

Outcomes of **P**ercutaneous Revasculariza**T**ion for **M**anagement of **S**urgically Ineligible Patients with **M**ultivessel or Left Main Coronary Artery Disease: Primary Results from the **OPTIMUM Registry**

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on behalf of the OPTIMUM Investigators



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Outcomes of **P**ercutaneous revasculariza**T**ion
for **M**anagement of **s**urgically ineligible patients
with **M**ultivessel or left main coronary artery disease:
A Prospective Registry

Disclosure

Within the past 12 months, I or my spouse/partner have had a financial interest/arrangement or affiliation with the organization(s) listed below

| <u>Affiliation/Financial Relationship</u> | <u>Company</u> |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Grant/Research Support (Institutional) | Abbott Vascular, Boston Scientific, Medtronic CardioVascular, Biotronik, Medinol, Orbus Neich, Teleflex |
| Consulting Fees/Honoraria | Medtronic CardioVascular, CSI, Magenta |
| Major Stock Shareholder/Equity | BioStar Ventures (none related to ASI) |
| Royalty Income | None |
| Ownership/Founder | None |
| Intellectual Property Rights | None |
| Other Financial Benefit | None |

Perspective

Surgical Ineligibility and Complex Left Main/Multivessel Coronary Disease

- Increasing prevalence: 1 in 5 patients with left main and/or multivessel disease may be deemed surgically ineligible¹
 - Increasing sensitivity to public reporting of outcomes and physician metrics
 - Historical sense of PCI as default therapy
 - Advancing ‘CHIP’ momentum and expanding interventional therapeutic toolbox
- Many factors that influence decision for operative ineligibility not captured in risk models
- Societal guidelines offer limited, if any, decision making in complex coronary disease when surgery is not an option
- Surgical turndown patients are systematically excluded from clinical trials; no data regarding health status outcomes following PCI procedures in these patients
- When selected for PCI, no consensus regarding goals of interventional revascularization (e.g, complete revascularization versus ‘targeted’ PCI)

OPTIMUM Study Design

Outcomes of Percutaneous Revascularization for Management of Surgically Ineligible Patients with Multivessel or Left Main Disease

750 surgically ineligible patients by Heart Team
enrolled at 22 US centers

PCI, N=726

Medical Therapy, N=24

1° Objective: 30-day/in-hospital mortality in PCI cohort compared with predicted STS surgical risk

Key 2° Objectives

- 30-day/in-hospital mortality in PCI cohort compared with (1) EuroSCORE II and (2) Surgeon's predicted risk
- SAQ, KCCQ at 6 and 12 months
- 12 month SAQ PCI complete vs incomplete revascularization

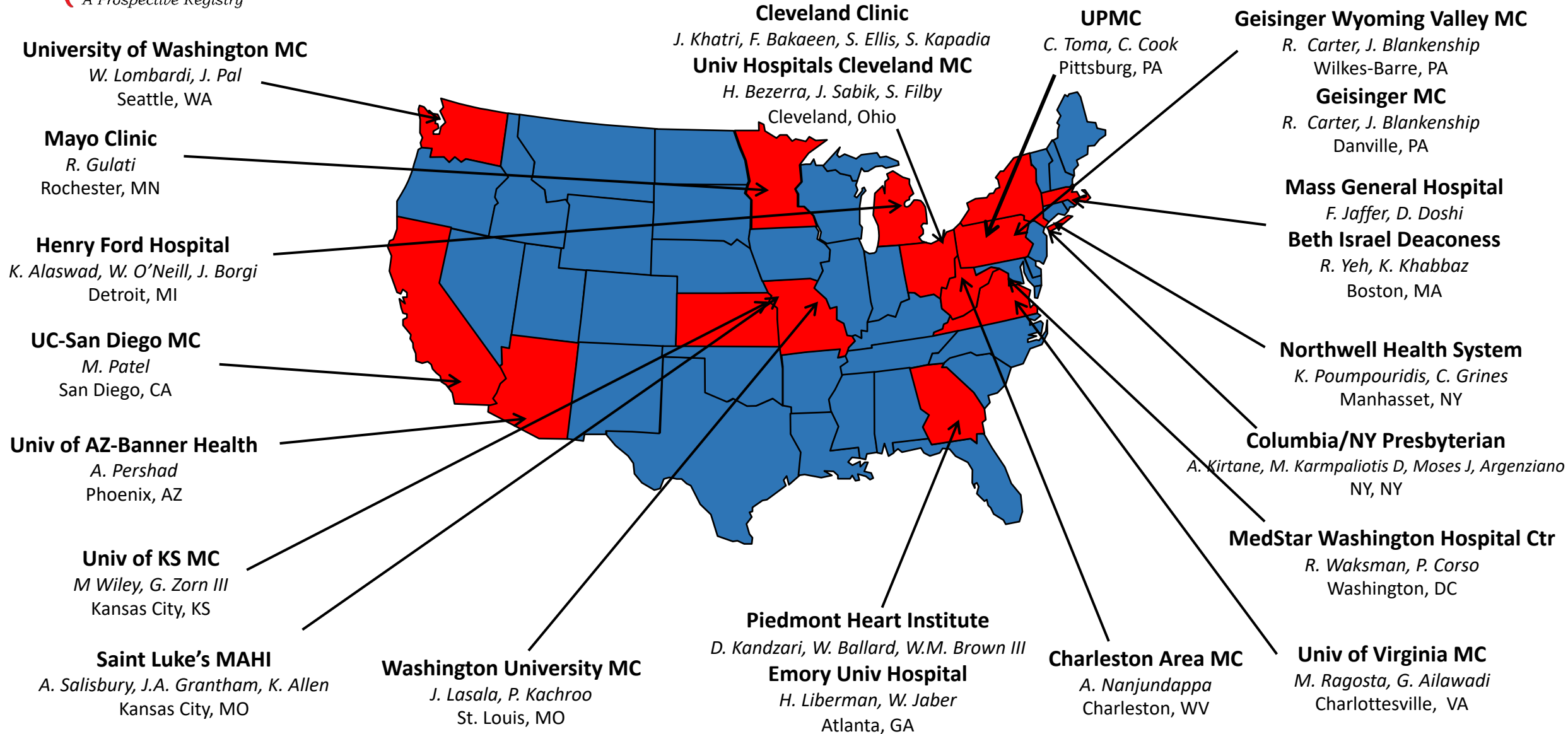
Additional Endpoints:

- Reasons for determination of CABG ineligibility
- Completeness of revascularization and predictors
- Predictors of survival and health status
- 30-day, 6 month and 1 year clinical, health status and economic outcomes
- Survival through 5 years



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Key Enrollment Criteria and Trial Conduct

Inclusion Criteria

- Age \geq 18 years
- Unprotected left main stenosis of \geq 50%, 3 vessel disease (stenoses \geq 70%) or 2 vessel coronary disease (\geq 70%) with one lesion involving the proximal left anterior descending artery
- Patients with prior bypass surgery: \geq 2 epicardial coronary distributions subtended by a severe native coronary stenosis with either no bypass graft supplying the vessel, a severely diseased (\geq 70% angiographic stenosis) bypass graft supplying the affected vessel
- **Heart Team determination for coronary bypass surgery ineligibility**

Exclusion Criteria

- Presentation with STEMI, ventricular arrhythmia or hemodynamic instability
- Expected survival of $<$ 1 year or any condition that would preclude ability for 1-year follow-up

Clinical events site reported with source document verification and adjudication of 30-day events
Patient-reported health status outcomes at 6 months and 1 year

Independent Angiographic Core Laboratory: Cardiovascular Research Foundation, NY, NY
Independent Clinical Events Adjudication: Mid America Heart Institute, Kansas City, MO

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Baseline Clinical Characteristics

| | N= 726 |
|----------------------------|---------------|
| Age, years | 70.0 ± 10.9 |
| Female | 31.5% |
| Diabetes mellitus | 56.6% |
| Prior MI | 48.2% |
| Prior PCI | 32.8% |
| Prior CABG | 16.4% |
| Current smoking | 18.2% |
| History of stroke | 13.8% |
| Chronic kidney disease | 37.2% |
| Atrial fibrillation | 23.1% |
| Class III/IV heart failure | 23.4% |
| LVEF, % | 42.6 ± 16.3 |
| Clinical presentation | |
| No angina | 26.8% |
| Stable angina | 35.5% |
| Unstable angina/ACS | 37.7% |

Data expressed as percent or mean ± SD

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Risk Characteristics and Reasons for Surgical Ineligibility

| | N= 726 |
|---------------------------------------------|---------------|
| Poor distal target/conduit | 18.9% |
| Severe LV dysfunction/non-viable myocardium | 16.8% |
| Severe lung disease | 10.1% |
| Frailty/immobility | 9.7% |
| Prior sternotomy | 8.7% |
| Advanced age | 6.1% |
| Prior stroke/severe cerebrovascular disease | 3.9% |
| Severe aortic calcification | 3.4% |
| Renal impairment | 3.2% |
| End-stage liver disease | 2.2% |
| Morbid obesity | 1.9% |
| Malignancy | 1.5% |
| Systemic infection | 1.4% |
| Other | 12.4% |

Data expressed as percent

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Angiographic and Procedural Characteristics

| Angiographic Characteristics | N= 726 |
|------------------------------|-----------------|
| Calcification, severe | 82.5% |
| Bifurcation | 80.2% |
| CTO | 56.9% |
| Any lesion \geq 20 mm | 78.5% |
| Total lesion length (mm) | 74.2 \pm 46.4 |
| SYNTAX Score (baseline) | 32.4 \pm 12.2 |
| Low (0-22) | 21.8% |
| Intermediate (23-32) | 32.8% |
| High (\geq 33) | 45.3% |

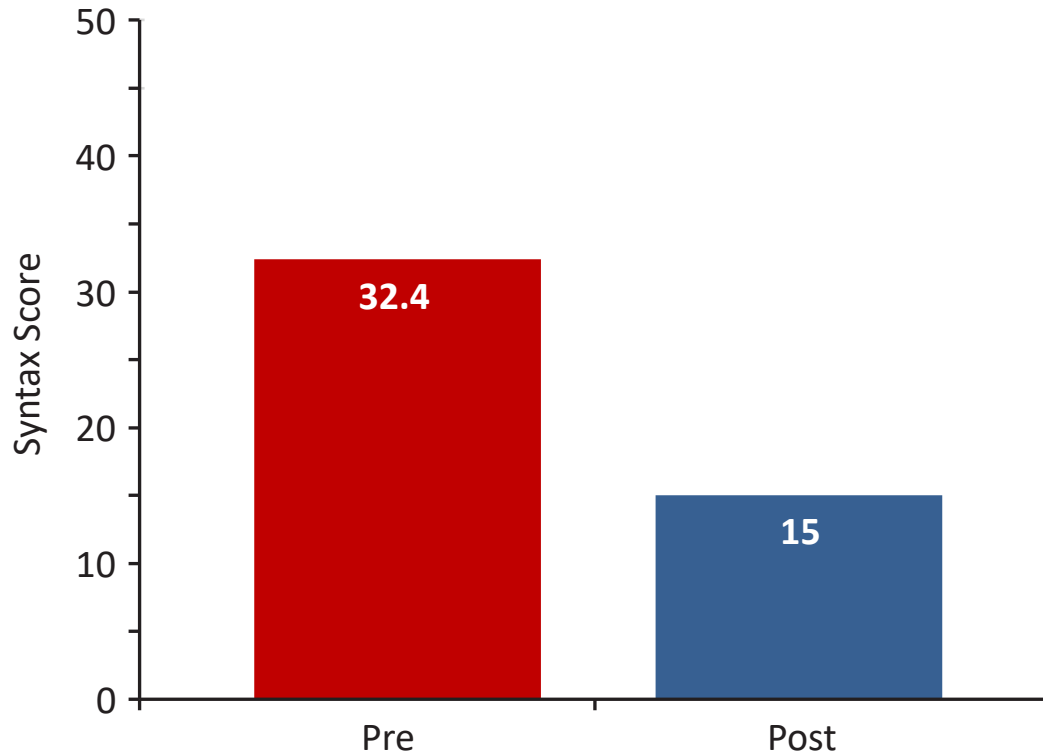
| Procedural Characteristics | N= 726 |
|----------------------------------------------------------------------------|---------------|
| Stents/patient | 3.2 \pm 1.9 |
| Left main PCI | 38.2% |
| CTO PCI | 20.3% |
| Atherectomy | 32.0% |
| Hemodynamic support | 27.0% |
| Intravascular imaging* | 63.9% |
| Procedural complications (MI, CIN, perforation, emergency surgery, bleed)* | 9.8% |

Data expressed as percent or mean \pm SD. *Non-hierarchical

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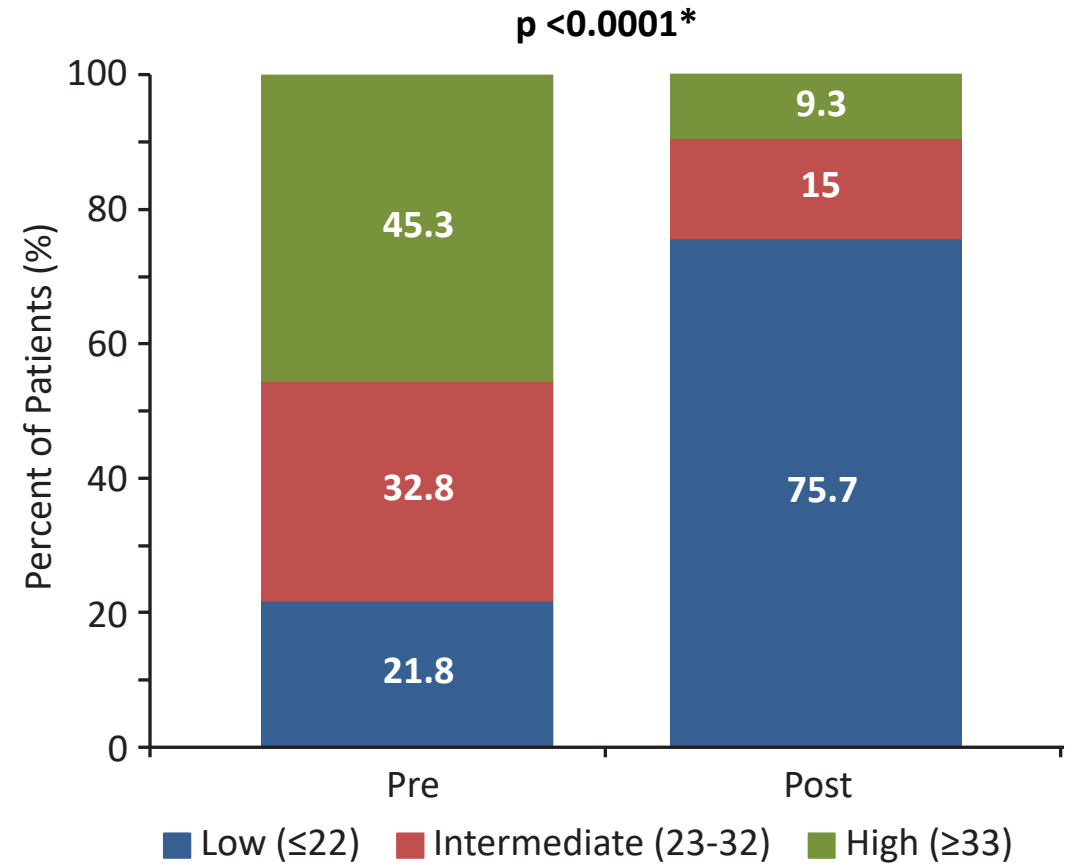
Procedural Outcomes

Baseline and Post-PCI Total SYNTAX Scores



| | |
|----------------------------|-------|
| Post SYNTAX Score ≤ 8 | 34.3% |
| Post SYNTAX Score 0 | 11.4% |

Baseline and Post-PCI SYNTAX Scores



*p-value represents McNemar-Bowker Test

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Surgical Risk Prediction, 30-day/In-hospital Mortality

| | N= 726 |
|----------------------------------|---------------|
| STS Predicted Mortality | 5.3 ± 5.7 |
| EuroSCORE II Predicted Mortality | 5.7 ± 5.4 |
| Surgeon's Predicted Mortality | 10.4 ± 12.3 |

Data expressed as percent

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Surgical Risk Prediction, 30-day/In-hospital Mortality

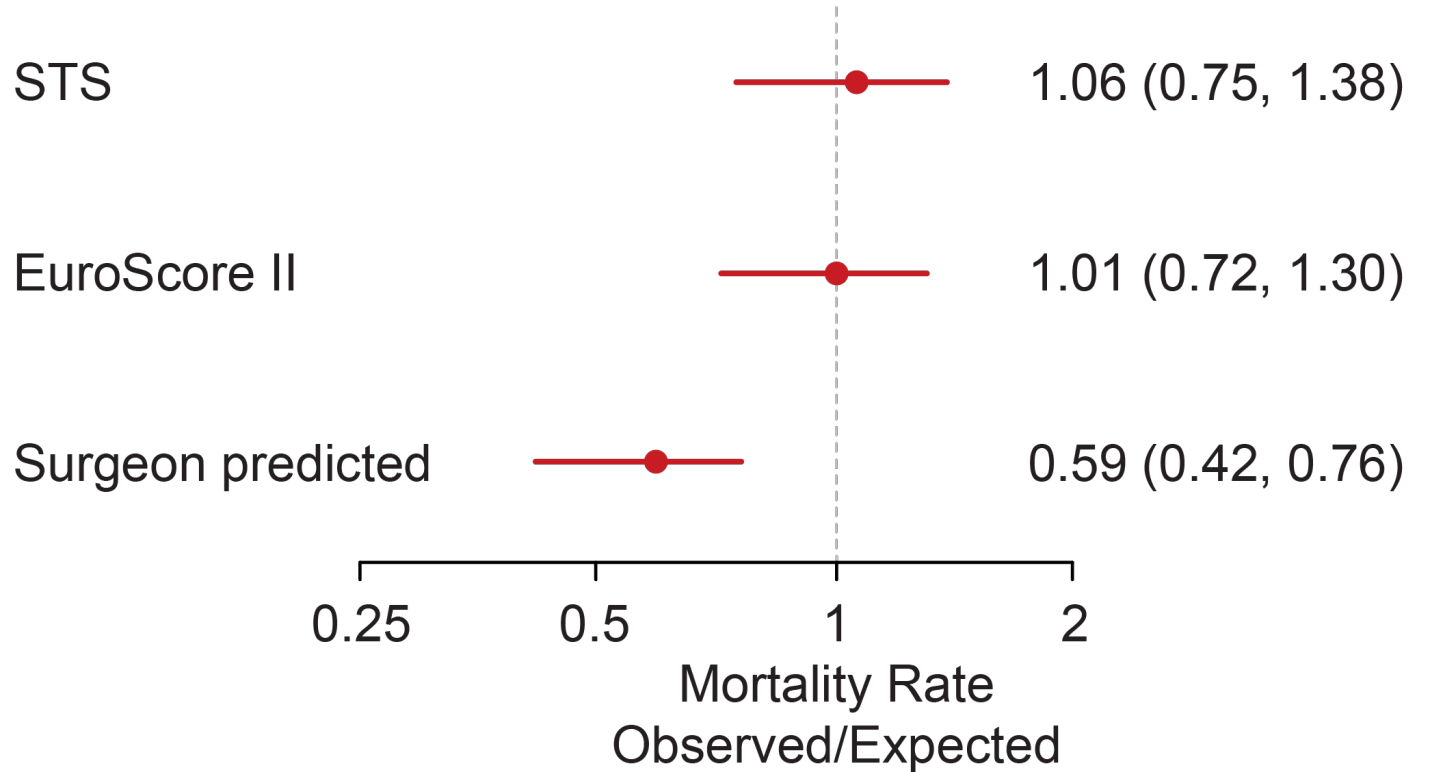
| | N= 726 |
|----------------------------------------------|---------------|
| STS Predicted Mortality | 5.3 ± 5.7 |
| EuroSCORE II Predicted Mortality | 5.7 ± 5.4 |
| Surgeon's Predicted Mortality | 10.4 ± 12.3 |
| Observed 30-day/In-hospital Mortality | 5.6 |

Data expressed as percent

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30-day/In-hospital Mortality and Observed/Expected Estimates

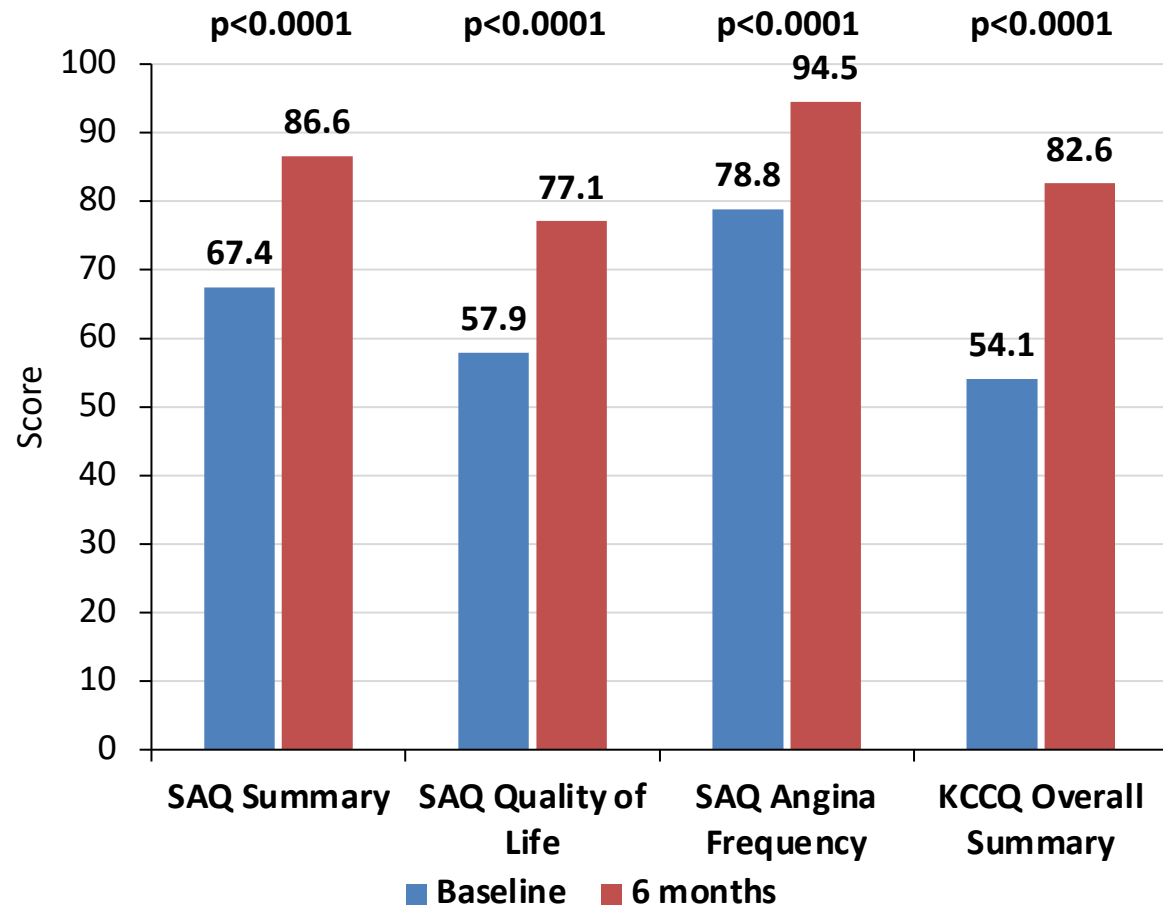
| | N= 726 |
|-----------------|---------------|
| Death, 30 Days | 5.6% |
| In-hospital | 3.0% |
| Post-discharge | 2.6% |
| Death, 6 Months | 12.3% |



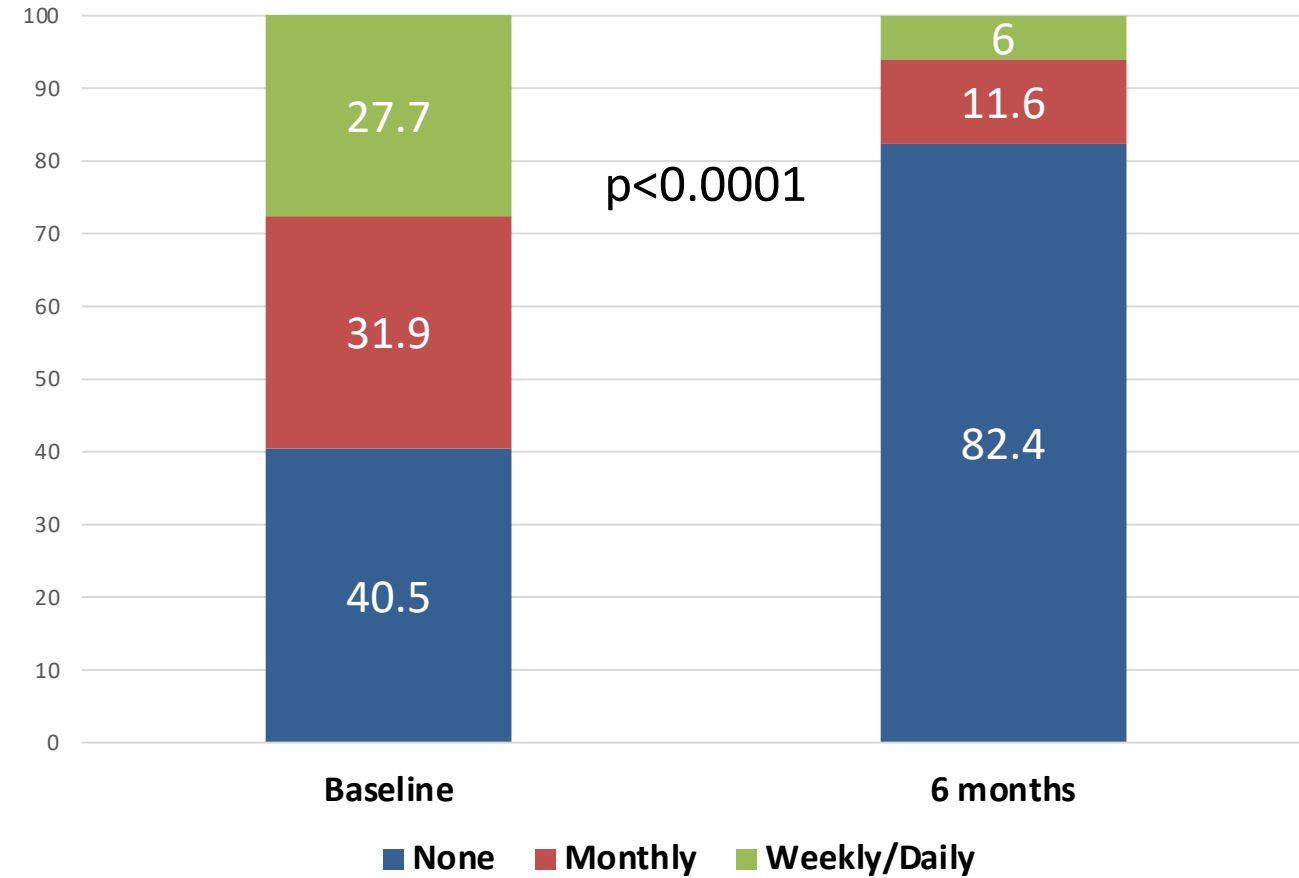
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Patient-reported Health Status

Baseline and 6-Month Health Status

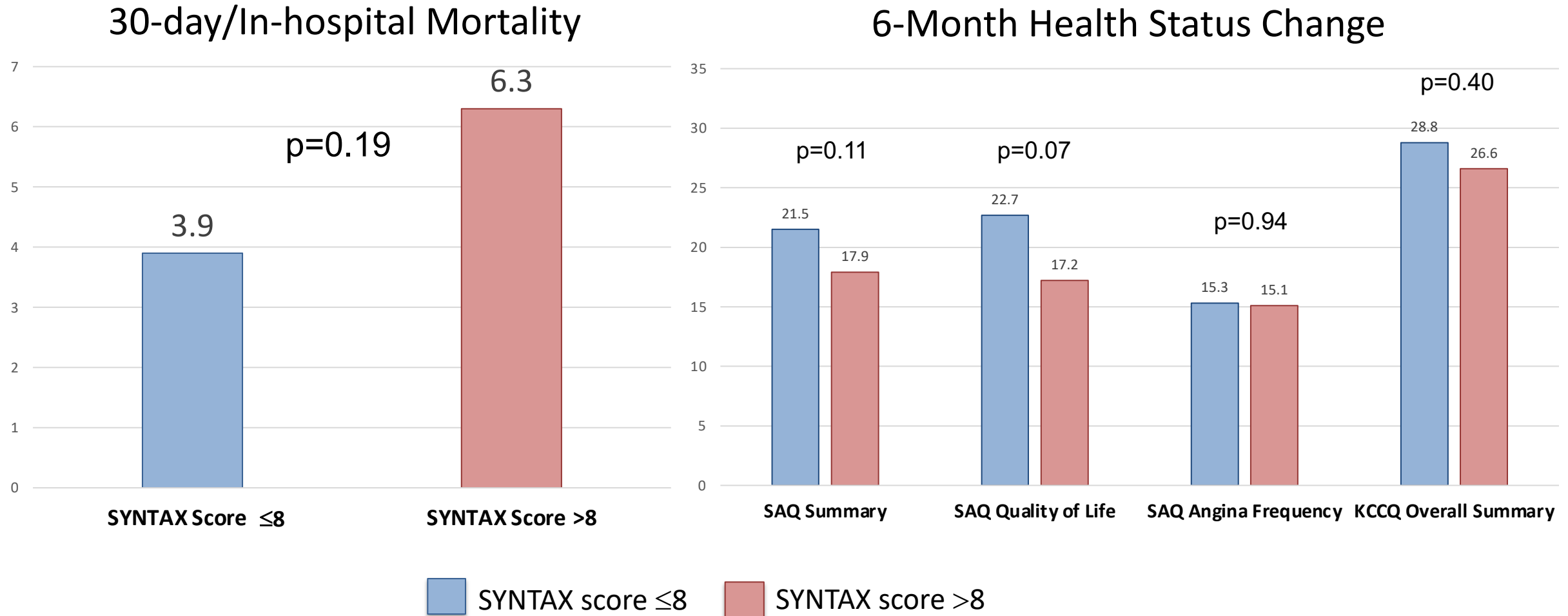


Baseline and 6-Month SAQ Angina Frequency



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30 Day Mortality and 6 Month Change in Health Status According to Completeness of Revascularization



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Outcomes of Percutaneous Revascularization for Management of Surgically Ineligible Patients with Multivessel or Left Main Disease

- Patients deemed prohibitive risk for CABG who undergo PCI have complex clinical profiles and high disease burden that are incompletely represented by surgical prediction models
- Following complex PCI, short-term mortality rates are similar to predicted mortality using surgical risk models, but considerably lower than the evaluating surgeon's estimates
- PCI is associated with significant, meaningful improvements in patients' symptom burden, physical function and quality of life
 - Findings underscore the potential of revascularization to improve patients' health status if it can be performed safely, even if surgery is not an option
- These findings inform decision making and outcomes for a high-risk and largely unstudied patient population relative to risk/benefit, procedural strategies and completeness of revascularization with complex PCI