# How To Involve QA In Hospital Heart Failure Care

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# **Conflict of Interest Disclosures**

- Grants/research support: Novartis, AstraZeneca, Bl
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- Other:

# **The Heart Failure Cycle**





# **Changes in the Population Pyramid**



Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare.

# With Each Subsequent HF Hospitalisation, the Risk of Death Almost Doubles for Patients with Symptomatic Chronic HF

Median survival (50% mortality) for patients with HF after each HF hospitalisation



First hospitalisation refers to patients who were hospitalised for HF for the first time from 1 Jan 2000–31 Dec 2004 CI, confidence interval; HF, heart failure

Setoguchi S et al. Am Heart J. 2007;154:260–266

# MORTALITY RATE IS HIGHER FOR HEART FAILURE THAN SOME CANCERS

The mortality rate for patients with chronic HF is as high as 50% at 5 years post-diagnosis<sup>1,2,3</sup>



1. Mamas et al. Eur J Heart Fail. 2017;19(9):1095-1104; 2. Benjamin et al. Circulation 2017;135(10):e146-e603; 3. Roger et al. JAMA 2004;292:344-50

# Decline In Systolic Function Leads To Activation Of Three Major Neurohormonal Systems



RS McKelvie 2016

# DAPA-HF: Reduction in CV death, HF hospitalization, urgent HF visit

### Primary composite outcome CV Death/HF Hospitalization/Urgent HF Visit



McMurray JJV et al. NEJM 2019.

# Incremental Benefit of Drug Therapies for HFrEF

- Summary results of treatment effect vs. placebo for selected drug group or combination
- of groups and for each endpoint

	All-cause Mortality	CV Mortality	All-cause Hospitalization	Hospitalization for HF
ARNI+BB+MRA	0.38 (0.20-0.65)	0.36 (0.16-0.71)	0.58 (0.36–0.92)	0.27 (0.07-1.07)
ACEI+BB+MRA+IVA	0.41 (0.21–0.70)	0.41 (0.19–0.82)	0.58 (0.36-0.92)	0.25 (0.07-0.99)
ACEI+BB+MRA	0.44 (0.27-0.67)	0.45 (0.25-0.75)	0.65 (0.45–0.93)	0.34 (0.13–0.91)
ACEI+BB	0.58 (0.42-0.73)	0.56 (0.37-0.75)	0.75 (0.54-0.92)	0.34 (0.17-0.56)
ACEI+MRA	0.58 (0.36–0.90)	0.56 (0.31-0.95)	0.69 (0.45–0.96)	0.36 (0.12-0.96)
BB	0.58 (0.34–0.95)	0.62 (0.27-1.32)	0.86 (0.59–1.18)	0.45 (0.13–1.39)
ACEI	0.84 (0.67–1.01)	0.81 (0.60–1.04)	0.89 (0.71–1.05)	0.52 (0.32-0.76)

# Comprehensive Therapy (ARNi + BB + MRA + SGLT2i) vs conventional therapy (ACEi/ARB + BB)

Primary endpoint: Composite of CV death or first hHF



Adapted from Vaduganathan M, et al. Lancet 2020;396:121-128

# Updated Canadian Cardiovascular Society Guidelines for Treatment of HFrEF

• Towards 4 Pillars of Care



Presented at Canadian Cardiovascular Congress, October 2020

### Annual Rate of HF admissions per 100,000 population in 2009 and 2018, by province and Canada



# Rate of hospital readmission at 30 days, by province and Canada, in 2009 and 2018



### Distribution of HF Admissions by Most Responsible Service By Province and Canada in 2009 and 2018



Distribution of HF admissions by Most Responsible Service (Cardiology vs Non-Cardiology) and number of cardiologists per 100,000 population in 2009 and 2018



# Are we actually optimizing our HF patients? Contemporary outpatient HFrEF patients, CHAMP-HF



ARNI, angiotensin-receptor-neprilysin inhibitor; EF, ejection fraction; HFrEF, heart failure with reduced ejection fraction Green SJ et al. *J Am Coll Cardiol* 2018; 72(4):351-366.

# **QUALIFY Registry: Adherence to GDMT –** Canada

Patients treated with ACEIs or ARBs = 86.8% Patients treated with B-blockers = 95.3%









Adapted from CHFS 2019

### Impact of delay to therapy per year in Canada Imputed from the PARADIGM-HF Trial results

Outcome	Actual Benefit	Potential Benefit
CV death and 1 <sup>st</sup> HF hospitalization	569	4, 187
CV death	387	2, 849
1 <sup>st</sup> HF hospitalization	340	2, 498
All-cause mortality	340	2, 498
30-day HF re-admission	448	3, 299

Huitema, McKelvie et al., CJC Open 2020

# **Follow-up Cardiovascular Care**

#### • Importance of Follow-up Care:

 A study of 3,136 patients in Alberta with HF found those who received regular cardiovascular follow-up visits with a FP had better outcomes and combined care was best



# The Significant Influence of Rapid Post Discharge Follow-up (7-14 days)

#### Death

Death, ED Visits, HF Hospitalizations





# **Early Outpatient Follow Up Improves HF Outcomes**

. et	P	Total			
Outcome	No Visits (n=13 463)	All Visits With Unfamiliar Physician(s) (n=3938)	≥1 Visit With Familiar Physician(s) (n=21 848)	(n=39 249)	P Value
≥1 follow-up visit, any cause	5727 (42.5)	3938 (100.0)	21 848 (100.0)	31 513 (80.3)	<0.0001
Visit to specialist	764 (5.7)	958 (24.3)	3881 (17.8)	5603 (14.3)	<0.0001
ED visit, any cause 4492 (33.4)		1332 (33.8)	6741 (30.9)	12 565 (32.0)	<0.0001
Urgent hospitalization			52) 57		
All-cause	2573 (19.1)	731 (18.6)	3462 (15.8)	6766 (17.2)	<0.0001
Cardiovascular	1106 (8.2)	329 (8.4)	1509 (6.9)	2944 (7.5)	<0.0001
Noncardiovascular	1586 (11.8)	456 (11.6)	2128 (9.7)	4170 (10.6)	<0.0001
Death	670 (5.0)	122 (3.1)	443 (2.0)	1235 (3.1)	<0.0001
Death or urgent hospitalization	2962 (22.0)	789 (20.0)	3690 (16.9)	7441 (19.0)	<0.0001
Admission to long term care facility	1459 (10.8)	259 (6.6)	736 (3.4)	2454 (6.3)	<0.0001

# Meta-Analysis of Disease Management Programmes All-Cause Mortality Rate

Study	Treatment n/N	Control n/N	Peto OR 95% CI	Weight %	Peto OR 95% CI
RiCH, 1995	13/142	17/140		3.87	0.73 [0.34, 1.56]
CLINE, 1998	24/80	31/110		5.51	1.09 [0.58, 2.06]
EKMAN, 1998	21/79	17/79		4.18	1.32 [0.64, 2.73]
STEWART, 1998	6/49	2/48		→ 1.07	2.88 [0.68, 12.13]
JAARSMA: 1999	27/89	18/97		4.93	1.89 [0.97, 3.70]
PHARM, 1999	3/90	5/91		1.11	0.60 [0.15, 2.47]
RAINVILLE,1999	1/17	4/17	← ■	0.63	0.26 [0.04, 1.66]
STEWART, 1999	18/100	28/100		5.13	0.57 [0.30, 1.10]
VARMA, 1999	7/42	7/41	<b>+</b>	1.70	0.97 [0.31, 3.05]
BLUE, 2001	25/84	25/81		5.05	0.95 [0.49, 1.84]
JERANT, 2001	2/25	0/12		→ 0.25	4.58 [0.23, 92.28]
PUGH, 2001	6/27	5/31		- 1.30	1.48 [0.40, 5.44]
CAPOMOLLA, 2002	4/122	23/112	<b>←</b>	3.45	0.19 [0.08, 0.41]
DOUGHTY, 2002	19/100	24/97	<b>_</b>	4.86	0.72 [0.36, 1.40]
HARRISON, 2002	6/92	5/100		1.50	1.32 [0.39, 4.46]
KASPER, 2002	7/102	13/98		2.60	0.49 [0.20, 1.24]
KRUMHOLZ, 2002	9/44	13/44	· · · · · · · · · · · · · · · · · · ·	2.40	0.62 [0.24, 1.62]
MCDONALD, 2002	3/51	3/47	-	0.82	0.92 [0.18, 4.75]
RIEGEL, 2002	16/130	32/228		5.55	0.86 [0.46, 1.62]
BOUVY,2003	10/74	16/78		3.12	0.61 [0.26, 1.42]
LARAMEE, 2003	13/141	15/146		3.65	0.89 [0.41, 1.93]
STROMBERG, 2003	7/52	20/54	3 <b></b> 6	2.92	0.29 [0.12, 0.70]
ATIENZA,2004	30/164	51/174		8.89	0.55 [0.33, 0.90]
DeBUSK, 2004	21/228	29/234		6.43	0.72 [0.40, 1.29]
MEJHERT, 2004	26/103	22/105		5.34	1.27 [0.67, 2.42]
NAYLOR,2004	11/118	13/121		3.12	0.85 [0.37, 1.98]
TROCHU, 2004	38/102	42/100		6.99	0.82 [0.47, 1.44]
TSUYUKI, 2004	16/140	12/136		3.63	1.33 [0.61, 2.90]
Total (95% CI)	2587	2721	•	100.00	0.80 [0.69, 0.93]
Total events: 389 (Treatmer	nt), 492 (Control)				
est for heterogeneity: Chi <sup>2</sup> est for overall effect: Z = 2	= 43.86, df =27 (P = 0.0 .97 (P = 0.003)	)2),l <sup>2</sup> = 38.4%			
			01 02 05 1 2	5 10	
			Eavours treatment Eavours or	ontrol	

# Meta-Analysis of Disease Management Programmes All-Cause (Re)hospitalization Rate

Study	Treatment n/N	Control n/N	Peto OR 95% CI	Weight %	Peto OR 95% CI
RiCH, 1995	13/142	17/140		4. 62	0.73 [0.34, 1.56]
WEINBERGER, 1996	29/222	19/221		7.37	1.59 [0.87, 2.89]
CLINE, 1998	24/80	31/110		6.58	1.09 [0.58, 2.06]
EKMAN, 1998	21/79	17/79		4.99	1.32 [0.64, 2.73]
STEWART, 1998	6/49	2/48		1.27	2.88 [0.68, 12.13]
JAARSMA: 1999	27/89	18/97		5.88	1.89 [0.97, 3.70]
PHARM, 1999	3/90	5/91		1.32	0.60 [0.15, 2.47]
RAINVILLE, 1999	1/17	4/17 ←		0.76	0.26 [0.04, 1.66]
STEWART, 1999	18/100	28/100		6.12	0.57 [0.30, 1.10]
VARMA, 1999	7/42	7/41		2.02	0.97 [0.31, 3.05]
BLUE, 2001	25/84	25/81		6.02	0.95 [0.49, 1.84]
JERANT, 2001	2/25	0/12	n	0.29	4.58 [0.23, 92.28]
PUGH, 2001	6/27	5/31		- 1.55	1.48 [0.40, 5.44]
CAPOMOLLA, 2002	4/122	23/112	• · · · · · · · · · · · · · · · · · · ·	4.11	0.19 [0.08, 0.41]
DOUGHTY, 2002	19/100	24/97		5.80	0.72 [0.36, 1.40]
HARRISON, 2002	6/92	5/100		1.79	1.32 [0.39, 4.46]
KASPER, 2002	7/102	13/98		3.11	0.49 [0.20, 1.24]
KRUMHOLZ, 2002	9/44	13/44		2.87	0.62 [0.24, 1.62]
MCDONALD, 2002	3/51	3/47		0.98	0.92 [0.18, 4.75]
RIEGEL, 2002	16/130	32/228		6.63	0.86 [0.46, 1.62]
BOUVY, 2003	10/74	16/78		3.73	0.61 [0.26, 1.42]
LARAMEE, 2003	13/141	15/146		4.36	0.89 [0.41, 1.93]
STROMBERG, 2003	7/52	20/54 -		3.49	0.29 [0.12, 0.70]
ATIENZA, 2004	30/164	51/174		10.61	0.55 [0.33, 0.90]
NAYLOR,2004	11/118	13/121		3.73	0.85 [0.37, 1.98]
Total (95% CI)	2236	2367	•	100.00	0.80 [0.68, 0.94]
otal events: 317 (Treatn	nent), 406 (Control)				
lest for heterogeneity: C	hi <sup>2</sup> = 45.13, df =24 (	P = 0.006), I <sup>2</sup> = 46.8%			
lest for overall effect: 7 :	= 2.66 (P = 0.008)				

# Benefits of heart failure clinics on heart failure hospitalization and all-cause mortality

	HF cli	nic	Usual	care		Odds Ratio	Odds Ratio
Study	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Azad 2008	0	45	2	46	0.8%	0.20 [0.01, 4.19]	· · · · · · · · · · · · · · · · · · ·
Capomolla 2002	12	112	58	122	6.5%	0.13 [0.07, 0.27]	
Cline 1998	46	80	74	110	7.2%	0.66 [0.36, 1.19]	
de la Porte 2007	23	118	47	122	7.3%	0.39 [0.22, 0.69]	
Doughty 2002	40	100	47	97	7.4%	0.71 [0.40, 1.25]	
Ducharme 2005	57	115	85	115	7.5%	0.35 [0.20, 0.60]	
Ekman 1998	57	79	55	79	6.6%	1.13 [0.57, 2.25]	
Jaarsma 2008	280	340	282	339	8.6%	0.94 [0.63, 1.40]	-
Kasper 2002	37	102	53	98	7.4%	0.48 [0.27, 0.85]	
Ledwidge 2003	3	51	3	47	2.4%	0.92 [0.18, 4.78]	
Leetma 2009	13	81	13	82	5.6%	1.01 [0.44, 2.35]	
Liu 2012	9	53	17	53	5.1%	0.43 [0.17, 1.09]	
Luttik 2014	15	92	20	97	6.2%	0.75 [0.36, 1.57]	
Schou 2013	129	460	131	460	9.3%	0.98 [0.73, 1.30]	+
Smith 2014	24	92	32	106	7.0%	0.82 [0.44, 1.52]	
Stromberg 2002	7	52	20	54	4.8%	0.26 [0.10, 0.70]	
Total (95% CI)		1972		2027	100.0%	0.58 [0.43, 0.78]	•
Total events	752		939				
Heterogeneity: Tau <sup>2</sup>	= 0.22; Cł	$hi^2 = 49$	9.41, df =	= 15 (P	< 0.000	1); $I^2 = 70\%$	0.01.01.1.10.100
Test for overall effect	t: $Z = 3.63$	B (P = 0)	0.0003)				Favours HFC Favours Usual Care

# Heart failure clinics reduce heart failure hospitalization

	HF cli	nic	Usual	care		Odds Ratio	Odds Ratio
Study	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Capomolla 2002	9	112	37	122	6.6%	0.20 [0.09, 0.44]	
Cline 1998	22	80	43	110	8.5%	0.59 [0.32, 1.10]	
de la Porte 2007	11	118	24	122	6.8%	0.42 [0.20, 0.90]	
Doughty 2002	21	100	23	97	7.9%	0.86 [0.44, 1.67]	
Ducharme 2005	45	115	66	115	9.9%	0.48 [0.28, 0.81]	
Ekman 1998	36	79	38	79	8.5%	0.90 [0.48, 1.69]	
Jaarsma 2008	84	340	84	339	13.0%	1.00 [0.70, 1.41]	+
Kasper 2002	30	102	40	98	9.0%	0.60 [0.34, 1.09]	
Liu 2012	7	53	10	53	4.4%	0.65 [0.23, 1.87]	
Luttik 2014	7	92	8	97	4.4%	0.92 [0.32, 2.64]	—
Schou 2013	69	460	67	460	12.7%	1.04 [0.72, 1.49]	+
Smith 2014	22	92	30	106	8.3%	0.80 [0.42, 1.51]	
Total (95% CI)		1743		1798	100.0%	0.68 [0.53, 0.88]	•
Total events	363		470				
Heterogeneity: Tau <sup>2</sup> =	= 0.10; Cł	$ni^2 = 23$	3.32, df =	= 11 (P	= 0.02);	$l^2 = 53\%$	
Test for overall effect: $Z = 2.97$ (P = 0.003)							Eavours HEC Eavours Usual Care

# **Comparative Effectiveness of Transitional Care Services in Reducing All-Cause Mortality After Hospitalization for Heart Failure**



# **Comparative Effectiveness of Transitional Care Services in Reducing All-Cause Readmissions After Hospitalization for Heart Failure**



# CCS Heart Failure Guideline 2017 Recommendations about HFC

We recommend that a HF specialist or clinic should have the capacity to accept referrals, transition of care, or arrange for transfer to a tertiary care centre within the recommended CCS benchmarks (Strong Recommendation; Very Low-Quality Evidence).

We recommend that specialized outpatient HF clinics or disease management programs provide access to an interprofessional team ideally including a physician, a nurse, and a pharmacist with experience and expertise in HF (Strong Recommendation; High-Quality Evidence).

We recommend that all patients with recurrent HF hospitalizations, irrespective of age, multimorbidity, or frailty, should be referred to a HF disease management program (Strong Recommendation; High-Quality Evidence).



			CCS QI Rating Scale					
QI#	Quality Indicator Name	Importance	Scientific	Feasibilit	Overall			
			Acceptability	У	Rating			
Care d	omain: Acute HF/Hospital Phase							
HF01	Blood chemistry: Electrolytes, BUN, creatinine	6.0 ± 1.7	6.0.±1.5	5.2±1.9	5.3±2.0			
HF02	Chest X-Ray	5.8 ± 1.7	5.6±1.4	5.1±1.6	5.1±1.7			
HF03	Electrocardiogram	6.3 ± 1.6	6.0±1.4	5.3±1.7	5.6±1.8			
HF04	Accuracy of Heart Failure Diagnosis in Emergency Department	5.6 ± 1.5	5.0±1.3	4.2±1.4	4.9±1.4			
HF05	Specialist Involvement in Patients with Acutely Decompensated Heart	5.0 ± 1.8	5.0±1.5	4.2±1.5	5.1±1.4			
	Failure							
HF06	Early Outpatient Assessment for HF Patients Discharged from	5.7 ± 1.6	5.2±1.4	5.0±1.4	5.2±1.4			
	Hospital							
HF07	Time to Heart Failure Therapy in Emergency Department	5.2 ± 1.6	4.8±1.5	4.6±1.4	4.5±1.6			
HF08	In-Hospital Use of ACE or ARB	6.2 ± 1.7	6.3±1.5	5.5±1.7	5.8±1.8			
HF09	In-Hospital Use of Beta Blockers	6.0 ± 1.8	6.0±1.7	5.2±1.7	6.0±1.6			
HF10	Assessment of daily weights	5.8 ± 1.9	5.7±1.4	5.1±1.5	5.5±1.5			
HF11	Dietary counseling regarding fluid intake	5.7 ± 1.5	5.5±1.0	5.0±1.2	5.1±1.3			
HF12	Use of a HF-specific order set	5.4 ± 1.5	5.1±1.2	5.2±1.7	5.0±1.5			
HF13	Assessment of ischemic or coronary artery disease etiology	5.9 ± 1.5	5.5±1.0	4.8±1.3	5.3±1.4			
HF14	Assessment of Left Ventricular Function	6.3 ± 1.6	6.1±1.4	5.3±1.4	5.8±1.7			

		CCS QI Rating Scale				
01#	Quality Indicator Name	Importance	Scientific	Feasibility	Overall	
QI#			Accepta		Rating	
			bility			
Care d	omain: Discharge/Transition					
HF15	Assessment of Cognition	4.9 ± 1.6	4.8±1.2	3.7±1.1	4.3±1.4	
HF16	Documentation of 30 day re-admission rate	5.9 ± 1.8	5.8±1.4	5.5±1.6	5.7±1.6	
HF17	Documentation patient has been set up to attend community health care team visit	5.5 ± 1.6	4.6±1.3	4.0±1.1	4.7±1.2	
	within two weeks of discharge.					
HF18	Documentation patients are on evidenced based HF therapy at the time of	5.8 ± 1.8	5.7±1.7	4.3±1.8	4.7±1.9	
	discharge.					
HF19	Documented follow up appointments with family doctor, specialist, and/or HF	5.6 ± 1.6	5.4±1.4	4.3±1.6	4.8±1.5	
	Clinic					
HF20	Provision of a written discharge summary to the primary care physician, specialist,	5.8 ± 1.6	5.0±1.4	4.6±1.6	4.9±1.5	
	Heart Failure Clinic within 48 hours of discharge.					
HF21	Provision of HF education initiation before discharge, and continuing after	5.6 ± 1.6	4.9±1.3	4.3±1.5	4.9±1.4	
	discharge					
HF22	Evidenced based therapy at the time of discharge	5.6 ± 1.6	5.6±1.5	4.4±2.0	5.1±1.7	
HF23	Attending community health care team visit within two weeks of discharge	4.9 ± 1.9	4.3±1.4	3.9±1.2	4.5±1.5	
HF24	30 day re-admission rate	5.9 ± 1.9	5.8±1.7	5.5±1.7	5.5±1.8	
HF25	β-blocker therapy at the time of discharge	6.4 ± 1.2	6.3±1.1	5.2±1.7	5.8±1.5	
HF26	Anticoagulation for atrial fibrillation	6.1 ± 1.7	5.7±1.7	4.9±1.8	5.4±2.0	
HF27	ACE inhibitor therapy at time of discharge	6.5 ± 1.1	6.5±0.8	5.3±1.8	6.0±1.6	
HF28	Referral to dietician	5.2 ± 1.2	4.7±1.1	3.9±1.0	4.5±0.9	
HF29	Referral for implantable cardiac defibrillator	5.3 ± 1.3	5.5±1.3	4.1±1.1	4.8±1.5	
HF30	Referral for cardiac rehabilitation	5.4 ± 1.6	5.2±1.5	4.8±1.0	5.0±1.2	
HF31	Assessment of LVEF within 30 days following an MI and 90 days following	5.7 ± 1.5	5.7±1.4	4.1±1.5	5.0±1.5	
	revascularization post discharge in patients with LVEF <35%					

		CCS QI Rating Scale				
		Importance	Scientific	Feasibility	Overall	
QI#	Quality Indicator Name		Acceptabilit		Rating	
			У			
Care dom	nain: Palliative Care/End of Life Planning					
HF32	Advance Care Planning (ACP) Discussion	5.5 ± 1.9	4.9±1.4	3.9±1.5	5.0±1.7	
HF33	Access to Palliative Care	5.3 ± 1.7	4.8±1.3	4.1±1.4	4.7±1.3	
HF34	Assessing Cognitive Function	5.0 ± 1.8	4.9±1.4	4.3±1.2	4.5±1.4	
HF35	Palliative care education in Academic Cardiology Programs	5.6 ± 1.7	5.1±1.3	5.2±1.6	5.2±1.6	
HF36	Specialist review of patients with persistent NYHA IV Heart Failure	5.8±1.6	5.3±1.5	4.3±1.2	5.0±1.5	
Care dom	nain: Outpatient Phase – Infrastructure					
HF37	Clinic Response Time	5.8±1.8	5.0±1.5	5.0±1.6	5.4±1.7	
HF38	Heart Failure Clinic Coordinated Program and Staffing	5.3±1.7	4.8±1.6	4.5±1.6	4.5±1.8	
Care dom	nain: Outpatient Phase – Therapies – Pharmacologic					
HF39	ACE Inhibitor Use	6.0±1.9	5.9±1.9	5.1±1.7	5.3±2.2	
HF40	Aldosterone Antagonist Use	5.6±1.9	5.7±1.9	5.0±1.8	5.3±2.0	
HF41	Beta Blocker Use	6.0±1.9	5.9±1.9	4.9±1.7	5.3±2.0	
HF42	Digoxin Indicator	4.7±1.8	4.7±1.9	4.5±1.8	4.4±1.8	
HF43	Hydralazine/Nitrate Use Indicator	4.9±1.7	4.9±1.6	4.3±1.8	4.6±1.7	

			CCS QI Rating Scale					
01#	Ossalita India etan Nama	Importance	Scientific	Feasibility	Overall			
QI#			Acceptabilit		Rating			
			У					
Care dor	nain: Outpatient Phase – Process							
HF44	Documentation of Care - History and Exam	5.5±1.8	5.3±1.5	4.6±1.9	4.8±1.8			
HF45	Documentation of Care – Etiology	5.3±1.5	5.3±1.4	4.6±1.6	5.1±1.6			
Care dor	nain: Outpatient Phase – Investigations & Monitoring of Therapy							
HF46	Investigations & Monitoring of LV Systolic Function	5.9±1.8	5.8±1.7	4.8±1.9	5.4±1.8			
HF47	Investigation & Monitoring of Efficacy of therapy	5.6±1.6	5.5±1.3	4.5±1.8	5.0±1.6			
Care dor	main: Outpatient Phase – Education, Long term and End-of-Life							
HF48	Patient Education	5.2±1.9	5.0±1.7	4.5±1.5	4.7±1.8			
Care dor	nain: Outpatient Phase – Pharmacologic							
HF49	Incorporation of a Pharmacist into the HF Team	4.8±1.9	4.7±1.6	4.6±1.6	4.7±1.5			
Overall m	nean ratings	5.6±1.7	5.4±1.5	4.7±1.6	5.1±1.6			

Notes for Table 1: 'Not sure' option was selected for 'Overall Rating':

by 3 respondents for HF19, HF28, HF35, HF36, HF38, HF43 and HF 47;

by 4 respondents for HF34 and HF37;

by 5 respondents for HF23 and HF 24;

by 7 respondents for HF22;

In remaining QIs the option was selected by  $\leq 2$  respondents.

- From the 49 QIs the committee, in conjunction with stakeholders and the Canadian cardiovascular community developed a short list of 6 QIs
- This short list was thought to be manageable for the initial operationalization

## CCS "Short List" Quality Indicators For HF

Туре	Name	Description	Importance	Scientific acceptability	Feasibility	Overall rating
Safety	Daily assessment of blood chemistry levels: electrolytes, blood urea nitrogen, creatinine	The percentage of inpatients with a diagnosis of acute HF who receive electrolytes and renal function assessment as part of their daily assessment	6.0 ± 1.7	6.0 ± 1.5	5.2 ± 1.9	5.3 ± 2.0
Safety	Chest radiograph	The percentage of patients seen in the ED or admitted to the hospital (or both) with acute HF who undergo chest radiography as part of their initial evaluation	5.8 ± 1.7	5.6 ± 1.4	5.1 ± 1.6	5.1 ± 1.7
Process	Patient education	The percentage of patients with HF and family members who receive at least 1 session of education regarding HF management (education may have been conducted in the hospital, in the clinic, or through Telehealth)	5.2 ± 1.9	5.0 ± 1.7	4.5 ± 1.5	4.7 ± 1.8
Process	In-hospital use of ACEIs or ARBs	The percentage of inpatients with a documented history of HF or newly diagnosed HF resulting from poor LV systolic function who are prescribed an ACEI or ARB during the hospital stay and at hospital discharge, unless a contraindication or known drug intolerance exists	6.2 ± 1.7	6.3 ± 1.5	5.5 ± 1.7	5.8 ±1.8
Process	Assessment of LV function	The percentage of patients with a documented history or a diagnosis of HF seen in the ED or admitted to the hospital (or both) for HF who receive an assessment of LV function within 18 mo <i>before</i> admission date or within 30 d from ED visit	6.3 ± 1.6	6.1 ± 1.4	5.3 ± 1.4	5.8 ± 1.7
Outcome	Documentation of 30-d readmission rate	The percentage of documented patients with HF who are readmitted for any cause within 30 d after discharge	5.9 ± 1.8	5.8 ± 1.4	5.5 ± 1.6	5.7 ± 1.6

#### Table 1. Canadian Cardiovascular Society "short list" quality indicators for heart failure

 $\pm$  indicates a scale from 1 (strongly disagree) to 7 (strongly agree). Full technical specifications for quality indicators (QIs) for HF are available in Supplemental Appendix S5 and at www.CCS.ca.

ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin-receptor blocker; ED, emergency department; HF, heart failure; LV, left ventricular.

## **Results of Feasibility Assessment For HF QI**

No.	Current feasibility for measurement by data holders	
	Feasible?	Data sources?
Daily assessment of blood chemistry panels	Yes	Measurable through APPROACH, HF clinic EMRs
Chest radiography	Yes	Measurable through HF clinic EMRs
Patient education	Yes	Measurable through HF clinic EMRs
In-hospital ACEIs or ARBs	No	
Assessment of LV function	Yes	Measurable through HF clinic EMRs
30-d readmission rate	Yes	Measurable through CIHI discharge abstract database, HF clinic EMRs

#### Table 2. Results of feasibility assessment for HF quality indicators

Sites consulted for feasibility assessment included the Alberta Health Services (AHS), Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease (APPROACH), BC Cardiac Care, Cardiac Care Network of Ontario (CCN), Cardiovascular Health Nova Scotia (CVHNS), Canadian Institute for Health Information (CIHI), Health Quality Council (HQC) – Ontario, HQC – New Brunswick, Institute for Clinical Evaluative Sciences (ICES), Institut national de santé publique du Québec (INSPQ), Canadian Heart Failure Network (CHFN), and Société québécoise de l'insuffisance cardiaque (SQIC).

ACEIs, angiotensin-converting enzyme inhibitors; APPROACH, Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease; ARBs, angiotensin-receptor blockers; CIHI, Canadian Institute for Health Information; EMRs, electronic medical records; HF, heart failure; LV, left ventricular.

McKelvie et al Can J Cardiol 2016

# Conclusions

- 5 out of 6 QIs were not feasible to systematically collect across Canada
- Major barriers are to QI measurement are information collection processes and knowledge infrastructure
- Administrative data are structured to capture information about health procedures but the designed is not adequate to capture data on chronic diseases
- Provincial/clinical registries collect more comprehensive patient data; however, they often include only a subset of the HF population, thus limiting their use for interprovincial comparisons
- EMRs in HFC offer great potential for comprehensive data collection for QIs but 2 major limitations: 1<sup>st</sup> HFC manage only a small percentage of the patients; 2<sup>nd</sup> a lack of standardization of EMRs

Why Aren't We Properly Optimizing Patients With Heart Failure??

# CCS HF Guidelines from 2009-2018

Canadian Cardiovascular Society Consensus Conference guidelines on heart failure, update 2009: Diagnosis and management of right-sided heart failure, myocarditis, device therapy and recent important clinical trials	The 2013 Canadian Cardiovascular Society Heart Failure Management Guidelines Update: Focus on Rehabilitation and Exercise and Surgical Coronary Revascularization
The 2010 Canadian Cardiovascular Society guidelines for the diagnosis and management of heart failure update: Heart failure in ethnic minority populations, heart failure and pregnancy, disease management, and quality improvement/assurance programs	The 2014 Canadian Cardiovascular Society Heart Failure Management Guidelines Focus Update: Anemia, Biomarkers, and Recent Therapeutic Trial Implications
The 2011 Canadian Cardiovascular Society Heart Failure Management Guidelines Update: Focus on Sleep Apnea, Renal Dysfunction, Mechanical Circulatory Support, and Palliative Care	The Canadian Cardiovascular Society Heart Failure Companion: Bridging Guidelines to Your Practice
The 2012 Canadian Cardiovascular Society Heart Failure Management Guidelines Update: Focus on Acute and Chronic Heart Failure	2017 Comprehensive Update of the Canadian Cardiovascular Society Guidelines for the Management of Heart Failure



on chronic disease management including self-care.

# **Optimize Care Transitions**

- More effective coordination and communication between healthcare professionals would help simplify the complex trajectories that patients follow through healthcare system
- Effective mechanisms should be put in place for sharing information between different specialties and centres to enable patients to be closely followed during hospitalization and after discharge
- Effective disease management programmes should improve patient outcomes. They should include predischarge education, postdischarge treatment optimization and long-term patient monitoring and should connect to outpatient services for chronic heart failure care as well as taking account for coexisting illnesses
- Clear information for patients and caregivers about the organization and provision of care should be available to help them navigate the healthcare system

# **Improve Patient Education and Support**

- Active involvement of patients with heart failure and their caregivers in the management of the disease should be encouraged
- Teaching of self-care behaviours, such as symptom monitoring, treatment adherence, and regular exercise is important for patient's long-term health
- Good communication between healthcare professionals and patients should include discussions to identify treatment goals and the needs and concerns of the patient and their family and/or caregivers

# **Provide Equity of Care For All Patients**

- Management protocols need to be in place so that the best practice is followed across all centres, ensuring high quality care for all, irrespective of age or economic status
- Appropriate diagnostic procedures, including echocardiography and blood biomarker tests, should be available to all patients, and not just in hospital
- More flexible care options, better tailored to patient needs, would help to increase the range of management strategies available for patients with acute heart failure – many of whom are admitted to hospital in the absence of other suitable alternatives

# **Transition of Care Recommendations for Clinical Practice**

Recommendations	Considerations for Implementation of Recommendations
Systematically implement principles of transition of care programs in high-risk patients with chronic HF.	Include Medication reconciliation Very early postdischarge contact and communication with patient and/or care provider Early office follow-up within first week of discharge Patient education on chronic HF self-care, including skills for recognizing early warning signs of worsening HF and independently completing HF self-care behaviors Communication of patient health record with patient and postdischarge healthcare providers Integrated, interdisciplinary collaboration and coordination A framework that ensures that education is initiated in the hospital before the day of discharge and continues during initial community-based care
Routinely assess patients for high-risk characteristics that may be associated with poor post-discharge clinical outcomes.	Exemplars include cognitive difficulties, impaired learning capabilities, non-English speaking, and long travel time to healthcare providers
Ensure that qualified and trained HF nurse or other healthcare providers of clinical HF provide care services.	Assess healthcare provider knowledge and comfort in delivering patient education and interdisciplinary care coordination services
Allot adequate time in the hospital and postacute setting to deliver complex chronic HF interventions and to assess patient and caregiver responsiveness.	Incorporate time to complete high-level interventions into care plans, including patients' ability to understand HF self-management interventions and to complete skills and expectations independently
Implement handoff procedures at hospital or post-acute care discharge.	Provide patient health records with key details of the hospital/postacute experience (medications used, discharge medications, procedures, treatments, postdischarge care expectations, planned rehospitalization and/or follow-up services, known psychosocial issues, and medication reconciliation) Ensure that handoff documents are transmitted to postdischarge care providers in a timely manner

# **Transition of Care Recommendations for Clinical Practice Cont'd**

Develop, monitor, and ensure transparency of results of quality measures using a structure, process, and outcome framework.	Include Handoff performance Patient adherence to 7-d healthcare provider follow-up office visit Healthcare providers capability of completing early postdischarge (48–72 h) contact with patient and/or primary lay caregiver in areas in which transitions of care occur (ED and short-stay units, long-term care, home) Leadership and administrative support for sustaining quality of transition of care program
Consider patients' perceptions of QoL as a surrogate for physical, psychological, and social concerns that require support during the transition of care process.	Provide bridging for specific patient support needs
Ensure availability of transition of care component details in writing (eg, a training manual)	Promote fidelity of the program and consistent application by healthcare providers Ensure leadership and administrative support, including clinical leaders (navigators, advocates, etc)
Use health informatics technology to assist with program sustainability. Informatics should be patient and healthcare provider centric.	Evaluate data for applicability and completeness in facilitating patient communication and care coordination, quality metrics, research, and financial analyses

ED indicates emergency department; HF, heart failure; and QoL, quality of life.

Albert et al Circ HF 2015

# Why use an order set?

### Shown in systematic reviews to improve HF outcomes

- Significant benefits demonstrated for in-hospital implementation of an HF order set:<sup>1</sup>
  - Mortality risk reduced with order set (1.8%) vs. no order set (3.2%; OR 1.818, P=0.04)
  - LOS almost 1 day shorter (4.75 vs. 5.46 days; P=0.004)
  - No significant reduction in 30-day readmissions (possibly due to insufficient information available)

CADTH review: Across all indications, order sets significantly lower hospital LOS, mortality and errors in medication dosages and types<sup>2</sup>

CADTH, Canadian Agency for Drugs and Technologies in Health; LOS, length of stay; OR, odds ratio

1. Krive J et al. AMIA Annu Symp Proc 2014;2014:815-824; 2. CADTH Rapid Response Report: Standardized Hospital Order Sets in Acute Care:

A Review of Clinical Evidence, Cost-Effectiveness, and Guidelines (July 25, 2019).

# Key HF order set components

#### **ADMISSION ORDERS**

- Notification to PCP
- Patient care instructions including:
  - Daily morning weights
  - Fluid and sodium restriction
  - Supplemental oxygen, if needed
- Laboratory investigations specific to HF, including when to repeat
- Medications, including target doses

#### TRANSITION TO COMMUNITY CARE

- Consults and referrals to HF clinics and other HCPs
- Education and self-care instruction
- Discharge management plan
- Early outpatient follow-up

Order sets ensure that critical components of patient care are considered <u>and</u> discussed with the patient

HCP, healthcare professional; PCP, primary care provider

Alberta Health Services. Heart Failure Acute Admission Order Set Bundle Supportive Source: Heart Failure Evidence Document (April 2019).

# **CollabCare website – HFordersets.ca**



HF in Canada Admissions Discharge Planning Overcoming Inertia Educational Program

#### **Overcoming Inertia**

#### Download the updated CHFS Order Set

Clinical trials involving guideline-directed medical therapies (GDMT) have been shown to improve patient outcomes and reduce costs to healthcare systems.

Inertia, however, is a known barrier to instituting evidence-based therapies. Clinicians and health systems have many priorities and commitments. The time required to update documentation and train clinical staff can easily become the positive intention that is months or years delayed.

Think Research's Order Sets<sup>1M</sup> make it easy to keep your clinical protocols in line with the latest evidence-based recommendations. That's why CHFS has partnered with Think Research to update their heart failure order set and make these new findings easily accessible.

Existing client partners within Think Research's network may work with their in-house clinical and customer service teams to localize, implement and maintain the new CHFS Order Set

#### Let's get started

#### I'm not part of Think Research's client partner network

You can still access the updated Order Set guideline. Think Research staff are available to answer any implementation questions you may have.





https://hfordersets.ca/

# Building a model for supporting system integration for heart failure care in Ontario



#### Canadian Journal of Cantinlogy 34 (2016) 863-870

Review

#### The Spoke-Hub-and-Node Model of Integrated Heart Failure Care

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#### ABSTRACT

Heart failure (HF) is a significant public health concern. Specialized HF clinics provide the optimal environment to address the complex needs of these patients and improve outcomes. The current and growing population of patients with HF outstrips the ability of these clinics to deliver care. Integrated care is defined as health services that are managed and delivered so that people receive a seamless continuum of health promotion, disease prevention, diagnosis, treatment, disease management, rehabilitation, and palliative care services. This approach requires coordination across different levels and sites of care within and beyond the health sector, according to changing patient needs throughout their lives. The spoke-hub-and-node (SHN) model represents an organization of care that works collaboratively with the primary care sector and is highly integrated with community-based multidisciplinary teams of health care professionals and specially care. The purpose of this article is to analyze the requirements for successful implementation of SHN models. We consider the respective roles of HF clinics, HF nurse specialists, pharmacists, palliative care teams, telemonitoring, and solo practitioners. We also discuss levels of care delivery and the importance of patient stratfication and patient flow. The SHN approach has the potential to build on and improve the chronic care model (CCM) to deliver centralized services to preserve high-quality patient-centred care at affordable costs.

#### RESUME

L'insuffisance cardiaque (IC) est un problème de santé publique important. Les cliniques spécialisées dans la prise en charge de l'IC offrent un erwironnement optimal pour répondre aux besoins complexes de ces patients et pour améliorer leurs résultats. La population actuelle et toujours croissante de patients atteints d'IC dépasse la capacité de ces cliniques de prodiguer des soins. On entend par soins intégrés des services de santé qui sont gérés et fournis de manière à ce que les patients recolvent un continuum sans heurt de services de promotion de la sante, de prévention des maladies, de diagnostic, de traitement, de prise en charge des maladies, de réadaptation et de soins palliatifs. Cette approche nécessite une coordination entre différents paliers et centres de soins tant à l'Intérieur qu'à l'extérieur du secteur de la santé. en fonction de l'évolution des besoins du patient tout au long de sa vie. Le modèle en étolle représente une organisation des solns caractérisée par le travail en collaboration avec le secteur des soins primaires et une forte intégration avec les équipes pluridisciplinaires des professionnels de la santé et des soins spécialisés ancrés dans la communauté. Cet article vise à analyser les conditions de la réussite de la mise en course des modèles en étoile. Nous analysons les rôles respectifs des cliniques de traitement de l'IC, du personnel infirmier spécialisé en IC, des équipes desoins palliatifs, de la télés urveillance et des praticiens indépendants. Nous abordons également les pallers de prestation de soins et l'importance de la stratification et du cheminement des patients. L'approche en étoile peut permettre de tirer parti du modèle des soins chroniques en l'améliorant pour fournir des services centralisés dans le but de continuer à dispenser des soins de haute qualité axés sur le patient, à des coûts abordables.

Heart failure (HF) is a significant public health concern, affecting more than 500,000 Canadians. HF cases have increased 1396 from 2010 to 2016, with a continued expected rise, greatly due to the aging population.<sup>1,2</sup> The prevalence of

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See page 868 for disclosure information.

HF is approximately 3.5%, increasing with age to approximardy 23% for those okler than age 85.<sup>1</sup> Annual mortality is approximately 12% overall, approaching 25% among those older than age 85.<sup>1</sup> There are more than 75,000 new case each year, and more than 60,000 patients die each year.<sup>1</sup> Despite current management 50% of patients die within 5 years of diagnosis.<sup>10</sup>

HF represents the second leading cause of hospital admissions for Canadians older than age 65 and the fifth leading cause of medical admissions overall.<sup>6</sup> Compared with



#### Minimal requirements and key clinical services for heart failure programs within a spoke-hub-node model of care

#### August 23, 2018

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# Integrated Model of Heart Failure Care: Spoke-Hub-Node



**Patient Risk and Complexity** 

#### LEVELS OF PATIENT CARE AND SETTING



SPOKE Stable, low risk, few co-morbidities Community provider office or clinic



COMMUNITY HUB Moderate risk multiple, stable co-morbidities Local hospital or community setting



TERTIARY NODE High risk, multiple co-morbidities, complex needs Advanced cardiac hospital The intensity and level of care may vary over time with the patient's complexity and risk changes, but the goal is to ensure that high quality care is available as close to home as possible and that care is coordinated across all levels of care.

# Summary

- Consider using a standardized order set
- Consider creating an EMR that will automatically generate a database that can be interrogated
- Develop a local system of care such as the spoke-hubnode design
- Regularly monitor wait times and readmission rates
- Consider using the CCS Heart Failure Quality Indicators as a template for data collection to monitor quality of care