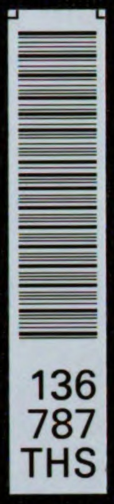

DEVELOPMENT OF A HEART FAILURE CLINIC DATABASE

By

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ABSTRACT

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Heart failure is a devastating disease that has no cure. Patients diagnosed with heart failure steadily decline and eventually die from complications of the disease. Average life expectancy for heart failure is 5 years. Controlling heart failure and slowing the progression can be achieved if patients know about their diagnosis and what they can do to modify behaviors that would assist them in maintaining their health and independence for as long as possible. Nursing can help patients with this process.

There was no database in place for use in the clinic that kept the patient information needed and allowed for easy retrieval of those records. The purpose of this scholarly project was to develop a computerized database that would efficiently maintain patient records and track patient education for a Heart Failure Clinic. The database provides an accurate and easy means to see trends in patient conditions, track what has been done, and still needs to be done for each patient. The database is developed in Microsoft Office using Word, Excel and Access to integrate the various components.

To Robert, Shawn, Rhonda, Jason, Brandon and Zachary Ogden

June Dufon and in memory of Frank Dufon

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Special thanks to my family. To my husband Bob, the wind beneath my wings, for his unending love and support. To my children Jason, Shawn and Rhonda, and to my grandchildren, Brandon and Zachary who have given me much joy and helped to keep me grounded. Thanks also to my mother, June Dufon, for her words of encouragement and her prayers, and in loving memory of my father, Frank Dufon whose spirit was with me every step of the way.

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INTRODUCTION

Heart failure results when the metabolic demands of the body are unable to be met by the cardiac output. The incidence of heart failure is rapidly increasing and becoming a common diagnosis in patients over the age of 65 (Boynton, 1989). Each year 500,000 new cases of heart failure are diagnosed (Yacone-Morton, 1995; Deedwania, 1994). The prevalence of heart failure is increasing while that of coronary heart disease, stroke, and myocardial infarction is decreasing (Deedwania, 1994). Heart failure is thought to be the number one reason for hospitalizations among the elderly (Ghali, Cooper & Ford, 1990). The increased incidence and mortality of heart failure has led to many health care dollars being spent in admissions and readmissions for exacerbation of the disease and long term care of these patients (Brass-Mynderse, 1996). The purpose of this project is to develop a product to improve the care of patients with heart failure.

Heart failure is a progressive and lethal disease with serious socioeconomic implications. Although the prognosis of heart failure is variable dependent on complications and comorbid conditions, current estimates suggest that fewer than 50% of those diagnosed with heart failure will survive 5 years (Rector & Cohn, 1995). The Framingham study showed a cumulative mortality rate of approximately 75% nine years after the onset of clinical symptoms (McKee, Castelli & McNamara, 1971). Hospital admissions related to heart failure have increased dramatically in the last 20 years. Heart failure is now the leading DRG (Diagnosis Related Group) in the Medicare program that

provides care for most older Americans (Cuffe, Rao & O'Connor, 1997; HCFA, 1994; Ghali, Cooper & Ford, 1990).

Heart failure is a devastating diagnosis with no cure at this time. Heart failure occurs when the heart is damaged from either disease or ischemia caused by heart attack. If the heart weakens due to disease or damage, pumping of blood becomes ineffective, leading to heart failure. There are two types of heart failure. Left-sided failure causes blood to back up into the lungs, causing extreme shortness of breath. Right-sided failure causes a back up of blood in the peripheral system and is evidenced by fluid accumulations in the lungs, liver and ankles. Heart failure patients become increasingly less functional in their daily lives and are prone to frequent hospitalizations. The realistic goals for heart failure patients are to prevent the exacerbation of the illness, and to decrease the frequent hospitalizations that go along with this disease.

Three possible causes identified for the increased incidence of heart failure are (1) decreased mortality from acute myocardial infarctions, (2) better management of hypertension, and (3) the ever increasing life span of the population (English & Mastrean, 1995). The last of these, the aging of the American population, is identified as the single most important reason for the rapid rise in this disease. The American Heart Association estimates yearly cardiovascular expenses at 117.4 billion, this figure includes the costs of physician and nursing services, hospital and nursing home services, medications, and productivity lost from disability (American Heart Association, 1993). The expense involved in caring for patients with this chronic illness indicates a need for primary care interventions associated with the diagnosis of heart failure.

Local Trends

The aging population continues to soar in Michigan and the tri-county areas of Ingham, Eaton, and Clinton counties. In the Tri-county area the over age 55 population is growing at twice the rate as the under age 55 population. The fastest growing segment of the population is those over age 85 (see tables 1 and 2).

Table 1 - Percent of Population by Age Group 1993

Age Group	Tri-County	Michigan	United States
< 55	84.1%	79.6%	79.1%
55-74	11.8%	15.2%	15.4%
75+	4.1%	5.1%	5.5%

Table 2 - Tri County Area Population Growth 1993-1997

Age Group	1993	1997	Percent Growth
< 55	372,026	383,911	3.2%
55-74	52,149	54,085	3.7%
75-84	13,212	14,996	13.5%
85+	4,887	6,247	27.8%
TOTAL 55+	70,248	75,328	7.2%

Local Cardiovascular Health Status and The Need for A Heart Failure Clinic

Risk factors for cardiovascular diseases include high blood cholesterol levels, which rise with age up to age 60, and high blood pressure which increase throughout life (Messerli, 1993). The Tri-County Office of the American Heart Association office has reported that nearly 80% of residents are at risk for heart disease, and that cardiovascular disease was one of the major causes of death in 1993, with 41% or 1161 deaths attributed

to heart disease (Lansing State Journal, 1996). Additional risk factors are sedentary life styles and smoking.

The combination of an upward trend in the aging population, and the decrease in cardiovascular health of tri-county area residents has resulted in increasingly more health care dollars being spent for long term care. A review of available resources in this area shows that a heart failure clinic would be unique to this community. Cardiac rehabilitation programs are available in the tri-county area at Ingham Regional Medical Center, Sparrow Hospital, Clinton Memorial Hospital and Lansing Community College. There is only one program in the area dealing directly with the management of heart failure that is associated with a particular cardiology practice and is not open to the general public. In the tri-county area, heart failure patients must go to a physician's office or an emergency room for care. Home care agencies are an additional source of care for heart failure patients, but are limited to the period of time that the patient is homebound.

With the advancement of heart failure, patients progress to experience alterations in physical and functional abilities. Functional status can be affected by non-compliance with medications, diet and fluid restrictions, and lack of exercise. Participation in a program focused on this disease process can improve patient compliance. Education and scrupulous monitoring of heart failure patients has been identified as the number one way to help reduce the costs associated with the management of this disease (Dracup, et.al, 1994). Heart failure clinics are an effective way of managing this chronic illness (Cardiology Preeminence Roundtable, 1994).

Elderly heart failure patients are at increased risk for early re-hospitalization three to six months after initial discharge, with readmission rates ranging from 29 to 47 percent

(Rich et al, 1995). Heart failure clinics can decrease the number of early readmission by addressing clients behavioral factors that frequently contribute to readmissions.

Problem

Education and close monitoring has been found to be the best way to help heart failure patients maintain quality of life and decrease the frequency of hospitalizations associated with this disease (Rich, et al, 1995; Dracup et al, 1994). Primary care visits are often short in duration, and do not allow much time for education. The heart failure clinic is a way to effectively assess patient status and to provide structured education. There is presently no tracking tool to monitor patients admitted to the clinic, including their health status, and educational needs. In order to have easily accessible records, a database is needed.

Purpose

The purpose of this Scholarly Project is to develop a database for use in the heart failure clinic to be an overall tracking tool for the clinic. Having all clinic patient information in a database will allow the APN to quickly identify trends related to changes in patient condition and monitoring of educational records. This database will also have the potential to serve as a resource for future research projects related to heart failure.

An additional benefit of having computer based patient records (CPRs) is the ease in monitoring effectiveness of care and the measurement of outcomes. CPRs are defined as "a complete and accurate patient health record residing in electronic format within a system that is specifically designed to support the entry, management, and extraction of the patient health record by caregivers and other users duly authorized with a valid need for the information" (Brooke, 1996). The technological advancements of information

systems have increased the need for hospitals, physician's offices, clinics, insurances and billing companies to use CPRs. CPRs improve efficiency by allowing quick and easy access to files and patient information. Costs improvements will be seen as staff time is saved through decreased time spent on data entry and retrieval, and further reduces paperwork and eliminates the duplicate storage of data (Lange, 1997).

The Heart Failure Patient

The first signs patients are in heart failure are usually increased shortness of breath, fatigue, and exercise intolerance. Advancement of heart failure results in a decreased quality of life, as functional capacity is lost due to the increase in symptoms. Quality of life includes physical and psychological functioning, work and social role performance, and life satisfaction, and is often affected by personal perception of health.

Heart failure can often be misdiagnosed as chronic obstructive pulmonary disease or vice versa. Heart failure needs to be appropriately diagnosed and then treated. Left untreated, heart failure is a fatal disease. Patients and significant others must be able to identify symptoms that lead to decline in functional ability and often leads to a hospital admission. The risk factors associated with heart failure and symptoms that are suggestive of heart failure are shown in Table 3. Heart failure is given a severity level based on exercise tolerance and symptoms. The most commonly used scale is the New York Heart Association (NYHA) Functional Classification Scale (Gorlin & Leaman, 1989). A chart of the NYHA Classification Scale is shown in Appendix 1.

The classification level at which heart failure is first diagnosed can affect the patient's perceptions of the disease, and how they feel about modifying their behavior. The education of heart failure patients needs to include information about disease progression,

medications, symptoms, and symptom management. Patients who are knowledgeable about their disease have fewer hospitalizations, better quality of life, and a longer prognosis (Dracup, Baker, Dunbar, Dacey, Brooks, Johnson, Oken, & Massie, 1994).

Table 3 Risk Factors and Suggestive Symptoms for Heart Failure

Risk Factors:	**Symptoms:**
• **Older age** • **Systemic hypertension** • **Isolated systolic hypertension** • **Coronary heart disease** • **Diabetes mellitus** • **Obesity** • **Reduced or falling vital capacity** • **Cigarette smoking** • **Hematocrit level** • **ECG abnormalities** **(Deedwania, 1994)**	• **Paroxysmal nocturnal dyspnea** • **Orthopnea** • **Dyspnea on exertion** • **Decreased exercise tolerance** • **Unexplained confusion, altered mental status, or fatigue in an elderly patient** • **Abdominal symptoms such as nausea or abdominal pain associated with ascites and/or hepatic engorgement** **(AHCPR, 1994)**

Heart failure risk factors that are modifiable are hypertension, obesity, smoking, and hyperlipidemia (English & Mastrean, 1995). The same authors also identified "heart-smart" behaviors that can be used as primary prevention of heart failure as low-fat, low-cholesterol diets, regular physical activity, weight reduction and smoking cessation. The success of maintaining changes in any of these modifiable behaviors is greatly increased with education and support.

The standard of practice in primary care, in the treatment of heart failure is the AHCPR Clinical Practice Guidelines. AHCPR guidelines are developed by a multidisciplinary panel and are based on research. Treatment for heart failure is based on

the severity of the disease. In the asymptomatic patient, treatment centers on the prevention of symptoms. When the disease becomes more advanced, treatment is geared toward the control of symptoms and decreased exacerbations. This is achieved by assessment and monitoring, pharmacological management and most importantly with patient and family education and counseling. Education is the piece that must be there to improve patient compliance with treatment protocol.

CONCEPTUAL FRAMEWORK

The conceptual framework chosen to guide this project is Dorothea Orem's Theory of Self Care Deficit that describes when nursing intervention is required (Hardweg, 1991; Fawcett, 1995). Nursing interventions are necessary when the patient is experiencing a deficit in self-care. Interventions for heart failure patients must include patient education during all stages of the disease, but it is most beneficial during the period when this chronic illness is first diagnosed. Orem identifies the five methods used by nursing to assist with health care as:

1. Acting for or doing for another
2. Guiding another
3. Supporting another (physically or psychologically)
4. Providing an environment promoting personal development in relation to becoming able to meet present or future demands for action
5. Teaching another

Figure 1 is a model of Orem's Self-Care theory.

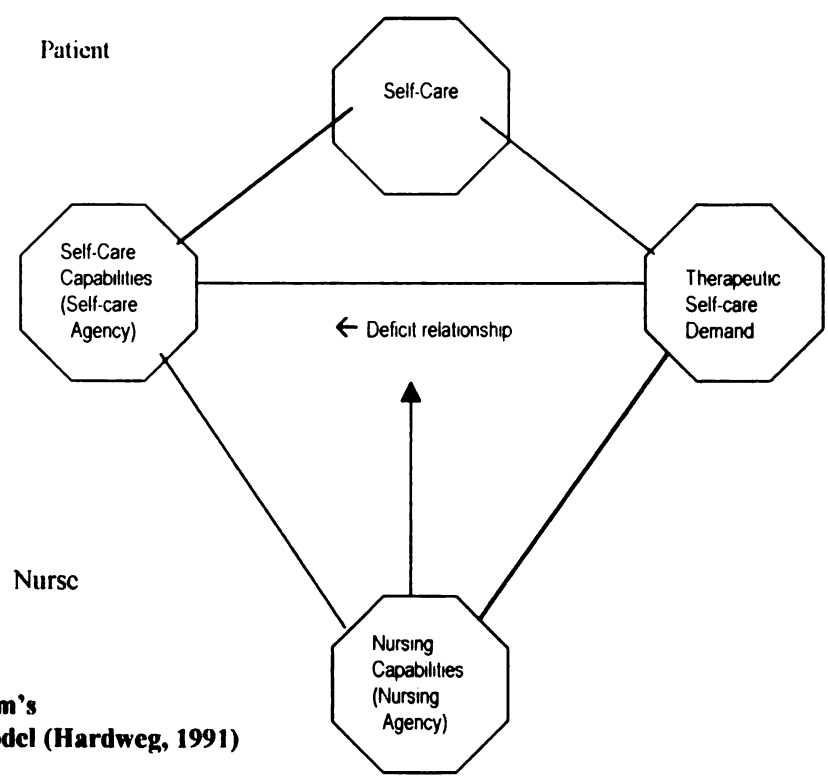

Figure 1 Orem's Self-Care Model (Hardweg, 1991)

Six basic concepts represented in figure 1 represent the conceptual structure of the Self-Care Deficit Theory of Nursing.

- *Self-Care* is a learned behavior or deliberate actions individuals initiate and perform on their own behalf in maintaining life, health and well-being (Orem, 1991).
- *Self-Care Agency* is the ability a person has to engage in self-care. Self care agency develops in childhood, matures in adulthood, and decreases with aging.
- *Therapeutic Self-Care Demands* can be identified as those requirements that individuals perform to maintain life, health and well being. Therapeutic self-care demands include: maintaining sufficient intake of air, water and food; maintaining balance between activity and rest, and solitude and social interaction; the prevention of hazards to human life, functioning and well-being; the provision of care associated with the processes of elimination and excrement, and the promotion of the development of a 'normal' self concept.
- *Nursing Agency* is a specialized acquired ability of adults to engage in deliberate action that is learned and performed with a goal in mind and is exercised for the well-being of others
- *Self-Care Deficit* is an unequal relationship between the capabilities for self-care and the individual's therapeutic self-care demands.
- *Nursing System* includes all of the actions and interactions that take place between a nurse and a patient in nursing practice situations.

An activated nursing agency produces diagnosis, prescription, and regulation of self-care, for persons with self-care deficits associated with their health state. The nurse must be able to identify the self-care deficit and the individual client needs followed by an

intervention that assists the client in overcoming this deficit. Using Orem's theory in the heart failure clinic setting, nurses would work with patients guiding them through the disease process by educating them about heart failure, and supporting them as they learn to make lifestyle changes for the purpose of increased self-care capabilities.

Orem classifies three nursing systems utilized in assisting patients with self-care: the wholly compensatory system, the partly compensatory system, and the supportive-educative system. It is when the patient's disease state is advanced that they would be in the wholly compensatory state and would require the most nursing intervention with the activities of daily living (ADLs) and the activities of independent daily living (AIDLs). In the partly compensatory system, the patients would be able to do some of their own care, but when becoming symptomatic with exertion would require some assistance with care.

The NP would work with patients in the educative-supportive system in the early stages of heart disease. As patients progress through the levels of heart failure, it is likely that a nurse would work with them through all of the levels. While working in the supportive educative system the advanced practice nurse will be able to positively impact the heart disease process by assisting in the delay progression of the disease, thus improving patient's quality of life. It is also at this level that it might be difficult to get the patient involved in self-care activities. If individuals are not actively experiencing symptoms, they are less likely to believe that they have a chronic illness and may be less receptive to behavior modification interventions. Patients might also move between the partly compensatory and the wholly compensatory systems when they are experiencing acute exacerbations of the disease.

Table 4 contrasts Orem's systems with the New York Heart Associations Classifications of severity of heart failure.

Table 4 Orem's System Contrasted With NYHA Classification System

System	NYHA Classification
Wholly Compensatory System *Nurse actions* - Accomplishes patient's therapeutic self-care - Compensates for patient's inability to engage in self-care - Supports and protects patients *Patient actions* - Accomplishes therapeutic self care	**NYHA Level IV** Severe limitations Symptoms present even at rest
Partly Compensatory System *Nurse action* -Performs some self-care measures for patient -Compensates for self-care limitations of patient - Assists patient as required - Regulates self-care agency *Patient action* -Performs some self-care measures -Regulates self-care agency -Accepts care and assistance from nurse	**NYHA Levels II and III** Level III Moderate limitations Symptoms noted with minimal activity Level II Slight limitations Symptoms during ordinary daily activity
Supportive-Educative System *Nurse action* -Regulates the exercise and development of self-care agency *Patient action* -Accomplishes self-care	**NYHA Level I** No limitation Asymptomatic during usual daily activities

LITERATURE REVIEW

The literature search conducted for this study provided a wealth of information related to the heart failure disease process and medical management of this chronic illness. There is also much information about the physiological manifestations and risk factors associated with heart failure. For the purposes of this project, the literature review will focus on the benefits of heart failure clinics to patient quality of life and the benefits of education on heart failure.

Heart Failure Disease Management and Nurse Practitioners

Feldman, Venture, & Crosby, (1987) identified a number of studies that looked at effectiveness and value of nurse practitioners in the management of chronic disease. Brass-Mynderse (1996) found that disease management for heart failure at a California based nurse managed clinic, estimated the potential savings of more than $2.5 million in lost revenue by managing this chronic disease and keeping patients out of the hospital. The use of nurse practitioners in practice and in chronic disease management is still not fully accepted by the medical community. A 1995 Cardiology Preeminence Roundtable Study pointed out that the concept of heart failure clinics is still revolving and controversial, and is often seen by cardiologists and primary care physicians as a threat to their business or an infringement on their provider patient relationship.

Risk Factors Modification and Heart Disease

The benefits of modifying risk factors related to heart disease have been shown in a number of studies. Those risk factors that are modifiable and have the most effects on the cardiovascular system are exercise, hyperlipidemia, hypertension, and smoking.

DeBusk (1996) looked at why he believes the present health care system is often unsuccessful with risk factor modification. He writes that this is because physicians most often have brief outpatient encounters with patients, and that physicians feel that they often get little nonphysician support from nurses in primary care. He further identified that physicians often give risk modification a low priority, preferring to attend to acute problems, and reimbursement for risk modifying behaviors are much lower in primary care as opposed to the acute care setting.

The benefits of lowering lipids on cardiovascular disease were reported in several studies (Consensus Conference, 1985; Holmes, I., 1990; Pearson & Swan, 1996). Gaziano and Manson, (1996) studied the role fat, alcohol and antioxidants have on heart disease and reported that there seems to be overwhelming evidence indicating that the diet habits of the western culture plays a major role in artherosclosis, which in turn damages the heart. Other diet considerations are the decreasing the amount of sodium in the diet and careful monitoring of the amounts of fluid intake, both of which can worsen heart failure symptoms (Dracup, et al, 1994).

Exercise has always been an important component of cardiac rehabilitation. Fletcher, (1996) reported on the importance of developing a prescription for exercise for cardiovascular patients. Exercise has been proven to have positive effects on left ventricular function in studies by Fletcher, Oberman & Nanda, (1995), and Ghilarducci, Holly and Amsterdam, (1989).

Smoking is another risk factor that is modifiable and has been proven to have negative effects on the cardiovascular system. Many researchers have looked at the effects of smoking on the heart and the positive effects of smoking cessation (Aberg,

Bergstrand & Johnson, 1983; Barry, Mead & Nabel, 1989; Cavender, Rogers & Fischer, 1992; Daly, Mulcahy & Graham, 1983). Rigotti and Pasternak (1996) report that smoking is the number one preventable cause of death in the United States and an important cause of coronary heart disease. This article identifies the unfavorable effects of smoking on the heart as: a) acute increases in blood pressure and coronary vascular resistance; b) reduction in oxygen delivery; c) enhancement of platelet aggregation; d) increased fibrinogen; and e) depression of HDL cholesterol. Smoking cessation rapidly reduces cardiovascular morbidity and mortality. The authors also point out that primary care is the place where counseling about smoking cessation belongs.

The MULTIFIT study was a randomized clinical trail that examined a system designed for coronary risk factor modification related to the behaviors of diet, for the purpose of lowering blood cholesterol, exercise, and smoking in post myocardial infarction patients. Nurse case managers followed patients in the study after discharge from the hospital in three ways: 1) nurse-initiated phone contacts; 2) Computer generated patient progress reports developed from questionnaires patients mailed in; 3) A total of 4 visits to the clinic for baseline assessments and counseling. The MULTIFIT study proved to be more effective in modifying these risk behaviors than follow up appointments as used in primary care. This was attributed to frequent contact and support provided the patients via telephone. The MULTIFIT study was so successful with risk factor modification that it was expanded to include patients with diagnosis of heart failure, diabetes mellitus, and hypertension.

Education and Behavior Modification of Risk Factors Associated with Heart Failure

Beyond Heart Disease is a successful community program designed by nurses to reduce long-term risk factors and risk of coronary events (Lipon and Carlson, 1994). This six-week program focused on the education and skill building techniques to assist clients in modifying cardiovascular risk factors. Understanding that simply providing patients with information about risk factors is not enough to cause change, the authors enlisted Bandura's social learning theory and created a supportive learning environment, conducive for change. This program was followed up by telephone support to participants, which further supported the patient's efforts to change.

A study reported in the New England Journal of Medicine looked at the effects of a nurse directed, multidisciplinary intervention for high risk patients aged 70 years and older who were hospitalized with heart failure (Rich, Beckham, Wittenberg, Leven, Freedland, & Carney, 1995). The basis of this study was to work with patients on behavior modifications to see if it would affect 90-day hospital readmission rates, improve quality of life, and decrease the costs of care for patients with heart failure. This study concluded that patients did benefit with improved quality of life from baseline, as evidenced by a decline in the number of hospital admissions by 56.2 percent in the treatment group, as well as an overall decrease in the cost of care by $460 per patient.

The Cardiology Preeminence Roundtable (1994,1995) presented a series of studies looking at heart failure management, heart failure patient cardiac rehabilitation, and heart failure clinics. The 1994 study tracked the cardiac rehabilitation of inpatients and outpatients. Of importance in this study is the observation that the amount of education, and patient interaction with staff directly correlated with decreased number of

readmissions to the emergency room for heart failure related events. As a follow up, the 1995 study looked at the development and organization of congestive heart failure clinics. The executive summary points out that heart failure clinics "have evolved as a source of care which is specifically tailored to meet the needs of this unique patient population and designed to compensate for the inadequacies of traditional methods of care." The tracking of outcomes is also noted to be an essential component of heart failure clinics.

Education is identified in many journals as an essential component of care for all heart failure patients. (Seager, 1995; AHCPR, 1994). The chronic nature of heart failure makes it important that patients understand not only the disease process but as well their role in the management of the disease. Education and continuous reinforcement of self-care management strategies are vital in helping heart failure patients improve or maintain their quality of life and delay the progression of heart failure (English & Mastrean, 1995; AHCPR, 1994). Counseling and education were found to be crucial in assisting patients in making major lifestyle adjustments leading to improved patient outcomes and decreased unnecessary hospitalizations (Dracyup, et al., 1994; Brass-Mynderse, 1996).

It is of interest to note that a number of articles deal with the disease process of heart failure and identify risk factors that are modifiable (Kannell & Belanger, 1991; Deedwania, 1995; Gorlin & Leaman, 1989; Young, 1995). The studies fall short by completely leaving patients out of the picture, dealing only with diagnosis, medical interventions and medications. Medical interventions and medications are much more effective when coupled with education and counseling. If patients know what to expect of the disease and the interventions, they are more likely to comply with the recommendations for care.

PROJECT DEVELOPMENT

For this scholarly project, this author developed a database using Microsoft (MS) Office. The main database is in MS Access with links to MS Word and MS Excel, for use in a heart failure clinic. The parts of the database are:

- demographic and medical information - a table to track basic information about the patient and store pertinent medical information
- patient medications - a table to keep a running record of medications. This table includes medication names, dosages and dates the medications are started or stopped
- clinic visits – a table to track assessment data collected during clinic visits
- telephone contacts – a table to keep track of information gathered during a telephone contact with a patient
- Primary care physicians and cardiologists – tables that store lists of frequently used physicians that will be contacted periodically for updates on the patient's progress

Supplementing the database, links to MS Word are used to generate copies of records and form letters used to communicate between the clinic and client's primary care physician. MS Excel is used to score and store results on The Minnesota Living with Heart Failure Questionnaire (Rector and Cohn 1992, cf., Appendix 2). This survey is given to patients as they enter the program, and then at 3, 6, and 12 months after completion of the clinic program

When patients are admitted into the clinic an initial record is started in the database including demographic and pertinent medical information about them (Appendix 3). The patients are assigned a number, which is used as a reference link to all other tables in the database. Clinic visits are monitored in another table that tracks current patient assessment and medication data and records what education has been done for that patient (Appendix 4). Additional tables in use with the database are medication records, and telephone contact forms that are integrated with the patient's initial record. Reports will be computer

generated drawing information from all of the forms to provide accurate and up to date information. Reports can be used as motivation for the patients by showing them their progress or areas that still need work. Generated reports will also be used to communicate patient progress to their primary care provider.

Confidentiality

Confidentiality between a patient and their medical care provider has always been of utmost importance in the development and maintenance of therapeutic relationships. The terms privacy, confidentiality and security are sometimes used interchangeably, but, although they are related, they do in fact have different meanings. Styffe, (1997) identifies these terms in relationship to information systems as:

- *Privacy* - the right of individuals to determine when, how, and to what extent information is transmitted.
- *Confidentiality* - trust placed that information shared will be respected and used for the purpose disclosed.
- *Security* - the protection of information from accidental or intentional access by unauthorized people, including the modification or destruction of the information.

The medical record keeping business has been forced to advance into the "computer era" as we have moved into what is known as the "information age". With any medical database comes the concern that patient records could get into the wrong hands. A patient needs to feel safe in revealing all significant medical information to their provider. Breach of confidentiality is a legitimate concern when patient records are stored electronically. Patient privacy is an issue of utmost importance as more and more patient records are computerized. The lack of security of patient information can cause the loss of

medical and or life insurance and the ability of a person to obtain coverage of any kind. Once a person has been labeled with a medical disability, the label can follow them for life.

The best way to have a secure system is by limiting access to that system. This database for the time being will be on a stand alone computer system dedicated for use with this clinic. A password will be required to get into the system and only the patient's contact number is accessible when looking at individual visits and for data queries. This helps to ensure patient confidentiality in this database. MS Access has the ability to encrypt stored data, thereby further increasing security.

Evaluation

Tracking patient data and interventions with a computerized database simplifies the task of evaluation. Patient care interventions need to be evaluated for effectiveness, and encounters with the patients need to be evaluated for quality, process of care and outcomes of care.

The effectiveness of interventions will be evidenced by patient's response to therapy and is seen as outcomes of care. Outcome variables are those measures that indicate the patient's disease state. Other measures of effectiveness are frequency of emergency room visits, hospitalizations, and exacerbation of the disease. This program also tracks baseline and periodic scores of the Minnesota Living With Heart Failure Questionnaire seen in Appendix 2. This questionnaire looks at the patient's quality of life and will be an indicator of effectiveness of interventions.

Evaluation of the delivery of care looks at process variables involving the use of protocols for patient contacts and follow up. Questions to be addressed are:

- Were patient contacts done according to protocol?

- Were patient intervention protocols followed?
- Did follow up communication with primary care providers occur according to protocol?

Evaluation of quality of care can often best be determined by tracking patient satisfaction. Patients tend to base the quality of the care they receive on the encounters they have with the care providers. If the environment is deemed therapeutic by the patients, patient satisfaction will go up. The database has the potential to generate patient satisfaction surveys, although this will not been dealt with at this time.

Implications for NP Practice

A heart failure clinic is an innovative addition to primary care for patients with a chronic illness. The expert training and assessment skills of nurse practitioners (NP) make them the ideal care providers for quality compassionate cost effective care to heart failure patients in a primary care setting. Participation in a heart failure clinic will help patients maintain much of their health and independence for as long as possible. An additional benefit to the health care system is cost savings recognized because the NP will help the patient stay out of the acute care system.

NPs working in a clinic setting will have the opportunity to utilize many skills and roles in dealing with clients and their families, by helping them to understand what the disease is, how it will progress, and what behavior modifying interventions can be done to lessen the severity of the disease, and maintain functional status. Educating patients in the need for strict adherence to dietary and drug regimens is identified as an essential element in cost effective management strategies for heart failure (Seager, 1995). Client visits

include regular assessments of current health status, and the opportunity for the NP to provide counseling with the clients and their significant others.

Nurse managed clinics also provide NPs the opportunity to work in collaboration and consultation with primary care physicians and cardiologists as they work with clients. Collegiality is built as NPs communicate with physicians on their patients involvement (Sherman, 1995). This database will benefit the client, by allowing the NP to increase continuity of care, enhance patient capacity for self-care via appropriate teaching and to individualize treatment plans by following the patient's progress and by looking at trends.

Implications for Research

An important component of this database is the ability to query data, and the tracking of outcomes that can be used for future research. Evidenced-based practice is important for health care providers in developing treatment protocols that should lead to improved patient outcomes. Many of the treatment guidelines in use today come from research that was done in the past. An example of this is the AHCPR guidelines (1994), that were developed collaboratively after evaluating the research available on specific subjects.

This database has the ability to track many aspects related to the patient and patient care provided. There are a number of research questions that could be answered by tracking patient information in a database. Some examples of research questions are:

- The identification of risk factors in the local area
- Risk factor modifications affected by participation in a heart failure clinic
- The effect on quality of life with participation in the heart failure clinic

- The financial benefit seen by decrease in hospitalization and emergency room visits.

Implications for Education

Patient education has been determined to be one of the most important ways to help patients manage chronic disease. Educating patients can increase their cooperation with data collection leading to increased quality of their own care, and can improve the knowledge upon which future care will be based. This database will assist the APN in tracking the education done with individual patients. Using the database to monitor trends and changes in patient condition will help the APN determine the results of the education done.

In addition to patient education, there is a need for APN educational programs to provide instruction in the evaluation and role of computerized databases and their ability to enhance the quality of patient care.

CONCLUSION

This is an era of advanced information technology necessitating that medical records are up to date and efficient. The use of computerized patient care records for heart failure will improve the efficiency of the clinic and allow for more individualized care of the clients. This database is designed to assist NPs with keeping accurate patient care records in a time saving manner.

As managed care becomes more a part of patient care delivery, the tracking and reporting of outcomes become more important. This database will allow easy assess to data and a means of tracking and reporting patient care outcomes.

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Appendix 1

NEW YORK HEART ASSOCIATION

HEART FAILURE CLASSIFICATION

- **CLASS I No limitations on physical activities**

- **CLASS II Slight limitations on physical activity. NO symptoms at rest**

- **CLASS III More severe limitations. Usually comfortable at rest. Symptoms with many physical activities.**

- **CLASS IV Cannot carry on any activities without symptoms. Symptoms present at rest.**

Appendix 2

Minnesota Living With Heart Failure Questionnaire	No					Very Much
		Very Little				
Did your heart failure prevent you from living as you wanted in the past month by:						
1.Causing swelling in your ankles, legs, etc.?	0	1	2	3	4	5
2.making your working around the house or yard difficult?	0	1	2	3	4	5
3.making your relating to or doing things with your friends or family difficult?	0	1	2	3	4	5
4.making you sit or lie down to rest during the day?	0	1	2	3	4	5
5.making you tired, fatigued or low on energy?	0	1	2	3	4	5
6.making your working to earn a living difficult?	0	1	2	3	4	5
7.making your walking about or climbing stairs difficult?	0	1	2	3	4	5
8.making you short of breath?	0	1	2	3	4	5
9.making your sleeping well at night difficult?	0	1	2	3	4	5
10.making you eat less of the foods you like?	0	1	2	3	4	5
11.making your going places away from home difficult?	0	1	2	3	4	5
12.making your sexual activities difficult?	0	1	2	3	4	5
13.making you recreational pastimes, sports or hobbies difficult?	0	1	2	3	4	5
14.making it difficult for you to concentrate or remember things?	0	1	2	3	4	5
15.giving you side effects from medications?	0	1	2	3	4	5
16.making you worry?	0	1	2	3	4	5
17.making you feel depressed?	0	1	2	3	4	5
18.costing you money for medical care?	0	1	2	3	4	5
19.making you feel a loss of self-control in your life?	0	1	2	3	4	5
20.making you stay in the hospital?	0	1	2	3	4	5
21.making you feel you a burden to your family or friends?	0	1	2	3	4	5

From Patient's Self-Assessment of Their Congestive Heart Failure
Part 2: Content, Reliability and Validity of a New Measure,
The Minnesota Living with Heart Failure Questionnaire, (p206)
By Thomas S. Rector, Phd, Spencer H. Kubo, MD & Jay, N. Cohn MD.

Appendix 3

Heart Failure Clinic

Patient Information Record

Contact Number: 00001

Date: 5/12/98

Last Name:

First Name: Middle Initial:

Street Address:

City: State: MI Zip:

Home Phone #:

Work Phone #:

Significant Other:

Relationship:

Phone Number:

Insurance Provider 1:

Policy #:

Insurance Provider 2:

Policy #:

Gender: Race:

Birthdate: Age:

Social Security #:

Occupation:

Marital Status:

Level of Education:

Primary Care Provider:

Cardiologist:

Medical Information

Ejection Fraction:

Etiology of Heart Failure:

Height:

Weight on Admission:

Heart Failure Functional Outcome Score:

Severity Index (NYHA):

Co-morbidities/Risks

- ☐ Hypertension
- ☐ Renal Failure
- ☐ Diabetes ☐ Type 1 ☐ Type 2
- ☐ Cancer
- ☐ Angina
- ☐ COPD
- ☐ PVD
- ☐ CAD
- ☐ CVD
- ☐ MI

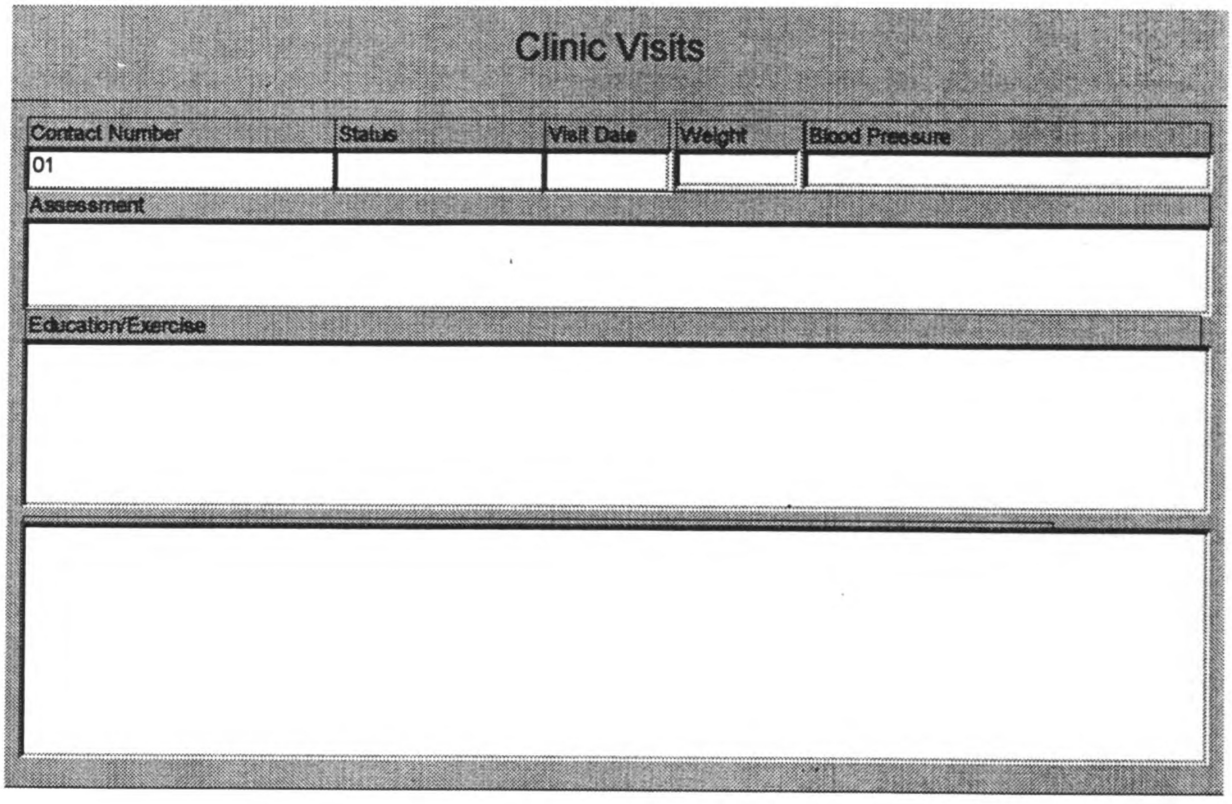
Risk Factors

- ☐ Alcoholism
- ☐ Dyslipidemia
- ☐ Sedentary Lifestyle
- ☐ Obesity
- ☐ Smoking
- ☐ Other

Significant Past Medical History:

Medications Subform:

Appendix 4



Clinic Visits

Contact Number	Status	Visit Date	Weight	Blood Pressure
01				

Assessment

Education/Exercise