

Appendix Table A. Comparison of study cohort vs. those with missing data, n(%) or median (25th, 75th percentiles)

Category	Variable	STUDY COHORT	MISSING	P-value
N		3445	717	
Demographic	Age, years	66 (58, 73)	66 (59, 73)	0.255
	Male	2746 (79.7%)	570 (79.5%)	0.898
Heart disease etiology	Ischemic, revascularized	481(14.0%)	194(27.1%)	<.001
	Ischemic, not revascularized	2193 (63.7%)	300 (41.8%)	
	Non-ischemic	771 (22.4%)	223 (31.1%)	
Arrhythmias	Non-sustained VT	372 (10.8%)	79 (11.0%)	0.863
	Atrial fibrillation	900 (26.1%)	229 (31.9%)	0.001
	Syncope	222 (6.4%)	59 (8.2%)	0.083
	Pre-existing pacemaker system	86 (2.5%)	186 (25.9%)	<.001
CV profile	Prior HF hospitalization	1308 (38.0%)	433 (60.4%)	<.001
	Hypertension	1977 (57.4%)	378 (52.7%)	0.022
	Diabetes: insulin or oral agents	1133 (32.9%)	223 (31.1%)	0.353
	Smoker	2070 (60.1%)	368 (51.3%)	<.001
	Stroke or TIA	123 (3.6%)	37 (5.2%)	0.044
	Peripheral vascular disease	334 (9.7%)	81 (11.3%)	0.193
CCS angina class	I or none	2512 (72.9%)	471 (65.7%)	<.001
	II-IV	270 (7.8%)	53 (7.4%)	
NYHA class	I-II	2248 (65.3%)	430 (60.0%)	0.007
	III-IV	1197 (34.7%)	287 (40.0%)	
Comorbidities	COPD	443 (12.9%)	74 (10.3%)	0.061
	Cancer	295 (8.6%)	57 (7.9%)	0.591
	Cognitive impairment	14 (0.4%)	SC	0.574
	Home oxygen use	16 (0.5%)	SC	0.215
Physical	Able to walk without support	3270 (94.9%)	669 (93.3%)	0.081
	Systolic BP, mmHg	120 (109, 134)	119 (107.5, 131)	0.091
Medications	β-adrenoreceptor antagonist	3096 (89.9%)	651 (90.8%)	0.452
	ACE inhibitor or ARB	3132 (90.9%)	650 (90.7%)	0.827
	Spironolactone	1128 (32.7%)	217 (30.3%)	0.197
	Loop diuretics	2255 (65.5%)	500 (69.7%)	0.028
	Digoxin	841 (24.4%)	191 (26.6%)	0.209
	Amiodarone	270 (7.8%)	55 (7.7%)	0.880
	HMG-coA reductase inhibitor	2579 (74.9%)	462 (64.4%)	<.001
	Anti-platelet agent*	2273 (66.0%)	393 (54.8%)	<.001
Laboratory	Hemoglobin, g/dL	13.8 (12.6, 14.8)	13.6 (12.5, 14.6)	0.012
	Sodium, mEq/L	139 (137, 141)	139 (137,141)	0.921
	Creatinine, mg/dL	1.09 (0.92, 1.36)	1.13 (0.96, 1.44)	0.001
	Creatinine, μmol/L	96 (81, 120)	100 (85, 127)	0.001
	ECG QRS duration, msec	126 (104, 158)	148 (112, 178)	<.001
	Left atrial size, mm	46 (41, 51)	46 (41, 52)	0.320
	LV end-systolic dimension, mm	53 (47, 60)	53 (47, 59)	0.345
LVEF	31-35%	558 (16.2%)	115 (16.0%)	0.059
	21-30%	2135 (62.0%)	419 (58.4%)	

≤20%	750 (21.8%)	181 (25.2%)
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Appendix Table B. Univariate predictors of appropriate shock competing with death

Category	Variable	Appropriate Shock Hazard Ratio (95%CI)	p-value	Mortality Hazard Ratio (95%CI)	p-value
Demographic	Age, per 10 years	0.89 (0.78, 1.01)	0.076	1.57 (1.39, 1.78)	< .001
	Male	1.69 (1.13, 2.54)	0.011	1.16 (0.85, 1.58)	0.350
Heart disease etiology	Ischemic revascularized	Reference		Reference	
	Ischemic not revascularized	1.35 (0.86, 2.12)	0.190	1.20 (0.83, 1.73)	0.330
	Non-ischemic	1.39 (0.84, 2.30)	0.200	0.86 (0.55, 1.34)	0.510
Arrhythmias	Non-sustained VT	1.57 (1.08, 2.28)	0.019	0.94 (0.63, 1.40)	0.760
	Atrial fibrillation	1.66 (1.25, 2.21)	< .001	1.57 (1.22, 2.01)	< .001
	Syncope	1.41 (0.87, 2.30)	0.160	1.23 (0.79, 1.92)	0.350
	Pre-existing pacemaker	2.07 (1.09, 3.90)	0.025	2.59 (1.58, 4.26)	< .001
Cardiovascular profile	Prior HF hospitalization [†]	1.13 (0.86, 1.49)	0.390	2.49 (1.95, 3.17)	< .001
	Hypertension	0.78 (0.59, 1.03)	0.077	1.39 (1.08, 1.78)	0.011
	Diabetes	1.12 (0.84, 1.49)	0.440	1.81 (1.42, 2.30)	< .001
	Smoker	0.80 (0.60, 1.05)	0.100	1.44 (1.11, 1.86)	0.005
	Stroke or TIA	1.25 (0.65, 2.42)	0.510	1.55 (0.90, 2.65)	0.110
	Peripheral vascular disease	0.90 (0.55, 1.46)	0.670	2.02 (1.47, 2.78)	< .001
CCS angina class	I or none	Reference		Reference	
	II-IV	0.91 (0.53, 1.55)	0.720	1.39 (0.94, 2.08)	0.100
NYHA class	I-II	Reference		Reference	
	III-IV	1.07 (0.81, 1.43)	0.620	2.14 (1.68, 2.72)	< .001
Comorbidities	COPD	0.77 (0.49, 1.22)	0.270	1.91 (1.43, 2.56)	< .001
	Cancer	1.23 (0.79, 1.93)	0.360	1.73 (1.22, 2.45)	0.002
	Cognitive impairment	1.46 (0.20, 10.50)	0.710	2.50 (0.61, 10.25)	0.200
	Home oxygen use	1.08 (0.16, 7.13)	0.940	8.31 (3.84, 18.00)	< .001
Physical	Walks without support	1.18 (0.61, 2.28)	0.630	0.40 (0.27, 0.58)	< .001
	Systolic BP, per 20 mmHg	0.84 (0.73, 0.98)	0.026	0.84 (0.73, 0.97)	0.019
Medications	β-adrenoreceptor antagonists	1.27 (0.77, 2.08)	0.350	0.73 (0.51, 1.03)	0.074
	ACE inhibitor or ARB	1.01 (0.62, 1.64)	0.980	0.53 (0.38, 0.74)	< .001
	Spirolactone	1.28 (0.96, 1.69)	0.090	1.30 (1.01, 1.66)	0.038
	Loop diuretics	1.36 (1.00, 1.84)	0.051	2.04 (1.52, 2.74)	< .001
	Digoxin	1.69 (1.26, 2.25)	< .001	1.31 (1.00, 1.70)	0.046
	Amiodarone	0.59 (0.31, 1.11)	0.100	1.61 (1.11, 2.33)	0.011
	HMG-coA reductase inhibitor	0.82 (0.61, 1.11)	0.200	1.12 (0.84, 1.48)	0.450

	Anti-platelet agent	0.67 (0.51, 0.89)	0.005	0.99 (0.77, 1.27)	0.930
Hemoglobin	≥12 g/dL	Reference		Reference	
	<12 g/dL	0.49 (0.29, 0.82)	0.007	2.59 (1.99, 3.39)	< .001
Sodium	≤138 mEq/L	Reference		Reference	
	>138 mEq/L	0.93 (0.70, 1.23)	0.600	1.73 (1.36, 2.20)	< .001
Serum creatinine	Per 1 mg/dL	1.13(0.99, 1.28)	0.063	1.35(1.27, 1.44)	< .001
QRSd - 130	Per 10 msec	0.84 (0.75, 0.95)	0.005	0.90 (0.81, 0.99)	0.039
Left atrial size	<45 mm	Reference		Reference	
	≥45 mm	1.63 (1.24, 2.15)	< .001	1.52 (1.19, 1.93)	< .001
LVESD	<45 mm	Reference		Reference	
	≥45 mm	1.43 (1.06, 1.93)	0.019	1.07 (0.83, 1.38)	0.590
LV ejection fraction	31-35%	Reference		Reference	
	21-30%	1.21 (0.79, 1.85)	0.370	1.38 (0.95, 2.01)	0.092
	≤20%	1.56 (0.98, 2.50)	0.061	1.40 (0.91, 2.15)	0.120
Device type	Single chamber	Reference		Reference	
	Dual chamber	1.27 (0.89, 1.80)	0.180	0.98 (0.70, 1.37)	0.890
	CRT-D	1.11 (0.81, 1.53)	0.520	1.42 (1.09, 1.85)	0.010

VT=ventricular tachycardia, HF=heart failure, TIA=transient ischemic attack, CCS=Canadian Cardiovascular Society, NYHA=New York Heart Association, COPD=chronic obstructive pulmonary disease, BP=blood pressure, ACE=angiotensin converting enzyme, ARB=angiotensin receptor blocker, QRSd=QRS duration, LV=left ventricular, LVESD=left ventricular end-systolic dimension, CRT-D=cardiac resynchronization therapy defibrillator

† Within previous 3 years, * To convert creatinine into SI units (μmol/L), multiply value in mg/dL by 88.4

APPENDIX 1. Participating Hospitals and Investigators in the Ontario ICD Database

Defibrillator Implantation and Follow-up Sites: Hamilton Health Sciences Centre (J.S. Healey), Kingston General Hospital (C.S. Simpson), London Health Sciences Centre (A.D. Krahn, R. Yee), Rouge Valley Health System (A. Janmohammed), St. Michael's Hospital (I. Mangat, P. Dorian), Southlake Regional Health Centre (Y. Khaykin), Sunnybrook Health Sciences Centre (E. Crystal), Toronto General Hospital (D. Cameron), Trillium Health Centre (C. LeFeuvre), University of Ottawa Heart Institute (D. Birnie)

Non-Implanting Defibrillator Follow-up Sites: Credit Valley Hospital (J. Cyriac), Grey Bruce Health Services (M. Newton), Hotel Dieu Grace Hospital (A. Glanz), Kawartha Cardiology Clinic (W. Hughes), St. Mary's General Hospital (C. Rinne), Scarborough General Hospital (E.G. Davies), Sudbury Regional Hospital (R. Labonte), Thunder Bay Regional Health Sciences Centre (C. Lai)