

Supplementary Online Content

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

eTable 1. Variable Missing Rates and Imputation Details

Variable	Missing %						Note on imputation
	Overall	Q1	Q2	Q3	Q4	Q5	
Age*	0.0	0.0	0.0	0.0	0.0	0.0	N/A
Sex	0.0	0.0	0.0	0.0	0.0	0.0	N/A
Race/Ethnicity	1.3	2.5	1.5	0.9	0.6	0.4	Grouped missing with Other/UTD/ND/Unknown
LVEF	2.5	3.1	1.8	2.4	2.0	3.9	Multiple imputation
EF, %*	6.2	7.8	5.6	5.7	5.0	7.8	
Medical History – Any except smoking	4.3	4.2	6.0	2.2	5.2	2.7	Impute to “No”
Medical History – Smoking	1.5	3.2	2.0	0.5	0.6	0.3	Impute to “No”
Vitals on Admission							
Heart Rate, bpm*	26.9	20.1	40.1	27.3	17.6	23.9	Multiple imputation
SBP, mmHg*	28.0	20.9	40.8	28.8	19.3	24.8	Multiple imputation
DBP, mmHg*	28.0	20.8	40.8	28.8	19.3	24.7	
BMI*	56.8	54.0	71.2	52.4	46.2	53.6	
Lipids							
Total Cholesterol, mg/dL*	87.0	86.4	91.3	84.9	84.4	85.5	
HDL, mg/dL*	87.0	86.5	91.3	85.1	84.6	85.6	
LDL, mg/dL*	86.7	84.3	90.9	85.7	85.0	86.0	
Triglycerides, mg/dL*	87.0	86.4	91.2	85.0	84.5	85.4	
Lab Measures							
Serum sodium, mEq/L*	45.9	42.7	55.6	42.2	41.4	42.9	Multiple imputation
Hemoglobin, g/dL*	64.5	66.0	75.4	57.3	57.8	59.6	
Albumin, g/dL*	72.4	72.4	80.4	64.7	71.6	67.8	
BNP, pg/mL*	74.8	75.0	83.1	72.9	64.1	76.0	
NBNP, pg/mL*	87.7	88.0	89.5	85.9	91.5	80.2	
Serum creatinine, mg/dL*	33.3	30.0	41.5	31.5	29.5	29.9	Multiple imputation
BUN, mg/dL*	60.7	63.3	69.9	52.3	55.4	57.4	
Troponin, ng/dL*	68.7	70.3	78.6	61.1	61.8	67.0	
Potassium, mEq/L*	63.2	64.2	73.6	56.8	56.6	58.6	
HbA1C, %*	91.4	92.9	94.1	87.7	90.0	90.4	
Blood Glucose, mg/dL*	76.1	76.7	83.4	67.2	73.0	77.6	
EKG QRS Duration, ms*	11.4	10.6	12.7	9.2	11.2	14.1	
Year of index HF	0.0	0.0	0.0	0.0	0.0	0.0	
Hospital Characteristics							
Number of Beds*	3.0	0.7	1.5	4.5	2.9	8.3	Not imputed, complete case only
Region	0.0	0.0	0.0	0.0	0.0	0.0	Not imputed, complete case only
Rural Location	2.8	5.7	0.9	1.5	3.4	2.5	Not imputed, complete case only
Teaching Status	3.1	1.4	2.0	4.4	1.5	9.4	Not imputed, complete case only
Heart Transplant Hospital	29.1	32.2	23.2	28.7	28.2	38.9	

We used multiple imputation by fully conditional specification methods with 10 imputed datasets. *continuous variables; shaded variables are those included in adjusted models; LVEF: left ventricular ejection fraction; EF: ejection fraction; HF: heart failure, COPD: chronic obstructive pulmonary disease; CAD: coronary artery disease; MI: myocardial infarction; CVA: cerebrovascular accident; TIA: transient ischemic attack; ICD: implantable cardioverter defibrillator; Scr: serum creatinine; CRT-P: cardiac resynchronization therapy-pacemaker; CRT-D: cardiac resynchronization therapy-defibrillator; Hx: history; PCI: percutaneous coronary intervention; CABG: coronary artery bypass graft; bpm: beats per minute; SBP: systolic blood pressure; DBP: diastolic blood pressure; HDL: high-density lipoprotein; LDL: low-density lipoprotein; BNP: beta natriuretic peptide; NBNP: n-terminal-pro beta natriuretic peptide; BUN: blood urea nitrogen; HbA1C: hemoglobin A1C; EKG: electrocardiogram.

eTable 2. Baseline Characteristics of Patients Hospitalized for Heart Failure at GWTG-HF Sites by Dual Eligibility Quintiles

Variable	Overall N=258,995	Q1 (0 - <13.3) N=57,640	Q2 (13.3 - <17.4) N=70,336	Q3 (17.4 - <23.16) N=50,950	Q4 (23.16 - <31.9) N=49,100	Q5 (31.9 - 83.3) N=30,969	P Value	% Std. Diff. Q1 vs Q5
Demographics								
Age*	81 (74 - 87)	82 (75 - 88)	81 (74 - 87)	80 (73 - 87)	80 (73 - 87)	80 (72 - 86)	<.0001	23.9
Female	137,726 (53.2)	30,425 (52.8)	37,066 (52.7)	26,621 (52.2)	26,205 (53.4)	17,409 (56.2)	<.0001	6.9
Race								
' Other (includes UTD)	6,179 (2.4)	1,196 (2.1)	1,124 (1.6)	1,138 (2.3)	1,396 (2.9)	1,325 (4.3)	<.0001	88.3
' Asian	3,859 (1.5)	678 (1.2)	992 (1.4)	522 (1.0)	543 (1.1)	1,124 (3.6)		
' Hispanic (any race)	11,871 (4.6)	1,484 (2.6)	1,299 (1.9)	1,473 (2.9)	2,394 (4.9)	5,221 (16.9)		
' Black	26,202 (10.3)	2,975 (5.3)	5,038 (7.3)	4,827 (9.6)	6,354 (13.0)	7,008 (22.7)		
' White	207,504 (81.2)	49,860 (88.7)	60,821 (87.8)	42,539 (84.2)	38,130 (78.1)	16,154 (52.4)		
LVEF**								
' Source of LVEF: Quantitative	242,831 (96.2)	53,135 (95.1)	66,428 (96.2)	48,055 (96.6)	46,663 (97.0)	28,550 (95.9)	<.0001	3.9
' Source of LVEF: Qualitative	9,708 (3.8)	2,723 (4.9)	2,641 (3.8)	1,692 (3.4)	1,441 (3.0)	1,211 (4.1)		
EF, %*	48 (30 - 58)	50 (30 - 58)	48 (30 - 58)	47 (30 - 59)	45 (30 - 58)	47 (30 - 59)	<.0001	3.8
EF groups*								
' 50 <= OH_EF <=100	125,160 (49.6)	28,887 (51.7)	34,407 (49.8)	24,074 (48.4)	23,223 (48.3)	14,569 (49.0)	<.0001	5.9
' 40 < OH_EF < 50	24,310 (9.6)	5,342 (9.6)	6,830 (9.9)	4,805 (9.7)	4,498 (9.4)	2,835 (9.5)		
' 0 <= OH_EF <= 40	103,069 (40.8)	21,629 (38.7)	27,832 (40.3)	20,868 (41.9)	20,383 (42.4)	12,357 (41.5)		
EF groups missing	6,456 (2.5)	1,782 (3.1)	1,267 (1.8)	1,203 (2.4)	996 (2.0)	1,208 (3.9)	<.0001	4.4
Year of HF Admission*								
' 2017	46,113 (17.8)	11,305 (19.6)	11,796 (16.8)	9,236 (18.1)	8,713 (17.7)	5,063 (16.3)	<.0001	19.7
' 2016	42,706 (16.5)	10,498 (18.2)	11,354 (16.1)	8,662 (17.0)	7,373 (15.0)	4,819 (15.6)		
' 2015	35,918 (13.9)	9,155 (15.9)	9,876 (14.0)	6,575 (12.9)	6,233 (12.7)	4,079 (13.2)		
' 2014	31,633 (12.2)	7,619 (13.2)	9,106 (12.9)	5,745 (11.3)	5,490 (11.2)	3,673 (11.9)		
' 2013	29,414 (11.4)	6,094 (10.6)	8,344 (11.9)	5,876 (11.5)	5,292 (10.8)	3,808 (12.3)		
' 2012	27,320 (10.5)	4,921 (8.5)	7,931 (11.3)	5,397 (10.6)	5,483 (11.2)	3,588 (11.6)		
' 2011	25,267 (9.8)	4,474 (7.8)	7,153 (10.2)	5,004 (9.8)	5,348 (10.9)	3,288 (10.6)		
' 2010	20,624 (8.0)	3,574 (6.2)	4,776 (6.8)	4,455 (8.7)	5,168 (10.5)	2,651 (8.6)		
Medical History								
Atrial Flutter/Fibrillation	121,559 (49.0)	28,968 (52.4)	33,485 (50.6)	24,551 (49.3)	22,272 (47.9)	12,283 (40.7)	<.0001	23.6
COPD or Asthma	84,990 (34.3)	18,202 (33.0)	22,331 (33.8)	17,515 (35.1)	16,544 (35.6)	10,398 (34.5)	<.0001	3.3
Diabetes	104,762 (42.3)	21,747 (39.4)	26,645 (40.3)	21,880 (43.9)	20,286 (43.6)	14,204 (47.1)	<.0001	15.7
Hyperlipidemia	144,563 (58.3)	32,355 (58.6)	39,931 (60.4)	29,970 (60.1)	26,861 (57.7)	15,446 (51.2)	<.0001	14.8
Hypertension	204,702 (82.6)	45,562 (82.5)	53,421 (80.8)	41,511 (83.3)	38,674 (83.1)	25,534 (84.7)	<.0001	6.0
Peripheral Vascular Disease	35,119 (14.2)	7,811 (14.1)	9,553 (14.4)	7,744 (15.5)	6,621 (14.2)	3,390 (11.2)	<.0001	8.7
CAD	135,483 (54.7)	30,049 (54.4)	36,531 (55.2)	27,561 (55.3)	25,897 (55.6)	15,445 (51.2)	<.0001	6.3

Variable	Overall N=258,995	Q1 (0 - <13.3) N=57,640	Q2 (13.3 - <17.4) N=70,336	Q3 (17.4 - <23.16) N=50,950	Q4 (23.16 - <31.9) N=49,100	Q5 (31.9 - 83.3) N=30,969	P Value	% Std. Diff. Q1 vs Q5
Prior MI	52,909 (21.3)	11,244 (20.4)	14,224 (21.5)	10,972 (22.0)	10,504 (22.6)	5,965 (19.8)	<.0001	1.4
CVA/TIA	45,252 (18.3)	10,028 (18.2)	12,112 (18.3)	9,470 (19.0)	8,395 (18.0)	5,247 (17.4)	<.0001	2.0
ICD only	20,285 (8.2)	4,161 (7.5)	5,878 (8.9)	4,088 (8.2)	3,685 (7.9)	2,473 (8.2)	<.0001	2.5
Heart failure	182,182 (73.5)	39,499 (71.5)	47,603 (72.0)	37,051 (74.3)	36,038 (77.4)	21,991 (73.0)	<.0001	3.2
Anemia	61,273 (24.7)	12,880 (23.3)	16,730 (25.3)	13,105 (26.3)	11,170 (24.0)	7,388 (24.5)	<.0001	2.8
Pacemaker	44,556 (18.0)	10,798 (19.5)	12,185 (18.4)	8,853 (17.8)	7,998 (17.2)	4,722 (15.7)	<.0001	10.2
Dialysis, chronic	8,379 (3.4)	1,392 (2.5)	1,915 (2.9)	1,799 (3.6)	1,487 (3.2)	1,786 (5.9)	<.0001	17.0
Renal insufficiency, chronic (SCr>2.0)	65,436 (26.4)	13,794 (25.0)	18,118 (27.4)	12,914 (25.9)	11,833 (25.4)	8,777 (29.1)	<.0001	9.3
Depression	34,038 (13.7)	7,605 (13.8)	9,237 (14.0)	7,439 (14.9)	6,206 (13.3)	3,551 (11.8)	<.0001	6.0
Valvular Heart Disease	56,801 (22.9)	13,234 (24.0)	16,454 (24.9)	11,926 (23.9)	9,855 (21.2)	5,332 (17.7)	<.0001	15.5
CRT-P	2,858 (1.2)	727 (1.3)	694 (1.0)	564 (1.1)	571 (1.2)	302 (1.0)	<.0001	2.9
CRT-D	15,364 (6.2)	3,567 (6.5)	3,962 (6.0)	3,217 (6.5)	3,169 (6.8)	1,449 (4.8)	<.0001	7.2
Ischemic Etiology: Med Hx of CAD, MI, prior PCI, prior CABG, or prior PCI/CABG	147,541 (59.5)	32,647 (59.1)	39,520 (59.8)	30,029 (60.2)	28,322 (60.9)	17,023 (56.5)	<.0001	5.3
Medical History Panel Missing	11,092 (4.3)	2,400 (4.2)	4,201 (6.0)	1,103 (2.2)	2,564 (5.2)	824 (2.7)	<.0001	8.3
Smoking	21,524 (8.4)	3,862 (6.9)	5,495 (8.0)	4,450 (8.8)	4,692 (9.6)	3,025 (9.8)	<.0001	10.4
Vitals on Admission								
Heart Rate, bpm*	80 (70 - 94)	80 (70 - 93)	81 (70 - 95)	80 (70 - 94)	81 (70 - 95)	81 (70 - 95)	<.0001	4.3
SBP, mmHg*	137 (119 - 157)	137 (119 - 157)	138 (119 - 158)	137 (118 - 157)	138 (119 - 158)	139 (120 - 158)	<.0001	5.5
DBP, mmHg*	73 (62 - 84)	72 (62 - 84)	73 (63 - 85)	73 (63 - 84)	72 (62 - 84)	73 (63 - 85)	<.0001	5.9
BMI*	27.0 (23.0 - 32.2)	26.7 (22.9 - 31.7)	26.9 (23.0 - 32.1)	27.3 (23.4 - 32.6)	27.1 (23.1 - 32.4)	26.8 (22.9 - 32.1)	<.0001	3.6
Lipids								
Total Cholesterol, mg/dL*	130 (107 - 158)	133 (111 - 162)	128 (105 - 156)	128 (106 - 156)	128 (106 - 157)	130 (107 - 159)	<.0001	4.8
HDL, mg/dL*	40 (32 - 50)	42 (33 - 53)	39 (31 - 49)	40 (32 - 50)	39 (31 - 50)	40 (31 - 50)	<.0001	13.0
LDL, mg/dL*	70 (53 - 91)	70 (54 - 91)	69 (52 - 90)	69 (52 - 90)	69 (52 - 92)	71 (54 - 94)	<.0001	4.0
Triglycerides, mg/dL*	86 (65 - 117)	88 (67 - 121)	83 (61 - 112)	87 (66 - 119)	87 (66 - 118)	84 (63 - 114)	<.0001	11.7
Lab Measures								
Serum sodium, mEq/L*	138 (135 - 141)	139 (136 - 141)	138 (135 - 141)	138 (135 - 141)	139 (136 - 141)	138 (135 - 141)	<.0001	9.1
Hemoglobin, g/dL*	11.5 (10.1 - 12.9)	11.6 (10.2 - 13.0)	11.5 (10.2 - 12.9)	11.5 (10.1 - 13.0)	11.4 (10.0 - 12.8)	11.3 (10.0 - 12.8)	<.0001	10.6
Albumin, g/dL*	3.4 (3.0 - 3.7)	3.5 (3.1 - 3.8)	3.3 (3.0 - 3.6)	3.4 (3.0 - 3.7)	3.4 (3.0 - 3.7)	3.4 (3.1 - 3.8)	<.0001	13.3
BNP, pg/mL*	854 (433 - 1,683)	833 (434 - 1,630)	891 (465 - 1,712)	901 (448 - 1,751)	785 (380 - 1,550)	941 (480 - 1,939)	<.0001	12.8
NBNP, pg/mL*	5,811 (2,606 - 13,020)	5,315 (2,486 - 11,673)	6,222 (2,874 - 13,659)	5,924 (2,659 - 13,025)	6,318 (2,807 - 13,926)	5,510 (2,187 - 13,249)	<.0001	0.3
Serum creatinine, mg/dL*	1.3 (1.0 - 1.9)	1.3 (1.0 - 1.8)	1.3 (1.0 - 1.9)	1.3 (1.0 - 1.9)	1.3 (1.0 - 1.9)	1.3 (1.0 - 1.9)	<.0001	5.7
BUN, mg/dL*	27 (19 - 40)	27 (19 - 40)	27 (19 - 40)	27 (19 - 40)	27 (19 - 41)	27 (19 - 40)	0.0002	0.1
Troponin, ng/dL*	0.04 (0.02 -	0.04 (0.02 -	0.04 (0.02 -	0.05 (0.02 -	0.04 (0.02 -	0.04 (0.03 -	<.0001	12.3

Variable	Overall N=258,995	Q1 (0 - <13.3) N=57,640	Q2 (13.3 - <17.4) N=70,336	Q3 (17.4 - <23.16) N=50,950	Q4 (23.16 - <31.9) N=49,100	Q5 (31.9 - 83.3) N=30,969	P Value	% Std. Diff. Q1 vs Q5
Potassium, mEq/L*	4.2 (3.8 - 4.6)	4.2 (3.9 - 4.6)	4.2 (3.8 - 4.6)	4.2 (3.8 - 4.6)	4.2 (3.8 - 4.7)	4.2 (3.8 - 4.7)	<.0001	0.7
HbA1C, %*	6.5 (5.8 - 7.4)	6.5 (5.9 - 7.5)	6.6 (5.9 - 7.5)	6.4 (5.8 - 7.3)	6.5 (5.9 - 7.5)	6.4 (5.8 - 7.4)	<.0001	8.6
Blood Glucose, mg/dL*	111 (94 - 142)	111 (94 - 139)	111 (95 - 140)	110 (94 - 141)	112 (94 - 144)	113 (95 - 145)	<.0001	6.2
EKG QRS Duration, ms*	110 (90 - 144)	112 (92 - 146)	110 (90 - 145)	110 (90 - 146)	109 (90 - 144)	106 (90 - 142)	<.0001	10.0
Hospital Characteristics								
Number of Beds*	360 (228 - 510)	303 (232 - 391)	383 (218 - 628)	379 (260 - 583)	370 (200 - 524)	376 (235 - 483)	<.0001	47.3
Geographic Region								
' West	32,315 (12.5)	6,244 (10.8)	6,127 (8.7)	8,969 (17.6)	3,852 (7.8)	7,123 (23.0)	<.0001	65.4
' South	82,542 (31.9)	14,151 (24.6)	19,496 (27.7)	16,928 (33.2)	20,203 (41.1)	11,764 (38.0)		
' Midwest	67,237 (26.0)	19,060 (33.1)	23,355 (33.2)	15,899 (31.2)	5,722 (11.7)	3,201 (10.3)		
' Northeast	76,901 (29.7)	18,185 (31.5)	21,358 (30.4)	9,154 (18.0)	19,323 (39.4)	8,881 (28.7)		
Rural Location	11,411 (4.5)	407 (0.7)	1,961 (2.8)	2,362 (4.7)	4,519 (9.5)	2,162 (7.2)	<.0001	33.4
Teaching Status	179,119 (71.4)	29,310 (51.6)	53,102 (77.0)	38,795 (79.6)	35,011 (72.4)	22,901 (81.7)	<.0001	67.3
Heart Transplant Hospital	18,292 (10.0)	2,537 (6.5)	4,918 (9.1)	8,983 (24.7)	1,683 (4.8)	171 (0.9)	<.0001	29.9

* Continuous variables. **LVEF assessment before arrival, during hospitalization, or if planned after discharge; LVEF: left ventricular ejection fraction, EF: ejection fraction, HF: heart failure, COPD: chronic obstructive pulmonary disease, CAD: coronary artery disease, MI: myocardial infarction, CVA: cerebrovascular accident, TIA: transient ischemic attack, ICD: implantable cardioverter defibrillator, Scr: serum creatinine, CRT-P: cardiac resynchronization therapy-pacemaker, CRT-D: cardiac resynchronization therapy-defibrillator, Hx: history, PCI: percutaneous coronary intervention, CABG: coronary artery bypass graft, bpm: beats per minute, SBP: systolic blood pressure, DBP: diastolic blood pressure, HDL: high-density lipoprotein, LDL: low-density lipoprotein, BNP: beta natriuretic peptide, NBNP: n-terminal-pro beta natriuretic peptide, BUN: blood urea nitrogen, HbA1C: hemoglobin A1C, EKG: electrocardiogram.

eTable 3. Baseline Characteristics of Hospitals Participating in GWTG-HF Registry by Dual Eligibility Quintiles.

Variable	Overall N=455	Q1 (0 - <13.3) N= 91	Q2 (13.3 - <17.4) N= 91	Q3 (17.4 - <23.16) N= 91	Q4 (23.16 - <31.9) N= 91	Q5 (31.9 - 83.3) N= 91	P Value	% Std. Diff. Q1 vs Q5
Hospital Characteristics								
Number of Beds*	276 (160 - 432)	254 (145 - 379)	238 (164 - 432)	310 (206 - 458)	270 (158 - 417)	342 (179 - 482)	0.1460	37.1
Geographic Region							0.0052	58.3
' West	75 (16.5)	14 (15.4)	14 (15.4)	15 (16.5)	10 (11.0)	22 (24.2)		
' South	152 (33.4)	25 (27.5)	25 (27.5)	29 (31.9)	39 (42.9)	34 (37.4)		
' Midwest	111 (24.4)	31 (34.1)	28 (30.8)	28 (30.8)	14 (15.4)	10 (11.0)		
' Northeast	117 (25.7)	21 (23.1)	24 (26.4)	19 (20.9)	28 (30.8)	25 (27.5)		
Rural Location	40 (9.2)	2 (2.4)	6 (6.7)	11 (12.6)	10 (11.6)	11 (12.2)	0.0826	38.7
Teaching Status	271 (63.9)	49 (55.1)	54 (62.8)	56 (65.9)	53 (60.9)	59 (76.6)	0.0629	46.7
Heart Transplant Hospital	20 (7.3)	2 (3.5)	4 (6.5)	8 (15.7)	4 (7.8)	2 (3.8)	0.1133	1.8
Dual Eligibility Rate*	20 (14 - 29)	11 (9 - 12)	15 (14 - 17)	20 (19 - 21)	27 (25 - 29)	46 (36 - 57)	<.0001	400.2

* Continuous variables.

eTable 4. Patient-Level and Hospital-Level, Treating Column Variable (DE Quintiles) as Ordinal

Variable	Level	Overall (N=258995)		Q1 (N=57640)		Q2 (N=70336)		Q3 (N=50950)		Q4 (N=49100)		Q5 (N=30969)		P-value+					
<u>Demographics</u>																			
Age*	Median	258995	81.0	57640	82.0	70336	81.0	50950	80.0	49100	80.0	30969	80.0	<.0001					
	25th		74.0		75.0		74.0		73.0		73.0		72.0						
	75th		87.0		88.0		87.0		87.0		87.0		86.0						
	Mean		80.5		81.5		80.9		80.0		80.0		79.5						
	STD		8.5		8.4		8.5		8.5		8.5		8.7						
	Min		65.0		65.0		65.0		65.0		65.0		65.0						
	Max		110.0		110.0		109.0		109.0		110.0		106.0						
	Missing (%)		0.0		0.0		0.0		0.0		0.0		0.0						
Female	Yes	137726	53.2	30425	52.8	37066	52.7	26621	52.2	26205	53.4	17409	56.2	<.0001					
	No	121269	46.8		47.2		33270		47.3		24329		47.8		22895	46.6	13560	43.8	
Race	Other (includes UTD)	6179	2.4	1196	2.1	1124	1.6	1138	2.3	1396	2.9	1325	4.3	<.0001					
	Asian	3859	1.5		678		1.2		992		1.4		522		1.0	543	1.1	1124	3.6
	Hispanic (any race)	11871	4.6		1484		2.6		1299		1.9		1473		2.9	2394	4.9	5221	16.9
	Black	26202	10.3		2975		5.3		5038		7.3		4827		9.6	6354	13.0	7008	22.7
	White	207504	81.2		49860		88.7		60821		87.8		42539		84.2	38130	78.1	16154	52.4
	Missing	3380	1.3		1447		2.5		1062		1.5		451		0.9	283	0.6	137	0.4
LVEF Source	Source of LVEF: Quantitative	242831	96.2	53135	95.1	66428	96.2	48055	96.6	46663	97.0	28550	95.9	<.0001					
	Source of LVEF: Qualitative	9708	3.8		4.9		2641		3.8		1692		3.4		1441	3.0	1211	4.1	
	Missing	6456	2.5		1782		3.1		1267		1.8		1203		2.4	996	2.0	1208	3.9
EF, %*	Median	242831	48.0		50.0	66428	48.0	48055	47.0	46663	45.0	28550	47.0	<.0001					

Variable	Level	Overall (N=258995)		Q1 (N=57640)		Q2 (N=70336)		Q3 (N=50950)		Q4 (N=49100)		Q5 (N=30969)		P-value+
				53135										
	25th		30.0		30.0		30.0		30.0		30.0		30.0	
	75th		58.0		58.0		58.0		59.0		58.0		59.0	
	Mean		44.6		45.3		44.6		44.7		43.8		44.6	
	STD		16.7		16.5		16.6		16.9		16.5		17.0	
	Min		5.0		5.0		5.0		5.0		5.0		5.0	
	Max		95.0		90.0		94.0		95.0		94.0		95.0	
	Missing (%)		6.2		7.8		5.6		5.7		5.0		7.8	
EF groups*	50 <= OH_EF <=100	125160	49.6	28887	51.7	34407	49.8	24074	48.4	23223	48.3	14569	49.0	<.0001
	40 < OH_EF < 50	24310	9.6	5342	9.6	6830	9.9	4805	9.7	4498	9.4	2835	9.5	
	0 <= OH_EF <= 40	103069	40.8	21629	38.7	27832	40.3	20868	41.9	20383	42.4	12357	41.5	
	Missing	6456	2.5	1782	3.1	1267	1.8	1203	2.4	996	2.0	1208	3.9	
EF groups missing	Yes	6456	2.5	1782	3.1	1267	1.8	1203	2.4	996	2.0	1208	3.9	0.0133
	No	252539	97.5	55858	96.9	69069	98.2	49747	97.6	48104	98.0	29761	96.1	
<u>Medical History</u>														
Atrial Flutter/Fibrillation	Yes	121559	49.0	28968	52.4	33485	50.6	24551	49.3	22272	47.9	12283	40.7	<.0001
	No	126344	51.0	26272	47.6	32650	49.4	25296	50.7	24264	52.1	17862	59.3	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
COPD or Asthma	Yes	84990	34.3	18202	33.0	22331	33.8	17515	35.1	16544	35.6	10398	34.5	<.0001
	No	162913	65.7	37038	67.0	43804	66.2	32332	64.9	29992	64.4	19747	65.5	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Diabetes	Yes	104762	42.3	21747	39.4	26645	40.3	21880	43.9	20286	43.6	14204	47.1	<.0001

Variable	Level	Overall (N=258995)		Q1 (N=57640)		Q2 (N=70336)		Q3 (N=50950)		Q4 (N=49100)		Q5 (N=30969)		P-value+
Hyperlipidemia	No	143141	57.7	33493	60.6	39490	59.7	27967	56.1	26250	56.4	15941	52.9	<.0001
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
	Yes	144563	58.3	32355	58.6	39931	60.4	29970	60.1	26861	57.7	15446	51.2	
	No	103340	41.7	22885	41.4	26204	39.6	19877	39.9	19675	42.3	14699	48.8	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Hypertension	Yes	204702	82.6	45562	82.5	53421	80.8	41511	83.3	38674	83.1	25534	84.7	<.0001
	No	43201	17.4	9678	17.5	12714	19.2	8336	16.7	7862	16.9	4611	15.3	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Peripheral Vascular Disease	Yes	35119	14.2	7811	14.1	9553	14.4	7744	15.5	6621	14.2	3390	11.2	<.0001
	No	212784	85.8	47429	85.9	56582	85.6	42103	84.5	39915	85.8	26755	88.8	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
CAD	Yes	135483	54.7	30049	54.4	36531	55.2	27561	55.3	25897	55.6	15445	51.2	<.0001
	No	112420	45.3	25191	45.6	29604	44.8	22286	44.7	20639	44.4	14700	48.8	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Prior MI	Yes	52909	21.3	11244	20.4	14224	21.5	10972	22.0	10504	22.6	5965	19.8	0.0014
	No	194994	78.7	43996	79.6	51911	78.5	38875	78.0	36032	77.4	24180	80.2	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
CVATIA	Yes	45252	18.3		18.2	12112	18.3	9470	19.0	8395	18.0	5247	17.4	0.0920

Variable	Level	Overall (N=258995)		Q1 (N=57640)		Q2 (N=70336)		Q3 (N=50950)		Q4 (N=49100)		Q5 (N=30969)		P-value+
ICD only	No	202651	81.7	10028	81.8	54023	81.7	40377	81.0	38141	82.0	24898	82.6	0.2850
	Missing	11092	4.3	45212	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
	Yes	20285	8.2	2400	7.5	5878	8.9	4088	8.2	3685	7.9	2473	8.2	
	No	227618	91.8	4161	92.5	60257	91.1	45759	91.8	42851	92.1	27672	91.8	
	Missing	11092	4.3	51079	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Heart failure	Yes	182182	73.5	39499	71.5	47603	72.0	37051	74.3	36038	77.4	21991	73.0	<.0001
	No	65721	26.5	15741	28.5	18532	28.0	12796	25.7	10498	22.6	8154	27.0	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Anemia	Yes	61273	24.7	12880	23.3	16730	25.3	13105	26.3	11170	24.0	7388	24.5	0.0014
	No	186630	75.3	42360	76.7	49405	74.7	36742	73.7	35366	76.0	22757	75.5	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Pacemaker	Yes	44556	18.0	10798	19.5	12185	18.4	8853	17.8	7998	17.2	4722	15.7	<.0001
	No	203347	82.0	44442	80.5	53950	81.6	40994	82.2	38538	82.8	25423	84.3	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Dialysis, chronic	Yes	8379	3.4	1392	2.5	1915	2.9	1799	3.6	1487	3.2	1786	5.9	<.0001
	No	239524	96.6	53848	97.5	64220	97.1	48048	96.4	45049	96.8	28359	94.1	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	

Variable	Level	Overall (N=258995)		Q1 (N=57640)		Q2 (N=70336)		Q3 (N=50950)		Q4 (N=49100)		Q5 (N=30969)		P-value+
Renal insufficiency, chronic (SCr>2.0)	Yes	65436	26.4	13794	25.0	18118	27.4	12914	25.9	11833	25.4	8777	29.1	<.0001
	No	182467	73.6	41446	75.0	48017	72.6	36933	74.1	34703	74.6	21368	70.9	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Depression	Yes	34038	13.7	7605	13.8	9237	14.0	7439	14.9	6206	13.3	3551	11.8	<.0001
	No	213865	86.3	47635	86.2	56898	86.0	42408	85.1	40330	86.7	26594	88.2	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Valvular Heart Disease	Yes	56801	22.9	13234	24.0	16454	24.9	11926	23.9	9855	21.2	5332	17.7	<.0001
	No	191102	77.1	42006	76.0	49681	75.1	37921	76.1	36681	78.8	24813	82.3	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
CRT-P (cardiac resynchronization therapy-pacing only)	Yes	2858	1.2	727	1.3	694	1.0	564	1.1	571	1.2	302	1.0	0.0153
	No	245045	98.8	54513	98.7	65441	99.0	49283	98.9	45965	98.8	29843	99.0	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
CRT-D (cardiac resynchronization therapy with ICD)	Yes	15364	6.2	3567	6.5	3962	6.0	3217	6.5	3169	6.8	1449	4.8	0.0002
	No	232539	93.8	51673	93.5	62173	94.0	46630	93.5	43367	93.2	28696	95.2	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	
Ischemic Etiology: Med Hx of CAD, MI, prior PCI, prior CABG, or prior PCI/CABG	Yes	147541	59.5	32647	59.1	39520	59.8	30029	60.2	28322	60.9	17023	56.5	0.0669
	No	100362	40.5	22593	40.9	26615	40.2	19818	39.8	18214	39.1	13122	43.5	
	Missing	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	

Variable	Level	Overall (N=258995)		Q1 (N=57640)		Q2 (N=70336)		Q3 (N=50950)		Q4 (N=49100)		Q5 (N=30969)		P-value+
Medical History Panel Missing	Yes	11092	4.3	2400	4.2	4201	6.0	1103	2.2	2564	5.2	824	2.7	<.0001
	No	247903	95.7	55240	95.8	66135	94.0	49847	97.8	46536	94.8	30145	97.3	
Smoking	Yes	21524	8.4	3862	6.9	5495	8.0	4450	8.8	4692	9.6	3025	9.8	<.0001
	No	233569	91.6	51953	93.1	63428	92.0	46235	91.2	44108	90.4	27845	90.2	
	Missing	3902	1.5	1825	3.2	1413	2.0	265	0.5	300	0.6	99	0.3	
<u>Hospital Characteristics</u>														
Number of Beds*	Median	251190	360.0	57223	303.0	69257	383.0	48644	379.0	47652	370.0	28414	376.0	<.0001
	25th		228.0		232.0		218.0		260.0		200.0		235.0	
	75th		510.0		391.0		628.0		583.0		524.0		483.0	
	Mean		397.7		313.4		435.4		436.1		387.5		427.3	
	STD		239.3		145.2		275.3		244.7		223.9		266.4	
	Min		11.0		18.0		55.0		25.0		24.0		11.0	
	Max		2574.0		979.0		1049.0		1307.0		1390.0		2574.0	
	Missing (%)		3.0		0.7		1.5		4.5		2.9		8.3	
Geographic Region	West	32315	12.5	6244	10.8	6127	8.7	8969	17.6	3852	7.8	7123	23.0	<.0001
	South	82542	31.9	14151	24.6	19496	27.7	16928	33.2	20203	41.1	11764	38.0	
	Midwest	67237	26.0	19060	33.1	23355	33.2	15899	31.2	5722	11.7	3201	10.3	
	Northeast	76901	29.7	18185	31.5	21358	30.4	9154	18.0	19323	39.4	8881	28.7	
Rural Location	Yes	11411	4.5	407	0.7	1961	2.8	2362	4.7	4519	9.5	2162	7.2	<.0001
	No	240408	95.5	53920	99.3	67748	97.2	47799	95.3	42918	90.5	28023	92.8	
	Missing	7176	2.8	3313	5.7	627	0.9	789	1.5	1663	3.4	784	2.5	

Variable	Level	Overall (N=258995)		Q1 (N=57640)		Q2 (N=70336)		Q3 (N=50950)		Q4 (N=49100)		Q5 (N=30969)		P-value+
Teaching Status	Yes	179119	71.4	29310	51.6	53102	77.0	38795	79.6	35011	72.4	22901	81.7	<.0001
	No	71787	28.6	27517	48.4	15858	23.0	9931	20.4	13336	27.6	5145	18.3	
	Missing	8089	3.1	813	1.4	1376	2.0	2224	4.4	753	1.5	2923	9.4	
Heart Transplant Hospital	Yes	18292	10.0	2537	6.5	4918	9.1	8983	24.7	1683	4.8	171	0.9	<.0001
	No	165277	90.0	36558	93.5	49087	90.9	27326	75.3	33547	95.2	18759	99.1	
	Missing	75426	29.1	18545	32.2	16331	23.2	14641	28.7	13870	28.2	12039	38.9	

eTable 4A

Variable	Level	Overall (N=455)		Q1 (N=91)		Q2 (N=91)		Q3 (N=91)		Q4 (N=91)		Q5 (N=91)		P-value+
<u>Hospital Characteristics</u>														
Number of Beds*	Median	423	276.0	88	254.0	87	238.0	84	309.5	86	270.0	78	342.5	0.0467
	25th		160.0		145.0		164.0		206.5		158.0		179.0	
	75th		432.0		379.0		432.0		457.5		417.0		482.0	
	Mean		332.1		284.3		311.0		367.6		320.2		384.5	
	STD		249.5		178.2		214.2		261.3		231.2		337.8	
	Min		11.0		18.0		55.0		25.0		24.0		11.0	
	Max				979.0									
	Missing (%)		2574.0	7.0		3.3	1049.0	4.4	1307.0	7.7	1390.0	5.5	2574.0	
Geographic Region	West	75	16.5	14	15.4	14	15.4	15	16.5	10	11.0	22	24.2	0.0003
	South	152	33.4	25	27.5	25	27.5	29	31.9	39	42.9	34	37.4	
	Midwest	111	24.4	31	34.1	28	30.8	28	30.8	14	15.4	10	11.0	
	Northeast	117	25.7	21	23.1	24	26.4	19	20.9	28	30.8	25	27.5	
Rural Location	Yes	40	9.2	2	2.4	6	6.7	11	12.6	10	11.6	11	12.2	0.0123
	No	397	90.8	83	97.6	83	93.3	76	87.4	76	88.4	79	87.8	
	Missing	18	4.0	6	6.6	2	2.2	4	4.4	5	5.5	1	1.1	
Teaching Status	Yes	271	63.9	49	55.1	54	62.8	56	65.9	53	60.9	59	76.6	0.0158

Variable	Level	Overall (N=455)		Q1 (N=91)		Q2 (N=91)		Q3 (N=91)		Q4 (N=91)		Q5 (N=91)		P-value+
	No	153	36.1	40	44.9	32	37.2	29	34.1	34	39.1	18	23.4	
	Missing	31	6.8	2	2.2	5	5.5	6	6.6	4	4.4	14	15.4	
Heart Transplant Hospital	Yes	20	7.3	2	3.5	4	6.5	8	15.7	4	7.8	2	3.8	
	No	253	92.7	55	96.5	58	93.5	43	84.3	47	92.2	50	96.2	
	Missing	182	40.0	34	37.4	29	31.9	40	44.0	40	44.0	39	42.9	
Dual Eligibility Rate*	Median	455	20.2	91	11.0	91	15.5	91	20.2	91	26.5	91	45.9	
	25th		14.5		8.9		14.5		19.0		25.2		36.1	
	75th		29.4		12.0		16.5		21.3		29.4		56.6	
	Mean		24.1		10.1		15.5		20.2		27.0		47.8	
	STD		14.5		2.8		1.2		1.6		2.4		13.1	
	Min		0.0		0.0		13.3		17.4		23.2		32.0	
	Max		83.3		13.3		17.4		23.2		31.9		83.3	
	Missing (%)		0.0		0.0		0.0		0.0		0.0		0.0	

Footnote on p-values:

+ P-values are based on ANOVA row mean scores statistics for categorical row variables.

* P-values are based on the Mantel-Haenszel correlation statistics for continuous/ordinal row variables (designated by *).

eTable 5. Composite Measures: Patient-Level Mean-Based Method, and Opportunity-Based Methods by Hospital and by DE Quintiles

a) Patient-level, mean-based calculation (or equal weight linear combination score, variable presented in Table 2 and S2)															
Variable	Level	Overall		Q1		Q2		Q3		Q4		Q5		P-value+	% Std. Diff.
CMS linked, primary analysis cohort		N=258,995		N= 57,640		N= 70,336		N= 50,950		N= 49,100		N= 30,969			
HF Composite Performance: Adherence Rate, %*	Median	226950	100	50112	100	61238	100	44589	100	43703	100	27308	100	<.0001	14.9
	25th		75		75		75		66.7		75		66.7		
	75th		100		100		100		100		100		100		
	Mean		86.2		88.0		86.9		84.3		86.1		84.4		
	STD		23.0		21.9		22.4		23.8		22.9		24.8		
	Min		0		0		0		0		0		0		
	Max		100		100		100		100		100		100		
	Missing (%)		12.4		13.1		12.9		12.5		11		11.8		
Registry, exploratory analysis cohort		N=430,015		N=95,148		N=110,746		N=87,679		N=75,668		N=60,774			
HF Composite Performance: Adherence Rate, %*	Median	377357	100	83198	100	96561	100	76694	100	67398	100	53506	100	<.0001	14.0
	25th		75		75		75		66.7		75		66.7		
	75th		100		100		100		100		100		100		
	Mean		86.0		87.7		86.7		84.3		86.1		84.3		
	STD		23.0		21.9		22.4		23.7		22.8		24.9		
	Min		0		0		0		0		0		0		
	Max		100		100		100		100		100		100		
	Missing (%)		12.2		12.6		12.8		12.5		10.9		12		
b) Hospital-level, opportunity-based calculation															
Variable	Level	Overall		Q1		Q2		Q3		Q4		Q5		P-value+	% Std. Diff.
CMS linked, primary analysis cohort		(N=455)		(N=91)		(N=91)		(N=91)		(N=91)		(N=91)			
Composite Measure (hospital level)*	Median	455	85	91	87.5	91	87	91	84	91	83.9	91	82.9	0.3877	20.5
	25th		75.4		79.6		78.9		76.4		71.9		72.7		
	75th		92.2		92.4		92.1		91.4		92.3		92.1		
	Mean		82.7		83.9		84.1		82.2		81.8		81.3		
	STD		12.2		12.0		11.6		11.2		12.4		13.6		
	Min		32.8		39.4		35.6		52.1		33.8		32.8		
	Max		100		98.1		100		98.1		100		100		
	Missing (%)		0		0		0		0		0		0		
Variable	Level	Overall		Q1		Q2		Q3		Q4		Q5		P-	% Std. Diff.

		(N=455)		(N=91)		(N=91)		(N=91)		(N=91)		(N=91)		value+	
Registry, exploratory analysis cohort															
Composite Measure (hospital level, registry)*	Median	455	85.6	91	87.8	91	86.8	91	84.1	91	84.6	91	83.3	0.2840	26.5
	25th		74.8		80.9		79.4		75		70.8		71.3		
	75th		92.2		92.5		92.2		91.6		92.5		92.7		
	Mean		82.6		84.3		84.0		82.1		81.6		80.9		
	STD		12.2		12.0		11.3		11.4		12.6		13.6		
	Min		34.8		38		45.5		52.7		34.8		35.4		
	Max		99.8		97.9		98.9		97.9		98.5		99.8		
	Missing (%)		0		0		0		0		0		0		

c) By DE quintile, opportunity-based calculation

	CMS linked cohort			Registry cohort			
	DE quintile	N Met	N Elig	Composite Measure	N Met	N Elig	Composite Measure
1	94723	108723	87.1	161385	185291	87.1	
2	115414	134482	85.8	184498	215129	85.8	
3	83900	100330	83.6	145651	173999	83.7	
4	83535	97938	85.3	130643	152968	85.4	
5	50798	60525	83.9	104370	123871	84.3	
Mean			85.2			85.2	
STD			1.4			1.3	
Overall	428370	501998	85.3	726547	851258	85.3	

eTable 6. Associations of Guideline-Based Care, and In-Hospital or 30d Outcomes With Dual Eligible Quintiles

Outcomes	DE Quintiles	Unadjusted Analysis		Adjusted Analysis	
		OR (95% CI)	P Value	OR (95% CI)	P Value
Achievement Measures					
ACEI/ARB or ARNI at Discharge	Q5	0.88 (0.60, 1.30)	0.5228	0.85 (0.57, 1.27)	0.4146
	Q4	1.10 (0.79, 1.52)	0.5775	1.05 (0.76, 1.45)	0.7736
	Q3	0.94 (0.69, 1.28)	0.7103	0.96 (0.69, 1.33)	0.8001
	Q2	1.04 (0.75, 1.46)	0.8033	0.99 (0.71, 1.37)	0.9321
	Q1	Reference		Reference	
Evidence-Based Specific Beta Blockers	Q5	0.80 (0.58, 1.11)	0.1806	0.70 (0.52, 0.94)	0.0165 *
	Q4	0.84 (0.64, 1.12)	0.2382	0.79 (0.61, 1.02)	0.0657
	Q3	0.86 (0.64, 1.17)	0.3442	0.78 (0.58, 1.04)	0.0950
	Q2	0.80 (0.58, 1.10)	0.1666	0.78 (0.60, 1.02)	0.0693
	Q1	Reference		Reference	
Measure LV Function	Q5	0.40 (0.20, 0.79)	0.0086 *	0.39 (0.21, 0.72)	0.0024 *
	Q4	0.88 (0.55, 1.39)	0.5779	0.81 (0.51, 1.29)	0.3765
	Q3	0.72 (0.44, 1.18)	0.1914	0.61 (0.37, 0.99)	0.0450 *
	Q2	1.21 (0.75, 1.97)	0.4344	1.00 (0.61, 1.65)	0.9924
	Q1	Reference		Reference	
Post Discharge Appointment for Heart Failure Patients	Q5	0.70 (0.48, 1.04)	0.0784	0.74 (0.51, 1.08)	0.1146
	Q4	0.75 (0.54, 1.05)	0.0980	0.78 (0.56, 1.08)	0.1281
	Q3	0.61 (0.43, 0.86)	0.0045 *	0.53 (0.38, 0.74)	0.0002 *
	Q2	0.79 (0.59, 1.06)	0.1179	0.72 (0.54, 0.96)	0.0230 *
	Q1	Reference		Reference	
HF Defect-Free Care: 100% Compliance	Q5	0.72 (0.54, 0.98)	0.0336 *	0.80 (0.60, 1.07)	0.1290
	Q4	0.79 (0.59, 1.06)	0.1125	0.84 (0.64, 1.10)	0.1967
	Q3	0.64 (0.48, 0.85)	0.0019 *	0.60 (0.46, 0.78)	0.0002 *
	Q2	0.83 (0.65, 1.07)	0.1529	0.78 (0.62, 0.99)	0.0426 *
	Q1	Reference		Reference	
Other Outcomes					
In-hospital Mortality	Q5	1.03 (0.87, 1.21)	0.7401	1.13 (0.97, 1.32)	0.1106
	Q4	1.03 (0.89, 1.19)	0.6886	1.03 (0.88, 1.19)	0.7261
	Q3	1.20 (1.03, 1.40)	0.0171 *	1.26 (1.08, 1.46)	0.0026 *
	Q2	1.06 (0.90, 1.25)	0.4944	1.07 (0.92, 1.23)	0.4009
	Q1	Reference		Reference	
Length of Stay >=4 days	Q5	1.12 (1.00, 1.27)	0.0562	1.05 (0.93, 1.19)	0.4005
	Q4	1.12 (0.97, 1.30)	0.1188	1.05 (0.94, 1.18)	0.3888
	Q3	1.04 (0.92, 1.19)	0.5291	0.99 (0.88, 1.11)	0.8363

Outcomes	DE Quintiles	Unadjusted Analysis		Adjusted Analysis	
		OR (95% CI)	P Value	OR (95% CI)	P Value
Aldosterone Antagonist at Discharge	Q2	1.02 (0.91, 1.15)	0.7126	0.95 (0.85, 1.06)	0.3428
	Q1	Reference		Reference	
	Q5	0.96 (0.73, 1.26)	0.7814	0.83 (0.62, 1.11)	0.2186
	Q4	0.81 (0.63, 1.03)	0.0831	0.72 (0.57, 0.91)	0.0056 *
	Q3	1.19 (0.95, 1.48)	0.1368	1.07 (0.86, 1.35)	0.5372
Hydralazine Nitrate at Discharge	Q2	0.98 (0.77, 1.25)	0.8949	0.94 (0.75, 1.17)	0.5924
	Q1	Reference		Reference	
	Q5	0.90 (0.50, 1.62)	0.7167	1.05 (0.51, 2.13)	0.9032
	Q4	0.40 (0.22, 0.71)	0.0018 *	0.44 (0.22, 0.88)	0.0212
	Q3	1.12 (0.58, 2.19)	0.7318	1.01 (0.49, 2.09)	0.9751
Anticoagulation for Atrial fibrillation or Atrial Flutter	Q2	0.76 (0.42, 1.36)	0.3529	0.65 (0.34, 1.25)	0.1981
	Q1	Reference		Reference	
	Q5	0.65 (0.49, 0.86)	0.0030 *	0.68 (0.51, 0.91)	0.0100 *
	Q4	0.74 (0.56, 0.99)	0.0397 *	0.67 (0.52, 0.85)	0.0013 *
	Q3	0.81 (0.61, 1.09)	0.1688	0.84 (0.64, 1.11)	0.2163
DVT Prophylaxis	Q2	1.08 (0.81, 1.43)	0.6148	1.03 (0.80, 1.33)	0.7926
	Q1	Reference		Reference	
	Q5	1.14 (0.78, 1.65)	0.5012	1.13 (0.77, 1.65)	0.5292
	Q4	0.80 (0.44, 1.44)	0.4502	0.86 (0.55, 1.34)	0.4961
	Q3	1.33 (0.91, 1.95)	0.1447	1.30 (0.92, 1.85)	0.1411
Influenza Vaccination During Flu Season	Q2	0.90 (0.55, 1.46)	0.6674	0.99 (0.65, 1.51)	0.9649
	Q1	Reference		Reference	
	Q5	0.89 (0.48, 1.64)	0.7092	0.88 (0.43, 1.83)	0.7362
	Q4	1.07 (0.53, 2.15)	0.8544	1.15 (0.55, 2.40)	0.7028
	Q3	1.19 (0.63, 2.24)	0.5927	1.02 (0.52, 2.01)	0.9457
Pneumococcal Vaccination	Q2	1.23 (0.66, 2.31)	0.5140	1.34 (0.65, 2.74)	0.4295
	Q1	Reference		Reference	
	Q5	1.07 (0.61, 1.86)	0.8101	1.09 (0.56, 2.15)	0.7981
	Q4	1.07 (0.57, 1.99)	0.8399	1.11 (0.58, 2.12)	0.7598
	Q3	1.14 (0.62, 2.07)	0.6765	1.11 (0.57, 2.16)	0.7480
Discharge Instructions	Q2	1.07 (0.62, 1.86)	0.8004	1.19 (0.64, 2.19)	0.5825
	Q1	Reference		Reference	
	Q5	0.92 (0.45, 1.86)	0.8117	0.83 (0.41, 1.68)	0.6099
	Q4	1.27 (0.74, 2.17)	0.3914	1.19 (0.71, 1.99)	0.5150
	Q3	0.95 (0.56, 1.62)	0.8627	0.87 (0.53, 1.45)	0.6037
Smoking Cessation	Q2	1.02 (0.60, 1.75)	0.9285	0.93 (0.56, 1.53)	0.7681
	Q1	Reference		Reference	
	Q5	1.18 (0.60, 2.30)	0.6305	1.07 (0.55, 2.09)	0.8318

Outcomes	DE Quintiles	Unadjusted Analysis		Adjusted Analysis	
		OR (95% CI)	P Value	OR (95% CI)	P Value
	Q4	1.01 (0.55, 1.86)	0.9750	0.93 (0.51, 1.68)	0.8049
	Q3	0.89 (0.48, 1.66)	0.7107	0.84 (0.45, 1.56)	0.5828
	Q2	1.25 (0.68, 2.31)	0.4717	1.16 (0.64, 2.11)	0.6225
	Q1	Reference		Reference	
	Q5	0.91 (0.54, 1.54)	0.7360	0.83 (0.52, 1.30)	0.4102
Beta Blocker at Discharge	Q4	0.95 (0.57, 1.56)	0.8307	0.88 (0.56, 1.36)	0.5523
	Q3	0.92 (0.57, 1.49)	0.7309	0.80 (0.51, 1.25)	0.3297
	Q2	1.22 (0.76, 1.97)	0.4040	1.06 (0.70, 1.59)	0.7823
	Q1	Reference		Reference	
	Q5	0.78 (0.55, 1.09)	0.1444	0.71 (0.50, 1.01)	0.0582
ICD placed or prescribed at discharge	Q4	0.77 (0.55, 1.09)	0.1477	0.74 (0.54, 1.02)	0.0667
	Q3	0.87 (0.61, 1.23)	0.4201	0.76 (0.55, 1.03)	0.0809
	Q2	0.81 (0.59, 1.10)	0.1727	0.75 (0.55, 1.03)	0.0722
	Q1	Reference		Reference	
	Q5	0.83 (0.73, 0.93)	0.0014	1.01 (0.91, 1.12)	0.8055
30d All-Cause Mortality	Q4	0.92 (0.85, 0.99)	0.0308	1.00 (0.91, 1.09)	0.9706
	Q3	0.98 (0.91, 1.07)	0.7077	1.05 (0.97, 1.14)	0.2065
	Q2	1.07 (0.99, 1.16)	0.0983	1.11 (1.02, 1.21)	0.0145 *
	Q1	Reference		Reference	
	Q5	1.30 (1.20, 1.41)	<.0001	1.24 (1.14, 1.35)	<.0001 *
30d All-Cause Readmission	Q4	1.18 (1.11, 1.25)	<.0001	1.14 (1.07, 1.22)	<.0001 *
	Q3	1.09 (1.02, 1.16)	0.0140	1.05 (0.99, 1.12)	0.1165
	Q2	1.03 (0.98, 1.09)	0.2324	1.01 (0.95, 1.07)	0.8453
	Q1	Reference		Reference	
	Q5	1.27 (1.15, 1.41)	<.0001	1.14 (1.03, 1.27)	0.0145 *
30d HF Readmission	Q4	1.24 (1.14, 1.35)	<.0001	1.15 (1.06, 1.26)	0.0013 *
	Q3	1.11 (1.02, 1.20)	0.0153	1.04 (0.95, 1.13)	0.3753
	Q2	1.06 (0.98, 1.14)	0.1226	1.01 (0.93, 1.09)	0.7996
	Q1	Reference		Reference	

*statistical significance with p<0.05, angiotensin converting enzyme inhibitors, ARB: angiotensin receptor blockers, LV: left ventricle, HF: heart failure, DVT: deep vein thrombosis, ICD: implantable cardioverter defibrillator.

eTable 7. Adjusted Model Adding Indicator Variable for Medical History Missing (MHM)

Outcomes	DE Quintiles	Original Adjusted Analysis		Adjusted Analysis + MHM	
		OR (95% CI)	P Value	OR (95% CI)	P Value
Achievement Measures					
ACEI/ARB or ARNI at Discharge	Q5	0.85 (0.57, 1.27)	0.4146	0.84 (0.56, 1.26)	0.3914
	Q4	1.05 (0.76, 1.45)	0.7736	1.05 (0.76, 1.46)	0.7598
	Q3	0.96 (0.69, 1.33)	0.8001	0.95 (0.68, 1.32)	0.7549
	Q2	0.99 (0.71, 1.37)	0.9321	0.99 (0.71, 1.37)	0.9479
	Q1	Reference		Reference	
Evidence-Based Specific Beta Blockers	Q5	0.70 (0.52, 0.94)	0.0165	* 0.67 (0.50, 0.92)	0.0126 *
	Q4	0.79 (0.61, 1.02)	0.0657	0.77 (0.59, 1.01)	0.0622
	Q3	0.78 (0.58, 1.04)	0.0950	0.75 (0.56, 1.01)	0.0597
	Q2	0.78 (0.60, 1.02)	0.0693	0.80 (0.61, 1.04)	0.0950
	Q1	Reference		Reference	
Measure LV Function	Q5	0.39 (0.21, 0.72)	0.0024	** 0.37 (0.20, 0.69)	0.0016 **
	Q4	0.81 (0.51, 1.29)	0.3765	0.81 (0.51, 1.28)	0.3650
	Q3	0.61 (0.37, 0.99)	0.0450	* 0.58 (0.35, 0.96)	0.0337 *
	Q2	1.00 (0.61, 1.65)	0.9924	1.01 (0.61, 1.67)	0.9698
	Q1	Reference		Reference	
Post Discharge Appointment for HF Patients	Q5	0.74 (0.51, 1.08)	0.1146	0.69 (0.47, 1.02)	0.0631
	Q4	0.78 (0.56, 1.08)	0.1281	0.75 (0.54, 1.06)	0.1087
	Q3	0.53 (0.38, 0.74)	0.0002	*** 0.49 (0.35, 0.69)	<.0001 ****
	Q2	0.72 (0.54, 0.96)	0.0230	* 0.70 (0.52, 0.96)	0.0265 *
	Q1	Reference		Reference	
HF Defect-Free Care: 100% Compliance	Q5	0.80 (0.60, 1.07)	0.1290	0.76 (0.57, 1.03)	0.0749
	Q4	0.84 (0.64, 1.10)	0.1967	0.82 (0.62, 1.09)	0.1714
	Q3	0.60 (0.46, 0.78)	0.0002	*** 0.57 (0.43, 0.75)	<.0001 ****
	Q2	0.78 (0.62, 0.99)	0.0426	* 0.77 (0.60, 0.99)	0.0450 *
	Q1	Reference		Reference	
Other Outcomes					
In-hospital Mortality	Q5	1.13 (0.97, 1.32)	0.1106	1.17 (0.99, 1.37)	0.0611
	Q4	1.03 (0.88, 1.19)	0.7261	1.04 (0.89, 1.22)	0.6251
	Q3	1.26 (1.08, 1.46)	0.0026	** 1.29 (1.10, 1.50)	0.0013 **
	Q2	1.07 (0.92, 1.23)	0.4009	1.07 (0.92, 1.25)	0.3827
	Q1	Reference		Reference	
30d All-Cause Mortality	Q5	1.01 (0.91, 1.12)	0.8055	1.02 (0.92, 1.13)	0.7179
	Q4	1.00 (0.91, 1.09)	0.9706	1.00 (0.92, 1.09)	0.9994
	Q3	1.05 (0.97, 1.14)	0.2065	1.06 (0.98, 1.15)	0.1602

	Q2	1.11 (1.02, 1.21)	0.0145	*	1.11 (1.02, 1.20)	0.0134	*
	Q1	Reference			Reference		
30d All-Cause Readmission	Q5	1.24 (1.14, 1.35)	<.0001	****	1.26 (1.16, 1.36)	<.0001	****
	Q4	1.14 (1.07, 1.22)	<.0001	****	1.15 (1.08, 1.22)	<.0001	****
	Q3	1.05 (0.99, 1.12)	0.1165		1.06 (1.00, 1.13)	0.0623	
	Q2	1.01 (0.95, 1.07)	0.8453		1.01 (0.95, 1.07)	0.8203	
	Q1	Reference			Reference		
30d HF Readmission	Q5	1.14 (1.03, 1.27)	0.0145	*	1.16 (1.04, 1.28)	0.0057	**
	Q4	1.15 (1.06, 1.26)	0.0013	***	1.16 (1.07, 1.26)	0.0006	***
	Q3	1.04 (0.95, 1.13)	0.3753		1.05 (0.97, 1.15)	0.2289	
	Q2	1.01 (0.93, 1.09)	0.7996		1.01 (0.93, 1.10)	0.7679	
	Q1	Reference			Reference		

eTable 8. Baseline Characteristics, Quality Metric Achievement, and In-hospital End Points in the Sensitivity Cohort by DE Quintiles

	Overall N=430,015	Q1 (0 - <13.3) N=95,148	Q2 (13.3 - <17.4) N=110,746	Q3 (17.4 - <23.16) N=87,679	Q4 (23.16 - <31.9) N=75,668	Q5 (31.9 - 83.3) N=60,774	P Value	% Std. Diff. Q1 vs Q5
Demographics								
Age*	80 (73 - 87)	81 (74 - 87)	81 (74 - 87)	80 (72 - 86)	80 (72 - 86)	78 (71 - 85)	<.0001	25.2
Female	225,032 (52.3)	49,222 (51.7)	57,595 (52.0)	45,154 (51.5)	39,774 (52.6)	33,287 (54.8)	<.0001	6.1
Race								
' Other (includes UTD)	11,094 (2.6)	2,279 (2.5)	2,045 (1.9)	1,855 (2.1)	2,248 (3.0)	2,667 (4.4)	<.0001	91.1
' Asian	8,171 (1.9)	2,133 (2.3)	2,056 (1.9)	900 (1.0)	1,005 (1.3)	2,077 (3.4)		
' Hispanic (any race)	28,159 (6.6)	5,282 (5.7)	2,554 (2.3)	2,892 (3.3)	3,896 (5.2)	13,535 (22.4)		
' Black	49,522 (11.7)	5,510 (5.9)	8,615 (7.9)	9,117 (10.5)	11,112 (14.8)	15,168 (25.1)		
' White	327,593 (77.2)	77,460 (83.6)	94,009 (86.0)	72,166 (83.0)	56,969 (75.7)	26,989 (44.7)		
LVEF Source								
' Source of LVEF: Quantitative	403,780 (96.3)	88,262 (95.6)	104,534 (96.1)	82,829 (96.7)	71,943 (97.2)	56,212 (96.3)	<.0001	3.6
' Source of LVEF: Qualitative	15,330 (3.7)	4,057 (4.4)	4,187 (3.9)	2,844 (3.3)	2,090 (2.8)	2,152 (3.7)		
EF, %*	47 (30 - 58)	48 (30 - 58)	47 (30 - 58)	45 (30 - 58)	45 (30 - 58)	45 (30 - 58)	<.0001	6.8
EF groups*								
' 50 <= OH_EF <=100	203,608 (48.6)	46,403 (50.3)	53,574 (49.3)	40,966 (47.8)	35,397 (47.8)	27,268 (46.7)	<.0001	8.2
' 40 < OH_EF < 50	40,652 (9.7)	9,187 (10.0)	10,686 (9.8)	8,402 (9.8)	6,979 (9.4)	5,398 (9.2)		
' 0 <= OH_EF <= 40	174,850 (41.7)	36,729 (39.8)	44,461 (40.9)	36,305 (42.4)	31,657 (42.8)	25,698 (44.0)		
EF groups missing	10,905 (2.5)	2,829 (3.0)	2,025 (1.8)	2,006 (2.3)	1,635 (2.2)	2,410 (4.0)	<.0001	5.4
Year of HF Admission*								
' 2017	79,894 (18.6)	19,288 (20.3)	19,367 (17.5)	15,778 (18.0)	14,318 (18.9)	11,143 (18.3)	<.0001	12.0
' 2016	73,032 (17.0)	17,514 (18.4)	18,252 (16.5)	15,076 (17.2)	11,803 (15.6)	10,387 (17.1)		
' 2015	62,190 (14.5)	15,352 (16.1)	15,890 (14.3)	12,035 (13.7)	10,117 (13.4)	8,796 (14.5)		
' 2014	52,713 (12.3)	12,237 (12.9)	14,129 (12.8)	10,617 (12.1)	8,817 (11.7)	6,913 (11.4)		
' 2013	47,554 (11.1)	9,887 (10.4)	12,804 (11.6)	10,155 (11.6)	7,737 (10.2)	6,971 (11.5)		
' 2012	43,933 (10.2)	7,940 (8.3)	12,358 (11.2)	9,151 (10.4)	8,002 (10.6)	6,482 (10.7)		
' 2011	38,895 (9.0)	7,213 (7.6)	10,678 (9.6)	7,865 (9.0)	7,596 (10.0)	5,543 (9.1)		
' 2010	31,804 (7.4)	5,717 (6.0)	7,268 (6.6)	7,002 (8.0)	7,278 (9.6)	4,539 (7.5)		
Medical History								
Atrial Flutter/Fibrillation	195,738 (47.3)	46,132 (50.3)	52,067 (49.6)	40,959 (47.9)	33,977 (47.0)	22,603 (38.2)	<.0001	24.6
COPD or Asthma	142,086 (34.3)	30,466 (33.2)	35,851 (34.1)	30,153 (35.3)	25,688 (35.6)	19,928 (33.6)	<.0001	0.9
Diabetes	180,452 (43.6)	37,837 (41.2)	43,820 (41.7)	37,901 (44.3)	32,171 (44.5)	28,723 (48.5)	<.0001	14.6
Hyperlipidemia	240,854 (58.2)	53,486 (58.3)	63,818 (60.8)	50,804 (59.4)	42,351 (58.6)	30,395 (51.3)	<.0001	14.1
Hypertension	343,040 (82.9)	75,826 (82.6)	85,301 (81.2)	70,883 (82.9)	60,606 (83.9)	50,424 (85.1)	<.0001	6.8
Peripheral Vascular Disease	57,328 (13.9)	12,688 (13.8)	15,027 (14.3)	12,894 (15.1)	10,451 (14.5)	6,268 (10.6)	<.0001	9.9
CAD	224,189 (54.2)	49,407 (53.9)	58,068 (55.3)	46,817 (54.8)	40,284 (55.8)	29,613 (50.0)	<.0001	7.7

	Overall N=430,015	Q1 (0 - <13.3) N=95,148	Q2 (13.3 - <17.4) N=110,746	Q3 (17.4 - <23.16) N=87,679	Q4 (23.16 - <31.9) N=75,668	Q5 (31.9 - 83.3) N=60,774	P Value	% Std. Diff. Q1 vs Q5
Prior MI	88,276 (21.3)	18,815 (20.5)	22,663 (21.6)	19,045 (22.3)	16,457 (22.8)	11,296 (19.1)	<.0001	3.6
CVA/TIA	72,915 (17.6)	16,046 (17.5)	18,895 (18.0)	15,667 (18.3)	12,691 (17.6)	9,616 (16.2)	<.0001	3.4
ICD only	34,638 (8.4)	6,995 (7.6)	9,412 (9.0)	7,062 (8.3)	5,941 (8.2)	5,228 (8.8)	<.0001	4.4
Heart failure	302,750 (73.2)	65,267 (71.1)	75,445 (71.8)	63,211 (74.0)	55,712 (77.1)	43,115 (72.8)	<.0001	3.7
Anemia	99,308 (24.0)	20,619 (22.5)	26,284 (25.0)	21,866 (25.6)	17,188 (23.8)	13,351 (22.5)	<.0001	0.2
Pacemaker	70,935 (17.1)	16,974 (18.5)	18,956 (18.1)	14,288 (16.7)	12,240 (16.9)	8,477 (14.3)	<.0001	11.3
Dialysis, chronic	13,141 (3.2)	2,327 (2.5)	2,798 (2.7)	2,755 (3.2)	2,171 (3.0)	3,090 (5.2)	<.0001	13.9
Renal insufficiency, chronic (SCr>2.0)	108,738 (26.3)	22,500 (24.5)	29,278 (27.9)	21,863 (25.6)	18,356 (25.4)	16,741 (28.3)	<.0001	8.5
Depression	54,308 (13.1)	11,865 (12.9)	14,469 (13.8)	12,239 (14.3)	9,391 (13.0)	6,344 (10.7)	<.0001	6.9
Valvular Heart Disease	91,173 (22.0)	20,579 (22.4)	25,457 (24.2)	20,109 (23.5)	15,292 (21.2)	9,736 (16.4)	<.0001	15.2
CRT-P	4,361 (1.1)	1,068 (1.2)	1,037 (1.0)	890 (1.0)	864 (1.2)	502 (0.8)	<.0001	3.2
CRT-D	25,167 (6.1)	5,683 (6.2)	6,013 (5.7)	5,637 (6.6)	4,942 (6.8)	2,892 (4.9)	<.0001	5.7
Ischemic Etiology: Med Hx of CAD, MI, prior PCI, prior CABG, or prior PCI/CABG	244,373 (59.1)	53,913 (58.8)	62,889 (59.9)	50,959 (59.6)	44,001 (60.9)	32,611 (55.1)	<.0001	7.5
Medical History Panel Missing	16,308 (3.8)	3,403 (3.6)	5,727 (5.2)	2,204 (2.5)	3,430 (4.5)	1,544 (2.5)	<.0001	6.0
Smoking	38,329 (9.1)	6,823 (7.4)	9,201 (8.5)	8,240 (9.5)	7,703 (10.2)	6,362 (10.5)	<.0001	10.8
Vitals on Admission								
Heart Rate, bpm*	81 (70 - 95)	80 (70 - 94)	81 (70 - 95)	80 (70 - 94)	81 (70 - 95)	81 (70 - 95)	<.0001	5.6
SBP, mmHg*	138 (119 - 158)	137 (119 - 157)	138 (120 - 159)	137 (119 - 157)	138 (119 - 158)	139 (120 - 159)	<.0001	5.1
DBP, mmHg*	73 (63 - 85)	72 (63 - 84)	73 (63 - 85)	73 (63 - 84)	73 (62 - 85)	74 (63 - 86)	<.0001	8.0
BMI*	27.2 (23.2 - 32.5)	26.9 (23.1 - 32.0)	27.1 (23.2 - 32.4)	27.5 (23.5 - 32.9)	27.3 (23.2 - 32.6)	27.1 (23.1 - 32.5)	<.0001	4.3
Lipids								
Total Cholesterol, mg/dL*	130 (107 - 158)	133 (110 - 161)	128 (106 - 156)	128 (106 - 156)	129 (105 - 157)	132 (109 - 161)	<.0001	0.5
HDL, mg/dL*	40 (32 - 50)	41 (33 - 51)	39 (31 - 49)	40 (31 - 50)	39 (31 - 49)	40 (32 - 51)	<.0001	4.0
LDL, mg/dL*	70 (53 - 92)	71 (54 - 93)	69 (53 - 91)	69 (52 - 91)	70 (53 - 92)	72 (55 - 95)	<.0001	5.0
Triglycerides, mg/dL*	86 (65 - 117)	88 (66 - 120)	83 (62 - 113)	88 (66 - 120)	87 (66 - 117)	84 (64 - 114)	<.0001	9.9
Lab Measures								
Serum sodium, mEq/L*	138 (135 - 141)	139 (136 - 141)	138 (135 - 141)	138 (135 - 141)	139 (136 - 141)	139 (136 - 141)	<.0001	2.7
Hemoglobin, g/dL*	11.5 (10.1 - 12.9)	11.6 (10.2 - 13.0)	11.5 (10.2 - 12.9)	11.6 (10.1 - 13.0)	11.4 (10.0 - 12.9)	11.4 (10.0 - 12.9)	<.0001	8.4
Albumin, g/dL*	3.4 (3.0 - 3.7)	3.5 (3.1 - 3.8)	3.3 (3.0 - 3.6)	3.4 (3.0 - 3.7)	3.4 (3.0 - 3.7)	3.5 (3.1 - 3.8)	<.0001	7.2
BNP, pg/mL*	859 (432 - 1,695)	844 (434 - 1,650)	897 (464 - 1,713)	906 (457 - 1,783)	782 (373 - 1,541)	935 (464 - 1,921)	<.0001	10.0
NBNP, pg/mL*	5,682 (2,550 - 12,748)	5,200 (2,428 - 11,354)	6,028 (2,814 - 13,342)	5,770 (2,582 - 12,875)	6,156 (2,710 - 13,746)	5,428 (2,198 - 12,846)	<.0001	1.4
Serum creatinine, mg/dL*	1.3 (1.0 - 1.9)	1.3 (1.0 - 1.8)	1.3 (1.0 - 1.8)	1.3 (1.0 - 1.9)	1.3 (1.0 - 1.9)	1.3 (1.0 - 1.9)	<.0001	4.7

	Overall N=430,015	Q1 (0 - <13.3) N=95,148	Q2 (13.3 - <17.4) N=110,746	Q3 (17.4 - <23.16) N=87,679	Q4 (23.16 - <31.9) N=75,668	Q5 (31.9 - 83.3) N=60,774	P Value	% Std. Diff. Q1 vs Q5
BUN, mg/dL*	27 (19 - 40)	27 (19 - 40)	27 (19 - 40)	27 (19 - 40)	27 (19 - 41)	26 (19 - 40)	<.0001	0.6
Troponin, ng/dL*	0.04 (0.02 - 0.10)	0.04 (0.02 - 0.10)	0.04 (0.02 - 0.10)	0.05 (0.02 - 0.10)	0.04 (0.02 - 0.10)	0.04 (0.02 - 0.09)	<.0001	12.4
Potassium, mEq/L*	4.2 (3.8 - 4.6)	4.2 (3.9 - 4.6)	4.2 (3.8 - 4.6)	4.2 (3.8 - 4.6)	4.2 (3.8 - 4.7)	4.2 (3.8 - 4.7)	<.0001	0.3
HbA1C, %*	6.5 (5.9 - 7.5)	6.6 (5.9 - 7.6)	6.6 (5.9 - 7.6)	6.4 (5.8 - 7.3)	6.5 (5.9 - 7.5)	6.4 (5.8 - 7.4)	<.0001	11.9
Blood Glucose, mg/dL*	112 (95 - 143)	113 (95 - 144)	112 (95 - 141)	110 (94 - 141)	111 (94 - 144)	113 (95 - 147)	<.0001	1.9
EKG QRS Duration, ms*	110 (90 - 144)	110 (91 - 146)	110 (90 - 144)	110 (90 - 146)	108 (90 - 142)	106 (90 - 140)	<.0001	10.5
Hospital Characteristics								
Number of Beds*	360 (232 - 508)	312 (232 - 394)	347 (213 - 604)	379 (265 - 564)	393 (217 - 539)	382 (261 - 537)	<.0001	54.9
Geographic Region								
' West	57,780 (13.4)	11,673 (12.3)	10,678 (9.6)	15,389 (17.6)	5,981 (7.9)	14,059 (23.1)	<.0001	54.9
' South	128,654 (29.9)	23,659 (24.9)	27,149 (24.5)	26,744 (30.5)	29,437 (38.9)	21,665 (35.6)		
' Midwest	104,360 (24.3)	27,313 (28.7)	35,658 (32.2)	25,475 (29.1)	9,614 (12.7)	6,300 (10.4)		
' Northeast	139,221 (32.4)	32,503 (34.2)	37,261 (33.6)	20,071 (22.9)	30,636 (40.5)	18,750 (30.9)		
Rural Location	17,959 (4.3)	648 (0.7)	3,319 (3.0)	3,851 (4.4)	6,919 (9.5)	3,222 (5.4)	<.0001	27.5
Teaching Status	301,715 (73.1)	53,346 (57.2)	80,154 (74.5)	65,965 (80.5)	55,662 (74.9)	46,588 (83.5)	<.0001	60.3
Heart Transplant Hospital	29,808 (9.9)	4,549 (6.7)	6,708 (8.1)	15,681 (25.6)	2,551 (4.8)	319 (0.9)	<.0001	31.2
Achievement Measures								
ACEI/ARB or ARNI at Discharge	81,144 (93.1)	16,662 (93.1)	18,989 (93.2)	16,884 (93.2)	15,502 (93.8)	13,107 (92.1)	<.0001	4.0
Evidence-Based Specific Beta Blockers	104,123 (89.1)	22,067 (90.4)	26,158 (88.5)	21,414 (89.2)	18,792 (88.7)	15,692 (88.7)	<.0001	5.7
Measure LV Function	366,456 (99.1)	80,914 (99.2)	94,241 (99.4)	74,409 (99.1)	65,809 (99.2)	51,083 (97.9)	<.0001	11.3
Post Discharge Appointment for HF Patients	174,824 (63.0)	41,742 (67.9)	45,110 (64.1)	32,944 (58.0)	30,540 (62.4)	24,488 (61.6)	<.0001	13.3
HF Composite Performance: Adherence Rate, %*	100 (75 - 100)	100 (75 - 100)	100 (75 - 100)	100 (67 - 100)	100 (75 - 100)	100 (67 - 100)	<.0001	14.0
HF Defect-Free Care: 100% Compliance	262,156 (69.5)	60,962 (73.3)	68,360 (70.8)	50,340 (65.6)	46,700 (69.3)	35,794 (66.9)	<.0001	14.0
Secondary Outcomes								
In-hospital Mortality	14,404 (3.3)	2,998 (3.2)	3,688 (3.3)	3,333 (3.8)	2,500 (3.3)	1,885 (3.1)	<.0001	0.3
Length of Stay*	4 (3 - 7)	4 (3 - 6)	4 (3 - 6)	4 (3 - 6)	4 (3 - 7)	4 (3 - 7)	<.0001	6.0
Quality Measures								
Aldosterone Antagonist at Discharge	33,762 (35.1)	7,242 (35.7)	8,805 (35.4)	7,575 (39.2)	5,375 (31.0)	4,765 (33.0)	<.0001	5.8
Hydralazine Nitrate at Discharge	1,865 (26.6)	245 (34.9)	387 (26.2)	350 (36.5)	361 (17.9)	522 (28.1)	<.0001	14.6
Anticoagulation for Atrial fibrillation or flutter	121,425 (82.2)	29,416 (84.3)	32,120 (85.1)	25,206 (82.3)	20,969 (79.1)	13,714 (76.8)	<.0001	19.0
DVT Prophylaxis	146,024 (83.3)	32,139 (83.9)	36,452 (82.1)	28,855 (85.7)	26,274 (80.9)	22,304 (84.2)	<.0001	0.8
Influenza Vaccination During Flu Season	131,884 (85.2)	29,103 (84.0)	34,981 (87.0)	27,502 (86.2)	23,446 (85.0)	16,852 (82.8)	<.0001	3.3
Pneumococcal Vaccination	255,235 (80.9)	56,313 (80.2)	65,427 (80.4)	53,620 (81.8)	46,329 (81.6)	33,546 (80.5)	<.0001	0.7
Reporting Measures								
Discharge Instructions	288,784 (93.5)	62,123 (93.3)	74,496 (93.2)	58,720 (93.2)	54,772 (94.7)	38,673 (92.8)	<.0001	1.9

	Overall N=430,015	Q1 (0 - <13.3) N=95,148	Q2 (13.3 - <17.4) N=110,746	Q3 (17.4 - <23.16) N=87,679	Q4 (23.16 - <31.9) N=75,668	Q5 (31.9 - 83.3) N=60,774	P Value	% Std. Diff. Q1 vs Q5
Smoking Cessation	32,030 (94.8)	5,677 (94.5)	7,687 (95.4)	6,843 (94.0)	6,531 (94.9)	5,292 (95.1)	0.0031	2.6
Beta Blocker at Discharge	118,598 (97.5)	24,785 (97.5)	29,969 (97.9)	24,219 (97.3)	21,836 (97.3)	17,789 (97.3)	<.0001	0.7
ICD placed or prescribed at discharge	43,734 (59.8)	8,869 (61.8)	10,993 (59.1)	9,381 (61.1)	8,267 (59.9)	6,224 (56.4)	<.0001	11.1

LVEF: left ventricular ejection fraction; EF: ejection fraction; HF: heart failure, COPD: chronic obstructive pulmonary disease; CAD: coronary artery disease; MI: myocardial infarction; CVA: cerebrovascular accident; TIA: transient ischemic attack; ICD: implantable cardioverter defibrillator; Scr: serum creatinine; CRT-P: cardiac resynchronization therapy-pacemaker; CRT-D: cardiac resynchronization therapy-defibrillator; Hx: history; PCI: percutaneous coronary intervention; CABG: coronary artery bypass graft; bpm: beats per minute; SBP: systolic blood pressure; DBP: diastolic blood pressure HDL: high-density lipoprotein; LDL: low-density lipoprotein; BNP: beta natriuretic peptide; NBNP: n-terminal-pro beta natriuretic peptide; BUN: blood urea nitrogen; HbA1C: hemoglobin A1C; EKG: electrocardiogram.