Supplementary Online Content

Pandey A, Golwala H, Hall HM, et al. Association of US Centers for Medicare and Medicaid Services hospital 30-day risk-standardized readmission metric with care quality and outcomes after acute myocardial infarction: findings from the National Cardiovascular Data Registry/Acute Coronary Treatment and Intervention Outcomes Network Registry–Get With the Guidelines. *JAMA Cardiol*. Published online April 26, 2017. doi:10.1001/jamacardio.2017.1143

This supplementary material has been provided by the authors to give readers additional information about their work.

eAppendix. Supplemental Methods

Details about NCDR-ACTION registry

In the ACTION Registry-GWTG, trained hospital personnel collected detailed information on patient demographic characteristics, medical history, clinical presentation, in-hospital management, and outcomes from medical records using standardized data collection forms with written definitions for data elements. Data quality is ensured through implementation of a NCDR data quality program that involves data abstraction training, periodic data quality check, site-specific data quality feedback reports, independent auditing, and data validation.

Socioeconomic status score calculation among study participants

Patient's zip code of residence was used to link with the American Community Survey (2007-2011) data for each zip code tabulation area (ZCTA). Socioeconomic status score was calculated for each zip code tabulation area by summing the z scores for each of the five variables listed below (z score for each ZCTA is created by subtracting the mean of the study population and dividing by the standard deviation)

- Median household income
- Median value of housing units
- The percentage of households receiving interest, dividend, or net rental income
- The percentage of adults 25 years of age or older who had completed high school

- The percentage of adults 25 years of age or older who had completed college

An increasing socioeconomic status score indicates increasing neighborhood socioeconomic advantages.

Variables included in the models assessing the association between MI-ERR and overall defect free care

Demographic characteristics (age, sex, race, socioeconomic status score, weight); presentation signs and symptoms (systolic blood pressure, HF only, HF with shock, STEMI, ST Depression or Transient ST Elevation, heart rate); laboratory results (baseline troponin ratio, initial hemoglobin, initial serum creatinine); medical history (peripheral arterial disease, hypertension, diabetes mellitus, current/recent smoker, dyslipidemia, prior MI, prior PCI, prior CABG, prior CHF, prior stroke); home medications prior to admission (home aspirin, home clopidogrel, home warfarin, home beta blocker, home ACE Inhibitor, home angiotensin receptor blocker, home aldosterone blocking agent, home statin, and home other lipid-lowering agent); and number of defect free care opportunities per patient .

Variables included in the models assessing the association between MI-ERR and 1-year clinical outcomes

Demographic characteristics (Age, sex, race, socioeconomic status score, weight); presentation signs and symptoms (systolic blood pressure, HF only, HF with shock, STEMI, ST Depression or Transient ST Elevation, heart rate);

laboratory results (baseline hemoglobin and creatinine levels); medical history (peripheral arterial disease, hypertension, diabetes mellitus, current/recent smoker, dyslipidemia, prior MI, prior PCI, prior CABG, prior CHF, prior stroke); and discharge medications (P2Y12 receptor Inhibitors, Statin, Beta Blocker, ACEI or ARB)

eTable 1. Acute and Discharge Process of Care Measures for Myocardial Infarction Evaluated in the Study

Acute process of care measures
• Aspirin at arrival
• Evaluation of left ventricular systolic function
• Reperfusion therapy (STEMI)
• Time to primary percutaneous coronary intervention (PCI) ≤ 90 minutes (STEMI)
• Time to fibrinolytic therapy administration ≤ 30 minutes (STEMI)
Discharge Process of care measures
• Aspirin prescribed at discharge
• Beta-blocker prescribed at discharge
• Angiotensin converting enzyme (ACE)-inhibitor or angiotensin receptor blocker (ARB) for left ventricular systolic dysfunction
• Statin prescribed at discharge
• Adult smoking cessation advice/counseling
• Cardiac rehabilitation patient referral

eTable 2. Comparison of Characteristics of Hospitals Included vs Excluded in the Study

Hospital Characteristics	Included (N = 380)	Excluded (N = 139)
Geographical region West Northeast Midwest South	 12.9 6.8 31.3 48.9	 18.7 17.3 17.3 46.8
CABG facility (%)	84.2	50.4
Academic (%)	20.0	12.2
Hospital size (no. of Beds)	321 (217 – 446)	218 (134 – 378)
Rural (%)	10.0	11.6
Data presented as median (interquartile range) or % CABG: coronary artery bypass graft		

eTable 3. Comparison of Baseline Characteristics of Patients Included vs Excluded in the Study

Patient Characteristics	Included (N = 176,644)	Excluded (N = 52,608)
Age, years	64.0 (54.0 – 75.0)	65.0 (55.0 – 76.0)
Women (%)	61,641/176,639 (34.9)	18,982/52,604 (36.1)
African Americans (%)	17,775/175,626 (10.1)	5,362/52,256 (10.3)
Hx of DM (%)	54,626/176,417 (30.1)	16,879/52,479 (32.2)
Hx of MI (%)	44,404/176,401 (25.2)	6,521/26,167 (24.9)
Hx of CHF (%)	21,716/176,304 (12.3)	3,567/26,139 (13.6)
Smoking (%)	64,087/ 176,437 (36.3)	17,036/52,520 (32.4)
STEMI presentation (%)	71,409/176,644 (40.4)	19,406/52,608 (36.9)
Signs of CHF at presentation (%)	26,652/176,363 (15.1)	8,270/52,400 (15.8)
Shock (%)	7,980/176,276 (4.5)	2,405/52,371 (4.6)
Severe depressed EF (%) (among patients with LVEF evaluated)	8,393/165,088 (5.1)	2,741/45,304 (6.1)
Major bleeding (%)	16,796/174,147 (9.6)	1,616/16,544 (9.8)
Length of stay (days)	3 (2 – 6)	3 (2 – 6)

Data presented as median (interquartile range) or count/denominator (%)
CABG: coronary artery bypass graft

eFigure. Cohort Derivation for the Study Population

DCF: Data collection form; ERR: Excess readmission ratio; PCI: Percutaneous coronary intervention