Supplemental Material

Supplemental Table 1. Potential Covariates in HF-ACTION Predictive Models for Primary Endpoint

	Variable
1	Age
2	Sex
3	Race
4	History of myocardial infarction
5	Previous revascularization
6	History of diabetes
7	History of peripheral vascular disease
8	Smoking status
9	History of chronic obstructive pulmonary disease
10	Heart failure hospitalizations in last 6 months
11	Hospitalizations in last 6 months
12	Etiology of heart failure
13	New York Heart Association Class (II versus III/IV)
14	Canadian Angina Class
15	Baseline automated implantable cardioverter/defibrillator
16	Baseline biventricular pacemaker
17	Baseline pacemaker
18	Atrial fibrillation/flutter
19	Mitral regurgitation grade by echocardiography
20	Systolic blood pressure
21	Diastolic blood pressure
22	Baseline heart rate
23	Body mass index
24	Left ventricular ejection fraction
25	KCCQ: total symptom score
26	KCCQ: quality of life score
27	KCCQ: self-efficacy score
28	KCCQ: symptom stability score
29	KCCQ: physical limitation score
30	KCCQ: social limitation score

Supplemental Table 1. Potential Covariates in HF-ACTION Predictive Models for Primary Endpoint

	Variable
31	Beck Depression Index II
32	Heart rate reserve on CPX test
33	Heart rate at peak exercise on CPX test
34	Heart rate at end of 2^{nd} stage of CPX test
35	Exercise duration on CPX test
36	Rest ECG rhythm on CPX test
37	Peak oxygen pulse on CPX test
38	Peak respiratory exchange ratio on CPX test
39	Ventricular conduction prior to CPX test
40	V_E/VCO_2 slope
41	Peak VO_2
42	Weber class
43	Six-minute walk distance
44	Serum creatinine
45	Sodium
46	Blood urea nitrogen
47	Hemoglobin
48	Treatment group (exercise vs. usual care)

CPX, cardiopulmonary exercise test; ECG, electrocardiogram; KCCQ, Kansas City Cardiomyopathy Questionnaire; V_E/VCO_2, volume of air exhaled/volume of CO_2 exhaled; VO_2, oxygen consumption

Supplemental Table 2. Full Predictive Model for Primary Endpoint

Parameter	Average χ^2	*P*	HR (CI)
Blood urea nitrogen (HR for 10 mg/dL increase)	30.4	<0.0001	1.07 (1.04-1.09)
KCCQ symptom stability			
Much worse/slightly worse	34.1	<0.0001	1.65 (1.38-1.97)
Much better/slightly better			1.22 (1.07-1.39)
KCCQ total symptom score (HR for 5-unit increase)	23.4	<0.0001	0.97 (0.96-0.98)
Weber class			
B (Peak VO_2 16.1-20)	26.0	<0.0001	0.96 (0.77-1.19)
C (Peak VO_2 10.1-16)			1.36 (1.09-1.69)
D (Peak $VO_2 \leq 10$)			1.55 (1.17-2.05)
Left ventricular ejection fraction (HR for 5% increase)	18.0	<0.0001	0.93 (0.89-0.96)
Exercise duration on CPX test (HR for 1-min increase)	17.3	<0.0001	0.96 (0.94-0.98)
Ventricular conduction prior to CPX			
Left bundle branch block	24.3	0.0001	1.07 (0.92-1.25)
Right bundle branch block			1.38 (1.07-1.77)
Intraventricular conduction delay			1.24 (1.06-1.46)
Paced			1.35 (1.18-1.54)
Sex: female	15.0	0.0001	0.79 (0.70-0.89)
Mitral regurgitation: severe	13.7	0.0002	1.32 (1.14-1.52)
Race			
Black or African American	5.7	0.0575	1.11 (0.99-1.25)
Other			1.24 (0.99-1.56)

CI, confidence interval; CPX test, cardiopulmonary exercise test; HR, hazard ratio; KCCQ, Kansas City Cardiomyopathy Questionnaire; VO_2, oxygen consumption.

Reference categories: KCCQ symptom stability=no change or no symptoms; Weber Class=A; ventricular conduction=normal; sex=male; mitral regurgitation=non-severe/none; race= white

Supplemental Table 3. Full Predictive Model for Mortality Endpoint

Parameter	Average χ^2	*P* value	HR (CI)
Exercise duration on CPX test (HR for 1-min increase)	118.0	<0.0001	0.84 (0.81-0.86)
Sex: female	18.2	<0.0001	0.56 (0.43-0.73)
BMI (HR for a 2 kg/m^2 increase, truncated above 25)	13.5	0.0002	0.80 (0.70-0.90)
Serum creatinine (HR for 0.1 mg/dL increase, truncated above 2.3)	12.1	0.0005	1.04 (1.02-1.07)
Mitral regurgitation: severe	7.9	0.0049	1.45 (1.12-1.88)
Left ventricular ejection fraction (HR for 5% increase)	7.8	0.0051	0.90 (0.84-0.97)
Blood urea nitrogen (HR for 10 mg/dL increase)	6.7	0.0097	1.06 (1.01-1.10)
Ventricular conduction prior to CPX			
Left bundle branch block	12.9	0.0120	0.76 (0.55-1.06)
Right bundle branch block			1.35 (0.86-2.12)
Intraventricular conduction delay			1.09 (0.79-1.51)
Paced			1.32 (1.02-1.71)
Diastolic blood pressure (HR for 5 mm Hg increase)	5.6	0.0175	0.94 (0.90-0.99)
Canadian Angina Classification			
1	6.8	0.0338	1.23 (0.87-1.74)
≥2			0.62 (0.40-0.94)

BMI, body mass index; CI, confidence interval; CPX test, cardiopulmonary exercise test; Hg, mercury; HR:, hazard ratio;

Reference categories: Sex=male; mitral regurgitation=non-severe/none; ventricular conduction=normal; Canadian Angina Classification=0