

## **CHARM Clinic: A Need for a Physician-Directed, but Nurse-Managed Community Based Heart Failure Clinics for Improving Patient Outcomes and Reducing Healthcare Costs in Canada**

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### **Abstract**

There are 600,000 Canadians living with heart failure (HF). HF in Canada costs over \$2.8 billion per year. HF patients have long and frequent hospital stays, resulting in high healthcare costs. Community-based heart failure clinics have been proven to reduce hospitalizations, but Alberta has only one. The CHARM (Community Heart Failure Assessment, Rehabilitation and Management) clinic at Advanced Cardiology, Calgary, Alberta is a community based, charity-run, publically funded clinic providing outpatient care, which is physician-directed but nurse managed. The main goals of CHARM clinic are to 1) help keep patients in the community and out of the hospital, which would reduce healthcare costs; and 2) provide assistance to HF patients with self-management, education and optimizing medications, which would improve patient outcomes and survival. In this article, we describe the importance of clinics such as the CHARM clinic in reducing healthcare costs and improving patient outcomes. We also highlight the need for health authorities to support community based clinics.

**Keywords:** *CHARM Clinic; Heart Failure Clinics; Healthcare Costs; Canada*

### **Introduction**

It is projected with the number of elderly increasing in Canada, so will the rate of chronic diseases. Alberta Health Services (AHS) defines chronic disease as “conditions which are long lasting, non-reversible and often require special therapy, education and training for the individual with chronic disease to maintain health” [1]. AHS considers the highest priority chronic diseases in Alberta to be (in alphabetical order):

- Arthritis
- Asthma
- COPD (Chronic Obstructive Pulmonary Disease)
- CAD (Coronary Artery Disease)
- Depression
- Diabetes
- Heart Failure (HF)
- Hypertension
- Obesity

According to the World Health Organization (WHO), Cardiovascular disease accounts for the most chronic disease deaths, also known as non-communicable diseases, with 17.5 million people dying annually worldwide, followed by 7.6 million cancer deaths, respiratory related deaths are a little over 4 million annually. Finally, diabetes causes 1.3 million deaths annually [2]. In Canada, WHO cites cardiovascular disease (27%) as the second leading cause of death in Canadians, only second behind Cancers (30%) [3].

According to the National Post, the death rates from Heart Disease has improved from 25.3% in 2000 to 21.5% in 2007 [5]. Unfortunately, one residual effect of this, is more Canadians are now living with heart failure (HF) due to an increase in incidence rates and increased survival rates resulting in increased prevalence rates and/or a combination of both factors [6]. As a result of these increasing number of HF cases, the economic impact of this disease on the health care system is staggering. According to Braunwald (1997), HF is described as an emerging epidemic [4]. HF is a complex chronic condition where the heart is unable to pump enough blood to meet the metabolic demands of the body. This results in poor exercise tolerance, reductions in the quality of life and survival. There are approximately 500,000 Canadians living with HF and 50,000 new patients are diagnosed each year [7]. Heart disease and stroke costs the Canadian economy more than \$20.9 billion every year in physician services, hospital costs, lost wages and decreased work productivity [8]. This information is further supported by the Public Health Agency of Canada which supports the notion that CVD accounts for more than \$7 billion in direct costs, including hospitalizations, drugs and physician care. With an additional \$15 billion in indirect costs, including mortality and long/short term disability [9].

Similar statistics are available which support the economic burden of HF in Alberta. During the period of January 1, 2000 to December 31, 2006, the HF prevalence increased from 37% however, the total costs of HF increased by approximately 60%. The proportion of total costs from new HF patients reduced from 22% in 2000 to 16% in 2006. 70% of costs in 2000 were related to hospitalizations while in 2006 hospitalizations accounted for 64% of total costs. In comparison, outpatient care costs increased from 11% to 15% and physician costs increased from 15% to 18%. 3% of total costs were due to Emergency room costs [10]. Furthermore, if the cost of HF continues to increase by 60% in 6 year increments, as is indicated by Kaul, *et al.* the majority of the costs for treating HF patients will be from preexisting patients already living with HF versus new cases of HF patients.

In addition, according to Tapan Chowdhury as cited in the Report of the Auditor General of Alberta, more than 75% of the all direct patient costs come from only 10% of the health care users who have at least one chronic disease. While only 2% of the health costs come from the healthiest segment of the population. As a result, the majority of the economic strain on the Alberta health care system comes from only a small proportion of Albertans [11]. This number will only rise as the population continues to age.

One way to minimize these health costs is to change the approach of the management of chronic diseases. A shift needs to occur, whereby both the patient and the Health Care Professionals (HCP) are actively involved in the management of HF. Patients with chronic diseases need to learn to live with their respective disease 24 hours a day, 7 days a week, while learning to minimize barriers that could affect their quality of life. In addition, HCPs need to develop skill sets that are specialized in chronic disease management, to better assist their patients in their ongoing management of their respective chronic disease; while also teaching them how to minimize the barriers they are experiencing in order to facilitate a better quality of life.

One such shift in thinking was suggested in a special edition of the British Medical Journal, whereby an approach to help assist HCPs in Chronic Disease Management (CDM) was introduced [12]. Various initiatives were introduced that focused on building capacities at both the physician and patient level. Based on these initiatives, the essential characteristics of chronic disease management should include the following:

- Providing patients with support to manage their disease
- Providing Primary care doctors with specific delegation of tasks
- Optimizing drug therapy
- Patient follow up that is intensive and systematic
- Multidisciplinary team approach to health care delivery
- Use of performance measure tools to track quality of care and also to evaluate effectiveness of interventions
- Systematic organization of care and services to optimize health outcomes and minimize costs
- Research on innovative methods to support patient living with chronic diseases.

These initiatives have been widely accepted and implemented in various CDM programs. Research is also now available to support its effectiveness.

### **Chronic disease management and heart failure**

According to Philibin and his meta-analysis on the literature on CDM geared towards a HF population, he concluded that comprehensive, multidisciplinary management programs can improve functional status and reduce the risk of hospital admission, and may lower medical costs [13]. Research has also shown that multidisciplinary provider teams with personal communication lead to fewer hospital readmissions for people with heart failure [14].

### **Canadian perspective**

Across Canada, the Wagner Model of CDM has been recommended in the management of HF patients in two major cities [15]. Presently, there are documents available which support the benefits are incorporating a CDM model within a HF clinical management framework.

### **Ontario initiative**

Currently in Ontario, the Cardiac Care Network, in their document titled “Strategy for Community Management of Heart Failure in Ontario” developed the followed recommendations which include CDM theories. The document states, “Recommendations (should) address gaps in the system and foster effective system level management of care, which includes planning for demographic change, improving the organization of care, ensuring access, and assessing the outcomes related to these modifications [16]. The recommendations are organized into three key priority areas:

- 1) Standardizing tools and resources for patients, caregivers, and clinicians
- 2) Improving organization of care; and
- 3) Enabling measurement and improvement.

### **British columbia initiative**

In BC, a working document titled “Improving Chronic Disease Management: A powerful Business Case for Congestive Heart Failure” was also created which once again developed recommendations which embedded much of the CDM theory [17]. The recommendations focus strongly at a population, provider and patient level. The recommendations were as follows:

- Population Components
- CHF patient registries (provincial and national)
- Performance Measurements
- Prevention
- Physician and HCP
- Practice guidelines development and use
- Standards of Care
- Shared Care
- Community Networks
- Patient Components
- Patient Surveys
- Patient recall and follow up
- Patient educational resources
- Care plans for patient
- Self efficacy training.

Both of the documents mentioned above have made their respective recommendations as a direct result of current gaps in the delivery of health care to HF patients. Some of these gaps include:

- 1) Inconsistencies in the use of a multidisciplinary team
- 2) Limited number of HF specialists able to see HF patients
- 3) Underutilization of proven therapies/lack of understanding of current practice guidelines.
- 4) Lack of follow up for HF patients
- 5) Lack of culturally sensitive handouts and teaching
- 6) Fragmented/Isolated care
- 7) Gaps in delivery of health care services
- 8) Gaps in Funding.

Unfortunately, many of the health care gaps mentioned above are also present in the management of HF patients in Calgary. Currently in Calgary there are four Heart Function clinics. Each clinic is unique in their delivery of heart failure care. At present, all the HF clinics in Calgary are hospital based. All have a core group, which consist of the Physician and the Nurse Clinician. However, some clinics also have access to a multidisciplinary team consisting of Pharmacists, Dieticians and Nurse Practitioners. While other HF clinics will defer this work to a team of Nurse Clinicians specialized in HF. This non-uniform use of multidisciplinary teams calls into question the inequality that can exist in the standards of care that is provided at these various HF clinics.

Second, there are limited numbers of HF specialist in Alberta. When reviewing the statistics, there are eight HF specialists in Calgary for the roughly 6268 new cases of HF that were diagnosed between 1997/1998 to 1999/2000 in the city of Calgary [18]. Unfortunately, there are no prevalence rates for HF cases in Calgary specifically. As a result, a true picture of the caseload for HF specialists is extremely underestimated. However, looking at the new HF cases in Calgary, the probability of a HF patient being seen by a HF specialist is small. Again, this sheds light on another potential inequality and gap in the care as not all HF patients will receive care from a HF specialist.

Third, family physicians (FP) familiarity with evidence based guidelines around HF is also varied from FP to FP. There are currently over 1200 guidelines which get updated and revised every 1 - 5 of years. (<https://www.cma.ca/en/Pages/cpg-recent-additions.aspx>) [19]. From a practical point of view, the ability for family doctors to be continually updated on these guidelines is a mammoth task. Being unfamiliar with the guidelines not only effects the appropriate prescribing of proven therapies, but also the accurate diagnosis of HF. Without a confirmed diagnosis of HF, patients would not be eligible for enrollment into the existing HF clinics currently set up in Calgary. This again becomes a barrier to patient's ability to have timely access to HF health care due to delayed HF diagnosis; in addition, access to clinical proven therapies effective in HF management and outcomes will also be delayed.

Fourth, HF patients require regular and frequent follow up. One reason for this is to facilitate the up titration of their cardiac medications to appropriate doses proven to improve heart function. Regular follow up also allows for close monitoring of side effects. Again, the frequency of follow up for these patients varies from FP to FP, depending on their availability of appointments, familiarity with guidelines and comfort levels with titrating medications.

In addition, focusing on the current HF clinics in existence in Calgary, there too, are discrepancies regarding frequency of patient follow ups. Reasons for this include variation in nurse's caseload (anywhere from 80 - 120 patients per caseload) with high caseload numbers potentially resulting in less frequent follow ups. Access to a multidisciplinary team, which can help to spread out the workload, further facilitating more frequent follow ups, and the existence of medical directive/medication titration algorithm, also further help facilitate appropriate and timely titration of medications.

Fifth, the availability of culturally sensitive teaching material around HF is also limited. The basic premise behind the CDM model is to teach patients about self-care techniques. This involves teaching patients daily weights, fluid and sodium restrictions, and recognition of warning signs that HF is worsening. By doing so, this approach is very much taking on a proactive approach to HF management, whereby

early signs of HF symptoms are addressed immediately to avoid potential costly hospitalizations and emergency room visits. To accomplish this, educational handouts in the patient native language will help facilitate patient teaching.

Unfortunately, these teaching materials are limited again creating another gap in healthcare resources.

Sixth, when managing HF patients, the ability to address risk factors is crucial to minimizing further heart damage, improving clinic outcomes and also to improve the quality of life for patients. It is not uncommon for patients living with HF to also have multiple comorbidities. Some of which may include diabetes, asthma, COPD, hyperlipidemia, hypertension and sleep apnea. When multiple comorbidities exist so does the potential for numerous visits to multiple specialists and various other medical appointments. This once again can lead to fragment of care, especially when the risk for miscommunication or lack of communication can exist between the various health practitioners.

Finally, there are strains in the current health care system due to limited resources, long wait times, reduced accessibility to health care resources, increased number of individuals with chronic diseases, increased acuity of patients in the community and cultural/language barriers. At present the health system is very much reactive versus proactive in its delivery of health care services. Slowly, the shift has been away from acute (tertiary) care medicine and focusing more on the primary (preventative) care. This has led to more pressures put on HCP at a primary care level, as not they are left with seeing more patients that are chronically ill and more complex due to their chronic conditions. Many of these patients present to the FP's office being more acutely sick; however, not sick enough to be sent to the emergency room. As a result, the patients are left to be managed at the FP primary care level.

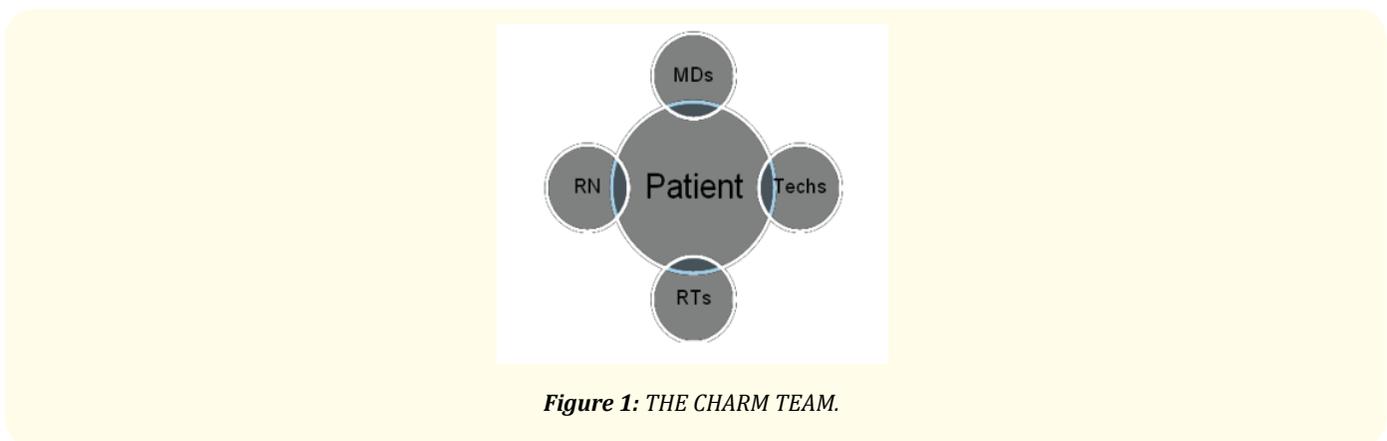
In addition, the role of both primary and tertiary care medicine can also further add to the increased rates of hospitalizations, further straining the limited resources available in health care. According to Roger, *et al.* advancements in primary care leads to new incidence rates of HF. While progress at the tertiary level of medicine would result in improved survival rates causing increased prevalence rates of HF cases. As a result of increased incidence and prevalence rates, both contribute to the increased burden that hospitalizations can have on, not only the health care system, but also the HF patient. From another perspective, with the incidence of chronic diseases increasing; the rate of hospitalizations will continue to increase, which again further puts a strain on the acute (tertiary) care system, which leads to quicker discharge of patients into the community, whereby again the primary HCP is left to manage the patient, which once again causes this vicious cycle.

### **CHARM model community heart function assessment rehabilitation**

#### **Management clinic (CALGARY model)**

The CHARM clinic at Advanced Cardiology does incorporate the principle of Wagner's Chronic Disease Model. By doing so, it is hoped that it will help minimize the gaps in our clinic that were identified in other HF clinics in Calgary, while also alleviating the strain from the 2 levels of health care delivery, both the tertiary and primary levels.

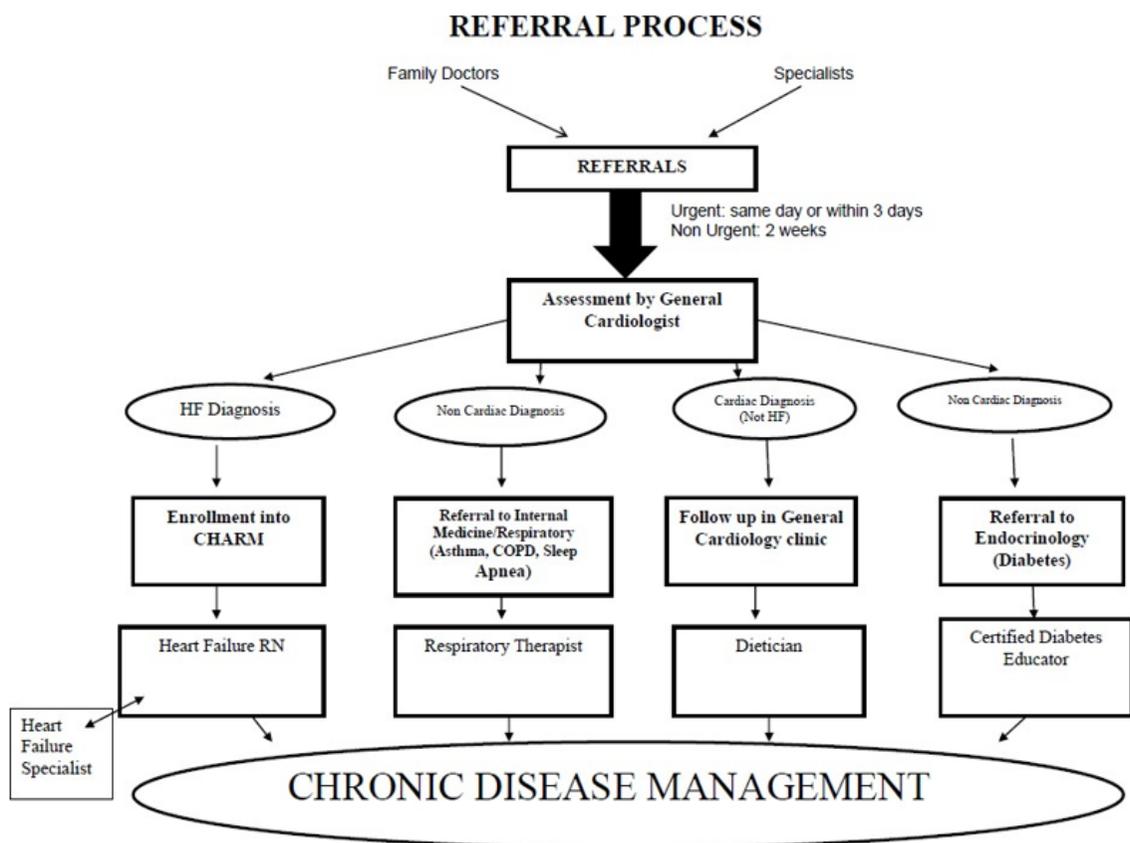
The CHARM clinic at Advanced Cardiology is a community based, public funded clinic providing outpatient care which is physician directed but RN managed. The HF team consists of a General Cardiologist, Endocrinologist, Internal Medicine/Respirologist, Heart Function Nurse/Certified Diabetes Educator, Respiratory Therapist, ECHO technicians, Stress Technicians and a Heart Failure Medical Specialist (Figure 1).



**Figure 1: THE CHARM TEAM.**

The clinic is located in Northeast Calgary, which has a high number of visible minorities of low socioeconomic status, coupled with language barriers, as many have English as their second language. The clinic is located close to a CTRAIN/bus route, and provides free parking. The clinic is also close to Calgary Lab Services. The clinic also provides services to the surrounding township of Chestermere, Strathmore, and Airdrie. The total number of family physicians that our clinic serves is over 200, with a catchment area of over 400,000.

At present, when a family physician refers a patient, the patient is assessed by the General Cardiologist, to confirm diagnosis. Once confirmed, the patient is then given a second appointment with a HF RN to provide assistance with self-management, patient education and optimization of proven therapies. The patient is followed up by the nurse until seen by the HF specialist. Patients who do not have a HF diagnosis will receive continued care in the general cardiology clinic. During this process, patients can also be referred to other specialties within the clinic to address their other co-morbidities and/or risk factors. Please see figure 2 for the 'Referral Process' at the CHARM clinic.



**Figure 2:** The referral process for the CHARM clinic.

The Wagner model for CDM was the chosen model because it provides a framework to address health care issues at multiple levels. At a patient level, the CDM model introduces concepts of patient self-management. But the model also addresses health care delivery at a higher patient population level. To address the gaps at the population level, CHARM also incorporated Intermediate Care (IC) to help alleviate the strain found at both the primary and tertiary levels of care.

IC is an alternative solution in health care delivery to address the strain that is seen at both the primary and tertiary care levels. The concept came into existence in order to address the pressures on both the acute care system by preventing unnecessary hospitalizations and premature long term care admissions by supporting more individuals in the community [21]. According to Millar, *et al.* IC is a term “for patient services that do not require the resources of a general hospital but are beyond the scope of the traditional primary care team. IC aims to promote timely discharge from the hospital, prevent unnecessary hospital admissions and reduce the need for long term residential care by optimizing functional independence” [21]. As a result of both the Wagner’s model of CDM and the concept of Intermediate Care (IC), the CHARM HF clinic came into existence as a direct response to not only address the gaps in HF management, but also to address and alleviate the strain on the 2 levels of health care delivery.

### **CHARM model within WAGNER’s CDM framework**

#### **Self-management support (SMS)**

According to the Wagner model, SMS are interventions that provides patient empowerment and facilitates self-management of their health. Self-management allows patients to be the center of their own health. Internal and External resources need to be utilized to support continued patient self-care [22].

At CHARM, patients are taught self-care by providing them with a one to one session with a nurse, who teaches them about daily weights, fluid/sodium restrictions and warning signs that their HF is getting worse. Teaching patients these topics puts the control back into the hands of the patients and empowers them to take charge of their own health. Taking such ownership helps to shift the focus away from the disease towards preventative health.

Second, patients are provided with patient handouts which also cover the topics of self-care that have already been discussed. Again, verbal cues in addition to visual cues also helps to tap into the different learning styles that individual patients have. Therefore, increasing understanding of the material presented.

Third, patients are also given a clear and concise action plan or goals on which they should focus on until their next visit. These goals are mutually agreed upon between the nurse and patient. Again, adopting the notion that care should be patient focused, which helps to improve patient outcomes.

Fourth, CHARM has also developed a patient needs assessment which will be completed by patients to understand their perceived gaps in care. Once identified, these areas can be addressed by holding brainstorming sessions.

#### **Delivery service design (DSD)**

The Wagner model encourages effective, efficient delivery of clinical care and self-management support. The focus is away from reactionary intervention to proactive wellness focus. The involvement of non-physician professionals to the health team is encouraged. Regular follow up that involves evidence based intervention is also encouraged [18].

At CHARM, nurses specialized in HF are responsible for patient teaching, medication titrations, side effect management and case management which is consistent with Wagner’s model. Again at CHARM, there is a focus on preventive health. There is a team of multiple specialists on site. The goal is to address the multiple risk factors associated with heart failure, including diabetes, sleep apnea, hyperlipidemia, hypertension, thyroid disorders, and asthma/COPD which can lead to reduced long complications in the future. In addition, by having the expertise in house to address the complex needs of these patients in the community, GPs have another alternative to manage the HF patients that are too sick to be managed within their own primary care practice. GP can refer them to our clinic to address the complex, high acuity level of these patients, which will lead to reduced rates of hospitalizations and ER visits; in turn helping to reduce the economic burden of the disease; which, is the underlying concept behind Intermediate Care.

Specifically, our clinic has access onsite to the following:

- a) **Endocrinologist:** To address issues with blood sugars, cholesterol, lipids, weight and thyroid disorders
- b) **Internal Medicine (Respiralogist):** To address issues with underlying COPD/asthma or sleep apnea disorders
- c) **General Cardiologist:** To address the timely diagnosis of HF in patient population
- d) **Sleep Study Specialist:** To address underlying issues with sleep
- e) **Heart Failure (HF) Specialist:** To address ongoing medical treatment that is based on current clinical practice guidelines

### **Decision support (DS)**

The Wagner model describes this as providing clinical care that is consistent with clinical evidence and is patient centered [18]. At CHARM, having a HF specialist on site to manage HF patient helps to ensure that HF guidelines are being followed but also at the time helps to educate other HCP teams on the HF guidelines as well. All HF patients referred to our clinic will be assessed and treated by our HF specialist. In addition, CHARM also holds regular Continuing Medical Education (CME) sessions to educate family physicians on the guidelines as well.

### **Clinical information systems (CIS)**

The Wagner Model states CIS can help to organize patient data at both a patient level and population level. By doing so the hope is to provide more efficient and effective patient care. CIS also help to ensure more thorough patient care [18]. At CHARM, the clinic uses an EMR to help facilitate patient care. The EMR is used to schedule patient appointments, tracking and follow up with no show/cancelled appointments, and follow up with abnormal labs/test results. Our clinic also has access to NETCARE; which is a provincial database which records all prescriptions, labs results, ER visits, diagnostics tests/procedures and consults done on patients. CHARM is in the process of developing a clinic specific data base which will help to track clinical outcomes including collecting data on clinical outcomes, weight, labs, diagnostics tests. The information collected in the database will then be used for quality improvement initiatives and ongoing research to address gap in current knowledge surrounding HF.

### **Community resources and polices (CRP)**

The Wagner model defines CRP as a mobilization of community resources to meet patient needs. This helps to make the health care system more accessible [18]. At CHARM, the clinic is close to public transit and parking is free. Since the clinic services a high number of immigrants and patients of low socioeconomic status (SES), having to not pay for parking can ease the financial burden for this patient population. The clinic is also close to Calgary Lab Services and diagnostic imaging centers, again ease to these services help to eliminate any potential barrier in having diagnostics and procedures done in a timely manner. Staff members that speak other languages, similar to the patient population, further helping to remove any cultural and language barriers that may be present.

CHARM will work closely with community pharmacists to provide medication reconciliation and medication reviews. CHARM also plans to develop partnerships with existing community resources, for examples PCNs, to avoid duplications of services. CHARM is also associated with the DILWalk Foundation, which is a nonprofit organization focusing on increasing the awareness of heart disease using a primary prevention approach. They hold an annual event, where community members can get basic heart health screening, including blood pressure, waist circumference, neck circumference and blood sugar values. In addition, participants have access to multiple allied health professionals to direct questions to and learn information. The focus is prevention with an emphasis on the South Asian population.

### **Health system (HS)**

The Wagner model defines this as the mobilization of support at all levels of organization. Higher leadership positions need to identify and highlight quality improvement in patient care as being important and facilitate learning from error. Ongoing learning to improve the

system [18]. CHARM has developed relationships with the Faculty of Nursing and the clinic has been involved in research in the area of Heart Disease and the South Asian community. Relationships have also been developed with experts in the Heart Failure to further highlight the need for this community clinic.

### **Outcomes/goals**

Research has shown that incorporating a CDM model in the management of HF patients has several benefits. According to researchers Atienza, *et al.* and Gustafsson, *et al.* the DM management model helps to intensify and optimize proven drug therapy, provide appropriate investigations/test to HF patients, provide education around self-care, and provide support to patients, physicians and other HCP [23,24]. High risk HF patients also seem to have the greatest benefits from Disease Management Programs (DMPs). Research has also shown a reduction in hospitalizations, reduced length of stay and an increased utilization of evidence based therapies [5]. According to Roccaforte, *et al.* reduced mortality and hospitalizations were also seen when patients were managed using the chronic disease management approach [25]. According to Ross, *et al.* the most common cause of hospitalizations for HF patient are medication and dietary non-adherence, therefore, further supporting the importance of patient self-care and the need for regular, consistent follow up with a HCP specialized in HF [5]. By doing so, the risk of hospitalization is reduced and further improving the quality of life of patients with heart failure.

As a result, the CHARM model plans to mimic these similar research outcomes of optimization by: increased utilization of proven medical therapies, reduced hospitalizations, reduced mortality, improve patient self-care management and finally patient's quality of life.

The CHARM clinic hopes to increase access to HCP specializing in HF for other HCP practicing in the community. Specifically, for GPs who are not comfortable or familiar with what the current evidence based medications are for heart failure, now have the option to refer their patients to the CHARM clinic for further management. In addition, GPs can also refer their patients to the CHARM clinic when a diagnosis of HF is suspected, but not yet confirmed, which allows for quicker access to specialized HF treatment.

To further address these gaps at the primary care level, ongoing and continuous medical education events hope to be planned in the future to further educate health care professional on heart failure.

Lastly, the CHARM clinic also plans to address the multiple comorbidities associated with HF, including sleep apnea, diabetes, hypertension, hyperlipidemia, asthma and COPD. This is done by having multiple specialists on site, who can address each of these. The clinic hopes to expand the number of HCPs by adding additional Nurses, Nurse Practitioners, Dieticians, Pharmacists and Exercise Physiologists to the team.

### **Impact so far**

We performed an economic-impact assessment study to determine the healthcare costs saved by the CHARM clinic during January 2016 to February 2017 (unpublished findings). The demographic and clinical data of the patients visiting the CHARM clinic was extracted from patient charts and from the NETCARE system. The average HF-related hospitalization cost per patient in Canada was derived from previously published literature and from inflation data from Statistics Canada. The number of hospitalizations saved was defined as the number of NT-proBNP events in patients visiting CHARM clinic, which would otherwise have led to patient hospitalization. Total healthcare cost saved was determined by multiplying average HF-related cost with the number of hospitalizations. CHARM clinic prevented 78 HF-related hospitalizations. In Canada, the current average HF-related hospitalization cost per patient (including physician and medications cost) was determined to be approximately \$20,000. Based on this cost, CHARM clinic saved \$1.56 million in healthcare costs during the time period examined. The clinic also saved ~780 "bed days" for HF patients. In addition, our data indicates that it is more economical to manage HF patients via HF nurses (LPNs) in community-based clinics versus hospitalization and/or rehospitalizations of HF patients (cost of hiring HF nurse vs healthcare savings = ~\$1:\$24). A limitation of these findings is that we have derived the cost saved from previously published literature and from inflation data from Statistics Canada as the current HF-related costs are not available. The current HF-related costs may be different than what we have derived.

### **Long term goals/next steps**

The CHARM clinic has also been involved with long term planning as well. The goal is to continue to expand the database to collect information around more clinical outcomes and parameters. With the eventual goal, to engage in research which will further address the gaps in the treatment of HF patients.

In the near future, the CHARM clinic website will be expanded to include more patient related resources focused on heart failure, with the plan to develop and include more culturally sensitive patient handouts.

To facilitate more understanding around heart failure within the greater medical community, the clinic also plans to host continuing medical education (CMEs) to improve the understanding of the current evidence and guidelines around HF. The eventual end goal is to standardize HF treatment; therefore eliminating any discrepancies in HF treatment.

CHARM also plans to start a cardiac rehabilitation program to provide medically supervised exercise programs in order to improve the overall health and well-being of people who have heart problems.

### **Conclusions**

We speculate that the “CHARM Clinic” model that runs with LPN (with 2-year training) vs traditional nurses in a cardiologist office would present an excellent alternative to managing HF in Canada. In addition, our data could also be used to perform a comparative analysis with the current model or another alternative model which may be the pipeline to determine the best available model for managing HF in Canada. The main goals of CHARM clinic are to 1) help keep patients in the community and out of the hospital, which would reduce healthcare costs; and 2) provide assistance to HF patients with self-management, education and optimizing medications, which would improve patient outcomes and survival. It is thus, important for health authorities to support and providing support for community based clinics where patients’ health is managed by nurses. Providing funding for LPNs/RNs/NPs in specialist physicians’ office can significantly save healthcare costs and improve patient outcomes.

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