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Short communication

The Optimize Heart Failure Care Program: Initial lessons from global implementation

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ABSTRACT

Hospitalization for heart failure (HF) places a major burden on healthcare services worldwide, and is a strong predictor of increased mortality especially in the first three months after discharge. Though undesirable, hospitalization is an opportunity to optimize HF therapy and advise clinicians and patients about the importance of continued adherence to HF medication and regular monitoring.

The Optimize Heart Failure Care Program (www.optimize-hf.com), which has been implemented in 45 countries, is designed to improve outcomes following HF hospitalization through inexpensive initiatives to improve prescription of appropriate drug therapies, patient education and engagement, and post-discharge planning. It includes best practice clinical protocols for local adaptation, pre- and post-discharge checklists, and 'My HF Passport', a printed and smart phone application to improve patient understanding of HF and encourage involvement in care and treatment adherence.

Early experience of the Program suggests that factors leading to successful implementation include support from HF specialists or 'local leaders', regular educational meetings for participating healthcare professionals, multidisciplinary collaboration, and full integration of pre- and post-hospital discharge checklists across care services. The Program is helping to raise awareness of HF and generate useful data on current practice. It is showing how good evidence-based care can be achieved through the use of simple clinician and patient-focused tools. Preliminary results suggest that optimization of HF pharmacological therapy is achievable through the Program, with little new investment. Further data collection will lead to a greater understanding of the impact of the Program on HF care and key indicators of success.

1. Introduction

Heart failure (HF) is the leading cause of hospitalization in the US and Europe, accounting for 1–2% of all admissions [1], and approximately 30% of these patients require rehospitalization within 60–90 days [2]. A recent nine-country analysis carried out in Asia showed that HF accounted for 2.2–19% of all admissions, with 30-day readmission rates of 3–15% [3]. Such findings demonstrate the global burden that HF hospitalization places on healthcare providers.

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While treatment advances have improved the prognosis for many HF patients over recent decades, hospitalization is one of the strongest predictors of increased mortality [2].

Mortality is particularly high in the first month after discharge [4]. Data from the most recently published National Heart Failure Audit of nearly 57,000 HF admissions in England and Wales in 2014–15 showed in-hospital mortality of 9.6%, 30-day mortality of nearly 20% and mortality at one year of 30% [5]. These rates were unchanged from those in the previous six years [5]. Post-discharge mortality at one year, and out to six years, was related to access to specialist HF care and to use of key disease-modifying drugs for HF with reduced ejection fraction [5]. The greatest benefit was seen in patients leaving hospital on angiotensin converting enzyme (ACE) inhibitors/angiotensin receptor blockers (ARBs), beta blockers (BBs) and mineralocorticoid receptor antagonists (MRAs) [5].

A recent analysis has suggested that ivabradine should be considered in HF patients with elevated heart rate during the 'vulnerable' phase after hospitalization to prevent early readmission [6].

Hospitalization, though in itself undesirable, is an opportunity to optimize HF therapy and to provide appropriate discharge information for both clinicians and patients about the importance of adherence to HF medication and regular monitoring. During HF hospitalization, the use of a simple checklist to remind physicians about medications and dose uptitration, relevant counseling, and follow-up instructions at discharge has been shown to improve quality of care and reduce readmissions [7]. 'Get With the Guidelines-Heart Failure' is an in-hospital program for improving care by promoting consistent adherence to treatment guidelines. It has been shown to reduce 30-day readmission for HF [8], but recent analyses suggest that there is continuing room for improvement [9]. International guidelines suggest that improving 'transition' arrangements for patients leaving hospital and returning to care in the community are key to success [10].

In this paper, we describe the Optimize Heart Failure Care Program, which includes inexpensive initiatives to improve prescription of appropriate guidelines-recommended drug therapies, patient education and engagement, and post-discharge planning. We also review key learnings about the implementation of this Program and preliminary findings concerning its impact on clinical practice.

2. The Optimize Heart Failure Care Program

The Optimize Heart Failure Care Program (www.optimize-hf.com) was initiated in 2013 and includes both clinician- and patient-focused tools for improving outcomes for patients who are hospitalized with HF.

Hospitals that express an interest in the Program are provided with examples of best practice protocols developed for optimizing HF management drawn up by other hospitals involved in the Program. These protocols are based on latest recommendations from the European Society of Cardiology guidelines [10], and include optimization of pharmacological therapy and pre-discharge assessment and planning for patients returning to the community. Centres are encouraged to adapt these protocols to local infrastructure and needs.

The Program also provides pre- and post-hospital discharge checklists of relevant clinical parameters for assessment, evidence-based pharmacologic and non-pharmacologic therapeutic measures and educational initiatives (Fig. 1). These are completed prior to discharge and copies given to patients and sent to their community-based clinicians, so that results can be updated at follow-up consultations. This aspect of the Program aims to ensure that measures instituted during hospitalization are continued post-discharge in order to optimize outcomes, especially during the first weeks and months when patients are particularly vulnerable to further potentially fatal events. Used as a hand-held tool during patient review, the checklist rapidly upskills both the patient and the healthcare professional about the key features of symptoms, clinical examination, drug therapy, and blood testing, that are required to optimize care. In most parts of the world such clinical review is not necessarily undertaken by a healthcare professional who is an expert in heart failure, so such an aid can be crucial for ensuring that care is up-to-date and tailored to the individual.

The patient education element of the Program, called 'My HF Passport', is designed to improve patient understanding of HF and encourage involvement in care and adherence to treatment. It also gives patients the opportunity to collect serial data on weight, blood pressure (BP) and heart rate (HR), tiredness and breathlessness, to aid subsequent clinical decision making. It is available in both printed form and as a smartphone application (MyHF application).

All elements of the Optimize Heart Failure Care Program have been translated and customized for participating hospitals.

3. How is the Program being used and what have we learned?

The Optimize Heart Failure Care Program is being used by clinicians and patients in 45 countries. Some hospitals have implemented the complete Program, while others are delivering either the clinician or patient-based elements (Fig. 2).

During review of the Program with each of the centres involved, a number of factors have been identified which are likely to lead to successful implementation, irrespective of the geographical location of the centres or the relative wealth of the country:

- Involvement of a national or local HF group and/or a 'local leader' to generate interest in the Program and drive diffusion of implementation across multiple hospitals
- Regular educational meetings of healthcare professionals involved in the Program to raise awareness of the impact of HF interventions on hospitalization and mortality and to share goals, experience and results of the Program in raising standards of care
- Multidisciplinary collaboration on Program implementation, including specialist nurses
- Full integration of pre- and post-hospital discharge checklists across inpatient, outpatient and community-based services to facilitate consistent use of evidence-based interventions across the healthcare community
- Simple-to-use tools, customized to local needs and languages

The main obstacles to implementation have been identified as:

- Lack of awareness of the importance of optimization of HF drug therapy
- Insufficient number of HF specialists, resulting in patients seeing doctors with different levels of training
- Difficulty in providing early follow-up visits during the vulnerable weeks after hospitalization
- Poor communication between inpatient and post-discharge services and a lack of consistency in HF care
- Failure of patients to attend for outpatient follow-up visits after hospital discharge due to lack of facilities, long waiting lists, or large geographical distances from the patient's home to the clinic or hospital

4. Impact on clinical practice

Data are being collected on the impact of the Program across the world. Introduction of the Program has been a trigger for establishing appropriate collection of data on both process and outcome measures, particularly where no HF register or practice audit has previously been in place. More complete data will be available in due course, but preliminary data describing the impact of Optimize on the prescription of pharmacological therapy and early post-discharge outcomes have been reported from two regions: in several Russian-speaking countries, and in Colombia, South America [11–12].

Lopatin et al. reported results over a three-month period from 317 patients in sinus rhythm hospitalized due to worsening HF at hospitals in Russia, Armenia, Belorussia, Georgia, Ukraine, Uzbekistan and

Pre- and Early Post-discharge Follow-up

Patient's name: Gender: Male Female Age:

	PRE-DISCHARGE VISIT	EARLY POST-DISCHARGE VISIT 1	EARLY POST-DISCHARGE VISIT 2
	Hospital specialist: Date of discharge: / / 20	Doctor/Nurse: Date of visit: / / 20	Doctor/Nurse: Date of visit: / / 20
CLINICAL ASSESSMENT			
Weight	kg	kg	kg
Resting heart rate	bpm Rhythm: sinus atrial fibrillation not available	bpm Rhythm: sinus atrial fibrillation not available	bpm Rhythm: sinus atrial fibrillation not available
Blood pressure	Systolic/diastolic: / mm Hg	Systolic/diastolic: / mm Hg	Systolic/diastolic: / mm Hg
Clinical symptoms of volume overload	Signs of congestions: pulmonary rales, jugular venous congestion, hepatomegaly, peripheral edema Breathlessness Orthopnea	Signs of congestions: pulmonary rales, jugular venous congestion, hepatomegaly, peripheral edema Breathlessness Orthopnea	Signs of congestions: pulmonary rales, jugular venous congestion, hepatomegaly, peripheral edema Breathlessness Orthopnea
NYHA class	Class I Class II Class III Class IV	Class I Class II Class III Class IV	Class I Class II Class III Class IV
Other measurements	LV ejection fraction % Serum creatinine Potassium mmol/L	LV ejection fraction % Serum creatinine Potassium mmol/L	LV ejection fraction % Serum creatinine Potassium mmol/L
PATIENT EDUCATION			
Nonpharmacological measurement	Diet Exercise Weight monitoring Detection of worsening symptoms	Diet Exercise Weight monitoring Detection of worsening symptoms	Diet Exercise Weight monitoring Detection of worsening symptoms
OPTIMIZATION OF MEDICAL THERAPY			
ACEIs or ARBs or ARNI	Prescribed Not prescribed (CI or intolerance) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (patient refused)
Beta-blockers	Prescribed Not prescribed (CI or intolerance) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (patient refused)
MRAs	Prescribed Not prescribed (CI or intolerance) Not prescribed (not indicated) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (not indicated) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (not indicated) Not prescribed (patient refused)
Ivabradine	Prescribed Not prescribed (CI or intolerance) Not prescribed (not indicated) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (not indicated) Not prescribed (patient refused)	Prescribed Not prescribed (CI or intolerance) Not prescribed (not indicated) Not prescribed (patient refused)

Fig. 1. Optimize checklist for pre- and post-discharge follow-up.

Kazakhstan which are using the Optimize Program [11]. At discharge of Program participants, the prescription rates of key guideline-based HF treatment with ACE inhibitors/ARBs, BBs, MRAs and ivabradine were 92.4%, 82.6%, 90.5% and 25.5%, respectively. Diuretics and digoxin were prescribed in 98.8% and 17.7% respectively. At three-month follow-up, 17.6% of patients had required rehospitalization. This is the first time that such data have been collected in this region, but they compare very favourably with regional data from other countries [5,13].

Saldarriaga et al. reported data on 250 HF patients hospitalized in nine hospitals in Colombia, which suggested that the use of a pre-discharge checklist and educational material for patients may help to improve the use of recommended therapies [12]. At discharge, 95% of

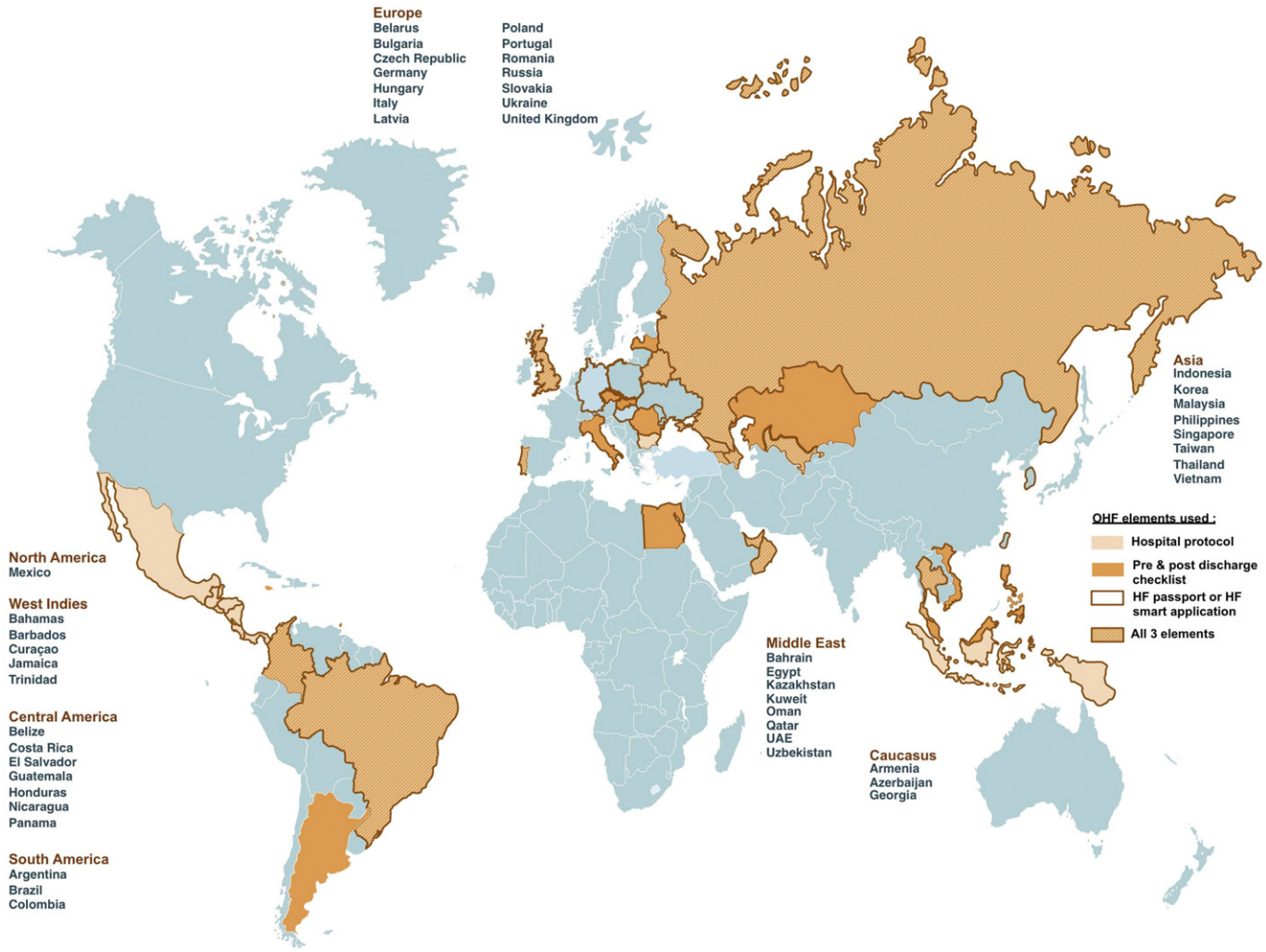

Fig. 2. Global implementation of the Optimize Heart Failure Care Program.

patients had been prescribed BBs, 85% ACE inhibitors/ARBs, 74% MRAs, and 36% ivabradine. The mean heart rate at discharge was 77 bpm and more than 50% of patients were discharged with a heart rate above 70 bpm. Seventy-one per cent of patients attended a follow-up visit within 30 days after discharge, and 67% of these patients had a heart rate below 70 bpm. The rate of rehospitalization and decompensation at 30 days was 7% overall. For those in sinus rhythm with tighter heart rate control with BBs and ivabradine, the rate of rehospitalization and decompensation was 1% at 30 days.

5. Conclusions

The Optimize Heart Failure Care Program is achieving encouraging levels of implementation, especially where there is support from HF specialists or 'champions', regular educational meetings for participating healthcare professionals, multidisciplinary collaboration, and full integration of pre- and post-hospital discharge checklists across care services. The Program is helping to raise awareness of HF and generate useful data on current practice and how good evidence-based care can be achieved through the use of simple clinician and patient-focused tools. Preliminary results suggest that optimization of HF pharmacological therapy is achievable through the Program, with little new investment. Additional data will be made available in a fuller report in due course, leading to a greater understanding of the impact of the Program on HF care, hospitalization and other key indicators of success.

Conflict of interest

Martin R Cowie has received speaker fees and has provided consultancy advice to Servier.

Yuri M Lopatin has received speaker fees and has provided consultancy advice to Servier.

Clara Saldarriaga has been a speaker for Servier, Novartis, Sanofi and Abbot and consultant for Medtronic.

Cândida Fonseca has received consulting and speaker fees from Servier, Novartis, OMPharma, Bayer, Daiichi Sankyo and Orion.

David Sim none reported.

Jose Antonio Magaña has been an advisor, speaker and researcher for Abbvie, Novartis, Servier and Sanofi, all with modest honoraria.

Denilson Albuquerque has received speaker fees and provided consultancy advice to Servier.

Marcelo Trivi has no conflict of interest about this publication.

Gustavo Moncada has no conflict of interest.

Baldomero A. González Castillo has been a clinical trial investigator for Sanofi, Lilly, Astra Zeneca and Novartis, and participant in Advisory Boards for Stendhal, MSD and Sanofi. Speaker for Servier, Novartis, Sanofi, MSD, Astra Zeneca, Bayer, Pfizer, Menarini, Abbott.

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References

[1] A.P. Ambrosy, G.C. Fonarow, J. Butler, et al., The global health and economic burden of hospitalizations for heart failure: lessons learned from hospitalized heart failure registries, J. Am. Coll. Cardiol. 63 (12) (Apr 1 2014) 1123–1133.

[2] M. Gheorghiade, M. Vaduganathan, G.C. Fonarow, R.O. Bonow, Rehospitalization for heart failure: problems and perspectives, J. Am. Coll. Cardiol. 61 (4) (Jan 29 2013) 391–403.

[3] E.B. Reyes, J.W. Ha, I. Firdaus, et al., Heart failure across Asia: same healthcare burden but differences in organization of care, Int. J. Cardiol. 223 (Nov 15 2016) 163–167.

[4] N.C. Marti, G.C. Fonarow, M. Gheorghiade, J. Butler, Timing and duration of interventions in clinical trials for patients with hospitalized heart failure, Circ. Heart Fail. 6 (2013) 1095–1101.

[5] British Society for Heart Failure. National Heart Failure Audit, (Accessed on 28 November 2016 at) https://www.ucl.ac.uk/nicor/audits/heartfailure/documents/annualreports/heartfailurepublication14_15 April 2014-March 2015.

[6] M. Komajda, L. Tavazzi, K. Swedberg, M. Böhm, J.S. Borer, A. Moyne, I. Ford, SHIFT Investigators, Chronic exposure to ivabradine reduces readmissions in the vulnerable phase after hospitalization for worsening systolic heart failure: a post-hoc analysis of SHIFT, Eur. J. Heart Fail. 18 (9) (Sep 2016) 1182–1189.

[7] A. Basoor, N.C. Doshi, J.F. Cotant, et al., Decreased readmissions and improved quality of care with the use of an inexpensive checklist in heart failure, Congest. Heart Fail. 19 (4) (Jul-Aug 2013) 200–206.

[8] American Heart Association, Get With the Guidelines-Heart Failure, http://www.heart.org/HEARTORG/Professional/GetWithTheGuidelines/GetWithTheGuidelines-HF/Get-With-The-Guidelines-Heart-Failure-Overview_UCM_307806_Article.jsp#.WDwlJqKLRcA.

[9] R.D. Kociol, E.D. Peterson, B.G. Hammill, et al., National survey of hospital strategies to reduce heart failure readmissions: findings from the Get With the Guidelines-Heart Failure registry, Circ. Heart Fail. 5 (6) (Nov 2012) 680–687.

[10] P. Ponikowski, A.A. Voors, S.D. Anker, et al., 2016 ESC guidelines for the diagnosis and treatment of acute and chronic heart failure: the task force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC, Eur. Heart J. 37 (27) (Jul 14 2016) 2129–2200.

[11] Y. Lopatin, A. Grebennikova, H. Sisakian, et al., Verification of guidelines-adherent medical therapy in patients with sinus rhythm hospitalised due to worsening of heart failure, Eur. J. Heart Fail. 18 (Suppl. 1) (2016) 233–234.

[12] C.I. Saldarriaga, G. Gonzalez, S. Navarrete, et al., Acute heart failure in Colombia, Eur. J. Heart Fail. 18 (Suppl. 1) (2016) 254.

[13] M.J. Krantz, A.V. Ambardekar, L. Kaltenbach, et al., Get With the Guidelines Steering Committee and Hospitals. Patterns and predictors of evidence-based medication continuation among hospitalized heart failure patients (from Get With the Guidelines-Heart Failure), Am. J. Cardiol. 107 (12) (Jun 15 2011) 1818–1823.