Supplemental Figure S1. Schematic presentation of HF pharmacotherapy algorithm

ACEi: angiotensin converting enzyme inhibitors
BB: Betablockers
MRA: mineralocorticoid receptor antagonists
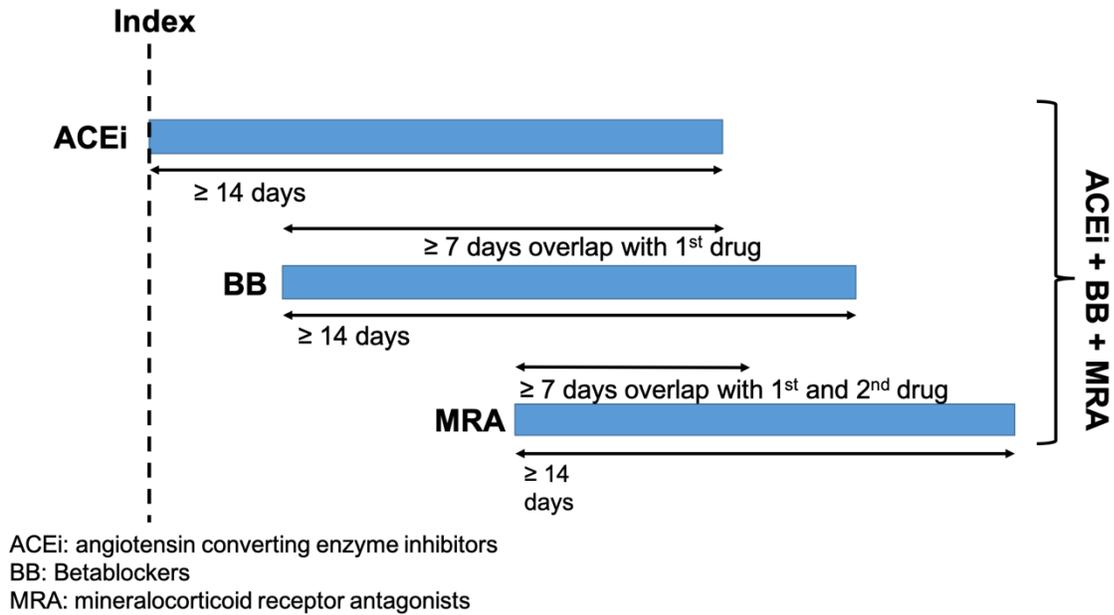
Supplemental Figure S2. Average proportion of maximum GDMT Intensity score calculated daily over 6 months post index discharge for patients with HFrEF alive at 6 months.
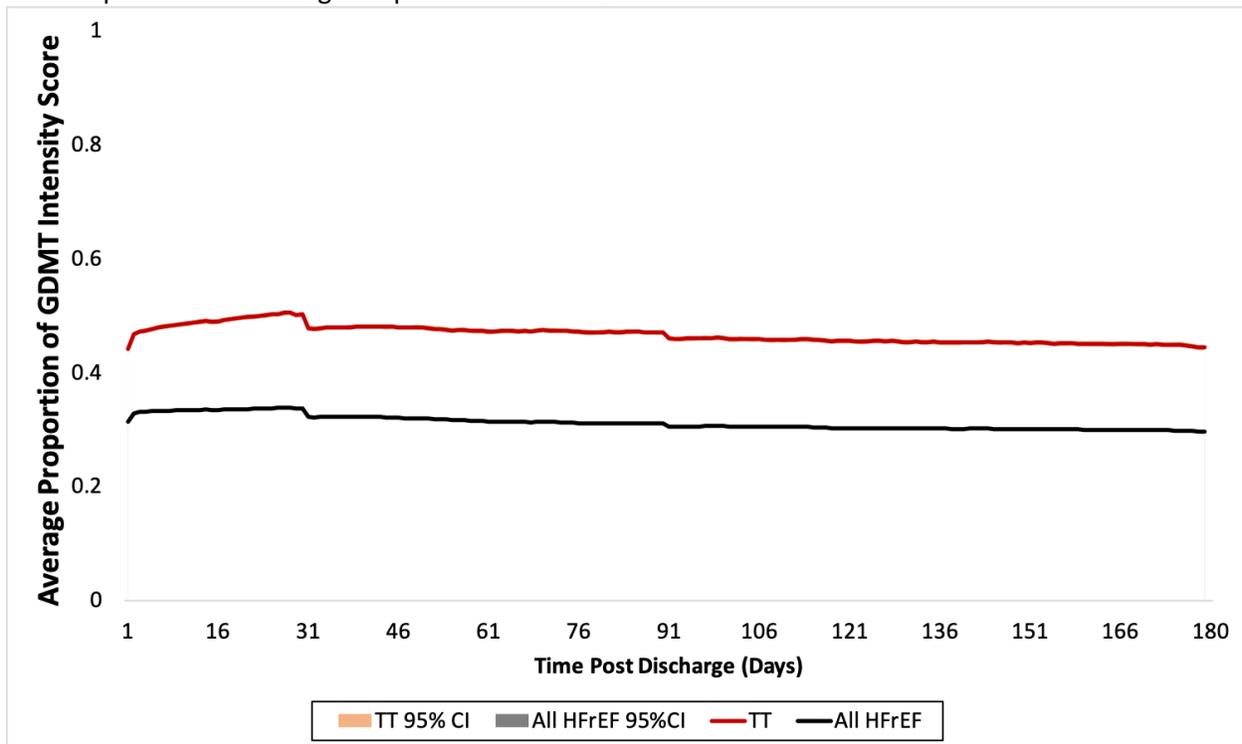
Only patients with HFrEF that were alive 6 months post discharge were included. Each data points are the average intensity scores with 95%CI for all patients with HFrEF (black, n=55,882) or patients with HFrEF on triple therapy (red, n=11,983) divided by the maximum achievable Intensity score (14). GDMT: guideline-directed medical therapy; HFrEF: heart failure with reduced ejection fraction.

Supplemental Table S1. Uijl Model coefficients and codes.

Variable	Coefficient ln(OR)	ICD / CCI / ATC codes	When measured
Intercept	0.3646		
Age (> 75yrs)	0.2776		At index
Sex (female)	0.6881		at index
Ischemic heart disease	-0.2485	I21 – I25	1 year prior to index + 30 days post index
Anemia	0.2070	D50-D53, D55-D64	1 year prior to index + 30 days post index
Atrial fibrillation	0.4187	I48.x	1 year prior to index + 30 days post index
COPD	0.2070	J41.x, J42.x, J44.x, J43.x	1 year prior to index + 30 days post index
Diabetes	0.0583	ICD10: E10, E11, E12, E13, E14	1 year prior to index + 30 days post index
Hypertension	0.5306	I10, I11 I15, I12, I13	1 year prior to index + 30 days post index
Valvular disease	0.1222	I05.0, I05.1, I05.2, I05.8, I05.9, I06.0, I06.1, I06.2, I06.8, I06.9, I08.0, I08.8, I08.9, I07.1, I07.2, I07.8, I09.89, I09.1, I09.9, I09.81, I09.89, Z95.3, Z95.2, 1.HU, 1.HS, 1.HT, 1.HV, 1.HW	1 year prior to index + 30 days post index
Malignant cancer	0.0862	C00.x–C26.x, C30.x–C34.x, C37.x– C41.x, C43.x, C45.x– C58.x, C60.x– C76.x, C77.x– C80.x, C81.x–C85.x, C88.x, C90.x–C97.x	3 year prior to and including index
Device therapy (implantable cardioverter defibrillator or cardiac resynchronization therapy)	-1.0788	CRT (CCI codes: 1.HZ.53.GR-NM, 1.HZ.53.LA-NM, 1.HZ.53.QA-NM, 1.HZ.53.GR-NK, 1.HZ.53.LA-NK, 1.HZ.53.QA-NK, 1.HZ.53.GR-NL, 1.HZ.53.LA-NL, 1.HZ.53.QA-NL, 1.HZ.53.GR-FR, 1.HZ.53.LA-FR, 1.HZ.53.SY-FR), ICD (CCI codes: 1.HZ.53.GR-FS, 1.HZ.53.HA-FS, 1.HZ.53.LA-FS, 1.HZ.53.SY-FS)	1 year prior to index + 30 days post index

RAAS inhibitor use	-0.7765	C09A C09B, C09C C09D	6 months prior to index + 30 days post index
Beta blocker use	-0.5978	C07	6 months prior to index + 30 days post index
MRA	-0.3711	C03DA01, C03DA04	6 months prior to index + 30 days post index
Digoxin	-0.1985	C01AA05	6 months prior to index + 30 days post index
Diuretics	-0.3011	C03CA01, C03CA02, C03CA04, C03CC01, C03AA01, C03AA03, C03AA08, C03BA04, C03BA08, C03BA11, C03DB01 C03DB02 C03EA01	6 months prior to index + 30 days post index

Supplemental Table S2. Evidence based heart failure medication and doses recommended by the Canadian Cardiovascular Society

Medication Class	Drug Name	Target Dose	ATC code
ACEi	Enalapril	10 mg BID	C09AA02, C09BA02, C09BB02, C09BB06
	Lisinopril	20 mg	C09AA03, C09BA03, C09BB03
	Perindopril	4 mg	C09AA04, C09BA04, C09BB04, C09BX02
	Ramipril	5 mg BID	C09AA05, C09BA05, C09BB05
	Trandolapril	4 mg	C09AA10, C09BB10
ARB	Candesartan	32 mg	C09CA06, C09DA06, C09DB07
	Valsartan	160 mg BID	C09CA03, C09DA03, C09DB01, C09DB08, C09DX01, C09DX02, C09DX04, C09DX05
MRA	Spironolactone	50 mg	C03DA01
	Eplerenone	50 mg	C03DA04
BB	Carvedilol	25 mg BID	C07AG02, C07FX06
	Bisoprolol	10 mg	C07AB07, C07FX04, C07FB07, C07BB07
	Metoprolol	200 mg	C07AB02, C07FX03, C07FB13, C07FB02, C07FX05, C07BB02, C07CB02
Ivabradine	Ivabradine	7.5 mg BID	C01EB17, C07FX06, C07FX05
ARNI	Sacubitril/Valsartan	200 mg BID	C09DX04
SGLT2 inhibitors	Empagliflozin		A10BK03
	Dapagliflozin	-	A10BK01
	Canagliflozin		A10BK02

*BID: twice a day

Supplemental Table S3. Patients achieving each category of therapy (no-, mono-, dual-, triple-) with prescription overlap of 7 days and 14 days.

Therapy	7 days overlap	14 days overlap
No therapy	54,163 (27.2%)	54,163 (27.2%)
Monotherapy	68,216 (34.2%)	68,646 (34.4%)
Dual therapy	59,894 (30.0%)	59,736 (30.0%)
Triple therapy	16,928 (8.5%)	16,662 (8.4%)

Supplemental Table S4. Conversion of guideline directed medication dosage to an intensity score

Conversion and standardization of medication class	Score assigned to converted dose levels
Beta blockers converted to carvedilol equivalent (CarvEquiv) CarvEquiv = Carvedilol TDD CarvEquiv = Metoprolol TDD / 2 CarvEquiv = Bisoprolol TDD * 5	0 mg = 0 < 6.25 mg = 0.5 6.25 – 12.49 mg = 1 12.5 – 24.99 mg = 2 25.0 – 37.49 mg = 3 37.5 – 49.9 mg = 4 ≥ 50 mg = 5
ACEi converted to lisinopril equivalent (LisEquiv) LisEquiv = Lisinopril TDD LisEquiv = Perindopril TDD * 5 LisEquiv = Trandolapril * 5 LisEquiv = Ramipril *2	0 mg = 0 < 5.0 mg = 0.5 5.0 – 9.9 mg = 1 10 – 14.9 mg = 2 15 – 19.9 mg = 3 20 – 39.9 mg = 4 ≥ 40 mg = 5
ARB converted to losartan equivalent (LosEquiv) LosEquiv = Candesartan TDD * 6 LosEquiv = Valsartan TDD * 0.6	0 mg = 0 < 25 mg = 1 25 – 49.9 mg = 2 50 – 74.9 mg = 3 75 – 99.9 mg = 4 ≥ 100 mg = 5
MRA converted to spironolactone equivalents (SpiroEquiv) SpiroEquiv = spironolactone TDD SpiroEquiv = Eplerenone TDD	0 mg = 0 < 25 mg = 1 25 – 37.49 mg = 2 37.5 – 49.9 mg = 3 ≥ 50 mg = 4
ARNI Sacubitril/Valsartan	0mg = 0 ≤ 50mg = 3 >50mg = 5

*TDD = total daily dose

Supplemental Table S5. Specific drug classification for all patients with HF on mono, double or triple therapy

	All HF patients		Alive patients	
Monotherapy	All HF patients n = 68,846	HFrEF Patients n = 17,184	All HF patients n = 56,048	HFrEF Patients n = 13,935
Monotherapy with ACEi	18,552 (26.9)	4,765 (27.7)	15,495 (27.6)	3,951 (28.4)
Monotherapy with ARB	4,967 (7.2)	1,066 (6.2)	4,186 (7.5)	889 (6.4)
Monotherapy with BB	40,438 (58.7)	10,204 (59.4)	32,531 (58.0)	8,224 (59.0)
Monotherapy with MRA	4,528 (6.6)	1,058 (6.2)	3,515 (6.3)	793 (5.7)
Switch between ACEi, ARB and or ARNi	361 (0.5)	91 (0.5)	321 (0.6)	78 (0.6)
Double Therapy	n = 60,641	n = 30,912	n = 52,407	n = 26,760
Double therapy with ACEi and BB	38,647 (63.7)	20,455 (66.2)	33,571 (64.1)	17,792 (66.5)
Double therapy with ARB and BB	8,020 (13.2)	3,570 (11.6)	7,025 (13.4)	3137 (11.7)
Double therapy with ACEi and MRA	3,158 (5.2)	1,623 (5.3)	2,656 (5.1)	1355 (5.1)
Double therapy with ARB and MRA	763 (1.3)	352 (1.1)	662 (1.3)	305 (1.1)
Double therapy with BB and MRA	8,252 (13.6)	3,937 (12.7)	6,843 (13.1)	3275 (12.2)
Switch between (ACEi, ARB and or ARNi) + (BB or MRA)	1,801 (3.0)	975 (3.2)	1,650 (3.1)	896 (3.4)
Triple Therapy	n = 17,536	n = 13,508	n = 15,586	n = 11,983
Triple therapy with ACEi, BB and MRA	13,688 (78.1)	10,644 (78.8)	12,102 (77.6)	9,390 (78.4)
Triple therapy with ARB, BB, and MRA	2,473 (14.1)	1,779 (13.2)	2,224 (14.3)	1,597 (13.3)
(Switch between ACEi, ARB and or ARNi) + BB + MRA	1,375 (7.8)	1,085 (8.0)	1,260 (8.1)	996 (8.3)
Triple therapy + SGLT2i (aka quadruple therapy)	244 (1.4)	207 (1.5)	222 (1.4)	188 (1.6)