

APPENDIX 2

(Analysis of Derivation Data)

Table 1. Hospital and Patient Characteristics for Derivation Dataset (N = 797)

Hospital Characteristic	Hospital ID			
	A	B	C	D
EHR vendor	Epic	Epic	Epic	Allscripts
Geographic location	South East	South	North	East
Status	Academic	Academic	Academic	Non-academic
Hospital bed size	873	700	385	247
Abstracted records (N)	262	66	199	270
Patient Characteristics	Hospital ID			
	A	B	C	D
Age, mean (S.D.)	68.6 (12.4)	67.0 (12.1)	75.3 (12.8)	80.0 (10.9)
Female, %	43.6	50.2	57.3	54.0
White race, %	54.3	10.1	88.9	95.9
No health insurance, %	0.0	5.9	1.0	6.0
Medicaid insurance, %	8.1	13.0	19.2	4.2

EHR: electronic health record

Table 2. Performance for EHR-based Framingham HF Phenotype Criteria (n=394)

HF Criteria Variables (n [†])	Sensitivity, % (95% CI)	Specificity, % (95% CI)	PPV, % (95% CI)
Weight loss \geq 4.5 kg ^{††} (38)	60.5 (89.0 – 94.6)	95.5 (92.8 – 97.4)	59.0 (44.6 – 74.4)
Jugular venous distension (55)	60.0 (45.9 – 73.0)	82.5 (77.2 – 87.1)	43.4 (32.3 – 54.5)
Hepatojugular reflux (1)	100.0 (25.0 – 100.0)	99.3 (97.6 – 99.9)	33.3 (0.0 – 86.6)
PND (32)	68.8 (50.0 – 83.9)	88.1 (83.6 – 91.7)	40.7 (27.6 – 53.8)
Orthopnea (55)	56.4 (42.3 – 69.7)	93.5 (89.7 – 96.2)	66.0 (52.4 – 79.5)
Pulmonary basilar rales (72)	65.3 (53.1 – 76.1)	62.9 (56.3 – 69.2)	35.6 (27.4 – 43.8)
S3 gallop (5)	20.0 (5.0 – 71.6)	95.6 (92.6 – 97.6)	7.1 (0.0 – 22.2)
Pulmonary edema (53)	83.0 (70.2 – 91.9)	48.0 (41.4 – 54.7)	27.0 (20.2 – 33.8)
Cardiomegaly (157)	49.7 (41.6 – 57.8)	95.2 (89.8 – 98.2)	92.9 (87.3 – 98.4)
Lower extremity edema (163)	74.8 (67.5 – 81.3)	84.8 (77.7 – 90.3)	85.3 (79.5 – 91.1)
Hepatomegaly (0)	0.0	99.3 (97.6 – 99.9)	0.0 (0.0 – 0.0)
Dyspnea on exertion (256)	78.5 (73.0 – 83.4)	62.2 (46.5 – 76.2)	92.2 (88.6 – 95.8)
Bilateral pleural effusion (81)	67.9 (56.6 – 77.8)	80.6 (74.4 – 85.8)	58.5 (48.6 – 69.5)

[†] instances in total cohort that criteria were identified by manual ARIC abstractors (reference standard)^{††} weight loss during hospitalization based on structured daily patient weight data, PPV: positive-predictive value, CI: confidence interval**Table 3.** Performance of EHR-based Ascertainment of Framingham HF Phenotype (n = 394)

Sensitivity, % (95% CI)	Specificity, % (95% CI)	PPV, % (95% CI)	P _{EHR}	P _{Ref}	P _{Ref} - P _{EHR}	% Agreement (95% CI)
75.0 (68.7 - 80.6)	74.1 (67.0 – 80.5)	78.6 (73.1 - 84.1)	0.533	0.558	0.025 (0.01-0.04)	74.6 (70.3 - 78.9)

[†]reference is calculations based on ARIC manually abstracted Framingham criteria,

Note types: emergency department notes, hospital admission notes, and discharge summaries

P_{EHR}: EHR-based ascertainment of HF prevalence, P_{Ref}: prevalence reference standard based on manual chart abstraction