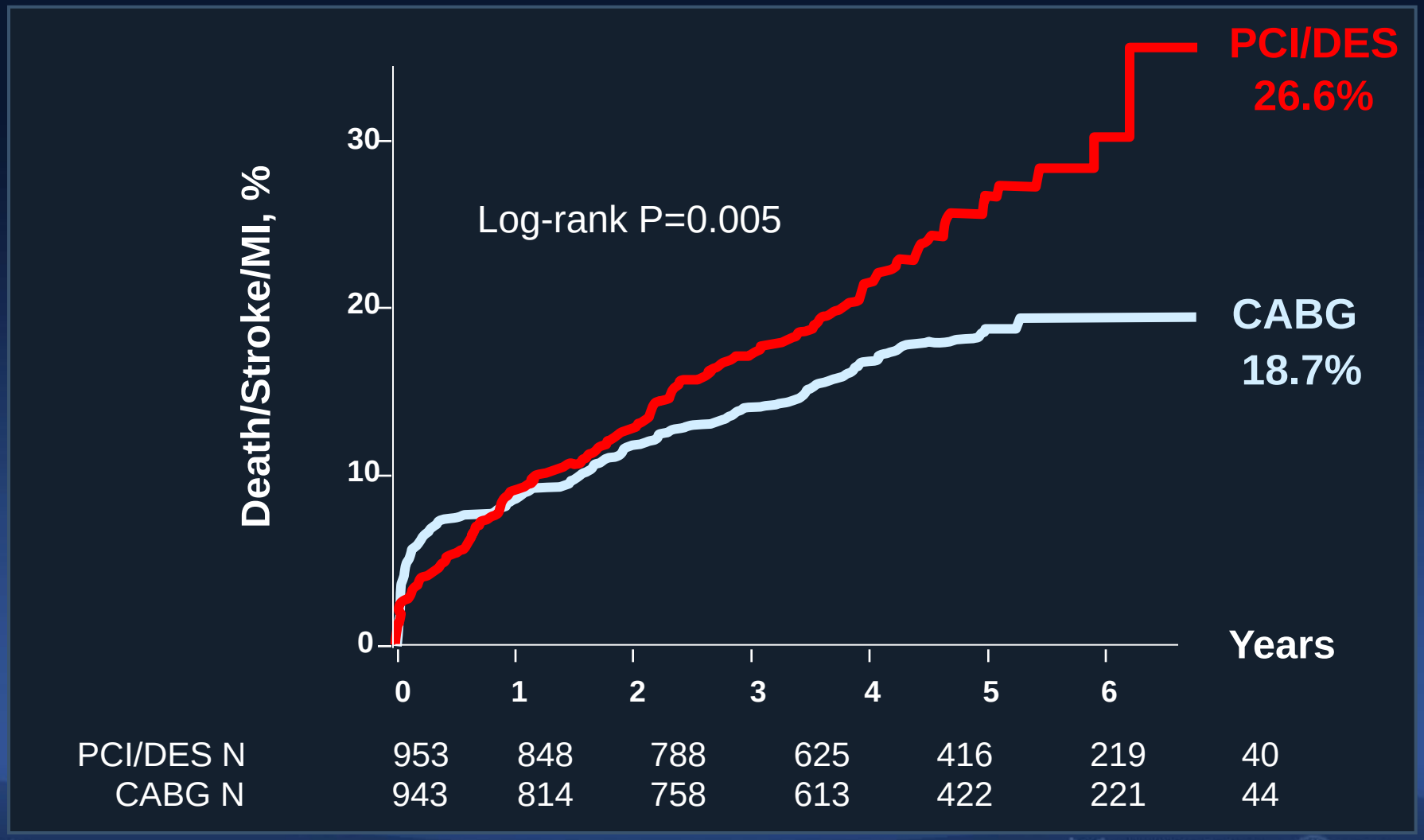
# FREEDOM *(Diabetics and MVD)*

## Death / MI / Stroke at 5 Year

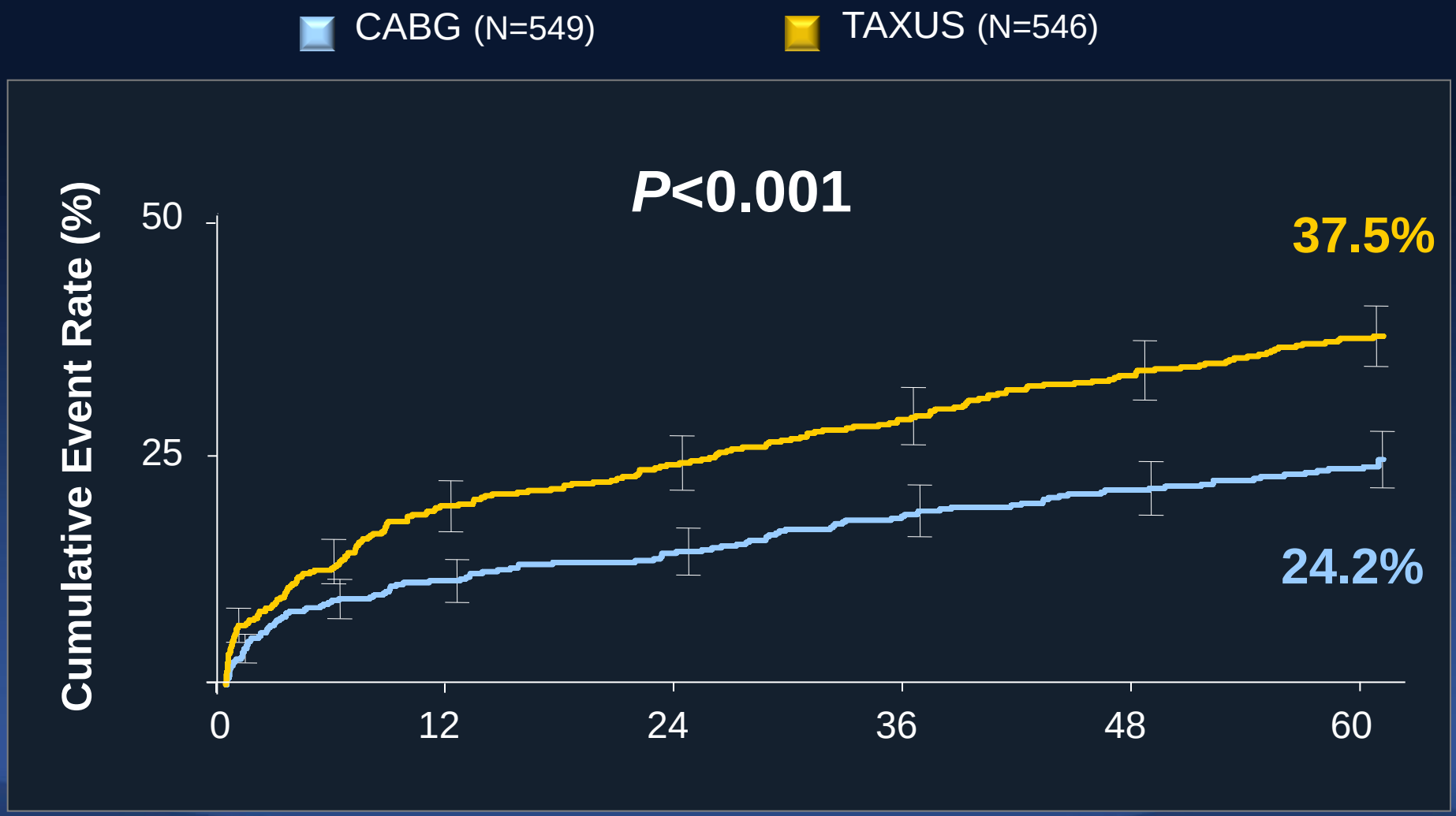





Farkouh et al, *NEJM* 2012 November 4

# SYNTAX *(3VD Subset)*

## MACCE to 5 Year




Mohr FW et al. Lancet 2013 Feb 23; 381:629

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# *Current Status 2015*
# DES vs. CABG *for 3-Vessel Disease*

CABG was superior to PCI with DESs in patients with diabetes and advanced CAD (predominantly, 3 VD).

# *ESC Guidelines 2014*
# Elective PCI for 3 Vessel Disease

| | CABG | | PCI | |
|---|---|---|---|---|
| **Recommendation according to extent of CAD** | **Class** | **Level** | **Class** | **Level** |
| 3 VD with a SYNTAX score ≤ 22 | I | A | I | B |
| 3 VD with a SYNTAX score 23 -32 | I | A | III | B |
| 3 VD with a SYNTAX score > 32 | I | A | III | B |

Reference; SYNTAX Study, .
*Patrick, SW et al, NEJM. 2009 March 5;360(10)*

# *Issue 1,*

## *Can We Make A Better* Clinical Outcomes *Using New DES ?*

# BEST Study

**Patients with**
**Multi-vessel Disease (Mainly 3VD)**


**PCI with Xience-V**

**CABG**

**Primary Endpoint at 2 years:**
**Death + MI + Repeat R**

PI : Park Seung-Jung

# Baseline Clinical Characteristics

| | PCI (N=438) | CABG (N=442) | P value |
|---|---|---|---|
| Age, years | 64.0 ± 9.3 | 64.9 ± 9.4 | 0.13 |
| Male sex | 304 (69.4) | 325 (73.5) | 0.18 |
| Body mass index | 24.7 ± 2.9 | 25.0 ± 2.9 | 0.16 |
| Diabetes | 177 (40.4) | 186 (42.1) | 0.62 |
| Hypertension | 296 (67.6) | 295 (66.7) | 0.79 |
| Hyperlipidemia | 239 (54.6) | 222 (50.2) | 0.20 |
| Current smoker | 88 (20.1) | 89 (20.1) | 0.99 |
| Previous PCI | 30 (6.8) | 38 (8.6) | 0.33 |
| Previous myocardial infarction | 25 (5.7) | 29 (6.6) | 0.60 |
| Previous congestive heart failure | 16 (3.7) | 12 (2.7) | 0.43 |

# Baseline Clinical Characteristics

| | PCI (N=438) | CABG (N=442) | P value |
|---|---|---|---|
| Chronic renal failure | 9 (2.1) | 7 (1.6) | 0.60 |
| Peripheral vascular disease | 15 (3.4) | 12 (2.7) | 0.54 |
| Chronic pulmonary disease | 8 (1.8) | 6 (1.4) | 0.58 |
| Clinical manifestation | | | 0.68 |
| Stable angina or asymptomatic | 210 (47.9) | 204 (46.2) | |
| Unstable angina | 185 (42.2) | 199 (45.0) | |
| Recent acute myocardial infarction | 43 (9.8) | 39 (8.8) | |
| Ejection fraction, % | 59.1 ± 8.5 | 59.9 ± 8.1 | 0.12 |
| Three vessel disease | 330 (75.3) | 349 (79.0) | 0.20 |
| EuroSCORE value | 2.9 ± 2.0 | 3.0 ± 2.1 | 0.55 |
| SYNTAX score value | 24.2 ± 7.5 | 24.6 ± 8.1 | 0.47 |

# Procedural Characteristics*

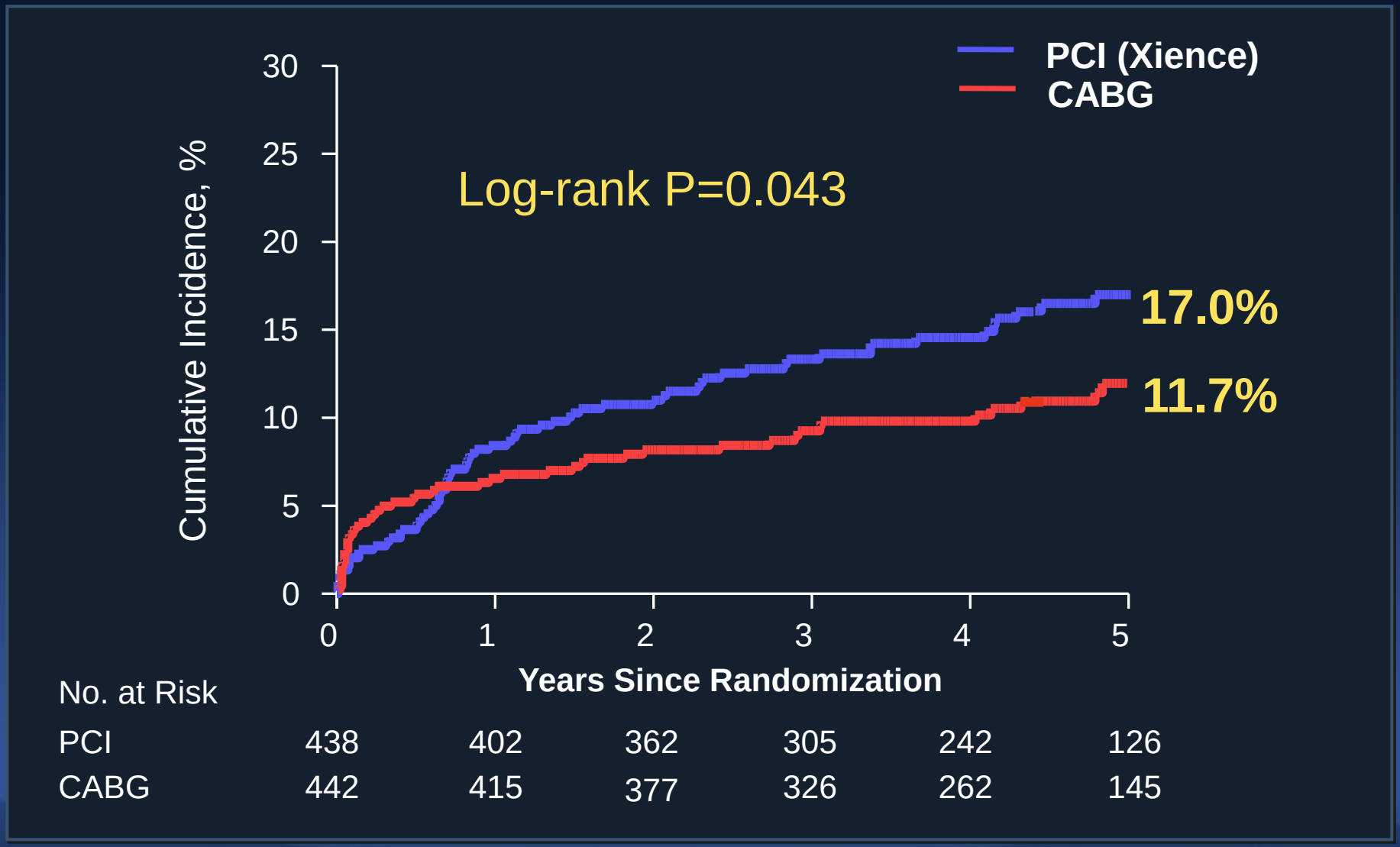
| | |
|---|---|
| **PCI** | 464 |
| Total stents number | 3.4 ± 1.4 |
| Total stent length, mm | 85.3 ± 38.2 |
| Mean stent diameter, mm | 3.1 ± 0.3 |
| IVUS guidance | 333 (71.8) |
| Complete revascularization | 236 (50.9)† |
| **CABG** | 401 |
| Total no. of grafted vessels | 3.1 ± 0.9 |
| Total no. of arterial grafts | 2.1 ± 1.1 |
| Total no. of vein grafts | 1.0 ± 0.8 |
| Left internal mammary artery graft | 398 (99.3) |
| Off-pump surgery | 258 (64.3) |
| Complete revascularization | 274/383 (71.5)† |

* Data were summarized according to the as-treated analysis

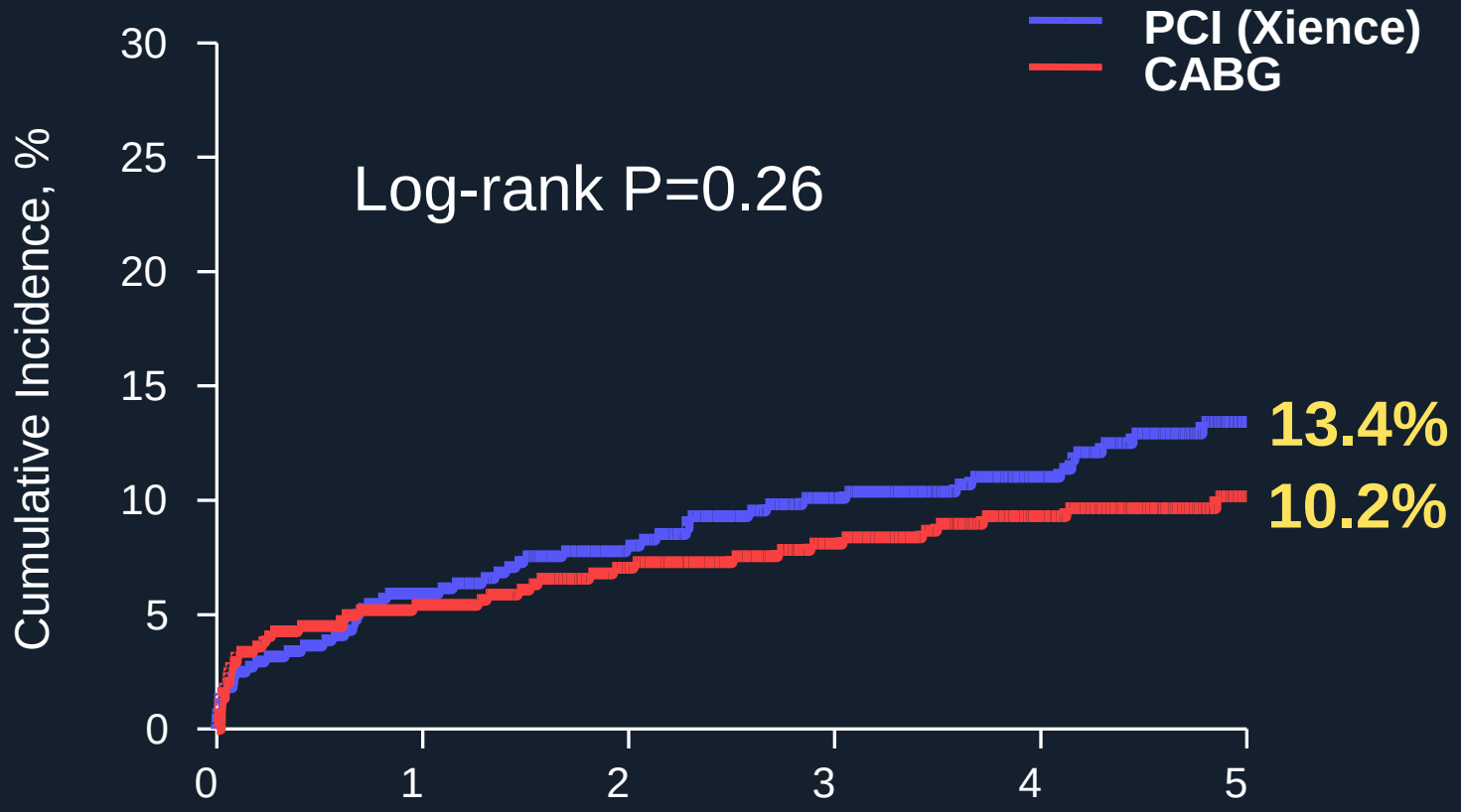
† P<0.05 between PCI and CABG group

# 5 Years Outcomes

# Primary End Point
## *Death, MI or TVR*



# Death, MI or Stroke

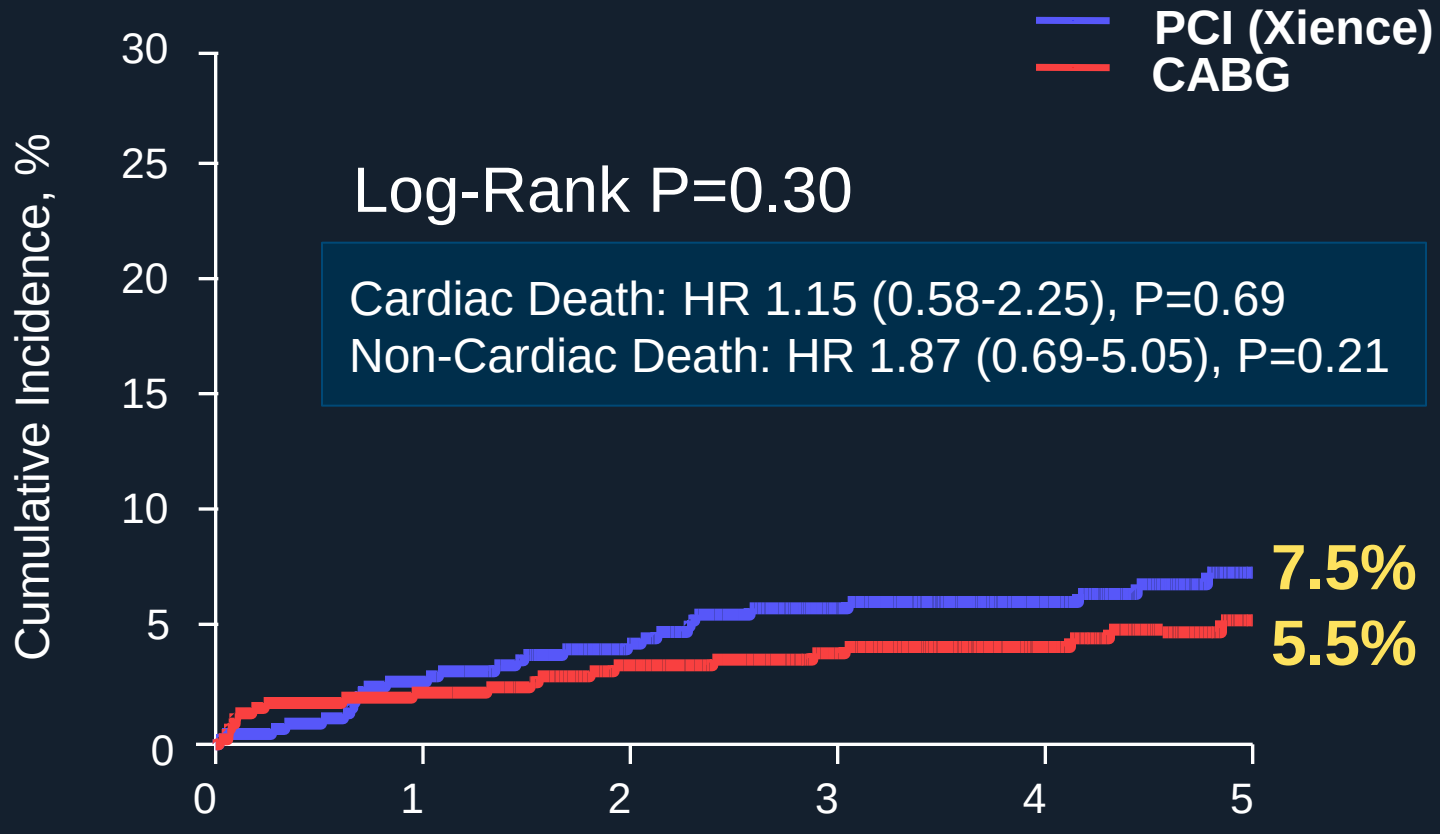



**No. at Risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| PCI | 438 | 413 | 373 | 318 | 255 | 133 |
| CABG | 442 | 419 | 381 | 329 | 263 | 144 |

Event rates were derived from Kaplan-Meier estimates

# Death

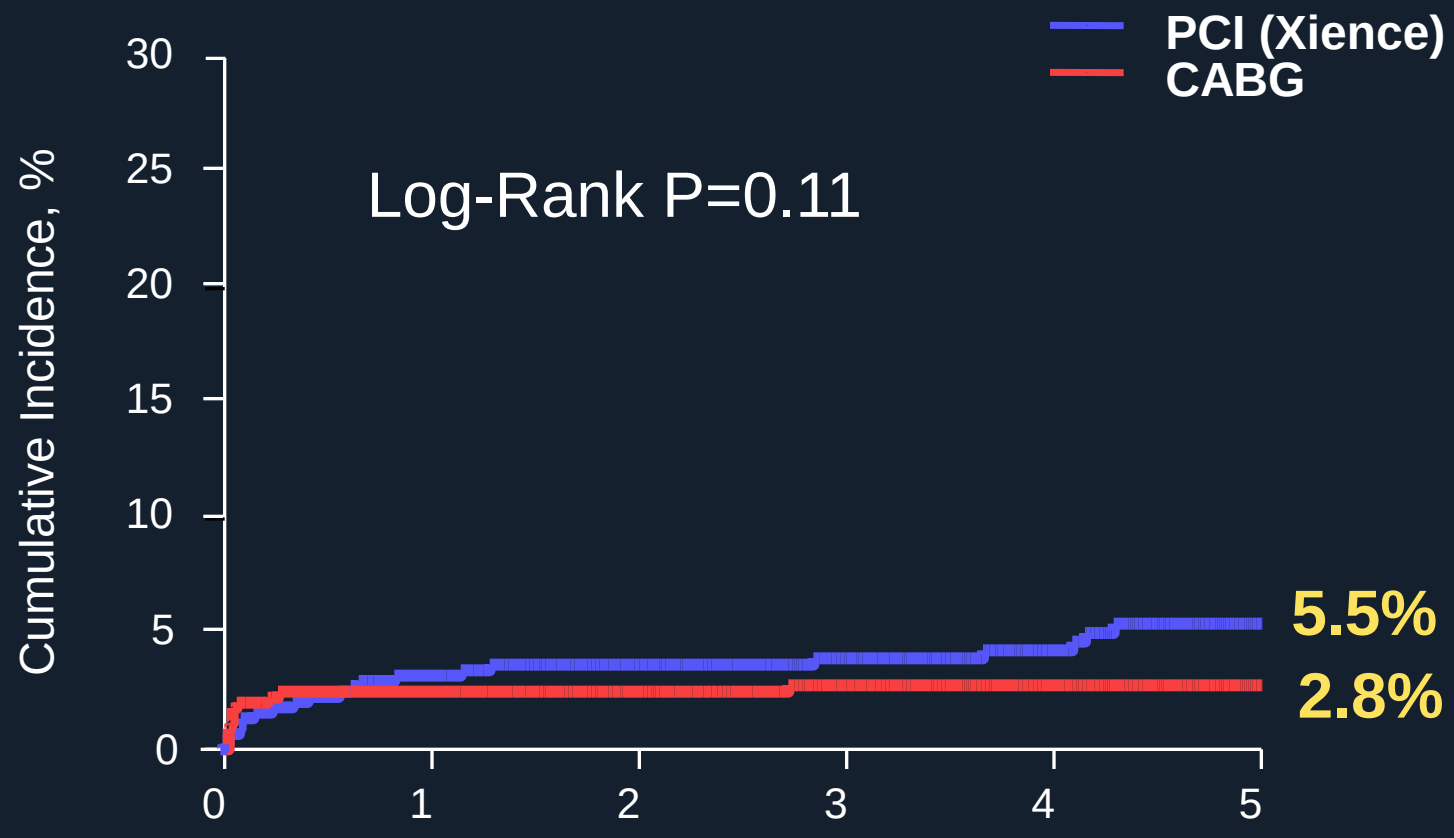



**No. at Risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| PCI | 438 | 426 | 387 | 333 | 268 | 146 |
| CABG | 442 | 433 | 397 | 346 | 278 | 154 |

Event rates were derived from Kaplan-Meier estimates

# Myocardial Infarction

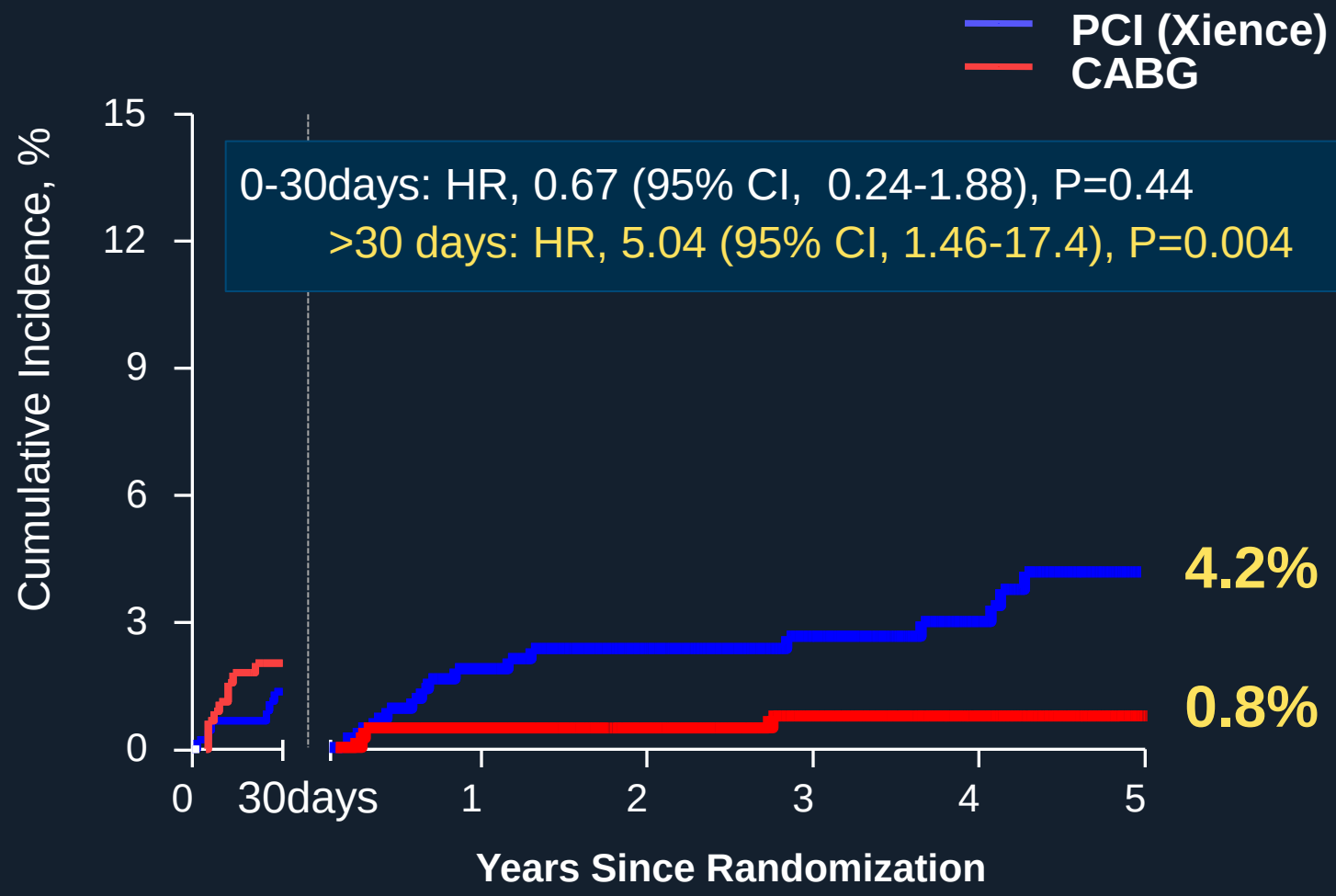



**No. at Risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| PCI | 438 | 419 | 382 | 325 | 261 | 140 |
| CABG | 442 | 422 | 386 | 335 | 271 | 151 |

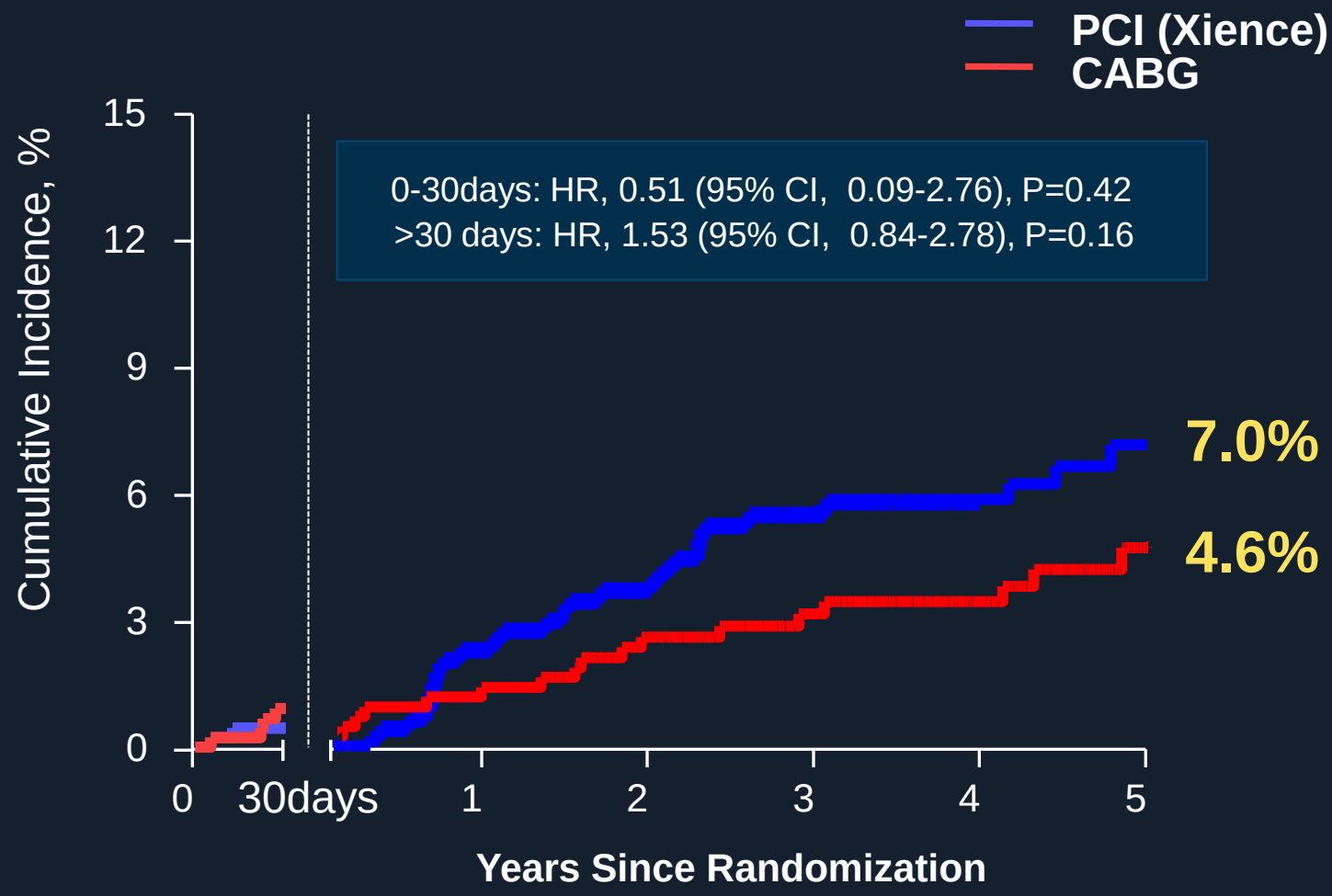
Event rates were derived from Kaplan-Meier estimates

# Land Mark Analysis of MI



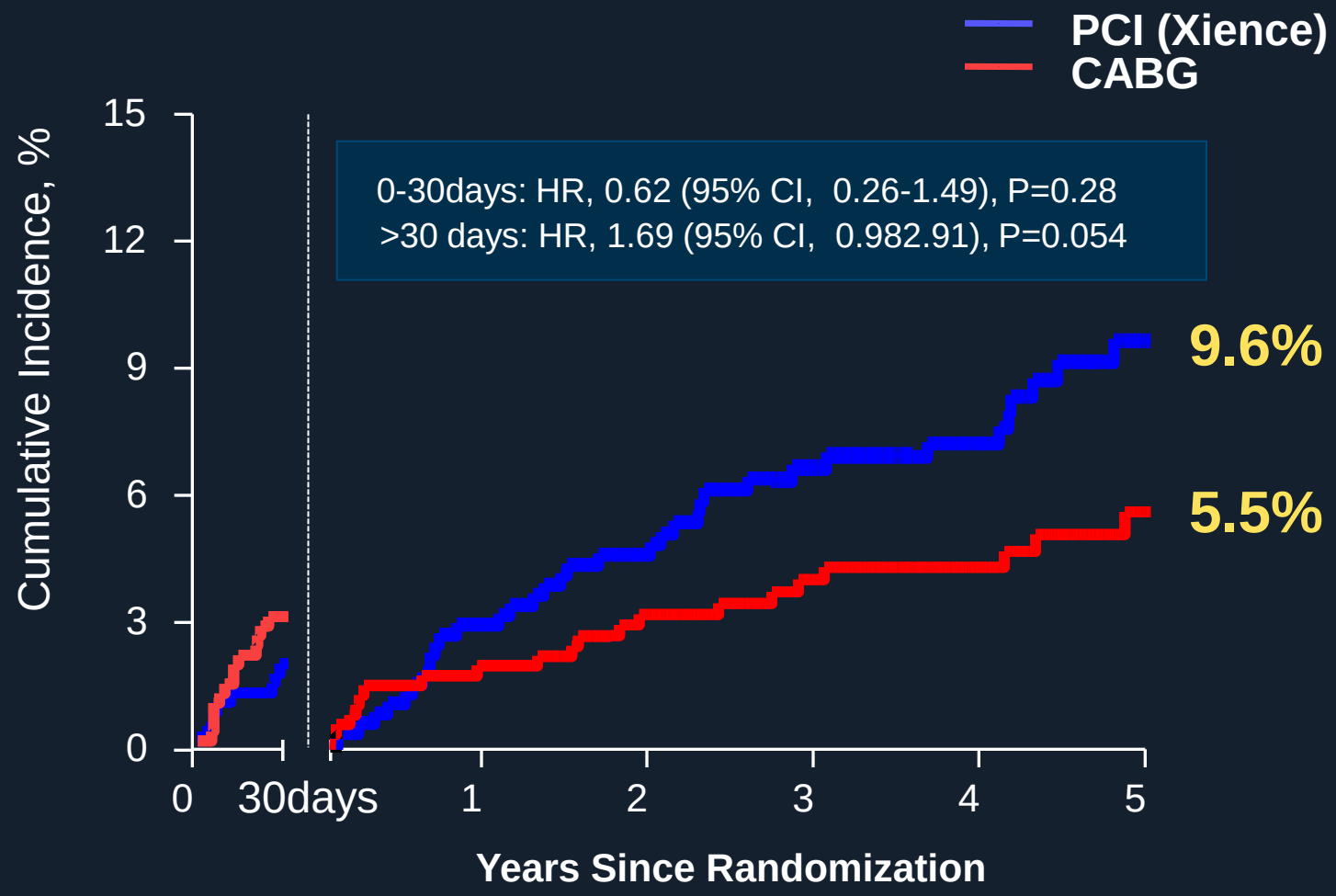

Event rates were derived from Kaplan-Meier estimates

# Land Mark Analysis of Death



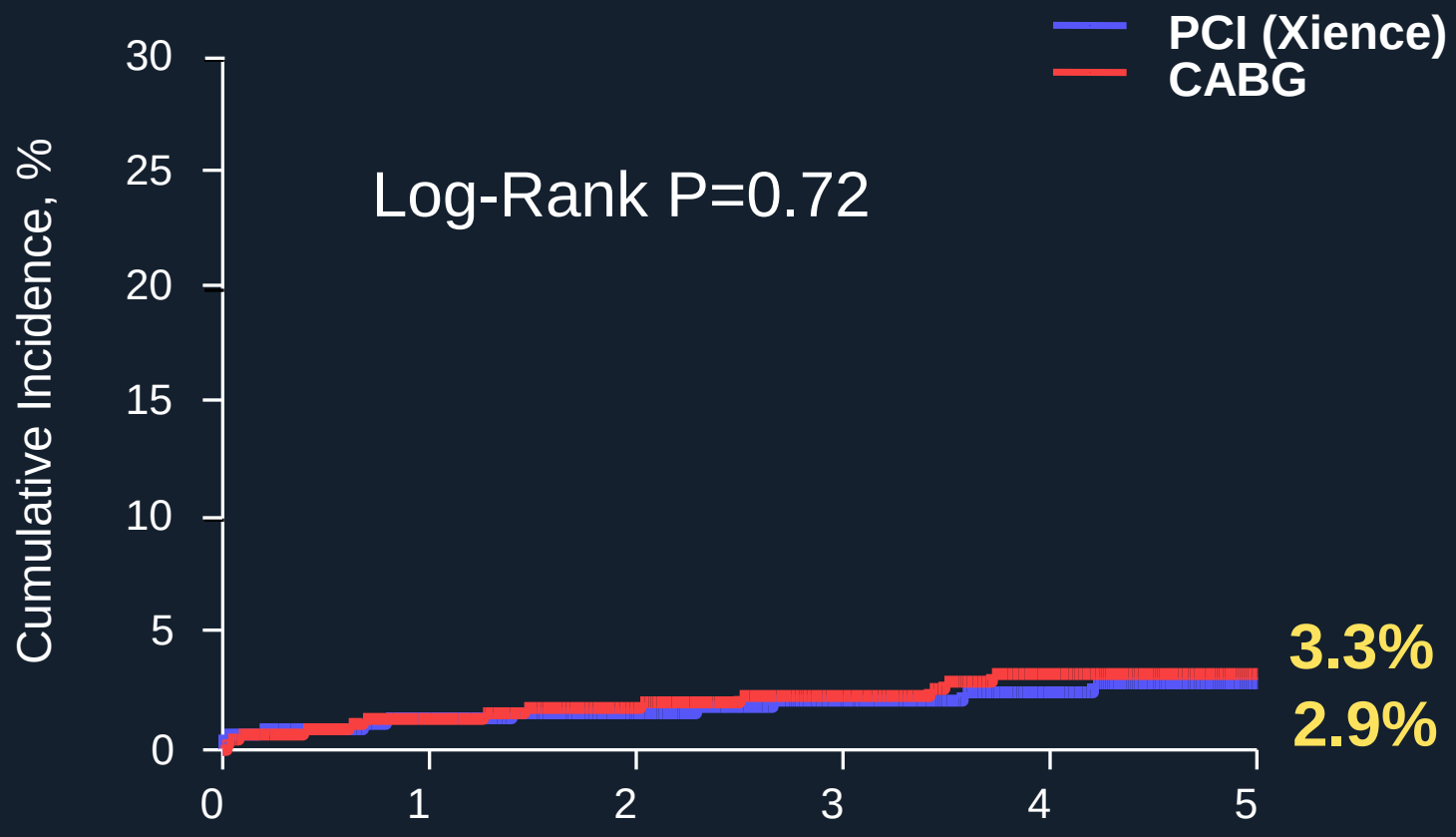

Event rates were derived from Kaplan-Meier estimates

# Land Mark Analysis of Death and MI




Event rates were derived from Kaplan-Meier estimates

# Stroke

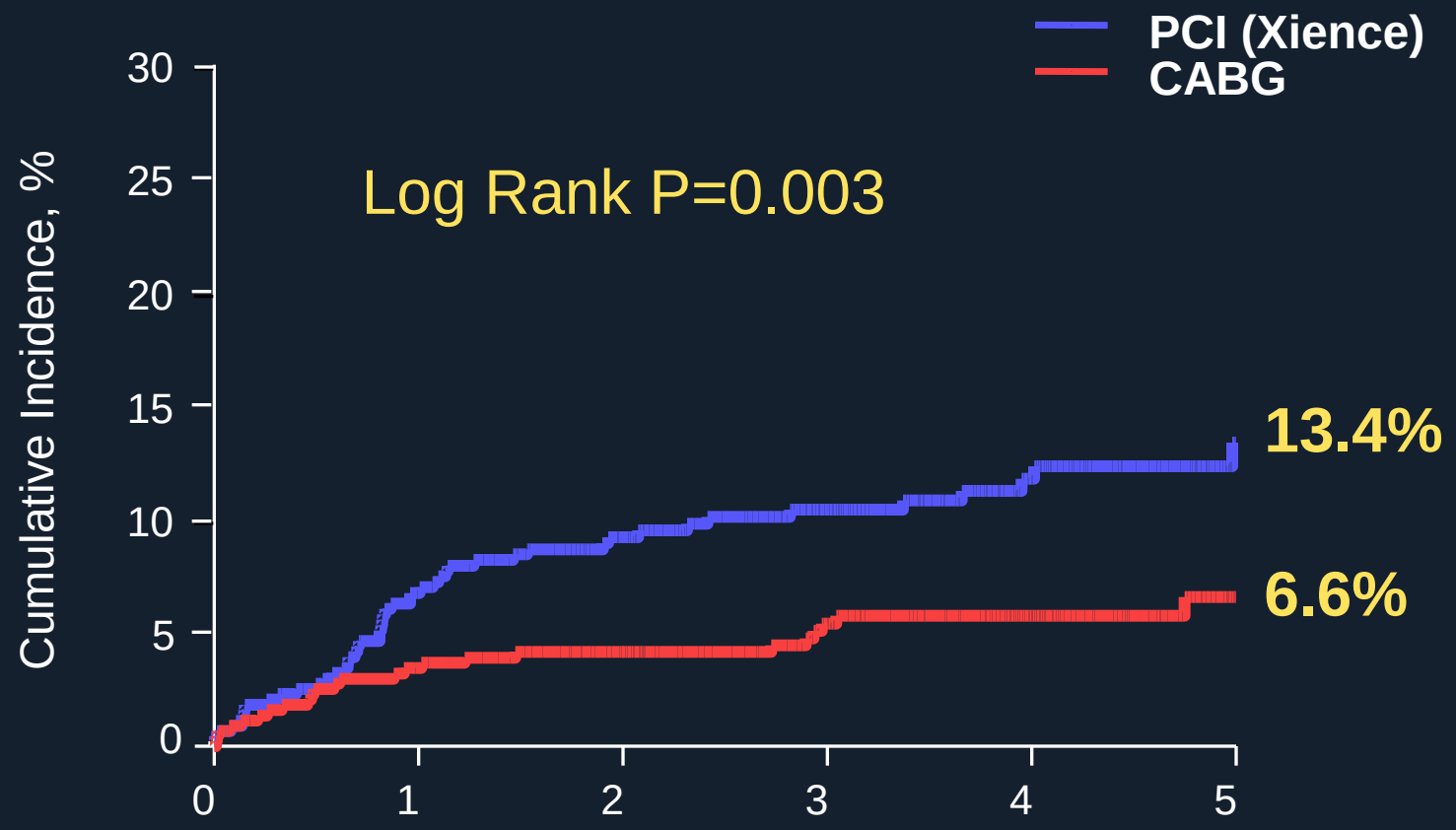



**No. at Risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| PCI | 438 | 421 | 383 | 326 | 262 | 140 |
| CABG | 442 | 427 | 389 | 338 | 271 | 152 |

Event rates were derived from Kaplan-Meier estimates

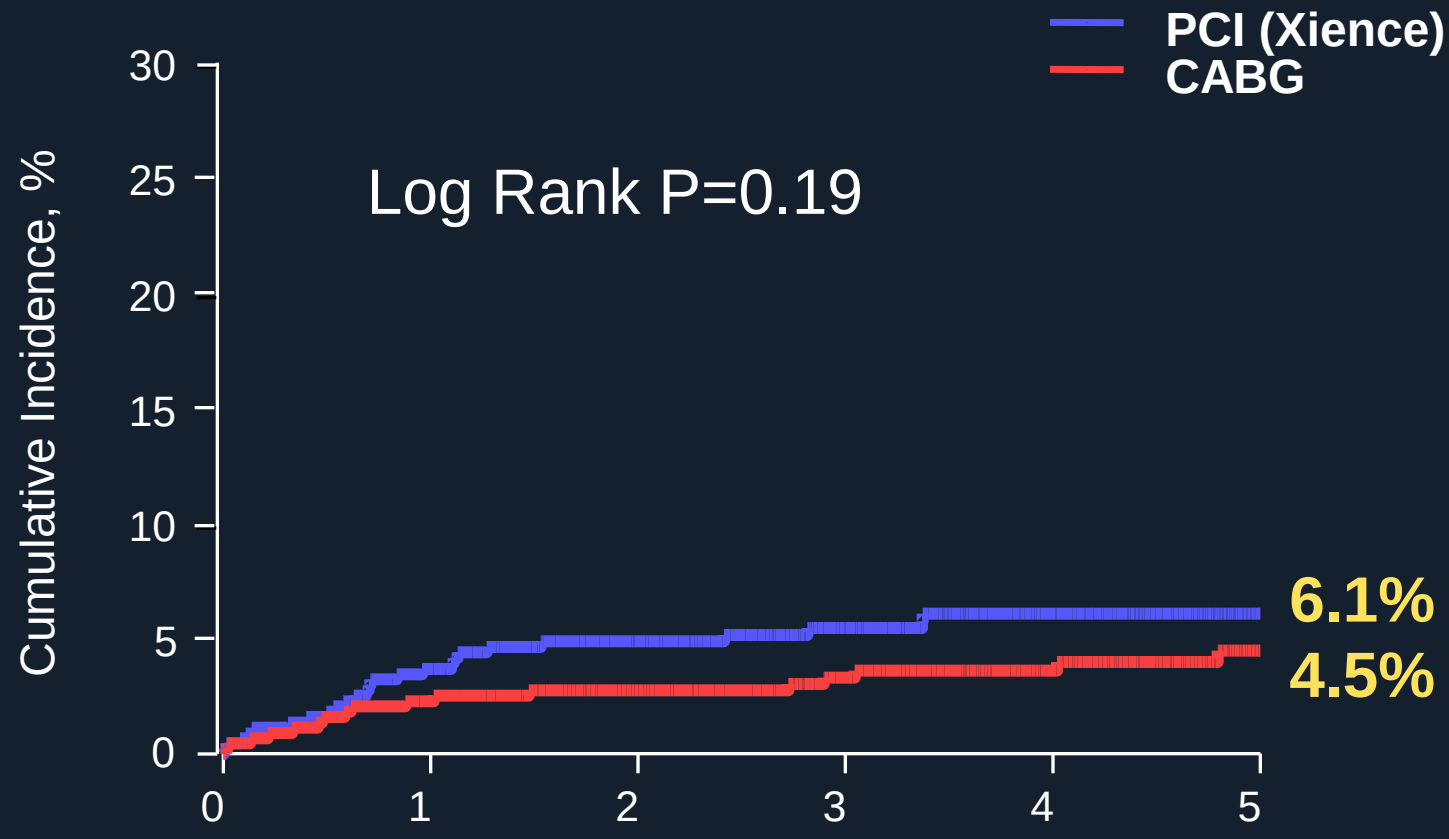
# Any Repeat Revascularization




| No. at Risk | | | | | | |
|---|---|---|---|---|---|---|
| PCI | 438 | 393 | 335 | 257 | 164 | 80 |
| CABG | 442 | 414 | 365 | 286 | 189 | 87 |

Event rates were derived from Kaplan-Meier estimates

# Target Lesion Revascularization

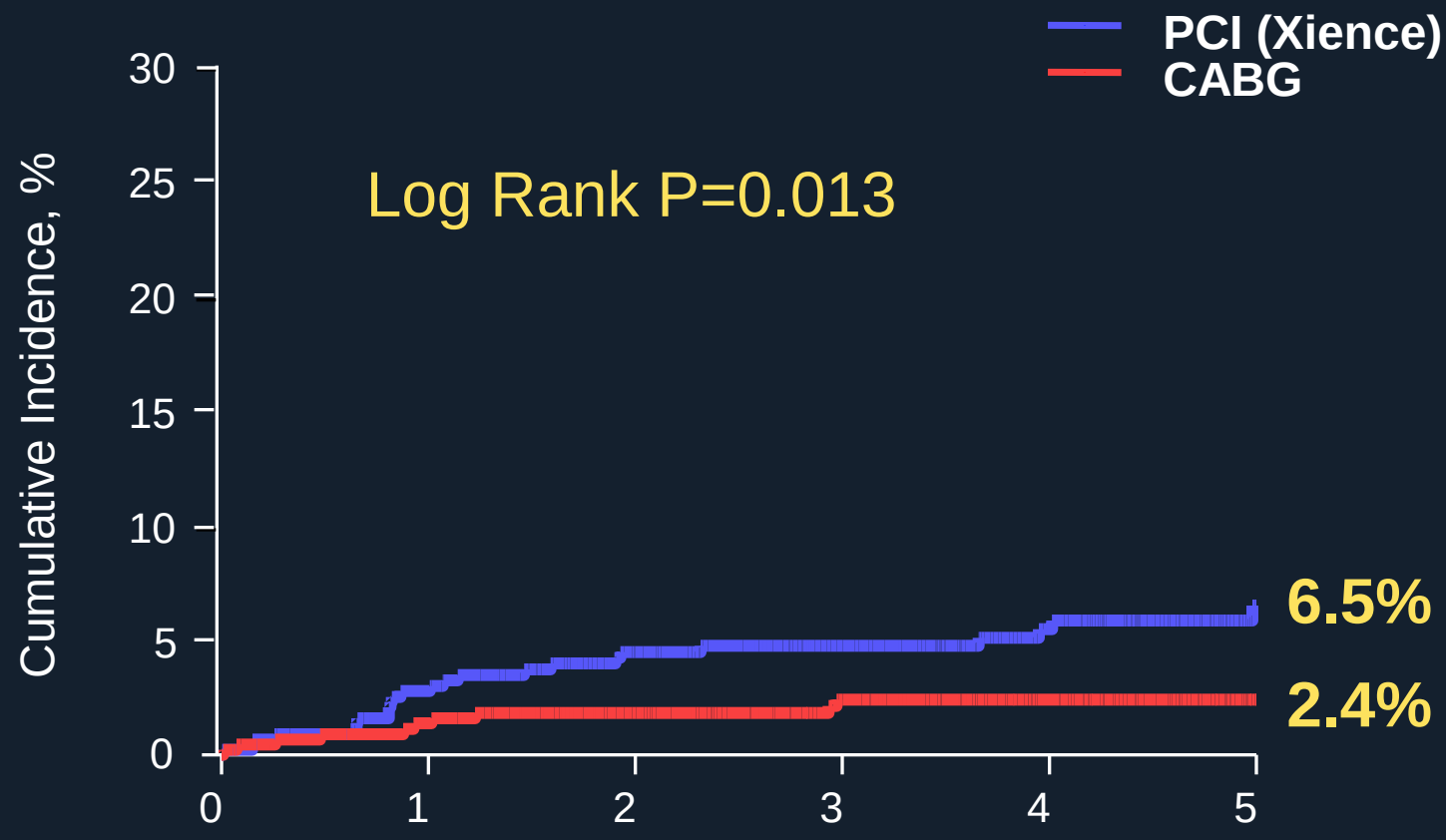



**No. at Risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| PCI | 438 | 408 | 365 | 310 | 247 | 130 |
| CABG | 442 | 424 | 386 | 334 | 267 | 147 |

Event rates were derived from Kaplan-Meier estimates

# New Lesion Revascularization



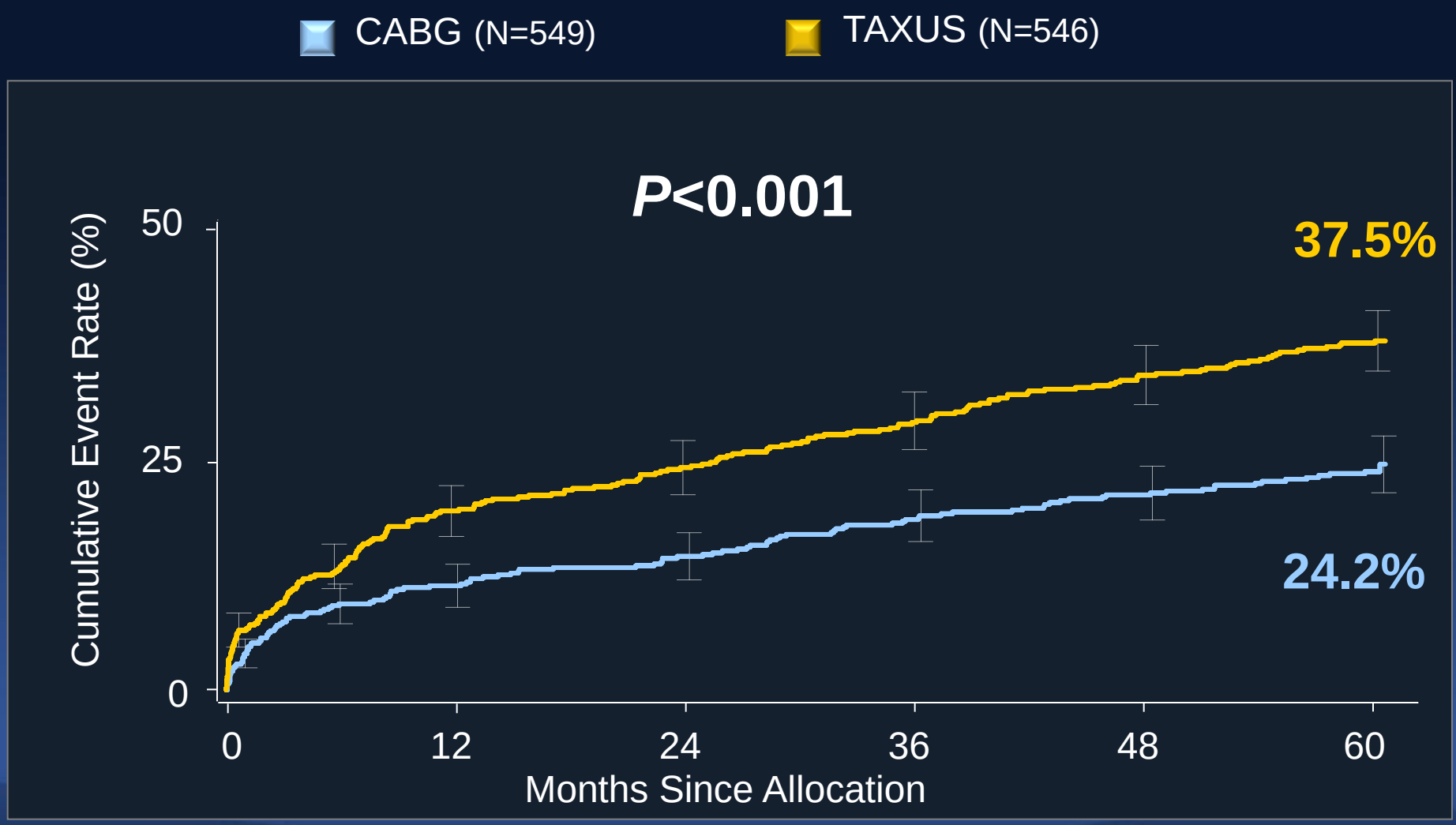

**No. at Risk**

| | | | | | | |
|---|---|---|---|---|---|---|
| PCI | 438 | 416 | 370 | 317 | 254 | 138 |
| CABG | 442 | 427 | 389 | 337 | 270 | 149 |

Event rates were derived from Kaplan-Meier estimates

***SYNTAX Primary End Point,***
***(Death, MI, Stoke or***
***Any Repeat Revascularization)***

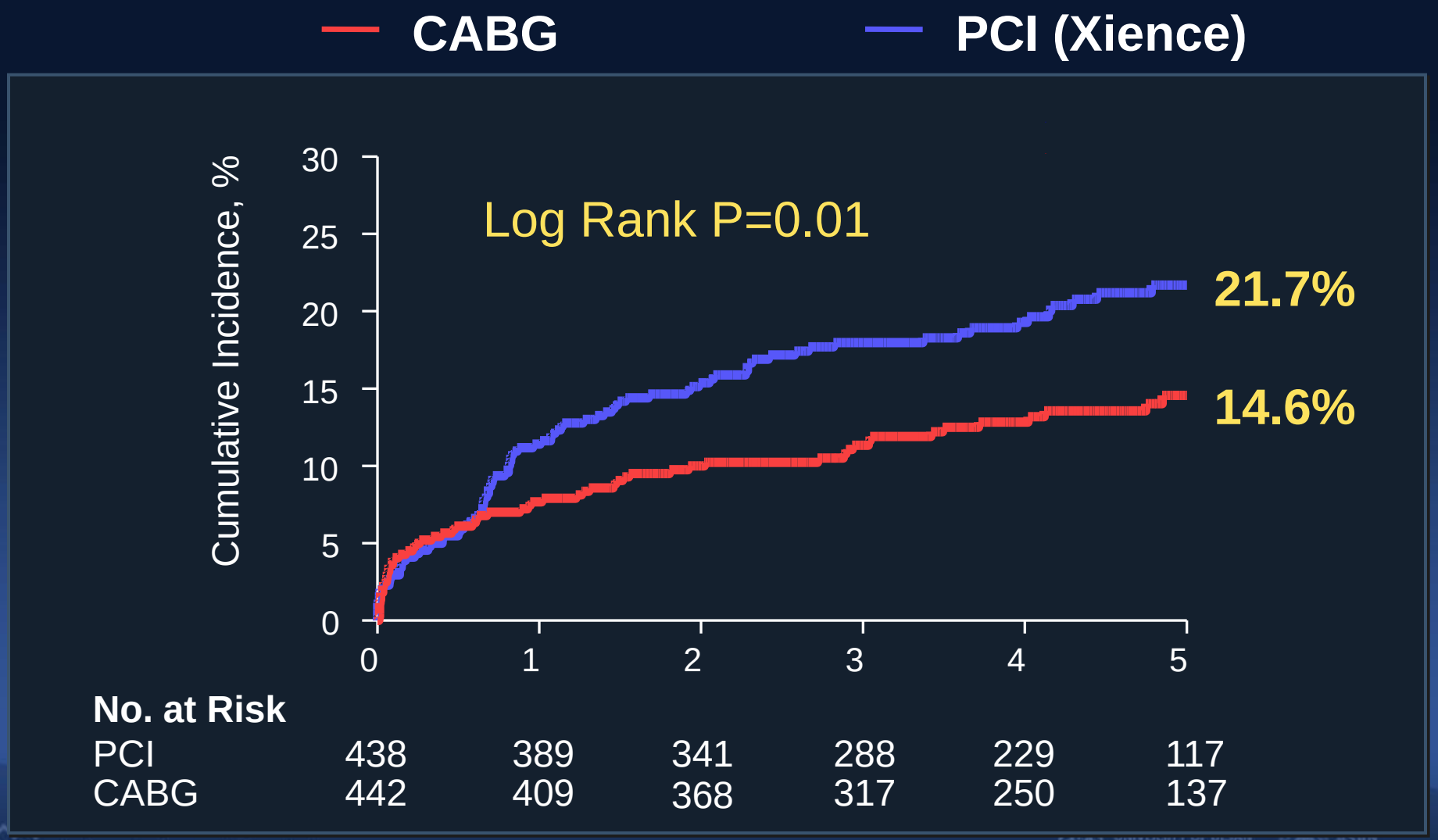
# Death, MI, Stroke or Any RR
## *SYNTAX*




Cumulative KM Event Rate ± 1.5 SE; log-rank *P* value;*Binary rates

ITT population

# Death, MI, Stroke or Any RR
## *BEST*




Event rates were derived from Kaplan-Meier estimates

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# *Same Messages from New York State Registry*

| | PCI with XIENCE | CABG | HR (95% CI) | P value |
|---|---|---|---|---|
| | N=9223 | N=9223 | | |
| Death at 3 year | 3.1 % | 2.86% | 1.04 (0.93-1.17) | 0.50 |
| Myocardial infarction | 1.87% | 1.13% | 1.51 (1.29-1.77) | <0.001 |
| Stoke | 0.72% | 0.97% | 0.62 (0.50-0.76) | <0.001 |
| Revascularization | 7.25% | 3.10% | 2.35 (2.14-2.58) | <0.001 |

Bangalore S et al. N Engl J Med 2015; 372:1213-1222

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ASAN Medical Center

# What We've Learned *from BEST and NY Registry*

## *CABG Is Still Better for MVD !*

## Even After New DES (Xience) Use.

Park SJ et al, NEJM. 2015; 372: 1204-1212

Bangalore S et al. N Engl J Med 2015; 372:1213-1222

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ASAN Medical Center

# Complete vs Incomplete *from New York Registry*

| | PCI | CABG | HR (95% CI) | P value |
|---|---|---|---|---|
| **Complete Revascularization** | N=1911 | N=1911 | | |
| Death at 3 year | 2.54 % | 2.50 % | 1.08 (0.82-1.42) | 0.58 |
| Myocardial infarction | 1.43% | 1.37% | 1.02 (0.71-1.47) | 0.93 |
| Stoke | 0.42% | 0.84% | 0.43 (0.24-0.75) | 0.003 |
| Revascularization | 5.46% | 3.40% | 1.55 (1.26-1.90) | <0.001 |
| **Incomplete Revascularization** | N=7312 | N=7312 | | |
| Death | 3.25% | 2.96% | 1.03 (0.91-1.17) | 0.63 |
| Myocardial infarction | 1.98% | 1.07% | 1.66 (1.39-1.98) | <0.001 |
| Stoke | 0.80% | 1.01% | 0.66 (0.52-0.83) | 0.0004 |
| Revascularization | 7.70% | 3.03% | 2.59 (2.34-2.88) | <0.001 |

# Complete vs Incomplete *from BEST Study*

| | PCI | CABG | HR (95% CI) | P value |
|---|---|---|---|---|
| **Complete Revascularization** | N=215 | N=295 | | |
| Death at 5 year | 7.0% | 4.4% | 1.50 (0.71-3.15) | 0.29 |
| Myocardial infarction | 2.3% | 3.1% | 0.75 (0.25-2.24) | 0.60 |
| Death, MI, or Stroke | 11.6% | 9.5% | 1.18 (0.69-2.02) | 0.55 |
| Any repeat revascularization | 6.5% | 3.4% | 1.89 (0.84-4.25) | 0.13 |
| MACCE | 16.7% | 12.2% | 1.34 (0.84-2.13) | 0.22 |
| **Incomplete Revascularization** | N=215 | N=122 | | |
| Death | 6.5% | 5.7% | 1.22 (0.49-3.02) | 0.68 |
| Myocardial infarction | 7.4% | 1.6% | 4.85 (1.11-21.1) | 0.036 |
| Death, MI, or Stroke | 12.6% | 9.0% | 1.52 (0.75-3.07) | 0.24 |
| Any Repeat Revascularization | 15.8% | 10.7% | 1.58 (0.83-3.00) | 0.16 |
| MACC | 23.7% | 16.4% | 1.59 (0.94-2.66) | 0.08 |

# What We've Learned *from BEST and NY Registry*

***Complete Revascularization Is Important Practical Issue !***

Park SJ et al, NEJM. 2015; 372: 1204-1212

Bangalore S et al. N Engl J Med 2015; 372:1213-1222

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# *Issue 2,*

## *Can We Make A Better* Clinical Outcomes *With Better Concept of PCI ?*

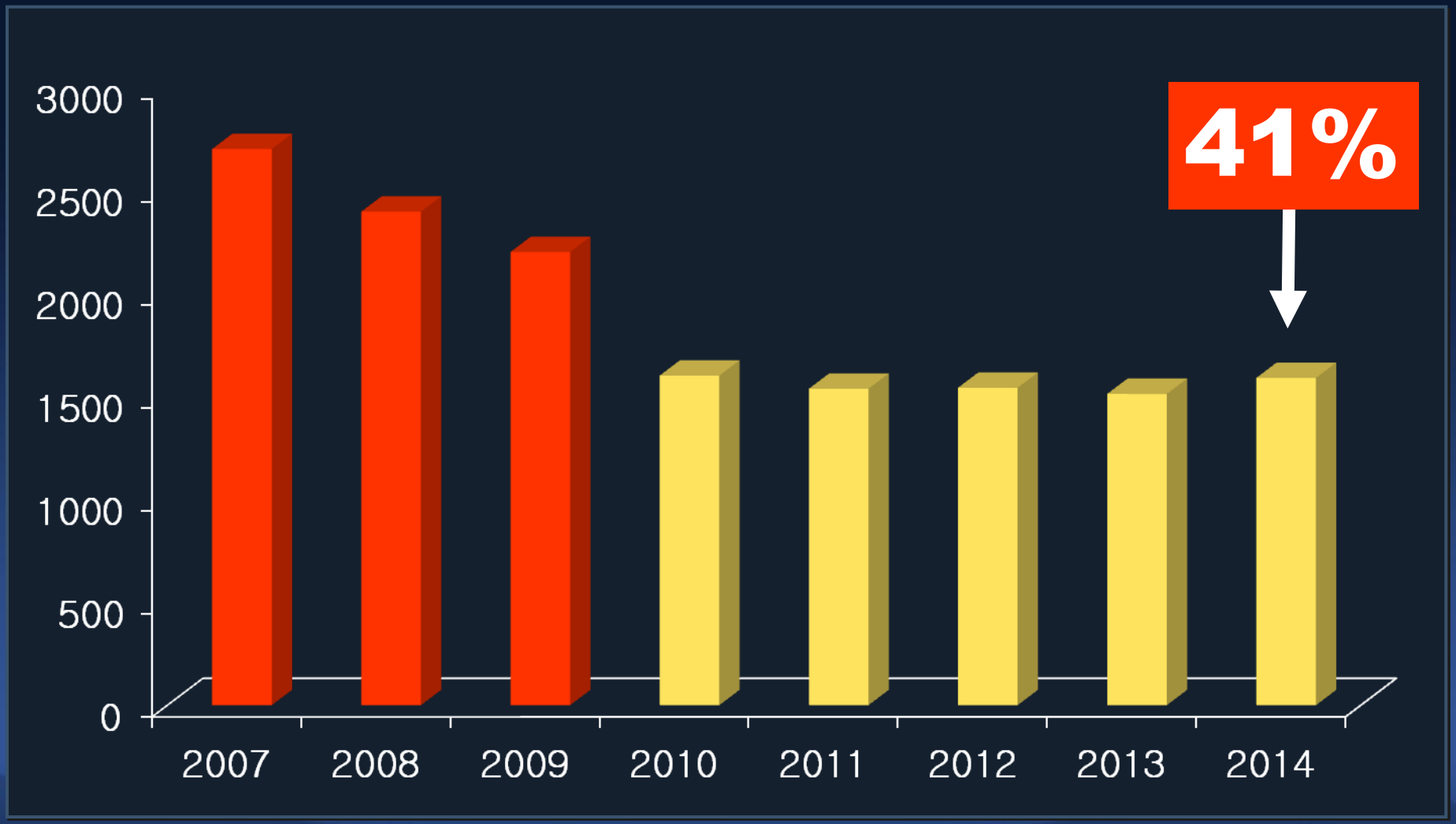
# Function vs. Morphology
## Impact of FFR on 3 VD

***Functionally,***
***ant***

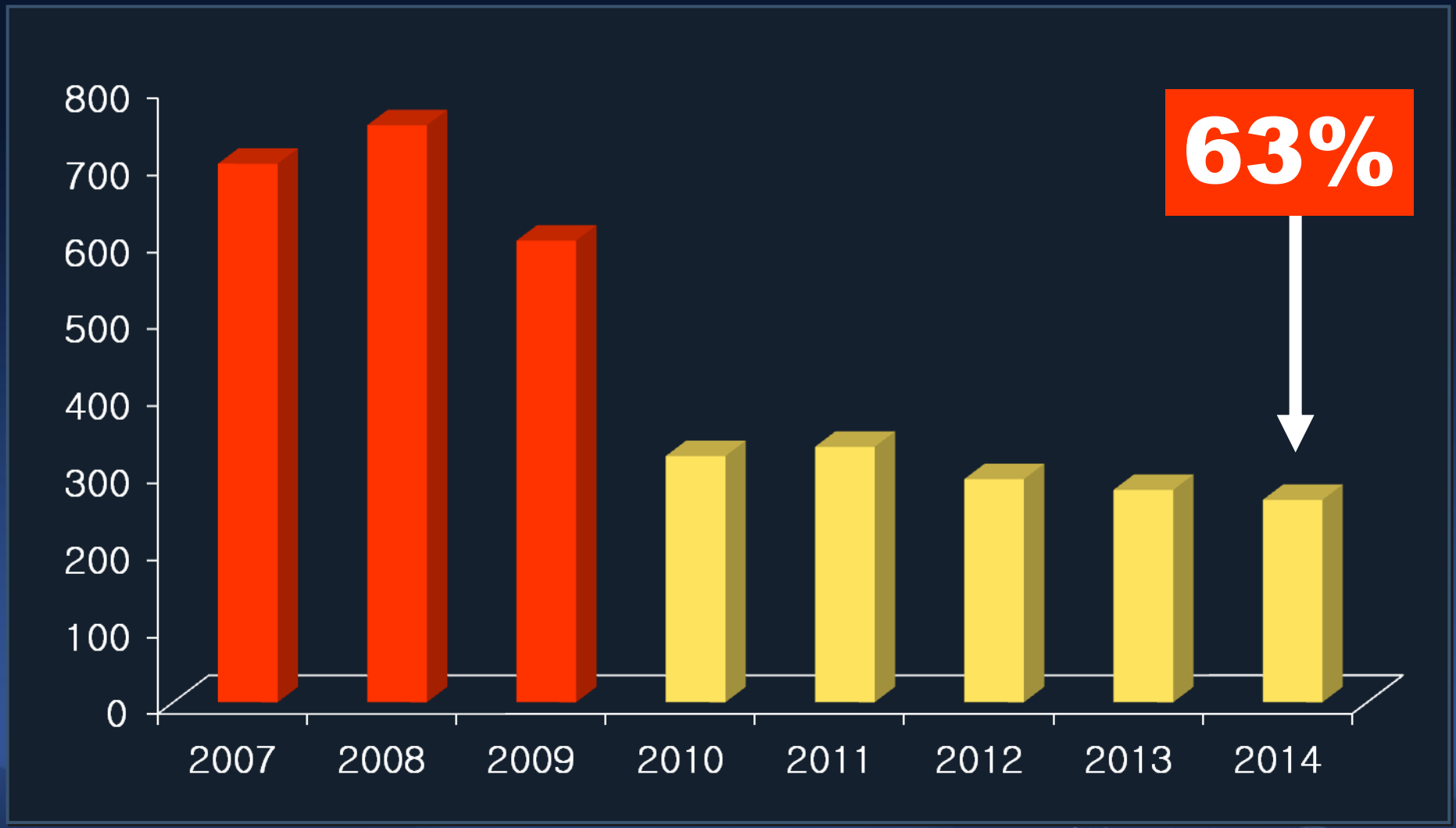
***Totally Different World !***
***Different Concept !***

Tonino et al, JACC 2010;55:2816-2821

# Number of *PCI Decreased*



# Number of *CABG Decreased*



# FAME3

**Patients with Angiographically 3 Vessel Disease without LM**

R

**FFR Guided PCI + OMT**

**CABG**

**Primary Endpoint at 2 years: Death + MI + Repeat R + Stroke**

PI ; William Fearon,MD

# PCI vs. CABG in Multi-Vessel Disease, *2015*

*We need absolutely new data, about the future role of PCI and CABG in functionally, significant multi-vessel disease.*

# Thank You !!

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