

# Improving Chronic Disease Management: A Powerful Business Case for Congestive Heart Failure

*Sponsored by AstraZeneca Inc.*



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#### Confidentiality/Validity

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## 1. EXECUTIVE SUMMARY

*“Today in the United States chronic disease is the major cause of disability, is the main reason why people seek health care, and consumes 70% of health care spending. With acute disease, the treatment aims at return to normal. With chronic disease, the patient’s life is irreversibly changed. Neither the disease nor its consequences are static. They interact to create illness patterns requiring continuous and complex management.”* (Holman and Lorig, 2000)

The number of persons with chronic illness is growing at an astonishing rate due in part, to the aging of the population, lifestyle habits, such as increased incidence of obesity, and the greater longevity of persons with many chronic conditions.

Congestive Heart Failure is a chronic health condition that occurs when the heart is unable to pump enough blood to meet the needs of the body’s tissues. Congestive Heart Failure affects approximately 400,000 Canadians. The incidence and prevalence of Congestive Heart Failure in Canada will continue to rise as the population ages – some estimates indicate that Congestive Heart Failure will nearly double by year 2030.

Over 37,000 British Columbians are impacted by Congestive Heart Failure. The total estimated cost [i.e. both primary and secondary diagnosis] of Congestive Heart Failure in British Columbia for the period 1995-2000 is in the range of \$85 million to \$96 million annually. This includes physician, hospital and pharmaceutical costs.

Approaches to chronic disease management include some combination of initiatives to build capacity at both the patient and physician level including:

- Support for patients in the management of their disease.
- Explicit delegation of tasks for primary care physicians.
- Optimization of drug management.
- Intensive and systematic patient follow-up.
- Use of multidisciplinary teams to deliver care.
- Application of performance measurement tools to track quality of care and evaluate effectiveness of interventions.
- Effective organization of care and services to achieve health outcomes and lower costs.
- Research on innovative methods to support people with chronic illness.

A notable chronic disease management initiative is *Improving Chronic Illness*, a national program of the Robert Wood Johnson (RWJ) Foundation in the United States. This program led to the development of the *Chronic Care Model* that integrates the community; the health system; self-management support; delivery system design; decision support and clinical information systems.

The implementation of the *Chronic Care Model* is being proposed for Congestive Heart Failure in British Columbia.

Specifically the Congestive Heart Failure Initiative consists of the following components:

1. **Population Actions:** Congestive Heart Failure registries, performance measurement and prevention services.
2. **Provider Actions:** clinical practice guidelines, standards of care, shared care and community networks.
3. **Patient Actions:** patient survey, patient recall and follow-up, patient education resources, patient care plans and patient efficacy training.

In order to assess whether a business case exists for a Congestive Heart Failure Initiative in British Columbia a financial analysis, a risk analysis and a feasibility analysis was conducted on the proposed investment. Using a Net Present Value approach it was determined that a Congestive Heart Failure Initiative when implemented throughout the province would realize a payback within 3 years – an attractive investment proposition. The analysis showed that the benefits gained from the significant reduction in hospital costs for Congestive Heart Failure more than offset any increase in costs for patient support and pharmaceuticals. However, the financial analysis did expose some significant risks associated with immediately implementing a provincial solution.

The most significant risks are scope, delivery model, benefits, implementation model and costs. The financial analysis, specifically the identification of the costs and benefits, was based on the MULTIFIT Cardiac program in the United States. While the MULTIFIT program has many similar components it is not the same as the Chronic Disease Model being proposed for implementation in British Columbia. The Chronic Disease Model needs to be tested to determine if the same magnitude of costs and benefits apply. Further, the MULTIFIT benefits were realized within the U.S. health system and at this time it is not clear whether the same order of benefits can be derived in Canada. In addition it is critical that key professional groups, namely physicians and nurses buy-in and are committed to use the Chronic Disease Model. After all, this is a different way of doing business.

For these reasons it was concluded that the most feasible staging of a Congestive Heart Failure Initiative would be to start with a local implementation within two Health Authorities in British Columbia. The Vancouver Coastal and Northern Health Authorities have been proposed, in part because of the physician leadership and interest in both these locations. It is anticipated that the first stage of the Congestive Heart Failure Initiative would commence late in 2002.

## 2. INTRODUCTION

### 2.1. Background

For the past several years, health interests in British Columbia have recognized a need for better approaches to the management of chronic disease. Today, health care providers and decision-makers acknowledge multiple challenges to effective chronic disease management. These include the under-coordination of health services, limited incentives and training for health care professionals, poor diagnostic methods, limited disease management protocols, lack of patient involvement in managing disease, and stove-piped funding mechanisms. These realities underpin recent efforts to change existing structures and practices in order to advance professional practice in chronic disease management, and improve health outcomes for people living with chronic illness. Most recently, the focus in British Columbia has been on Congestive Heart Failure. In July 2001, the Congestive Heart Failure Initiative was established to develop and implement a Congestive Heart Failure disease management initiative in British Columbia [see Appendix A for Collaborative members]. Background information on the genesis of the Congestive Heart Failure Initiative and its work to date follows.

#### **Getting Started, July 2001**

The inaugural meeting of the Congestive Heart Failure Initiative convened in Vancouver on July 18, 2001. Meeting participants included representatives from the BC Ministry of Health Services, St. Paul's Hospital, Heart & Stroke Foundation of BC and Yukon, the (former) Vancouver/Richmond Health Authority, and AstraZeneca Canada Inc. At the same time, the BC Medical Association's Joint Utilization Committee was working to identify priority actions for chronic disease. The central purpose of the inaugural meeting was to discuss individual interests relating to Congestive Heart Failure and identify common ground to serve as a basis for a worthwhile joint initiative.

The outcomes of the inaugural meeting of the Congestive Heart Failure Initiative have been documented in a paper entitled, "*Congestive Heart Failure Synthesis Paper: A Summary of Discussions of the Inaugural Heart Failure Meeting*," (Treena A. Chomik, PhD, August 2001). This paper summarizes the discussions of the newly established collaborative and sets forth a proposed approach for Congestive Heart Failure management in BC. The collaborative's approach consisted of six elements for future action:

- Identification and monitoring of key indicators for Congestive Heart Failure
- Development of Congestive Heart Failure clinical practice guidelines
- Physician training/capacity building in Congestive Heart Failure management
- Patient training/capacity building in Congestive Heart Failure management
- Public information and education related to Congestive Heart Failure
- Research and evaluation in Congestive Heart Failure management

The inaugural meeting of the Congestive Heart Failure Collaborative concluded with a clear consensus from all parties to move forward with a Congestive Heart Failure initiative that would optimize professional practice in Congestive Heart Failure management, improve health outcomes for people with chronic disease, and yield costs-savings (through reduced readmissions) to the health care system.

### **Identifying Priorities, September 2001**

The inaugural meeting of the Congestive Heart Failure Collaborative was followed by a round of data collection which consisted of (a) interviews with members of the collaborative, (b) a review of the published, peer-review literature, and (c) an internet search for Congestive Heart Failure initiatives in other jurisdictions. The findings of this exercise have been documented in a paper entitled, “*Congestive Heart Failure Project: Expanding Our Approach*,” (Treena A. Chomik, PhD, October 2001). This paper identifies a menu of strategies and interventions for improved Congestive Heart Failure management in British Columbia – as proposed by the members of the Congestive Heart Failure Collaborative. Additionally, the paper links proposed strategies to established chronic disease management models and best practices in this field.

### **Preparing for Action, November 2001**

At its most recent meeting in November 2001, the Congestive Heart Failure Collaborative identified three “action levels” for effective Congestive Heart Failure management. *Action Level 1* occurs at the population level. It aims to determine the scope and extent of Congestive Heart Failure in British Columbia, and to institute methods to track and monitor key Congestive Heart Failure indicators. *Action Level 2* involves health care providers. It pays particular attention to physician resource development and the adoption of best practices in Congestive Heart Failure management. The patient is the focus of *Action Level 3* that centres on the development of patient resources and tools, as well as methods to engage patients in the management of their disease.

The three action levels build on established chronic disease management models; notably, the *Chronic Care Model (CCM)* developed by the Group Health Cooperative in Puget Sound and the Institute for Health Improvement of Seattle, and the *Expert Patient Model* which originated in the United Kingdom. The action levels and associated disease management models are discussed in greater detail in later sections of this paper. The action levels, along with evidence to support their adoption, are fully described in a paper entitled, “*Proposal to Develop and Implement a Congestive Heart Failure Management Plan*.” (Treena A. Chomik, PhD, November 2001).

### **Next Steps**

Expectations of the Congestive Heart Failure Collaborative to successfully launch and implement a Congestive Heart Failure initiative are high. This initiative can facilitate structural changes to the health care system and facilitate comprehensive, evidence-based approaches to chronic disease management in BC. By serving as a template for chronic disease management, the Congestive Heart Failure initiative can guide the systematic development and implementation of similar initiatives in other chronic diseases. Taken together, these actions can contribute significantly to a reduction in the burden of chronic disease in British Columbia in the years to come.

Much of the developmental work of the Congestive Heart Failure Collaborative is now complete, and the members of the collaborative are ready to move forward. Advancement of the Congestive Heart Failure Initiative for British Columbia rests on a series of next steps that include the following:

- Development of a business plan
- Funding of the Congestive Heart Failure Initiative
- Leadership Council approval and announcement of the Congestive Heart Failure initiative
- Establishment of a steering committee and project coordination mechanism
- Development and implementation of a detailed work plan
- Operation of the Congestive Heart Failure Initiative

The purpose of this paper is to address the first step – development of a Congestive Heart Failure Business Plan for British Columbia.

## 2.2. Scope, Objectives and Approach

The scope of the Congestive Heart Failure business plan is:

- Congestive Heart Failure – a health condition where the heart is unable to pump enough blood to meet the needs of the body’s tissues, as designated by ICD-9 code 428.
- Business Plan – describe the business case for implementing a provincial Congestive Heart Failure Initiative, as well as a plan for a staged implementation in British Columbia
- British Columbia – the province of British Columbia in Canada

The primary objective of the Congestive Heart Failure business plan is to determine if a business case exists for a Congestive Heart Failure Initiative in British Columbia – in other words is this initiative worthy of investment.

Using a small working group from Ministries of Health and AstraZeneca staff to direct the project, provide input and access to Ministry data, as well as obtain input and feedback from key experts, Sierra Systems has been able to draft a business plan for wider review and feedback.



## 3. CONGESTIVE HEART FAILURE MANAGEMENT

To set the context for the business plan, a brief overview of Congestive Heart Failure, chronic disease management, and its applicability to British Columbia is provided.

### 3.1. What is Congestive Heart Failure?

The term Congestive Heart Failure belies its true nature, it does not mean that the heart has actually failed or stopped functioning. Rather, Congestive Heart Failure is a health condition that occurs when the heart is unable to pump enough blood to meet the needs of the body's tissues. To function effectively, our bodies depend on the heart's pumping action to deliver oxygen and nutrient rich blood.

With Congestive Heart Failure, the heart-pump is ineffective causing the blood to 'back up' and the heart to become 'congested'. This congestion leads to fluid accumulation in the lungs, kidneys and other body tissues. As a result, the person may experience fatigue, shortness of breath, diminished exercise capacity and retention of fluid (swelling). Everyday activities, such as walking, doing household chores and climbing stairs, become difficult.

Although there is usually no cure, Congestive Heart Failure can be managed by making healthy changes in daily life, including home support and rehabilitation, diet and weight, rest and exercise, stress reduction as well as a regimented medication program. To obtain a different perspective on Congestive Heart Failure a vignette detailing the condition is included in Appendix B.

### 3.2. The Burden of Cardiovascular Disease in Canada

For statistical purposes Congestive Heart Failure is categorized as a cardiovascular disease and is designated by the International Classification of Disease (ICD) code ICD-9-428. Cardiovascular diseases are defined as diseases and injuries of the cardiovascular system: the heart, the blood vessels of the heart, and the system of blood vessels (veins and arteries) throughout the body and within the brain. Stroke is the result of a blood flow problem in the brain. It is considered a form of cardiovascular disease.

The exact number of Canadians who have cardiovascular disease is unknown. It is estimated that one in four Canadians has some form of heart disease, disease of the blood vessels or is at risk for stroke. If this estimate is accurate, approximately eight million Canadians have some sort of cardiovascular disease.

Cardiovascular disease accounts for the death of more Canadians than any other disease. In 1998 (the latest year for which Statistics Canada has data), cardiovascular disease accounted for 79,389 Canadian deaths. Of this number 54% of all cardiovascular deaths are due to coronary artery

disease; 20% to stroke; 16% to other forms of heart disease such as problems with the electrical system of the heart, viral heart infections, and heart muscle disease [i.e. Congestive Heart Failure], and the remaining 10% to vascular problems such as high blood pressure and hardening of the arteries. Cardiovascular diseases cost the Canadian economy over \$18 billion a year according to a 1994 study by the Heart and Stroke Foundation.

### 3.2.1. Congestive Heart Failure in Canada

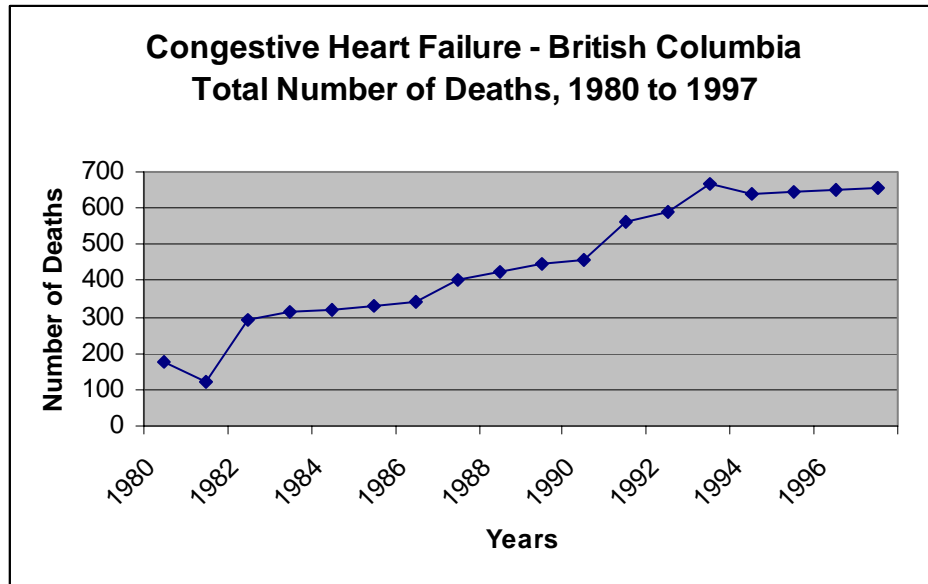
Congestive Heart Failure always occurs within a setting of cardiac disease and usually develops subsequent to injury to the heart from a heart attack, long-term high blood pressure, and an abnormality of the heart valves or diabetes. Congestive Heart Failure in Canada has the following attributes:

- Congestive Heart Failure affects approximately 400,000 Canadians.
- About 4,500 Canadians die from Congestive Heart Failure each year.
- Congestive Heart Failure is the most common cause of hospitalization of people over 65 years of age. Studies show that most people who have impaired cardiac function are unaware of the problem and about 30% will develop heart failure in the subsequent 3 years; among these, the survival rate is only 62%.
- The incidence and prevalence of Congestive Heart Failure will continue to rise as the population ages – some estimates indicate that Congestive Heart Failure will nearly double by year 2030.
- Congestive Heart Failure is characterized by high rates of re-hospitalization, attributable in part to a lack of treatment adherence and patient knowledge deficits.
- The major impact of Congestive Heart Failure on acute care services has been on CCU beds, catheterization laboratories and diagnostic services.
- Despite medical management, recent data suggest that the Congestive Heart Failure mortality rate may be as high as 40% to 50% in the two years following treatment.

### 3.2.2. Congestive Heart Failure in British Columbia

Congestive Heart Failure in British Columbia reflects the trend in Canada as a whole. More specifically for British Columbia:

- Congestive Heart Failure affected 37,302 British Columbians in 2000/01.
- The incidence of Congestive Heart Failure in British Columbia continues to increase over the past decade, even though the incidence of coronary heart disease, stroke and myocardial infarction has decreased.
- 658 British Columbians died from Congestive Heart Failure in 1997, when Congestive Heart Failure was recorded as the **primary** cause of death [note: this is the latest year that mortality data is available]. The number of deaths has tripled since 1980.



Source: Health Canada, Cardiovascular Disease Online, <http://cythera.ic.gc.ca>

- The estimated hospital costs for Congestive Heart Failure, **both primary and secondary diagnosis**, in British Columbia for the period 1995-2000 have been calculated to be in the range of \$80 million to \$90 million. The hospitalization days per case for Congestive Heart Failure in BC for the period 1995-2000 for these diagnoses have remained steady in a range of 7.67 to 7.97.

Hospital	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Cases	13,213	13,175	13,334	13,187	13,109	12,651
Days	105,281	102,742	103,288	105,522	100,525	100,459
Days/Case	7.97	7.80	7.75	7.77	7.67	7.94
RIW	23,005.1	23,588.6	24,325.2	24,336.7	25,050.9	25,835.2
Estimated Cost	\$80,517,904	\$82,560,101	\$85,138,133	\$85,178,467	\$87,678,050	\$90,423,100

Source: BC Ministries of Health

**Notes**

1. The table was produced using acute, rehab and surgical day care level data by the BC Ministries of Health
2. Residents of BC treated out of province are included. Non-BC residents are excluded.
3. Cases have been restricted to primary and secondary diagnosis with ICD-9 code 428
4. Days are acute/rehab hospitalization days
5. The cost estimate is based on \$3,500 per Resource Intensity Weight (RIW) operating cost of a hospital
6. A RIW standardizes the expression of hospital case volumes, recognizing that not all patients require the same health care resources. Volume is then expressed as “weighted cases”.

- The cost of fee-for-service physician services for Congestive Heart Failure in BC for the period 1995-2000 has been in the range of \$4.9 million to \$5.8 million annually.

MSP	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Services	144,794	146,848	153,835	149,378	150,673	147,122
Estimated Cost	\$4,903,954	\$5,226,671	\$5,653,396	\$5,581,933	\$5,701,939	\$5,816,760

Source: BC Ministries of Health

**Notes**

1. Paid amount includes NIA and rollback
2. Excludes out-of-province claims.

- In total, the hospital and fee-for-service physician expenditures on Congestive Heart Failure in BC for the period 1995-2000 was in the range of \$85 million to \$96 million.

Total Cost	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Estimated Cost	\$85,421,858	\$87,786,772	\$90,791,529	\$90,760,400	\$93,379,989	\$96,239,860

Source: BC Ministries of Health

**Notes**

1. The cost estimate is based on \$3,500 per Resource Intensity Weight (RIW) operating cost of a hospital
- Of the 37,302 BC residents with Congestive Heart Failure in 2000/01 a total of 22,083 (59%) patients were prescribed ACE-I or ARBs for pharmaceutical treatment. The total cost of pharmaceuticals for heart failure for 2000/02 was \$8,766,446 or \$397 per patient per year.

### 3.3. Chronic Disease Management

In all developed nations, the management of people with chronic disease consumes a large portion of health care expenditures. For example, in the United States today chronic disease is the major cause of disability, is the main reason people seek health care and consumes 70% of health care spending.<sup>i</sup> The Institute of the Future in describing the ‘juggernaut of chronic illness’ predicts that by 2010 some 120 million Americans, about 40% of the total population, will be living with a chronic illness and 40% of these will have at least two chronic conditions. The Institute estimates that the direct medical costs of chronic conditions in the US will total \$600 billion per year by 2010 and goes on to say that if we try to extend today’s approach to chronic care, which is ‘fragmented, system-centric and non-empowering’, the system will collapse.<sup>ii</sup> Yet despite these predictions chronic disease is often poorly treated and ineffectively prevented.

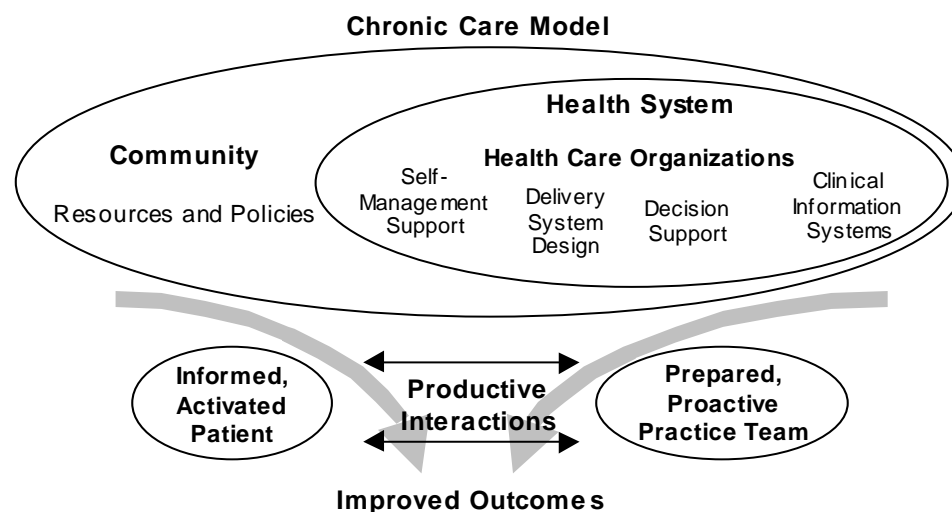
The burden of chronic disease not only impacts the health care system in terms of increased service utilization and cost; it also has profound impacts on people’s lives. People living with chronic disease face limitations in their daily activities, some find it difficult to maintain work and social activities, and others are unable to live independently.

### 3.3.1. Key Features of Chronic Disease Management

Approaches to chronic disease management include some combination of initiatives to build capacity at both the patient and physician level. In a special edition of the *British Medical Journal* on chronic disease management (February, 2000)<sup>iii</sup>, essential ingredients of chronic disease management were set forth. They include the following:

- Support for patients in the management of their disease.
- Explicit delegation of tasks for primary care physicians.
- Optimization of drug management.
- Intensive and systematic patient follow-up.
- Use of multidisciplinary teams to deliver care.
- Application of performance measurement tools to track quality of care and evaluate effectiveness of interventions.
- Effective organization of care and services to achieve health outcomes and lower costs.
- Research on innovative methods to support people with chronic illness.

A notable chronic disease management initiative is *Improving Chronic Illness*, a national program of the Robert Wood Johnson (RWJ) Foundation in the United States. This program led to the development of the *Chronic Care Model* that integrates the available literature about promising strategies for chronic disease management.<sup>iv</sup> The Chronic Care Model identifies the essential elements of a system that encourages high-quality chronic disease management. These include: the community; the health system; self-management support; delivery system design; decision support and clinical information systems.



Self-management is a central construct of the Chronic Care Model. It refers to ‘activated patients’ who are informed and willing to take actions to effectively manage their illnesses. Patients are supported by ‘prepared practitioners’ who assess and respond to patient needs, while being supported by guidelines, specialty expertise and information systems. The result is ‘productive interactions’ between patient and health care practitioners that leads to:

- Effective assessment
- Tailoring of clinical management by protocol
- Initiative goal-setting and problem solving
- Shared care plan
- Active, sustained follow-up.

The United Kingdom has also adopted several initiatives to improve the management of Congestive Heart Failure through chronic disease management approaches. This is reflected in a series of ‘national service frameworks’ for identified national health priorities. The recently developed *National Service Framework for Coronary Heart Disease* features a separate chapter on Congestive Heart Failure that outlines service standards, models, priorities, milestones, goals, and performance standards for Congestive Heart Failure management.<sup>v</sup>

### 3.3.2. The Importance of Self-Management Techniques

Self-management or user-led programs have become increasingly popular over the past twenty years. Many of today’s chronic disease self-management programs are underpinned by the work of Professor Kate Lorig of Stanford University, California, who is recognized internationally for her work in this field. Locally, Dr. Patrick McGowan of the Institute of Health Promotion Research at the University of British Columbia has conducted research in the self-management of arthritis and published several articles associated with the benefits of self-management models.

Self-management programs recognize that people with chronic illness need to deal not only with their disability but also with pain, stigma and stress on a daily basis. The programs develop coping skills and typically cover topics such as cognitive symptom management, exercise, nutrition, problem solving and communication with health professionals. Additionally, teams of trained volunteers, who themselves have a chronic condition, often lead self-management programs. By providing patients with information and developing knowledge of their illness, self-management programs encourage patients to work in partnership with health care providers. Patients feel more capable of dealing with the many challenges they face, and thereby, gain greater control over their disease and their lives.

Effective self-management is more than providing information or telling patients what to do. It requires giving patients a central role in determining their care, one that fosters a sense of responsibility for their own health. Under a chronic disease self-management approach, patients and health care providers work together to define problems, set priorities, establish goals, create treatment plans and solve problems along the way.

One exemplar initiative has been developed and implemented in the United Kingdom. It is described in a recently released document entitled, *The Expert Patient: A New Approach to Chronic Disease Management for the 21<sup>st</sup> Century*.<sup>vi</sup> The Expert Patient program is designed to reduce the severity of symptoms and improve the confidence, resourcefulness and self-efficacy of patients so that they are empowered to assume responsibility for the management of their disease. An underlying assumption of this initiative is that ‘the knowledge and experience held by the patient has for too long been an untapped resource’, and that today’s patients with chronic diseases need not be ‘mere recipients of care’. Rather, they should become key decision-makers in the treatment and management of their disease.

### 3.4. Chronic Disease Management and Congestive Heart Failure

Some research does exist that demonstrates the effectiveness of managing Congestive Heart Failure through a chronic disease management model. Two examples are provided below.

**Case 1:** The MULTIFIT Program for Cardiac Solutions, a physician-supervised, nurse-mediated, home-based system for heart failure management implements consensus guidelines using a nurse manager to enhance dietary and pharmacological adherence and to monitor clinical status by frequent telephone follow-up.<sup>vii</sup> Fifty-one participants in the study were patients hospitalized at a Kaiser Permanente medical centre in Northern California in the previous 12 months with the primary or secondary diagnosis of heart failure, or outpatients referred for treatment of heart failure. Over a thirteen-month period the daily dietary sodium intake of participants fell by 38%; average daily medication doses increased significantly, and functional status and exercise capacity improved significantly. In addition, the frequency of general medical and cardiology visits declined by 23% and 31% respectively; emergency room visits for heart failure declined by 67%, hospitalization rates declined 87%, and overall costs were reduced by 55%. The MULTIFIT system enhanced the effectiveness of pharmacological and dietary therapy for heart failure in clinical practice, improving clinical outcomes and reducing medical resource utilization.

**Case 2:** A meta-analysis of the literature on chronic disease management approaches for Congestive Heart Failure evaluated the impact of comprehensive, multidisciplinary management programs on the process of care, resource utilization, health care costs, and clinical outcomes in patients with Congestive Heart Failure.<sup>viii</sup> Five of the studies reported improved functional status, aerobic capacity, and patient satisfaction. Six of the studies reported a 50% to 85% reduction in the risk of hospital admission. Three studies reported economic analysis and suggested evidence of financial benefit. The review article concluded that comprehensive, multidisciplinary management programs for Congestive Heart Failure can improve functional status and reduce the risk of hospital admission, and may lower medical costs.

### 3.5. The Components of a Congestive Health Failure Initiative

This section discusses the components of the proposed Congestive Heart Failure Initiative – namely population, provider and patient components.

### 3.5.1. Population Components

In order to determine the scope and extent of Congestive Heart Failure in BC and to monitor, track and report on key indicators for Congestive Heart Failure, the following elements are required.

#### 1. *Congestive Heart Failure Patient Registries (Provincial/Regional)*

Using data from the BC Medical Service Plan, as well as hospital data the Congestive Heart Failure Patient Registries will track people with clinical evidence of Congestive Heart Failure, as well as people at high risk of Congestive Heart Failure (e.g., people with myocardial infarction, angina pectoris, hypertension and diabetes). The registries would be capable of identifying patients with modifiable risk factors for Congestive Heart Failure, including smoking, physical activity, blood pressure serum cholesterol and plasma glucose. A provincial Congestive Heart Failure Registry would have the capability to be searched for patients who have not received follow-up care in the recommended period of time. Registry data will support outcome evaluation of the Congestive Heart Failure Management Plan.

#### 2. *Performance Measurement*

Identify the key indicators to measure the performance of the Congestive Heart Failure Initiative. Once baseline measures are obtained set targets for improvement in Congestive Heart Failure (e.g. reduce the hospitalization rate by an identified percentage). Collect data over time to populate the indicators and produce an annual report using a report card format to facilitate easy reading and comparability of outcomes from one year to another.

#### 3. *Prevention*

The use of workplace screening programs to take people at high risk of Congestive Heart Failure and implement lifestyle programs and other measures that will reduce that risk.

### 3.5.2. Physicians and Health Care Providers Components

In order to build physician and health care provider capacity in Congestive Heart Failure management and to close the gap between current practice and best practice in the management of Congestive Heart Failure, the following components are required.

#### 1. *Practice Guidelines Development and Use*

Practice guidelines are an essential component of any chronic disease management strategy. They will include some combination of the following:

- Patient assessment
- Methods and indications for relevant clinical investigations
- Therapy, treatment and medication
- Indications for referral



- Local arrangements for referral to specialists and Congestive Heart Failure clinics
- Methods to involve patients
- Arrangements for patient education and family support
- Arrangements for follow-up and review

A Canadian review showed that variables that affect the adoption of guidelines include: the quality of the guidelines; characteristics of the health professional; characteristics of the practice setting; and, incentives and regulations.<sup>ix</sup> This study also ranked the effectiveness of various adoption mechanisms. Lowest ranking went to traditional continuing medication education and mailings. Information targeted to specific providers and delivered by peers or opinion leaders ranked moderately effective. Reminder systems, academic detailing and multiple interventions ranked most effective.

A process to develop Congestive Heart Failure practice guidelines is underway. It is occurring under the guidance of the Guidelines and Protocols Advisory Committee (GPAC), established by the Medical Services Commission to oversee and coordinate guideline development and implementation in BC. The practice guidelines will be reviewed every two years or sooner, as new and relevant information becomes available.

## *2. Standards of Care*

Clinical practice guidelines will be translated into various evidence-based tools and templates to support practice decisions and include clinical pathways and management algorithms. Technology can be used to support physician assessment tools, care templates, algorithms, etc, and provide clinical cuing systems to increase conformance to standards of care. Standards of care will also be made available to patients as a way to increase their understanding of best practices in the management of their illness.

## *3. Shared Care*

Identify and implement physician reimbursement and incentive mechanisms to encourage **shared care** between specialists and general practitioners. Services such as patient assessment and care planning, self-management training and support, and active follow-up must be adequately reimbursed if they are to become part of routine patient care.

Shared care initiatives will include:

- **Telephone consultations** where specialist salaries are compensated for time spent conducting telephone consultations with general practitioners in communities around the province.
- **Physician training** such as Congestive Heart Failure management seminars, “train the trainer” initiatives and quarterly teleconference series.

These kinds of programs build capacity province-wide and encourage the consistent application of standards of care.

#### **4. Community Networks**

Encourage community-based agencies, community health care providers, and existing community networks to work toward improved Congestive Heart Failure management, including social supports, healthy public policies, and healthy lifestyle (risk reduction) programs. Encourage patient advocacy groups to continue to play their critical role in ensuring that all persons afflicted with Congestive Heart Failure have access to appropriate care. Establish a centralized Congestive Heart Failure Resource Center that will house relevant materials and resources for distribution to community groups and other interested parties.

### **3.5.3. Patient Components**

In order to build patient capacity in Congestive Heart Failure management and to facilitate patient self-management, the following elements are required.

#### **1. Patient Surveys**

Patient surveys are an effective way of incorporating patients' perspectives into Congestive Heart Failure management. This survey consists of questions related to diagnosis, treatment, coping strategies, needs and challenges.

#### **2. Patient Recall and Follow-up**

Institute a **patient recall** system where the Provincial Congestive Heart Failure Registry will be searched for patients who have not received follow-up care in the recommended period of time and alerts generated to notify these patients immediately. Research indicates that specialized follow-up after hospital discharge can improve the outcome of patients with heart failure. The Initiative would institute mechanisms for effective **patient follow-up**, such as home visits or home-based interventions, telephone follow-up and follow-up clinics. Follow-up should be arranged at least every six months, however, in some circumstances, more frequent follow-up may be desirable.

#### **3. Patient Education Resources**

Effective patient education resources will help patients deal with their illness on a day-to-day basis and focus on the self-monitoring of symptoms. Patient education resources will take the form of:

- High quality printed materials
- Interactive Internet or web-based instruction
- Telehealth initiatives

Effective teaching on chronic disease must be grounded in theories of human behaviour and principles of learning and motivation. Patient self-management involves the conscious use of strategies to manipulate situations and thereby reduce the impact of disease on daily life. The patient learns what strategies work (or do not) through the process of experimentation. Patient education should not be a matter of simply providing information about the disease, but should

allow patients to develop the capacity to observe themselves, make sensible judgments, feel confident, and strive for desirable outcomes.<sup>x</sup>

#### **4. Care Plans For Patients**

An essential tool for patient self-management is the care plan, developed in partnership between the patient and health care provider(s).

Care plans provide the following:

- Identify specific problems
- Establish realistic objectives
- Set targets (expected levels of change with time lines)
- Develop strategies to achieve objectives
- Address foreseeable obstacles and challenges
- Seek written commitment to see the plan through

Care plans need to be developed in the context of patient preferences and readiness, and need to flow from best practices for Congestive Heart Failure management (as embedded in clinical practice guidelines and standards of care).

#### **5. Self-Efficacy Training**

Some time-tested models of self-efficacy training exist and could be modified to local needs and circumstances. Typically, self-efficacy programs are run by people who themselves have a chronic condition. They cover topics such as the following:

- Pain control
- Use of medications
- Behaviour and lifestyle change
- Methods to adjust to social and workplace dislocations
- Strategies to cope with emotional reactions
- Methods to interpret changes in the disease and its consequences
- Use of medical and community resources

Self-efficacy enables participants to learn from each other and has enabled participants to experience reduced symptoms, improved physical activity and significantly less need for medical treatment.<sup>xi</sup>

By encompassing a variety of theoretical and intellectual foundations, the Congestive Heart Failure Management Plan is multidisciplinary in nature and relevant to a variety of professions and disciplines.

## 4. THE BUSINESS CASE

The business case analysis has four components:

- a description of the proposed investment;
- a financial analysis of the proposed investment;
- a risk analysis of the proposed investment; and
- a feasibility analysis of what should be done next.

### 4.1. The Proposed Investment

The vision is to implement a Congestive Heart Failure Initiative that:

*“will lead to improved health and quality of life for people with Congestive Heart Failure by supporting health care providers, patients and communities to work together toward better disease management and health outcomes”*

The development and implementation of a Congestive Heart Failure Management Plan is guided by the following principles:

- Foster patient involvement in disease management.
- Encourage shared care between general practitioners and specialists.
- Identify evidence-based interventions that aid in Congestive Heart Failure management.
- Facilitate implementation of standards of care.
- Adopt measures to inform progress and performance.
- Work collaboratively through innovative and effective partnerships to generate quality products and resources.
- Involve rural communities and utilize the benefits of technology to support information exchange and sharing of expertise.
- Adopt a comprehensive chronic disease model that works across morbidities and informs the development/implementation of similar initiatives.

### 4.2. The Financial Analysis

The financial review includes a detailed quantitative analysis of the costs and benefits over a 5-year period, including a Net Present Value analysis to determine the financial feasibility of the BC Congestive Heart Failure initiative, including all assumptions made. It must be stressed that

the financial analysis is provided for **PLANNING PURPOSES ONLY** and should not be construed to constitute the actual costs and benefits that will be incurred.

	A	B	C	D	E	F
1	<b>CONGESTIVE HEART FAILURE</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
2	BC Population	4,144,310	4,203,040	4,263,280	4,321,940	4,383,010
3	BC Population Over 65 years of Age	548,000	559,200	570,700	582,700	596,500
4	Over 65 Years of Age Population Growth	0.0204	0.0206	0.0210	0.0237	
5	BC Residents with Congestive Heart Failure	38,011	38,786	39,585	40,416	41,374
6	BC CHF Pharmaceutical Target Cases	12,407	12,660	12,920	13,192	13,504
7	<b>BENEFITS</b>					
8	GP visit reduction [23%]	\$0	\$453,615	\$709,871	\$724,778	\$741,955
9	Specialist visit reduction [31%]	\$0	\$453,615	\$956,782	\$976,874	\$1,000,026
10	Hospital visit reduction [40%]	\$0	\$18,804,164	\$38,383,059	\$39,189,103	\$40,117,885
11	Total Benefits	\$0	\$19,711,393	\$40,049,711	\$40,890,755	\$41,859,866
12	<b>COSTS</b>					
13	Pharmaceutical Use	-\$4,925,392	-\$5,025,870	-\$5,129,403	-\$5,237,120	-\$5,361,240
14	<b>1. Population Level of Action</b>					
15	CHF Patient Registry	-\$130,000	-\$60,000	-\$60,000	-\$60,000	-\$60,000
16	Performance Measurement	-\$60,000	-\$60,000	-\$60,000	-\$60,000	-\$60,000
17	Prevention	-\$150,000	-\$150,000	-\$150,000	-\$150,000	-\$150,000
18	Total Population Level of Action Cost	-\$340,000	-\$270,000	-\$270,000	-\$270,000	-\$270,000
19	<b>2. Provider Level of Action</b>					
20	Practice Guidelines Development	-\$125,000				
21	Physician Support	-\$400,000	-\$1,000,000	-\$2,600,000		
22	Standards of Care	-\$360,000	-\$360,000	-\$360,000	-\$360,000	-\$360,000
23	Shared Care	-\$360,000	-\$360,000	-\$360,000	-\$360,000	-\$360,000
24	Community Networks	-\$15,000	-\$15,000	-\$15,000	-\$15,000	-\$15,000
25	Total Provider Level of Action Cost	-\$1,260,000	-\$1,735,000	-\$3,335,000	-\$735,000	-\$735,000
26	<b>3. Patient Level of Action</b>					
27	Patient Survey	-\$110,000	-\$110,000	-\$110,000	-\$110,000	-\$110,000
28	Patient Recall & Followup	-\$5,069,781	-\$5,173,205	-\$5,279,773	-\$5,390,648	-\$5,518,406
29	Patient Education Resources	-\$76,021	-\$1,551	-\$1,598	-\$1,663	-\$1,916
30	Patient Self-Efficacy Training	-\$2,850,805	-\$58,156	-\$59,925	-\$62,347	-\$71,840
31	Total Patient Level of Action Cost	-\$8,106,608	-\$5,342,912	-\$5,451,295	-\$5,564,657	-\$5,702,162
32	<b>Other Costs</b>					
33	Congestive Heart Failure Collaborative	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000
34	Evaluation (10%)	-\$297,198	-\$113,219	-\$92,563	-\$101,545	-\$207,215
35	Total Other Costs	-\$497,198	-\$313,219	-\$292,563	-\$301,545	-\$407,215
36	<b>Total Cost</b>	<b>-\$15,129,198</b>	<b>-\$12,687,000</b>	<b>-\$14,478,261</b>	<b>-\$12,108,322</b>	<b>-\$12,475,617</b>
37	<b>Cost per CHF patient</b>	<b>\$398</b>	<b>\$327</b>	<b>\$366</b>	<b>\$300</b>	<b>\$302</b>
38	<b>BUSINESS CASE ANALYSIS</b>					
39	<b>Net (Cost)/Saving</b>	<b>-\$15,129,198</b>	<b>\$7,024,392</b>	<b>\$25,571,450</b>	<b>\$28,782,433</b>	<b>\$29,384,249</b>
40	discount rate	6%				
41	discount factor	0.9434	0.8900	0.8396	0.7921	0.7473
42	PV of Cash Flow	-\$14,272,828	\$6,251,684	\$21,470,283	\$22,798,383	\$21,957,620
43	Cumulative PV of the Cash Flow	-\$14,272,828	-\$8,021,144	\$13,449,139	\$36,247,522	\$58,205,142
44	<b>Net Present Value</b>	<b>\$58,205,142</b>				
45	<b>Pay Back Period</b>	<b>&lt; 3years</b>				

#### 4.2.1. Assumptions

**Line 1: Timeframe:** the financial analysis was conducted over a 5 year period assuming a start date of 2002. All costs are in Canadian dollars and are exclusive of any sales taxes.

**Line 2: BC Population** – total population estimates for 1981 –2026 from BC Stats.

**Line 3: BC Population Over 65 Years of Age** – population estimates by age for 1981 –2026 from BC Stats - – the target group for Congestive Heart Failure.

**Line 4: BC Population Over 65 Years of Age Growth Rate**– the rate of population growth of the elderly population based on the BC population estimates for 1981–2026 from BC Stats – the target group for Congestive Heart Failure.

**Line 5: BC Residents with Congestive Heart Failure** – the estimated number of British Columbians with Congestive Heart Failure – based on the 2000/01 number of cases in BC [individuals diagnosed with Congestive Heart Failure in BC] and the growth rate of the BC population over the age of 65 years of age.

**Line 6: BC Congestive Heart Failure Target Cases** – the estimated number of British Columbians with Congestive Heart Failure who have not had pharmaceutical treatment (i.e. ACE-I and ARBs) for the condition. In 2000/01 22,083 patients received ACE-I or ARB treatment, therefore 15,219 residents with Congestive Heart Failure did not. The 2002 number of target cases of 15,508 includes the estimated growth in the over 65 population since 2000/01.

**Line 7: Benefits** – the anticipated financial benefits derived from implementing the Congestive Heart Failure Initiative.

**Line 8: GP Visit Reductions**– the benefit associated with a 0% change in year 1, 15% decrease in year 2 and a 23% decrease in year 3 and beyond for the number of visits to family physicians that can be anticipated from a Congestive Heart Failure program. In 2000/01 for BC, the total cost of fee-for-service visits for Congestive Heart Failure was \$5,816,760. To obtain a 2003 base cost we applied the over 65 population growth of 1.9% for 2001, as well as the 2.04% for the 2002 year for a total of \$6,048,194. Further, we assumed that 50% of this cost was for GP visits. In addition the cost of GP visits was increased annually from 2004 to 2006 based on the estimated growth in the number of Congestive Heart Failure cases.

**Line 9: Specialist Visit Reductions**– the benefit associated with a 0% in year 1, 15% decrease in year 2 and a 31% decrease in year 3 and beyond for the number of visits to cardiology specialists that can be anticipated from a Congestive Heart Failure program. In 2000/01 for BC, the total cost of fee-for-service visits for Congestive Heart Failure was \$5,816,760. To obtain a 2003 base cost we applied the over 65 population growth of 1.9% for 2001, as well as the 2.04% for the 2002 year for a total of \$6,048,194. Further, we assumed that 50% of this cost was for specialist visits. In addition the cost of specialist visits was increased annually from 2004 to 2006 based on the estimated growth in the number of Congestive Heart Failure cases.

**Line 10: Hospital Visit Reductions** – the benefit associated with a 0% change in year 1, 20% decrease in year 2 and a 40% decrease in year 3 and beyond for the number of visits to hospital that can be anticipated from a Congestive Heart Failure program. In 2000/01 for BC, the total cost of hospitalization for Congestive Heart Failure was \$90,423,100. To obtain a 2003 base cost we applied the over 65 population growth of 1.9% for 2001, as well as the 2.04% for the 2002 year

for a total of \$94,020,818. In addition the cost of hospitalizations was increased annually from 2004 to 2006 based on the estimated growth in the number of Congestive Heart Failure cases.

**Line 11: Total Benefits** – the sum of the benefits derived from GP visit reductions, specialist visit reductions and hospital visits.

**Line 12: Costs** – the anticipated financial costs associated with implementing the Congestive Heart Failure Initiative.

**Line 13: Pharmaceutical Use Increase** – the yearly increase in pharmaceutical use for Congestive Heart Failure medications. We assumed that 80% of the total number of Congestive Heart Failure patients would use pharmaceuticals, therefore there would be 12,407 target cases in 2003. Based on \$397 per Congestive Heart Failure patient not already on ACE-1 or ARB pharmaceutical therapy the 2003 increase in the cost of pharmaceuticals would amount to \$4,925,392.

**Line 14: Population Level of Action** – the population-based set of activities that will be undertaken by the Congestive Heart Failure Initiative.

**Line 15: Congestive Heart Failure Patient Registry** – the cost of 0.5 FTE and some associated systems development costs to operate the patient registry.

**Line 16: Performance Measurement** – the cost based upon 1 FTE, external expert assistance and meetings.

**Line 17: Prevention** – the cost of a workplace screening and lifestyle program.

**Line 18: Total Population Level of Action Cost** – the financial costs associated with implementing the population-based activities of the Congestive Heart Failure Initiative.

**Line 19: Provider Level of Action** – the set of activities directed at health care providers that will be undertaken by the Congestive Heart Failure Initiative.

**Line 20: Practice Guidelines Development** – The cost of the FTEs in the Utilization Management Branch together with the annual cost of the MPS/BCMA Guideline & Protocol Advisory Committee is \$625,000. It is estimated the committee with the support of the staff can produce five guidelines in fiscal year 2002/2003. Therefore, 20% is for a Congestive Heart Failure guideline.

**Line 21: Physician Support** – Physician support includes: adoption of practice guidelines, physician training and ongoing support as well as web access by physicians to patient activity data. These strategies will be developed with physicians and their associations. For 4,000 physicians at a cost of \$1,000 per physician the total costs would be \$4,000,000 – this cost has been spread over 3 years.

**Line 22: Standards of Care** – \$360,000 for telephone consultation and physician training (train-the-trainer).

**Line 23: Shared Care** – Specialist support of GPs based upon \$6,000 per month x 5 regions.

**Line 24: Community Networks** –\$15,000 a year to support meeting costs.

**Line 25: Total Population Level of Action Cost** – the anticipated financial costs associated with implementing the provider-based-activities of the Congestive Heart Failure Initiative.

**Line 26: Patient Level of Action** – the set of activities directed at patients that will be served by the Congestive Heart Failure Initiative.

**Line 27: Patient Survey** – This is the cost of a part FTE, development costs with disease organizations (focus group testing), postage and telephone support.

**Line 28: Patient Recall & Follow-up** – the estimated cost of nurses to support one-third of the Congestive Heart Failure patients with intense nursing follow-up (1 nurse per 150 patients at \$60,000 per year) and two-thirds of the Congestive Heart Failure patients with telephone line follow-up using Nurseline at \$40 per Congestive Heart Failure patient loaded cost.

**Line 29: Patient Education Resources** – the education materials are already available. This item includes the cost of dissemination at \$2 per patient.

**Line 30: Patient Self-Efficacy Training** – using a community based model with volunteers including a “train the trainer” approach and extensive resources for each patient, the cost is estimated at \$75 per patient.

**Line 31: Total Patient Level of Action Cost** – the total anticipated financial costs associated with implementing the patient oriented activities of the Congestive Heart Failure Initiative.

**Line 32: Other Costs** – the other management activities associated with the Congestive Heart Failure Initiative.

**Line 33: Congestive Heart Failure Initiative** – Covers costs for strategic and administrative support, including the planning committee meetings, medical advice and communications.

**Line 34: Evaluation** – estimated at 10% of the year 1 cost (excluding the pharmaceutical cost) of the initiative.

**Line 35: Total Other Costs** – the total anticipated financial costs associated with the management of the Congestive Heart Failure Initiative.

**Line 36: Total Costs** – the sum of the pharmaceutical, population actions, provider actions, patient actions and other costs associated with the Congestive Heart Failure Initiative.

**Line 37: Cost per Congestive Heart Failure Patient** – the total costs divided by the number of BC residents with Congestive Heart Failure.

**Line 38: Business Case Analysis** – the Net Present Value Analysis to determine if the business case exists for the Congestive Heart Failure Initiative.

**Line 39: Net Cost or Saving** – the net (cost) or saving is determined by subtracting the total costs from the total benefits.

**Line 40: Discount Rate** – the discount rate is assumed to be 6% – the interest rate of a competing investment.

**Line 41: Discount Factor** – the discount factor is  $1/(1+r)^n$  where r is the discount rate and n is the period in years.

**Line 42: The Present Value Of The Cash Flow** – is the discount rate multiplied by the net (cost)/saving for each period.

**Line 43: The Cumulative Present Value Of The Cash Flow** – is the total sum of cash flow present values from period 1 to period 5 (i.e. 2002-2006).



**Line 44: The Net Present Value** – the value of the investment expressed in current dollars.

**Line 45: The Payback Period** – is the time required for the cumulative present value of the cash flow to yield a positive value – the period of time it takes for the accrued benefits to offset the costs. A preferred payback period for a new investment is often three or less years.

The financial analysis as outlined demonstrates a payback within 3 years. This is an extremely short payback period and strongly suggests that the BC Congestive Heart Failure Initiative based on the assumptions outlined is worthy of investment.

This analysis is based on costs and benefits that are derived from a Congestive Heart Failure Initiative that has the following characteristics:

- The Initiative is directed at all BC residents with Congestive Heart Failure.
- The benefits indicated are based on the MULTIFIT Program for Cardiac Solutions, with one exception – a more conservative 40% reduction in hospitalization costs versus 87% was used.
- All BC residents with Congestive Heart Failure would be placed on ACE-1 or ARB pharmaceutical therapy.
- The BC Congestive Heart Failure Initiative would have population, provider and patient levels of action.
- A BC Congestive Heart Failure Collaborative consisting of key stakeholders would be put in place to evaluate the Initiative and provide advice back to the key stakeholder groups.

The distribution of costs for the BC Congestive Heart Failure Initiative as shown below indicates that most of the cost is for patient actions and increased pharmaceutical use.

Percent of Budgeted Cost					
Level of Action	2002	2003	2004	2005	2006
Pharmaceutical	33%	40%	35%	43%	43%
Population	2%	2%	2%	2%	2%
Service Provider	8%	14%	23%	6%	6%
Patient	54%	42%	38%	46%	46%
Administration	3%	2%	2%	2%	3%

The distribution of benefits for the BC Congestive Heart Failure Initiative as shown below indicates that almost all the financial benefits are derived from reduced hospitalization costs. Only about 1% of the benefits for the initiative are derived from physician services.

Percent of Budgeted Benefits					
Level of Action	2002	2003	2004	2005	2006
GP Visit Reduction	0%	2%	2%	2%	2%
Specialist Visit Reduction	0%	2%	2%	2%	2%
Hospital Visit Reduction	0%	96%	96%	96%	96%

### 4.3. The Risk Analysis

The identification of the types and magnitude of risk associated with implementing the Congestive Heart Failure Initiative in British Columbia include the following:

Type of Risk	Level of Risk		
Scope Risk	High		
Service Delivery Model Risk	High		
Benefits Risk	High		
Implementation Model Risk		Medium	
Cost Risk		Medium	
Quality of Care Risk			Low
Professional Practice Risk			Low
Management and Operation Risk			Low
Technology Risk			Low

For the high and medium risk items the following analysis applies and must be taken into consideration when considering what implementation options are feasible for the Congestive Heart Failure Initiative in British Columbia.

#### 4.3.1. Scope Risk: High

- Some success has been achieved in the United States new chronic disease management models, directed at Congestive Heart Failure. These implementations have had a tightly managed scope – for example, the MULTIFIT Program for Cardiac Solutions where there are proven paybacks. The MULTIFIT approach has yet to be used in Canada and is not being proposed “as is” for implementation in British Columbia. The Chronic Care Model that is proposed has yet to be tested and proven for Congestive Heart Failure.
- The risk in the Canadian setting is to want to expand the scope “to be all things to all people” –disease management, self care, health promotion and prevention, health information line, providers network and so on. This tendency is caused by the Canadian health care setting being broader in scope and less confined by a controlled (i.e. insurance/HMO) service delivery model than the US.
- This risk can be reduced if the initial scope of Congestive Heart Failure is confined to what has been successful in other jurisdictions.

#### 4.3.2. Service Delivery Model Risk: High

- Chronic Disease Management in the US has been associated with the development and evolution of managed care organizations. It has been very successfully implemented within that service delivery model.
- There has not been the same level of implementation and success with the chronic disease management model in Canada – especially as it relates to Congestive Heart Failure.

- The implementation of chronic disease management (i.e. Congestive Heart Failure) as a part of a primary care reform initiative runs the risk of having it being seen as tool to move the managed care agenda forward. Chronic disease management (i.e. Congestive Heart Failure) could then become a focal point in the debate about whether managed care is preferable. As a result support for chronic disease management (i.e. Congestive Heart Failure), especially among provider groups may be based on support for managed care and not for the benefits that chronic disease management (i.e. Congestive Heart Failure) may itself bring.
- This risk can be reduced if chronic disease management (i.e. Congestive Heart Failure) is presented and accepted by stakeholders as a tool that can benefit the health system in both a non-managed care and in a managed care environment. Further, this risk can be reduced if chronic disease management (i.e. Congestive Heart Failure) is successfully demonstrated in a non-managed care environment.

#### 4.3.3. Benefits Risk: High

- The implementation of chronic disease management (i.e. Congestive Heart Failure) in the United States in managed care delivery systems has shown reductions in GP visits, specialist visits, emergency department visits and hospitalizations.
- The implementation in Canada of chronic disease management (i.e. Congestive Heart Failure) is new. The evidence that the benefits obtained in the United States can be duplicated in Canada does not yet exist.
- The risk of not being able to realize the benefits (through cost reduction or cost avoidance) is that chronic disease management (i.e. Congestive Heart Failure) simply becomes an incremental cost to the health system.
- To reduce this risk the Government of British Columbia could implement a cost avoidance strategy that would reduce a planned future expenditure(s) (e.g. planned budget increase) by the amount(s) required to realize the benefit. This approach is contingent upon clearly knowing the extent of benefits that can be achieved in a Canadian setting.

#### 4.3.4. Implementation Model Risk: Medium

- Chronic disease management has yet to be offered to large populations within Canada. The level of readiness and willingness to participate by key providers (i.e. physicians and nurses) and Congestive Heart Failure patients has yet to be determined.
- Unless previously proven chronic disease management models for Congestive Heart Failure are implemented in British Columbia (e.g. The MULTIFIT Program for Cardiac Solutions) then there is no basis on which to assume that the implementation model to be used will be successful.
- To reduce this risk a staged approach to implementation needs to be considered, whereby the selected implementation model can be tested and refined in a limited setting before it is rolled out at a regional or provincial level.

#### 4.3.5. Cost Risk: Medium

- The primary cost drivers in a Congestive Heart Failure Initiative are the cost of pharmaceuticals, physician support, as well as patient recall and follow-up. To manage these costs it is critical that each cost factor is carefully managed. For the physician community the cost is \$1,000 per physician. If this cost was to double for example, then 3 year payback would not be possible. For the patient recall and follow-up the time to complete a call and the number of nurse clinicians drives the costs. Any change to patient call times and the number of nurse clinicians required will also negatively impact the business case.
- This risk can be reduced by only implementing a Congestive Heart Failure Initiative after it has been fully tested and the demand and cost implications of providing this type of service can be better understood.

#### 4.3.6. Other Risks: Low

The risks associated with quality of care, the role and scope of professional practice, the ability of health organizations to manage and operate the service, as well as the technology required to support the service is considered low.

### 4.4. Feasibility Analysis

The next step is the determination of what is feasible with a Congestive Heart Failure Initiative – what can be realistically started in British Columbia within the next 12 months.

Three implementation options are obvious:

1. **Local Implementation** – within controlled environment in a small geography within a regional health authority.
2. **Regional Implementation** – within a single regional health authority.
3. **Provincial Implementation** – within all regional health authorities in the province.

The nature of the high and medium risks support the conclusion that a lot more study and refinement is required before a provincial implementation of the Congestive Heart Failure Initiative can be considered. The scope of the service, the service delivery and implementation models for the initiative, as well as and the associated costs and benefits need to be more clearly understood.

**Conclusion:** based on the findings of the financial analysis and the risk analysis to move the Congestive Heart Failure Initiative from theory to reality at this time requires a **staged implementation approach**, starting with a **local implementation**.

## 5. THE BUSINESS PLAN

### 5.1. The Congestive Health Failure Initiative

#### 5.1.1. Chronic Care Model

The underpinning of the Congestive Heart Failure Initiative will be the “Chronic Care Model”. The Chronic Care Model is part of a US national program called “Improving Chronic Illness Care” funded by the Robert Wood Johnson Foundation, and based in Seattle, Washington at the MacColl Institute for Health Care Innovation at the Group Health Cooperative of Puget Sound.

The Congestive Heart Failure Initiative will use the Chronic Care Model as an organizational approach to caring for people with Congestive Heart Failure in a primary care setting. The model is population-based, data driven and creates practical, supportive, evidence based interactions between an informed activated client and a prepared proactive practice team.

#### 5.1.2. Location

Stage One of the Congestive Heart Failure Initiative will be located within two different BC communities – Vancouver (i.e. a large urban centre) and Terrace (a small northern rural community).

The Vancouver Coastal Health Authority would be responsible for Vancouver implementation and the provision of nursing support. The Heart Function Clinic at St. Paul’s Hospital will provide tertiary and specialist expertise and support (incorporating the shared care model) to both providers and clients of the project. Primary care physicians with practices in the Vancouver Coastal Health Authority will be recruited to participate in Stage One of the Congestive Heart Failure Initiative with patients being recruited from their practice rosters.

The Northern Health Authority would be responsible for Terrace implementation, including the provision of primary, secondary levels of care. The Heart Function Clinic at St. Paul’s Hospital will provide tertiary and specialist expertise and support (incorporating the shared care model) to the Terrace providers and clients of the project. Primary care physicians with practices in the Terrace area will be recruited to participate in Stage One of the Congestive Heart Failure Initiative.

It is assumed that as patients have already chosen to access their primary medical care in these neighbourhoods they will be comfortable obtaining enhanced community based supports, education and other services within these geographic localities. Patient education, group visit, health clinics and other activities will be provided in a range of sites hosted by partnering organizations such as recreational centres and physician offices, or in regional community health centres or other sites. Services will be offered in the range of hours most appropriate for participants.

### 5.1.3. Participants

In Vancouver approximately 40 primary care physicians will be recruited to participate in Stage One of the Initiative. Congestive Heart Failure patients will then be recruited from their patient rosters. Assuming an average rate of 10 patients per roster the patient population will approximate 400.

In Terrace approximately 15 primary care physicians with practices will be recruited to participate in Stage One of the Initiative. Congestive Heart Failure patients will then be recruited from their patient rosters. Assuming an average rate of 10 patients per roster the patient population will approximate 150.

Therefore, for the Stage One implementation the total number of 55 physicians will participate with approximately 550 Congestive Heart Failure patients.

### 5.1.4. Timing

It is anticipated that project initiation will be January 2003. Participants will be phased in over a 12-month period and the Stage One – Local Implementation of the Congestive Heart Failure Initiative will run for a period of 3 years. It is anticipated that the next level of implementation, namely Stage Two – Regional Implementation will be commenced toward the end of the initial 3-year period.

### 5.1.5. Partners

One of the strengths of this project is the breadth of partners who have expressed initial interest in participating in this initiative, namely:

- BC Ministries of Health
- Northern Health Authority
- Vancouver Coastal Health Authority
- St Paul's Hospital
- BCMA (Joint Utilization Committee)
- Heart & Stroke Foundation of BC/Yukon
- AstraZeneca Canada Inc

These discussions have been preliminary, and participation will need to be confirmed pending design and funding details.

## 5.2. Governance and Operations

The Congestive Heart Failure Initiative by the nature of the players will be a **Collaborative**. The Collaborative will be created at a provincial level with participation from the key partners. The role of the Collaborative will be to support the provision of the 3 levels of action – population, provider and patient by providing:

- strategic guidance
- expert advice

- operational coordination
- marketing and communication
- funding support
- evaluation services

The accountability for the delivery of the Congestive Heart Failure services will lie with the various partners depending upon the level of action.

The **Population level of action** documents the extent of Congestive Heart Failure in British Columbia, identifies Congestive Heart Failure indicators, monitors performance, and establishes a Provincial Congestive Heart Failure Registry. This will lead to effective information management and regular and thorough reporting of progress related to the management of Congestive Heart Failure in this province. The key partners include:

- **BC Ministries of Health** – data collection, data management, indicator development, Congestive Heart Failure registry, data analysis and reporting
- **Health Authorities** – data collection, data management, indicator development, Congestive Heart Failure registry, data analysis and reporting

The **Provider level of action** develops and implements clinical practice guidelines for Congestive Heart Failure management, implements methods to adopt and reinforce practice guidelines, devises standards of care and associated tools, institutes mechanisms for patient follow-up and recall, facilitates shared care between physicians and general practitioners, and engages community-based agencies in initiatives to improve Congestive Heart Failure management. The key partners include:

- **BC Ministries of Health** – clinical guidelines development and review (with GPAC), standards of care coordination, and physician reimbursement mechanisms
- **Health Authorities** – Congestive Heart Failure specialists, heart function clinic expertise / resources, patient follow-up and recall and community networks
- **BCMA** – practice guidelines
- **Physicians** – physician support, shared care
- **Heart and Stroke Foundation** – community networks, resource message development and Congestive Heart Failure resource centre
- **AstraZeneca Canada Inc.** – physician training, academic detailing, physician and specialist networks and link to technology support

The **Patient level of action** develops and implements a patient survey, identifies and develops (as needed) patient education resources and tools, introduces care plans, and institutes a self-efficacy training program. The key partners include:

- **BC Ministries of Health** – patient survey and patient education resources and tools
- **Health Authorities** – patient education resources and tools, patient care plan and a self-efficacy training program
- **Physicians** – patient care, patient education

- **Heart and Stroke Foundation** – patient education resources and tools and a self-efficacy training program
- **AstraZeneca Canada Inc.** – patient education resources

Experience has also shown that several important themes reoccur through the different stages of a public-private initiative, such as the Congestive Heart Failure Initiative. These include the importance of free and open communications between partners, a commitment to fair process, acceptance of organizational change, a need for accountability procedures, and changes to existing legislative and regulatory requirements. It is important, therefore, for partners to establish principles that will guide the public-private arrangement and to develop a road map to direct and inform the process.

### 5.3. Marketing and Communication

The success of the Congestive Heart Failure Initiative will depend on awareness of the services offered by a number of different stakeholders – patients, providers (physicians, nurses), regional health authority management, Ministries of Health management, and other organizations involved in Congestive Heart Failure. The Congestive Heart Failure Initiative will be responsible for managing the marketing and communication.

Marketing and communication strategies will need to address:

- create awareness and encourage Congestive Heart Failure patients to use the services
- promote ongoing dialogue and endorsement/support from key stakeholders such as physicians
- The marketing and communication strategies will include:
  - creating an identity or image for the Congestive Heart Failure Initiative (also known as “branding”) that is easily identifiable
  - designating a Initiative spokesperson and conducting a high-visibility media event to announce the program publicly
  - promoting the services to the public, health care professionals, health authorities, government, to create awareness and acceptance of the Initiative. Internet, and printed media (e.g. magazines, newsletters, etc) will be employed
  - conducting stakeholder (e.g. physicians, patients) information sessions and distributing stakeholder information packages
  - public and community relations, via community networks

### 5.4. Stage One Local Implementation Budget

Based on the cost for all the components of the BC Congestive Heart Failure Initiative the Stage One Local Implementation has been determined to cost approximately \$640,000 in year 1 and



about \$300,000 for each of the following 2 years. A more detailed budget breakdown, by population, provider and patient levels of action is shown below.

	A	B	C	D
1	<b>CONGESTIVE HEART FAILURE</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
2	BC Population	4,144,310	4,203,040	4,263,280
3	BC Population Over 65 years of Age	548,000	559,200	570,800
4	Over 65 Years of Age Population Growth	0.0190	0.0204	0.0207
5	Stage 1 Congestive Heart Failure Cases	550	550	550
6	<b>COSTS</b>			
7	Pharamceutical Use	-\$87,340	-\$87,340	-\$87,340
8	<b>1. Population Level of Action</b>			
9	CHF Registry & Performance Measurement	-\$15,000	-\$15,000	-\$15,000
10	Prevention	-\$30,000	-\$30,000	-\$30,000
11	Total Population Level of Action Cost	-\$45,000	-\$45,000	-\$45,000
12	<b>2. Provider Level of Action</b>			
13	Practice Guidelines Development	-\$125,000		
14	Physician Support	-\$55,000		
15	Standards of Care	-\$5,000	-\$5,000	-\$5,000
16	Shared Care	-\$49,500	-\$49,500	-\$49,500
17	Community Networks	-\$500	-\$500	-\$500
18	Total Provider Level of Action Cost	-\$235,000	-\$55,000	-\$55,000
19	<b>3. Patient Level of Action</b>			
20	Patient Survey	-\$15,000	-\$15,000	-\$15,000
21	Patient Recall & Followup	-\$73,358	-\$73,358	-\$73,358
22	Patient Education Resources	-\$1,100	\$0	\$0
23	Patient Self-Efficacy Training	-\$110,000	\$0	\$0
24	Total Patient Level of Action Cost	-\$199,458	-\$88,358	-\$88,358
25	<b>Other Costs</b>			
26	Congestive Heart Failure Collaborative	-\$20,000	-\$20,000	-\$20,000
27	Evaluation (10%)	-\$49,946		
28	Total Other Costs	-\$69,946	-\$20,000	-\$20,000
29	<b>Total Cost</b>	<b>-\$636,743</b>	<b>-\$295,698</b>	<b>-\$295,698</b>

The budget is based on the costs identified in the business case analysis and where appropriate, pro-rated for the number of patients that would be served in the Local Implementation Stage. Some costs, such as the cost of clinical practice guidelines are included in full, because that cost is fixed irrespective of the size of the implementation.

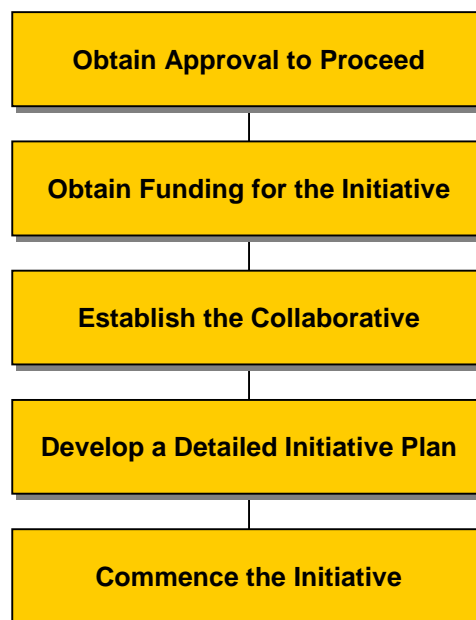
## 5.5. Next Steps

The business case exists for the Congestive Heart Failure Initiative to proceed. The most feasible option that will mitigate the risks is a Local Implementation, which will refine the delivery model

for the chronic disease management and in particular Congestive Heart Failure for a Canadian setting, as well as reconfirm the costs and benefits associated with the business case.

The Congestive Heart Failure Initiative is now at a decision point – the need for an approval from the key stakeholders to proceed to the next step, namely the commencement of the Stage One Implementation project at the Vancouver Coastal Health Authority and at the Northern Health Authority in BC. Once that approval is in place, funding will need to be obtained, the Collaborative established and a detailed operational plan developed for the Initiative. With these pre-requisite steps in place the Collaborative will be ready to start the Congestive Heart Failure Initiative.

### Next Steps



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## Appendix A. Planning Group Members

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## Appendix B. Congestive Heart Failure Vignette

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Congestive Heart Failure is a “chronic disease” and the best outcomes are achieved through a collaborative proactive interaction between the informed patient, the primary care physician and other health professionals. The use of effective self-management approaches, proactive practice models, decision-support guidelines and information technology solutions within the community-at-large support this ‘productive interaction’.

This vignette will highlight these aspects of chronic disease management.

### 1. Setting the Stage

Fred is a forest worker in Hope, British Columbia. He is 52 years old. He works hard, has played hockey for as long as he can remember and still plays in the weekend hockey league. Although Fred generally considers himself in good health, he is a one pack a day smoker, and drinks alcohol 4-5 times per week. He also frequents fast food restaurants and loves his twice-daily intake of coffee.

Over the last couple of weeks, Fred became short of breath when he played hockey. This breathlessness was increasingly accompanied by dizziness and sometimes nausea. When Fred came home from last weekend's hockey game saying he was exhausted, his wife took one look at his pallor and insisted that he make an appointment with Dr. Sims, his family physician.

### 2. Initial Visit to GP Clinic

Fred was fortunate to get into see Dr. Sims early the next week. During his visit to Dr. Sims, Fred describes how he had experienced shortness of breath and increasing dizziness and rapid heartbeat when he worked or played especially hard. He reported that his father had died of a sudden heart attack at aged 56.

Dr. Sims examined Fred and found that his heartbeat was regular, but his lungs sounded congested and his blood pressure was elevated. What also concerned Dr. Sims was Fred's family history of heart problems. Dr. Sims electronically sent requisitions for several tests including a chest x-ray, an electrocardiogram (ECG), and some blood tests.

Dr. Sims' receptionist arranged for Fred to return in two days time when the results would be available.

### 3. Blood Tests and ECG Tests

Fred goes to the local health centre where he has blood samples taken for the required blood tests and also has an ECG test. The blood samples are sent to the regional laboratory where the blood tests are performed, interpreted and the results then sent electronically to Dr. Sims via secure e-mail and placed in Fred's file. The ECG readings are electronically forwarded to Dr. Sims.

Dr. Sims has all the results in the file when Fred returns and he proceeds to explain to Fred what they mean. As soon as the Doctor starts to get into the details, Fred mentions that his wife Ethel is in the waiting room and 'is much better at all this stuff than I am'. Dr. Sims is aware that verbal communications in a time of stress, like hearing bad news about one's health, is not effective, so he asks Fred would he like Ethel to join them. Fred seems very relieved, as he knew he would not be able to remember any of what the Doctor was saying.

Dr. Sims explains the test results and what in particular led him to conclude that Fred had a previously undetected heart attack that has left him with some heart muscle damage causing mild Congestive Heart Failure (CHF) with signs of intermittent arrhythmia. He advises Fred and Ethel that CHF is a condition that could progress and seriously hamper Fred's activities but that much of his future health was dependent on

him initiating lifestyle changes, carefully monitoring his symptoms, managing stress positively and taking the medication according to directions.

Dr. Sims explains to both Fred and Ethel, that given Fred's test results and family history, Fred should take immediate action to lower the risk of heart damage. Dr. Sims prescribes a combination of drugs to help control his blood pressure (BP), help reduce the fluid buildup in his body and also help his heart beat more efficiently. Dr. Sims then sends the prescription electronically to Fred's preferred pharmacy.

Fred is advised that he should stop smoking immediately, withdraw from hockey but replace it with regular moderate exercise, and modify his diet to significantly reduce his caffeine, alcohol, salt and fat intake. Fred and Ethel are given written information and an educational video on risk factors for heart disease. Dr. Sims suggested that they go home and review the material and come back and discuss it at their next visit.

Dr. Sims asks to be notified of weight gain, chest pain, irregular heartbeats, increased shortness of breath and dizziness, or uncomfortable side effects of the medication he prescribes.

#### **4. Treatment Plan (Chronic Disease Management Model)**

Dr. Sims sets up a treatment plan that incorporates the best practice protocols of the chronic disease management model. These include:

1. Setting up a comprehensive management plan:
  - Goals are set conjointly with patient, doctor and family (in this case Fred's wife Ethel).
  - How Fred can monitor parameters, including: blood work; home monitoring of BP; daily weight log; exercise tolerance; irregular heart beats; etc. Dr. Sims advises Fred on when and how to notify him when parameters are outside desired range, e.g. weight. Fred also gets information about his medications, as they include a diuretic, Dr. Sims tells Fred how to titrate the diuretic in response to symptoms.
  - Dr. Sims recommends that Fred join the local 'healthy heart program' which will instruct him in a graduated exercise program.
2. Dr. Sims frequently reviews this information and the CHF risk factors with Fred and explains how Fred can self-manage appropriate issues.
3. Dr. Sims utilizes several decision-support programs specifically for physicians, including the latest guidelines via Internet, Healthy Heart Program, etc.
4. As it has been demonstrated in the Chronic Disease Management Model, that being 'proactive' in monitoring and follow-up is often vague and left up to patient to call the physician, Dr. Sims is very specific about his instructions but also ensures that he has regular contact with Fred, and schedules regular follow-up appointments.

#### **5. Pharmacy – Dispense Medication**

When Fred goes to his usual pharmacy, the druggist dispenses the prescribed medication and takes time to discuss with Fred side effects and contra-indicated medications. The druggist also gives Fred a printout of administration instructions and known side effects, along with the initial doses of medication. He warns Fred to avoid decongestants unless he first consults with Dr. Sims.

As the pharmacist is a valuable part of the chronic care management team, Dr. Sims involves him/her in the appropriate areas of the treatment plan.

## 6. Patient/Family Monitoring

At home, Fred and Ethel discuss their new circumstances. They review all the material the doctor gave them and then figure out how to incorporate the changes into their lives. The fact that Dr. Sims has included them in the management plan makes them both feel more in control of their circumstances.

Fred follows the plan closely and is pleased to see a significant improvement in his weight and blood pressure over the next few months. All goes well for about six months. Then he notices occasional periods of dizziness associated with extra exertion or stress. He also tires more easily and finds some work activities very strenuous. Fred also notices a weight gain of 3 pounds in one week after maintaining his target weight for several months. He consults with Dr. Sims.

## 7. GP Visit and Referral to Specialist

Dr. Sims reviews Fred's records and commends him on taking such positive action to improve his own health. Dr. Sims notices the increasing frequency of dizziness and suspects a reoccurrence of heart arrhythmia. The weight gain suggests fluid retention in spite of the medication intended to counteract it.

Dr. Sims adjusts Fred's treatment plan and makes a referral to a cardiac specialist, Dr. Black in Vancouver, for a more extensive workup and treatment. With Fred's consent, Dr. Sims emails all Fred's records and test results to the cardiac specialist, this will ensure that tests are not duplicated. He also forwards the treatment plan and informs the specialist how Ethel has become an important part of the 'team'.

Dr. Sims is please that the cardiac specialists has facilities to receive Fred's records electronically, as it is so much easier than trying to assemble all the notes and mail them off. However, Dr. Sims has read about central registries for Congestive Heart Failure and other chronic diseases and he looks forward to the day when these technologies will further enhance the way patients are managed and hopefully radically improve outcomes.

## 8. Specialist Visit and Corresponding Tests

Dr. Black reviews Fred's records and arranges for Fred to have a series of tests, including tests to examine the structure and function of his heart, in the outpatient Cardiac Clinic on the morning of his appointment. As Fred lives out of town, the tests were arranged to minimally inconvenience him.

When Fred met with Dr. Black, he was amazed at how much the doctor already knew about him and his condition. Yet Dr. Black still listened intently to Fred's perspective and thoroughly accessed his current symptoms. Dr. Black undertook a physical examination and reviewed Fred's latest tests. Before relating his findings, he asked if Fred would like him to have his wife present. Again Fred was happy to have Ethel be part of the consultation, she was always so helpful when they got back home and seemed to be able to recall what his various medications were for.

Fred's test results present an unusual pattern and Dr. Black consults online references to determine what is known about this specific pattern. He notices that Fred has an atypical arrhythmia and seeks Fred's consent to discuss it with Dr. Green at the Vancouver Centre of Excellence for Cardiology.

## 9. Consultation with Centre of Excellence Specialist

Fred meets with Dr. Green who views the portion of Fred's record he is authorized to see on his office workstation. He agrees that Fred's condition and his active participation in his own health care make him a good candidate for the new course of treatment. Dr. Green notes that the clinical protocol requires that the electrical activity of the heart must be monitored and the dosages of the drugs adjusted accordingly.

Dr. Green discusses this with Fred and he agrees to wear an ambulatory monitor. Dr. Green then contacts both Drs Black and Sims and informs them of the new treatment plan and the requirement to monitor the electrical activity of Fred's heart. Dr. Sims agrees to manage Fred's progress under Dr. Black's supervision, and contribute all records to Dr. Green. Arrangements are made for the ambulatory monitor and corresponding monitoring and record keeping applications.

## **10. Arrhythmia Monitoring**

Fred returns home with the ambulatory monitor. He continues to record his own perspective on his health and treatment on his home computer and regularly hooks the ambulatory monitor to the computer to forward the monitoring records along with his personal observations to Dr. Sims. Dr. Sims produces a summary report every month, which he forwards to Dr. Black and Dr. Green, along with the details of the monitoring and drug administration regime. As the involvement of the three physicians would not be covered under the current fee-for-service payment mechanism, the Centre of Excellence has a special arrangement with the Ministry of Health to be compensated by alternative payment arrangements, such as a 'blended' payment system.

So far, Fred has continued to maintain his health at a level that permits him to continue to work at a reduced level of activity. He enjoys his new lease on life, he has maintained his love of hockey by being assistant coach of a junior team and his relationship with his family has gone from strength to strength. He has learned to use the health record keeping as a means to manage his stress level and now looks forward to setting personal health goals and achieving them.

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