

ACTION Registry - GWTG: Defect Free Care for Acute Myocardial Infarction Specifications and Testing Overview

Measure Purpose	To provide defect free AMI care to all patients. Meaning all of the ACC/AHA endorsed performance measures are followed for eligible patients.				
Numerator	<p>Count of Care patients that received defect free care for AMI. For the STEMI population:</p> <ol style="list-style-type: none"> 1. Aspirin at Arrival 2. Aspirin prescribed at Discharge 3. Beta-Blocker Prescribed at Discharge 4. Statin Prescribed at Discharge 5. Evaluation of LV Systolic Function 6. ACEI or ARB for LVSD at Discharge 7. Time to Fibrinolytic Therapy 8. Time to Primary PCI 9. Reperfusion Therapy 10. Adult Smoking Cessation Advice Counseling 11. Cardiac Rehabilitation Patient Referral From an Inpatient Setting <p>For the NSTEMI population:</p> <ol style="list-style-type: none"> 1. Aspirin at Arrival 2. Aspirin prescribed at Discharge 3. Beta-Blocker Prescribed at Discharge 4. Statin Prescribed at Discharge 5. Evaluation of LV Systolic Function 6. ACEI or ARB for LVSD at Discharge 7. Adult Smoking Cessation Advice Counseling 8. Cardiac Rehabilitation Patient Referral From an Inpatient Setting 				
Denominator	Count of patients that had an acute myocardial infarction				
Exclusions	Patients must be eligible for care. If the patient is excluded the in individual measure then the patient is not eligible for care.				
Demonstrated Opportunity for Improvement	Exclusions	Number of Hospital Stay		Number of Facilities	
		#	%	#	%
	Initial Sample	483534	100	839	100
	Discharges not between Jan 2011 and Dec 2012	211937	43.83	91	10.85
	Remaining	271597	56.17	748	89.15
	Age<18	0	0.00	0	0.00
	Remaining	271597	100.00	748	100.00
	Hospital submission that did not pass the data quality check	53561	19.72	190	25.40
	Remaining	218036	80.28	558	74.60
	Not eligible to the defect free care measure	10510	4.82	0	0.00
	Study Sample	207526	95.18	558	100.00
	The defect free care measure	140762	67.83	553	99.10

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Reference 1. Defect Free Care Measure			
Name	Denominator	Numerator	Rate
Aspirin at Arrival	130943	128532	98.16
Aspirin prescribed at Discharge	175010	171970	98.26
Beta-Blocker Prescribed at Discharge	183659	177918	96.87
Statin Prescribed at Discharge	179373	176651	98.48
Evaluation of LV Systolic Function	193716	183693	94.83
ACEI or ARB for LVSD at Discharge	31669	28208	89.07
Time to Fibrinolytic Therapy: <30 minutes	255	117	45.88
Time to Balloon: <90 minutes	44770	42332	94.55
Reperfusion Therapy	75042	65730	87.59
Adult Smoking Cessation Advice Counseling	69478	68341	98.36
Cardiac Rehabilitation Patient Referral From an Inpatient Setting	179445	138660	77.27

Table 1 Selected Characteristics by Calendar Year							
Description	Total		Year				P
			2011		2012		
	#	%	#	%	#	%	
ALL	207526	100.00	93977	100.00	113549	100.00	
Age>=65							0.0009
No	109557	52.79	49989	53.19	59568	52.46	
Yes	97969	47.21	43988	46.81	53981	47.54	
Female							0.7812
No	135678	65.38	61471	65.41	74207	65.35	
Yes	71848	34.62	32506	34.59	39342	34.65	
RACE							0.0000
White non-Hispanic	10604	5.11	4562	4.85	6042	5.32	
Black non-Hispanic	167928	80.92	76480	81.38	91448	80.54	
Hispanic	23595	11.37	10606	11.29	12989	11.44	
Other	5399	2.60	2329	2.48	3070	2.70	
Random Splitting Samples							0.1104
First	103848	50.04	47208	50.23	56640	49.88	
Second	103678	49.96	46769	49.77	56909	50.12	
Safety Net Hospital*							0.0000
Unknown	920	0.44	436	0.46	484	0.43	
No	171501	82.64	77050	81.99	94451	83.18	
Yes	35105	16.92	16491	17.55	18614	16.39	

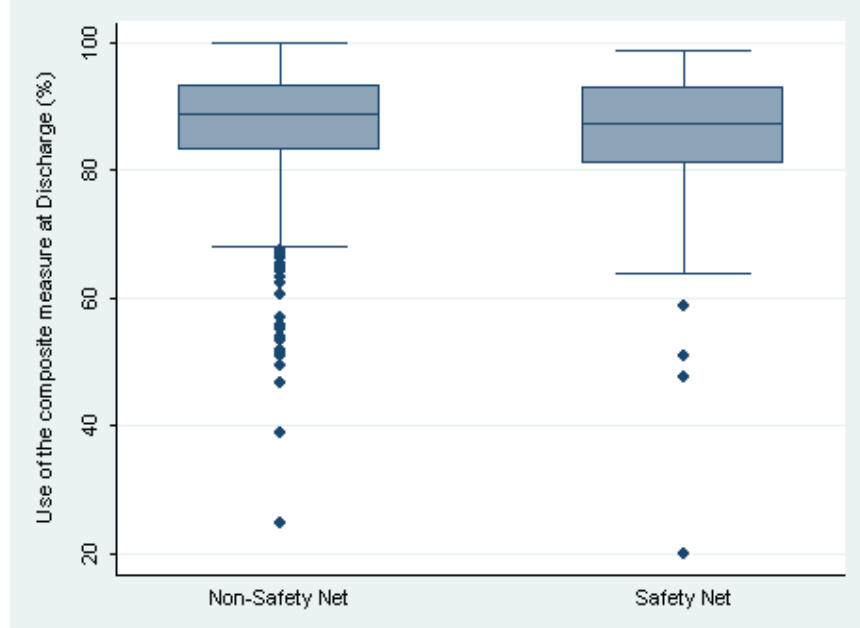
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Hospital % Non-White								0.0000
Q1	43863	21.14	20066	21.35	23797	20.96		
Q2	55172	26.59	24423	25.99	30749	27.08		
Q3	58284	28.09	26591	28.30	31693	27.91		
Q4	50207	24.19	22897	24.36	27310	24.05		
Hospital % Medicaid*								0.0000
Unknown	920	0.44	436	0.46	484	0.43		
Q1	48240	23.25	21771	23.17	26469	23.31		
Q2	54076	26.06	25126	26.74	28950	25.50		
Q3	53172	25.62	22908	24.38	30264	26.65		
Q4	51118	24.63	23736	25.26	27382	24.11		
The Composite Measure								0.0000
Performance Not Met	66764	32.17	31098	33.09	35666	31.41		
Performance Met	140762	67.83	62879	66.91	77883	68.59		
* Hospital information about the SNH and %Medicaid are derived from AHA 2010 data.								

Reliability Testing

Distribution of The Composite Measure at Discharge Stratified by Safety Net Status		
Description	Safety Net Status	
	No	Yes
N	1153	213
Mean	0.8732	0.8537
Std Deviation	0.0851	0.1004
75% Q3	0.9333	0.9296
50% Median	0.8886	0.8733
25% Q1	0.8313	0.8091
* Defined as government hospitals or non-government hospitals with high Medicaid caseload using AHA 2010 Data.		

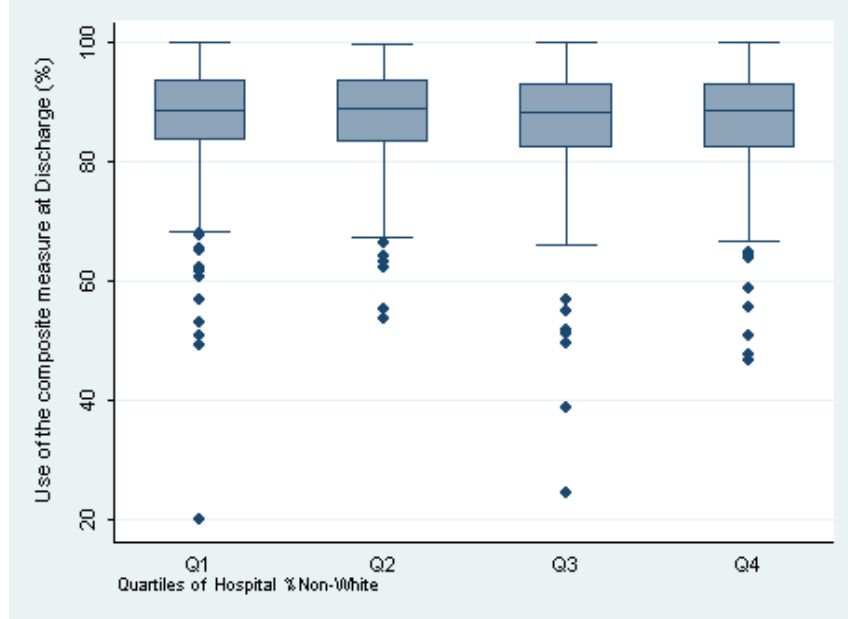
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Distribution of The Composite Measure at Discharge Stratified by Hospital %Non-White

Description	%Non-White	%Non-White			
		Q1	Q2	Q3	Q4
		N	1386	346	347
Mean	0.1311	0.8709	0.8765	0.8658	0.8662
Std Deviation	0.1435	0.0934	0.0793	0.0918	0.0877
75% Q3	0.1724	0.9367	0.9373	0.9295	0.9293
50% Median	0.0826	0.8866	0.8908	0.8818	0.8849
25% Q1	0.0348	0.8345	0.8311	0.8221	0.8238

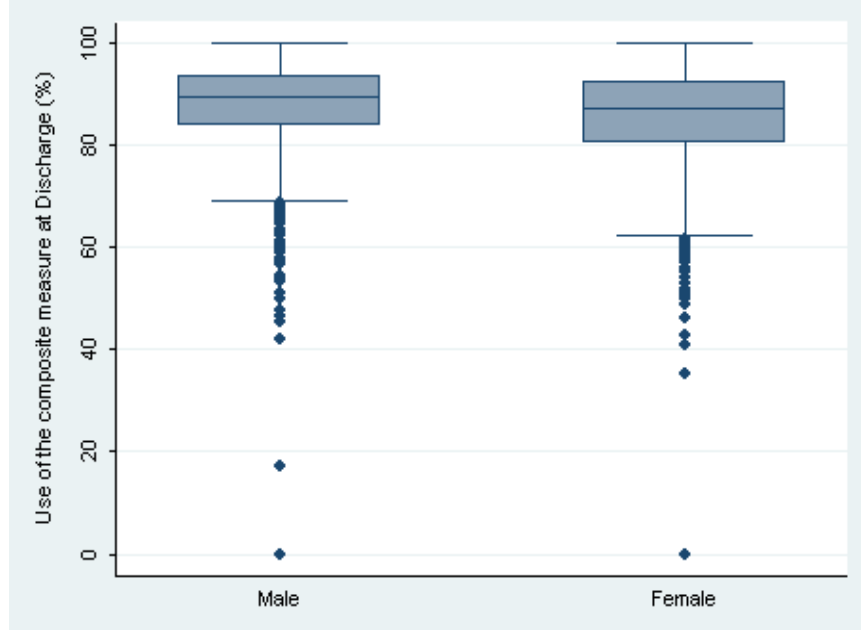
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**Distribution of The Composite Measure at Discharge
Stratified by Gender**

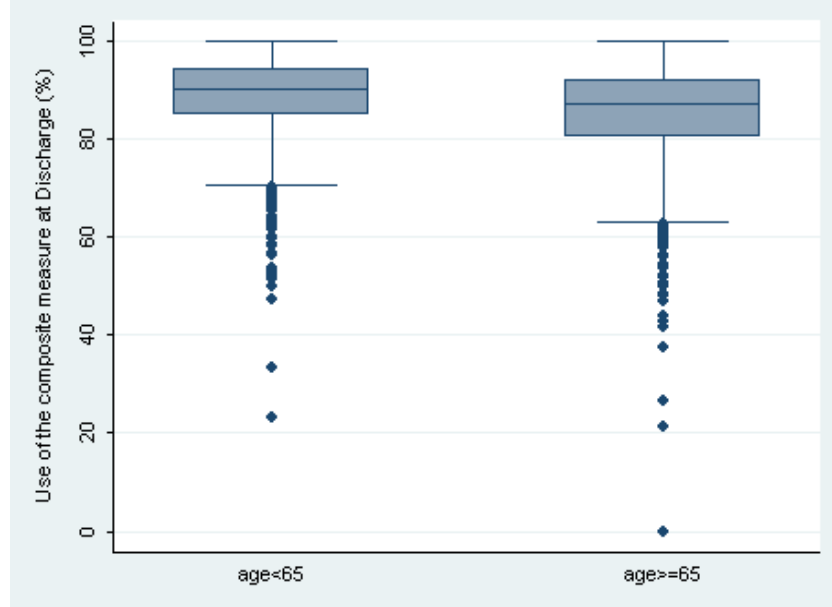
Description	Female	
	Yes	No
N	1386	1385
Mean	0.8563	0.8764
Std Deviation	0.0965	0.0892
75% Q3	0.9268	0.9367
50% Median	0.8720	0.8950
25% Q1	0.8056	0.8379

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Distribution of The Composite Measure at Discharge Stratified by Age		
Description	Age >= 65	
	Yes	No
N	1385	1385
Mean	0.8551	0.8851
Std Deviation	0.0985	0.0854
75% Q3	0.9231	0.9437
50% Median	0.8723	0.9038
25% Q1	0.8058	0.8480

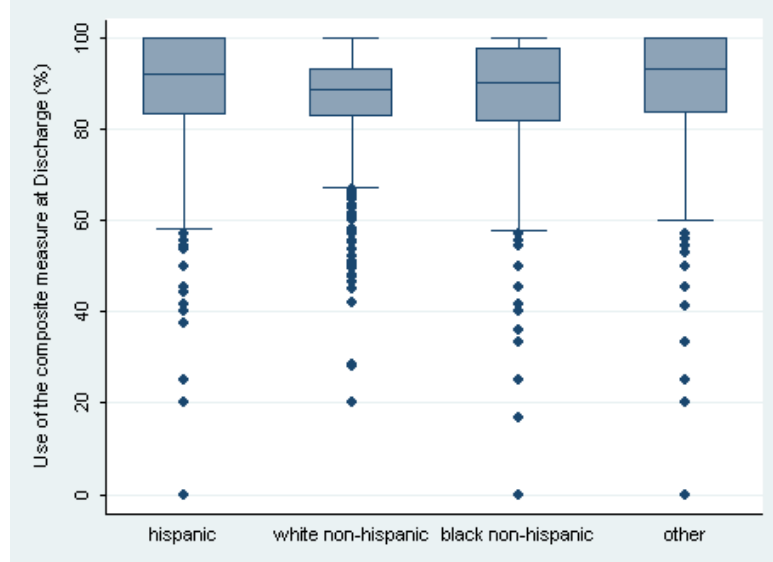
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Distribution of The Composite Measure at Discharge Stratified by Race

Description	Race			
	Hispanic	White non-Hispanic	Black non-Hispanic	Other
N	1317	1386	1304	1274
Mean	0.8783	0.8688	0.8726	0.8853
Std Deviation	0.1666	0.0900	0.1432	0.1607
75% Q3	1.0000	0.9314	0.9782	1.0000
50% Median	0.9228	0.8860	0.9034	0.9333
25% Q1	0.8311	0.8276	0.8176	0.8333

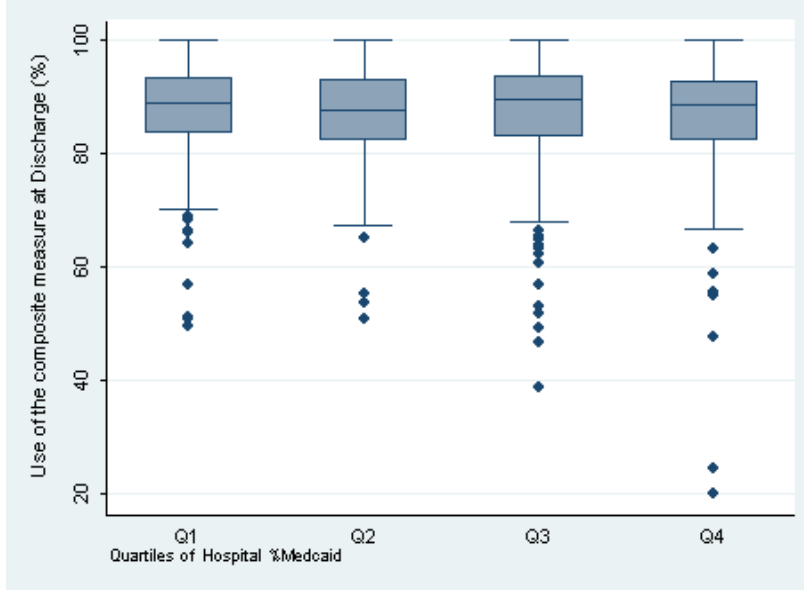
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Distribution of The Composite Measure at Discharge Stratified by Hospital %Medicaid*

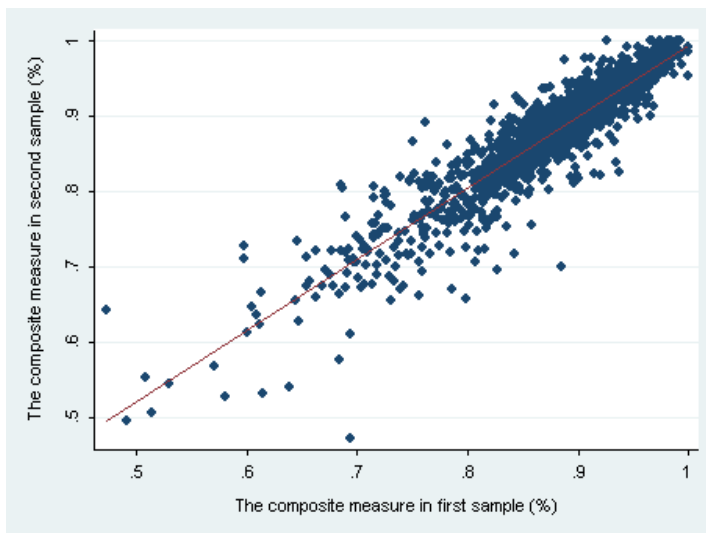
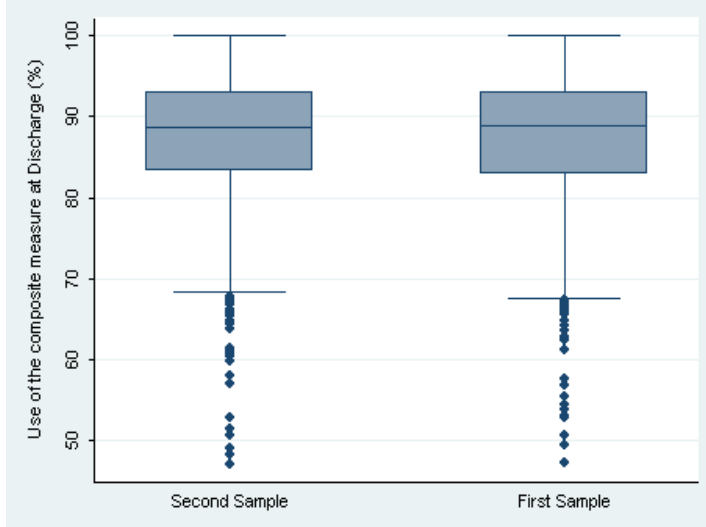
Description	%Medicaid	%Medicaid			
		Q1	Q2	Q3	Q4
N	1366	341	342	342	341
Mean	18.39	0.8782	0.8681	0.8715	0.8629
Std Deviation	8.82	0.0786	0.0795	0.0945	0.0971
75% Q3	22.38	0.9333	0.9310	0.9367	0.9287
50% Median	18.20	0.8893	0.8764	0.8964	0.8849
25% Q1	12.69	0.8359	0.8236	0.8301	0.8223

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Distribution of The Composite Measure at Discharge Stratified by The Randomly Split Samples		
Description	Randomly Split Samples	
	First (RAND=1)	Second (RAND=0)
	DCM	DCM
N	1291	1293
Mean	0.8737	0.8730
Std Deviation	0.0806	0.0802
75% Q3	0.9314	0.9313
50% Median	0.8897	0.8876
25% Q1	0.8288	0.8322
Correlation coefficient: 0.92392		

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Kappa scores for pertinent audit variables

CE #	Field Name	Kappa	95% CI	Nlevels	Final Agreement Rate
3110	Transferred From Outside Facility	0.965	0.931 - 0.999	2	99.0%
4030	STEMI or STEMI Equivalent	0.878	0.827 - 0.93	2	95.3%
4040	ECG Findings	0.777	0.713 - 0.842	4	90.7%
4041	STEMI or STEMI Equivalent First Noted	0.733	0.665 - 0.8	3	87.3%
5020	Current/Recent Smoker (w/in 1 year)	0.863	0.806 - 0.92	2	95.0%
5070	Diabetes Mellitus	0.909	0.86 - 0.957	2	96.3%
6010	Aspirin in First 24 Hours	0.384	0.139 - 0.63	4	95.3%
6020	Aspirin at Discharge	0.883	0.822 - 0.943	4	96.3%

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6270	Beta Blocker at Discharge	0.824	0.761 - 0.887	4	94.0%
6320	ACE Inhibitor at Discharge	0.811	0.758 - 0.864	4	89.0%
6470	Statin at Discharge	0.843	0.782 - 0.904	4	94.3%
7011	LVEF Not Assessed	0.602	0.469 - 0.736	2	93.0%
7100	PCI	0.987	0.97 - 1	2	99.3%
8000	Reperfusion Candidate	0.606	0.534 - 0.678	3	80.7%
8020	Thrombolytics	0.669	0.592 - 0.746	3	85.3%
1110 0	Discharge Status	0.934	0.844 - 1	2	99.7%
1110 1	Smoking Counseling	0.756	0.688 - 0.823	3	89.7%
1110 4	Cardiac Rehabilitation Referral	0.386	0.314 - 0.458	4	65.3%
1110 5	Discharge Location	0.808	0.746 - 0.87	8	91.7%

Validity Testing

Systematic assessment of content validity:

Content validity of this process was achieved by the specialized expertise of those individuals who developed this measure as well as the structured discussions that the group conducted. For this particular topic those individuals who were involved in identifying the key attributes and variables for this process measure were leaders and experts in the field of electrophysiology. Serial phone calls were held to both define the eligible population and given process. These clinical leaders are noted below.

NCDR Scientific Quality and Oversight Committee—a committee that served as the primary resource for crosscutting scientific and quality of care methodological issues. These members included Drs. Frederick Masoudi (Chair), David Malenka, Thomas Tsai, Matthew Reynolds, David Shahian, John Windle, Fred Resnic, John Moore, Deepak Bhatt, James Tchong, Jephtha Curtis, Paul Chan, Matthew Roe, and John Rumsfeld.

NCDR Strategic Quality and Oversight Committee— an ACC leadership oversight committee that serves as the primary resource for crosscutting scientific and quality of care methodological issues – ensured the data dictionaries and metrics are consistent across registries. They also reviewed and approved the methodology and results of the bleeding outcome and model.

NCDR AR-G Steering Committee provides strategic direction for the Registry and ensures the measures submitted to NQF met key criterion such as reliability, feasibility, and that there is compelling evidence base behind the development and implementation of this measure.

These members include James G. Jollis, M.D., F.A.C.C., Deepak L. Bhatt, M.D., M.P.H., F.A.C.C., Robert L. McNamara, M.D., M.H.S., F.A.C.C., Ivan Rokos, M.D., F.A.C.C., Michael A. Ross, M.D., Michael C. Kontos, M.D., F.A.C.C., Steven V. Manoukian, M.D., F.A.C.C., Harper Stone, MD, Harold L. Dauerman, M.D., F.A.C.C., Martha J. Radford, M.D., F.A.C.C., James A. de Lemos, M.D., F.A.C.C.

Tracy Wang, M.D., F.A.C.C.

Lastly the 16 member NCDR Management Board and 31 member ACCF Board of Trustees approved these measures for submission to NQF.

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Confounding Bias: No empirical testing was performed since this metric is neither an outcome or resource use measure.

Evidence:

Many references are noted below including guidelines, focused updates to guidelines and performance measures endorsed by the American College of Cardiology and American Heart Association.

Krumholz HM, Anderson JL, Bachelder BL, Fesmire FM, Fihn SD, Foody JM, Ho PM, Kosiborod MN, Masoudi FM, Nallamothu BK. ACC/AHA 2008 performance measures for adults with ST-elevation and non-ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Performance Measures (Writing Committee to Develop Performance Measures for ST-Elevation and Non-ST-Elevation Myocardial Infarction). *J Am Coll Cardiol* 2008;52:2046–99.

Anderson JL, Adams CD, Antman EM, et al. ACC/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction) developed in collaboration with the American College of Emergency Physicians, the Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons, endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation and the Society for Academic Emergency Medicine. *J Am Coll Cardiol*. 2007;50:e1–157.

Antman EM, Hand M, Armstrong PW, et al. 2007 Focused update of the ACC/AHA 2004 guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol*. 2008;51:210–47.

Antman EM, Anbe DT, Armstrong PW, et al. ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1999 Guidelines for the Management of Patients With Acute Myocardial Infarction). *J Am Coll Cardiol*. 2004;44:E1–211.

Antman EM, Hand M, Armstrong PW, et al. 2007 Focused update of the ACC/AHA 2004 guidelines for the management of patients with ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol*. 2008;51:210–47.

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	and the Society of Thoracic Surgeons, endorsed by the American Association of Cardiovascular and Pulmonary Rehabilitation and the Society for Academic Emergency Medicine. J Am Coll Cardiol. 2007;50:e1-157.
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