Instituto de Ensino e Pesquisa HCor

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Duke Clinical Research Institute

BCRI Brazilian Clinical Research Institute

A Multifaceted Intervention to Narrow the Evidence-Based Gap in the Treatment of Acute Coronary Syndromes:

THE BRIDGE-ACS TRIAL

Presenter:
Otavio Berwanger (MD; PhD) on Behalf of the BRIDGE-ACS Steering Committe

Sponsor: Ministry of Health-Brazil

Conflicts of Interest

Presenter: **Otávio Berwanger**

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FINANCIAL DISCLOSURE:

None to declare

Trial Organization

Trial Steering Committee

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Background and Rationale

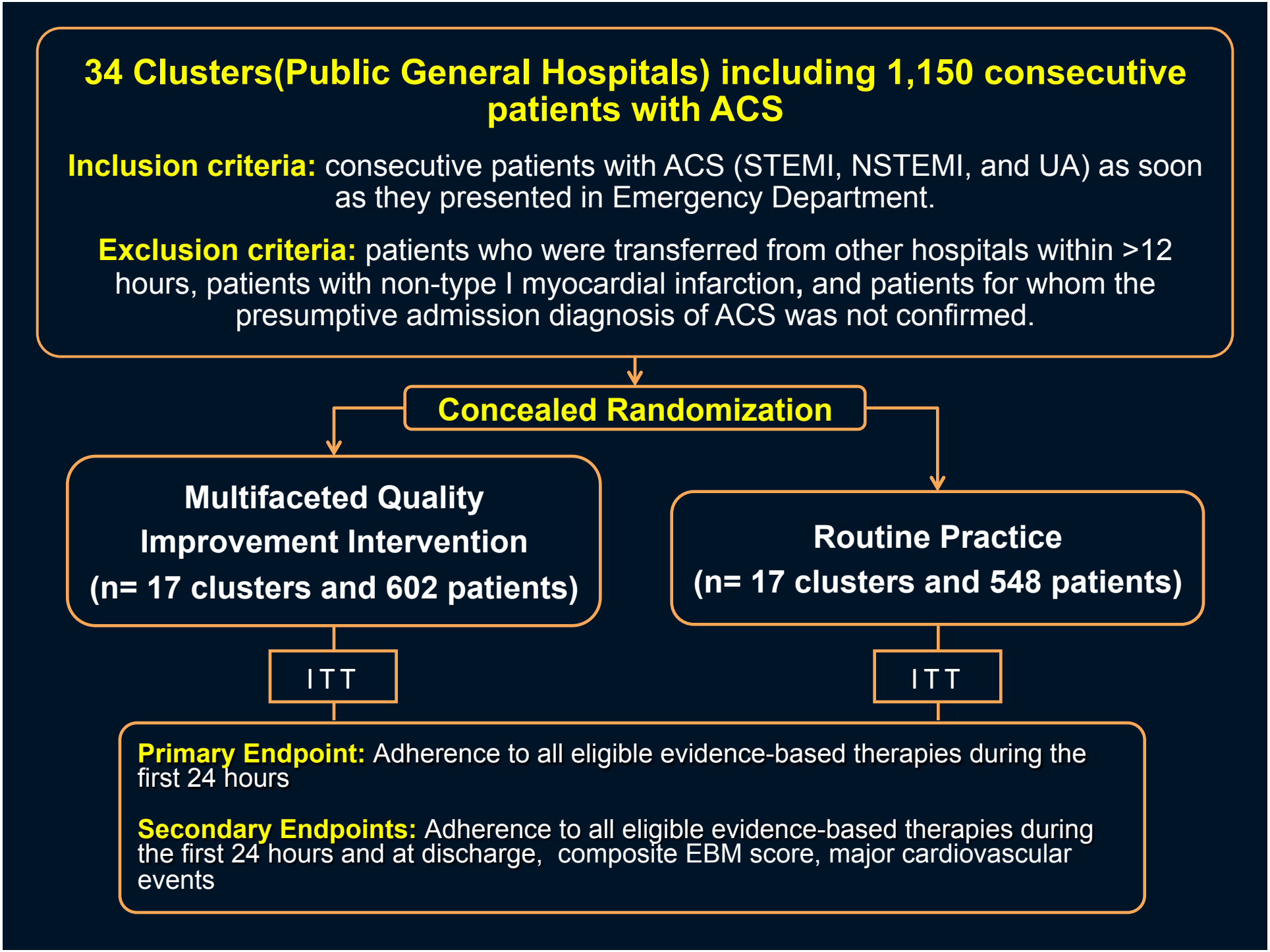
- Large-scale randomized trials have established the efficacy of several interventions for the management of patients with ACS
- Registries have consistently demonstrated that the translation of research findings into practice is suboptimal and that these care gaps are even greater in low- and middle-income countries
- QI interventions have rarely been rigorously evaluated, especially in low- and middle-income countries, where up to 80% of the global burden of cardiovascular diseases resides

THE BRIDGE-ACS TRIAL

- **Design:** **Pragmatic Cluster Randomized Trial**
- **Prevention of Bias:**
  - Concealed allocation (central web-based randomization) and Intention-to-treat analysis
  - Blinding of outcome assessors
- **Quality control:** **on-site monitoring + central statistical checking + e-CRF + central adjudication of eligibility criteria and endpoints**
- **Sample Size:** **1,150* patients from 34 clusters(public hospitals) in Brazil recruited between March and November 2011**

* Original Target Sample Size: 1020

Berwanger O et al, AHJ, 2012

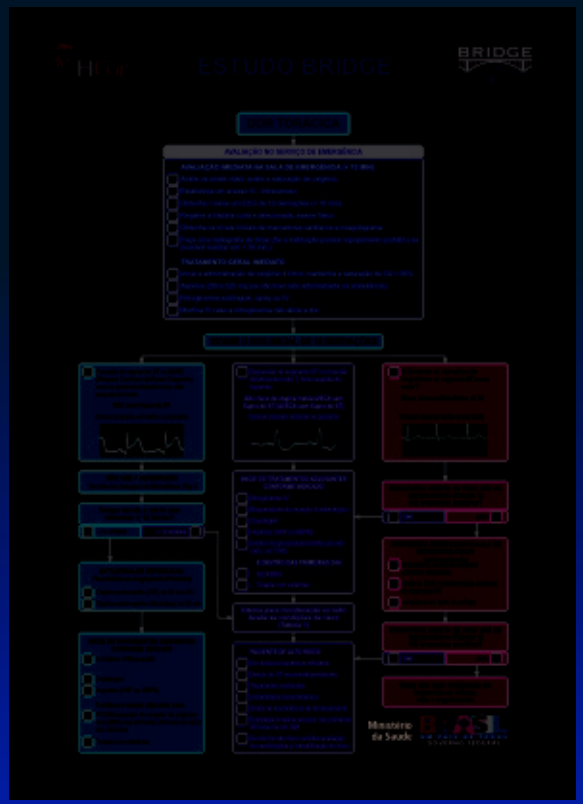

34 Clusters(Public General Hospitals) including 1,150 consecutive patients with ACS
Inclusion criteria: consecutive patients with ACS (STEMI, NSTEMI, and UA) as soon as they presented in Emergency Department.
Exclusion criteria: patients who were transferred from other hospitals within >12 hours, patients with non-type I myocardial infarction, and patients for whom the presumptive admission diagnosis of ACS was not confirmed.
Concealed Randomization
Multifaceted Quality Improvement Intervention (n= 17 clusters and 602 patients)
Routine Practice (n= 17 clusters and 548 patients)
ITT
ITT
Primary Endpoint: Adherence to all eligible evidence-based therapies during the first 24 hours
Secondary Endpoints: Adherence to all eligible evidence-based therapies during the first 24 hours and at discharge, composite EBM score, major cardiovascular events

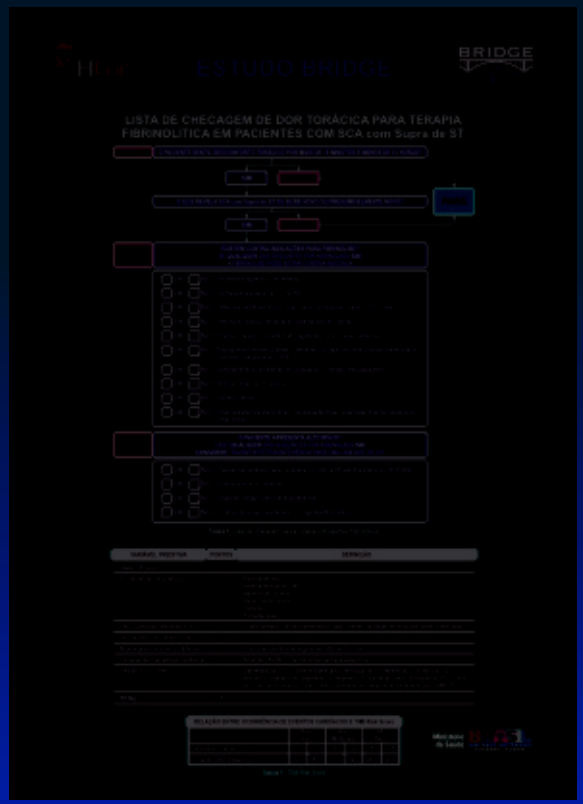
Multifaceted Quality Improvement Intervention

"Chest Pain" Label

Checklist

The multifaceted quality improvement intervention included reminders, a checklist, case management, and educational materials (pocket guidelines, posters and a interactive website).





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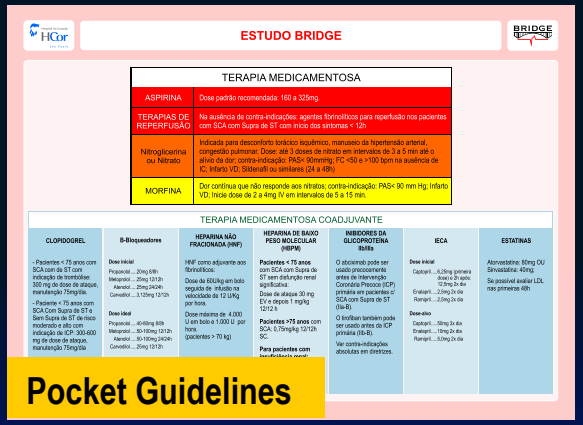
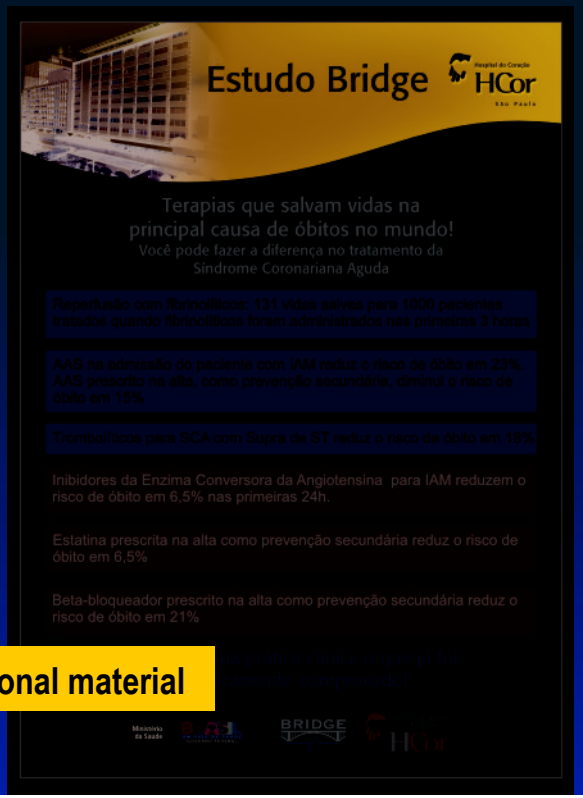


Pocket Guidelines

Case Manager



Educational material

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Endpoints

- Primary endpoint
  - Adherence to all evidence-based therapies (aspirin, clopidogrel; anticoagulation therapy and statins) during the first 24 hours in patients without contraindications
- Secondary endpoints
  - Adherence to all evidence-based therapies at admission and within one week of discharge (aspirin, clopidogrel, anticoagulation and statins during the first 24 hours and aspirin, beta-blockers, statins, and angiotensin-converting enzyme inhibitors at discharge)
  - Composite adherence score (CRUSADE endpoint)
  - Major cardiovascular events (CV mortality, non-fatal MI, Non-fatal stroke and non-fatal cardiac arrest)
  - All-cause mortality
  - Major bleeding

Statistical Analysis

- All analyses followed the intention-to-treat principle
- Comparisons between intervention and control groups were conducted using a generalized estimation equation (GEE) extension of logistic regression procedures for cluster-randomized trials
- Effects were expressed as a population average odds ratio (OR_{PA}) and 95% CIs
- Analyses were performed by the HCOR Research Institute (São Paulo, Brazil) and validated by the Duke Clinical Research Institute (Durham, NC)

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Patient Baseline Characteristics

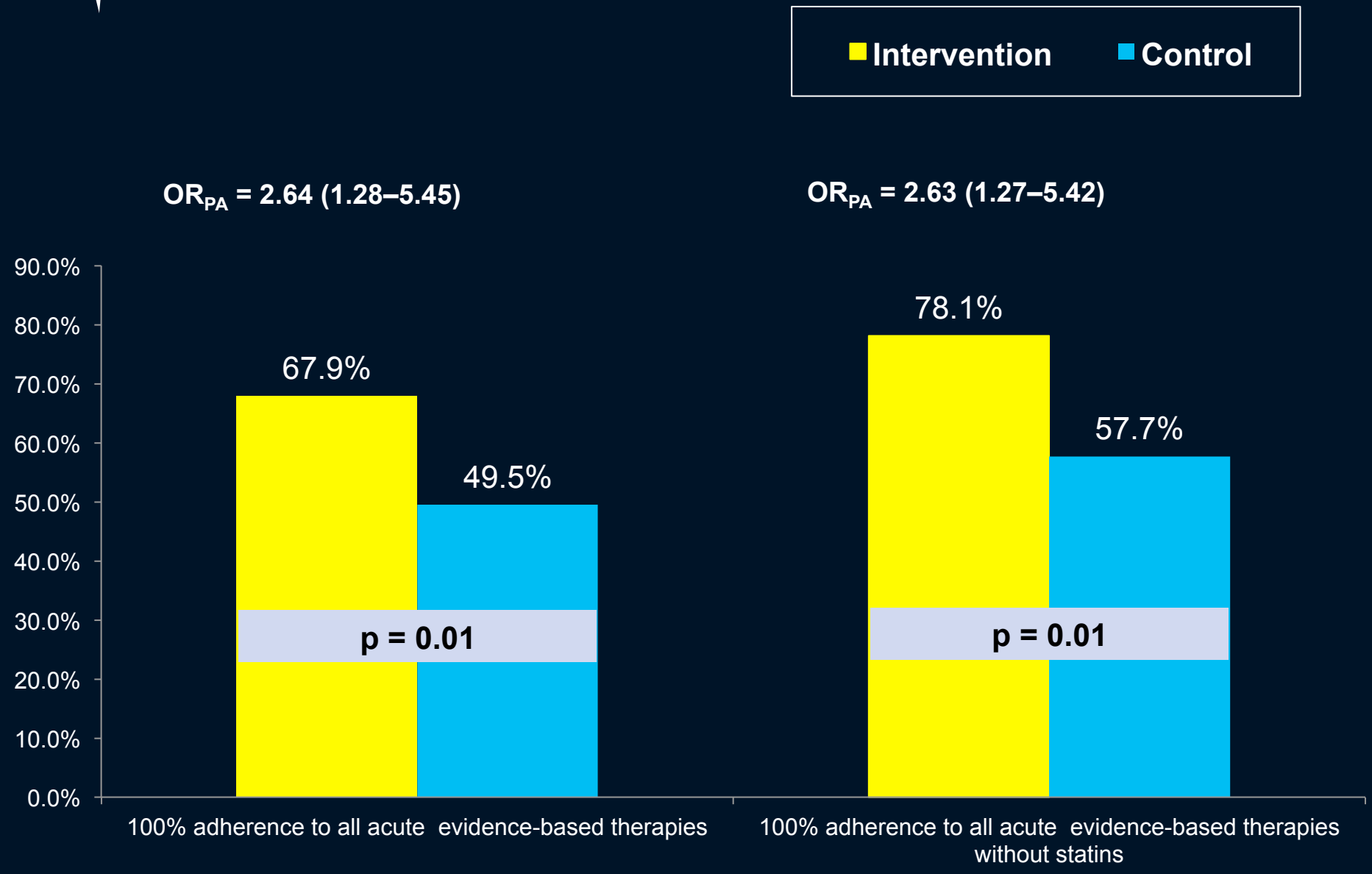
Patient Baseline Characteristics	Intervention (n=602)	Control (n=548)
Male, no. (%)	413 (68.6)	376 (68.6)
Age, mean±SD, yrs	62±13	62±13
Diabetes, no. (%)	175 (29.1)	182 (33.2)
Hypertension, no. (%)	433 (71.9)	402 (73.4)
Dyslipidemia, no. (%)	216 (35.9)	162 (29.6)
Current smoker, no. (%)	187 (31.1)	147 (26.8)
Family history of coronary artery disease, no. (%)	242 (40.2)	242 (44.2)
Angina, no. (%)	243 (40.4)	177 (32.3)
Renal failure, no. (%)	31 (5.1)	24 (4.4)
Previous myocardial infarction, no. (%)	146 (24.3)	121 (22.1)
Previous percutaneous coronary intervention, no. (%)	91 (15.1)	88 (16.1)
Cerebrovascular disease, no. (%)	53 (8.8)	48 (8.8)
Previous coronary artery bypass graft, no. (%)	57 (9.5)	34 (6.2)
Use of aspirin in the last month, no. (%)	197 (32.7)	178 (32.5)
Final diagnosis, no. (%)		
ST-elevation myocardial infarction	232 (38.5)	236 (43.1)
Non-ST-elevation myocardial infarction	230 (38.2)	180 (32.8)
Unstable angina	140 (23.3)	132 (24.1)

Cluster Baseline Characteristics

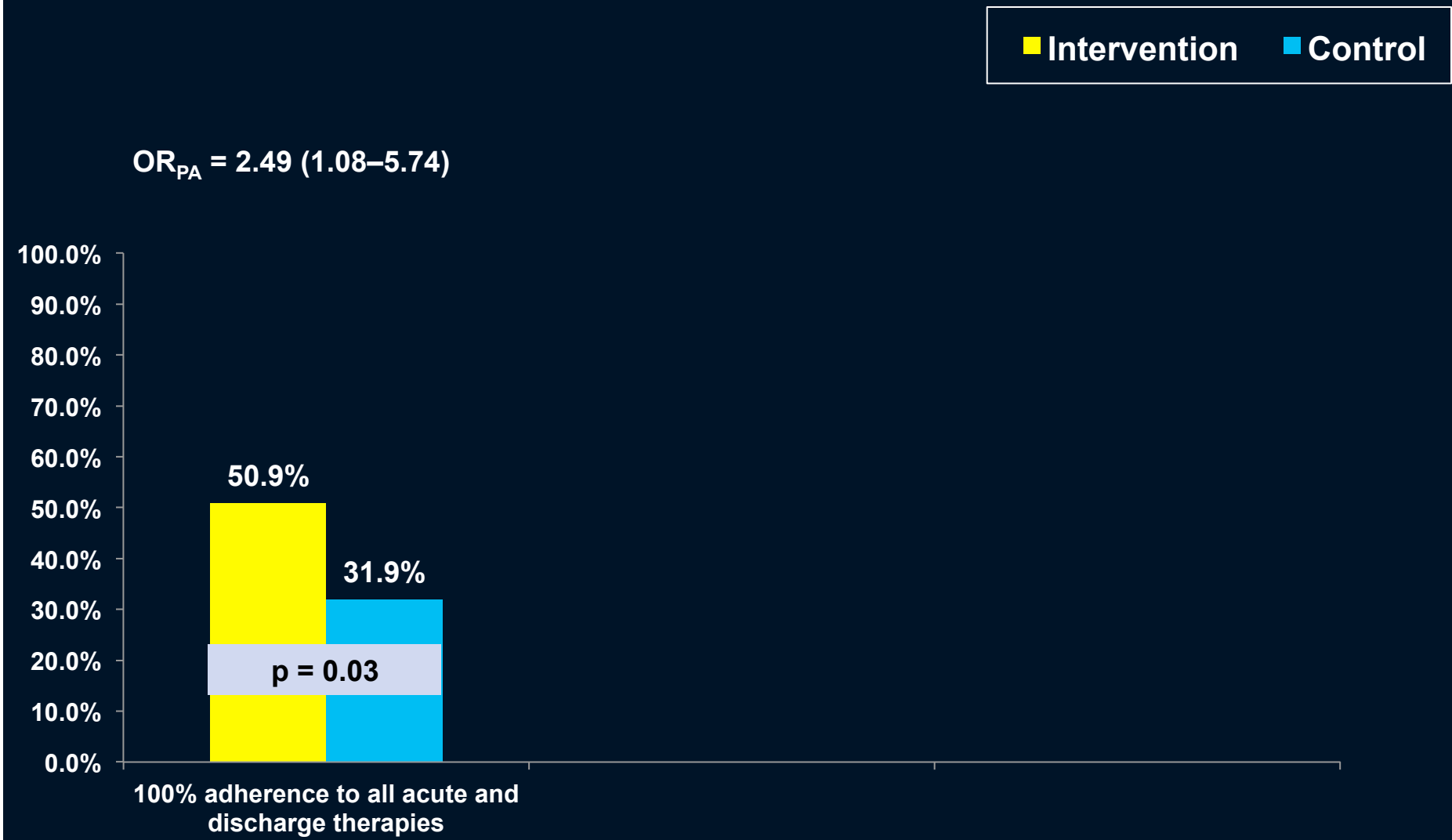
Cluster Baseline Characteristics	Intervention (n=17)	Control (n=17)
Cardiologist available at ED[1], no. (%)	12 (70.6)	12 (70.6)
Cardiac surgery team available 24 hours, no. (%)	6 (35.3)	7 (41.2)
Percutaneous coronary intervention capabilities, no. (%)	7 (41.2)	7 (41.2)
Coronary care unit, no. (%)	10 (58.8)	9 (52.9)
Teaching hospital, no. (%)	14 (82.4)	13 (76.5)
Chest pain protocol at ED[1], no. (%)	13 (76.5)	11 (64.7)
Prior participation on multicenter clinical trial, no. (%)	8 (47.1)	7 (41.2)
Volume of patients seen in the ED[1] per month, median (25th, 75th)	4537 (2698, 13485)	4175 (1000, 10500)
Number of beds (coronary care unit), median (25th, 75th)	8 (7, 10)	9 (7, 10)

[1]Emergency department

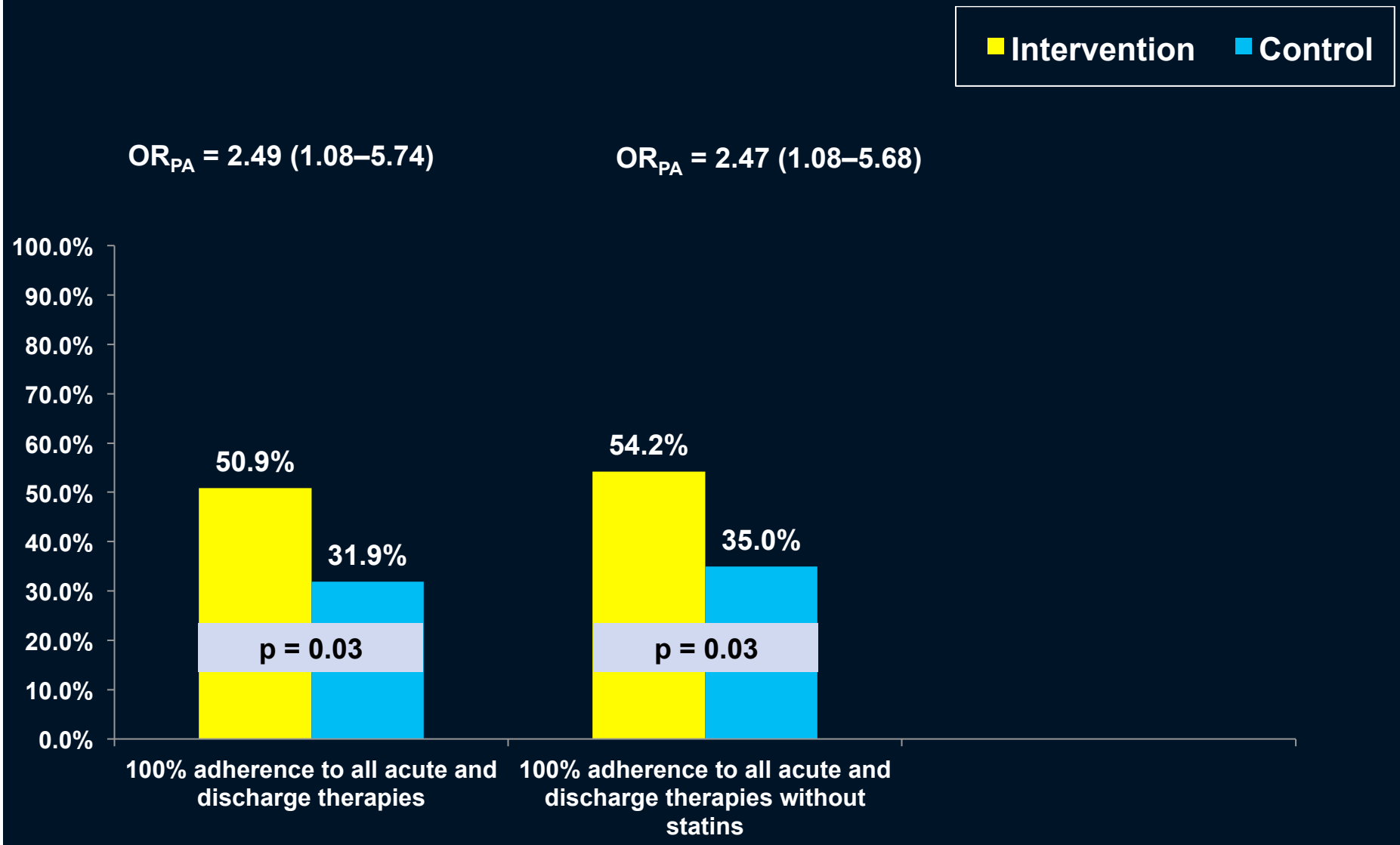
Results


Intervention
Control
OR_{PA} = 2.64 (1.28–5.45)
OR_{PA} = 2.63 (1.27–5.42)
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
67.9%
49.5%
p = 0.01
78.1%
57.7%
p = 0.01
100% adherence to all acute evidence-based therapies
100% adherence to all acute evidence-based therapies without statins

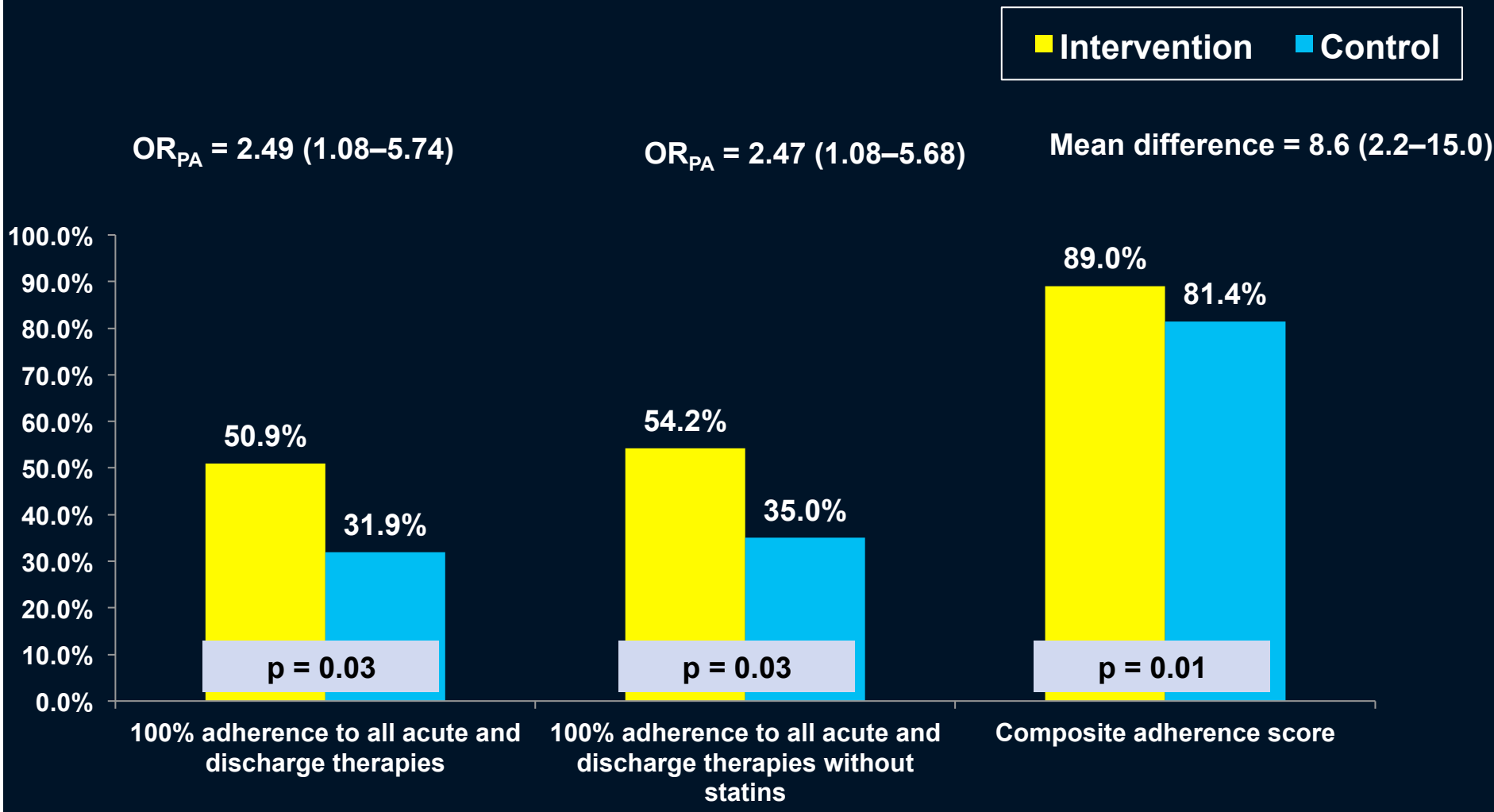
Results


Intervention
Control
OR_{PA} = 2.49 (1.08–5.74)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
50.9%
31.9%
p = 0.03
100% adherence to all acute and discharge therapies

Results

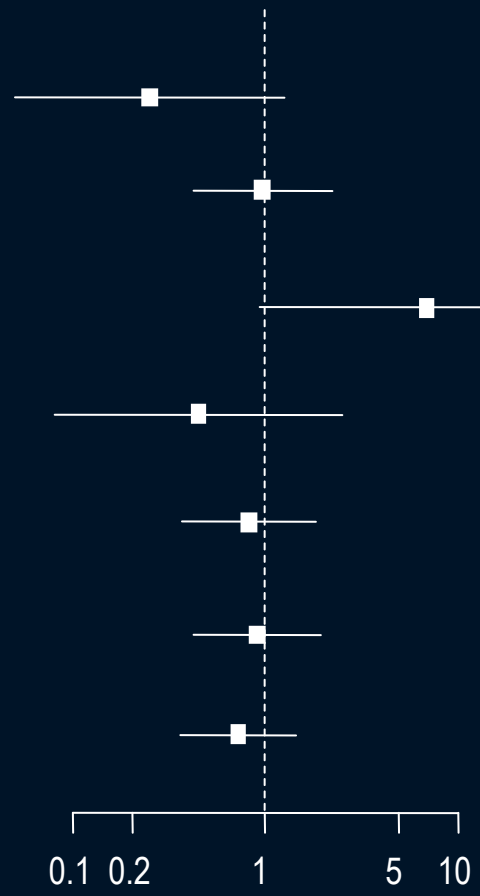

Intervention
Control
OR_{PA} = 2.49 (1.08–5.74)
OR_{PA} = 2.47 (1.08–5.68)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
50.9%
31.9%
p = 0.03
54.2%
35.0%
p = 0.03
100% adherence to all acute and discharge therapies
100% adherence to all acute and discharge therapies without statins

Results

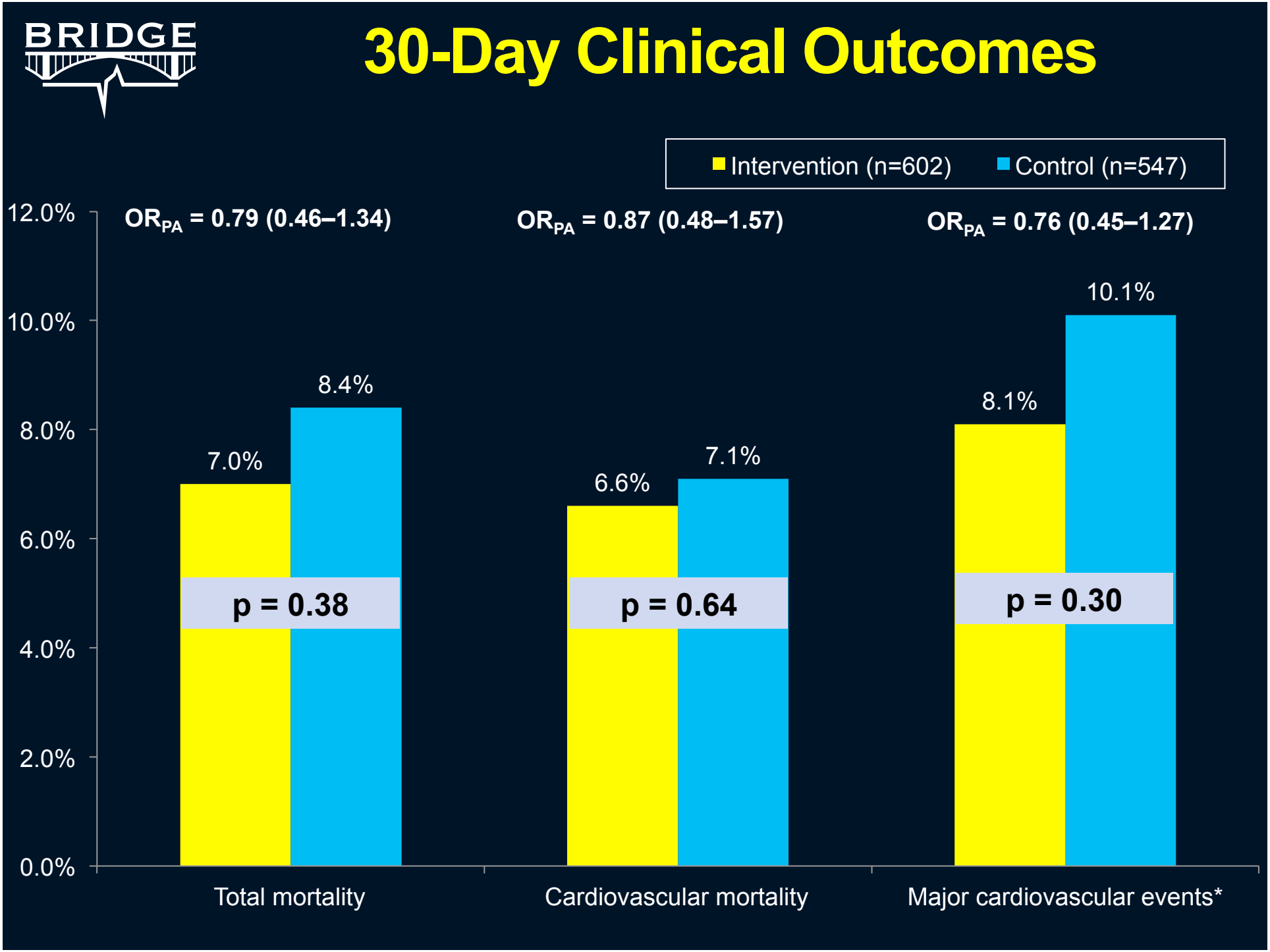

Intervention
Control
OR_{PA} = 2.49 (1.08–5.74)
OR_{PA} = 2.47 (1.08–5.68)
Mean difference = 8.6 (2.2–15.0)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
50.9%
31.9%
54.2%
35.0%
89.0%
81.4%
p = 0.03
p = 0.03
p = 0.01
100% adherence to all acute and discharge therapies
100% adherence to all acute and discharge therapies without statins
Composite adherence score

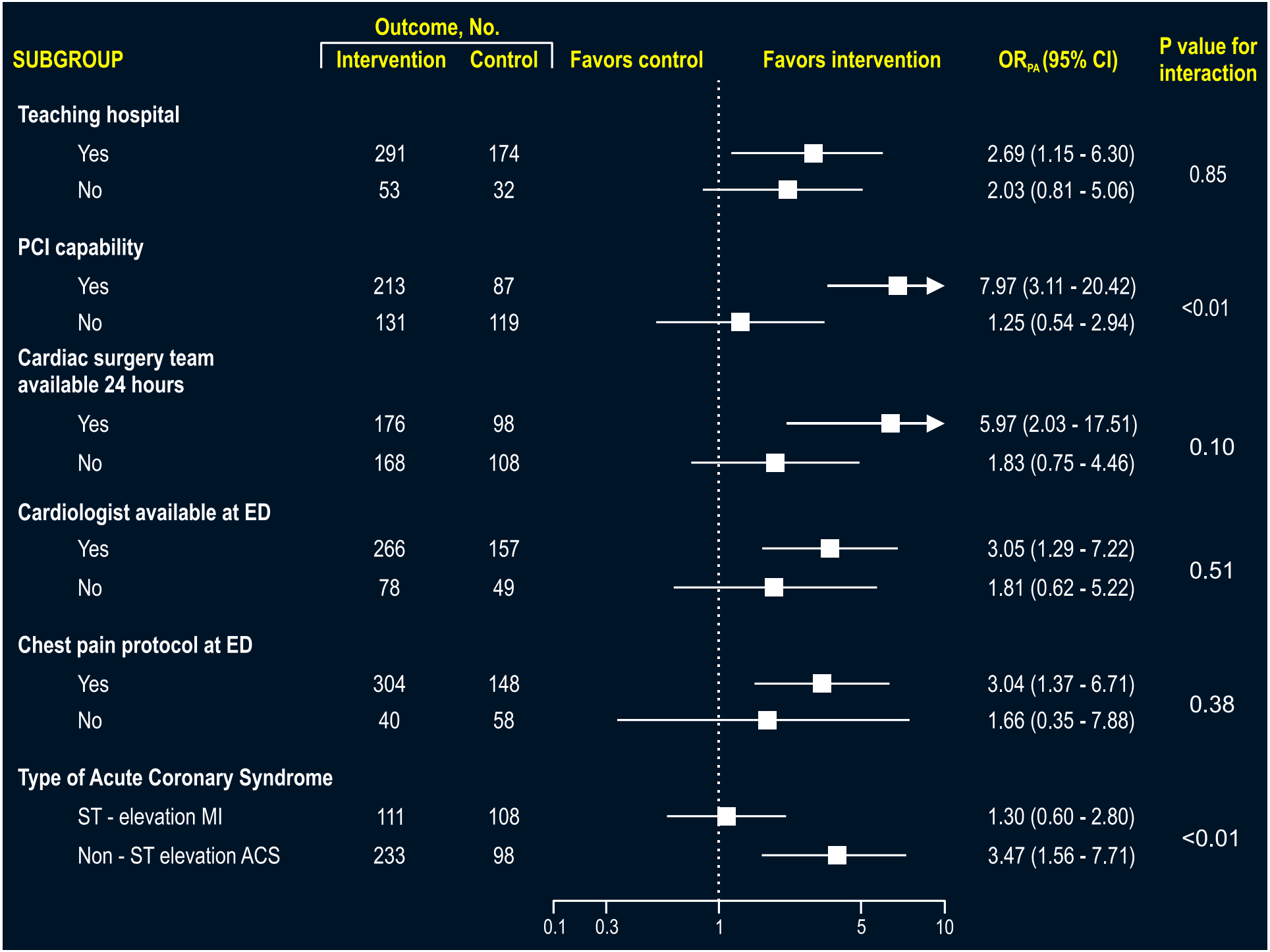
In-Hospital Clinical Outcomes

EVENTS	Outcome, no Intervention n = 602	Control n = 548	OR_{PA} (95% IC)	P value
New myocardial infarction	4	14	0.25 (0.05–1.26)	0.09
Cardiac arrest	26	22	0.96 (0.42–2.21)	0.93
Major bleeding	7	1	6.88 (0.93–51.10)	0.06
Stroke	2	4	0.45 (0.08–2.50)	0.36
Total mortality	29	28	0.82 (0.37–1.82)	0.62
Cardiovascular mortality	26	23	0.91 (0.42–1.96)	0.81
Major cardiovascular events	33	38	0.72 (0.36–1.43)	0.35



30-Day Clinical Outcomes




SUBGROUP
Outcome, No.
Intervention
Control
Favors control
Favors intervention
OR_PA (95% CI)
P value for interaction
Teaching hospital
Yes 291 174 2.69 (1.15 - 6.30)
No 53 32 2.03 (0.81 - 5.06)
0.85
PCI capability
Yes 213 87 7.97 (3.11 - 20.42)
No 131 119 1.25 (0.54 - 2.94)
<0.01
Cardiac surgery team available 24 hours
Yes 176 98 5.97 (2.03 - 17.51)
No 168 108 1.83 (0.75 - 4.46)
0.10
Cardiologist available at ED
Yes 266 157 3.05 (1.29 - 7.22)
No 78 49 1.81 (0.62 - 5.22)
0.51
Chest pain protocol at ED
Yes 304 148 3.04 (1.37 - 6.71)
No 40 58 1.66 (0.35 - 7.88)
0.38
Type of Acute Coronary Syndrome
ST - elevation MI 111 108 1.30 (0.60 - 2.80)
Non - ST elevation ACS 233 98 3.47 (1.56 - 7.71)
<0.01
0.1
0.3
1
5
10

Conclusions

- In patients with ACS, a simple multifaceted educational intervention resulted in significant improvement in the use of evidence-based medications

- Because it is simple and feasible, the tools tested in the BRIDGE-ACS trial can become the basis for developing QI programs to maximize the use of evidence-based interventions for the management of ACS

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