This is to certify that the

thesis entitled

AN ANALYSIS OF NURSE PRACTITIONER PERCEPTIONS OF COMPETENCY AND BARRIERS IN THE MANAGEMENT OF CHF CLIENTS IN PRIMARY CARE

presented by

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has been accepted towards fulfillment
of the requirements for

Master of Science degree in Nursing

Barbara Given
Major professor

Date 12/10/99

AN ANALYSIS OF NURSE PRACTITIONER PERCEPTIONS OF COMPETENCY AND BARRIERS IN THE MANAGEMENT OF CHF CLIENTS IN PRIMARY CARE

By

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE IN NURSING

College of Nursing

1999

ABSTRACT

AN ANALYSIS OF NURSE PRACTITIONER PERCEPTIONS OF COMPETENCY AND BARRIERS IN THE MANAGEMENT OF CHF CLIENTS IN PRIMARY CARE

By

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Congestive heart failure (CHF) is the most prevalent hospitalization for persons over 65 years of age. Yet, it is currently unclear as to what extent nurse practitioners in the primary care setting manage CHF clients, the barriers encountered, or their level of competency in this management. The purpose of this study was to describe the relationships between barriers in the practice environment, Nurse Practitioner (NP) expertise in the management of CHF clients, the number and severity of CHF clients NPs actually manage, and the performance of necessary skilled practice functions in the management of the CHF client, within a sample of family, adult and geriatric NPs in Michigan. An anonymous, random survey design of 400 family, adult and geriatric nurse practitioners in Michigan was used.

NP efforts in CHF client management could impact both the client and health care system by buffering exacerbations, reducing hospitalizations, and improving continuity of care. This study has contributed information to nursing knowledge regarding the interactive role of the NP in the management of CHF clients.

This work is dedicated to my husband Jeff, who by offering his support on every level of this endeavor, helped turn a dream of achievement into a reality.

ACKNOWLEDGEMENTS

The author of this work most thankfully acknowledges the leadership, assistance, keen perceptions, and astute wit of her thesis committee chair, Dr. Barbara Given. Without her encouragement, energetic motivation, and tenacious support, this work might not have been fully realized, and I shall always be in her debt for this achievement. Thank you for serving as an exemplary role model while guiding and facilitating my entry onto the path of nursing research, thus opening my future to new possibilities and direction.

Extreme appreciation is also felt for another committee member, Brigid Warren, whose delightful and informative lectures inspired a good deal of the contemplation required to construct this work. Her ready guidance and cheerful demeanor has been a pillar in a storm, and her insightful direction has remedied more than a few sleepless nights. Thank you Brigid.

Further, grateful acknowledgement is due Louise Selanders for her kind, generous donation of time, energy and support, her insightful input and guidance, and her continued encouragement throughout a long process. Thank you for believing in this work.

Finally, I would like to acknowledge all three of my committee members for their support, belief, and encouragement of nursing scholarship at the master's level. Thank you for being the invaluable role models that you are.

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INTRODUCTION

Congestive heart failure (CHF) is a leading cause of morbidity and mortality in the United States and other industrialized countries, affecting an estimated 5 million Americans with 400,00 new cases annually, as well as causing annual hospitalization rates greater than 700,00 (Chin & Golman, 1997; Gillum, 1993; Massie & Shah, 1997; Stafford, Saglam, & Blumenthal, 1997). CHF also accounts for annual health care costs of approximately 38 billion, with much of this outflow spent on those greater than 65 years of age. Individually, chronic CHF clients suffer in variable degrees from long-term physical symptoms that usually affect their quality of life, functional, and emotional status, as well as economic well-being (American College of Cardiology & The American Heart Association, 1995; O'Connell & Bristow, 1994, Stafford et al., 1997).

As a chronic illness, congestive heart failure (CHF) is an increasingly prevalent and thus significant finding for clients, primary care providers and the health care system. The increase in incidence and prevalence of CHF noted in the 1990's is occurring despite a 31% decline in mortality from ischemic heart disease. Three causes for increased prevalence have been explored: 1) mortality reduction from

acute myocardial infarction, 2) better management of hypertension, which is prolonging survival but postponing CHF, and 3) aging of the population. It is well known that the incidence of CHF increases markedly with age, in fact doubling with each decade of life. Specifically, as of 1995, 82% of clients with CHF were over 65 years of age, and 50% had three or more co-morbid conditions, requiring an average of six daily medications. Furthermore, hospitalizations for heart failure in the 1990's have tripled since the 1970's. And, hospital readmission rates viewed as another marker of morbidity, show that as many as 78% of CHF clients have at least 2 admissions per year, and 16% three, leading to an ever increasing economic and public health burden (English & Mastrean, 1995; Funk, 1993; Massie & Shah, 1997).

Further, CHF is classified as a terminal condition, with the projected 6 year mortality rate following diagnosis at 80% for men, and 65% for women. However, with the advent of new treatment regimes and the delivery of fundamental care interventions on a consistent basis, CHF survival time following diagnosis are slowly lengthening, making CHF a chronic terminal illness (Stafford et al., 1997).

The experience of congestive heart failure affects the lives of both the client and the family in significant ways. The congestive heart failure client struggles with a large range of responses, secondary to the failure itself and the advancing role of dependency. Physiologically CHF clients

often have multiple co-morbid conditions, which increase case complexity, client debility, and can create a heightened demand on the family and health care provider. The downhill trajectory of CHF may be quite long with extended periods of stability, but will eventually be punctuated with frequent exacerbations and decompensation. Periodic needs for emergent interventions and hospitalizations can place the client and the family in a constant state of anxiety (Venner & Seelbinder, 1996).

Background of the Problem

CHF has multiple etiologies and can be defined as a condition of reduced contractility of the heart in which the ventricles are consistently unable to pump sufficient amounts of blood to meet the needs of the body. With the progressive increase in ventricular blood volume due to pumping inadequacy, cardiac muscle cells stretch beyond their optimal length resulting in the build-up of more blood volume and yet more stretching, leading to an overall decreased capacity for adequate ventricular contraction. As a clinical syndrome, CHF is thus characterized by interstitial and intravascular volume overload leading to inadequate tissue perfusion. Consequently overt symptoms such as fatigue and dyspnea on exertion commonly accompany peripheral edema, orthopnea and pulmonary rales. Causes can include any condition that increases plasma volume to an extent that ventricular muscle fibers are stretched beyond their capacity; cardiac injury or malfunction, coronary

artery disease, hypertension, congenital heart disease, rheumatic heart disease, diabetes and kidney failure are among common contributory factors (Brunwald, 1997; Dahlen & Roberts, 1995; Lilly, 1998; Seager, 1995).

CHF is a progressive illness that ultimately achieves inadequate cardiac function and manifestations of overt symptoms at rest, which severely affects exercise capacity and functional status of the sufferer. The severity in progression of CHF is commonly categorized according to the New York Heart Association (NYHA) Classification of Heart Failure: Class I individuals show no symptoms and have no limitations of physical activity. Class II shows slight limitation of activity, with dyspnea and fatigue with moderate activity. Class III individuals show marked limitations in activity and dyspnea with minimal activity. The most extreme category, Class IV, shows severe limitation of activity and overt symptoms of dyspnea and fatigue at rest (Lilly, 1998).

Due to significantly increasing numbers of cases in the 1980's and 1990's, increased national, economic, medical, and nursing attention has been focused on the management of CHF, which has also become a favorite target of hospital-based disease management teams. The discovery of long-term use of new pharmacological agents such as angiotensin-converting enzyme (ACE) inhibitors have led to new trends in treatment and significant advancements in the last 10 years, prolonging disease survival rates and improving short and

long-term outcomes in those with CHF (Krum, Karrasch, Hamer, Hare, Howes, Jackson, & Leslie, 1998; Massie & Shah, 1997).

In recent years, other non-pharmacological interventions have also shown effectiveness in the treatment of the CHF population, especially class III clients whose symptoms are more labile, while simultaneously reducing the incidence of hospitalizations and the overall economic burden of health care. Careful monitoring of illness progression, encouragement and management of lifestyle changes through frequent counseling and support, close monitoring of minor weight changes and respiratory symptoms, frequent assessment and rapid initiation of pharmacological agents, as well as the coordination of the complex needs in the care of the CHF client's multiple co-morbid conditions have been shown to be effective in reducing hospital admissions for acute exacerbations of CHF, which are most common among class III CHF clients. Class I and II CHF clients are in need of accurate diagnosis, preventative pharmacological intervention, psychosocial support, monitoring, and aggressive educational support regarding lifestyle changes. Exercise and endurance training have also been shown to improve the status of NYHA Class I and II CHF clients, but requires frequent monitoring. The interventions as discussed have also proven successful in specialized CHF clinics in the 1990's, due to a multidisciplinary team approach, involving concentrated in-home management of weight and diuretic therapy, counseling,

education, and provider initiated close follow-up of clients. Many of these interventions are fundamental to home health care and nursing case management, and are now recognized as critical to the efficient management of the CHF client (Brass-Mynderse, 1996; Dracup, 1996; Rich, Gray, Beckham, Wittenburg, & Luther, 1996; Wagner, Austin, & Von Korff, 1996). Moreover, in 1994 evaluation of these interventions and standard medical management of the CHF client was made by the Agency for Health Care Policy and Research (AHCPR), and were subsequently incorporated into a national guideline.

The AHCPR CHF guideline was published in 1994, and developed as a compendium of all studies reported to date on heart failure associated with left ventricular dysfunction. The guideline was intended for use by primary care providers, cardiac specialists, advanced practice nurses and physician assistants involved in the coordination of the care of the heart failure patient in the outpatient setting. It has since undergone wide dissemination and review in the United States (Konstam, Dracup, Baker, Bottorf, Brooks, Dacey, Dunbar, Jackson, Jessup, Johnson, Jones, Luchi, Massie, Pitt, Rose, Rubin, Wright, & Hadorn, 1994). Yet, in spite of the medical profession's heightened national focus on CHF and the AHCPR CHF guideline, physicians in general have been slow to respond with changes in practice and remain in need of much improvement in the care of the CHF client. For example, despite clear evidence that ACE

inhibitor therapy significantly reduces morbidity and mortality in all classes of CHF client it has been reported that in 1989, ACE inhibitors were prescribed to eligible clients by cardiologists only 46% of the time, and primary care providers 21% of the time (Deedwania, 1997; Stafford, Saglam, & Blumenthal, 1997). As evidenced by these reports and detailed by the AHCPR CHF guideline (1994), there is clearly much room for improvement in the routine management of the CHF client in the primary care setting.

The fatigue, dyspnea, edema and associated discomforts so characteristic of progressive heart failure, eventually places a great burden of coping upon the patient, family, and the health care provider. To modify these effects, CHF symptoms must be successfully managed through partnership between the health care provider, client, and the family, who must be diligent and competent in recognizing impending signs and symptoms and subtle downward trends, which can be achieved through frequent interaction with each other. Further, it is imperative that the health care provider coordinates the client's ongoing understanding of all necessary medications, the monitoring of weight fluctuations, and adherence to a strict dietary regimen. Careful and attentive management of the CHF client by the health care provider can help decrease hospital admissions otherwise required for stabilization of the CHF client whose symptoms are out of control (Nyamanthi, Jacoby, Constancia,

& Ruvevich, 1992; Rich et al., 1996; Sirles & Selleck, 1989).

The role of advanced practice nurses (APNs) as health care providers has been shown to increase access to basic health services in a wide variety of settings, as well as demonstrated improvements in continuity of care for undeserved, at risk, and chronically ill populations (Brass-Mynderse, 1996; Kegel, 1995; Rich et al., 1996; Safreit, 1992; Wagner et al., 1996) such as congestive heart failure. Yet, APNs remain an under-utilized resource in the management of chronic illness (Safriet, 1992), and specifically congestive heart failure (Kegel, 1995), further contributing to the observed phenomenon of ineffective management of CHF clients described by the AHCPR guideline (1994). This circumstance is of particular interest in today's managed care environment, which seeks the most effective and cost conscious provider of care (Brown & Grimes, 1993; Kegel, 1995; Safreit, 1992). Further, to adapt to the reform of health care and the rising importance of primary care, APNs have expanded their holistic focus, to consistently include health promotion, early screening, self-care participation and the health education needs of the patient. The health promotion and education focus of the APN in the primary care managed care setting can produce positive patient outcomes of care while increasing access, continuity and comprehensiveness (Coile, 1997; McGivern, Mezey, & Glynn, 1990; Safreit, 1992).

APNs have been shown to be responsively adherent to guidelines and protocols in the treatment of chronic illness, as well as irreplaceable members of a multidisciplinary team approach to care delivery, and have offered effective, capable and comprehensive management of such chronic illnesses as asthma and CHF in all settings (Alexander, Younger, Cohen, & Crawford, 1988; Kegel, 1995; Safriet, 1992). Consequently, the underutilization of the APN in the care of the CHF population could deprive this population of access to the APN's unique abilities to successfully and comprehensively manage this syndrome from a holistic perspective and according to nationally accepted guidelines, which ultimately contributes to enhanced continuity of care. Benner (1984) has described the extensive use of guidelines in the management of client illness as a characteristic of novice and advanced beginner levels of competency. Thus, the novice who internalizes this approach to client management has a firm beginning on the continuum of expertise in nursing practice, and completes an initial step toward the comprehensive and optimal management of the CHF client.

Nurse practitioners are particularly appropriate primary care providers for the CHF client and family due to the comprehensive disease management skills inherent within the role. These include advanced nursing practice, which incorporates evidenced-based evaluation and treatment of the client in multiple spheres such as education, counseling,

and psychosocial evaluation, performed in concert with medical, pharmacological knowledge and for the NP, prescriptive authority. Despite the fact that nurse practitioners have built their current practice on what may amount to years of experience as registered nurses, becoming a nurse practitioner involves the taking on of a new role with different clinical practice skills and performance expectations, constructed from a foundation of study and clinical experiences. Thus, though the role is an extension of nursing practice, the nurse practitioner must begin again through experience, to acquire expertise by traversing the levels of competency in a newly adopted role (Roberts, Tabloski, & Bova, 1997). Furthermore, the advancement of the NP through the five levels of competency described by Benner (1984), occur at varying rates dependent upon the individual's experiential background, years of practice, and qualities of each practice setting (Arena & Page, 1992; Holt, 1984). Therefore, continued experience with the varying needs of all classes of CHF client is important for the progression of NP expertise with this client population.

Unfortunately, barriers for NPs in the practice environment have been identified in recent research, which may decrease client access to the NP or decrease the NP's abilities to comprehensively manage the client. These barriers are a lack of full prescriptive authority, lack of physician support, reimbursement difficulties, and lack of public awareness of the NP role (Anderson, Gilliss, & Yoder,

1996). However, research related specifically to barriers in the management of an illness such as CHF are limited or nonexistent. In addition, despite guidelines which describe the appropriate skilled practice functions for the physician or APN in the care of the CHF client, little evidence-based research is presently available which isolates, describes, or measures the effectiveness of these practice functions in the management of the CHF population in any setting. Further, there is an elemental lack of information describing to what extent APNs or NPs in any setting actually participate in the management of the CHF population. If some APNs or NPs are minimal or non-participants in the care of CHF clients in the primary care setting, what are their perceived barriers to this situation, and how do other intervening factors such as number of CHF client, NP years of experience, expert status of the NP, self-reported expertise with CHF clients, and the functional classification of CHF clients relate to these barriers?

This research sought to fill some of these gaps by describing what skilled practice functions are being performed by NPs as APNs in the management of CHF clients. And, if a NP is not providing the skilled practice functions described in the AHCPR CHF guideline as comprehensive and appropriate for CHF clients in the primary care setting, what are the barriers present, and what is the impact of other intervening factors? The value of this research is

that the results will serve to communicate to APNs and others regarding current participation in practice for the CHF population, as well as barriers to the management of the CHF population that may be modifiable by APN intervention. Additionally, the identification of future needs and missed opportunities for clients with CHF to gain access to quality, cost effective care from the advanced practice nurse will provide care that is of great value to both the client and health care system.

Statement of the Problem

NPs provide care management in the primary setting for chronically ill CHF clients in a magnitude of which is presently unknown. Not knowing what skilled practice functions are being provided and the associated perceived barriers to management contributes to a lack of knowledge regarding opportunities that may increase the effectiveness and comprehensiveness of NP management of the CHF population. Comprehensively delivered NP care may also increase continuity for the CHF population, which is vitally important due to the complexity of the CHF client's co-morbid conditions resulting in increased demand on the health care system. Therefore, the purpose of this study was to identify and determine the magnitude of practice barriers present within the NP's practice environment. In addition, what impact have the barriers had have upon the NP's performance of the skilled practice functions in the management of the CHF population. Further, what was the

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relationship between the perceived barriers and the five intervening variables of number of CHF clients per week, years of NP practice, expert status of the NP, self-reported expertise with CHF clients, and functional classification of the CHF clients seen per week. As discussed above, these questions warrant further study, as it is important for advanced practice nurses and specifically nurse practitioners to understand the barriers, as well as their own positive potential in the management of CHF clients. The research questions to be answered were:

What are the perceived barriers of NPs, encountered while carrying out skilled practice functions in the management of the CHF client?

What is the relationship between the perceived barriers; and skilled practice functions, number of CHF clients per week, years of NP practice, expert status of the NP, self-reported expertise with CHF clients, and functional classification of CHF clients?

What is the relationship between the number of CHF clients, years of NP practice, expert status of the NP, self-reported expertise with CHF clients, and functional classification of CHF clients with the skilled practice functions?

Review of Literature

Definitions

The study concepts are: 1) nurse Practitioners (NPs); 2) CHF clients; 3) skilled practice functions performed in

management of CHF clients; 4) practice barriers; 5) number of CHF clients managed per week; 6) years of NP practice; 7) expert status of NP; 8) self-reported expertise with CHF clients; and 9) functional classification of CHF client.

Nurse Practitioners (NPs). The American Nurses Association (1996), defines NP as a master's-prepared nurse from an accredited institution, with advanced clinical skills and appropriate certification. Despite the current standard of master's preparation for the NP, it is recognized that this phenomenon is a recent trend, and that there are certified individuals that hold less than a master's degree. Therefore, for the purposes of this study, NPs included all family, adult or geriatric individuals with ANCC or ACNP certification. Although many clinical nurse specialists provide care in acute settings and CHF clinics, nurse practitioners are usually the only type of APN to care for CHF clients who possesses prescriptive authority, which has been identified as a barrier to provision of effective client care (Anderson, Gilliss, & Yoder, 1996; Safriet, 1992). Because the CHF client usually requires extensive medication management as a routine part of care delivery, only nurse practitioners holding the appropriate certification was surveyed for this research.

For the purposes of this study, congestive heart failure (CHF) clients referred to any and all individuals with suspected or actual diagnosis of reduced left-ventricular systolic dysfunction (as might be measured by a

cardiac ejection fraction of less than 35-40% and, or may be suffering from CHF symptomology in the outpatient setting. Symptomology is defined as: 1) intravascular and interstitial volume overload such as orthopnea, shortness of breath, pulmonary rales, weight gain and peripheral edema; and 2) inadequate tissue perfusion, such as fatigue and exercise intolerance as defined by the AHCPR, CHF guideline (Konstam et al., 1994).

Skilled Practice Functions. This concept refered to any skilled practice functions directly delivered, or facilitated by the NP at an advanced level, described as appropriate delivery of care by the AHCPR CHF guideline (Konstam et al., 1994), and the domains of practice as described by Brykczynski (1989) toward the screening, diagnosis or management of a CHF client's immediate or ongoing needs. These needs may take the form of screening, assessment, monitoring, coordinating, evaluation, diagnosis, pharmacological management, recommendation of therapeutic or diagnostic interventions, acquiring consultation, counseling, education, facilitating hospitalization, facilitating other care outside of clinic setting, telephone follow-up, ongoing care, and home visits. While these needs and the associated functions of care delivery are typical of any ill population, the CHF population generally requires more intense need on a more frequent basis, of a greater combination of functions due to the multiple co-morbid illnesses present. This phenomenon is evidenced by the fact

that CHF is currently the most common reason why Medicare patients are admitted to the hospital (Chin & Goldman, 1997). Furthermore, the comprehensive delivery of the functions as described have been validated as specifically necessary and appropriate in the care of the CHF population in particular (Chin & Goldman, 1997; Rich et al., 1996).

The six role behaviors identified by Hupcey (1990) as appropriate for the master's prepared, advanced practice nurse will also be included in this concept. They include leader, change agent, educator, evaluator, nursing theory user and researcher in the care of the CHF client.

Practice Barriers. King defines perception as a process of information transformation through organization and interpretation of incoming data, combined with recalled memories (1981). Further, the concept of perception refers to the individual's ability to extract and use information in the application of meaning toward the achievement of reality. The perception of facts relies upon the background knowledge and theories of the observer; ignorance tends to make facts perceptually inaccessible (Everson, 1995). Practice barriers are defined as the expressed perceptions of the NP regarding any and all obstacles to their direct participation in the delivery of the skilled practice functions that will lead to appropriate, as well as comprehensive, quality care provision for the CHF client that may take the dimensions of the following: 1) perceived barriers regarding prescriptive authority; 2) perceived

barriers regarding reimbursement; 3) perceived barriers regarding physician support; 4) perceived barriers regarding adequacy of NP educational preparation; 5) perceived barriers regarding NP level of competency; 6) perceived barriers regarding public acceptance of the NP role (Anderson et al., 1996; Benner, 1984; Brykcznski, 1989; Inglis & Kjervik, 1993; Safriet, 1992, Wagner et al., 1996).

Perceived barriers regarding prescriptive authority, refers to an inability to care for CHF clients due to lack of ability to prescribe necessary pharmacological agents in a timely and adequate manner, due to supervisory needs (Anderson et al., 1996; Safriet, 1992).

Perceived barriers regarding reimbursement refers to self, supervisory or administratively imposed limits to clients seen, due to a lack of adequate or fair reimbursement for services rendered for the care of the CHF client (Anderson et al., 1996; Safriet, 1992).

Perceived barriers regarding physician support refers to any perceived physician imposed lack of access to the APN in the care of the CHF client, or lack of support for the management of the CHF client by the NP (Anderson et al., 1996; Safriet, 1992).

Perceived barriers regarding NP adequacy of educational preparation refers to the NP's perceived lack of educational or clinical preparation to provide comprehensive, but basic management of CHF clients.

Perceived barriers regarding NP level of competency refers to the NP's perceived level of competency in the NP role according to Bryckcznski's model of the domain's of the NP and competencies of nursing practice, while providing care for the CHF client. Levels of expertise and skill acquisition may be altered due to barriers and subsequent lack of access to, and experience with the CHF client population (Brykcznski, 1989).

Perceived barriers regarding public acceptance of the role of the nurse practitioner, refers to the NP's perceptions that access or provision of care for the CHF client is hampered by the client's lack of acceptance of the NP's role in the primary care setting (Safriet, 1992).

Number of CHF Clients Managed per Week. This concept was an intervening variable and refered to the number of different CHF clients the NP in the primary care setting manageed on a weekly basis. This number was used as a measure to determine the family, geriatric or adult NPs level of participation in the care of the CHF population. This variable may have been impacted by barriers within the practice environment, or might have impacted the comprehensiveness of care delivered by the NP for the CHF population, or the perceived practice barriers of the NP.

Years of NP Practice. This concept was an intervening variable and refers to the number of years each NP has been practicing since graduation from their respective educational programs. Both Benner (1984) and Brykczynski (1989) have demonstrated the importance of time and experience in the practice setting toward progression within the continuum of competency. This variable was correlated with other variables and dependent upon the results was planned as a potential measure of NP competency in the practice setting. This variable may be impacted by barriers within the practice environment, or may impact the comprehensiveness of care delivered by the NP for the CHF population, or the perceived practice barriers of the NP.

Expert Status of NP. This concept was an intervening variable and refers to the level of expertise of the NP as defined by Benner (1984), and Bryckcznski (1989). Both Benner (1984) and Brykczynski (1989) have demonstrated the importance of time and experience in the practice setting in progression within the continuum of competency, and for this study, level of expertise in general, and then specifically in the care of the CHF client was determined. The levels of competency were as follows: novice, advanced beginner, competent, proficient, and expert. For the purposes of this study, only expert nurses could be accurately described from the data collection. This variable was used as a measure of expertise in the practice setting, and might have been impacted by barriers within the practice environment, or might impact the comprehensiveness of care delivered by the NP for the CHF population, or the perceived practice barriers of the NP. This variable was examined as follows: expert status of NP (an objective measure collected using the subset of expertise questions), self-reported expertise with general clients, self-reported expertise with CHF clients.

Functional Classification of CHF Clients. This concept was an intervening variable and refers to the New York Heart Association's (NYHA) Functional Classification of the CHF client's severity of disease. The classification is defined as follows: Class I individuals show no symptoms and have no limitations of physical activity. Class II shows slight

limitation of activity, with dyspnea and fatigue with moderate activity. Class III individuals show marked limitations in activity and dyspnea with minimal activity. The most extreme category, Class IV, shows severe limitation of activity and overt symptoms of dyspnea and fatigue at rest (Lilly, 1998). This variable was used as a measure of severity of CHF client illness in the practice setting, and the presence of clients with higher or lower classifications might have been found to be impacted by barriers within the practice environment, or might impact the comprehensiveness of care management by the NP for the CHF population, or the perceived practice barriers of the NP.

An assumption of this study was that the NP's ability to deliver appropriate and comprehensive care to the CHF population through a set of skilled practice functions was dependent upon the barriers present within the practice environment, as well as other intervening factors. These concepts have been identified through literature review as pertinent to the NP and particularly the nurse practitioner managing the CHF client population.

Conceptual Framework

An assumption of this research was that the nurse practitioner's perceptions of practice barriers in the form of prescriptive authority, reimbursement, physician support, NP adequacy of educational preparation, NP perceived level of competency, and NP public acceptance would impact NP performance of the skilled practice functions toward the

goal of comprehensive care in the management of the congestive heart failure client in the primary care setting, and may be impacted by other intervening factors as well. Intervening factors may also impact the NP's perceived barriers to practice in an undetermined manner.

Following the generation of research questions for this study, two models were chosen for their abilities to best support and understand inherent concepts. Adaptations were thus generated in an inductive approach by which to achieve greater understanding of the complex relationships between the concepts involved in the research questions.

King's conceptual model was used in this study to understand the influence of the concept of perception as it relates to the nurse practitioner in the practice environment, and with CHF clients. King describes perception as a representation of an individual's sense of reality, and involves awareness of persons, objects, and events within the environment. Past experiences, self-concept, and educational background have input into the perceptive process. However, the chief time orientation involved in perception is the future (King, 1981, p. 146). Perceptions are selectively processed as each individual permits the influence of stimuli from the environment (King, 1981, p. 22). Overall, perception can be defined as a process in which selected stimuli are organized, interpreted, and transformed into useful data, utilizing present orientation and memory of past experiences.

Perceptions provide meaning to an individual's experience, and serves to influence the behavior of the individual, while representing an image of reality (King, 1981, p. 24.). Thus, perception is an important concept inherent within this study due to its broad-reaching influence upon study concepts. Specifically in this study, King was used to understand the influence of the concept of perception related to the NP's view of barriers present within the practice environment, as well as NP self-reported expertise with CHF clients.

The second conceptual model adapted for this study was Bryckcznski's nurse practitioner model (1989). In describing Bryckcznski's model, it must be noted that the model was an adaptation of Benner's model (1984) regarding the domains of nursing practice, as well as the competency levels of nurses. In order to adapt the various levels of competency found within nursing practice in patient care situations, five levels were identified through research: novice, advanced beginner, competent, proficient and expert. Further, clinical experience over time results in a collection of useful and concrete paradigms that have been directly related to the level of achieved competency in Benner's model.

By analyzing descriptions of actual practice, Benner (1984) developed a model describing five levels of competency in clinical nursing practice, as well as seven descriptive domains of practice. These domains describe the

practice functions, characteristic of client care delivery by the clinical registered nurse (RN). Later, Brykczynski (1989) created a nurse practitioner model that used Benner's five levels of competency, but refashioned Benner's domains to specifically address the skilled practice functions of the nurse practitioner in the ambulatory care setting. Some of these functions include advanced assessment, nursing and medical diagnosis, coordination, and management of health status, facilitating hospital or clinic admissions, counseling, education, support, and follow-up at an advanced level of practice. Within Bryckcznski's model, the five levels of competency capture and describe the progression and acquisition of NP skill and expertise, acquired through ongoing experience within the specific domains of NP practice; it is known that the novice NP will not perform skilled practice functions as accurately and comprehensively as the expert NP.

Using interpretive descriptions of actual practice, Benner (1984) examined differences in practical and theoretical knowledge, and discovered that experience is an important catalyst to the development of expertise within the domains of practice. She discovered that the expert nurse perceives any given situation as a whole and applies past concrete situations as paradigms for guidance, and is therefore able to disregard irrelevant information in making a decision. The novice however, has few concrete situations derived from experience on which to draw, and must rely on a

conscious and deliberate problem solving approach using abstract principles. Thus, the various levels of competency represent differences in aspects of skilled performance and situational decision-making abilities.

Specifically, some of the performance characteristics of the APN in the different levels of competency as described by Bryckcznski (1989) include the following attributes. Novice: narrow scope of practice, development of technical skills, development of diagnostic reasoning and clinical reasoning, needs frequent consultation and validation of clinical skills, needs and establishes mentor, development of confidence; Advanced Beginner: seeks to enhance clinical areas of weakness, seeks to enhance diagnostic and clinical reasoning, begins development of indirect roles of educator and counselor, incorporates research findings into practice, is able to set priorities, is building confidence and credibility; Competent: feels competent in clinical and diagnostic reasoning, develops organizational skills and feels efficient, networks, senses nuances, relies on maxims to guide practice; Proficient: uses indirect roles of educator, consultant, and researcher in daily practice, conducts or directs research project, is an effective change agent, holistically approaches care, interprets nuances; Expert: scope of practice is global, integrates indirect roles smoothly, uses intuition, has greater visibility in practice, is reflective, empowers patients, and acts as a mentor (Hixon, 1996).

Benner (1984) origianlly identified seven domains of nursing practice into which most functions of nursing activities fall as: 1) the helping role; 2) the teaching-coaching function; 3) the diagnostic and patient-monitoring function; 4) effective management of rapidly changing situations; 5) administering and monitoring therapeutic interventions and regimens; 6) monitoring and ensuring the quality of health care practices; and 7) organizational and work-role competencies. These domains were developed to describe the practice functions of the clinical registered nurse (RN).

Brykczynski (1989) researched the skilled practice functions of the nurse practitioner as compared to the clinical RN in order to adapt Benner's domains of practice for the nurse practitioner delivering advanced functions of care in the ambulatory care setting. Brykcznski's research revealed the need for one additional domain, which consolidates and replaces two of Benner's domains that were more typical of inpatient nursing practice. Thus, management of patient health/illness status in ambulatory settings replaces diagnostic and monitoring function, and administering and monitoring therapeutic interventions and regimens, which is viewed as more appropriate for nurse practitioners.

Specifically related to advanced nurse practitioner practice as adapted by Brykczynski (1989), the functions of the helping role includes providing emotional and

informational support to the patient and their families during the crisis of diagnosis and management of both acute and chronic illnesses.

The teaching coaching function refers to NP's assistance and coaching of clients to alter their lifestyle and self-care needs. The effective management of rapidly changing situations refers to skilled performance in life-threatening emergencies and the identification and management of a patient crisis until further assistance is available.

The new domain of management of patient health/illness status in ambulatory care settings refers to the advanced functions of assessment, monitoring of status, coordinating and managing the health status of patients over time as a primary care provider, detecting acute and chronic disease while attending to the experience of illness, attention to the responses to illness processes, scheduling follow-up visits to closely monitor patients in uncertain situations, selecting and recommending appropriate diagnostic and therapeutic interventions and regimens, attending to cost, safety, invasiveness, simplicity, acceptability and efficacy as aspects of care functions.

Monitoring and ensuring the quality of health care practices refers to the functions of developing fail-safe strategies when concerns arise over physician consultation, using physician consultation effectively, giving constructive feedback to physicians and others to ensure

safe practices. Organizational and work role competency refers to facilitating hospital admission and other care, obtaining specialist care for the patient while remaining the primary provider, and patient advocacy.

The six domains of practice as identified by Brykczynski (1989) effectively categorizes functions of NP practice activities in the delivery of care for the CHF client as recommended by the AHCPR CHF guideline and recent research. The capture and categorization of these functions as an adaptation of Bryckczinski's model is important as a potential goal-oriented measurement device by which to gauge the optimal management of the CHF client by the NP, both in practice and for the purposes of this study. Further, Bryckcznski has postulated that the more comprehensively these skilled practice functions are performed, the more effective the care provision for the client. Barriers and intervening factors in the management of the CHF client may directly impact comprehensive practice in the domains of the nurse practitioner, and thus negatively impact the NP's performance of the skilled practice functions. Intervening factors in the form of number of CHF client visits, years of NP practice, expert status of the NP, self-reported expertise with CHF clients, and functional classification of the CHF client may also be related to the NP skilled practice functions, and NP perceptions of barriers (see Figure 1).

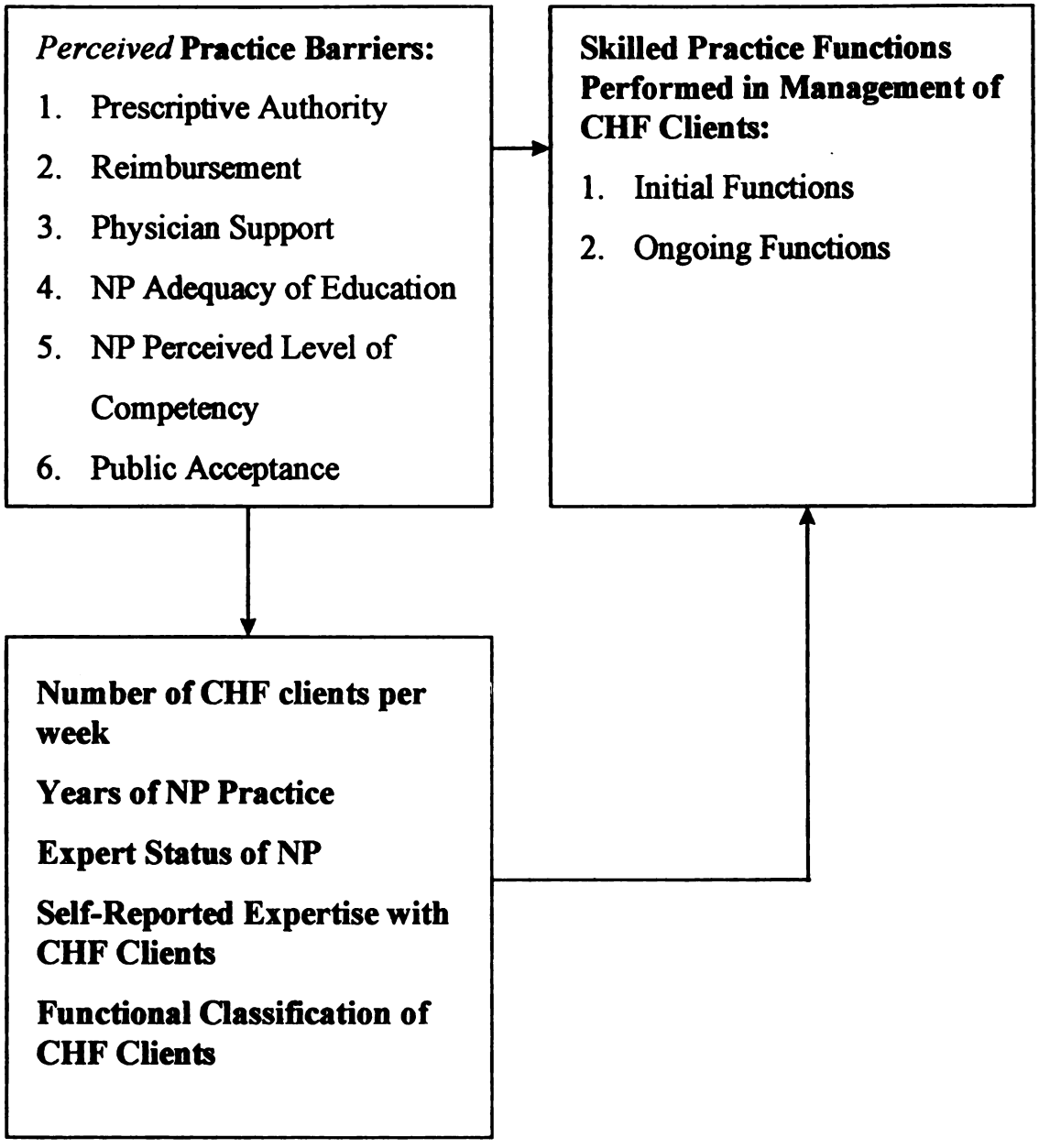

Figure 1. A Modification of Bryckcznski's model (1989), influenced by King's concept of perception: Perceived Practice Barriers, Skilled Practice Functions and Intervening Variables in the Management of the CHF Client.

The demographic variables for the nurse practitioners in this study include age and gender. It is believed these factors may impact the CHF client's access to the nurse practitioner, as well as the nurse practitioner's perceived barriers in the management of the CHF client.

Research described in the literature involving the specific skilled practice functions of the nurse practitioner who is involved in the management of the CHF client is very limited, as is research specifically related to barriers which inhibit the performance of any necessary practice functions in the management of the CHF population. Recent or older research, which addresses barriers to the NP provision of care specifically for congestive heart failure clients or for any particular illness is limited or nonexistent.

Congestive Heart Failure and NP Skilled Practice Functions

Adherence to evidence-based medicine in the form of diagnosis-specific guidelines, standards of care and standing orders has long been a topic of discussion within and about the discipline of medicine. Reluctance on the part of physicians to adapt established practice to include new research findings and optimal practice patterns and skilled practice functions is a well-known phenomenon with many associated factors (Deutsch, Denton, & Borenstein, 1998; Grimshaw & Russel, 1993). The University of Iowa identified some of these factors in a 1998 research study regarding physician compliance to adult preventative care

guidelines: uncertainty regarding the effectiveness of guidelines, lack of knowledge, and self-perceived effectiveness in changing patient behavior. This study also identified female gender as an independently supportive factor in compliance to guideline use (Ely, Goerdt, Bergus, West, Dawson, & Doebbling, 1998). Despite these findings, other research has shown that guidelines do improve the performance of skilled practice functions in clinical practice as well as patient outcomes, but vary in intensity of improvement (Grimshaw & Russell, 1993).

Chin and Goldman (1997) identified factors contributing to the readmission of CHF clients to the hospital. Patient characteristics were identified, as well as clinical reasons for acute deterioration. The study showed a failure on the part of health care providers in general, to aggressively manage the medication regimes of those with advanced CHF; specifically the underutilization of ACE Inhibitor therapy and upward dose titration, as well as diuretic therapy. Only physicians as health care providers were discussed, and specific skilled practice functions of care were not delineated.

Rich, Beckman, Wittenberg, Leven, Freedland, and Carney (1995) studied the effects of a multidisciplinary effort on the hospital readmission rates of elderly patients with CHF. The 142 patients in the treatment group were provided a set of specific, nurse-driven interventions while hospitalized, globally consisting of comprehensive education for the

patient and the family, a prescribed diet, social-service consultation, early discharge planning, a review of medications and close post-discharge follow-up consisting of multiple visits and telephone consultations. The control group of 140 patients received conventional care that was not detailed in the study report. Survival for 90 days without readmission was achieved in 91 of 142 treatment group patients, and 75 of 140 of the control group. Further, there were 53 re-admissions within 90 days in the treatment group and 94 in the control group. In a subgroup of 126 patients, quality of life score improved significantly more from baseline in the treatment group than in the control group, and overall cost of care decreased by $460.00 per patient in the treatment group. It was also found that there were fewer re-admissions in the treatment group for other causes as well as CHF. The report did not detail the educational characteristics of the nurses involved in the study protocol--it is unknown if any were nurse practitioners. The study was hampered by a small sample size of 282, representing 21.6% randomization of the population utilized. The study was also unable to isolate and correlate any of the specific interventions delivered with decreased admission rates.

Research used to construct the AHCPR CHF guideline also identified wide practice variation and errors among physicians regarding diagnosis, evaluation and testing, and the management of CHF clients with left-ventricular systolic

dysfunction. One of the most common errors made in the diagnosis of CHF clients is the failure to obtain measurement of left-ventricular function upon initial diagnosis. This measurement may prevent other common errors and misdiagnosis of CHF by absolute confirmation of decreased cardiac ejection fraction. Both echocardiography and radionuclide ventriculography are sufficient tests to initially determine cardiac ejection fraction indicative of left-ventricular systolic dysfunction. In addition, many CHF clients with hypertension and coronary artery disease and angina are not properly evaluated, or treated for these problems. The guideline's panel also found that chest x-rays, electrocardiograms, echocardiography, holter monitoring, radionuclide ventriculography, and exercise testing are over-utilized for monitoring the CHF client's progress, rather than symptom or activity-based measures. Management problems for CHF clients were found to include inadequate patient and family education related to home symptom management and disease process, not instructing patients to closely monitor weight, failure to recognize patient noncompliance with lifestyle changes and medication regimes, under utilization of exercise prescription, the lack of use and appropriate titration of ACE inhibitors, inadequate dosing of diuretic therapy, lack of consistent prescription of anticoagulation therapy for clients with arrythmias, and the concomitant use of deleterious agents such as calcium channel blockers, NSAIDS, and beta-agonist

inhalers (Konstam, Dracup, Baker, Bottorf, Brooks, Dacey, Dunbar, Jackson, Jessup, Johnson, Jones, Luchi, Massie, Pitt, Rose, Rubin, Wright, & Hadorn, 1994).

Cintron, Bigas, Linares, Aranda, and Hernandez (1983) examined the NP in a hospital-based CHF clinic regarding number of hospitalizations, total hospitalized days, total costs and patient satisfaction, but not specific NP interventions. The findings showed decreased hospitalizations, hospitalized days, and costs, while revealing high reports of patient satisfaction in those managed by NPs. However, the sample size for the study was only 15 patients, and seven of the 15 died in the 3-month follow-up period, thus dampening positive interpretations of study results, but serving as a pilot for future studies.

Most of these studies have discussed necessary skilled practice functions in the care of the CHF population by health care providers, particularly physicians, but leave an elemental lack of knowledge concerning the nurse practitioner functions involved in the care of CHF clients in the primary care setting, as well as the barriers to that care provision. Also lacking are details of the extent of care received, specific interventions and their impact on the outcome of care for the CHF population.

General Barriers in the Practice Environment

Anderson, Gilliss, and Yoder (1996) surveyed all certified nurse practitioners in California regarding the perceived legal or social barriers within their practice

environment. Practice environment was defined from an earlier study by Sekscenski, Sansom, Bazell, Salmon, and Mullen (1994) as the climate resulting from regulatory, social and political influences on NP, physician assistant (PA), and certified nurse-midwife (CNM) practice. Practice environment scores were devised for each state, with higher scores indicating a most favorable environment. Anderson et al. (1996) report that California scored 30 points of a possible 100 for practice environment, and that 43% of the sample of 2,741 stated they experienced legal or social barriers. Specific barriers were found in four broad categories: 1) lack of ability to prescribe medications; 2) lack of physician support; 3) difficulties with reimbursement; 4) lack of public awareness of the nurse practitioner's role. The limitation of prescribing privilege was the most frequently reported barrier with 415 hand-written comments. Lack of physician support was next with 175 comments, reimbursement difficulties 118, and lack of public awareness with 111 comments.

As mentioned, Sekscenski et al. (1994) determined practice environment scores for all states. In Michigan, practice environment was rated a score of 45 of 100, 89 for PA's, and 70 for CNM. Ohio scored 14 for NPs, 51 for PAs, and 60 for CNMs. Wisconsin scored 67 for NPs, 95 for PAs, and 62 for CNMs. The mean score for NPs in all states was 60.2, with a SD of 23.8. The authors also state that among states with low practice environment scores, both

prescriptive privilege and reimbursement were important factors for the NP group.

These studies provide a general overview of the barriers found within the practice environments of the NP in the United States. General barriers include a lack of full prescriptive authority, a lack universal reimbursement potential, a lack of consistent physician support, and a lack of public awareness of the nurse practitioner role.

Prescriptive Authority Barriers in the Practice Environment

Hamric, Worley, Lindebak, & Jaubert (1998) performed a small study using 33 NPs in 25 different primary care sites in Louisiana, examining safety and effectiveness of NP prescriptive authority, in which 1,708 patients were seen over a 2 month period. In 76% of the cases examined in which therapeutic treatment took place, the patient's condition stabilized or improved, and patient's evaluated their own outcomes positively. The physicians who participated in the evaluation of the NPs and their patients were unanimously supportive of prescriptive authority for NPs.

In 1995, Brown, and Grimes performed a meta-analysis of outcomes of NPs, and CNMs compared with physicians in primary care. The analysis included 38 NP and 15 CNM studies, examining 33 outcomes. In the studies that employed randomization to provider for therapeutic treatment, greater patient compliance to treatment recommendations was shown with NPs than with physicians.

Mahoney (1995) examined the process of implementing prescriptive authority in the workplace. She discovered that some employers are selectively and arbitrarily limiting the scope of NP practice by prohibiting prescribing as a function of employment, despite supportive state regulations for the APN role.

Mahoney (1994) studied the prescribing decisions of NPs and physicians in the care of geriatric patients. 209 NPs were randomly chosen from a universe of 1,200, and 373 randomly selected primary care physicians participated in a telephone survey consisting of an imaginary vignette for a client of 70 years, requiring therapeutic intervention choices. The choices were coded and given appropriateness scores ranging from 0 to 33. NPs were divided into groups consisting of those with legal right to prescribe and those without. The group with prescriptive rights scored a higher mean of 15.8 than those without, at 14.9. The physician group score mean was 13.3, which was significantly lower than the NPs mean score of 15.3, also contributing to a significant cost savings per patient. Prescribing experience, years of experience, and education were also factors analyzed in the study.

Wilcox, Himmelstein, and Woolhandler (1994) also supported Mahoney's (1994) finding in their study that physicians prescribe both inappropriate and potentially inappropriate medications in almost twenty-five percent of community-based persons aged 65 years or more.

The literature related to prescriptive authority identifies the need for full prescriptive privileges in the practice environment to enable the comprehensive use of the nurse practitioner in the care of any client population, and the lack of these privileges is therefore a barrier to practice. None of these studies discusses prescriptive authority specifically as a barrier related to the provision of care for the CHF population, or specifically in Michigan. Chin and Goldman (1997) however have identified that underutilization of necessary medications, as well as a lack of aggressive pharmacological treatment has resulted in greater hospital readmission rates for CHF clients. Therefore, limitations to NP prescriptive authority in the practice environment may become a specific barrier in the care of the CHF client.

Reimbursement Barriers in the Practice Environment

Ament (1998), who studied the impact of reimbursement policies on the viability of nurse practitioners and CNM practices, found that the ability to seek and maintain a client base, as well as the overall financial viability of the practice was not impaired. Private and Medicaid insurance was explored.

Other studies have identified reimbursement as a barrier to effective practice, Anderson et al. (1996) acquired 118 comments regarding reimbursement difficulties as a barrier to NP practice in a study gathering perceived legal and social barriers from California nurse

practitioners. Most complained of a lack of consideration for the role of NP as a billable provider. Specific difficulties included obtaining payment for services rendered, planned exclusions from payer plans, insurance companies unwilling to permit capitated reimbursement to an NP, and an inability to become part of established provider panels.

Sekscenski et al. (1994) also identified reimbursement as a significant barrier, and included it as a factor in the analysis of their practice environment score.

A lack of third-party reimbursement potential constrains the practice of APNs in several ways: by decreasing recognition and status, thus decreasing autonomy, thus decreasing control over practice, thus decreasing decision-making power in the care of their patients. Overall, restriction of direct reimbursement to NPs blocks their ability to function fully and completely (Caraher, 1988; Safriet, 1992; Mittelstadt, 1993). The literature lacks reference to the implications of a lack of reimbursement on the CHF population. However, specifically, a lack of direct reimbursement may affect the ability of the APN to provide comprehensive care for the CHF client.

Physician Support Barriers in the Practice Environment

From a medical point of view, the Institute of Medicine's Committee on the Future of Primary Care (1996) supported the use of nurse practitioners to deliver primary care and recommended that the care from all providers be

delivered from within the concept of an interdisciplinary team. Furthermore, the American Academy of Family Physicians (1997) has stated that they recognize the valuable place of the nurse practitioner in the present day managed health care environment, and support all health professionals as they endeavor to work together for the good of the patient in an integrated, interdependent approach.

In 1994 the American College of Physicians, Task Force on Physician Supply (PTF) published a position paper on the projected shortages of primary care physicians and the expanded roles of physician assistants and nurse practitioners. The PTF supported the presence of non-physician providers in primary care due to an inability to train enough physicians to fill the growing need. They also supported a complementary and collaborative role for physician assistants and nurse practitioners, but only on a health care team headed by a physician. The credibility of nursing generated research was questioned, and the PTF declared an interest in fostering collaborative educational experiences between nurse practitioners, physician assistants and students of medicine.

In 1993, Nursing's Agenda for Health Care Reform outlined a number of insightful changes for America's health care system, and directed the consumer's need for equal access to health care services should be at the center of the reformed system. And, Nursing's Social Policy Statement (1996) further identified nursing as a profession whose

boundaries are not rigid, but pliant and responsive to the changing boundaries of other health care disciplines.

In 1991, Lamb demonstrated that interdisciplinary interaction and participatory decision-making depend a great deal on the nurse practitioner's perceptions of the patient's medical complexity, as well as the NP's mental cost to benefit analysis regarding the involvement of any particular physician. Physicians were not always available or willing to help, when NPs perceived the need for help.

McClain (1988) demonstrated that interdisciplinary collaboration in the primary care setting between nurse practitioners and physicians is highly valued as an ideal, but is not often practically applied. Her findings uncovered clinicians that were in agreement that interdisciplinary collaboration was valuable, but NPs were much more definite than physicians in their assertions regarding this value. The majority of the physicians in the study relayed choices for another physician as a preferred collaborative team partner, but considered a nurse practitioner better than no one at all. Communication patterns were also shown to be crucial in an environment attempting to promote interdisciplinary collaboration: distorted or dysfunctional communication patterns will decrease the rate of interpersonal interaction among team members, thus decreasing the likelihood of collaboration. Underlying personal beliefs and values, as well as issues of social class and gender were all found to have significant

potential to create barriers to effective interdisciplinary collaboration. The study revealed that joint practice is not common, due to a number of contributory factors, and the practice of substituting a nurse practitioner for a physician in the delivery of primary care can lead to a competitive, non-communicative relationship between the two disciplines, as opposed to a collaborative relationship.

Weiss and Davis (1985) developed and tested the validity and reliability of an instrument called the collaborative practice scales, designed to measure behaviors used by nurses and physicians in collaborative practice, and found alpha coefficients of .80 and .84 as support for items involving assertiveness and collaboration.

Also in 1985, Prescott and Bowen studied the analysis of conflicts present in the physician-nurse relationship. This study was performed through the School of Nursing at the University of Maryland, sanctioned by the American College of Physicians. Findings focused on the methodology used in interdisciplinary problem resolution which was noted to be predominantly competitive or accommodative in method, but showed little if any evidence of collaborative relationships. Other findings revealed the need for clinical competence in the nursing profession in order to provide motivation for physicians to collaborate, the need for collaboration in relating practice to patient outcomes, and physician concern regarding the competition felt by

primary care physicians from their own increasing numbers as well as the expansion of advanced practice nurses.

The National Joint Practice Commission (NJPC) formed in 1971, supported by both the American Medical Association and the American Nurse's Association, was developed to resolve concerns between physicians and nurses in the hospital setting. The NJPC defined joint practice as the collaboration of nurses and physicians as colleagues, in the provision of patient care. Further, the NJPC identified the patient's needs as the center focus and primary reason for attempting to resolve differences. However, the AMA withdrew support from the project in 1981 however, citing discomfort with the expansion of nurse's roles and salaries. Despite the early termination of the project, the NJPC introduced research into discussions of interdisciplinary collaboration, setting a precedent for the future for both acute and primary care (National Joint Practice Commission, 1977).

A lack of professional support for the role of the nurse practitioner has been a topic of consideration in the literature since the inception of the role in the 1960's (Ford, 1979; Levine, Orr, Sheatsley, Lohr, & Brodie, 1978). Promoting the presence and collaboration of many disciplines within the U.S. health care system has been a long-standing goal in the literature since the early 1970's when Aradine and Hansen discussed the concept of teamwork in the family health setting, citing the results of positive patient

outcomes. And through the years, official views from both nursing and medicine seem to promote the same goals of interdisciplinary acceptance and collaboration.

The literature illuminates little evidence of physician motivation to pursue a collaborative relationship with APNs despite statements to the contrary, and specifically does not address professional support for NP management of the CHF client. However, a lack of professional support from physicians may contribute to a lack of access to the NP by the CHF population, as well as a lack of ability to comprehensively perform the necessary skilled practice functions.

Educational Barriers in the Practice Environment

A study in 1996 by Haward, Powell and McRoberts and done through the Idaho Rural Interdisciplinary Training Project examined change over time of the professional perceptions of a variety of disciplines of health care students involved in rural primary care. Among participants were nursing and nurse practitioner students, pharmacy, medicine, social work, physical therapy and counseling students. The study saw a significant change from pre to post-test in many of the perceptions of the students: an increased awareness and knowledge of the roles of other future health care providers seemed to contribute to the students perceptions of increased perception of the importance of collaborative practice in the care of the patient.

The PEW Health Professions Commission Taskforce on Health Care Workforce Regulation (1994) cited barriers to practice, lack of professional mobility, public confusion, and turf wars among health professionals as problems for advanced practice nursing. Some of their recommendations include standardizing entry-to-practice requirements, informing the public about practitioner services, assessing practitioner competence, and removing barriers that inhibit the comprehensive use of competent practitioners.

Morgan and Tolinger (1994) conducted a survey of 112 ambulatory care-focused, accredited nurse practitioner programs for a response rate of 53%, to determine the amount and characteristics of the clinical education of their students. The duration of the programs ranged from 4-30 months, averaging 15 months. The range of clinical hours required was 192-1600, with an average of 597 hours. Elimination of the extremes left a narrower range of 62% falling between 400-700 hours, with certificate programs reporting more hours than master's programs.

The literature does not specifically address educational preparedness and the ability to provide care for any population, nor the CHF population. However, a lack of educational or clinical preparation may contribute to the NP's inability to provide knowledgeable, comprehensive care for the CHF population.

Competency Level Barriers in the Practice Environment

Brown and Olshansky (1997) studied the experiences of the new nurse practitioner graduate in the first year of practice in primary care using a grounded theory approach, which guided the data collection and analysis. Thirty-five persons were interviewed in groups or alone at 1, 6 and 12 months after graduation. This research resulted in a theoretical model, which represents both the positive and negative transitions experienced in the initial first year of practice. The model is labeled From Limbo to Legitimacy and encompasses four categories. This research adds value to the body of work began by Benner (1984) and Brykcznsky (1989), as the tumultuous first year of practice is isolated and examined in detail.

O'Neill (1997) examined 10 home health nurses through one hundred patient records in order to examine autonomy and decision making. Two types of decisions were identified: self-directed and autonomous, using consultation and collaboration. It was found that novice nurses encountered more dilemmas requiring decisions, and they also used collaboration more extensively than more experienced nurses who were more autonomous. The author suggests the need for decision supports for the novice nurses.

Despite the fact that most nurse practitioners have built their current practice on what may amount to years of experience as registered nurses, becoming a nurse practitioner involves the taking on of a new role with

different clinical practice skills and performance expectations. In effect, though an extension of nursing practice, the nurse practitioner must begin all over again to traverse the levels of competency in a newly adopted role (Roberts, Tabloski, & Bova, 1997).

Maynard (1996) studied the relationship of critical thinking ability to professional nursing competence. A sample of 121 randomly selected nursing graduates was selected and categorized according to Benner's (1984) levels of competency. Two cohorts of the sample group (n=30) were measured longitudinally (from beginning student to practicing nurse) for critical thinking ability relating to the professional competencies of: leadership, critical care, teaching and collaboration, planning and evaluation, interpersonal communication, and professional development. Results showed that critical thinking ability did not change significantly from sophomore to senior, but increased as nurses began to practice. This study showed that experience was a key influential factor in the development of both critical thinking ability and level of competence.

Professional competence is an issue repeatedly brought forward by medicine when discussing the role expansion of nursing (Chavigny, 1993; American College of Physicians, 1994). And if not present, this physician-perceived factor could create a barrier for interdisciplinary collaboration in the practice environment. In 1993, Chavigny, Director of Nursing Affairs at the AMA addressed the implications of a

lack of consistent education of advanced practice nurses at the graduate level as a contributing factor to a physician-perceived lack of competency in the nurse practitioner population. The need for uniform educational preparation is stressed as a precursor to the competence that will gain physician trust and ensure future collaboration. Chavigny further stated that the AMA as a whole, supports advanced practice nurses especially in managed care systems as part of the health care team, but demands proof of APN competence and scientific accountability in research prior to a collaborative relationship in health care delivery.

Advancement through the five levels of competency occurs at varying rates for each APN, depending upon the individual's experiential background, years of practice and the qualities of each practice setting (Arena & Page, 1992).

Hupcey (1990) examined the socialization of master's prepared nurse practitioner students, and found that these students may place greater importance on acquiring and mastering technical skills than adopting master's-level role behaviors. These role behaviors are in addition to skills required to provide direct patient care, and were identified as leader, consultant, change agent, evaluator, educator, user of nursing theory and researcher.

Brykczynski (1989) conducted a qualitative study of 22 experienced nurse practitioners over an eight month period, in order to describe and communicate the knowledge that develops among practitioners and patients. She modeled her

research after Benner's in an attempt to further describe the knowledge underlying the practice of nurse practitioners, using the same hierarchical levels. As a result, she incorporated and further defined Benner's domains of practice as well as adding an additional domain explicit to the NP in the ambulatory care setting. Though not meant to be an exhaustive listing, these domains add to the knowledge and effectively categorize most of the advanced practice functions of the nurse practitioner in the ambulatory care setting.

Benner (1983, 1984) inspired by Dreyfus, studies clinical judgement in the practicing nurse. Using qualitative point of view, she uncovers new knowledge, and categorizes abilities according to five hierarchical levels, from novice to expert in describing the clinical nurse. Observation and small group interviews were the data-gathering methods used. Application of her findings in the clinical setting provides a way of describing the knowledge underlying clinical practice.

Dreyfus (1979) brings forth an important and influential declaration regarding practical knowledge; computers are not capable of possessing such knowledge, only humans are. Further, that practical wisdom develops through both theoretical concepts and practical knowledge is refined through experience in actual situations.

The literature supports the identification of different levels of competency for the nurse practitioner, dependent

upon length and depth of experience and practice setting. The literature also supports the need for experience in the practice setting, with clinical specific experience necessary to build competency in any given area of clinical expertise, such as CHF. Research by Brykczynski (1989) provides a framework by which to evaluate the domains of practice of the nurse practitioner, but does not comprehensively include the distinct role characteristics of the advanced practice nurse illuminated by later research.

Public Acceptance Barriers in the Practice Environment

Anderson, Gilliss, and Yoder (1996), identified a lack of public awareness as a barrier to NP practice in California. Cited in their study is concern over 111 of a total of 917 respondents, with comments related to a lack of public understanding regarding the public's understanding of the role of the NP.

Whitmore and Jaffe (1996) acknowledge that very little research has been done regarding the public perceptions of nurse practitioners. They conducted a small survey utilizing computer networks and bulleting boards for Internet service companies. Sixteen responses were received via e-mail and public boards. For this survey, three questions were asked, "1) What do you know about nurse practitioners?; 2) Have you ever received your health care from a nurse practitioner?; and 3) If so, describe this experience in terms of quality of care, your comfort level, and the difference between your experience with nurse

practitioners and with physicians" (p. 19). All respondents had at one or more times received care from a nurse practitioner, and comfort levels were high in all but two of the respondents. One of these individuals had actually seen a physician's assistant, and the other detailed a visit in which her child was not treated appropriately for the illness. This nurse practitioner was a new graduate and "did not seem confident" (p. 19). Comfort level, competency, cost, availability, and rapport described experienced differences between nurse practitioners and physicians. Most felt more comfortable with the NP, that they were as competent, cost less, were more available, and established greater rapport than the physicians.

Armer (1993) conducted a telephone survey of a random sample of 500 residents of a mid-western community, regarding the public's perceptions of a health care crisis, and responses to the role of the advanced practice nurse. The sample was composed of 62% women, 51% young adults, 36% middle-aged adults, and 13% 65 or over. 47% lived in the city, 24% resided in small towns, and 29% lived on farms or in the country. 70-94% of the respondents gave highly favorable responses to three selected advanced practice nursing activities. Without exception, farm dwelling residents showed the most support in all categories, and were also the most dissatisfied with recent physician care visits. The categories included need for increased access to health care, need for better out-of-office care for the

chronically ill, and for those with transportation difficulties.

Safriet (1992) states that nurse practitioners suffer from "invisibility" (p. 423) in the medical model-dominated health care system of the United States. Lumped in with physician assistants and called "non-physician practitioners" (p. 423) serves to marginalize, dominate and control the progression of the advanced practice nursing profession. She notes that nurse practitioners have unique skills to offer the health care system yet are severely underutilized, due in part to a lack of public and professional awareness regarding the role.

Edmunds (1988) discusses the need and strategies for promoting visibility for the role of nurse practitioner. Multiple titles for advanced practice nurses are noted to be confusing to the public however, the title of nurse practitioner is acknowledged as being more recognizable to the public than in the 1960's and 1970's. It is also acknowledged that not enough individuals are aware of the nurse practitioner's contributions to health care. Solutions suggested involve hiring professional marketing for the role, using different media forms. Suggestion is also made to individual nurse practitioners to become involved in their local community to personally educate the both private citizens and other multidisciplinary professionals.

The literature related to public acceptance of the role of the nurse practitioner shows public satisfaction by most of those who are cared for by an NP, but does not specifically address the CHF client population. However, if the CHF client was not aware of, or accepting of the role of the NP, access to the comprehensive care available by the NP may be inhibited.

In general, research shows that nurse practitioners are accepted as valuable members of the health care team in the care of the CHF client. An early study did attempt to specifically show the value of the NP in providing care for the CHF client, but was hampered by a small sample size and an acute-care setting. The research and literature findings also consistently show gaps related to knowledge of exactly what functions of care are provided by the nurse practitioner at an advanced level for the CHF client, as well as a lack of knowledge regarding what barriers are present in the delivery of this care. The literature supports the identification of different levels of competency for the nurse practitioner, dependent upon length and depth of experience and practice setting, as well as clinical specific experience. Research by Brykczynski (1989) provides a framework by which to evaluate the domains of practice of the nurse practitioner, but does not comprehensively include the distinct role characteristics of the advanced practice nurse illuminated by later research (Hupcey, 1990).

General barriers for nurse practitioners within the practice environment have been studied and are well understood to include lack of full prescriptive authority in most practice environments, reimbursement difficulties that vary by state, lack of consistent physician support in the practice setting despite declarations of support from the medical profession, variable educational backgrounds and clinical preparation for nurse practitioner practice, as well as a tentative but variable acceptance by the public of the role of the nurse practitioner. The research does not describe specific NP barriers in caring for any given population, and not for the congestive heart failure population. There is also a lack of research on many of the demographic variables such as gender and age, as well as practice factors such as number of clients per day, years of NP practice, expert practice status of the NP, and CHF functional classification related to barriers in the practice environment and NP functions of care for the CHF population.

The literature reviewed and the many apparent gaps present do provide some support for this descriptive study concerning the function of care for the CHF client and the barriers associated with the provision of this care.

Methods

Research Design

A non-experimental, descriptive survey research design will be employed, by mailing a self-administered

questionnaire consisting of closed-ended questions utilizing multiple choice and Likert scales, as well as optional open-ended comments questions. In addition to the survey, a cover letter and sheet defining Benner's five levels of competency will be enclosed to aid the respondent in the identification of their self-perceived level of competency.

Population

The population proposed for this study consisted of certified nurse practitioners in Michigan. This group was narrowed to include certified family, adult or geriatric NPs only, practicing in a primary care setting, because the literature shows that these individuals have the most potential to provide care for the CHF client. Since master's preparation as a requirement for certification is a recent phenomenon, all educational preparations were accepted in the certified population as eligible respondents. A list of all certified family, adult and geriatric nurse practitioners within Michigan was obtained for a cost of $300.00, through the American Nurse's Credentialing Center in Washington, D.C. This body governs the certification of all nurses, and nurse practitioners in the United States. The list obtained contained the names of 768 nurse practitioners, and from this population a total of 400 were randomly selected utilizing a table of random numbers. Returned surveys numbered 189 and the first 100 eligible samples were used. Forty-nine surveys were deemed unusable due to failure to complete the questionnaire, and

two respondents who answered all the skilled practice function questions with a single line drawn through the "always" response were eliminated. The sample population used thus consisted of 100 adult, geriatric, and family, certified nurse practitioners currently practicing within the state of Michigan.

Data Collection Procedures

Prior to the study taking place, permission from the human subjects review committee at Michigan State University was sought and approved. Survey data was obtained using forced multiple choices, and closed-ended questions in a Likert format, as well as optional open-ended questions in the form of comments. The purpose of the forced choice format was to encourage the participant to make a gradated choice regarding his or her practice experiences.

When 100 eligible surveys were received, each was entered into a database (SPSS Version 8) and given a numerical code. Other eligible and ineligible respondent surveys were saved, but not entered into a database.

Conceptual and Operational Definitions

Listed below are the specific definitions for the research variables.

The study concepts are: 1) Nurse Practitioners NPs); 2) CHF Clients; 3) NP Skilled Practice Functions used in the management of CHF clients; 4) NP Perceived Practice Barriers; 5) Number of CHF Client Visits; 6) Years of

NP Practice; 7) Expert Status of NP; 8) Functional Classification of CHF Client.

Conceptual Definitions

Nurse Practitioners (NPs). Nurse practitioners holding ANCC or ACNP specialty certification in family, geriatric, or adult, in the primary care setting.

CHF clients. Clients with any classification of congestive heart failure symptomology currently treated in the primary care setting by a family, geriatric or adult certified NP.

NP Skilled Practice Functions. Care that is directly delivered or facilitated by the NP in the management of the CHF client.

NP Perceived Practice Barriers. Practice barriers are defined as the perceptions of the NP regarding present obstacles of access to, or the performance of skilled practice functions necessary to provide appropriate, comprehensive care for the CHF client. These potential barriers have been pre-determined as: prescriptive authority, reimbursement, physician support, NP adequacy of education, NP level of competency, and public acceptance of NP.

Number of CHF Clients per Week. Number of different CHF clients managed per week by the NP in the primary care setting.

Years of NP Practice. Number of years of NP practice since graduation.

Expert status of NP. Objective measurement of current level of NP expertise, as well as self-reported level of expertise as defined by Benner (1984): categories include novice, advanced beginner, competent, proficient, expert.

Functional classification of CHF client. Classification of severity of illness for CHF client as defined by the NYHA: Class I, II, III, or IV.

Operational Definitions

The independent variables in this study were: 1) number of perceived barriers regarding prescriptive authority; 2) number of perceived barriers regarding reimbursement; 3) number of perceived barriers regarding physician support; 4) number of perceived barriers regarding adequacy of NP education; 5) number of perceived barriers regarding NP competency; 6) number of perceived barriers regarding patient acceptance of NP role.

Dependent variables were NP Skilled Practice Functions, listed as follows: 1) numbers of assessment of coronary artery disease, 2) numbers of assessment of hypertension, 3) numbers of diagnosis of CHF using LVF measurement, 4) numbers of physician collaboration, 5) numbers of echocardiography, 6) numbers of radionuclide ventriculography, 7) numbers of chest x-rays, 8) numbers of holter monitoring, 9) numbers of exercise testing, 10) numbers of Ace Inhibitors, 11) numbers of Digoxin, 12) numbers of diuretics, 13) numbers of discussion of prognosis with patient and family, 14) numbers of screening for

comorbid illnesses, 15) numbers of dietary prescription and counseling, 16) numbers of exercise prescription, 17) numbers of weight monitoring, 18) numbers of ensuring client has a working weight scale, 19) numbers of client instructions on when to call provider, 20) numbers of facilitating hospitalization, 21) numbers of management of client in hospital. Ongoing management of CHF includes: 1) numbers of monitoring of illness progression over time, 2) numbers of monitoring quality of care delivery for client, 3) numbers of coordinating multiple provider's regimens of care, 4) numbers incorporating research into CHF care, 5) numbers of pharmacological management of acute exacerbations, 6) numbers of pharmacological management of ongoing problems, 7) numbers monitoring pharmacological side effects, 8) numbers of echocardiography, 9) numbers of radionuclide ventriculography, 10) numbers of chest x-rays, 11) numbers of holter monitoring, 12) numbers of exercise testing, 13) numbers of evaluating effectiveness of care regimen, 14) numbers changing ineffective care regimen, 15) numbers addressing noncompliance issues, 16) numbers of specialist consultation, 17) numbers of emotional support and counseling, 18) numbers of family support and counseling, 19) numbers of anticipatory guidance for disease progression, 20) numbers using nursing theory to guide practice, 21) numbers facilitating hospitalization, 22) numbers of hospital management of client, 23) numbers of telephone follow-up, 24) numbers of home visits, 25) numbers

of ACE Inhibitor therapy, 26) numbers of titration of ACE Inhibitors, 27) numbers of Digoxin, 28) numbers of diuretics, 29) numbers of outpatient ionotropic therapy, 30) numbers of anticoagulation, 31) numbers of calcium channel blockers, 32) numbers of NSAIDS, 33) numbers of beta-agonist inhalers.

Intervening variables were: 1) numbers of CHF clients managed per week; 2) numbers of years of NP practice; 3) expert status of NP score, 4) self-reported expertise with CHF clients; 5) numbers of functional classifications of CHF clients, I, II, II, and IV.

1. Nurse Practitioners: Nurse practitioners holding ANCC or ACNP certification in family, geriatric, or adult, and providing care for family, geriatric, or adult clients. Including the following: all NP ages and genders, all educational preparations, and past clinical experiences, currently working in a primary care setting: specialty certification, majority type of clients, age, gender, years of practice, current and past settings of practice, educational degrees, certification type, length of present employment, past RN experience, total and type of other full and part-time professional providers, collaborative providers, number of total clients per week, perceived level of competency, perceived level of competency in caring for CHF clients. Defining advanced practice competency in the care of CHF clients: consultation, education, seek

out learning experiences, mentoring, theory use, competent in ability to diagnose, evaluation of own practice, research involvement, feeling overwhelmed, competent in ability to manage acute crisis, other providers refer CHF clients, incorporation of research findings into practice, evidence-based practice, feeling overwhelmed in the care of the CHF client, counseling, intuition, guidelines, perceived credibility, and change agent (Questionnaire: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 18, 19/ a, b, c, d, e, f, g, h, I, j, k, l, m, n, o, p, q, r, s, t).

2. CHF clients: Clients with cardiac ejection fraction of 35-40%, and, or suffering from intravascular and interstitial volume overload such as shortness of breath, rales, weight gain and edema; and inadequate tissue perfusion, such as fatigue and exercise intolerance as defined by the AHCPR, CHF guideline, and classified by the New York Heart Association CHF classification system. Numbers of CHF clients seen per week (Questionnaire: 15, 16).

3. NP Skilled Practice Functions: Includes care delivered at the advanced practice level, in a primary care setting by a certified NP caring for a CHF client who is defined above. The functions of care for the initial evaluation of CHF include the following: assessment of coronary artery disease, assessment of hypertension, diagnosis of CHF using LVF measurement,

physician collaboration, echocardiography, radionuclide ventriculography, chest x-ray, holter monitoring, exercise testing, Ace Inhibitor, Digoxin, diuretics, discussion of prognosis with patient and family, screening for comorbid illnesses, dietary prescription and counseling, weight monitoring, ensuring client has a working weight scale, client instructions on when to call provider, facilitating hospitalization, management of client in hospital. Ongoing management of CHF includes the following: monitoring of illness progression over time, monitoring quality of care delivery for client, coordinating multiple provider's regimens of care, incorporating research into CHF care, pharmacological management of acute exacerbations, pharmacological management of ongoing problems, monitoring pharmacological side effects, echocardiography, radionuclide ventriculography, chest x-ray, holter monitoring, exercise testing, evaluating effectiveness of care regimen, changing ineffective care regimen, addressing noncompliance issues, specialist consultation, emotional support and counseling, anticipatory guidance for disease progression, using nursing theory to guide practice, facilitating hospitalization, hospital management of client, telephone follow-up, home visits, ACE Inhibitor therapy, titration of ACE Inhibitor, Digoxin, diuretic, outpatient ionotropic therapy, anticoagulation, calcium

channel blockers, NSAIDS, beta-agonist inhalers. The skilled practice functions cover all of Bryckcznski's domains of practice of the nurse practitioner. Further embedded within the skilled practice functions are the advanced practice role characteristics of being a leader, change agent, educator, evaluator, user of nursing theory, and researcher in the care of the CHF client. An optional comments question was included (Questionnaire: 20 Part 1: a, b, c, d, e, f, g, h, I, j, k, l, m, n, o, p, q, r, s, t, u; and Part 2: a, b, c, d, e, f, g, h, I, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z/ aa, bb, cc, dd, ee, ff, gg, hh).

4. NP Practice Barriers: Practice barriers include the following: 1) perceived barriers regarding prescriptive authority (21 a, k, t); 2) perceived barriers regarding reimbursement (21 e, j, s); 3) perceived barriers regarding physician support (21 b, h, i, o); 4) perceived barriers regarding the adequacy of NP educational preparation (21 d, l, r); 5) perceived barriers regarding NP level of competency (21 g, m, q); 6) perceived barriers regarding public acceptance of the NP role (21 p, n, f). An optional comments question was included (Questionnaire: 21 a, b, d, e, f, g, I, j, k, l, n, o, p, q, r, s, t, u).

5. Number of CHF Clients managed per Week: Number of different CHF clients managed per week by the NP in the primary care setting (Questionnaire 15, 21 c.)

6. Years of NP Practice: Number of years of NP practice since graduation from educational program of NP preparation and specialty certification (Questionnaire 5).

7. Expert Status of NP: Level of expertise as defined by Benner (1984), categories include: novice, advanced beginner, competent, proficient, expert. Self-perceived level of competency, questionnaire 17. Self-perceived level of competency with CHF clients, questionnaire 18. Objective measure of expert status of NP (Questionnaire 19 a, b, c, d, e, f, g, h, I, j, k, l, m, n, o, p, q, r, s, t).

8. Functional Classification of CHF client: Classification of severity of illness for CHF client as defined by the NYHA: Class I, II, III, or IV. Class I individuals show no symptoms and have no limitations of physical activity. Class II shows slight limitation of activity, with dyspnea and fatigue with moderate activity. Class III individuals show marked limitations in activity and dyspnea with minimal activity. The most extreme category, Class IV, shows severe limitation of activity and overt symptoms of dyspnea and fatigue at rest (Questionnaire 16, 21 h, m).

Instrument

A questionnaire was developed for this study because there are no instruments available that address NP skilled

practice functions, NP practice barriers in the management of the CHF population, or level of NP expertise with CHF clients. The questionnaire was developed based on the skilled practice functions appropriate for management of the CHF client as outlined by the AHCPR guideline, and Bryckcznski's domains of NP practice, as well as characteristics of NP competency adapted from from Benner's model of Novice to Expert (1984) as modified by Brykcznski (1989), characteristics of advanced nursing practice as delineated by Hupcey (1990), and NP perceived barriers within the practice environment as identified in the literature.

The validity of an instrument as defined by Polit and Hungler (1995) is the "degree to which and instrument measures what it is supposed to be measuring" (p. 353). Various persons knowledgeable of the content areas established face validity through review of the instrument in a pilot study. These individuals were determined to in practice greater than 5 years, and found as acquaintances of faculty of the Michigan State University College of Nursing, and were all graduate level NPs. The individuals numbered 15 and were from Indiana, Wisconsin, and Texas. Specifically, they were asked, "Does this instrument work?" and "Does this instrument accomplish what I am trying to do?" Their responses were evaluated and shared with thesis committee members. Other than format suggestions and numbering changes, no changes were made to the instrument

based on the comments of the pilot study group. The development of the survey questions used in the pilot study were based on literature review, and are further described under the section entitled "Pilot Study".

The questionnaire included 4 sections: Background Information, Demographic Information, Practice Information, and Barriers to Care Provision. The Background information section consisted of NP specialty and majority type of clients. These two questions addressed respondent eligibility: family, geriatric or adult NPs who see the appropriate type of clients for their certification. The Demographic Information included age and gender. Practice information included: years of NP practice, current setting of practice, past setting of practice, educational degrees, NP certifications held, length of present employment, areas with 6 months experience as RN, number of providers in the practice site, what other providers are in the practice site, total clients managed per week, total CHF clients managed per week, functional classification of the clients managed per week, self-reported expertise with general clients, self-reported expertise with CHF clients.

Also included in the practice section are the skilled practice functions of: assessment of coronary artery disease, assessment of hypertension, diagnosis of CHF using LVF measurement, physician collaboration, echocardiography, radionuclide ventriculography, chest x-ray, holter monitoring, exercise testing, Ace Inhibitor, Digoxin,

diuretics, discussion of prognosis with patient and family, screening for comorbid illnesses, dietary prescription and counseling, weight monitoring, ensuring client has a working weight scale, client instructions on when to call provider, facilitating hospitalization, management of client in hospital. Ongoing management of CHF includes: monitoring of illness progression over time, monitoring quality of care delivery for client, coordinating multiple provider's regimens of care, incorporating research into CHF care, pharmacological management of acute exacerbations, pharmacological management of ongoing problems, monitoring pharmacological side effects, echocardiography, radionuclide ventriculography, chest x-ray, holter monitoring, exercise testing, evaluating effectiveness of care regimen, changing ineffective care regimen, addressing noncompliance issues, specialist consultation, emotional support and counseling, anticipatory guidance for disease progression, using nursing theory to guide practice, facilitating hospitalization, hospital management of client, telephone follow-up, home visits, ACE Inhibitor therapy, titration of ACE Inhibitor, Digoxin, diuretic, outpatient ionotropic therapy, anticoagulation, calcium channel blockers, NSAIDS, beta-agonist inhalers. Embedded within the functions of care are the advanced practice role characteristics of being a leader, change agent, educator, evaluator, nursing theory user, and researcher in the care of the CHF client. Also included is a comments question.

Also included in the Practice section was a set of questions which focused on an objective measure of expert status of NP, which addressed: consultation, education, seeking out learning experiences, mentoring, theory use, competent in ability to diagnose, evaluation of own practice, research involvement, feeling overwhelmed, competent in ability to manage acute crisis, other providers refer CHF clients, incorporation of research findings into practice, evidence-based practice, feeling overwhelmed in the care of the CHF client, counseling, intuition, guidelines, perceived credibility, and change agent.

The Practice Barrier section included the following possible perceived NP barriers in the management of the CHF client: prescriptive authority, reimbursement barriers, physician support or lack of support as a barrier, NP educational preparation as a barrier, NP self-perceived level of competency as a barrier, public support as a barrier, public acceptance as a barrier. Also included was an optional comments question.

The Background section consisted of 2 questions, the Demographics section 2 questions, the Practice Information section has 14 single or multiple choice questions and 2 questions with lists of activities: the expert status of NP subset of the Practice section with 20 questions, the skilled practice functions subset with 21 questions regarding the initial skilled practice functions, and 33 questions regarding the ongoing skilled practice functions,

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and 1 optional comments question, for a total of 89 questions. The Barriers section included 8 positive, and 12 negative questions, with 1 optional comment question for a total of 21 questions. The survey totaled 114 questions, but many questions included multiple answers, and covered 7 pages. Five point Likert scales were used for the expert status of NP subset, and the Barriers subset used the graded answers of: Definitely True, Mostly True, Unsure, Mostly False, Definitely False. These responses were chosen because the questions requested the truthfulness of the perceptions of the NP. The Skilled Practice Functions were worded with the responses of: Always, Sometimes, Unsure, Not Usually and Never because the listing asked for frequency of activity performance. Questions in the Barriers subset were balanced in terms of positive and negative wording to avoid any tendency to agree with all positively worded statements.

Pilot Study

The questions developed for this study were done so through literature review, and face validity of the instrument established with knowledgeable persons through a small pilot study. Since content validity is based on judgement, and no objective methods exist to evaluate content, one way to achieve some measure of validity is to have others with expertise in the selected areas review the items in question (Polit & Hungler, 1995). The pilot study sought to establish sufficient face validity to carry out the study with the planned group of NPs. For the pilot, the

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instrument and evaluation page was administered to 15 family, geriatric or adult NPs with 5 or greater years in practice, selected from graduate NPs across the country who were acquaintances of faculty members from the Michigan State College of Nursing. Each pilot study participant was personally contacted and asked to complete the questionnaire and evaluation page, which was mailed to them with the cover letter, a level of expertise explanation sheet, and a page evaluating the validity of the survey.

The evaluation page asked the respondent NPs to identify whether the items on the survey adequately addressed the issues of demographics, practice information, skilled practice functions, and barriers within the practice environment. They were asked to complete the survey, as well as an evaluative page addressing the readability of the survey related to verbiage, design, understandability and validity of the questions toward the issues, fatigability, and response time. An optional comments section was included on the evaluation form asking for feedback and recommendations on survey improvements.

Upon return of the 15 pilot surveys, results from the evaluation page were evaluated using the thesis committee of the researcher as a judging panel. Following discussion and consensus, the questionnaire, cover letter, and explanation sheet was not revised, save for font size and minor numbering changes.

Measurement and Scoring

Questions 1-2 were single choice questions, which classify the respondents by specialty and client type of practice. Questions 5, 10, 12, 14, and 15 were interval level variables and measured in years. Questions 4, 6, 7, 8, 9, 11, 13, 16, 17, and 18 are nominal variables and will be assigned numeric codes. Questions 19, 20, and 21 were measured on a 5 point Likert scale. Questions 19 and 20 were measured by: always=5, sometimes=4, unsure=3, not usually=2, never=1. Question 21 was be measured by: definitely true=5, mostly true=4, unsure=3, mostly false=2, definitely false=1. Questions 20 and 21 had optional comments sections available.

The Skilled Practice Functions were evaluated according to Initial Functions and Ongoing Functions. In order to eliminate irrelevant questions and make the sets more manageable for correlation, factor analysis was performed on each subset in the interest of data reduction. Questions eliminated through the factor analysis process for Initial Functions were d ,f, h ,l, t, v, and y. Questions eliminated through the factor analysis process for Ongoing Functions were j, m, o, t, y, aa, bb, cc, hh, and jj. The responses from each of the skilled practice functions will be described, and the Initial and Ongoing factored subsets used for correlation with other variables.

The Expert Status of NP subset was designed to aid discrimination between the expert NP and other levels of NP

expertise. There were 20 questions with a high score possible of 100, and a low score possible of 20. However, 5 specific question derived from Benner's (1989) work on levels of expertise were chosen to represent the expert category of level of expertise. These questions were c, h, j, q, and s. Scoring on this set of question could range from a high of 25 to a low of 5. The total range of scores per individual NP was used to determine the expert status of NP scores. Scores were interpreted into two categories: Those of Expert status with scores ranging from 20-25, and, a category of non-expert status with scores ranging from 5-19.

Expert status of NP was correlated with years of NP practice to further substantiate an expert status. The mean of the expert status of NP scores was further correlated with other variables. Pearson's r will be used to investigate the relationship of these variables to each group of barriers, as well as the barriers score as a whole, and then further correlated with the skilled practice functions as two factored groups, to investigate possible relationships.

The Barriers subset was designed to determine which barriers and in what magnitude are perceived within the practice environment of Michigan. Positively worded questions 21 b, f, g, j, k, l, o, and p, with a score of 4 (mostly true) or higher, and negatively worded questions 21 a, c, d, e, h, i, m, n, q, r, s, and t, with score of 2

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(mostly false) or less indicated low barriers in the practice environment. And thus positively worded questions 21 b, f, g, j, k, l, o, and p, with a score of 2 (mostly false) or lower, and negatively worded questions 21 a, c, d, e, h, i, m, n, q, r, s, and t, with score of 4 (mostly true) or more indicated high barriers in the practice environment. Positively worded questions 21 b, f, g ,j, k ,l, o, and p will be re-coded in the data analysis program to reflect scores of 5=1, 4=2, 3=3, 2=4, 1=5, in order to achieve a total possible score of 100 on the barriers scale, indicating the highest number of barriers present in the environment, and giving each individual case a total barrier score, as well as a total score for the population of NPs surveyed.

Barrier questions specifically related to each subset are as follows: 1) perceived barriers regarding prescriptive authority (21 a, k, t, score of 15 indicating high prescriptive barriers); 2) perceived barriers regarding reimbursement (21 e, j, s, score of 15 indicating high reimbursement barriers); 3) perceived barriers regarding physician support (21 b, h, i, o, score of 20 indicating high physician support barriers); 4) perceived barriers regarding adequacy of NP educational preparation (21 d, l, r, score of 15 indicating high NP educational preparation barriers); 5) perceived barriers regarding NP level of competency (21 g, m, q, score of 15 indicating high perceived level of competency barriers); 6) perceived

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barriers regarding public acceptance of the role of the nurse practitioner (21 p, n, f, score of 15 indicating high barriers related to public acceptance).

Correlations were sought between the barriers as a total score and the skilled practice functions, as well as with the intervening variables.

Data Analysis

SPSS version 8 was the statistical package used to enter and analyze the research data. Following data collection, unstructured data was analyzed using descriptive summaries and frequency distributions in order to examine the value of each variable collected, as well as the proportion of the responses and the shape of each distribution. Measures of central tendency were used to describe the spread of the data: means, medians, and standard deviations. Research question 1 sought to identify and determine the magnitude of the perceived barriers of the NP, encountered in the practice environment while carrying out the skilled practice functions necessary in the management of the CHF client. This question was answered through descriptive statistical summaries.

Question 2 sought to identify relationships between the independent variables consisting of the 6 categories of practice barriers, the 2 dependent variables consisting of the initial and ongoing skilled practice functions, and the 5 intervening variables: years of NP practice, expert status of NP, self-reported expertise with CHF clients, number of

CHF clients managed per week and the functional classifications of the CHF client managed per week. This question was answered by utilizing Pearson's Product-Moment Correlation Coefficients to determine the significant relationships between variables.

First, the total score for the barriers, as well as individual barrier subsets were correlated with the two factored categories of initial and ongoing skilled practice functions, for measurement of significant relationships. Then, relationships between the total barriers, and the barrier subsets with each of the intervening variables was sought: years of NP practice, expert status of NP, self-reported expertise with CHF clients, the number of CHF clients per week, and the CHF client's functional classifications, and examined for significance.

Question 3 further sought to identify the magnitude of the relationships through Pearson's Correlation, performed between the 5 intervening variables: years of NP practice, expert status of NP, self-reported expertise with CHF clients, the number of CHF clients per week, and the CHF client's functional classifications, with the 2 dependent variables consisting of the initial and ongoing skilled practice functions of the NP.

Protection of Human Subjects

The rights of the respondents was protected in the following ways:

1. The approval of the University Committee on Research Involving the use of Human Subjects (UCRIHS) was sought and approved. There was adherence to the established standard criteria developed by UCRIHS.

Anonymity for the study participants was guaranteed by the lack of identifying features on the survey, and the assignment of a numerical code to each of the cases during data entry and analysis.

A brief explanation of the research study and objectives, voluntary participation and lack of punishment for non-participation, instructions and assurances of anonymity were provided the respondents in the cover letter.

The survey respondents were warned in writing placed on the survey, that the subject matter of the questions did not necessarily indicate appropriate practice for the CHF client.

Those participants interested in study results were asked to send the request portion of the letter under separate cover.

Research Limitations

The following limitations were identified in advance, which may affect the results of this study:

This study provided for self-report of practice participation, perceived barriers, and perceived level of competency. Variation between perceived and actual practice may occur.

The unavailability of a reliable and valid instrument for this study in the measurement of skilled practice functions, practice barriers, and level of NP expertise is a distinct disadvantage that may limit reliability and generalizability of the results.

The small pilot study of 15 subjects was not of sufficient size to address the reliability and validity of the instrument as developed.

A disadvantage of utilization of a mailed survey is the inability for the researcher to clarify questions for the study respondents, which may have resulted in error.

A disadvantage of a mailed survey is the inability of the researcher to control the environmental factors of the respondent, which may have resulted in errors of undeterminable significance.

General reliability of the instrument as developed and tested was hampered due to an inability to utilize measures of stability such as test/retest in the distribution of the survey tool.

Results

Description of the Sample

A total of 400 questionnaires were mailed to this randomly chosen group of family, adult and geriatric nurse practitioners in Michigan. Returned surveys numbered 188 and the first 100 eligible samples were used. Surveys were

deemed unusable if incomplete, and these numbered 49. Two respondents who answered all the skilled practice function questions with a single line drawn through the "always" response were eliminated. The sample population consisted of 100 adult, geriatric, and family, certified nurse practitioners currently practicing within the state of Michigan. Certification type, majority type of clients seen, NP ages, gender and practice setting were described. As expected, the sample contains proportionately greater numbers of family NPs, and also proportionately greater numbers of female NPs in the 40-49 year age range, working in a primary care office or clinic setting (see Table 1).

Categories were also created to describe NP educational degrees, national certification type, length of current employment, and past experience as a registered nurse for at least six month's duration. Far more family, adult and geriatric NPs are certified by The American Nurse's Credentialing Center than the American College of Nurse Practitioners. Proportionately more NPs fall into a 0-2 year length of employment category, and have a common background of medical-surgical nursing.

About one half of NPs (n=100) with master's degrees first obtained associate degrees in nursing. Data collection was incomplete in this area in that the NP population was not queried regarding prior obtainment of diploma degrees, thus limiting the completeness of study results (see Table 2).

Table 1.

NP Characteristics by Certification Type, Client Type, Age, Gender, and Practice Setting (N=100)

	n	% of n
NP Certification Type		
Family	62	62
Adult	27	27
Geriatric	11	11
NP Client Type		
Family	41	41
Internal Medicine	35	35
Geriatric	15	15
Pediatric	1	1
OB/GYN	1	1
Neonatal	0	0
NP Age		
20-29	10	10
30-39	26	26
40-49	45	45
50-59	18	18
60 or more	1	1
NP Gender		
Female	95	95
Male	5	5
NP Practice Setting		
Primary care office/clinic	65	65
Public health department	5	5
Hospital-based care/clinic	19	19
Urgent care clinic	6	6

Table 2.

NP Characteristics by Educational Degrees, Certification, Length of Employment, and Past RN Experience (n=100)

	n	%
NP Educational Degrees		
Associate's degree	33	33
Bachelor's, nursing	70	70
Bachelor's, other	22	22
Master's, nursing	89	89
Master's, other	17	17
Doctorate, nursing	2	2
Doctorate, other	2	2
NP National Certifications		
ANCC family	55	55
ANCC geriatric	14	14
ANCC adult	25	25
ACNP family	6	6
ACNP geriatric	1	1
ACNP adult	2	2
Length of Current Employment		
0-2 years	48	48
3-5 years	29	29
6-8 years	7	7
9-12 years	6	6
More than 12 years	10	10
Past Experiences as RN		
Primary or ambulatory care	51	51
Cardiology clinic or office	23	23
Hospital medical-surgical	68	68
Hospital/outpatient surgery	18	18
Hospital med-surg cardiac	55	55
Critical care	53	53
Home health	26	26
Hospice care	6	6
Public health	18	18
Various other	32	32

Of the sample population of 100 nurse practitioners, categories were created to describe the types, numbers, and employment status of other professionals in the workplace. As expected, physicians were the most prevalent types of other professional present in the work site. Sixty-one percent of the sample reported they were the only NP in the work site. However, when present, other nurse practitioners and social workers were found to be proportionately more prevalent in the NP work site than physician assistants (see Table 3). Thirty-nine percent of other NPs in the work site were employed full-time, and thirty-one percent were employed part-time.

Of the sample population of 100 nurse practitioners, categories were created to describe the total number of clients managed per week, total number of CHF clients managed per week, as well as the total number of CHF clients per functional classification, managed per week. Overall, proportionately more nurse practitioners managed 1-5 CHF clients per week. Further, more NPs managed class II CHF clients during a routine week than other classes (see Table 4).

Of the sample population of 100 NPs, level of expertise categories of novice, advanced beginner, competent, NPs reported themselves as proficient than other categories. However, with CHF clients NPs reported themselves lower, and equally divided between the categories of advanced beginner and competent. Unfortunately, only 7% of NPs rated

Table 3.

NP Characteristics by Type and Number of Other Professionals in the Work Setting (n=100)

	n	% of n
NPs Reporting Type of Other Professionals in Work Setting		
Physicians	90	90
Other Nurse Practitioners	44	44
Physician Assistants	27	27
Social Workers	30	30
Numbers of Other Professionals		
Full Time Physicians:		
None	22	22
1	20	20
2	14	14
3	10	10
4	9	9
5	5	5
6	6	6
7	2	2
8	3	3
10,11,12,13,14,15,30,100	1	1
Part Time Physicians:		
None	60	60
1	25	25
2	4	4
3	6	6
4	1	1
5	2	2
6	1	1
7	1	1
Full Time Nurse Practitioner:		
None	61	61
1	23	23
2	7	7
3	4	4
4	2	2
5	1	1
6	1	1
12	1	1

Table 3 (cont.)

	n	% of n
Part Time Nurse Practitioner:		
None	68	68
1	15	15
2	11	11
3	5	5
5	1	1
Full Time Physician Assistant:		
None	77	77
1	13	13
2	2	2
3	5	5
4	1	1
5	1	1
6	1	1
Part Time Physician Assistant:		
None	94	94
1	3	3
2	1	1
3	1	1
8	1	1
Full Time Other:		
None	94	94
1	4	4
2	1	1
6	1	1
Part Time Other:		
None	99	99
1	1	1

Table 4.

Numbers of Total Clients, CHF Clients, and Functional Class of CHF Client Managed by the NP per Week (n=100)

	n	% of n
Number of Total Clients/Week		
1-24	22	22
25-49	17	17
50-99	38	38
100-149	22	22
150 or more	1	1
Number of CHF Clients/Week		
1-5	65	65
6-10	24	24
11-15	6	6
16-20	3	3
21 or more	2	2
Number of NPs Managing CHF Class/Week		
Class I	62/100	62
Class II	79/100	79
Class III	44/100	44
Class IV	19/100	19

themselves as experts with CHF clients compared to 18% who rated themselves expert with general clients (see Table 5). The difference in NP reported levels of expertise between general clients and those with CHF clients is plausible since more NPs see 50-99 clients per week, and only 1-5 of those are CHF clients.

Twenty Questions were derived from the performance characteristics of novice, advanced beginner, competent, proficient, and expert in order to query the 100 NPs of the population sample regarding their level of expertise related to the routine care and management of the CHF client. The

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Table 5.

NP Reported Expertise with General Clients, and with CHF Clients (n=100)

	n	% of n
Reported Expertise, General Clients		
Novice	5	5
Advanced Beginner	18	18
Competent	25	25
Proficient	34	34
Expert	18	18
Reported Expertise, CHF Clients		
Novice	10	10
Advanced Beginner	33	33
Competent	33	33
Proficient	17	17
Expert	7	7

sample of 100 NPs responded to the 20 questions related to their self-perceived expertise in the following manner: 1=never, 2=not usually, 3=unsure, 4=sometimes, 5=always. Despite most areas of self-reported performance expertise at a high level, NPs report that other professionals in the work site do not often refer CHF clients to them for care or treatment (see Table 6).

The sample of 100 nurse practitioners responded to the 25 questions related to the initial evaluation, diagnosis and treatment of CHF clients in the following ways: 1=never, 2=not usually, 3=unsure, 4=sometimes, 5=always. Most performance characteristics in this category were reported to be high, (4-5) but the boundaries of NP practice and role performance are apparent with low (1-3) reports of managing

Table 6.

NP Characteristics of Expertise (n=100)

	Min	Max	Mean	SD
Includes education	2.0	5.0	4.7	.63
Evaluates and seeks improvement	2.0	5.0	4.7	.58
Credibility in setting	3.0	5.0	4.5	.58
Seeks new learning experiences	2.0	5.0	4.5	.86
Includes counseling daily for CHF	2.0	5.0	4.4	.85
Efficient change agent	2.0	5.0	4.1	.76
Competent to diagnose CHF	1.0	5.0	4.0	.80
Uses theory to guide practice	1.0	5.0	4.0	1.0
CHF care is evidence-based	1.0	5.0	3.9	1.0
Uses references and guidelines for CHF Clients	2.0	5.0	3.9	.89
Serves as a mentor	1.0	5.0	3.8	1.2
Uses intuition	1.0	5.0	3.7	.90
Incorporates research into CHF care	1.0	5.0	3.7	1.1
Seeks mentor	1.0	5.0	3.6	1.2
Feels competent to manage acute CHF	1.0	5.0	3.5	1.1
Feels overwhelmed daily	1.0	6.0	3.4	1.1
Feels overwhelmed with CHF clients	1.0	5.0	2.7	1.1
Involved in/directs research	1.0	5.0	2.7	1.0
Others refer CHF clients to NP	1.0	5.0	2.1	1.2

the CHF client in the hospital during the evaluative, diagnostic stages of treatment (see Table 7).

The sample responded to the 36 questions related to the ongoing management of CHF clients in the following ways: 1=never, 2=not usually, 3=unsure, 4=sometimes, 5=always. Again, most skilled practice functions were self-reported to be high (4-5), and were quite homogenous in this respect.

However, the boundaries of NP role and practice are evidenced with low performance (1-3) reports related to the management of the CHF client in the hospital, visiting the CHF client at home, and the utilization of outpatient intravenous therapy techniques (see Table 8). This finding is important in order to provide insight into where the current boundaries of NP practice exist, as well as provide beginning insight and information into a further analysis of who is responsible for setting the NP's practice boundaries.

The sample of 100 NPs responded to the 20 questions related to perceived barriers in the practice environment in the following manner: 1=definitely false, 2=mostly false, 3=unsure, 4=mostly true, 5=definitely true. NP self-reports reveal that most do not consider barriers within the practice setting to be a significant factor in their care of CHF clients (see Table 9). This finding is important, and contradicts current findings in the literature to the contrary. Of further interest is the finding that most NPs in the sample did not perceive prescriptive supervision to

Table 7.

NP Performance of Initial Skilled Practice Functions of Evaluation, Diagnosis, and Treatment of CHF Clients (n=100)

	Min	Max	Mean	SD
Incorporates client's concerns into care	1.0	5.0	4.6	.76
Assesses HIN	1.0	5.0	4.6	.84
Screens for comorbid illness	1.0	5.0	4.5	.79
Instructs client when to call health provider	1.0	5.0	4.5	.95
Assesses client's readiness to learn	1.0	5.0	4.4	.87
Includes dietary counseling	1.0	5.0	4.4	.88
CXR for assessment	1.0	5.0	4.3	.91
Collaborates with physician	1.0	5.0	4.3	.84
Facilitates client decision-making regarding treatment options	1.0	5.0	4.2	.94
Provides exercise counseling	1.0	5.0	4.2	.99
Facilitates client hospitalization	1.0	5.0	4.2	1.1
Assesses CAD	1.0	5.0	4.2	1.1
Prescribes diuretic	1.0	5.0	4.1	.95
Prescribes ACEI	1.0	5.0	4.1	.94
Instructs client on daily weight monitoring	1.0	5.0	4.1	1.0
Discusses prognosis	1.0	5.0	4.0	1.1
Provides scientifically grounded information to patient/family	1.0	5.0	4.0	1.0
Uses echo to assess LVF	1.0	5.0	3.8	1.3
Prescribes cardiac glycoside (digoxin)	1.0	5.0	3.4	1.1
Uses holter for assessment of arrythmias	1.0	5.0	3.4	1.3
Ensures client has a working scale	1.0	5.0	3.4	1.3
Uses exercise testing for assessment of CAD	1.0	5.0	3.4	1.3
Measures LVF	1.0	5.0	3.4	1.5
Uses ventriculography for assessment of LVF	1.0	5.0	2.5	1.2
Manages CHF client in hospital	1.0	5.0	2.0	1.5

Table 8.

NP Performance of Ongoing Management of CHF Clients (n=100)

	Min	Max	Mean	SD
Collaborates with team	1.0	5.0	4.6	.99
Monitors side effects of therapy	1.0	5.0	4.3	1.1
Gives emotional support & counseling	1.0	5.0	4.3	1.1
Provides psycho-social interventions	1.0	5.0	4.3	1.2
Monitors illness progression over time	1.0	5.0	4.3	1.3
Evaluates effectiveness of treatment regimen	1.0	5.0	4.2	1.1
Addresses noncompliance issues	1.0	5.0	4.2	1.1
Changes ineffective care regimen	1.0	5.0	4.2	1.2
Provides routine pharmacological management of CHF client	1.0	5.0	4.2	1.1
Provides family support & counseling	1.0	5.0	4.1	1.2
Provides pharmacological management of symptoms	1.0	25.0	4.1	2.4
Prescribes diuretic therapy	1.0	5.0	4.1	.96
Negotiates with client toward outcomes	1.0	5.0	4.0	1.1
Prescribes ACEI	1.0	7.0	4.0	1.2
Provides anticipatory guidance for disease progression	1.0	5.0	3.9	1.2
Aquires specialist consultation	1.0	5.0	3.9	1.1
Facilitates hospitalization as appropriate	1.0	5.0	3.8	1.3
Assesses client's learning style prior to teaching	1.0	5.0	3.8	1.3
Titrates ACEI upward toward goal	1.0	5.0	3.7	1.3
Uses routine CXRs for assessment	1.0	5.0	3.7	1.3
Coordinates multiple providers in care of CHF client	1.0	5.0	3.7	1.3
Uses echo for routine assessment	1.0	5.0	3.7	1.3
Incorporates research into care	1.0	5.0	3.5	1.2
Uses nursing theory to guide care	1.0	5.0	3.4	1.3
Uses anticoagulant therapy for arrythmias	1.0	5.0	3.4	1.4
Assumes primary accountability for client	1.0	5.0	3.4	1.4
Uses cardiac glycosides in therapy	1.0	5.0	3.3	1.2
Performs telephone follow-up w/ client	1.0	5.0	3.1	1.4
Uses routine exercise testing	1.0	5.0	3.1	1.3
Uses NSAIDS in therapy	1.0	5.0	3.1	1.2
Uses routine holter monitoring	1.0	5.0	2.9	1.4
Develops & uses database to aid f/u	1.0	6.0	2.8	1.4
Uses outpatient inotropic therapy	1.0	5.0	2.6	1.3
Uses ventriculography for assessment	1.0	5.0	2.4	1.3
Manages CHF client in hospital	1.0	5.0	1.9	1.4
Visits clients at home	1.0	5.0	1.7	1.2

Table 9.

NP Perceived Barriers Within the Practice Environment (n=100)

Variables	Min.	Max	Mean	Std. Deviation
Physicians collaborate in care of CHF clients	1.0	5.0	4.2	.87
Physicians support care of CHF clients	1.0	5.0	4.2	.97
CHF clients accept role of NP	2.0	5.0	4.1	.66
Prescribes without difficulties with supervision	1.0	5.0	3.9	1.1
Reimbursement is not an issue with CHF clients	1.0	5.0	3.7	1.3
Present level of competency allows for comprehensive care of CHF clients	1.0	5.0	3.6	1.0
CHF clients understand role of NP	1.0	5.0	3.5	.85
Clinical preparation as a student prepared to provide basic care for CHF clients	1.0	5.0	3.4	1.1
Level of competency with CHF clients is not progressing rapidly	1.0	5.0	2.8	1.1
Present level of competency prevents care of class III & IV CHF clients	1.0	5.0	2.7	1.3
NP education did not prepare to give basic care for CHF clients	1.0	5.0	2.5	1.1
Most CHF clients NP encounters would rather see a physician	1.0	4.0	2.5	.79
Barriers in practice environment impact the number of CHF clients per week	1.0	5.0	2.4	1.3
NP found care of CHF clients to be too complex following educational preparation	1.0	5.0	2.4	1.0
Reimbursement issues hinder care of CHF clients	1.0	5.0	2.1	1.0
Prescriptive supervision hinders care of CHF clients	1.0	5.0	2.1	1.2
Physicians prevent NP caring for severe CHF clients	1.0	5.0	2.0	1.0
Physicians hinder NP care of CHF clients	1.0	5.0	1.8	.93
NP prefers not to care for CHF clients due to problems prescribing medications	1.0	4.0	1.7	.82
NP not allowed to care for CHF clients due to reimbursement issues	1.0	5.0	1.5	.80

be a barrier in managing CHF clients. This finding is also contrary to current published literature on the subject.

Answers to Research Questions

1. What are the perceived barriers of NPs, encountered while carrying out skilled practice functions in the management of the CHF client?

The perceived barriers investigated within the practice environment of the sample population (n=100) of NPs can be described as a whole, and divided into 6 subsets: prescriptive authority, reimbursement, physician support, NP adequacy of education, NP perceived level of competency, and public acceptance. Specific barrier questions k, j, b, o, l, g, p, and f were re-coded, so that all barrier questions were negatively matched. For all barriers together and each subset, a mean response can be observed among the following descriptors: 1=never, 2=not usually, 3=unsure, 4=sometimes, and 5=always. The mean of the prescriptive authority subset=1.94 (SD=.81), the reimbursement subset=1.98 (SD=.85), the physician support subset=1.8 (SD=1.8), the NP adequacy of education=2.5 (SD=.9), the NP perceived level of competency=2.6 (SD=.93), and the NP public acceptance subset=2.3 (SD=.55). The combined mean for all subsets of barriers for the population (n=6) was 2.2 (SD=.48). This score reveals responses between the mostly false and unsure categories of measurement.

Practice environment barriers were also described both totally and by subset, using a scoring system. The

resulting scores were then used for correlation with the other variables. The greater the score the greater the perceived barriers, with a score of 5 indicating low barriers, 7.5 average barriers, and above 7.5, above average to higher barriers. Most scores showed average to above average barriers but in particular, the reimbursement subset showed an above average score (10.0, SD 1.0), as well as NP competency scores (8.0, SD 3.0), and NP education scores (8.0, SD 3.0) thus revealing a greater perception of reimbursement, NP education and NP competency barriers within the population sample (see Table 10).

Table 10.

Description of Practice Environment Barrier Scores (n=100)

Barriers	Score Range	Mean Score	SD
Total Barriers	20-100	48.0	9.0
Prescriptive Authority	3-15	6.0	2.0
Reimbursement	3-15	10.0	1.0
Physician Support	4-20	7.0	3.0
NP Education	3-15	8.0	3.0
NP Competency	3-15	8.0	3.0
NP Public Acceptance	3-15	7.0	2.0

2. What is the relationship between the perceived barriers; skilled practice functions; and number of CHF clients per week, years of NP practice, NP expert status, and functional classification of CHF clients?

The perceived barriers investigated within the practice environment of the sample population (n=100) of NPs have been described as a whole, and divided into 6 subsets: prescriptive authority, reimbursement, physician support, NP adequacy of education, NP perceived level of competency, and public acceptance. The total mean barrier score was 48 (SD=9.0) and was graded from 20 (low barriers) to 100 (high barriers) (see Tables 10 and 11).

For the purposes of correlation, (see Table 12) the skilled practice functions have been reduced through factor analyses into two subsets: initial evaluation and diagnosis, and ongoing management skilled practice functions. The range of scores for the initial functions 18-88, with a mean score of 74.99 (SD=12), and the ongoing functions with a range of 26-130, with a mean score of 101.6 (SD=23). These scores can be interpreted as 1=never, 2=not usually, 3=unsure, 4=sometimes, and 5=always.

The number of CHF clients per week can be interpreted as 1=1-5 clients, 2=6-10, 3=11-15, 4=16-20, and 5=21 or more. Years of NP practice can be interpreted as 1=0-1 years, 2=1-2, 3=2-3, 4=3-5, and 5=5 or more. NP expert status can be interpreted as a score between 20-25, with 20 interpreted as less expert than a score of 25, from an

Table 11.

Description of Barriers, Skilled Practice Functions and Intervening Variables (n=100)

	Score Range	Mean	SD
Barriers			
Total barriers	20-100	47.6	9.4
Prescriptive authority	3-15	5.8	2.4
Reimbursement	3-15	10.2	1.3
Physician support	4-120	7.4	2.9
NP education	3-15	7.6	2.6
NP Competency	3-15	7.9	2.8
NP Public Acceptance	3-15	6.9	1.7
Skilled Functions			
Initial functions	18-88	75.0	12.0
Ongoing functions	26-130	102.0	23.0
Intervening variables			
Years of NP practice	1-4	3.3	1.5
CHF clients/ week	1-4	1.5	.90
Expert status of NP	20-24	21.0	1.1
Functional class		Count	SD
Class I		62	41
Class II		79	41
Class III		44	50
Class IV		19	40

Table 12.

Correlations of Barriers and Initial and Ongoing Skilled Practice Functions

	Initial Functions	Ongoing Functions
Total Barrier mean score	-.31**	-.35**
Subsets		
Prescriptive authority	-.34**	-.35**
Reimbursement	.24*	.30**
Physician Support	-.18	-.21*
NP Adequacy of Education	.03	-.03
NP Competency	-.26*	-.31**
NP Public Acceptance	-.24*	-.18

** = 0.001 level and * = 0.05 level of significance

identified n of 40 experts. Functional classifications have been broken down into four categories, class I-IV, with the mean corresponding to the percent of NPs (n=100) with CHF clients in that class (see Table 11).

Moderately significant findings were discovered between total barriers and initial and ongoing functions, indicating that as barriers within the practice environment rise, the performance of skilled practice functions decreases. And specifically, as prescriptive authority barriers rise the performance of both the initial and ongoing skilled practice functions decrease. Further, the presence of reimbursement barriers also decreases the performance of both initial and ongoing functions, and as inadequacy of NP competency barriers rise, the performance of initial and ongoing practice functions decreases, and as performance of initial skilled practice functions declines, so does NP public acceptance (see Table 12).

Although the overall mean score of NP education did not significantly correlate with the overall scores of the initial and ongoing skilled practice functions, with further inquiry there were significant findings of a moderate nature between the mean of NP education and some individual practice functions (see Table 13). As might be expected, these findings may indicate that lack of knowledge regarding specific practice functions may lead to a lack of use, or misuse of these specific practice functions. Specifically, correlation between NP education and assessment of client's

learning style prior to teaching was enlightening and raises further questions of NP knowledge of client teaching in general. Further, one of the items identified in Table 13 relates to a rather sophisticated diagnostic evaluation technique which is understandably not included in the basic education of the NP. Three other items refer to pharmacological management of the client, and one item refers to an advanced data base technique used to facilitating follow-up of the complicated CHF client. Knowledge of management of the CHF client in the hospital is most likely a NP boundary issue both with programs that focus exclusively on NP education in primary care, and with the physician population who literature suggests may have interest in limiting the practice of nurse practitioners and physician assistants.

The relationships between the some of the perceived barriers and intervening variables show correlations of a moderate to strong nature. Prescriptive authority correlates moderately with years of NP practice, number of CHF clients per week, and class III clients. Thus, as years of NP practice rise, prescriptive barriers may decrease, and as prescriptive barriers increase number of CHF clients as well as the management of class III clients may decrease. (see Table 14).

Further, the presence of reimbursement barriers correlated moderately with years of NP practice, number of CHF clients per week, NP self-reported expertise, and the

Table 13.

Correlations of NP Education and Selected Initial and Ongoing Skilled Practice Functions

	NP Education
Initial Functions:	
Ventriculography for assessment of LVF	.23*
Manages CHF client in hospital	.20*
Ongoing Management	
Assessment of client's learning style prior to Teaching	.22*
Develops & uses database to aid follow-up	.23*
Utilizes cardiac glycosides as appropriate	.28**
Utilizes outpatient inotropic therapy	.26**
Utilizes NSAIDs in therapy	.21*

Physician support barriers correlated moderately with number of CHF clients per week, NP self-reported expertise, and strongly with class III clients. Thus, as physician support declines, number of CHF clients may decline, NP self-reported expertise may decline, and especially the management of class III clients may decline (see Table 14).

NP competency barriers correlated moderately with decreased numbers of CHF clients per week and class IV CHF clients, but correlated strongly with NP self-reported expertise and the management of class III CHF clients, who are challenging to manage. Thus as NP competency increases, so does NP self-reported expertise and the management of class III clients (see Table 14).

Table 14.

Correlations of Barriers with Intervening Variables

Intervening Variables	Barriers						
	Prescriptive Authority	Reimburse-ment	Physician Support	NP Education	NP Competency	NP Public Acceptance	Total Barriers
Years NP Practice	-.26**	.27**	-.09	-.04	-.12	-.18	-.24*
# CHF clients/ week	-.34**	.20*	-.29**	-.08	-.33**	-.12	-.37**
Expert status of NP	-.08	-.09	-.09	.26	-.50**	-.13	.003
Self-reported expertise	-.24*	-.21*	-.26**	-.114	-.65**	-.35**	-.51**
Class I	-.07	.11	-.001	.03	.12	-.14	-.41**
Class II	-.10	.15	-.20*	.02	.06	-.10	-.13
Class III	-.30**	.25*	-.49**	-.13	-.55**	-.25*	-.56**
Class IV	-.06	.12	-.24*	-.06	-.30**	.02	-.24*

**=0.01 level and *=0.05 level of significance

NP public acceptance correlated moderately with NP self-reported expertise, and the management of class III CHF clients. Thus, as self-reported expertise rises, perhaps through the management of class III clients, so NP public acceptance (see Table 14).

The total mean barriers score showed moderate correlation with number of CHF clients per week, but strong correlation with NP self-reported expertise, class I clients, and especially class III clients. Thus as total barriers rise, the number of CHF clients seen by the NP falls as well as the management of class I clients. But more strongly, as total barriers rise the NPs self-reported expertise and management of class III CHF clients declines (see Table 14).

What is the relationship between the skilled practice functions; and number of CHF clients, years of NP practice, expert status of the NP, functional classification of CHF clients?

For the purposes of correlation, the skilled practice functions have been reduced through factor analysis to two subsets: initial skilled practice functions, and ongoing skilled practice functions. These scores can be interpreted as 1=never, 2=not usually, 3=unsure, 4=sometimes, and 5=always.

The number of CHF clients per week can be interpreted as 1=1-5 clients, 2=6-10, 3=11-15, 4=16-20, and 5=21 or more. Years of NP practice can be interpreted as 1=0-1

years, 2=1-2, 3=2-3, 4=3-5, and 5=5 or more. Expert status of NP has scores between 20-25, with 20 interpreted as less expert than 25, and among identified 40 experts from 100 NPs. Functional classes consist of 4 categories, class I-IV, with the mean the percent of NPs (n=100) with CHF clients in that class (see Table 11).

The initial and ongoing skilled practice functions as composite scores correlated moderately with expert status of the NP and self-reported expertise with CHF clients, but failed to significantly correlate with years of NP practice, number of CHF clients per week, or Class I, II, III, or IV CHF clients. Thus, as the expertise level of the NP increases, so does the performance of the skilled practice functions necessary for the competent and comprehensive care of the CHF client (see Table 15).

Table 15.

Correlations of Initial and Ongoing Skilled Practice Functions and Intervening Variables

Intervening Variables	Initial Skilled Practice Functions	Ongoing Skilled Practice Functions
Years of NP Practice	.03	.15
Number CHF clients/ week	.12	.20*
Expert status of NP	.35**	.36**
Self-reported expertise with CHF	.32**	.30**
Class I clients	-.05	-.11
Class II CHF clients	.07	.16
Class III CHF clients	.11	.19
Class IV CHF clients	-.02	.11

* = 0.05 level of significance

When examined individually instead of as composite scores, many of the initial and ongoing skilled practice functions revealed correlations of a moderate to strong nature with intervening variables which not apparent earlier. Years of NP practice correlated moderately with two selected ongoing skilled practice functions. Number of CHF clients per week correlated moderately with two ongoing skilled practice functions. However, expert status of NP scores correlated consistently moderately to strongly with most of the initial and ongoing skilled practice functions. Thus, as expertise levels of the NP rise so does the performance of the skilled practice functions deemed necessary to effectively manage CHF clients. The management of class III CHF clients also correlated moderately with four of the skilled practice functions (see Table 16).

Other Findings

Other findings of interest revealed that while family and adult NPs work predominately in a primary care site, 30% of adult NPs are in a hospital clinic site compared to 16% of family NPs. Geriatric NPs are predominately employed in various other sites, some of those named include nursing homes and skilled care facilities. These findings show the differences in work sites, per certification type (see Table 17).

Further interesting differences by NP certification type involve the numbers of CHF clients, and functional class of CHF client seen in the work setting. Geriatric Nps

Table 16.

Correlations Between Selected Intervening Variables and Selected Initial and Ongoing Skilled Practice Functions

	Variables			
		Intervening		
Initial Skilled Practice Functions	Years of NP Practice	# CHF clients/wk.	Expert Status of NP	Class III CHF
Measurement of LVF			.43**	.32**
Echocardiogram			.30**	.24*
Orders cardiac glycoside			.30**	
Incorporates client's concerns into plan of care			.30**	
Instructs client/daily weight			.28**	
Facilitates hospitalization			.31**	
Ongoing Skilled Practice Functions				
Assumes primary accountability		.31**	.35**	.29**
Coordinates multiple providers		.31**	.34**	.23*
Assesses client learning style	.20*		.26**	
Provides routine pharmacological management			.37**	
Echocardiogram			.30**	
Ventriculography			.32**	
Evaluation of effectiveness of treatment regime			.31**	
Develops and uses database for follow-up			.32**	
Acquires specialist consultation			.30**	
Gives emotional support to client			.26**	
Gives family support & counseling			.30**	
Provides anticipatory guidance			.30**	
Facilitates hospitalization			.35**	
Utilizes outpatient inotropic therapy			.41**	
ACE I provided			.24*	
ACE I titrated upward	.23*		.21*	

**=0.01 level of significance, *=0.05 level of significance

Table 17.

Family, Adult and Geriatric NPs and Associated Work Site

Work Site	Family NP		Adult NP		Geriatric NP	
	n	% of n	n	% of n	n	% of n
Primary care office	46	74	14	52	5	45
Public health	4	7	0	0	1	9
Hospital clinic	10	16	8	30	1	9
Urgent care	6	10	0	0	0	0
Other various	11	18	7	26	7	64

see the most numbers of CHF clients per week. Family and adult NPs report they see predominately class II CHF clients, while geriatric NPs report they see more class III CHF clients than other classes. However, adult NPs report managing more class II clients than family NPs. This finding is made plausible by the understanding that many geriatric NPs are employed in institutions, and 30% of adult NPs report employment in a hospital clinic setting, therefore both may encounter sicker and more challenging clients than are found in a primary care site. However, overall, geriatric NPs appear to consistently see more clients and more severely ill (class III and IV) CHF clients than family or adult NPs (see Table 18).

Self reported expertise both in general, and with CHF clients among the NPs by certification type was also of interest. All certification types predominately rated their levels of expertise as proficient in managing clients in general, but there were more adult and geriatric NPs who

Table 18.

Family, Adult and Geriatric NPs, Number of CHF Clients, and Functional Class of CHF Clients Per Week

Number of CHF Clients/ Week	Family NP		Adult NP		Geriatric NP	
	n	% of n	n	% of n	n	% of n
1-5	43	70	17	63	5	45
6-10	13	21	8	30	3	27
11-15	3	5	2	7	1	9
16-20	1	2	0	0	2	18
21 or more	2	3	0	0	0	
Functional Class						
Class I CHF client	44	71	11	41	7	64
Class II CHF client	50	81	22	82	7	64
Class III CHF client	23	37	13	48	8	73
Class IV CHF client	11	18	4	15	4	36

rated themselves as experts. With regard to CHF clients, more family NPs rated themselves novices, and proportionately more adult and geriatric NPs rated themselves both competent and proficient than family NPs. In part, these findings are understandable due to the proportionately higher numbers of more acutely ill (class III, class IV) clients seen by geriatric and adult NPs in their respective work sites. Thus, increased access to CHF clients through hospital clinic settings (as with adult NPs) or skilled care facilities and nursing homes (as with geriatric NPs) probably contributes to increasing levels of expertise (see Table 19).

Table 19.

Family, Adult, and Geriatric NPs and Self-Reported Expertise with General Clients and CHF Clients

Self-reported Expertise	Family		Adult		Geriatric	
General Clients	n	% of n	n	% of n	n	% of n
Novice	4	7	0		1	9
Advanced beginner	13	21	5	19	0	0
Competent	17	27	6	22	2	2
Proficient	19	31	5	46	5	5
Expert	9	15	6	22	3	3
CHF Clients						
Novice	8	13	2	7	0	0
Advanced beginner	24	39	7	26	2	2
Competent	18	29	10	37	5	5
Proficient	8	13	6	22	3	3
Expert	4	7	2	7	1	1

Comparisons of the subjective measure of self reported expertise (NP experts) and the more objective measure of expertise (expert status of NP) also yields some interesting findings. A score of 20 or greater among 5 questions was used to determine an objective measure of the expert NPs within the population of 100 NPs. There were 40 individuals who fell into the NP experts category. The variables of NP experts, expert status of NP, NP self-evaluation of expertise, and self evaluation of expertise with CHF clients were analyzed using Pearson Correlation. The significant correlational findings suggest there is good congruence between subjective and objective measurements of NP expertise, except for the group of NP experts. These individuals showed congruence with their self-reported expertise with CHF clients and the subjective measure of

themselves as experts, but failed to show significant congruence between their self-evaluation of expertise in general and the subjective measure of themselves as experts (see Table 20).

Further inquiry into this finding reveals that 2 (5%) of the 40 NPs in the NP expert category rated themselves as novices, 4 (10%) rated themselves as advanced beginners, 11 (27%) as competent, 11 (27%) as proficient, and 12 (30%) rated themselves as experts, when subjectively they fell into the NP expert category by virtue of their scoring results. Methodological limitations and possible explanation for these findings may include: an inability of the expertise questions as developed, to accurately and comprehensively measure the attributes of the expert NP; the inability to accurately define years of practice since the population was not queried regarding their full or part-time employment status, therefore legitimately affecting total patient care hours in the NP career; and the possibility that the assumption that accumulated practice years alone produce expert status may be erroneous, as other attributes such as learning ability, personality characteristics, etc., may also have positive and negative effects upon the growth and development of the professional NP progressing toward expert status.

Despite these limitations, the findings between the objective measurement of expert status of NP and the subjective reports of self-evaluation of expertise and

Table 20.

Correlations of Expert Status of NP, NP Expert, Years of NP Practice with Self-reported Expertise, and Self-reported Expertise with CHF Clients, Expert Status of NP, and NP Expert

	Expert Status of NP	NP Expert	Years of NP Practice
NP Self-reported Expertise	.35**	.22	.68**
NP Self-reported Expertise with CHF Clients	.43**	.40**	.31**
Expert Status of NP			.02
NP Expert			.13

**=0.01 level of significance

expertise with CHF clients, shows that as the scoring measurement of expert NP climbs, so does self reported expertise in general and especially with CHF clients (see Table 20).

In attempting to understand the supportive characteristics of the expert status of NP, further inquiry was performed seeking correlation between this variable and various others, such as age, years of practice, past practice experience, etc. There was but one moderate correlation between expert status of NP and any other variable in this study that might provide clues to characteristics of the expert NP: that of managing class III CHF clients (.36) at a 0.01 level of significance. This class of CHF client can be demanding due to multiple medications and frequent exacerbations of symptoms requiring acute intervention and careful medical management (see Table 21).

Table 21.

Correlations of NP Levels of Expertise and Total Barriers with Functional Classes of CHF Clients

	Class I	Class II	Class III	Class IV	Number of CHF clients
NP self-reported expertise with CHF clients	.03	.03	.49**	.22*	.28**
Expert status of NP	-.02	-.02	.36**	.18	.07
Mean of total barriers	-.13	-.13	-.56**	-.24*	-.37**

**=0.01 level of significance

The management of class III CHF clients does not significantly correlate with age, years of practice, or any past practice experiences. However, it does moderately correlate with expert status of the NP scores, and strongly correlate with NP self-evaluation of expertise with CHF clients, and total barriers (see Table 21). Thus, this finding provides support that access to the management experience of class III-CHF clients is directly related to higher expertise of the NP with CHF clients. Since fewer NPs are managing class III clients than class I and II CHF clients, (see Table 18) this finding offers insight into why NP self-reported expertise with CHF clients is lower than with other clients. Despite differences in practice setting by NP certification type and subsequent variation in rates of access to severely ill CHF clients, this finding may generate further questions above and beyond issues of access, related to what barriers exist that may prevent greater NP management of more class III clients.

An assumption of this study was that years of years of NP practice would correlate significantly with level of NP expertise, and does so strongly with self-reported expertise and moderately with self-reported expertise with CHF clients, but does not correlate with expert status of NP, or NP expert. Thus, as years of practice increase, self reports of expertise with general clients increases strongly, and increases moderately with CHF clients. However, objective measurement of expertise does not correlate at all with years of practice. Thus self-perception of expertise increases with increasing years of practice, but it may be that objective measurement of actual performance of practice characteristics indicative of expertise does not increase with increasing years of practice. This issue warrants further study (see Table 20).

Further, cross tabulation of years of NP practice with the 40 NPs experts revealed that proportionately more of these individuals had less than 3 years of experience as a NP (see Table 22). These findings indicate a probable inability to rely on number of practice years as a reliable indicator of NP expertise, or a lack of reliability of the scores of the designated group of NP experts.

In addition, certain practice characteristics are of interest for their surprising lack of significance with the objective measurement of expert status of NP. Other findings have indicated the probability that the higher the expert status of NP scores, the more likely the professional

Table 22.

Designated NP Experts and Categories of Mean Practice Years (n=40)

0-1 years	8 (42%)
1-2 years	7 (47%)
2-3 years	7 (47%)
3-5 years	5 (29%)
5 or more years	13 (38%)

will include these characteristics in the evaluation and management of the CHF client. However there were non-significant relationships of interest between NP experts, and expert status of NP, with the following ongoing skilled practice functions: using nursing theory to guide care, management of the client in the hospital, visiting the client at home, and providing telephone follow-up to CHF clients (see Table 23). Further inquiry into this finding reveals the performance frequency of each of these specific practice functions falls beneath the category of "sometimes", indicating a general lack of performance of these practice functions regardless of expertise (see Table 24).

Barriers within the 100 NPs sampled also showed some interesting findings. The mean scores of the 5 question expert NP subset showed a negative correlation of 0.01 level of significance with the total mean barrier scores (-.391), indicating the higher the NP expert score, the lower the perception of total barriers to practice in the work

Table 23.

Correlations of Expert Status of NP, NP Expert, and Selected Ongoing Skilled Practice Functions

	Expert status of NP	NP Expert
Selected Ongoing Skilled Functions		
Uses nursing theory to guide care	.17	.19
Manages CHF client in hospital	.12	-.126
Visits client at home	.02	-.05
Provides telephone follow-up	.17	.19

**=-0.01 level of significance, *=0.05 level of significance

Table 24.

Means of NP Responses to Selected Ongoing Skilled Practice Functions

	Mean	SD
Selected Ongoing Skilled Practice Functions		
Uses nursing theory to guide care	3.4	1.3
Manages CHF Client in hospital	1.9	1.4
Visits client at home	1.7	1.2
Provides telephone follow-up	3.1	1.3

Scoring reference: 1= Never, 2= Not Usually, 3= Unsure, 4= Sometimes, 5= Always

environment. Other interesting findings showed prescriptive authority with a strong correlation (.450) at the 0.01 level of significance with physician support, indicating that as physician support decreases, prescriptive authority barriers increase. The expert status of NP scores were found to correlate strongly (-.496) at a 0.01 level of significance with NP competency, indicating that as NP expertise increases, NP competency barriers decrease.

Further, strong correlations (.41) of a 0.01 level of significance between NP competency with physician support, and expert status of NP (.50), as well as moderate correlations with NP education (.32), and public acceptance (.27), demonstrates the lower the competency level, the lower the physician support, and NP public acceptance. Further, the lower the competency level the lower the NP education, and expert status score. And, the lower the competency level the less public acceptance (see Table 25).

Lastly, differences were found between NPs by certification type, indicating family NPs perceive greater barriers in for them in the practice environment related to their educational preparation (34%), compared to adult NPs (19%), or geriatric NPs (9%), as determined by NP education scores at 10 or greater (see Table 26).

Discussion

For this descriptive study, 100 family, adult, and geriatric nurse practitioners were queried to determine their perceptions of expertise, the performance of necessary skilled practice functions toward the optimal management of CHF clients, and barriers in the management of CHF clients in the primary care setting. The results were used to describe the relationships of those barriers with skilled practice functions, number of CHF clients per week, years of NP practice, expert status of the NP, and the functional classifications of CHF clients. Further inquiry was undertaken to clarify understanding of the differences

Table 25.

Correlations of NP Competency with Physician Support, NP Public Acceptance, Expert Status of NP, Years of Practice, and NP Education

	Physician Support	NP Public Acceptance	Expert Status of NP	Years of NP Practice	NP Education
NP Competency	.41**	.27**	.50**	-.11	.32**

**=0.01 level of significance

Table 26.

NP Education Scores, by Percent of Family, Adult, Geriatric Nps

	NP Education Scores			
	1-4	5-9	10 or more	Total n
% of Family	10%	56%	34%	62
% of Adult	4%	78%	19%	27
% of Geriatric	27%	63%	9%	11
Range=1-15	1=low barriers,	15=high barriers		

between NPs by certification type, as well as identify possible characteristics related to the expertise of the NP with CHF clients.

Sample

The predominant certification type of NP for this study, derived from the sample population was the family NP, found predominately within a primary care setting, which is consistent with the findings of other studies. Further, most of the population ages fell between 30 and 49 years of

age, which is understandable in part, as 30 years is within an appropriate age range to begin work following an advanced degree. However, for all certifications, there were only 19 (19%) individuals above the age of 50 while 81 (81%) were less than 50. Despite the relative newness of the occupation of nurse practitioner, these findings certainly generate further potential questions, i.e., why there seems to be a scarcity of the 50+ age group in NP practice. Further, are suitability, desirability and acceptance significant inhibiting factors of NP practice after 50 years of age?

Total numbers of clients seen by the NP per week were examined and predominately fell into the category of 50-99, which can be translated into 10-20 clients per day for a full-time employee. These results are consistent with the findings of other studies. However, it has not been described in the past how many CHF clients are managed per week by the NP in the practice setting, or the severity of CHF client illness.

Summary of Major Findings

For the sake of clarity, an outline of 10 major findings will be made here:

1. An important finding of this study was that there was a difference among all NPs when reporting their perceptions of expertise with general clients compared to CHF clients. NPs reported a competency level of

proficient with general clients, but lower levels with CHF clients (see Table 5).

2. It was also found that the lower reported levels of expertise with CHF clients varied by certification type. Family NPs reported the lowest levels of expertise with advanced beginner levels, which were two levels beneath the proficient level reported with general clients. Adult and geriatric NPs reported feeling competent with CHF clients, one level beneath their reported level of proficient with general clients (see Table 19).
3. NP self-reported expertise with CHF clients correlated very strongly with management of class III CHF clients (.49), mildly with class IV clients (.22), moderately with number of CHF clients managed per week (.28), and surprisingly, not at all with class I or II CHF clients (see Table 21).
4. The objective measure of expert status of NP correlated moderately with class III CHF clients (.36) but surprisingly, not at all with class I, II, or IV clients, or with number of CHF clients managed per week (see Table 21).
5. The variable of years of NP practice correlated very strongly with NP self-reported expertise (.68), and moderately with NP self-reported expertise with CHF clients (.31) but surprisingly, not at all with

objective measures of NP expertise, expert status of NP or NP expert (see Table 20).

6. The NP's perception of competency as a potential barrier in practice correlated strongly with the objective measure of expert status of the NP(-.50), strongly with self-reported expertise with CHF clients (-.65), strongly with the management of class III CHF clients (-.55), and moderately with the management of class IV CHF clients (-.30). Surprisingly, perceived competency did not correlate at all with years of NP practice or the management of class I or class II CHF clients (see Table 14).
7. Perception of NP competency is also strongly correlated to physician support (.41), and more moderately related to NP public acceptance (.27).
8. A serendipitous finding of this study was that only one barrier, reimbursement, showed a distribution curve skewed to the right indicating higher than average barriers in the practice environment. Barriers other than reimbursement displayed normal distribution curves, illustrating only average numbers of these barriers present within the practice environment.
9. Despite a mostly average magnitude of barriers within the practice environment, each barrier examined separately still correlated strongly to moderately with the intervening variables. This demonstrates that even an average presence of barriers within the practice

environment has an impact upon many of the intervening variables.

10. The initial and ongoing skilled practice functions deemed necessary for the optimal management of the CHF client correlated moderately with the objective measure expert status of the NP, and self-reported expertise with CHF clients, but did not correlate as composite scores with other intervening variables.
11. Study findings indicate that fewer class IV CHF clients are managed by NPs of any certification type than any of the other classes of CHF client.

Discussion of Major Findings

1. There was a difference among all NPs when reporting their perceptions of expertise with general clients compared to CHF clients. NPs reported a competency level of proficient with general clients, but lower levels with CHF clients. An examination was made of the study results seeking support for this finding. However, all NPs see between 1-5 CHF clients per week, thus eliminating differences in sheer CHF volume as a strong contributing factor. In further examination, management of functional class of CHF clients reveals that 62% of total NPs report managing class I CHF clients weekly, 79% report class II, 44% report class III, and 19% report managing class IV CHF clients on a weekly basis.

2. It was thus further discovered that the lower reported levels of expertise with CHF clients varied by certification type. Family NPs reported the lowest levels of expertise with advanced beginner levels, which were two levels beneath the proficient level reported with general clients. Adult and geriatric NPs reported feeling competent with CHF clients, one level beneath their reported level of proficient with general clients. In seeking supportive reasons for this finding through the type of CHF client predominately managed by each certification type, it was discovered that 71% of family NPs report managing class I clients, and 81% class II, 41% of adult NPs report managing class I clients, and 82% class II, 64% of geriatric NPs report managing class I clients, and 64% class II clients. Thus it can be seen that family NPs see a slightly higher percentage of class I and II CHF clients than adult or geriatric NPs who see about the same number of class I and II clients per week. However, upon examination of class III CHF clients, 37% of family NPs, 48% of adult NPs, and 73% of geriatric NPs report managing class III CHF clients. It may be that increased numbers of older, and perhaps more severely ill clients would be expected to be managed by geriatric NPs due to their certification type and work-site opportunities. Nevertheless, this finding reveals large differences between NP types of certification

that corroborate the findings of lesser levels of self-reported expertise with CHF clients by family NPs. Further, there are strong correlations between NP self-reported expertise with CHF clients and the management of class III CHF clients (.49), and moderate correlation with expert status of NP scores (.36). However, there are no significant correlations between NP self-reported expertise or expert status of NP and class I or II CHF clients. Therefore, it is plausible to assume that the management of class III clients strongly contributes to the overall expertise of the NP with CHF clients.

Further factors that may contribute to this phenomenon may be found within the differences noted between the practice settings of each NP certification type. Family NPs report employment predominately in a primary care setting (74%), adult NPs report primary care and hospital clinics as major employment sites (52% and 30%), and geriatric NPs report other various, which include nursing homes and skilled practice facilities as the predominate employment site (64%). Thus it may be true that geriatric and adult NPs have greater access to more severely ill CHF clients (classes III and IV) than family NPs due to the nature of their sites of care delivery, which may help to explain the findings of this study. It also seems likely that the individual NP plays a role of

undetermined significance in the decision-making that determines their own management of fewer class III and IV clients.

3. NP self-reported expertise with CHF clients correlated very strongly with management of class III CHF clients (.49), mildly with class IV clients (.22), moderately with number of CHF clients managed per week (.28), and surprisingly, not at all with class I or II CHF clients. Therefore, it is supposable to assume that class III clients contribute strongly to the NP's perception of expertise with CHF clients, but that class I and class II clients do not. It may be that class I and II CHF clients who do not need to be seen as frequently in practice by the NP, also do not have needs as diversified and complex as more severely ill and thus professionally challenging class III and IV CHF clients.

Further, it may be said through the findings of this study that greater numbers of NP-managed CHF clients moderately contributes to higher levels of NP's self- perception of expertise (.28). This finding is understandable in that greater numbers of clients will yield greater experience in the management of this population.

4. The objective measure of expert status of NP correlated moderately with class III CHF clients (.36) but surprisingly, not at all with class I, II, or IV

clients, or with number of CHF clients managed per week. However, on further examination of these findings, the expert status of NP score which was used in part as an objective measure of the expertise of the NP showed but a moderate correlation with the management of class III clients, and no correlation with class I, II or IV clients or number of CHF clients per week. Thus, it may be said that the management of class III clients contributes moderately to objective measures of the expert status of the NP, but to a lesser degree than the strong correlation noted with the NP's self-reported expertise. The discrepancy between the measure of self-report compared to objective measure may be due in part to the tool used as an objective measure of NP expertise, or may reflect actual differences between the NP's perceptions of circumstances and the objective measure of similar circumstances. In support of the tool used to objectively measure NP expertise, there were strong correlations between the perception of NP competency and the objective measures of expert status of the NP (.50), as well as with NP self-reported expertise with the CHF client (.65).

5. The intervening variable of years of NP practice correlated very strongly with NP self-reported expertise (.68), and moderately with NP self-reported expertise with CHF clients (.31). However, a

serendipitous finding of this study revealed that there was no correlation of years of NP practice with the objective measures of NP expertise, expert status of NP or NP expert. Further, the years of NP practice variable was found to correlate moderately with total barriers (.24), and specifically with prescriptive authority (.26) and reimbursement (.27), but no other barriers. In addition, years of practice did not correlate with the composite scores of either the initial or ongoing skilled practice functions, but did so weakly with assesses client learning style (.20) and ACE Inhibitor titrated upward (.23). Thus it is apparent that years of practice contributes to the NP's perception of expertise, both in general and with CHF clients. However, it seems plausible to assume that NP years of practice is not a reliable indicator of, or objective measurement of expertise, nor does it predict the performance of the necessary skilled practice functions in the management of the CHF client.

6. The NP's perception of competency as a potential barrier in practice correlated strongly with the objective measure of expert status of the NP (-.50), strongly with self-reported expertise with CHF clients (-.65), strongly with the management of class III CHF clients (-.55), and moderately with the management of class IV CHF clients (-.30). Surprisingly, perceived competency correlated very weakly with years of NP

practice (.12), and the management of class I (.12) or class II (.06) CHF clients. Thus it seems plausible to assume that both the objective and perceived measures of expertise are very congruent with the NP's perception of competency. In addition, class I and class II CHF clients do not contribute to either the perception of competency of the NP, or does the perception of a lack of competence act as a barrier in the care of class I or class II CHF clients. Further, years of NP practice does not appear to contribute to the perception of NP competency.

7. Perception of NP competency is also strongly related to physician support (.41), and more moderately related to NP public acceptance (.27). Further examination of the barrier of NP competency, showed that NP perceptions of competency are strongly related to the presence of physician support in the practice environment. This finding is made understandable by the finding that the physician is the predominate type of other professional present in the work site, thus rendering the support of this individual extremely important to the practicing NP. Furthermore, while collaboration and partnership are preferred, is likely that the NP is in a role of subordination with the physician, and thus in need of approval overall. The findings also support the NP's need of competency to achieve public (client) acceptance. Literature has shown that the public is

becoming increasingly educated regarding knowledge of their own health needs, as well as the appropriate and necessary actions health care providers undertake on their behalf. Thus it is reasonable that low levels of NP competency would serve as a barrier to practice with the client.

8. A serendipitous finding of this study was that only one barrier showed a distribution curve leaning toward higher barriers in the practice environment, that of reimbursement (10/11, of a 1/15 scale). Despite standard deviations of up to 2.0, the other barriers displayed normal distribution curves, illustrating the presence of an average number of barriers within the practice environment.

9. When examined separately however, most barrier subsets correlated strongly to moderately with the intervening variables. a) Reimbursement barriers correlated moderately with years of NP practice (.27), number of CHF clients managed per week (.20), self-reported expertise (.21), and class III CHF clients (.25). b) prescriptive authority correlated moderately with years of NP practice (.26), number of CHF clients managed per week(.34), self-reported expertise (.24), and class III clients (.30). c) physician support correlated strongly with class III clients (.49), moderately with self-reported expertise (.26) and number of CHF clients managed per week (.29). d) NP education did not

correlate with any of the intervening variables. e) NP public acceptance correlated moderately with self-reported expertise (.35), and less moderately with class III CHF clients (.25). f) total barriers as a composite score correlated strongly with self-reported expertise (.51), class III clients (.56), and moderately with class II (.41) and IV CHF clients (.24), and number of CHF clients managed per week (.37).

10. The initial and ongoing skilled practice functions deemed necessary for the optimal management of the CHF client correlated moderately with the objective measure expert status of the NP, as well as self-reported expertise with CHF clients, but did not correlate as composite scores with other intervening variables.
11. Study findings indicate that fewer class IV CHF clients are managed by NPs of any certification type than any of the other CHF classes. Forty-four (44%) NPs reported that they manage class III clients on a weekly basis, and 19 (19%) report managing class IV clients. Since most CHF clients progress to class IV status prior to death, the question arises regarding who is assuming primary management responsibility for the more severely ill (class III and IV) CHF client in the primary care site. It is plausible to assume that because physicians are the most reported "other professional" in the NP's work site, it is they who are

probably providing the mainstay of this care. Further, the findings suggest that NPs do not regard physician support to be a barrier in the management of the CHF client, thus either decreased management of the class IV client is not perceived by NPs to be a negative issue related to physicians, or is not an issue. Unfortunately, this study does not have the data necessary to analyze access to CHF clients compared with actual numbers of CHF clients in the practice environment. Because of this fact, further questions arise regarding the numbers of CHF clients of all classes managed by NPs in practice, compared to numbers of CHF clients available to be seen by any health care provider in practice. Additionally, due to the subordinate relationship the NP may have with the physician in practice, further questions arise regarding the part the physician may play in the decision-making that determines which class of severity CHF client the NP will manage (see Tables 9 and 11). Without querying physicians directly, it is difficult to ascertain how they regard NP's abilities to manage CHF clients, and particularly severely ill CHF clients. It may be enlightening to consider however, that NPs reported mean results in the "not usually" category (2.0) when asked if others refer CHF clients to them (see table 6). In addition, the study shows that the functional classification of class III clients

correlates highest with the expertise of the NP (see Table 21).

Results From Research Questions.

For research question one, the perceived barriers of prescriptive authority, reimbursement, physician support, NP adequacy of education, NP perceived level of competency, and NP public acceptance, were identified prior to the study from an extensive literature search. Twenty questions were then devised with 3 questions each related to each component barrier except for physician support, which had 4 questions. This study question sought verification of the existence and magnitude of the pre-determined barriers within the practice environment. The scoring of the barriers in total and the barriers as separate components fell into a middle range, with reimbursement barriers somewhat higher. Thus it can be said that within Michigan, proportionately more NPs perceive reimbursement barriers to be of greater important to their practice than prescriptive authority, physician support, NP competency, NP education or NP acceptance (see Table 10). This finding is more understandable when considered in light of recent trends in changes within the health care system, from fee-for-service to a managed care environment, in which insurers have greater control over the practice decisions of the health care provider.

However, it must be noted that the findings of moderate barriers in the practice environment as identified in this study, do not consistently support the findings of other

studies in the literature. In further examination however, none of the previous literature describing practice barriers within the environment focuses exclusively or in part on the state of Michigan. Moreover, the literature describes differences in practice environments from state to state, dependent upon the legislation passed in each state, which governs the practice of the NP. Therefore, it seems likely that the differences noted in the magnitude of the barriers within the practice environment, might be an actual reflection of barriers exclusively within the state of Michigan, and not generalizable to the rest of the country.

Further, if this finding is considered a possibility, it is interesting to note that the results of this study indicate that despite their comparatively limited prescriptive authority, NPs within Michigan do not report high levels of dissatisfaction with their present prescriptive situations (see Table 11). Yet, Michigan is one of the few remaining states in the country that has not passed full prescriptive authority legislation allowing the NP to order and be responsible for prescription medications without the direct supervision of a physician.

It must also be noted here that possible methodological shortcomings of this study may include an inadequacy of the wording or incompleteness of the questions as a subset, to reliably convey the intended subject matter related to barriers, thus affecting responses and the subsequent results of this study. It should also be considered here

that a more accurate technique of discovering practice barriers exclusively pertinent to the NP in Michigan might have been obtained through a qualitative approach, which incorporates the use of open-ended questions without pre-determined response categories. Despite these considerations, the magnitude of the mean barrier scores were found to be moderate and subsequently used in correlations with other variables.

For research question two, the impact of barriers upon the performance of the skilled practice functions was sought, as well as the impact of each barrier upon the number of CHF clients seen per week, years of NP practice, expert status of the NP, and the functional classes of CHF clients seen in NP practice. Many significant findings were made among the variables (see Tables 12, 13, and 14). Of overall importance, is the finding that despite the lack of high barriers, the very presence of some of the barriers within the practice site was found to have a negative influence upon the number of CHF clients seen per week, and the subsequent performance of many of the skilled practice functions in the management of the CHF client (see Tables 12, 13, and 14). Thus, it can be said that barriers within the practice environment of Michigan may affect the management of the CHF client by the NP. Moreover, it seems probable from the results of this study and the supporting literature, that the practice environment of each state is individual in nature, varies from state to state and is

defined in part, by barriers dependent upon state legislation that may ultimately affect NP management of the CHF client.

Another important study finding was that the NP's management of the class III CHF client seems to correlate significantly with both self-reported level of expertise and expert status of the NP. Though not discussed in the literature, it is possible that the routine management of the class III client is at least one factor in the development of the expertise of the NP with CHF clients. Further, it was found that certain barriers within the practice site adversely affect the management of the class III client: prescriptive authority, reimbursement, physician support, and NP competency (see Table 14). These findings give some insight into possible strategies to increase the level of NP expertise necessary to deliver more comprehensive care to the CHF client.

For research question number three, the impact of the total means of the variables of number of CHF clients, years of NP practice, expert status of the NP, and the functional classifications of CHF clients upon the performance of the skilled practice functions was found to be mostly negligible, though total mean scores were used to represent the two sections of the skilled practice functions (see Table 15). Responses in general to the skilled practice function questions were quite homogenous, and usually favorable. A possible explanation for a lack of greater

variation of responses to the questions may have been the tedium of responding to two long sets of skilled practice function questions, i.e., two respondents who answered all questions with a single line drawn through the "always" response were eliminated. Another possibility, is that despite the assurance of anonymity, the NP may have felt compelled to answer most questions favorably in order to appear to more highly competent in the clinical management of the client.

Because of a lack of findings between many of the intervening variables and the composite scores of the skilled practice functions, individual skilled practice function questions were used for correlation. Mindful of the possible limitations of the skilled practice questions, it was found that as expert status of NP scores increase, so does the comprehensive performance of many skilled practice functions, i.e., assessment of client's learning style prior to teaching (see Table 16). This finding is supported by literature, and understandable yet important to stress, particularly since NPs were found to have lower self-perceived levels of expertise with CHF clients than with other clients. Findings indicate that low levels of NP self-perceived expertise with CHF clients may indirectly deprive the client from being managed by a more competent and thus comprehensive and effective NP. As individuals, NPs must have adequate levels of expertise in order to

provide CHF clients with consistent comprehensive care management as delineated by the AHCPR guidelines.

In summary, the important findings from this study were that routine management of class III CHF clients was found to be supportive of higher measures in the expert status of the NP, as well as the NP's self-reported expertise with CHF clients. Additionally, NP education and NP perceived level of competency were found to be supportive of the NP's management of class III CHF clients. However, it was found that barriers in the practice environment, prescriptive authority, reimbursement, physician support, and NP perceived level of competency affected both the number of CHF clients the NP manages per week, as well access to class III CHF clients, which ultimately affects the performance of the skilled practice functions in the management of the client.

Methodological Limitations

A possible error in data collection related to NP expertise must be mentioned here. The collection of the measurement of self-reported expertise and the subsequent objective measure of expertise within during the same survey was likely to result in some degree of situational bias, affecting the results obtained. It is likely that every NP wishes to be considered at a level of expert in their practice. Though necessary for the design of this research, providing the NP with a thorough explanation of the various levels of expertise necessary in order to obtain a self-

report, is likely to influence attempts at objective measures of this variable if performed later within the same query period. A more optimal plan might have been to examine expertise separately from barriers or skilled practice functions. In any event, expertise may benefit from the distribution of two questionnaires, the first measuring self-reported expertise, and the later obtaining the objective measure of NP expertise. This methodology would be more likely to reduce the possibility of an immediate influential bias effect upon the subjective measure, produced through presentation of the definitions of the different levels of competency. Thus, the influence of this error in data collection was likely to reduce the reliability and validity of the measurement of the expert status of the NP.

It must also be noted that possible methodological shortcomings of this study may include an inadequacy of the wording or incompleteness of the questions as a subset, to reliably convey the intended subject matter related to barriers, thus affecting responses and the subsequent results of this study. It should also be considered that a more accurate technique of discovering practice barriers exclusively pertinent to the NP in Michigan, and more particular to individual practice environments might have been obtained through a qualitative approach, which incorporates the use of open-ended questions without pre-determined response categories. Despite these

considerations, the magnitude of the mean barrier scores were found to be moderate and subsequently used in correlations with other variables.

Further, when NPs were examined by certification type, the sample population of the three groups was decreased to 62 family NPs, 27 adult NPs and 11 geriatric NPs. Therefore, any conclusions drawn regarding adult or geriatric NPs would be hampered by a small sample size.

Discussion of the Results within the Conceptual Framework

Understanding and adaptations of the concept of perception was sought through King's conceptual model and subsequently used as a lens by which to view NP barriers within the practice environment, as well as NP self-reported expertise with CHF clients. King describes perception as a representation of an individual's sense of reality, which involves awareness of persons, objects, and events within the environment. Perception can be defined as a process in which selected stimuli are organized, interpreted, and transformed into useful data, utilizing present orientation and memory of past experiences. Thus, perceptions provide meaning to an individual's experience, and serves to influence the behavior of the individual, while representing a subjective image of reality (King, 1981, p. 24.).

Many subjective perceptions within the concepts of this study were ultimately compared to more objective collections of data, in an effort to transform the perceptions of the NP into a more aggregated, thus concrete reality. For example,

an assumption of this research as described by the study's research questions was that the nurse practitioner's perceptions of practice barriers in the form of prescriptive authority, reimbursement, physician support, NP adequacy of educational preparation, NP perceived level of competency, and NP public acceptance would impact NP performance of the skilled practice functions toward the goal of comprehensive care in the management of the congestive heart failure client in the primary care setting, and may be impacted by other intervening factors as well.

Some of the results of this study provide support for the utility of the conceptual frameworks used to construct this work, an adaptation of King's conceptual framework, and Bryckczynski's model for advanced nurse practitioner practice, which was derived from Benner's model detailing the novice to expert skill levels of registered nurses. In response to research question one, findings from the study regarding practice barriers revealed NPs perceived a moderate amount of barriers present within the environment, which were incidentally less than descriptions published in recent literature. Yet, the study finding is important within the context of King's conceptual framework and definition of perception, thus representing a collective sense of reality for the NPs within Michigan, despite divergence from current published literature. Further, despite findings of moderate magnitude, many of the individual barriers were found to correlate moderately to

strongly with some of the objectively focused intervening variables (see Table 14). Consequently, this finding lends additional credence to NP perceptions through relationships with the objective findings, thereby confirming the presence of some of the barriers within the practice environment, regardless of perceived magnitude.

The skilled practice functions were derived from Bryckcznski's (1989) six domains of NP practice, which effectively describes the functions of NP activities used in practice and adapted to the management of the CHF client. The capture and categorization of these functions as an adaptation of Bryckczinski's model is important as a potential goal-oriented measurement device by which to gauge the optimal management of the CHF client by the NP. However, with this study it should be considered that there may have been flaws in the methodology used to collect the data related to the skilled practice functions. For most questions regarding basic management, the performance of the initial and ongoing skilled practice functions of the 100 NPs in the population sample were homogeneously reported to be quite high, in the "sometimes" to "always" categories. Mindful of methodological considerations, it appears that NPs perceive they perform comprehensively regarding the management of the CHF client. Objective confirmation of these results may have been gained through observation of NP performance of the skilled practice functions, though procurement of this data was beyond the scope of this study.

Furthermore, all six of Bryckcznski's domains of practice have proved relevant in adaptation of the domains into the initial and ongoing skilled practice functions. Regardless, it seems that the utility of Bryckcznski's model, utilized in the adaptation of the nurse practitioner's domains of practice toward the measurement of the management of the CHF client by the NP has been demonstrated.

Furthermore, in answer to research question number two of this study, composite scores of the initial and ongoing skilled practice functions revealed moderate relationships with many of the NP perceived practice barriers, showing that as these perceived barriers increased, the performance of the skilled practice functions decreased (see Table 12). Thus the contrast and effect of perception upon objective data shows that in some cases, the reality of the NP is corroborated by the objective data, thus becoming a more concrete reality.

In answer to research question number three of this study, the initial and ongoing skilled practice functions of the 100 NPs in the population sample showed moderately strong relationships with the intervening variable of expert status of the NP, as well as with the group of NP experts that evolved from the study (see Tables 16, and 23). Most of the skilled practice functions displayed an upward trend of performance as the scores of expert status of NP climbed from a low of 12, to a high of 24. Similarly, the group of 40 NP experts also displayed the same upward trend among

their scoring range of 20-24. Despite possible problems related to internal reliability regarding the scores of expert status of NP and NP expert, these trends may help to corroborate the assumptions of the models of both Benner and Bryckczinski in describing the existence of levels of expertise, as well as the practice characteristics embedded within each level that have demonstrated utility in the analysis of the NP in the management of the CHF client.

In addition, differing levels of perceived competency by NPs between the management of general clients and CHF clients was a significant finding of this study. In the context of both Benner's and Bryckcznski's models, this finding appears to support the existence of the levels of competency, as well as the defining characteristics of each level. Further, King's concept of perception is well understood here to represent the reality of the NP with at least two different client populations.

Therefore, meaningful findings of this study within the context of the conceptual models included the finding that the concept of perception used in the study was able to define and represent the reality of nurse practitioners related to their competency with CHF clients. Further, the linking of the NP's perceived expertise with objective levels of expertise, as well as perceived practice barriers to the performance of the skilled practice functions demonstrated that perceived reality may potentially impact the management of the CHF client. Further, In addition, the

use of Benner's (1984) levels of competency provided categorical classification of the NPs in the study population, which promoted greater understanding through stratification of the study findings especially seen with NP competency with CHF clients, as well as the performance of the skilled practice functions. Further, Bryckcznski's (1989) extensive description of the domains of practice of the nurse practitioner enabled the development and adaptation of the skilled practice functions as a measure by which to indicate the comprehensiveness of the management of the CHF client.

Consequently, based on the findings from this study, the following alterations to the conceptual model are proposed. The original concept of perceived practice barriers will remain the same. Despite a lack of high barriers in the practice environment among the six subsets of barriers, all subsets had some degree of significant correlation with other variables, (see Tables 12, and 14) and will thus remain unchanged. Additionally, the barriers of NP competency and NP education actually reflect internal characteristics brought to the environment and will be described categorically as such, compared to other barriers stemming from or found within the practice environment. Physician support and NP public acceptance are barriers stemming from other sources more amenable to modification than those of legislatively regulated prescriptive authority and reimbursement, and will be categorically described as

such. However, a question mark will be added to this category of barriers to represent the possibility of other unknown barriers, which may be of equal or greater importance within individual practice environments that have not yet been discovered.

The concept of the skilled practice functions as a comprehensive set of functions that represents the optimal management of CHF clients will also remain unchanged. However, the intervening variables consisting of: number of CHF clients per week, years of NP practice, expert status of the NP, self-reported expertise with CHF clients, and functional classifications of CHF clients will change in part. First, years of NP practice, as an objective function of the measurement of NP expertise will become a separate intervening variable. Despite a failure to significantly correlate this variable with expertise or other variables, years of NP practice was shown to affect the NP's perception of practice barriers as well as some of the skilled practice functions. In addition, number of CHF clients and functional classification of CHF clients were both found to be highly significant toward the formation of NP expertise in practice, especially the management of class III clients. This finding thus necessitated the separation of the CHF client-focused variables from the NP-focused variables into two distinct entities, which better reflects their mutual interaction. Further, for the purpose of adapting the conceptual model more specifically to the CHF client, expert

status of NP will be narrowed to expert status of NP with CHF clients.

Thus, continuing with the separation of the intervening variables as discussed above, level of expertise of NP becomes a singular intervening concept composed of expert status of NP with CHF clients and self-reported expertise with CHF clients. Finally as discussed above, CHF clients will become a separate variable, composed of number of CHF clients and functional class of CHF clients. This change is made in recognition of the significance of both numbers of CHF clients and the management of functional class, especially class III clients, upon the expertise level of the NP with CHF clients. This modification will aid in a more accurate description of conceptual relationships based on study findings.

The practice barriers will have a bi-directional flow toward skilled practice functions, reflecting the impact that barriers may have upon the performance of the skilled practice functions, as well as the impact their performance may have upon practice barriers. The newly separated intervening variable of years of NP practice has a uni-directional relationship flowing to both practice barriers and the skilled practice functions, depicting the finding that years of NP practice may decrease the perception of barriers yet increase the performance of some of the skilled practice functions. The relationships of the concept of practice barriers and NP will become bi-directional,

reflecting the potential impact the NP according to level of expertise, may have upon barriers in the practice environment and vice versa. NP has a bi-directional flow with CHF clients, depicting the effect the management of CHF clients has upon the level of expertise of the NP with CHF clients, and vice versa. The variable of CHF clients consisting of number of CHF clients and functional classification will have a bi-directional flow with the skilled practice functions. This flow depicts the effect the number and classification of CHF clients will have upon the performance of the skilled practice functions.

Further, NP has a bi-directional relationship with the skilled practice functions, depicting the impact level of expertise may have upon performance of those functions, while the performance of the functions also impacts the NP's level of expertise. In addition, the practice barriers has a bi-directional relationship with CHF clients, depicting the impact barriers may have upon the number and classification of CHF clients, as well as the impact the CHF clients may have upon the practice barriers (see Figure 2).

Implications for Advanced Practice Nursing in Primary Care

Congestive heart failure in the 1990's has become an ever-increasing burden to the public, as well as health care, and national economic systems (English & Mastrean, 1995). As of 1997, an estimated 5 million Americans suffer from congestive heart failure with 400,00 new cases annually, resulting in multiple hospitalization rates

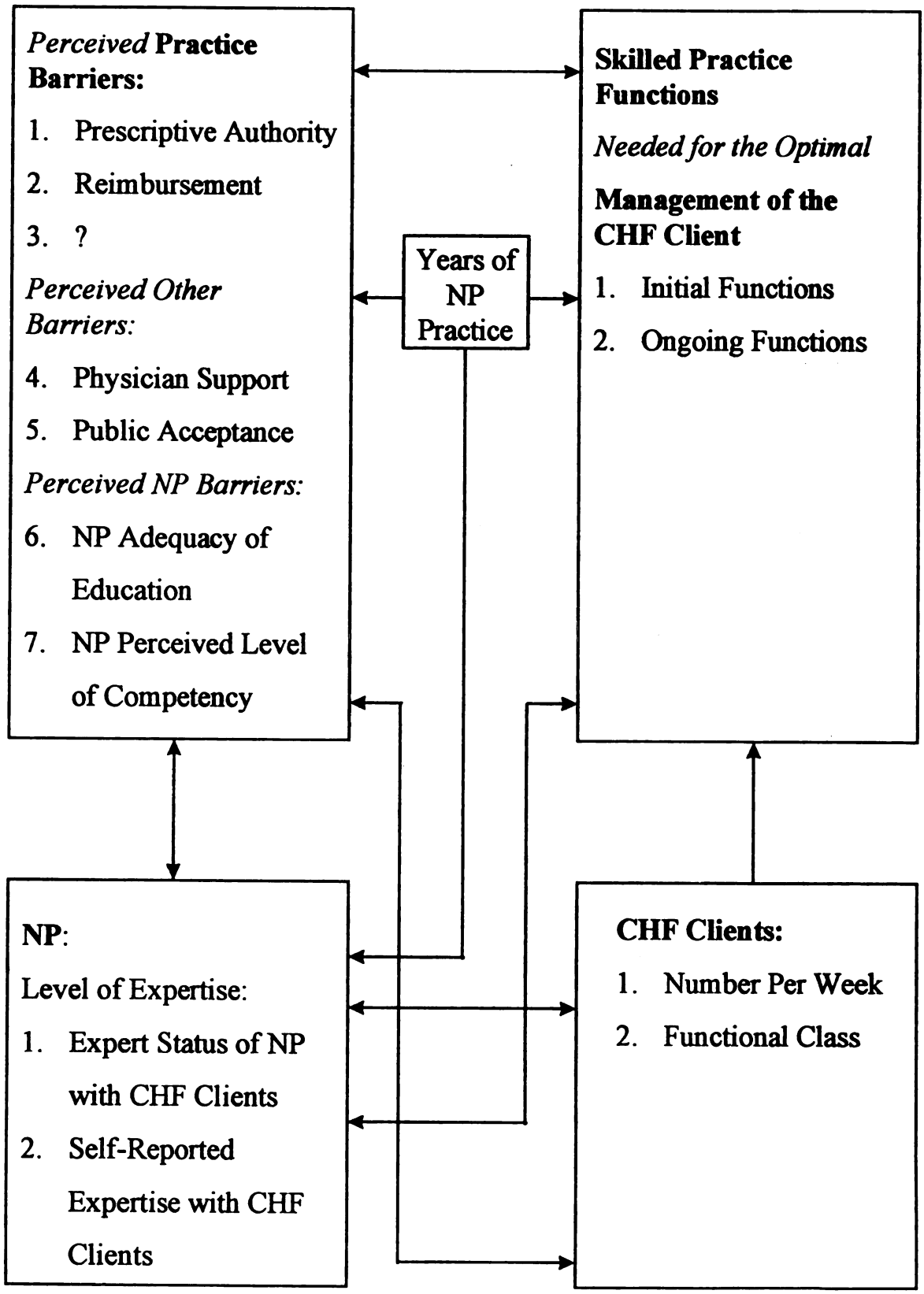

Figure 2. Modification of Study Conceptual Model.

greater than 700,00 annually. Thus, CHF is a leading cause of morbidity and mortality in the United States and other industrialized countries (Chin & Golman, 1997; Gillum, 1993; Massie & Shah, 1997; Stafford, Saglam, & Blumenthal, 1997). The increase in incidence and prevalence of CHF noted in the 1990's is occurring despite a 31% decline in mortality from ischemic heart disease. Hospitalizations for heart failure in the 1990's have tripled since the 1970's, with as many as 78% of CHF clients experiencing at least 2 admissions per year, and 16% three (Funk, 1993; Massie & Shah, 1997). Subsequently, annual health care costs of 38 billion are spent on CHF, comprised mostly of those greater than 65 years of age (Stafford et al., 1997).

In order to address this national increase in the incidence of CHF, the nurse practitioner as an APN is a particularly appropriate primary care provider for the CHF client and family due to the comprehensive disease management skills inherent within the role. These skills include advanced nursing practice which incorporates evidenced-based evaluation and treatment of the client in multiple spheres such as education, counseling, and psychosocial evaluation, which are performed in concert with medical, pharmacological knowledge, and for the NP some degree of prescriptive authority. Furthermore, the APN who possesses a high degree of knowledge and skill in the treatment of cardiovascular disease, is both well-suited and obliged as a health care professional to aid the in

optimization of care for the CHF client and family (Brass-Mynderse, 1996; Kegel, 1995).

The goal of the the NP in the primary care setting should be the comprehensive and optimal management of the CHF client, which can be attained and subsequently measured through the performance of a composite of necessary interventions described in this study as skilled practice functions, which are also described within the AHCPR CHF guideline. The attainment of these goals are dependent upon multiple factors. These factors must come together to enable the NP to have access to the care management of the CHF client and further, to have the necessary abilities to manage this population while establishing a favorable, accepting, ongoing relationship with the client and family. The NP may accomplish these initiatives through an adequate educational foundation, and the utilization of advanced practice role characteristics and interventions, focused toward the comprehensive performance of the necessary skilled practice functions in the management of the CHF client.

Implications Related to Practice

Competency. Overall, nurse practitioners perceive they are less competent to care for CHF clients compared to other, general clients (see Tables 5, and 19). In search of further data to explain this finding, it was also found that NP perceptions of low competency with CHF clients was moderately related to how many CHF clients seen per week

(.33), but strongly related to class III CHF clients (.55) and moderately to class IV clients (.30) (see Table 14). In addition, the findings revealed that family NPs in particular perceive they are less competent to care for CHF clients than adult or geriatric NPs. In search of further explanations, volumes of CHF clients were examined. It was noted that 91% of family NPs reported managing between 1-10 CHF clients per week, as well as 93% of adult NPs. However, though 72% of geriatric NPs report managing between 1-10 CHF clients per week, 18% of this population also reported managing between 16-20 CHF clients per week, more than adult or family NPs (see Table 18). Thus, the data seems to support an explanation that observed differences in volume are probably attributable to the work site and predominate age of clients managed by the geriatric NP. In addition, the study noted that adult and geriatric NPs saw more severely ill individuals in the form of class III CHF clients than family NPs, also probably related to work site (see Table 18). However, the management of more CHF clients, especially class III CHF clients, and to a more moderate degree class IV clients, is associated with higher levels of self-reported expertise with CHF clients, and the objective measure of expert status of NP (see Table 21). Yet, despite differences in work site opportunities to manage CHF clients, all NPs, and especially family NPs must take advantage of available opportunities to manage the CHF client population. NPs must be made aware that increasing

the number of clients as well as the number of severely ill CHF clients managed will concomitantly increase skill levels, as well as provide holistic benefits for the CHF client. As preparation for these opportunities, NPs must endeavor to obtain, study, and comply with the AHCPR CHF guideline (1994) that is available, in order to enhance clinical understanding, competence, and perfect the management techniques that will enable the attainment of consistent and comprehensive care of the CHF client population. Further, an adequate educational base combined with CHF-specific continuing education will provide the foundation from which to advance the NP's level of expertise with CHF clients, consequently increasing NP self-perceptions of competency, and leading to greater acceptance by CHF clients, as well as enhanced physician support (see Table 25).

Unfortunately, study findings also show that despite the fact that physicians as well as PAs manage clients while hospitalized, few NPs currently manage CHF clients across the continuum of care (see Tables 7, and 8). Office or site-bound NPs who dare not cross these boundaries may be contributing to the current scarcity of NPs managing CHF client hospitalizations, and thus contribute to their decreased management of class III clients compared to class I or II clients (see Table 11). However, a NP who is well versed with the CHF AHCPR guideline, comfortable with cardiovascular assessment and pharmacology, and given

ongoing experiences with CHF clients, should be able to competently manage class III clients despite their tendencies to frequent exacerbations and hospitalizations. In fact, management of class III CHF clients by the NP, in concert with other professionals as necessary, can be very beneficial for the client. The broad, holistic qualities of the APN in practice make this individual an extremely valuable member of the team in the care of the CHF client, who is likely to have a holistic range of problems.

As expected, NP years of practice was found to be strongly related to NP self-reported expertise with clients overall, and more moderately with self-reported expertise with CHF clients. A surprising finding however, was that NP years of practice have no relationship with the objective measure of expert status of the NP. Thus, there may be a divergence between the NP's perception of expertise and actual expertise, which is worthy of further question and research (see Table 20). As an objective measure, expert status of the NP has been lent some confidence through a strong relationship to NP perceptions of competency (.50) (see Tables 14, and 25). Study findings further revealed that as the expert status of NP score increased, the advanced practice role characteristics of counselor, evaluator, leader, and educator may increase as well (see Table 16). Thus, as expertise climbs, the NP is more likely to give emotional support and counseling, evaluate the effectiveness of the client's treatment regime, assume

primary accountability for the client, and assess the client's learning style prior to teaching.

Practice barriers. A surprising finding of this study, was that the NP's perception of barriers within the six categories of inquiry was not reported to be more problematic, as frequently reported in the literature. The six categories included prescriptive authority, reimbursement, physician support, NP competency, NP education and NP public acceptance. However, when examined as a total composite score, the barriers in this study showed a moderate to strong inverse relationship with number of CHF clients managed per week (.37), and the management of class III clients (.56). Examined in detail, prescriptive authority, reimbursement, physician support and NP competency showed moderate correlation one or both of these variables (see Table 14). Thus, despite the study's serendipitous findings of the NP's perception of moderate amounts of barriers present within the practice environment, it is still important for the NP to be aware of any and all barriers that may inhibit full potential in practice, as access to CHF clients in general and especially class III CHF clients may be impacted. Becoming aware of barriers such as difficulties with reimbursement, prescriptive authority, physician support, or public acceptance within the practice environment may enable the initiation of actions that might result in NP management of greater numbers of CHF clients, as well as more comprehensive care

for the CHF client. To accomplish these goals, NPs must increase their awareness of existing practice barriers by familiarizing themselves with state and national legislation concerning their practices, and then assessing and comparing the barriers present within their own practice environments. This assessment should include a personal analysis of the boundaries of their own scope of practices asking, are these boundaries chosen or imposed? To alleviate or amend existing barriers in the practice environment, NPs must take an active leadership role, realizing that decreasing barriers in the practice environment may enhance client access to he NP, as well as optimize client management, as outlined by national guidelines.

Furthermore, important relationships were discovered between some of the barriers. For instance, physician support was shown to have a strong relationship with NP competency (see Table 25). Despite a failure of the study to show strong findings regarding NP perceptions of physician-related practice barriers that are described in the literature, the findings do show that physician support impacts some of the intervening variables, such as the moderate relationship with number of CHF clients per week(.29), and the strong relationship with class III CHF clients(.49) (see Table 14). Thus, physician support may impact both access to the CHF client and the development of NP expertise with the CHF client, by somehow limiting NP management of class III CHF clients. Moreover, study

results indicate that the physician is the most prominent other professional in the work site, thus contributing to a reasonable assumption that this individual probably exerts some degree of influence on other professionals in the practice environment (see Table 3). Benner's model of novice to expert highlights the fact that the physician and nurse relationship is a critical facilitative force in the transition from a proficient level of expertise to the expert level of expertise. Further, the use of multiple perspectives to improve the clinical understanding of the NP, such as that of the physician, improves clinical reasoning and subsequent clinical decision-making and responses, thus demonstrating the significance of a supportive and collaborative relationship between the NP and physician (Benner, Tanner, & Chesla, 1996).

Therefore, in order to be cognizant of physician-related issues and their subsequent impact on CHF client management, the NP must embrace the advanced practice role characteristics of leader and change agent, by assessing and intervening in the quality of the relationships between the NP and any collaborating and supervisory physicians in the work site. Some questions relevant to the assessment of this subject might be as follows. What are the attitudes of the physicians concerning NPs, especially regarding physician-imposed practice boundaries that may influence the severity or complexity of the CHF client population seen by the NP? How would the NP characterize the quality of the

collaborative relationship with the physician? How would the NP assess the physician's knowledge regarding the role of the NP? And following assessment, are interventions needed aimed at improvement or enlightenment in order to expand the physician's outlook regarding the role of the NP?

In addition, study findings showed that the NP's advanced practice role of consultant in the management of the CHF client is vastly underused by the physician (see Table 6). To achieve credibility the NP must be able to assess the prevailing communication patterns between themselves and physicians. Breakdowns in communication or patterns of non-communication first require the establishment of trust between individuals. The NP must be certain of individual self-perceptions of competency, and take positive steps toward improvement if necessary. Another step in fostering NP credibility will be to utilize the role of educator to facilitate enlightenment of the physician regarding the role and competency of the NP, through the use of a therapeutic communication style. Further, failure to have a supportive, credible and collaborative relationship with physicians in the work site may hamper NP access to CHF clients (see Table 14).

NPs were found to perceive overall, that public acceptance of their role was of a moderate or average magnitude, therefore existing as a moderate barrier within the practice environment. Specific survey questions on this subject asked if NPs perceived that their CHF clients

accepted them, understood their role, or preferred a physician give their treatment. Overall mean scores revealed NPs perceived that CHF clients accepted them as "mostly true", NPs were "unsure" if CHF clients understood their roles, and NPs perceived that CHF clients preferred a physician give their treatment as "mostly false" (see Table 9). Thus, an important finding from these results is that NPs perceive there is a lack of client understanding and therefore public understanding, about their role as an NP. Yet, without further in-depth data it is impossible to understand this finding completely, but a probable explanation may be a need for greater attention to the attributes of the role, garnered through individual practitioners, professional organization, and perhaps the media in general.

Strategies to improve the public's understanding and acceptance of the NP should be dealt with both individually and collectively. Individual NPs should include checking for evidence of client understanding of the NP role with each NP encounter, and devoting extra time if needed to clarify this understanding, as well as having written brochures ready for distribution and further support of discussion. Further, periodic awareness campaigns, and media distribution aimed at the public in order to elucidate the role of the NP, and to highlight advantages of the NP as provider may provide additional support for understanding. Public sharing of defining abilities that may help increase

understanding and acceptance include: advanced assessment skills, the ability to provide expert guidance and teaching, the ability to work with and coordinate the care of clients, and their families, the ability to diagnose and prescribe, the ability to manage the client's health-illness status, advanced ability to synthesize and analyze data, and the ability to consult with or refer to other health care providers (The National Council of State Boards of Nursing, 1992). Some of the advantages mentioned in the literature related to public acceptance of the NP that may also be shared in an awareness campaign involve easy access, greater time devoted to appointments, as well as client questions, problems, and high levels of NP sensitivity and caring.

Furthermore, NP public acceptance was also found to have a moderate relationship with self-reported expertise with CHF clients (.35), and a less moderate one with NP competency (.27) (see Tables 14, and 25). Despite the study's lack of a preponderance of relationships between NP public acceptance and most of the intervening variables, its moderate relationship with self-reported expertise with CHF clients shows that the NP does perceive the importance of expertise as part of their relationship with the client, perhaps as a dimension of credibility with the client and the public. Thus, improvement in NP self-reported expertise through increased numbers of CHF clients, and especially class III clients may lead to a higher level of credibility and acceptance of the NP by the client. Furthermore, and in

general, improved levels of NP expertise may well lead to greater credibility and acceptance of the role of the NP by the public at large.

Skilled Practice Functions. The performance of the initial and ongoing skilled practice functions necessary for the appropriate and optimal care of the CHF client were shown to have moderate relationships with both the objective measure of expert status of the NP (.35/.36) and self-reported expertise with CHF clients (.32/.30) (see Table 15). Therefore, as objective and self-reported levels of NP expertise increase, the NP is more likely to comprehensively perform the skilled practice functions that will provide for the optimal management of the CHF client. Thus, in order to attain these goals, the achievement of expertise by the NP is very important. Further, moderate relationships were also discovered between the initial and ongoing skilled practice functions and total barriers, and specifically: prescriptive authority, reimbursement, and NP competency, showing that as these barriers increase in the practice environment, the performance of the skilled practice functions decreased (see Table 12). Study findings also show that the initial and ongoing skilled practice functions are performed more comprehensively with class III CHF clients than the other classes (see Table 15). Thus, the promotion of NP expertise with CHF clients and the subsequent enhancement of the role characteristics of the

advanced practice nurse can also lead to greater benefit for the client.

Implications Related to Education

Competency. A paradoxical finding of this study was that NP education as a barrier did not significantly correlate with any of the intervening variables, but did understandably reveal a moderate relationship with NP competency (.32) (see Table 25). However, upon closer examination of this finding, NPs by certification type do differ in their perception of NP education as a barrier in the practice environment. Proportionately more family NPs perceive greater barriers related to education (34%), than adult (19%), or geriatric (9%) as determined by mean total scores greater than 10 (see Table 26). Further, as discussed above under implications related to practice, nurse practitioners overall perceive they are less competent to care for CHF clients than other, general clients, (see Tables 5, and 19) and in examination, family NPs perceive they are less competent to care for CHF clients than adult or geriatric NPs. Study data suggests the availability of the type of CHF client in various work sites, according to NP certification type, may be a major contributory factor to these findings. However, NP education may have an impact on these findings as well.

Consequently, the disparity in reported competency levels by NP certification type may be related to differences between educational programs for family, adult,

and geriatric NPs, and the subsequent emphasis placed on congestive heart failure. Further study data may add additional support to this hypothesis. Total NP responses to the survey question "I found the care of CHF clients to be too complex following my educational preparation." revealed a predominant overall mean in the "mostly false" category. However, on further analysis, a cross-tabulation of this question by NP certification type revealed 26% of family responses in the "mostly true" range compared to 11% of adult NPs, and no geriatric NPs responses in this range.

Moreover, the survey question, "My clinical preparation as a student prepared me to provide basic care for CHF clients." revealed a predominant overall mean in the "unsure" category. However, with closer examination, this survey question cross-tabulated by NP certification type showed 11% of family NPs responding in the "definitely false" category, compared to no responses from adult or geriatric NPs in this category. Therefore, despite access to greater numbers of clients, or more severely ill CHF clients as gained through the work site of NPs by certification type, these subsequent findings imply that there might be basic preparatory educational differences that further contribute to this problem. Thus, from the findings of this study, it can be assumed that the differences in NP self-reported competency levels have important implications for the education of the nurse

practitioner student, especially family NP students, as well as the continuing education of practicing NPs.

Consequently, based on these findings, it seems plausible to assume that family nurse practitioner programs in Michigan may be doing less toward educating their students in the care and management of the CHF client than either adult or geriatric programs in Michigan. This finding is understandable in part, due to the broad range of client types and ages found within the realm of a family practice setting, which necessitates a broad range of information taught, compared to the settings of adult and geriatric NPs who are largely able to narrow their focus to a smaller age segment of the general population. However, since CHF is the number one diagnosed DRG in the greater than 65 year age range, and its incidence is increasing yearly, it also seems plausible to suggest that greater time be devoted to the subject so that more family NPs can report higher levels of competency with CHF management upon initiation of practice.

Because NP competency was shown to have a strong relationship with expert status of the NP (.50), (see Table 14), the education of the NP in the management of the CHF client should be re-evaluated. Strategies to improve competency levels of family NPs in the management of the CHF client, through changes in the current curriculum of family nurse practitioner educational programs in Michigan should involve both the classroom and the NP's clinical learning

site. Classroom focus on congestive heart failure as a syndrome should utilize the AHCPR CHF guideline (1994), as the performance of the initial and ongoing skilled practice functions necessary for the appropriate and optimal care of the CHF client that were based in part on the guideline, were shown in this study to have moderate relationships with both the objective measure of expert status of the NP (.35/.36) and self-reported expertise with CHF clients (.32/.30) (see Table 15).

Skilled practice functions. The skilled practice functions were developed in part to measure the comprehensiveness of the NP's management of the CHF client. Study results have shown that an adequate education is an important precursor to the NP's ability to manage the CHF client competently and comprehensively, and that many individual skilled practice functions displayed moderate relationships with NP education, but that many of these functions were beyond the basics of graduate education, i.e., radionuclide ventriculography for assessment of LVF for instance is a specific, yet costly second-line cardiac diagnostic tool (see Table 13). However, study findings revealed that as the expert status of NP score increased, the advanced practice role characteristics of counselor, evaluator, leader, and educator embedded within the survey questions, may increase as well. Thus, as expertise climbs, the NP is more likely to give emotional support and counseling, evaluate the effectiveness of the client's

treatment regime, assume primary accountability for the client, and assess the client's learning style prior to teaching (see Table 16)

Recommendations for changes in NP education. Classroom learning approaches to CHF should be stratified by functional classification; learning needs, client education, treatment approaches, and even cardiac pathology differs by client classification. For example, Class I clients display basic pathological changes involving deformations of the left ventricle, but do not display symptoms that impact day to day functioning. However, pertinent studies in the current literature (Solvd, 1992; Consensus, 1987) indicate all CHF clients diagnosed with left ventricular systolic dysfunction should be protectively placed on an ACE inhibitor, progressively titrated upward, and followed periodically for side effects and tolerance.

Equally as important for this stage of disease are the psychosocial needs of the client, which involve necessary emotional, and lifestyle adjustments to a chronic, yet ultimately terminal disease state. Psychosocial issues including client and family grieving, as well as education regarding lifestyle changes are treatment priorities for this class of CHF client and their families, and may require a considerable amount of time and effort on the part of the NP, contingent upon the client's support network. The NP who performs consistently according to the AHCPR CHF guideline in the management of class I and II clients may

deter the rate of progression of ventricular remodeling, thus prolonging survival time in this client population. Similarly, CHF classes II through IV have specific physiologic changes, and thus specific educational, and management needs for the client. Furthermore, classroom focus on congestive heart failure should be heavily linked to prevention. Both undiagnosed and uncontrolled hypertension and coronary artery disease are major causes of CHF in the 1990's, which if identified and properly treated may prevent CHF in many individuals (Konstam et al., 1994).

Though difficult to control at times due to a lack of availability, the clinical sites of the NP student should be able to provide experiences with either class I or II CHF clients, which will improve the NPs knowledge and experience in the necessary education and counseling that so typifies advanced nursing practice in the management of these classes of CHF client. The provision of education regarding lifestyle changes, and frequent monitoring of status combined with the necessary management interventions for the class I CHF client may greatly impact the rate of progression of the CHF client's disease. Surprisingly however, the findings of this study denote that class I and II CHF clients do not seem to contribute to increased self-reported NP expertise with CHF clients or the objective measure of expert status of the NP in an overall, or significant manner (see Table 21). But because NP perceptions of low competency with CHF clients was

moderately related to how many CHF clients were seen per week (.33), as well as strongly related to the management of class III clients (.55), NP students must be provided with, and seek opportunities to manage the CHF client population, especially class III CHF clients (see Table 14).

Therefore, a site should be provided that will allow access to, and management experience with the class III client, even if found within an acute care setting. As identified in the study, the class III CHF client has strong relationships with expert status of the NP (.50), NP self-reported expertise (.65) and NP competency (.55) (see Table 14). However, the frequent hospitalizations and periodic intense management of the class III client sometimes makes for difficult distinctions between primary and acute care designations, which if attended to by the educational program in a strictly categorical manner, may decrease the NP student's access to the class III client. Study results revealed that currently, very few NPs actually cross the boundary lines of primary care and manage CHF clients who are in the hospital setting, despite a large number of NPs with experiential backgrounds in acute care (see Tables 2, 7, 8, and 23). Thus, it might be suggested that a class III client be identified and followed in the acute care setting through a cooperative provider, providing the NP student experience with CHF acute exacerbation and stabilization of symptoms. The NP student might then follow the same client post-discharge to the primary care and perhaps home sites,

for further experience in follow-up and long-term management focused on decreasing CHF exacerbations and hospitalizations, while increasing functional status and quality of life. In all likelihood, NPs who were taught to manage hospitalized clients may be more likely to take advantage of opportunities to do so, thus increasing their skills and expertise with class III CHF clients (see Table 13). In addition, the NP student clinical scenario as outlined above and performed over a one semester trial, might provide an opportunity for further clinical nursing research to compare pre and post NP student-perceived competency levels in the management of the CHF client.

NP accountability. Moreover, on an individual level NPs in practice must display professional accountability by evaluating and seeking improvement, a characteristic described by Bryckczinski (1989) as typifying an expert level of nurse practitioner practice. Improvements in CHF client management by practicing NPs may be sought through continuing education, self-study, and increased experience with CHF clients. Again, the NP should be made aware that increasing the number and severity of CHF clients will concomitantly increase skill levels. In preparation for these opportunities, NPs must endeavor to obtain, study, and comply with the AHCPR CHF guideline that is available, in order to enhance their clinical understanding, competence, and perfect management techniques that will enable consistent and comprehensive care of the CHF client

population. An adequate educational base and continuing education regarding CHF will provide the foundation from which to advance the NP's level of expertise with CHF clients, consequently increasing NP self-perceptions of competency, and leading to greater acceptance by CHF clients, as well as enhanced physician support (see Table 25).

Summary of nursing implications. Important implications exist regarding NP barriers and competency, for both practice and education. A surprising finding of this study was that the NP's perception of barriers within the six categories of inquiry was not reported to be more problematic, as is frequently reported in the literature. It may be that the presence of NP barriers is more individualistic in each practice environment than was previously thought. However, despite these findings which solely reflect NP perceptions, further significant relationships were sought and found between the barriers and other variables. The barriers in total revealed a moderate relationship with number of CHF clients managed per week and a strong relationship with the management of class III CHF clients. Specifically, prescriptive authority, reimbursement, physician support and NP competency showed moderate relationships with number of CHF clients per week and class III CHF clients. Thus, due to these findings, as well as to the likelihood that NP practice environments are individualistic, it is important for the NP to be aware of

barriers that may inhibit full potential in practice, as access to CHF clients in general and especially class III CHF clients may be impacted.

Study results also show that physician support has a moderate relationship with number of CHF clients per week, but a strong relationship with class III CHF clients. Thus, physician support may impact both access to the CHF client as well as the development of NP expertise with the CHF client, by limiting NP management of class III CHF clients in undetermined ways. Further, if present as a barrier, physician support may be more readily accessed and addressed by the NP than other barriers within the environment that may be legislatively controlled.

NPs were found to perceive overall, that public acceptance of their role was of a moderate magnitude yet when examined in detail, an important finding was that NPs do perceive there is a lack of client, therefore public understanding about the NP role. In addition to seeking evidence of client understanding of the NP role with each client encounter, NP strategies to improve public understanding and acceptance should include periodic awareness campaigns, and media distribution aimed at the public in order to elucidate the role of the NP, and to highlight advantages of the NP as provider.

The comprehensive performance of the skilled practice functions, derived from Bryckczinski's, domains of NP practice (1989), and guided for content and

comprehensiveness by the AHCPR CHF guideline, (1994) remains a measurable goal of the NP who strives for the optimal management of the CHF client in the primary care setting. This study discovered that as objective and self-reported levels of NP expertise increase, the NP is more likely to comprehensively perform the skilled practice functions necessary for optimal management of the CHF client. Thus, in order to attain these goals, the achievement of expertise by the NP is very important. Further, moderate relationships were also discovered between the initial and ongoing skilled practice functions and total barriers, and specifically: prescriptive authority, reimbursement, and NP competency, showing that as these barriers increase in the practice environment, the performance of the skilled practice functions decreased.

In this study, competency was understandably found to be strongly linked to NP expertise. In addition, the NPs in the sample population perceive they are less competent to care for CHF clients compared to other, general clients. Furthermore, family NPs perceive they are less competent to care for CHF clients than adult or geriatric NPs. Work site availability of CHF clients is probably a contributory factor in the findings of family NPs with less perceived competency with CHF clients than adult or geriatric NPs. However, study results revealed that family NPs perceived they had less clinical preparation, and that NP education did not prepare them to provide basic care for CHF clients,

compared to adult and geriatric NPs. These findings have important implications for the NP, especially the family NP, and demonstrate the need for the re-evaluation of the clinical and educational preparation of the NP student related to CHF, as well as the continuing education of the practicing NP. Family NP programs in particular may necessarily be so broadly focused as to be unable to provide an in-depth experience of any one-disease entity. However, due to the findings of this study and because the incidence and prevalence of CHF is steadily increasing, becoming the most prominent DRG of the 65 plus age range, the need to place greater focus on CHF in the educational setting is apparent.

Furthermore, in contemplating changes to the curriculum of the family NP, both classroom and clinical experiences must be considered. The education of the NP student related to CHF should be stratified by functional classification, as the different classes of CHF exhibit varying physiological changes, education and management needs. In illustration of this point, the NP who performs consistently according to the AHCPR CHF guideline in the management of class I and II clients may deter the rate of progression of ventricular remodeling, thus prolonging survival time in this client population. Clinical instruction should consider that NP perceptions of low competency with CHF clients in this study was moderately related to how many CHF clients were seen per week, but strongly related to the management of class III

clients. Therefore, NP students must be provided with, and seek opportunities to manage the CHF client population, and especially class III clients, even if the acute care setting must be utilized. NPs must realize that an adequate educational base combined with CHF-specific continuing education will provide the foundation from which to advance the NP's level of expertise with CHF clients, consequently increasing NP self-perceptions of competency, and leading to greater acceptance by CHF clients, as well as enhanced physician support.

Furthermore, on an individual level NPs in practice must display professional accountability by evaluating and seeking improvement, a characteristic described by Bryckczinski (1989) as typifying an expert level of nurse practitioner practice. Thus, improvements in CHF client management by practicing NPs may be sought through continuing education, self-study, and increased experience with CHF clients.

In conclusion, study findings indicated that moderate to strong relationships exist between NP competency and the variables of NP expertise, physician support, and public acceptance of the NP by the CHF client. Thus, the competency of the NP and subsequent physician support and acceptance of the NP by the CHF client may be heightened through increased expertise of the NP with CHF clients. This expertise may be enhanced and improved through fundamental education of CHF, as well as the experiential

management of greater numbers of CHF clients, especially class III clients. Therefore, the NP's unique abilities in primary care combine to equal an ideal health care provider for clients with chronic illness in the ambulatory care setting, providing both comprehensive care and a measure of continuity that is often lacking through physician-delivered medical care alone (Safreit, 1992). In addition, the broad, holistic qualities of the APN in practice make this individual an extremely valuable member of the team in the care of the CHF client, who is likely to have a holistic range of problems.

Further sharing of the findings of this study is planned through a dissemination to approximately one third (33) of the NPs within the sample of 100 who requested information related to study results. Further information may be shared via poster at Michigan State University, College of Nursing, and perhaps a professional paper via a nurse practitioner-focused journal.

Recommendations for Further Research

As previously discussed in the literature review, very little information has been available detailing nurse practitioner management of CHF clients. This study therefore, provides beginning insights into patterns of practice and client management for this particular population of individuals. In order to add to the body of knowledge regarding NP management of CHF clients, further inquiry and research is suggested:

1. Further research is needed to accurately identify all NP barriers within the practice environment of Michigan, utilizing a qualitative research design.

Because barriers within the practice environment are largely dependent upon perceptions, it is likely that practice barriers in Michigan are in part, particular to the characteristics of each individual practice site, as well as being controlled by the legislative environment of the state. Despite the assumption gleaned from the literature that barriers are categorically similar across the United States, research does not exist to support this assumption, nor does it consider the individualistic characteristics of practice environments. Through this study guided by literature review, six suspect and problematic barriers in the practice environment were investigated with moderate results, however it is likely that other barriers exist and were not addressed. For instance, NP opinions concerning state legislation governing prescriptive rights were not surveyed. Further, administrative staff in the work site was not addressed by the survey questions, i.e., what types of attitudes may be conveyed to clients by receptionists, concerning NPs that may impact client acceptance of the NP. Even though this study may serve as a precursor to the identification of a thorough knowledge of barriers within Michigan, a qualitative design should be employed that would allow the discovery of any and all possible barriers that may prevent the client's access to the NP, or efficacious

management of the client. This design would also provide guidance for the wording of the survey questions for the best possible transmission of ideas to the respondents. In addition to the barriers covered in this study. Further, there is limited knowledge regarding the scope, depth, and precedence of NP barriers existing within the practice environments of Michigan, and it is currently unknown what attributes may contribute to the formation of significant practice barriers within the state. A grounded theory approach might be a next step and a more accurate technique of discovering all possible barriers and contributing attributes within the pactice environment. Using an open-ended approach to questions may eliminate research errors that involve the cataloging of responses into pre-determined classifications. Once identification and confirmation of all NP barriers has taken place, efforts toward modification of these barriers can begin through the educational and political processes. Barriers related to reimbursement and prescriptive authority if confirmed in further research, are particularly amenable through activism. NP educational programs and state NP associations can be used to disseminate information and thus generate the interest and caring necessary to foster productive political activity. This further research could also serve as a stepping stone to replication of the present study, which would be better accomplished by addressing the various sections at separate times.

2. Further research is needed to identify state-related practice barriers, in order to gain a larger perspective of barriers within the United States as a whole, and as a comparison to the state of Michigan.

Literature used for this study focused for the most part on NP barriers within various microcosms of the country, and the results from this study did not necessarily support the findings from the literature. Therefore, it is possible that all states may be largely similar with smaller, but significant differences, or perhaps they may be very dissimilar. Regardless, little information is available to offer a representative sample by which to judge the similarities in practice barriers by state. This study may serve as a precursor to further research on this topic. However, as discussed in recommendation number 1 above, a qualitative approach might be a more accurate technique of discovering all possible barriers and contributing attributes within the practice environment. Using an open-ended approach to questions may eliminate research errors that involve the cataloging of responses into pre-determined classifications. The information obtained could aid in directing NPs across the country toward nationally recognized unified goals by which to affect positive changes toward the resolution or appeasement of amenable barriers. Appropriate actions toward resolution could then be initiated at the state and national political levels through nursing and nurse practitioner associations. Further, NP

barriers found to be specific to certain state practice environments could be identified, and thus more easily understood and perhaps modified through the dissemination of information and a unified approach to problem-solving, again through nursing or nurse practitioner associations.

3. Further research is needed to identify physician attitudes toward NPs, and their management of more complex clients, particularly in the acute care setting, as well as public attitudes and acceptance of the NP as a care manager.

Study research questions attempted to identify barriers in the practice environment, and further discover relationships between the barriers and other variables. The barrier of physician support was perceived by the NP to be of a moderate nature. Despite the neutral perceptions of NPs however, this issue should be pursed in further research because study results show that physician support is significantly related to both numbers of CHF clients seen by the NP and the management of complex CHF (class III and IV) clients. Study results also show that the NP is currently managing less class III and IV clients than classes I and II, thus affecting both access of the severely ill CHF client to the NP and the development of NP expertise with CHF clients. Furthermore, NPs in the study predominately perceive there is a lack of physician referral of CHF clients to NPs on a consultative basis, which may be due to

physician attitudes toward NPs, or because of lower levels of NP expertise with CHF clients.

Despite study results which indicate only a moderate amount of NP perceived barriers associated with physician support it is still possible, and even probable that physician attitudes toward the expansion of the NP's scope of practice is a deterring factor in this phenomenon. It is also possible that physician support as a barrier in this study was not adequately or fully explored, or that NPs are somehow unaware of physician behaviors or the implications of that behavior, which may be contributing to barriers within the practice environment. Also, as discovered in this study, the predominant other professional in the work site was the physician. Thus, it may also be that the physician in many practice settings is the mentor of the NP, thus automatically placing the physician in a sort of sacrosanct relationship with the NP, who may understandably be hesitant to criticize mentor behaviors.

Further, it is understood that the American Medical Association is an influential and dominant force in the United States health care system, and the literature shows that many AMA opinions have been negative toward the expansion of the role of the nurse practitioner, specifically with regard to prescriptive authority and reimbursement. In light of these facts, it is important for the NP to be aware of the attitudes of the physicians within their individual practice sites, to ensure open

communication channels, a collaborative relationship, and thus help to limit physician-imposed boundaries in NP practice. Influencing physicians at the practice level may eventually influence physicians at the state and national levels. The assessment of physician attitudes toward NPs in individual practice sites is the first step toward assessment of possible physician associated barriers, and thus physician imposed boundaries on NP practice.

Additionally, NP acceptance by the public was perceived by the NPs of this study to be non-problematic. However, more research should be conducted into this area to discern a broader foundation from which to analyze the issue than was covered in this study. For example, subtle differences in client satisfaction with NP care management might be compared to physician management, and subsequently weighed as a barrier regarding client access to the NP, or NP provision of care. This information would help give a broader perspective on NP barriers, while providing knowledge of a barrier that may be amenable to improvement through organized NP actions involving education of the public through information dissemination.

4. Further research is needed to completely understand the factors responsible for increasing NP perceptions of competency with CHF clients. In addition, there may be a divergence between the NP's perception of expertise and actual expertise, which deserves further investigation.

The findings of discrepancy in NP reported competency levels between general clients and CHF clients is important for further analysis. Factors from this study that intimate responsibility includes NP education, and differences in NP practice sites, yet other factors probably exist, such as NP personality characteristics. This study also discovered difficulty with assigning precise categories of expertise to the NP through survey questions, and it is thought that more extensive development of a higher number of questions may lead to more success with this goal. If more precise assignment of level of NP competency could be made in the study population, more meaningful correlations could be made with regard to inhibiting or contributing factors to NP competency progression.

Furthermore, NP years of practice was found to be strongly related to NP self-reported expertise with clients overall, and more moderately with self-reported expertise with CHF clients. A surprising finding in this study however, was that NP years of practice have no relationship with the objective measure of expert status of the NP. Thus, there may be a divergence between the NP's perception of expertise and actual expertise, which is also worthy of further question and research. As an objective measure, expert status of the NP has been lent some confidence through a strong relationship to NP perceptions of competency (.50).

The study results are supportive in part, of the differentiation of NPs by level of expertise as described within the conceptual model. However, the study results are partially inconclusive due to unreliability of the measurement of NP expertise. A revised research design should incorporate a split-survey design delivered in two different time phases to reduce the possibility of the subjective measure of expertise producing bias in the objective measure. Furthermore, the survey should employ a broader range of questions per competency level, 10-12 at least, and utilize a pilot study with the goal of confirming the validity of the questions while knowing the outcome of the level of expertise of the respondent. This study necessarily limited the number of questions addressing expertise, due to the breadth of the amount of material to be covered. A more effective research design might limit the survey to the singular subject of NP expertise.

Some prior research has been done describing the practice characteristics of NPs and their advancement through levels of competency, however it is still not clear what the contributing and inhibiting factors may be toward the development and refinement of the expertise of the practicing NP. The results of further research might then be communicated to NPs while still in educational programs, increasing the possibility of affecting the rate and speed of the development of expertise post-graduation. Study results show that increased NP expertise will benefit the

CHF client, the NP, and the NP-physician relationship, which the literature shows is predicated upon trust and NP competency.

5. Further research is needed to ascertain NP perceptions of barriers particular to their practice environments, perceptions of their scopes of practice, perceptions of practice boundaries, perceptions of public acceptance, and of the related contributing and inhibiting factors. Specifically, is age an inhibiting factor in NP practice?

Study results concerning NP perceptions of barriers within the practice environment were fairly homogenous save for reimbursement, which was higher, revealing greater perceived barriers. Nonetheless overall, NPs in Michigan do not seem to perceive there are extensive barriers in their practice environments, which is not supported in the literature. Therefore, this obvious discrepancy may be related to the design or extent of the barrier-focused questions, the quality of other published research, the lack of a qualitative process of identification from which to initiate the present study, or it may be that the results actually reflect NP reality in Michigan despite the state's lack of full prescriptive authority for NPs. In any event, all of these possibilities raise further researchable questions that deserve confirmation. A reasonable next step in a quest for answers may be obtained in part through a replication of this study that re-focuses on barriers

obtained, but through a qualitative process, and further exploration of NP perception of scope of practice and boundaries of NP practice, including NP age. If present, age-related bias may provide insight into the relative absence of NPs in the 50+ age group found in the sample population of this study.

The results of further research in this area will facilitate the awareness of the NP to the forces that ultimately shape this role, providing a necessary step toward action-oriented outcomes. Resulting knowledge may foster further inquisition into the ethical considerations of the contributing and inhibiting factors thought responsible for practice boundaries, i.e., physician input into critical decision-making, both at the legislative level and in the practice site, and public acceptance and support of the role. Ultimately, this knowledge may facilitate greater commitment from the practicing body of nurse practitioners that may lead to interventions on both state and national levels, which in turn may help to expand the future role of the NP.

6. Further research is needed to identify current patterns of management for class IV CHF clients, and the NP's role in this management.

This study identified decreased NP participation in the management of class IV CHF clients compared to class I and II clients. Further, it is currently not described in the literature how terminally ill, class IV CHF clients are

actually managed, where they are managed, who is involved in this management, and what quality of life is achieved by these clients through prevailing management patterns. This knowledge may be extremely helpful in identifying resolvable problems and issues that may be improve the quality of life for this client population and their families. Nurse practitioners would benefit from this knowledge, as unrealized opportunities for improving client care may be discovered and acted upon. Moreover, a vulnerable, terminally ill client population would almost certainly benefit from the acquisition of new knowledge and the consolidation of knowledge toward a goal of improvement of care delivery, and thus quality of life.

7. A replication of this study needs to be conducted with as large or larger population sample in order to reproduce any significant findings from this study, thus offering validation for those findings.

In order to facilitate a more comprehensive gathering of useful information, a replication of the study should probably divide major sections for separate survey processes. The design may be facilitated in a more meaningful fashion if King's conceptual model of goal attainment were used more extensively to guide the study concepts. For example, the perceptions of the NP and of the client in the interactive communication process might be examined for goal attainment. Measurements of the NP's goals might include the skilled practice functions as

developed, barriers to practice, competency of the NP, as well as additional cost effectiveness measures, and client satisfaction measures. Client-centered measures might include goals of satisfaction and outcomes of care related to progression of illness. Thus, more comprehensive study results might spring from a more deductive theory utilization process.

In addition, a qualitative design would be a reasonable first step in which to approach the gathering of further information related to barriers within the practice environment. In addition, the replicated study should examine the self-reported expertise of NPs at a separate time or mailing, prior to an objective measurement of expertise, in order to decrease possible situational bias and provide greater validity to the measurement tool. Any given level of expertise should be granted at least 10-12 questions each, to accurately construct divisions and identify overlap between the various levels. Further, a pilot study with the goal of confirming the validity of the questions should first be employed, in which the outcome of the level of expertise per respondent is already known.

With replication, the skilled practice functions would also benefit from isolation through a separate survey, away from identification of barriers or NP expertise. The amount of necessary material for the study in order to reflect both Bryckczinski's NP domains of practice, as well as the AHCPR CHF guideline made the skilled practice function sections

both long and tedious, as evidenced by some respondents refusal to complete them, or simply draw a line through the highest score possible for all responses. Despite an overall completion time of 20 minutes, long and tedious questions should be avoided placed at the end of any survey, and in all likelihood, more reliable and valid results would probably be obtained for the skilled practice functions if these questions had been separately surveyed.

An overall plan for the deployment of the survey process may be to divide the barriers, 2 expertise sections, and the skilled practice functions into separate mailings, in order to reduce fatigue and bias. An alternative plan might be to send all materials with instructions on completion of each section at different time periods. In any event however, the objective and subjective measurements of NP expertise should be completed by the respondents through separate mailings, spaced probably at least one month apart.

Summary

This study sought to identify barriers according to pre-determined categories that may be inherent within the practice environment of Michigan, which relate to family, adult, and geriatric nurse practitioners. Further, the impact of the identified barriers upon the level of expertise of the NP, the number and functional classification of CHF clients managed, and the completeness of the skilled practice functions used to manage them was

examined. Additionally, the impact of the number and classification of the CHF client and the NP's expertise upon the skilled practice functions was examined.

Study findings demonstrated that the magnitude of the barriers identified within the practice environment of Michigan were of a moderate nature. NPs reported slightly more difficulties from reimbursement issues than from other barriers, which may reflect an increasingly saturated managed care environment in Michigan. A further interesting finding was that despite Michigan's status as one of few remaining states to pass prescriptive authority legislation, NPs in Michigan perceive the barriers from this circumstance to be only of a moderate, and therefore largely inconsequential nature.

It was also found that routine management of class III CHF clients was found to be supportive of higher measures in the expert status of the NP, as well as the NP's self-reported expertise with CHF clients. Additionally, NP education and NP perceived levels of competency, and physician support were found to facilitate the NP's management of class III CHF clients. However, it was found that barriers in the practice environment, prescriptive authority, reimbursement, physician support, and NP perceived level of competency affected both the number of CHF clients the NP manages per week, as well as access to class III CHF clients.

Advanced practice nurses and especially nurse practitioners, are in the right place (primary care setting), at the right time (CHF is rapidly increasing) to demonstrate their uniqueness of character with the CHF client population, who is so desperately in need of comprehensive management. APNs have been shown to increase access to basic health services, while they contribute to improvements in continuity of care for the underserved, at risk and chronically ill populations. Yet, as demonstrated by study findings of decreased NP management of class III and IV CHF clients, nurse practitioners remain an under-utilized resource in the management of congestive heart failure, particularly severe CHF. This phenomenon is most likely a contributory factor to observations highlighted within the AHCPR CHF guideline, which describes the current national trend of ineffective management of CHF clients, predominately by primary care providers. Furthermore, this finding is of particular interest in today's managed care environment, which seeks the most effective and cost conscious methods and client-care providers.

The new nurse practitioner must begin afresh to traverse the levels of competency in an expansive role, and advancement through the five levels of competency occurs at varying rates for each. In spite of these facts, the NP whose ultimate goals include the improvement of care for client populations in need must be cognizant of what factors may contribute to the advancement of NP expertise and what

factors may deter this advancement. Specifically with the CHF population, study results seem to support the management of class III CHF clients toward the development of NP expertise with CHF clients.

Unfortunately for the CHF client population, NPs do not seem to be providing routine care for the more severely ill class III and IV CHF clients. Lack of access to these clients may be a contributory factor in the lower NP expertise levels with CHF clients, compared to general clients found in this study. Again, the NP who aspires to improve the care of client populations in need should first assess barriers to this care present within their practice environments, and then seek to impact them on an individual, state and national level. Reducing barriers to NP practice while increasing levels of expertise with CHF clients will achieve cost-effective, holistic, and comprehensive care delivery, perhaps resulting in an improved quality of life for the client suffering from congestive heart failure.

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APPENDIX A

Levels of Competency
(For Self-Interpretation)

Stage 1) NOVICE: Has little or no experience of the situations in which one is expected to perform. Uses learned objectives, rules and guidelines to interpret and support practice actions. Displays mostly rule-governed behavior by following lists of predetermined actions.

Stage 2) ADVANCED BEGINNER: Begins to incorporate experience into practice, but still concentrates heavily on objectives, rules & guidelines. Requires assistance to set true priorities. Is beginning to perceive repetitive and significant patterns in clinical practice.

Stage 3) COMPETENT: Has experience in comparable situations for 2-3 years. Actions become embedded into long-term goals, which drive the most pertinent factors of clinical practice. Is beginning to achieve efficient and organized practice, through deliberate planning. Is beginning to feel a level of mastery, and ability to cope with and manage most situations of practice.

Stage 4) PROFICIENT: Practice actions are not thought out or broken down into parts which are guided by maxims or rules; the clinician's perspective is perceived as a whole that has been built on experience. Decision-making is less labored. Still uses maxims as a guide, but possesses a deeper understanding of the clinical picture. Can interpret which clinical data is most pertinent and quickly zero-in on the correct problem area. Is beginning to build speed and flexibility into practice management.

Stage 5) EXPERT: No longer needs maxims or guidelines to direct practice decisions. Has an immediate and holistic grasp of the situation based on a rich pool of experiences. Is able to pinpoint the pertinent parts of the problem without wasting time in consideration of unfruitful alternate possibilities. Is characterized by deep clinical understanding and frequent use of intuition in practice.

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APPENDIX B

NP SKILLED PRACTICE FUNCTIONS, COMPETENCY AND PERCEIVED BARRIERS IN MANAGING CHF CLIENTS IN PRIMARY CARE

Background Information

1. What is your specialty certification as a Nurse Practitioner (NP)? (check one)

Family	_____	(1)
Adult	_____	(2)
Geriatric	_____	(3) (Please disregard all numbers in parenthesis)
Pediatric	_____	(4)
Nurse Midwife	_____	(5)
Neonatal	_____	(6)
Not certified	_____	(7)
Other _____		(Please fill in blank) (8)

2. What type of clients compose the majority of the care you deliver? (check one)

Family (adults, geriatric, adolescents, children, infants)
_____ (1)

Internal Medicine (adults, geriatric)
_____ (2)

Geriatric (adults 65 and older)
_____ (3)

Pediatric (infants, children, adolescents to 18 years)
_____ (4)

OB/GYN (adolescent, adult women)
_____ (5)

Neonatal (infants less than 1 year)
_____ (6)

Other_____ (Please fill in blank)
(7)

Demographic Information

3. What is your age? (check one)

20-29	_____	(1)
30-39	_____	(2)
40-49	_____	(3)
50-59	_____	(4)
60 or more	_____	(5)

4. What is your gender? (check one)

Female	_____	(1)
Male	_____	(2)

Practice Information

5. How many years have you practiced as a certified Nurse Practitioner? (check one)

0-1	_____	(1)	3-5	_____	(4)
1-2	_____	(2)	5 or more	_____	(5)
2-3	_____	(3)			

6. In what setting(s) do you currently practice? (check ALL that apply)

Primary care office/ clinic	_____	(1)
Public Health Department/ clinic	_____	(2)
Hospital-based clinic	_____	(3)
Urgent care clinic	_____	(4)
Other_____		(5)

7. In what setting(s) have you practiced in the past? (check ALL that apply)

Primary care office/ clinic	_____	(1)
Public Health Department/ clinic	_____	(2)
Hospital-based clinic	_____	(3)
Urgent care clinic	_____	(4)
Other_____		(5)

8. What educational degrees do you hold? (check ALL that apply)

Associate in Nursing	_____(1)	Masters Other	_____(5)
Bachelors in Nursing	_____(2)	Doctorate Nursing	_____(6)
Bachelors Other	_____(3)	Doctorate Other	_____(7)
Masters in Nursing	_____(4)		

9. What NP certifications do you hold? (check ALL that apply)

ANCC Family	_____(1)	ACNP Family	_____(4)
ANCC Geriatric	_____(2)	ACNP Geriatric	_____(5)
ANCC Adult	_____(3)	ACNP Adult	_____(6)

Other types of certifications held:_____ (fill in blank) (7)

10. How long have you been employed at your present work site? (check one)

0-2years	_____	(1)	9-12years	_____	(4)
3-5years	_____	(2)	>12 years	_____	(5)
6-8years	_____	(3)			

11. In what areas do you have at least 6 months experience as a registered nurse? (check ALL that apply)

Primary/ ambulatory care (clinic or office)	_____	(1)
Critical care	_____	(6)
Cardiology (clinic or office)	_____	(2)
Home health	_____	(7)
Hospital medical-surgical	_____	(3)
Hospice	_____	(8)
Hospital or outpatient surgery	_____	(4)
Public health	_____	(9)
Hospital cardiac (medical or surgical)	_____	(5)
Other _____	fill in blank	(10)

12. How many **providers** (physician, NP, PA) are employed at your practice site, excluding yourself? (fill in number in blanks)

Physicians:
Number of full-time_____ft Number of Part-time_____ pt (1)
Nurese Practitioners:
Number of Full-time_____ft Number of Part-time_____ pt (2)
Physicia Assistants:
Number of Full-time_____ft Number of Part-time_____ pt (3)
Other:
Number of Full-time_____ft Number of Part-time_____ pt (4)

(Specify)_____ _____ (fill in blanks) (5)

13. With what **other providers** do you routinely practice? (check ALL that apply)

Physicians	_____	(1)
Other NP's	_____	(2)
PA's	_____	(3)
Social Workers	_____	(4)
Other_____		(fill in blank)(5)

14. About how **many total clients** do you routinely provide primary care for per **week?** (check one)

1-24	_____	(1)	100-149	_____	(4)
25-49	_____	(2)	150-more	_____	(5)
50-99	_____	(3)			

15. About how many different congestive heart failure **(CHF) clients** do you routinely provide care for per **week?** (check one)

1-5	_____	(1)	16-20	_____	(4)
6-10	_____	(2)	21 or more	_____	(5)
11-15	_____	(3)			

16. On a routine weekly basis, what **New York Heart Association functional classification(s) best describes** the CHF clients for whom you provide care? (check All that apply).

Class I	_____	Asymptomatic. No activity limitations. (1)
Class II	_____	Slight limitation. Dyspnea & fatigue with moderate activity. (2)
Class III	_____	Marked limitation. Dyspnea with minimal activity. (3)
Class IV	_____	Severe limitation. Dyspnea & symptoms at rest. (4)

17. At what level do you perceive your own **expertise in your role as a NP?** (check one)
(See Level of Competency self-interpretation sheet enclosed)

Novice	_____	(1)
Advanced Beginner	_____	(2)
Competent	_____	(3)
Proficient	_____	(4)
Expert	_____	(5)

18. **At what level do you perceive your own expertise in the care of CHF clients?** (check one)
(See Level of Competency self-interpretation sheet enclosed)

Novice	_____	(1)
Advanced Beginner	_____	(2)
Competent	_____	(3)
Proficient	_____	(4)
Expert	_____	(5)

Please answer the following questions related to your present, routine daily practice with CHF clients. Please answer all items in the following manner:
Always=5 Sometimes=4 Unsure=3 Not Usually=2 Never=1

a)_____ I frequently consult another professional health care provider regarding insecurities about my clinical decisions or skills in the care of the CHF client.
b)_____ I include education into my daily care of all clients.
c)_____ I serve as a mentor for others.
d)_____ I use a theory, or parts of a theory to guide my daily practice.
e)_____ I need, and have sought out a mentor in my practice site.
f)_____ I feel competent in my ability to diagnose CHF.
g)_____ I seek to enhance my many weak clinical areas with new learning experiences.
h)_____ I frequently evaluate my own practice and seek improvement.
I)_____ I am involved in, or direct research projects in my practice.
j)_____ I frequently feel overwhelmed in my daily practice environment.
k)_____ I feel competent in my ability to manage acute problems with CHF clients, such as volume overload, respiratory distress and arrhythmia's.
l)_____ Other providers refer CHF clients to me for care.
m)_____ I incorporate research findings into my care of CHF clients.
n)_____ I feel my care of CHF clients is evidence-based.
o)_____ I frequently feel overwhelmed in the care of the CHF client.
p)_____ I include counseling into my daily care of all clients.
q)_____ I frequently use intuition in my routine care of CHF clients.
r)_____ I need and frequently use references and guidelines to direct my care of CHF clients.
s)_____ I feel I have credibility in my practice setting.
t)_____ I feel that I am an efficient change agent.

Place additional comments for this section here:

What skilled practice functions do you routinely provide for CHF clients on either a self-directed basis, or in collaboration with a physician in your practice site? Please answer all items in the following manner:
Always=5 Sometimes=4 Unsure=3 Not Usually=2 Never=1

Note: The skilled practice functions listed below do not necessarily indicate the appropriate treatment of the CHF client in any particular phase of care.

INITIAL EVALUATION, DIAGNOSIS & TREATMENT OF CHF CLIENT INVOLVES:

a)_____ assessment of CAD before or during initial diagnosis of CHF
b)_____ assessment of hypertension before or during initial diagnosis of CHF
c)_____ measurement of LVF (left ventricular function)
d)_____ collaboration with physician in practice site
e)_____ echocardiography for assessment of LVF
f)_____ radionuclide ventriculography for assessment of LVF
g)_____ chest x-ray for assessment
h)_____ holter monitoring for assessment of arrythmias
I)_____ exercise testing for assessment of CAD
j)_____ ACE Inhibitor prescription
k)_____ Digoxin
l)_____ diuretic(s) prescription
m)_____ discussion of prognosis with patient and family
n)_____ scientifically grounded information support for client & family
o)_____ screening for comorbid illnesses
p)_____ facilitating client decision-making regarding treatment options
q)_____ assessment of client's readiness to learn
r)_____ incorporating client's concerns into plan of care
s)_____ dietary prescription and counseling
t)_____ exercise prescription and counseling
u)_____ client instruction on daily monitoring of weight
v)_____ ensuring client has a working weight scale
w)_____ instructions for client on when to call health provider
x)_____ facilitating hospitalization as appropriate
y)_____ on-site management of client in the hospital

ONGOING MANAGEMENT OF CHF CLIENT INVOLVES:

a)_____ monitoring of illness progression over time
b)_____ assessment of client's learning style prior to teaching
c)_____ negotiation with client toward desired outcomes
d)_____ psycho-social interventions as needed
e)_____ collaboration with other team members as appropriate, according to expertise.
f)_____ assuming primary provider accountability for management of CHF client
g)_____ coordination of care of multiple providers involved in CHF client's care
h)_____ incorporating research into care of CHF client
I)_____ routine pharmacological management of CHF client's symptoms
j)_____ pharmacological management of acute exacerbation of symptoms
k)_____ monitoring side effects of pharmacological therapy provided
l)_____ ordering echocardiography for routine assessment
m)_____ ordering radionuclide ventriculography for routine assessment
n)_____ ordering routine chest x-ray for routine assessment
o)_____ ordering holter monitoring for routine assessment
p)_____ ordering routine exercise testing for routine assessment
q)_____ evaluating effectiveness of total regimen of care
r)_____ changing ineffective care regimen
s)_____ addressing noncompliance issues in CHF client

t)_____ the development and use of a database to aid comprehensive care provision
u)_____ acquiring specialist consultation
v)_____ emotional support and counseling of CHF client
w)_____ family support and counseling
x)_____ anticipatory guidance for disease progression
y)_____ use of nursing theory to guide care of CHF clients
z)_____ facilitating hospitalization as appropriate
aa)_____ management of CHF client in the hospital
bb)_____ telephone follow-up with client
cc)_____ home visits to client
dd)_____ utilization of ACE Inhibitor therapy
ee)_____ upward titration of ACE Inhibitor dose
ff)_____ utilization of diuretic(s)
gg)_____ utilization of cardiac glycosides
hh)_____ utilization of outpatient ionotropic therapy
ii)_____ utilization of anticoagulation in clients with arrythmias
jj)_____ utilization of NSAIDS

Place additional comments for this section here:

BARRIERS TO PRACTICE

21. **Please provide your perceptions to the following questions related to your daily practice in the care of CHF clients. Please answer all items in the following manner:**
Definitely True=5 *Mostly True=4* *Unsure=3*
Mostly False=2 *Definitely False =1*

a)_____ Prescriptive supervision hinders my care of the CHF client.
b)_____ Physicians in my practice setting support my care of CHF clients.
c)_____ Barriers in my practice environment impact the number of CHF clients I care for per week.
d)_____ My educational preparation did not prepare me provide basic care of CHF clients after graduation.
e)_____ Reimbursement issues in my practice setting hinder my care of the CHF client.
f)_____ The CHF clients I care for understand the role of the nurse practitioner.
g)_____ My present level of competency allows me to provide comprehensive care for CHF clients.
h)_____ Physicians in my practice environment prevent me from caring for CHF clients with a greater severity of illness (functional classes III & IV).
I)_____ Physicians in my practice setting hinder my care of CHF clients in some way.

j)_____ Reimbursement problems are not an issue for me in the care of CHF clients.

k)_____ I prescribe medications for CHF clients without any difficulties with prescriptive supervision.

l)_____ My clinical preparation as a student prepared me to provide basic care for CHF clients following my graduation.

m)_____ My present level of competency prevents me from caring for CHF clients with a greater severity of illness (functional classes III & IV).

n)_____ Most CHF clients I encounter would rather receive their care from a physician.

o)_____ Physicians in my practice setting willingly collaborate in caring for CHF clients.

p)_____ The CHF clients I care for accept my role as a nurse practitioner.

q)_____ Progression of my level of competency with CHF clients, is not as rapid as I'd like.

r)_____ Following my educational preparation as an NP, I found care of the CHF client to be too complex.

s)_____ I am not allowed to care for CHF clients due to reimbursement issues.

t)_____ In general, I prefer not to care for CHF clients due to problems I have prescribing their medications.

u). Place additional comments for this section here:

APPENDIX C

Hello. Thank you very much for agreeing to participate in this pilot study concerning the perceived barriers of nurse practitioner functions of care for the CHF client population.
You are being asked to be part of a small pilot study for the purposes of data collection, and the evaluation and refinement of a developed instrument.
Your responses to the questions below will be carefully considered by the researcher and her thesis committee toward the revision of this instrument.

Please answer the following questions regarding your own perceptions of this instrument in the following manner: Definitely true=5, Mostly true=4, Unsure=3, Mostly false=2, Definitely false=1.

_____ This survey defines the functions of care delivered by the NP in the care of the CHF client in the primary care setting.

_____ This survey sufficiently addresses NP practice.

_____ I got lost in this survey after the first few pages.

_____ This survey sufficiently addresses the barriers present in the practice environment that may hinder the functions of care by the NP.

_____ The survey was easy to read.

_____ The survey's concepts are easily understood as worded.

_____ The survey was easy to follow.

_____ The survey took 15 minutes or less to complete.

_____ I didn't understand the point of what I was being asked to do in this survey.

_____ My concentration waned after the first few pages of this survey.

_____ As a whole, does this survey work?

Your comments/ recommendations will be appreciated:

Pilot Study Evaluation Tool, 1/99

APPENDIX D

December 15, 1999

Mary Lou Leonard
ANCC
600 Maryland Ave., S.W.
Suite 100 West
Washington, DC 20024

Dear Mary Lou:

Thank you for your recent correspondence concerning a list of nurse practitioners for Michigan. I have decided to use your list to procure the sample for my research. I have enclosed a check for $300.00, the forms as requested, a draft of my thesis abstract, the letter to respondents, and my research tool.

I am a graduate student in the College of Nursing at Michigan State University, in the Family Nurse Practitioner program, and this research is in conjunction with my graduate thesis. If you need further information, please do not hesitate to call me at my home phone at 517-893-2750.

Sincerely,

Michele K. LaFave, RN, BSN, MSN Candidate

APPENDIX E

Dear Nursing Colleague: January 23, 1998

As a graduate student in the College of Nursing at Michigan State University, I am gathering data for my thesis. My area of interest surrounds the extent to which family, geriatric and adult nurse practitioners participate in providing care for the congestive heart failure (CHF) client in the primary care setting. Furthermore, I am interested in identifying the barriers that may prevent these nurse practitioners from caring for CHF clients in this setting.

This study is of a descriptive nature, and your input is essential to this research. Your name was selected from the list of Certified Nurse Practitioners from your state Nurse's Association and the State Board of Nursing for your state. This listing provides only your address and that you are certified, not information on your specialty area of certification and practice. Therefore, if you are NOT a family, geriatric or adult NP, thanks for taking the time to read this far. If you are a family, geriatric, or adult NP but do not routinely care for CHF clients for whatever reason, PLEASE continue and fill out the questionnaire enclosed. Your completion of the questionnaire will serve as your consent to participate in this study.

Please be assured that there are no identifying features in this survey. Your identity will therefore be completely anonymous. All data will be reported in aggregate fashion, however comments MAY be anonymously extracted and reported. Your completion and return of the survey will serve as your consent to participate in this research.

Since there is no mechanism for me to identify you, a reminder post card will be arriving in your mail approximately one week following the receipt of your survey packet. Again, this is done to assure complete anonymity. Please excuse any inconvenience if you are not an eligible study participant.

CHF clients are defined as those with left ventricular systolic dysfunction and usually have cardiac ejection fractions of 35-40%, which have been validated through echocardiography or radionuclide ventriculography. They may also commonly suffer from symptoms of intravascular and interstitial volume overload such as jugular venous distention, shortness of breath, orthopnea, cough, rales, abdominal bloating, weight gain and edema; nocturia, a third heart sound, and inadequate tissue perfusion, such as fatigue and exercise intolerance as described by the AHCPR, CHF guideline.

I do realize your time is valuable and limited! I sincerely appreciate the 10-15 minutes required to fill out and promptly return the survey in the envelope enclosed.

Thank you in advance for your participation!

Sincerely,

Michele K. LaFave, RN, MSN-Candidate
Michigan State University
College of Nursing

UCRIHS APPROVAL FOR THIS project EXPIRES:

MAR 9 2000

SUBMIT RENEWAL APPLICATION ONE MONTH PRIOR TO ABOVE DATE TO CONTINUE

IF YOU WOULD LIKE TO RECEIVE A COPY OF THE RESULTS FROM THIS RESEARCH, PLEASE TEAR OFF THIS PROTION OF THE LETTER, AND RETURN TO ME IN A SEPARATE MAILING.

Name_____

Address_____

_____

Mail to:
Michele K. LaFave
2120 McKinley
Bay City, Michigan
48708

APPENDIX F

MICHIGAN STATE
UNIVERSITY

March 9, 1999

TO: Dr. Barbara A. GIVEN
A230 Life Sciences
MSU

RE: IRB# 99092 CATEGORY: 1-C

APPROVAL DATE: March 9, 1999

TITLE: AN ANALYSIS OF NURSE PRACTIONER PERCEPTIONS OF COMPETENCY AND BARRIERS IN MANAGING CHF CLIENTS IN PRIMARY CARE

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete and I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the **UCRIHS approved this project.**

RENEWALS: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Projects continuing beyond one year must be renewed with the green renewal form. A maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for a complete review.

REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB# and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.

PROBLEMS/CHANGES: Should either of the following arise during the course of the work, notify UCRIHS promptly: 1) problems (unexpected side effects, complaints, etc.) involving human subjects or 2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of further assistance, please contact us at 517 355-2180 or via email: UCRIHS@pilot.msu.edu. Please note that all UCRIHS forms are located on the web: http://www.msu.edu/unit/vprgs/UCRIHS/

Sincerely,

David E. Wright, Ph. D.
UCRIHS Chair

DEW: ah

cc: Michelle LaFave

OFFICE OF
RESEARCH
AND
GRADUATE
STUDIES

University Committee on
Research Involving
Human Subjects
(UCRIHS)

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