Supplemental Table 1. Patient Characteristics

Variable	IVC Diameter ≤ 2.07cm N=75	IVC Diameter > 2.07cm N=125	P Value	HFrEF LVEF < 50% N=122	HFpEF LVEF ≥ 50% N=78	P Value	Deceased Within 1yr N=9	Not Deceased Within 1yr N=191	P Value
IVC Diameter	--	--	--	2.31 (0.57)	2.16 (0.56)	0.06	2.92 (0.65)	2.22 (0.55)	<0.001
BSA	1.86 (0.30)	2.12 (0.32)	<0.001	2.04 (0.31)	1.99 (0.37)	0.36	2.11 (0.43)	2.02 (0.33)	0.40
Corrected IVC Diameter	--	--	--	1.15 (0.29)	1.09 (0.23)	0.13	1.42 (0.36)	1.11 (0.26)	<0.01
Age	70 (15)	64 (14)	<0.01	62 (13)	72 (15)	<0.001	64 (16)	66 (14)	0.68
Sex			<0.01			<0.01			0.85
Women	35 (46.7%)	26 (20.8%)		25 (20.5%)	36 (46.2%)		3(33.3%)	58 (30.4%)	
Men	40 (53.3%)	99 (79.2%)		97 (79.5%)	42 (53.8%)		6(66.7%)	133 (69.6%)	
NYHA Functional Class			0.02			0.62			0.73
I	2 (2.7%)	0 (0.0%)		1 (0.8%)	1 (1.3%)		0 (0.0%)	2 (1.0%)	
II	36 (48.0%)	39 (31.2%)		43 (35.2%)	32 (41.0%)		2(22.2%)	73 (38.2%)	
III	30 (40.0%)	68 (54.4%)		60 (49.2%)	38 (48.7%)		6(66.7%)	92 (48.2%)	
IV	7 (9.3%)	18 (14.4%)		18 (14.8%)	7 (9.0%)		1 (11.1%)	24 (12.6%)	
Afib/Aflutter	24 (32.0%)	50 (40.0%)	0.26	39 (32.0%)	35 (44.9%)	0.07	6 (66.7%)	68 (35.6%)	0.06
Ischemic Heart Disease	29 (38.7%)	35 (28.0%)	0.12	38 (31.1%)	26 (33.3%)	0.75	3 (33.3%)	61 (31.9%)	0.93
HLD	24 (32.0%)	27 (21.6%)	0.10	28 (23.0%)	23 (29.5%)	0.30	2 (22.2%)	49 (25.7%)	0.82
HTN	42 (56.0%)	75 (60.0%)	0.58	64 (52.5%)	53 (67.9%)	0.03	4 (44.4%)	113 (59.2%)	0.38
PAD	2 (2.7%)	6 (4.8%)	0.46	4 (3.3%)	4 (5.1%)	0.52	2 (22.2%)	6 (3.1%)	<0.01
CVA	7 (9.3%)	10 (8.0%)	0.74	11 (9.0%)	6 (7.7%)	0.74	2 (22.2%)	15 (7.9%)	0.13
Diabetes	32 (42.7%)	49 (39.2%)	0.63	44 (36.1%)	37 (47.4%)	0.11	3 (33.3%)	78 (40.8%)	0.65
CKD	19 (25.3%)	34 (27.2%)	0.77	25 (20.5%)	28 (35.9%)	0.02	3 (33.3%)	50 (26.2%)	0.64
COPD	11 (14.7%)	13 (10.4%)	0.37	12 (9.8%)	12 (15.4%)	0.24	1 (11.1%)	23 (12.0%)	0.93
Delta Weight	11.15 (10.18)	17.79 (12.84)	<0.001	16.10 (12.66)	14.00 (11.71)	0.24	16.44 (10.63)	15.23 (12.41)	0.77
Systolic BP	126 (25)	125 (22)	0.77	122 (22)	131 (25)	0.01	123 (15)	126 (24)	0.77
Diastolic BP	72 (17)	76 (17)	0.13	79 (17)	67 (15)	<0.001	74 (17)	74 (17)	0.95
HR	86 (20)	89 (20)	0.37	93 (20)	80 (18)	<0.001	82 (15)	88 (21)	0.34
Creatinine	1.41 (0.66)	1.63 (0.96)	0.06	1.43 (0.65)	1.73 (1.10)	0.03	1.64 (0.93)	1.55 (0.86)	0.75
eGFR	59.26 (26.88)	58.76 (27.87)	0.90	61.85 (23.07)	54.41 (32.79)	0.08	58.62 (33.94)	58.96 (27.20)	0.97
Sodium	139 (3)	138 (4)	0.44	138 (4)	139 (4)	0.03	138 (2)	138 (4)	0.63
Potassium	4.1 (0.5)	4.3 (0.6)	0.44	4.2 (0.5)	4.2 (0.5)	0.99	4.3 (0.4)	4.2 (0.5)	0.33
Hemoglobin	12.1 (2.9)	11.4 (2.2)	0.11	12.5 (2.1)	10.4 (2.4)	<0.001	10.8 (3.1)	11.7 (2.4)	0.26
NT-proBNP	5448 (5750)	7149 (9151)	0.17	7809 (9112)	5281 (9505)	0.07	7558 (10472)	6478 (8002)	0.70
Elevated JVP	41 (54.7%)	84 (67.2%)	0.08	87 (71.3%)	38 (48.7%)	<0.01	4 (44.4%)	121 (63.4%)	0.25
Crackles	32 (42.7%)	61 (48.8%)	0.40	55 (45.1%)	38 (48.7%)	0.62	2 (22.2%)	91 (47.6%)	0.14
Peripheral Edema	54 (72.0%)	108 (86.4%)	0.01	96 (78.7%)	66 (84.6%)	0.30	9 (100.0%)	153 (80.1%)	0.14
Medications									
Beta Blocker	59 (78.7%)	93 (74.4%)	0.49	99 (81.1%)	53 (67.9%)	0.03	7 (77.8%)	145 (75.9%)	0.90
ACE/ARB	37 (49.3%)	59 (47.2%)	0.77	75 (61.5%)	21 (26.9%)	<0.001	3 (33.3%)	93 (48.7%)	0.37
Aldosterone Antagonist	17 (22.7%)	34 (27.2%)	0.48	38 (31.1%)	13 (16.7%)	0.02	4 (44.4%)	47 (24.6%)	0.18
ARNI	5 (6.7%)	7 (5.6%)	0.76	11 (9.0%)	1 (1.3%)	0.03	0 (0.0%)	12 (6.3%)	0.44
Loop Diuretic	66 (88.0%)	118 (94.4%)	0.12	111 (91.0%)	73 (93.6%)	0.51	9 (100.0%)	175 (91.6%)	0.37
Statin	49 (65.3%)	64 (51.2%)	0.05	58 (47.5%)	55 (70.5%)	<0.01	5 (55.6%)	108 (56.5%)	0.95
Antiplatelet	11 (14.7%)	10 (8.0%)	0.14	13 (10.7%)	8 (10.3%)	0.93	0 (0.0%)	21 (11.0%)	0.29
Warfarin	5 (6.7%)	19 (15.2%)	0.07	16 (13.1%)	8 (10.3%)	0.54	2 (22.2%)	22 (11.5%)	0.33
DOAC	24 (32.0%)	34 (27.2%)	0.47	34 (27.9%)	24 (30.8%)	0.66	3 (33.3%)	55 (28.8%)	0.77
Digoxin	3 (4.0%)	14 (11.2%)	0.08	13 (10.7%)	4 (5.1%)	0.17	0 (0.0%)	17 (8.9%)	0.35
ICD	5 (6.7%)	12 (9.6%)	0.47	15 (12.3%)	2 (2.6%)	0.02	1 (11.1%)	16 (8.4%)	0.77
CRT	3 (4.0%)	2 (1.6%)	0.29	4 (3.3%)	1 (1.3%)	0.38	0 (0.0%)	5 (2.6%)	0.62
CardioMEMS	1 (1.3%)	2 (1.6%)	0.88	2 (1.6%)	1 (1.3%)	0.84	0 (0.0%)	3 (1.6%)	0.71
Echocardiographic Findings									
LVEF	45 (19)	38 (20)	0.03	--	--	--	44 (22)	41 (20)	0.65
PA Pressure	41 (14)	50 (14)	<0.001	47 (14)	46 (16)	0.64	60 (22)	46 (14)	0.01
Tricuspid Regurgitation			0.06			<0.01			0.86
none/trace	24 (32.0%)	25 (20.0%)		20 (16.4%)	29 (37.2%)		2 (22.2%)	47 (24.6%)	
mild	41 (54.7%)	38 (30.4%)		49 (40.2%)	30 (38.5%)		3 (33.3%)	76 (39.8%)	
moderate/severe	10 (13.3%)	62 (49.6%)		53 (43.4%)	19 (24.4%)		4 (44.4%)	68 (35.6%)	
Mitral Regurgitation			0.15			<0.001			0.31
none/trace	29 (38.6%)	36 (28.8%)		23 (18.9%)	42 (53.8%)		5 (55.6%)	60 (31.4%)	
mild	28 (37.3%)	49 (39.2%)		47 (38.5%)	30 (38.5%)		2 (22.2%)	75 (39.3%)	
moderate/severe	18 (24.0%)	40 (32.0%)		52 (42.6%)	6 (7.7%)		2 (22.2%)	56 (29.3%)	
Race/Ethnicity									
White	35 (46.7%)	61 (48.8%)	0.77	49 (40.2%)	46 (59.0%)	0.01	5 (55.6%)	91 (47.6%)	0.64
Black	15 (20.0%)	31 (24.8%)	0.44	35 (28.7%)	11 (14.1%)	0.01	3 (33.3%)	43 (22.5%)	0.45
Hispanic (any race)	9 (12.0%)	20 (16.0%)	0.44	20 (16.4%)	9 (11.5%)	0.32	0 (0.0%)	29 (15.2%)	0.21
Asian	11 (14.7%)	8 (6.4%)	0.05	10 (8.2%)	9 (11.5%)	0.45	0 (0.0%)	19 (9.9%)	0.32
Other	14 (18.6%)	25 (20.0%)	0.82	6 (4.9%)	3 (3.8%)	0.70	1 (11.1%)	36 (18.8%)	0.56

Values are mean ± standard deviation for continuous variables and number and percent of patients for categorical variables. The statistical difference between variables is given for the comparison between patients with and without ADHF readmission within 1 year, and between IVC diameter greater than and less than 2.07 cm. Corrected IVC diameter refers to IVC diameter corrected for body surface area. BSA = body surface area; NYHA = New York Heart Association; HLD = hyperlipidemia; HTN = hypertension; PAD = peripheral arterial disease; CVA = cerebrovascular accident; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; BP = blood pressure; HR = heart rate; eGFR = estimated glomerular filtration rate; NT-proBNP = N-terminal B-type natriuretic peptide; JVP = jugular venous pulse; ACE/ARB = angiotensin converting enzyme/angiotensin receptor blocker; ARNI = angiotensin receptor neprilysin inhibitor; DOAC = direct oral anticoagulant; ICD = implantable cardioverter defibrillator; CRT = cardiac resynchronization therapy; LVEF = left ventricular ejection fraction; PA = pulmonary arterial.

Supplemental Table 2. Univariable Cox Regression for ADHF Rehospitalization Within 1 Year: NYHA Class I/II (N=77 patients with 34 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
IVC Diameter	3.08 (1.85-5.10)	18.93	<0.001
BSA Corrected IVC Diameter	7.14 (2.28-22.37)	11.40	<0.001
Ideal BSA (BMI 25) Corrected IVC Diameter	5.06 (1.89-13.53)	10.43	<0.01
Height Corrected IVC Diameter	5.91 (2.30-15.14)	13.67	<0.001
Days Hospitalized	1.10 (0.98-1.23)	2.61	0.11
Age	0.98 (0.96-1.00)	3.15	0.08
Afib/Aflutter	0.58 (0.26-1.29)	1.78	0.18
Ischemic Heart Disease	0.54 (0.22-1.30)	1.90	0.17
Sodium	0.89 (0.81-0.97)	6.55	0.01
Hemoglobin	0.86 (0.75-0.99)	4.67	0.03
Log NT-proBNP	2.23 (1.10-4.53)	4.89	0.03
LVEF	0.99 (0.97-1.00)	2.15	0.14
PA Pressure	1.03 (1.01-1.05)	7.28	0.01
Tricuspid Regurgitation	4.56 (1.64-13.29)	8.34	<0.01
Mitral Regurgitation	2.44 (1.14-5.24)	5.25	0.02

Only showing variables with P<0.2

Supplemental Table 3. Multivariable Cox Regression for ADHF Rehospitalization Within 1 Year: NYHA Class I/II (N=77 patients with 34 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
IVC Diameter	3.30 (1.91-5.71)	18.14	<0.001
Log NT-proBNP	2.30 (1.17-4.54)	5.78	0.02

Multivariable cox regression analysis based on independent predictor variables from forwards and backwards procedures.

Supplemental Table 4. Univariable Cox Regression for ADHF Rehospitalization Within 1 Year: NYHA Class III/IV (N=120 patients with 107 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
IVC Diameter	1.81 (1.25-2.60)	9.99	<0.01
BSA Corrected IVC Diameter	4.16 (1.99-8.70)	14.33	<0.001
Ideal BSA (BMI 25) Corrected IVC Diameter	3.48 (1.76-6.87)	12.94	<0.001
Height Corrected IVC Diameter	3.22 (1.67-6.21)	12.12	<0.001
Ischemic Heart Disease	0.62 (0.42-0.93)	5.34	0.02
CVA	1.83 (0.94-3.55)	3.20	0.07
Smoking	6.81 (1.62-28.60)	6.87	0.01
Delta Weight	0.98 (0.97-1.00)	3.77	0.05
Diastolic BP	1.01 (1.00-1.02)	2.87	0.09
HR	1.01 (1.00-1.02)	7.82	0.01
Creatinine	1.18 (0.95-1.46)	2.22	0.14
Hemoglobin	0.93 (0.85-1.01)	2.95	0.09

Only showing variables with P<0.2

Supplemental Table 5. Multivariable Cox Regression for ADHF Rehospitalization Within 1 Year: NYHA Class III/IV (N=120 patients with 107 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
BSA Corrected IVC Diameter	4.11 (1.94-8.69)	13.64	<0.001
Delta Weight	0.98 (0.96-1.00)	6.09	0.01
HR	1.02 (1.01-1.03)	13.90	<0.001
Creatinine	1.29 (1.03-1.62)	4.72	0.03

Multivariable cox regression analysis based on independent predictor variables from forwards and backwards procedures.

Supplemental Table 6. Univariable Cox Regression for ADHF Rehospitalization Within 1 Year: HFpEF LVEF ≥ 50% (N=78 patients with 56 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
IVC Diameter	1.92 (1.23-2.98)	8.36	<0.01
BSA Corrected IVC Diameter	3.27 (1.17-9.10)	5.13	0.02
Ideal BSA (BMI 25) Corrected IVC Diameter	2.58 (1.10-6.11)	4.63	0.03
Height Corrected IVC Diameter	2.83 (1.25-6.42)	6.25	0.01
Days Hospitalized	1.07 (1.01-1.31)	5.32	0.02
Age	0.98 (0.97-1.00)	2.7	0.10
NYHA Functional Class III/IV vs I/II	4.78 (2.56-8.93)	24.15	<0.001
Delta Weight	1.02 (1.00-1.05)	2.6	0.11
Systolic BP	1.01 (1.00-1.02)	3.45	0.06
Creatinine	1.42 (1.13-1.80)	8.8	<0.01
Sodium	0.95 (0.88-1.01)	2.45	0.12
Hemoglobin	0.81 (0.71-0.92)	11.22	<0.001
Log NT-proBNP	2.11 (1.13-3.93)	5.47	0.02
PA Pressure	1.02 (1.01-1.04)	6.15	0.01
Tricuspid Regurgitation	1.79 (1.01-3.15)	4.04	0.05
Mitral Regurgitation	1.61 (0.95-2.74)	3.11	0.08

Only showing variables with P<0.2

Supplemental Table 7. Multivariable Cox Regression for ADHF Rehospitalization Within 1 Year: HFpEF LVEF ≥ 50% (N=78 patients with 56 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
BSA Corrected IVC Diameter	5.48 (1.43-20.99)	6.15	0.01
NYHA Functional Class III/IV vs I/II	5.98 (2.99-11.95)	25.63	<0.001
Hemoglobin	0.82 (0.72-0.93)	9.26	<0.01
Tricuspid Regurgitation	2.10 (1.18-3.76)	6.27	0.01

Multivariable cox regression analysis based on independent predictor variables from forwards and backwards procedures.

Supplemental Table 8. Univariable Cox Regression for ADHF Rehospitalization Within 1 Year: HFrEF LVEF < 50% (N=122 patients with 88 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
IVC Diameter	2.94 (2.02-4.27)	31.79	<0.001
BSA Corrected IVC Diameter	6.77 (3.33-13.75)	27.96	<0.001
Ideal BSA (BMI 25) Corrected IVC Diameter	5.92 (3.26-10.74)	34.17	<0.001
Height Corrected IVC Diameter	6.17 (3.35-11.36)	34.05	<0.001
Days Hospitalized	1.03 (1.00-1.07)	2.88	0.09
NYHA Functional Class III/IV vs I/II	2.70 (1.63-4.47)	14.83	<0.001
Ischemic Heart Disease	0.67 (0.42-1.07)	2.89	0.09
COPD	1.60 (0.84-3.00)	2.04	0.15
Smoking	6.99 (1.66-29.39)	7.03	0.01
Delta Weight	0.98 (0.96-0.99)	6.75	0.01
Systolic BP	0.99 (0.98-1.00)	5.33	0.02
HR	1.02 (1.01-1.03)	9.79	<0.01
Sodium	0.95 (0.89-1.00)	3.36	0.07
Hemoglobin	0.90 (0.81-1.00)	4.12	0.04
Log NT-proBNP	1.44 (0.88-2.33)	2.13	0.14
PA Pressure	1.01 (1.00-1.03)	3.34	0.07
Tricuspid Regurgitation	2.31 (1.16-4.61)	5.63	0.02

Only showing variables with P<0.2

Supplemental Table 9. Multivariable Cox Regression for ADHF Rehospitalization Within 1 Year: HFrEF LVEF < 50% (N=122 patients with 88 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
Ideal BSA (BMI 25) Corrected IVC Diameter	4.65 (2.48-8.71)	23.03	<0.001
NYHA Functional Class III/IV vs I/II	2.03 (1.21-3.42)	7.10	<0.01
Delta Weight	0.97 (0.96-0.99)	8.78	<0.01
HR	1.02 (1.01-1.03)	11.10	<0.001

Multivariable cox regression analysis based on independent predictor variables from forwards and backwards procedures.

Supplemental Table 10. Univariable Cox Regression for ADHF Rehospitalization Within 1 Year: RV Dysfunction (N=109 patients with 84 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
IVC Diameter	2.40 (1.66-3.44)	22.01	<0.001
BSA Corrected IVC Diameter	4.72 (2.21-10.08)	16.12	<0.001
Ideal BSA (BMI 25) Corrected IVC Diameter	4.71 (2.48-8.92)	22.56	<0.001
Height Corrected IVC Diameter	4.74 (2.51-8.94)	23.03	<0.001
Delta Weight	0.98 (0.96-1.00)	5.09	0.02
NYHA Functional Class III/IV vs I/II	2.68 (1.60-4.51)	13.90	<0.001
LVEF	0.99 (0.97-1.00)	3.96	0.05
Tricuspid Regurgitation	1.60 (0.80-3.21)	1.79	0.18
Log NT-proBNP	1.53 (0.94-2.49)	2.96	0.09
Creatinine	1.34 (0.99-1.81)	3.50	0.06
Sodium	0.95 (0.89-1.00)	3.52	0.06
Hemoglobin	0.93 (0.84-1.02)	2.30	0.13
Systolic BP	0.99 (0.98-1.00)	5.25	0.02

Only showing variables with P<0.2

Supplemental Table 11. Multivariable Cox Regression for ADHF Rehospitalization Within 1 Year: RV Dysfunction (N=109 patients with 84 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
Height Corrected IVC Diameter	4.56 (2.42-8.59)	21.98	<0.001
Delta Weight	0.97 (0.95-0.99)	6.20	0.01
NYHA Functional Class III/IV vs I/II	2.13 (1.25-3.62)	7.77	0.01
LVEF	0.99 (0.97-1.00)	4.05	0.04

Multivariable cox regression analysis based on independent predictor variables from forwards and backwards procedures.

Supplemental Table 12. Univariable Cox Regression for ADHF Rehospitalization Within 1 Year: No RV Dysfunction (N=91 patients with 60 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
IVC Diameter	2.29 (1.43-3.68)	11.79	<0.001
BSA Corrected IVC Diameter	5.73 (2.18-15.03)	12.57	<0.001
Ideal BSA (BMI 25) Corrected IVC Diameter	3.57 (1.54-8.30)	8.78	<0.001
Height Corrected IVC Diameter	3.84 (1.69-8.75)	10.28	<0.01
Days Hospitalized	1.08 (1.03-1.12)	9.81	<0.01
NYHA Functional Class III/IV vs I/II	4.10 (2.27-7.43)	21.74	<0.001
PA Pressure	1.03 (1.01-1.05)	10.46	<0.01
Tricuspid Regurgitation	1.97 (1.13-3.42)	5.69	0.02
Mitral Regurgitation	1.71 (1.00-2.93)	3.79	0.05
Elevated JVP	0.65 (0.39-1.08)	2.76	0.10
Crackles	1.44 (0.86-2.39)	1.95	0.16
Log NT-proBNP	1.58 (0.93-2.70)	2.82	0.09
Creatinine	1.26 (0.99-1.61)	3.39	0.07
Sodium	0.95 (0.89-1.02)	2.22	0.14
Hemoglobin	0.78 (0.69-0.88)	16.26	<0.001
Systolic Blood Pressure	1.01 (1.00-1.02)	3.61	0.06
Heart Rate	1.02 (1.01-1.04)	9.62	<0.01

Only showing variables with P<0.2

Supplemental Table 13. Multivariable Cox Regression for ADHF Rehospitalization Within 1 Year: No RV Dysfunction (N=91 patients with 60 events)

Variable	Hazard Ratio (95% CI)	Wald Chi Square	P value
BSA Corrected IVC Diameter	3.81 (1.16-12.57)	4.83	0.03
NYHA Functional Class III/IV vs I/II	3.13 (1.71-5.72)	13.71	<0.001
Heart Rate	1.02 (1.01-1.03)	8.58	<0.01
Hemoglobin	0.80 (0.69-0.91)	10.67	<0.01

Multivariable cox regression analysis based on independent predictor variables from forwards and backwards procedures.

Supplemental Figure 1. IVC Diameter Distribution