Collaborative Nurse Practitioner And Physician Primary Health Care Service Provision For At-Risk Seniors In Fort St. John, B.C.

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Abstract

Collaborative nurse practitioner and physician primary health care service provision has the potential to improve access, ensure quality, and promote cost effective primary health care and case management for frail elders. Through a critical appraisal of research, this paper will seek to explore outcomes regarding the provision of collaborative nurse practitioner and physician community based primary health care service for the frail elderly. The research substantiates that collaborative nurse practitioner and physician health care service provision to at-risk seniors, reduces emergency department utilization, reduces admissions to hospitals and nursing homes and maintains or improves functional capacity. Three integrated health care service delivery models will be discussed, critiqued, and woven into these research findings to serve as a framework to sift these research findings into practice. Finally, recommendations based on this research will be proposed for integration into the Northern Health Authority Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. for application of these research findings in practice.

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Introduction

Projections regarding Canada's aging population, in combination with budget constraints and subsequent major reforms in health care systems, have placed increasing pressure on primary care and continuing care networks. Particular emphasis has been directed towards frail elders, as frailty is a strong predictor of negative outcomes, including new disabilities, institutionalization, and mortality (Iersel & Olde Rickert, 2006). "Care for the frail elderly is characterized by fragmentation, lack of overall accountability and responsibility" resulting in "costly and inappropriate use of acute care hospitals and long-term care institutions" (Bergman, et. al., 1997). Prevention, early identification, and timely management of elder care issues have the potential to impact positively on the present and future burden of health care services by maintaining or improving the health status of aged and aging persons. Northern Health Authority's Integrated Health Network (IHN) for At-Risk Seniors in British Columbia is a primary health care initiative focused on improving care for at-risk seniors living in community settings (Northern Health, 2008). The aim of the IHN is to improve care for frail elders through a coordinated, multidisciplinary, proactive approach (Northern Health, 2007b).

Collaborative practice amongst nurse practitioners and primary health care physicians has the potential to improve access, ensure quality, and promote cost effective primary care and individual case management to frail elders (Cestari & Currier, 2001). "The combined knowledge of physicians and nurse practitioners has resulted in multidimensional teams in which each professional contributes unique skills to provide comprehensive health care and

produce improved outcomes for patients" (Bickford, n.d., para. 5). Through a critical appraisal of evidence, this paper will seek to explore outcomes regarding primary health care service provision to the frail elderly, provided collaboratively through nurse practitioner and physician services. This appraisal of evidence will be explored in terms of four key outcome measures: decreased emergency department utilization, admissions to hospital, admissions to long term care institutions, and maintenance of functional capacity. Four emergent implementation themes were extracted from this research evidence as strategies for success and will be discussed. An analysis of three integrated health care service delivery models will be discussed, critiqued, and integrated into the research findings to serve as a framework, through which to improve continuity and increase efficiency of community based health care services for frail elders. These research findings will be applied to the Northern Health Authority Integrated Health Network for At-Risk Seniors. Themes emanating from this project are proposed to guide future discussions regarding health care service provision for frail elders in Fort St. John, B.C.

Background

Frailty

The investigation of *frailty* as a concept is an emerging field of research at an early stage of inquiry (Walston, et al., 2006). Frailty is a term that is frequently utilized and variably defined (Rockwood, 2005a) with a "lack of consensus about its meaning and use, and no clear conceptual guidelines for identifying and describing older adults as frail" (Markle-Reid & Browne, 2003, p. 58). It is imperative that the term frail be operationalized to identify clinically recognizable degrees of frailty, and to establish criteria to describe older adults as frail in order to appropriately determine what frailty is and to consequently perform

measurements regarding the receipt of health care services (Rockwood, 2005b). The conceptualization of frailty will directly influence management strategies and access to services. Once frailty is conceptualized, "proactive, individualized, multi-disciplinary interventions, either targeted at the individual or environment, can be developed to identify and strengthen available resources, thereby reducing frailty and the use of costly health care resources" (Markle-Reid & Browne, 2003, p. 65).

The Canadian Initiative on Frailty and Aging has operationalized the term *frailty* by summarizing frailty definitions as belonging to one of four classes: "(i) physiological definitions; (ii) definitions based on frailty as a complex syndrome; (iii) frailty based on a balance model (which adds to the complex syndrome social elements); and (iv) frailty defined on the basis of a geriatric syndrome, such as delirium and falls" (Hogan, Macknight, & Berman, 2003 as cited in Rockwood, 2005b, p. 432). From this, the Canadian Study of Health and Aging (CHSA) Clinical Frailty Scale was developed. The tool addresses seven key indicators of frailty and is considered to be an effective and comprehensive measurement tool (Health Canada, 1996). Northern Health Authority's Integrated Health Network (IHN) for At-Risk Seniors will utilize this tool to assist in the identification, planning, and tracking of patients at risk for frailty (Northern Health, 2007b).

Collaborative Practice

Collaboration between health care professionals may be defined as a dynamic inter-professional process of interaction that synergistically influences client care (Way, Jones, & Busing, 2000). Interdisciplinary collaboration may also be described as "sharing in planning, making decisions, solving problems, setting goals, assuming responsibility, working together cooperatively, coordinating and communicating openly" (Baggs & Schmidt, 1988, p. 145 as

cited in Neale, 1999. p. 254). According to Way, et al. (2000), collaborative practice can also be defined as:

> A way of working, organizing, and operating within a practice group or network in a manner that effectively utilizes the provider resources to deliver comprehensive primary health care in a cost efficient manner to best meet the needs of the specific practice population. (p. 4)

Regardless of the definition of collaboration, it is imperative for nurse practitioners and physicians to not only comprehend what collaborative practice is, but to also clarify how collaborative practice will develop in those particular nurse practitioner and physician health care service settings for program success.

The initial efforts put forth into the development of collaborative practice between nurse practitioners and family physicians will be beneficial in the long term as "collaborative professional relationships between NP's (nurse practitioners) and physicians appear to be more cost effective and comprehensive than independent practice" (Mundinger, 1994 as cited in Neale, 1999, p. 254). Role definition and communication amongst nurse practitioners and physicians is vital to the success of collaborative practice as partnerships between these two professions can provide a vital link for the provision of care to homebound frail elders by "addressing barriers to primary care, combining access, quality, and cost-effective case management" (Cestari & Currier, 2001, p. 357).

McGee (2004) asserts that collaboration with members of an interdisciplinary team is essential to the management of the care of homebound frail elders in order to effectively meet these individual's complex medical, social and psychological health care needs. When care of the elderly is provided by a health care team, "productivity is enhanced by maximizing the expertise of each team member" (Kavesh, 1993 as cited in Womack, 1997, p. 33).

Throughout the literature, collaborative practice between physicians and nurse practitioners in long term care and nursing home settings has proven to be a very effective model of health care service provision. Collaborative practice has been deemed to be the precursor to success in the provision of care to the institutionalized elderly (Ryan, 1999). "As the NP and physician work together, there should be awareness that they each bring unique talents, knowledge, and abilities to the situation, and that they are not interchangeable but rather interdependent" (Ryan, 1999, p. 128).

Upon further examination of collaborative physician and nurse practitioner health care service provision in long term care institutional settings, Caprio (2006) maintains that "potential cost savings from NP and physician collaboration in the nursing home has been reported in the literature since the 1970's" (Schultz & McGlone, 1977 as cited in Caprio, 2006, p. 22). More specifically, Caprio's (2006) literature search extrapolated research evidence that overall emergency department transfers and acute hospitalizations were significantly reduced through collaborative nurse practitioner and physician services provided to nursing home residents. This type of service provision has translated into a corresponding increase in the number of nursing home resident visits, but still has netted a significant cost savings secondary to decreased total associated costs of acute care services and hospitalization (Caprio, 2006). It is feasible that the success and cost savings of collaborative nurse practitioner and physician services in long term care institutions could also translate into cost savings in the provision of care to homebound frail elders in the community setting.

Primary Health Care Service Planning for At-Risk Seniors in British Columbia

The frail elderly have been identified by the British Columbia Ministry of Health

(BCMOH), the British Columbia Medical Association (BCMA), and Northern Health Authority (NHA) as a high priority population. As a group, the frail elderly are high system users presenting with multiple chronic conditions and complex care needs contributing to increased emergency department utilization, and admissions to hospitals and long term care institutions (British Columbia Medical Association, 2002). The *Primary Health Care Charter* set forth by the British Columbia Ministry of Health (2006) emphasises that "co-ordinated patient centered team planning; including advanced health care planning is central to the care of the frail elderly" (British Columbia Ministry of Health, 2006, p. 33). The *Charter* identifies physicians as the cornerstone of primary care and as part of a community network and professional team that includes but is not limited to "nurse practitioners, community nurses, mental health professionals, dieticians, home and community care workers.... and non-governmental organizations who work as a team with patients and their extended families" (British Columbia Ministry of Health, 2006, p. 1).

In response to the *Primary Health Care Charter,* Northern Health Authority's primary health care renewal initiative, *Care North*, was set forth as a strategy to improve access and to improve the quality of primary healthcare services for residents in Northern BC (Northern Health, 2008). As part of this initiative, Northern Health Authority (NHA) is in the process of developing an Integrated Health Network (IHN) for At-Risk Seniors. This IHN is described by the Northern Health Authority (2007b) as a "primary health care initiative focused on improving care for frail seniors living in the community" (p. 1). The aim of the collaborative is to "improve care provided to frail seniors living in the community through a coordinated, multidisciplinary approach" (Northern Health, 2007a, p. 6).

Primary Health Care Service Planning for At-Risk Seniors in Fort St. John, B.C.

In November 2006, the *Fort St. John and Area Seniors' Needs Project: Population Background and Trends Report* was completed by the Community Development Institute at the University of Northern British Columbia (Doddridge, Van De Keere, Hoffman, Halseth & Hanlon, 2006). This project estimated that Fort St. John may be adding between 602 and 792 new seniors to the city between 2001 and 2011 with an additional 55 to 73 new seniors in the nearby community of Taylor. Accessibility and quality of primary health care services in rural areas such as Fort St. John and the surrounding area are challenging issues, particularly for the elderly and those with chronic or complex medical conditions. "Rural and remote communities in Canada face significant health disadvantages as a result of poorer access to healthcare services, geographical and climatic factors, lack of infrastructure, and challenges in recruiting and retaining healthcare professionals" (Banner & MacLeod, 2008, p. 38). Chronic disease management and primary health care reform is a modality that has the potential to impact positively on the present and future burden of health care services in Fort St. John, B.C. by maintaining and improving the health status of aged and aging persons; thus possibly contributing to reduced health care expenditures.

Fort St. John, B.C. is one of three leading communities within Northern Health Authority moving forward with the Integrated Health Network (IHN) for At-Risk Seniors in order to respond to the above described needs of this community and the surrounding area. The scope of the Integrated Health Network in Fort St. John is to improve primary care provided to at-risk seniors incorporating "significant changes to the service delivery model across the continuum of care for at-risk-seniors involving changes to policies, processes, roles, job descriptions, location of service delivery, relationships between NHA providers

and physicians" (Northern Health, 2007b, p. 2). The objectives of the Integrated Health Network for At-Risk Seniors are to improve quality of life for seniors and their care providers, to increase the level of satisfaction amongst health care providers and to reduce hospital utilization by frail elders. Reductions in hospital utilization are more specifically aimed at reductions in emergency attendance, acute-care hospital days, reductions in ALC (alternate level of care) bed days, and fewer clients in acute care hospital waiting for placement in residential care facilities (Northern Health, 2007b).

Statement of the Problem

The frail elderly are particularly vulnerable to disability and frequently present with multiple chronic illnesses and complex care needs (Northern Health, 2007a). "Social support networks are often overextended or at risk of breaking down" which can "easily lead to increased use of medical and social resources" (Bergman & Beland, 2000, para. 7). In the absence of early identification, comprehensive assessment, care planning and responsive interventions, frail elderly individual's health is likely to deteriorate requiring urgent care and taxation of acute care resources. The Northern Health Authority Integrated Care Network for At-Risk Seniors was developed as a primary health care strategy as a response to this dilemma. This collaborative is focusing on "bringing physicians and other providers together to create the interdisciplinary teams that can ensure comprehensive and integrated patient care" (Northern Health, 2007a, p. 9). Nurse practitioners, working in collaborative practice with physicians in the care of the frail elderly, and as a part of the integrated health care team, have the potential to improve access and health care service provision to frail elders without additional cost. However, is not known specifically how collaborative practice contributes to positive outcomes, nor is it known what specific interventions are most

effective in sustaining the health and well being of frail elderly individuals for as long as possible.

Purpose of the Project

The purpose of this project is to explore the evidence based research to address the following question: In frail and elderly persons living in community settings, how does primary health care service provision provided collaboratively through nurse practitioner and physician services, reduce emergency department utilization, reduce admissions to hospital and long term care institutions, and maintain or improve functional capacity? The overall purpose of this paper will be to examine the research literature to explore outcomes regarding primary health care service provision to the frail elderly, provided collaboratively through nurse practitioner and physician services. Integrated health care service delivery models will be discussed, critiqued, and integrated into the research findings extracted from the review of literature to serve as a guiding framework in the proposed application of these research findings towards the Northern Health Authority Integrated Health Network for At-Risk Seniors in Fort St. John, British Columbia.

Significance of the Project

It can be anticipated that the conclusions drawn through a critical appraisal of the evidence set forth this project paper, will contribute to a better understanding of collaborative nurse practitioner and physician primary health care service provision in the care of frail elders, as nurse practitioners are new health care providers within the province of British Columbia. Upon the application of these research findings to primary health care service provision for frail elders in Northern British Columbia, this project may inform the provision of appropriate and cost effective health care service provision for frail elders. Locally, this

project will provide additional insight into processes and modalities to formulate a responsive interdisciplinary team for the care of at-risk seniors in Fort St. John, B.C.

Summary

Fort St. John, B.C., not unlike the rest of British Columbia and Canada, is anticipating an increase in its aging and aged population. Functional decline in health status in elderly persons and the associated impact on health care resources may be able to be averted through responsive primary care systems such as the Northern Health Authority Integrated Health Network (IHN) for At-Risk Elders. It is recognized by this Integrated Health Network that interdisciplinary teams can "improve care provided to frail seniors living in the community through a coordinated, multidisciplinary approach" (NHA, 2007a). Nurse practitioner and physician collaborative practice in the care of frail elders is a modality of primary health care service provision that is proposed to improve access and health outcomes which will be explored in the next section.

Appraisal of Evidence

Introduction

This section describes the search strategy and subsequent critique of the evidence based literature to examine the question: In frail and elderly persons living in community settings, how does primary health care service provision provided collaboratively through nurse practitioner and physician services, reduce emergency department utilization, reduce admissions to hospital and long term care institutions, and maintain or improve functional capacity? Three of these four outcome measures were extracted from twelve research articles. These outcome measures were emergency department utilization, hospital admissions, and nursing home admissions. The outcome measure of health status/functional capacity was added as it was determined to be an important measure of relevance to the planning of care for at-risk seniors in Fort. St. John, B.C. Additionally, three integrated health care service delivery models will be discussed, critiqued, and integrated into the findings of the review of literature.

Sources and Search Process

A variety of search strategies were utilized to complete a comprehensive and methodical review of the literature. The search was confined to systematic reviews, meta-analyses and randomized control trials as these are regarded as the 'gold standard' of medical research evidence and the hierarchy of research evidence (Barton, 2000). The University of Northern British Columbia online library was accessed to obtain relevant and related research articles. The Biomedical Reference Collection, Medline (Ovid), Medline (EBSCO), CINAHL, the Johanna Briggs Institute, the Cochrane Central Register of Controlled Trials and the Cochrane Library of Systematic Reviews data bases were searched. The literature

search was confined to these search engines to ensure the inclusion of quality articles. The literature search was intended to capture English language articles for ease of interpretation of results. Articles from the United States, Canada, Europe and Australia were identified and retrieved. The available articles spanned the time frame from 1985 to 2007. More recent studies were sought out but were not available. Key words, used singularly or in combination, for the search included: 'frail older people', 'frail elderly', 'frail elder', 'frailty', 'aged', 'nurse practitioners', 'advanced practice nurses', "advanced practice nursing' 'hospitalization', 'emergency department use', 'home care services', 'primary care', 'nursing homes' and 'long term care institutions'. Reference lists from each selected article were retrieved and examined for additional relevant articles not identified through the described electronic search strategy. This search strategy derived nineteen articles of which twelve articles were determined to be appropriate in an attempt to address the question of inquiry set forth in this paper. These twelve articles include one systematic review (Van Haastregt, Diedericks, van Rossum, de Witte, Crebolder, 2000), two meta-analyses (Ploeg et al., 2005; Stuck & Siu, 1993), one combined systematic review and meta-analysis (Elkan et al., 2001), five randomized control trials (Leveille, et al., 1998; Sledge et al., 2006; Stuck, et al., 1995; and Stuck et al., 2000; Zimmer, Groth-Juncker, & McCusker, 1985) and three variations of randomized control trials (Bula et al., 1999; Kravitz, et al., 1994; and Naylor & McCauley, 1999). It was noted that the randomized control trial conducted by Levielle, et al. (1998) was utilized in the meta-analysis conducted by Ploeg, et al. (2005). No other RCT's were noted to be contained within the systematic reviews and/or meta-analyses selected for this literature review. These twelve research articles will be overviewed in an attempt to formulate a critical appraisal of evidence.

Literature Review and Analysis

Three outcome measures were sought out and identified for the retrieval of evidence in order to address the question of inquiry set forth in this paper. These are as follows: reduced emergency department utilization, reduced hospital admissions, and reduced nursing home admissions. The outcome measure of health status/functional capacity was determined to be an additional relevant outcome measure that was extracted from these articles. Thus, the original question of inquiry was reformatted and this fourth outcome measure was additionally utilized as a means to extract information from the research towards the application of findings in Fort St. John, B.C. A summary of the twelve articles is presented in Appendix A.

Emergency Department Utilization

Two of the twelve articles address emergency department utilization as an outcome measure including two randomized control trials by Zimmer, et al. (1985) and Sledge et al. (2006). In the first RCT, Zimmer, et al. (1985), found that patients cared for by a home care team consisting of a physician, a nurse practitioner, and a social worker in the delivery of home based primary care services to homebound chronically or terminally ill elders living in Rochester, New York, experienced lower emergency department utilization than those individuals not receiving this service. The nurse was a master's degree prepared nurse practitioner who performed many of the physical assessments, routine and emergency, in the community. She was responsible for the nursing plan and supported medical care in close cooperation with the physician. Elderly patient eligibility was based upon the patient being home-bound, wishing to remain at home, having significant illness (not primarily psychiatric), requiring medical care, not having a physician who would make home visits,

and having a friend or family member available to assist in their care at home. One notable aspect of this study is that twenty four hour, seven day per week emergency access to the team was available through telephone support. Another notable aspect of this study is that physical and psychological support and education was provided by the home health care team to informal care providers and friends. The authors indicate that their utilization data showed that savings in hospital days can be attributed almost entirely to the fact that more patients spent their days of highest care needs at home, where much of the service was provided by informal family caretakers at no cost to the system. The relative strengths of this RCT are that it included an adequate sample size of 210 patients and it utilized a rigorous methodology and statistical analysis. Even though the study and interventions took place in New York and the study is over a decade old, the interdisciplinary team network for frail elders could be generalizable to rural and remote locales such as Fort St. John, B.C. Questions for further inquiry regarding this study arise in regards to whether or not the nurse practitioner had received additional gerontological training and what was the nature of collaborative practice between the nurse practitioner and physician.

The second RCT that cited emergency department utilization as an outcome measure was conducted via means of a clinic-based ambulatory care intervention in the northeastern United States (Sledge, et al., 2006). A team approach was again utilized with a nurse practitioner serving as a case manager for 12 months of follow-up intervention for primary care patients who had a record of high use of inpatient services in the previous 12-18 months. The nurse practitioner held advanced practice certifications in medical and psychiatric nursing. The intervention consisted of comprehensive interdisciplinary medical and psychosocial assessments, and follow-up ambulatory case management consisting of a social

worker, a psychiatrist, and a general internist, in addition to the nurse practitioner. This study's research findings found that the proposed interventions did not contribute to decreased utilization of emergency department services. The authors assert however, that inadequate sample size (47 patients in the intervention group and 49 patients in the control group) was a considerable limitation to their study, which contributed to inadequate statistical power. "A sample size of approximately 75 patients in each comparison group would be needed in order to detect a moderate effect" (Kraemer & Thiemann, 1987 as cited in Sledge et al., 2006). The authors state, "there was a trend toward reduced emergency department utilization after enrollment" (Sledge et al., 2006, p. 335), and that the low sample size may have contributed to a lack of statistical significance. Taking into account the lack of statistical significance, this research finding for no reductions in emergency department utilization raises a further question about the value of additional interventions such as home based service provision, caregiver support, and 24 hour 7 day per week access in combination with these clinic based interventions. An additional question for further consideration is whether or not additional advanced training of nurse practitioners contributes to better outcomes when working with at-risk elders. Consequently, the validity of the application of these findings to Northern Health Authority is in question as this intervention incorporated specialists such as a psychiatrist and general internist. In rural and remote regions of British Columbia such as Fort St. John, specialist services may not be readily available to devote to this initiative for at-risk seniors.

Hospital Admissions

Decreased hospital admissions as an outcome measure is addressed in eight of the twelve research articles. Four of these eight studies found that the research interventions did

not decrease hospital admissions. These four studies consisted of the systematic review by Van Haastregt, et al. (2000), the meta-analysis by Ploeg, et al. (2005), the combined systematic review and meta-analysis by Elkan, et al., (2001) and the RCT conducted by Sledge et al. (2006). The four studies that did determine that their interventions contributed to reduced hospital admissions consisted of a meta-analysis conducted by Stuck and Siu (2000), a RCT by Naylor and McCauley (1999), a RCT by Zimmer, et al. (1985), and a RCT conducted by Leveille, et al. (1998).

Seven of the fifteen RCTs included in the systematic review conducted by Van Hasstregt, et al. (2000) found favorable effects of home visits. Their review failed to confirm that home visits have an appreciable effect on the number of subsequent hospital admissions. The authors do claim however, that a limitation to their study was that some of the trials appeared to be underpowered and thus it was possible that the effectiveness of home visits was underestimated. Only two of the fifteen RCTs in this systematic review utilized nurse practitioners and only one of the twelve RCTs took place in Canada, with the others taking place in the USA, the UK, Denmark, and the Netherlands. None of these twelve studies implemented 24 hour 7day per week access and only two of the inclusive trials consisted of a collaborative team. More specifically, one of the RCTs collaborative teams consisted of only one geriatric nurse practitioner and an unknown number of geriatricians, and the other consisted of a only a nurse and a physiotherapist. The generalizability of this research to the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. is limited as even the authors indicate that "most trials provided little or no information about the extent to which the intervention programmes were implemented" (Van Haastregt, et al., 2000, Implications section, para. 2).

In their combined systematic review and meta-analysis of health studies, Elkan et al. (2001) determined that the interventions employed in 15 inclusive studies also failed to elicit findings of decreased hospital admissions. It is unknown however, which health care professionals carried out home visits to older persons. The authors only stated that they "excluded studies in which the home visitor was a specialist in a brand of nursing other than health visiting" (Elkan, et al., 2001, Inclusion criteria section, para 1). Furthermore, Elkan, et al. (2001) state that the descriptions of what the home visitors did was brief and that further studies in this area should focus on the process of care delivery and the components of these interventions. The generalizability of this research to the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. is limited as the findings from this combined systematic review and meta-analysis are inconclusive.

In a meta-analysis conducted by Ploeg, et al., (2005), nineteen preventative primary care intervention randomized control trials involving patients 65 years and over who received preventive primary care through home visits, office visits, and/or telephone contacts did not lead to reductions in admissions to acute care hospitals. However, the authors determined that preventive primary care outreach interventions aimed at older people resulted in a "23% increased likelihood of continuing to live in the community" (Ploeg et al., 2005, Abstract section para. 1). The interventions were provided by nurses, physicians, other professionals, or volunteers. The authors indicate the study brings to light implications for further research in regards to primary care outreach interventions such as geriatric evaluation and management as these "may result in more positive outcomes when targeting specific groups of frail elderly people" (Ploeg et al., 2005, Implications for further research section, para. 1). Again, the generalizability of this research to the Integrated Health Network for At-Risk

Seniors in Fort St. John, B.C. is limited as the findings from study are inconclusive. This study does however raise a question in regards to what would be considered to be the composition of successful geriatric interventions and management strategies. An additional question that arises from this meta-analysis is whether the exclusion of nurse practitioners in some of the inclusive trials may have contributed to less statistically significant findings.

A RCT conducted by Sledge, et al. (2006) found no observed effect for admissions to hospital. The clinic based interventions in this RCT utilized comprehensive interdisciplinary psychosocial and medical assessments carried out by the team social worker, psychiatrist, and general internist. Team reports were developed and recommendations were directed towards primary care providers. In addition to the limitation of the small sample size, the authors state that primary care clinics may not have been able to concentrate on these patients as it is difficult to direct expertise and effort on complex care patients to reduce variations in services offered. Even though this randomized control trial's interventions are directed towards client-centered care, additional supports and adjunctive services are not provided. Thus, the generalizability of these findings in Fort St. John, B.C. is limited as Northern Health Authority has already recognized adjunctive services beyond primary prevention strategies as important to support frail elders.

In a meta-analysis conducted by Stuck and Siu (2000), twenty eight international randomized control trials were reviewed. The authors determined that comprehensive geriatric assessment (CGA) programs linking geriatric evaluation with strong long-term management are effective in improving function in older adults. "CGA determines an elderly person's medical, psychosocial, functional, and environmental resources and problems, linked with an overall plan for treatment and follow-up" (Stuck & Siu, 2000, Introduction

section, para. 1). The authors determined that "all CGA programs taken together reduced hospital (re)admission during follow-up by 12%" (Stuck & Siu, 2000, Hospital Admission section, para. 1). Six of the twenty eight RCT's described home assessment service with 2 of these 6 trials showing statistically significant reductions in hospital admissions. No further description was provided as to what these home assessment services were. Additionally, statistically significant findings for maintenance of health status were found in 14 of the 28 trials. A rigorous search strategy is described and the authors indicate that they did not solely rely on computer databases, and obtained additional RCTs, some of which were only available in abstract form. This is a relative strength of this meta-analysis as the authors limited the commonly occurring issue of publication bias evident in most research trials. The authors assert that some of the inclusive studies were small and some had no available data about certain outcomes which resulted in fairly wide confidence intervals, which was a limitation to this meta-analysis. Again, it is unknown which health care professionals carried out the CGAs. Additionally the question arises as to what was the specific makeup of these CGAs. Therefore, the extent to which these conclusions are generalizable to Fort St. John, B.C. is suboptimal.

One noteworthy trial, a secondary analysis of a RCT, deemed that comprehensive discharge planning and home follow-up provided by advanced practice nurses (APNs) for medical and surgical patients with cardiac conditions, contributed not only to fewer multiple readmissions, but also to a reduction in the total number of days of re-hospitalization for both medical and surgical elderly cardiac patients (Naylor & McCauley, 1999). The intervention consisted of weekly telephone calls and a minimum of two home visits provided only by APNs, not by a collaborative team, over a 24 week period of time. Initial assessments of

patient and caregiver needs occurred within 48 hours of hospital admission and at least every 48 hours thereafter. Home visits occurred within 48 hours after discharge home from hospital. The APNs were masters prepared with at least 1 year of in-hospital or home care experience working with older adults. The findings from this study indicate that coordinated discharge planning and home follow-up that includes telephone and home visits provided by APNs benefits high risk elders with significant cardiac problems (Naylor & McCauley, 1999). The findings from this study emphasize that coordinated discharge planning and home follow-up that includes telephone and home visits provided by APNs benefits high risk elders with significant cardiac problems (Naylor & McNauley, 1999). The generalizability of these findings to the Fort St. John Integrated Health Network for At-Risk seniors is most feasible with a question arising as to how the addition of physician's in collaborative practice with APNs could result in even more statistically significant findings.

The noteworthy RCT by Zimmer, et al. (1985), which was previously discussed for their intervention of a 24 hour 7day per week accessible home health care team, contributed not only to decreased emergency department utilization but also to decreased hospital admissions. The authors report that "high intensity home health care can be cost effective (Zimmer, et al., p. 140). Additionally, the authors indicate that 24 hour 7 day per week intervention provided through a physician, a nurse practitioner, and a social worker home health care team, was especially statistically significant for caretaker satisfaction. The authors comment that it is "most remarkable that these caretakers, who contributed most significantly with their time and effort to lowering costs are also the group most satisfied with this care approach" (Zimmer, et al., p. 141). In spite of the relative age of this RCT, these statistically significant findings would be applicable to Fort St. John, B.C. as this study

utilized 24 hour 7 day per week access, and support for informal care providers with health care service provision for at-risk seniors provided by the home health team.

The last study in this appraisal of evidence, for the outcome measure of reduced hospital admissions, determined that a 1 year senior's center chronic illness self-management and disability prevention program in Seattle, led by a geriatric nurse practitioner, contributed to the findings that the number of hospitalized patients in the control group increased by 69%, whereas the number of hospitalized patients in the intervention group decreased by 38% (Leveille, et al., 1998). Additionally, the total number of inpatient hospital days during the study year was significantly less in the intervention group. Physical activity and chronic illness self-management were the two key components of the intervention. The strength of this RCT is that it contains an adequate sample size of 201 chronically ill seniors aged 70 and older recruited through medical practices. Rigorous research methodologies, comprehensive interpretation of findings, and implications and recommendations are all clearly set forth in this trial. "This project provides evidence that a community-based collaboration with primary care providers can improve function and reduce inpatient utilization in chronically ill older adults" (Leveille, et al., 1998, p. 1,191). Unlike, the clinic based intervention carried out by Sledge et al. (2006), this RCT provided adjunctive client-centered care services including physical activity and chronic illness self management strategies. Thus the generalizability of these findings to the Integrated Health Network is in question as it is still debatable whether or not home visits are cost effective in the long term.

Nursing Home Admissions

Seven of the twelve articles selected for this critique assert that proposed interventions contributed to reduced nursing home admissions. These seven studies are comprised of one

systematic review (Van Haastregt, et al., 2000), one meta-analysis (Ploeg, et al., 2005), one combined systematic review meta-analysis (Elkan, et al., 2001), two RCT's (Zimmer, et al., 1985; Stuck, et al., 1995), one subgroup analysis of a 3-year RCT (Bula, et al., 1999), and one stratified RCT (Stuck, et al., 2000).

In the systematic review by Van Haastregt, et al. (2000), seven of fifteen inclusive RCT's utilized nursing home admissions as an outcome measure. Two of these trials found a significant reduction in permanent nursing home admissions. These trials all focused on preventative home visits, however the authors indicate that "most trials provide only general information about the characteristics of the interventions" and "most trials provide little or no information about the extent to which the intervention programmes were implemented" (Van Haastregt, et al., 2000, Implications section, para. 2). Thus, the generalizability of these findings to the Integrated Health Network for At-Risk Seniors in Fort St. John questionable as the findings from this systematic review is vague.

Elkan, et al. (2001) report that home visiting was associated with a significant reduction in admissions to long term institutions amongst members of the general elderly population and frail older people who are at risk of adverse outcomes. The fifteen inclusive randomized and non-randomized control trial interventions focused on surveillance, support, health promotion, and the prevention of ill health. Elkan et al. (2001) make reference to the systematic review conducted by Van Haastregt, et al. (2000), and state that "our findings are in marked contrast to those of Van Haastregt, et al, who failed to find evidence that home visiting resulted in any consistent positive outcomes. "It seems that the decision of Van Haastregt et al. not to perform a meta-analysis might have led them to underestimate the effectiveness of preventive home visits to older people" (Comparisons with other studies

section, para. 1). In comparing their work with Stuck et al. (2000), Elkan et al. (2001) indicate that they "confirmed the earlier promising findings of Stuck et al" (Comparisons with other studies section, para. 2) which provides even more evidence that these findings towards may be applicable in the implementation of home visits for at-risk seniors in Fort St. John, B.C.

In their systematic review/meta-analysis, which included nineteen randomized control trials, Ploeg et al., (2005) identified that primary preventative care outreach interventions do not reduce admissions to nursing homes even though their statistical analysis revealed that these interventions contributed to a "23% likelihood of continuing to live in the community" (Ploeg et. al., 2005, Abstract section para. 1). One particular drawback to this research is that the authors report that many of the included studies provided only a minimal description of the primary preventative care outreach interventions which negates the generalizability of these research findings to the Integrated Health Network for frail elders in Fort St. John, B.C.

One RCT found that the interventions of 24 hour 7 day per week access and the provision of support and education to informal caregivers by a collaborative team consisting of a social worker, a nurse practitioner, and a physician (internist) experienced in geriatric care reduced nursing home admissions (Zimmer, et al., 1985). The team was available for emergency consultation through telephone services as patients were given the home phone numbers of the physician and nurse practitioner and the physician's pager number. It was discovered that off hour telephone calls were surprisingly limited and that "more than 70 per cent of the calls could be handled by a phone call alone without the need for immediate follow-up" (p. 135). Additionally, informal care providers were provided with the "necessary physical and psychological support and education to take on or continue home

care" (p. 135). The generalizability of these findings towards health care service provision for frail elders in Fort St. John, B.C. is most applicable as 24 hour 7 day per week access is an already established objective of Northern Health Authority. This study substantiates the potential usefulness of this intervention strategy towards reduced nursing home admissions. However, the question arises whether or not specialists, such as an internist in this RCT, contribute to more positive outcomes as compared to family physicians.

Another RCT that is of particular interest was conducted by Stuck, et al., (1995). This trial took place in Santa Monica, California over the course of three years in which collaborative practice between geriatricians and nurse practitioners elicited evidence that annual comprehensive geriatric assessments (CGAs) and follow-up for patients living in the community can reduce permanent admissions to nursing homes. The CGAs were performed in the patient's homes by gerontologic nurse practitioners. Each case was then discussed with the geriatrician(s) and the nurse practitioners continued to follow the patients through in-home follow-up every three months. If additional contact was considered necessary, the nurse practitioner telephoned the patient or was available by telephone. The study does not indicate 24 hour 7 day per week access was available. The focus of the interventions was self care management and physical activity to reduce risk factors for disability. The results of this RCT yielded a higher mean functional status which is believed to have resulted in reduced nursing home admissions (Stuck, et al., 1995). The sample size of 414 persons aged 75 years and older was sufficient to establish statistical significance. The generalizability of these findings towards the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. is applicable as "patients are partners in their own care, with emphasis on enabling self

managed care" which is a key feature of integrated health networks (Impact BC, Key Features section, para. 2).

Stuck, et al. (2000) utilized what they term as in-home preventative multidimensional geriatric assessments for a 3 year period of time in their intervention with 791 study participants in Bern, Switzerland. Their research determined that their intervention elicited statistically significant findings that nursing home admissions were reduced. The intervention consisted of nurses, who received additional training in public health nursing focusing on physical assessments and gerontology. These nurses were responsible for performing comprehensive geriatric assessments (CGAs), formulating a problem list of 24 defined problem categories and then discussing client cases with geriatricians. In home follow-up visits were then carried out every three months to monitor implementation of the geriatricians recommendations. This intervention was found to have contributed to an "unfavorable increase in nursing home admissions amongst high baseline risk patients, but reduced nursing home admissions amongst low risk subjects, which resulted in net cost savings in the third year (US $1403 per person per year)" (Stuck, et al., 2000, Results section, para. 1). The one limitation to this study, as asserted by the authors, is that this analysis is classified as a secondary analysis. However, this analysis was conducted according to an analytical plan with hypothesis formulated before outcome data collection (Stuck, et al., 2000). These findings are somewhat applicable towards the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. as this study indicates that comprehensive geriatric assessments and associated management plans are effective intervention strategies for reducing nursing home admissions. This study did not utilize nurse practitioners; however advanced practice training was portrayed to be a vital aspect of these nurses practice which

could be considered to be more or less equivalent to nurse practitioner practice. Additionally, geriatricians were utilized in this study. Geriatric specialists in northern locals such as Fort St. John, B.C., are available through the Geriatric Outreach Team four times per year with the availability for consultation in between times (Northern Health, 2005). Thus, a question for further consideration arises as whether physicians and nurse practitioners without additional geriatric specialization, but who work in consultation with this resource, can contribute to statistically significant outcome measures for reduced nursing home admissions in Fort St. John, B.C.

Health Status/Functional Capacity

Outcome measures of health status and/or functional capacity are addressed in seven of twelve inclusive research studies which include: one combined systematic review meta-analysis (Elkan, et al., 2001), one secondary analysis of a RCT (Naylor & McCauley, 1999), three randomized control trials (Sledge et al., 1995; Leveille, et al., 1998; Stuck, et al., 1995;) one subgroup analysis of a RCT (Bula, et. al., 1999), one stratified RCT (Stuck, et. al., 2000), and one observational study nested withon a RCT (Kravitz, et al., 1994).

Elkan, et al. (2001) determined that three of the fifteen randomized and non-randomized control trials selected for their systematic review and meta-analysis, showed no significant effect on health and four studies showed no effect on the activities of daily living. However, two of the fifteen inclusive trials measured instrumental activities of daily living (IADLs) and reported significant improvements. The authors include in their summation of these findings that the "absence of evidence of improved health and functional status requires explanation" (Elkan et al., 2001, Impact on Health and Functional Status section, para. 1) and state that the difference between the intervention and control groups was that those in poorest

health died. Thus, this outcome was measured as only a subset of the original sample. Additionally, Elkan, et al. (2001) suggest that self rated measures may not have been sensitive to detect improvements in health or functional ability. Thus the generalization of these findings towards the care of at-risk seniors in Fort St. John, B.C. is questionable.

In spite of the statistically significant research findings for the outcome measure of reduced hospital admissions, Naylor and McCauley (1999), in their secondary analysis of a RCT, found no difference in functional status in either surgical or medical cardiac patients who received advanced practice nursing 24-week home based post-discharge follow-up. Likewise, Sledge, et. al. (2006) in their RCT did not find any appreciable differences in functional status between the intervention and control groups in which the intervention consisted of clinic based ambulatory care management interventions provided by nurse practitioners over a 12 month period of time. Inadequate sample size is a limitation in both of these studies. Consequently, the generalizability of these two study findings to the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. is not supported.

Three of the research articles that utilize functional capacity as an outcome measure (Bula, et al., 1999; Stuck, et al., 1995; Stuck et al., 2000) found that activities of daily living (ADLs) and instrumental activities of daily living (IADLs) were both maintained. Bula, et al. (1999) found through their annual in home comprehensive geriatric assessments with quarterly home visits by gerontologic nurse practitioners that intervention subjects spent significantly fewer days dependent in both ADLs and IADLs. Through annual in-home comprehensive geriatric assessments, Stuck, et al. (1995) also found that persons in the intervention group displayed a higher mean functional status, in both ADLs and IADLs, than those in the control group. Furthermore, these interventions by Stuck, et al. (1995) also

contributed to significant statistical findings for reduced nursing home admissions. Stuck et al. (2000) found that in low risk subjects who received in-home comprehensive preventive visits with multidimensional geriatric assessments, ADLs and IADLs were both maintained and additionally reductions in nursing home admissions occurred. High risk subjects, however, were determined not to show an appreciable difference between intervention and control groups for maintenance of ADLs or IADLs. And in a randomized control trial conducted by Leveille, et al. (1998), an increase in participants functional capacity occurred through a 1 year geriatric nurse practitioner case managed senior center based chronic illness self management and disability prevention program. This program was also statistically significant for decreased hospital admissions and reductions in the number of inpatient hospital days.

The study by Kravitz, et al. (1994), identified a "high yield of important and potentially reversible clinical problems" (p. 1229) from their proposed intervention of post-discharge geriatric home assessments in southern California. The sample consisted of 152 intervention subjects aged 65 years and older who had one or more specific risks for functional decline and who were waiting discharge from a teaching hospital. A geriatric nurse practitioner conducted comprehensive geriatric assessments (CGAs) while in hospital and again within 24 to 72 hours after discharge home from hospital. New or worsening conditions were identified in 150 patients (99%) by the nurse practitioner, which were then reviewed in collaboration with a geriatrician. "Fifty percent had medical problems, 58 percent functional problems, and 90 percent had problems in understanding follow-up instructions" (p. 1,231). The team additionally consisted of a physical therapist and a gerontologic social worker. The most common recommendation categories were diagnostic evaluation and monitoring (51%),

advance directives (50%), physical and occupational therapy (44%), and alterations in medication regimens (44%). No further outcome measures were evaluated such as readmissions to hospital; however, the authors do indicate that further research is needed to identify potential links between short hospital stays, health outcomes, and costs. The generalization of these findings towards the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. is most applicable as this research again substantiates Northern Health Authority's objective of including coordinated hospital discharge planning with at home follow-up within 48 hours. The study did however utilize specialists such as a geriatric nurse practitioner and a geriatrician. Thus the question again arises as to the necessity for inclusion of specialists in the interdisciplinary teams who would directly provide interventions versus consultation services with geriatric specialists available though Geriatric Outreach Services.

Discussion

It can be concluded that this literature substantiates the contention that community-based interdisciplinary primary health care service provision to the frail elderly, provided collaboratively through nurse practitioner and physician services, has the potential to improve access, ensure quality, and promote cost effective primary health care and case management for at-risk seniors. Four successful intervention strategies were extracted from an analysis of the literature towards the application of achieving the outcome measures of reductions in emergency department utilization, reductions in admissions to hospital and long term care institutions, and to delays in functional decline. These intervention strategies include: (1) comprehensive geriatric assessments (CGAs) linked to overall plans for treatment and strong long-term management; (2) 24 hour 7 day per week access to a home health care team; (3) comprehensive, collaborative, and coordinated discharge planning and

subsequent at-home follow-up by a nurse practitioner and the attending physician within at least a 48 hour time period after discharge home from hospital; (4) education and support for informal caregivers providing care for at-risk seniors in the community setting. These will be further discussed towards the application of the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C.

Synthesis of the Research for Emergency Department Utilization

From a synthesis of the articles that utilized reduced emergency department use as an outcome measure, 24 hour 7 day per week telephone access to a home health care team and physical and psychological support and education provided to informal care providers were both successful implementation strategies. Clinic based interventions alone without the addition of services provided in the home showed no appreciable gain in reducing emergency department utilization. Interventions were provided through collaborative nurse practitioner and physician health care service provision, in combination with interdisciplinary teams, with nurse practitioners acting as case managers. The application of these findings towards the Integrated Health Network in Fort St. John, B.C would be most generalizable as it substantiates Northern Health Authority's objectives to take "responsibility 24/7" (Northern Health, 2007a, p. 6) and to "evolve....the relationships that will best support frail seniors and care providers (both formal and informal)" (Northern Health, 2007a, p. 6). However, according to the findings extracted from this literature review it would be advisable for this IHN take the objective of supporting informal care providers one step further to include both physical and psychological support and education.

A question for further inquiry that arises from this research is whether or not specialists such as geriatricians and psychiatrists, as well as additional specialized training for nurse

practitioners is required for more positive outcomes, or would the availability for consultation through the Geriatric Outreach Service Team be sufficient to contribute to statistically significant findings. Additionally, a question arises as to the exact nature of collaborative practice amongst nurse practitioners and physicians as these relationships have the potential to impact on the successful or unsuccessful implementation of these strategies.

Synthesis of the Research for Hospital Admissions

Through a synthesis of these articles that utilized reduced hospital admissions as an outcome measure, comprehensive geriatric assessments (CGAs) linked with an overall plan for treatment with strong long-term management, coordinated hospital discharge planning with home follow-up within 48 hours, and 24 hour 7 day per week access were deemed as successful interventions. Of interest, a seniors center chronic illness and disability prevention program without home based interventions which focused on self management strategies and physical activity, led by a geriatric nurse practitioner, was statistically significant for reductions in hospital admissions (Leveille, et al., 1998). However, another study which provided clinic based comprehensive interdisciplinary psychosocial and medical assessments in which a nurse practitioner worked closely with primary health care providers to achieve the recommendations set forth from their assessments, contributed to no observable effect for reductions in hospital admissions (Sledge, et al., 2006). A further study offering office, home, and telephone visit interventions that focused upon primary care prevention strategies only, also failed to achieve positive outcomes (Ploeg, et al., 2005). It can be noted that there were other variables to account for the inconsistent findings in these articles, yet a question arises as to whether primary preventive care strategies directed towards frail elders are enough to prevent hospital admissions. Without the incorporation of

acute and long term care management strategies, regardless of whether or not the interventions are home based or not, it is debatable if reductions in hospital admissions can be achieved.

The generalizability of these findings to the Integrated Health Network for At-Risk Seniors in Fort St. John is most applicable as the aim of Northern Health Authority is to "improve care provided to frail seniors in the community through a coordinated multidisciplinary approach, which includes planning and implementing client-centered care" (Northern Health, 2007a, p 6). Northern Health Authority recognizes that coordinated care planning and crisis response is required for health care service provision to frail elders and as such these studies substantiate the objectives of the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. From this research it is deemed feasible for Northern Health Authority to integrate already proposed objectives for comprehensive geriatric assessments (CGAs) linked with treatment and associated long-term care management strategies, coordinated hospital discharge planning with follow-up within 48 hours, and 24 hour 7 day per week access into their Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. Additional consideration should be given to the development of a seniors center chronic illness and disability prevention program for frail elders who are still mobile and could be transported to the center. Group visits provide informal peer support structures and cost effective service care provision and are a key feature of integrated health networks "where a critical mass of clients with a particular condition, or group of conditions is present" (Impact BC, 2007, Key Features section, para. 9).

Synthesis of the Research for Nursing Home Admissions

Through a synthesis of the articles that utilized decreased nursing home admissions as an outcome measure, it can be drawn from these that 24 hour 7 day per week access, comprehensive geriatric assessments, and the provision of support and education to informal care providers were all successful implementation strategies. Some debate again arose about the utility of preventive primary care in two of the articles, with the systematic review by Van Haastregt, et al. (2000) and the meta-analysis by Ploeg et al. (2005) showing inconclusive results. However, a combined systematic review/ meta-analysis by Elkan, et al. (2001) showed conclusive results that home visits focused on surveillance, support, health promotion, and prevention of ill health were successful in reducing nursing home admissions. Little or no information about the characteristics of the preventative visits interventions was provided and thus it is not possible to formulate any recommendations to propose to Northern Health Authority about the validity of expanding the Integrated Health Network for At-Risk Seniors to provide preventative home visits to those seniors at low risk or no risk.

Northern Health Authority has already recognized that "24/7 responsibility" and that self-management by the client and the family must be built and/or fostered (Northern Health, 2007a). "Proactive, planned care methods that employ a common care plan for each client embraced by all health service delivery components" (Impact BC, 2007, Key Features section, para. 3) such as comprehensive geriatric assessments are key features of integrated health networks. Thus the generalizability of these findings to the Integrated Health Network for At-Risk Seniors in Fort St. John is most applicable as they substantiate the already established future direction of interventions towards the reduction of nursing home admissions in Fort St. John, B.C.

Synthesis of the Research for Health Status/Functional Capacity

Through a synthesis of the articles that utilized maintenance of functional capacity as an outcome measure, comprehensive geriatric assessments (CGAs) and coordinated hospital discharge planning with timely in home follow-up were both deemed to be successful strategies in reducing functional decline. Comprehensive in-home geriatric assessments with long-term management follow-up were again deemed successful intervention measures as they contribute not only to reductions in functional decline but also to associated nursing home admissions (Stuck, et al., 1995; Stuck, et al., 2000). A seniors center chronic illness self management and disability prevention program managed by a geriatric nurse practitioner indicated that these interventions contributed not only to reductions in functional decline but also to associated reductions in hospital admissions and the number of inpatient days (Leveille, et al., 1998). An additional study by Kravitz, et al. (1994) provided specific insights into the spectrum of significant problems identified during home assessments by gerontologic nurse practitioners in which ninety nine percent of patients discharged home from hospital were determined to have new or worsening problems. The authors do state that "more research is needed to identity additional links between short hospital stays, impairment or instability at discharge, and adverse outcomes" (Kravitz, 1994, p. 1229) however, this research does give an indication of the value of early in-home follow-up after discharge home from hospital as it can be surmised that through the nurse practitioners early interventions, subsequent hospital admissions were prevented.

These study findings suggest that home visits with comprehensive geriatric assessments are invaluable in maintaining the health status of higher functioning seniors but not necessarily those with lower functional capacity. As such, it may be advisable for

Northern Health Authority to take this research finding into account when planning future intervention strategies that are linked to outcome measures as this subset of seniors could skew outcome measure results. Again, this research indicates that consideration should be given to the development of seniors center chronic illness self management and disability prevention program for seniors who are still mobile and could participate and benefit from a group setting environment.

Overview of Proposed Health Service Delivery Models

In order to ensure service co-ordination, quality of outcomes, efficiency, and ultimately cost effectiveness, an implementation framework for health care service provision for at-risk seniors must encompass effective intervention strategies. *Integration* of health care services became a buzz word in the 1990's as it was recognized that health care service provision was fragmented with disjointed care, less than optimal quality, system inefficiency and difficult-to-control costs (Kodner, 2000). Integrated care is defined by Kodner and Spreeuwenberg (2002) as a "discrete set of techniques and organizational models designed to create connectivity, alignment, and collaboration within and between the cure and care sectors at the funding, administrative and/or provider level" (Kodner and Spreeuwenberg (2002) as cited in Kodner, 2006, p. 385). Integrated health care has become a major theme in health care reforms related to the poor quality of care being delivered to those with chronic conditions, particularly the elderly (MacAdam, 2008).

Multiple integrated health care service delivery models have been developed in Canada and internationally. MacAdam (2008) performed a systematic review which incorporated eight Canadian and international evaluated trials of integrated health care delivery models for the elderly. The program models with the strongest results for the outcome measures of

reductions in hospital utilization, reductions in nursing home utilization, cost effectiveness or savings and client satisfaction and quality of life included the SIPA (Système de services integers pour personnes âgées en perte d'antonomie) model (Canada), Integrated Care in Italy, the PACE (Program 0f All-Inclusive Care For Elderly People) model (USA), and the SA HealthPlus Model (Australia) (MacAdam, 2008). Canada's PRISMA (Program of Research to Integrate Services for the Maintenance of Autonomy) model was not included in the systematic review, as even though it shows promising results, it has not been effectively evaluated (MacAdam, 2008). Kodner (2006) expanded his research outside of the American validated PACE model by comparing Canada's SIPA and PRISMA models. A discussion of the SIPA model and the PRISMA model follows. Another lesser known and unevaluated model, the Medical House Calls Program (MHCP), a US model, will be reviewed it is a framework that "can provide high quality primary health care to frail elderly at home, improve the continuity of care between the home, and the hospital, provide support and education to families or caregivers, and provide linkage to a broad range of social and supportive services in the community" (Gammel, 2007, Medical House Calls Program Overview section, para. 3). A general overview of the SIPA, the PRISMA, and the MHCP service delivery models follows.

SIPA Model

The fundamental premise of the SIPA model is that it is a community based primary care system that is responsible for a full range of health and social services in community settings, acute care hospitals, and long term care institutions (Bergman, et al., 1997; Health Canada 1998). SIPA is a fully integrated model that "maintains and promotes autonomy of frail elderly people; and promotes optimal utilization of community-based services as a

substitute for hospital and nursing home care" (Kodner, 2006, p. 388). Furthermore, SIPA is a "patient-focused model designed to meet the needs of the frail elderly to assure comprehensive care, integration of all available services and continuity of care by all professionals and institutions involved" (Bergman, et al., 1997, pp. 1,117-1,118). Important features associated with the SIPA model include multidisciplinary teams, case management, and the application of guidelines and services based on the latest knowledge (Beland, et al., 2006). The SIPA model is a system that assesses the quality of services and adapts to personal circumstances via rapid response and on-call services and provides linkage and coordination amongst service providers (Beland, et al., 2006). The utility of the SIPA model was evaluated through a randomized control trial in which Beland et al., (2006) reported that the SIPA model "was highly effective in increasing access to community based health and social services, and reducing acute hospitalizations (by 50%) of alternate level of care patients (i.e. 'bed blockers' who are chronically ill and disabled" (Kodner, 2006, p. 387). However, "no significant differences were discerned in emergency department, hospital or nursing home stays or costs" (Kodener, 2006, p. 387). Due to a lack of policy consensus, the SIPA model has not become a permanent program. The Quebec government is considering incorporating certain elements of the model into this province's existing health care system (Hollander, et al., 2002 as cited in Kodner, 2006). The Solidage Research Group at McGill University (n.d.) states the "SIPA model represents a major challenge and change to the existing system of care for the frail elderly" and that before proposing major reforms "issues raised by the introduction into Canada's health care system need to be addressed" (p. 3).

PRISMA Model

The PRISMA model is an innovative health care service framework with a goal of

integrating service delivery to ensure individuals functional autonomy (Kodner, 2006). The mechanisms and tools of the PRISMA model include co-ordination between decision-makers and managers, a single entry point, a case management process, individualized service plans, a single assessment instrument based on the clients' functional autonomy, and computerized clinical charts for communicating between institutions for client monitoring purposes (Hebert, et al., 2003a; Kodner, 2006). The key feature of the PRISMA model is that all service organizations maintain their own structure but "agree to participate in an umbrella system and to adapt its operations and resources to agreed-upon requirements" (Hebert, et al., 2003b). Services covered by this model include existing acute care, long term care, rehabilitative, and supportive services (Kodner, 2006). Service management is provided by case managers who work closely with family physicians (Kodner, 2006). The PRISMA model has been implemented in two territories in the Victoriaville region in Quebec (Hebert, et al., 2003b). Kodner (2006) reports that a three year quasi-experimental design was undertaken to evaluate the PRISMA model which found the model contributed to a "declining trend in institutionalization" (p. 388).

MCHP Model

The basic premise of the of the MHCP model is the provision of timely, comprehensive, coordinated care management to offset the effects and associated costs of delayed or crisis intervention of the homebound frail elderly (Gammel, 2005). This program provides comprehensive, ongoing medical care and chronic care management instead of time limited intermittent care focused only on treating specific acute care events (Sanders & Harahan, 2008). This model is additionally being utilized by oncology physicians and associated oncology programs in the United States. "Managing cancer patients in the home

is the most humane and cost-effective method of care if appropriate medical, educational, and supportive services can be made available in the home" (Gammel, 2005, p. 45). The MHCP model is a framework whereby the designated MHCP physician manages or co-ordinates patient care of the frail elderly ensuring continuity of care. Primary health care services are delivered in the home through physicians, nurse practitioners, and a social worker (Gammel, 2005). The programming goals of this model are to improve access, improve continuity with coordination of support services, provide counselling and education to family members and caregivers and provide palliative elderly persons with the opportunity to die at home (Gammel, 2007). Gammel (2005) proclaims that "because MHCP clinicians treat the patient in the home, they have access to a tremendous amount of information about caregiver abilities and the home environment" allowing "clinicians to make better informed decisions than would otherwise be possible" (p. 40). This consistent and co-ordinated means of care delivery often results in decreased days of hospital admission and shorter hospital stays as a support system is already in place prior to discharge home (Gammel, 2007). It is important to keep in mind that this model has as yet not been validated through a formal research evaluation, however multiple sites in the United States are reporting "a decreased rate of unnecessary emergency room visits, an average length of stay for hospital admissions that is almost three days shorter than for the comparable elderly population" and "triple the national average of persons being able to die in their own homes" (Gammel, 2007, Benefit to the Sponsor Hospital and Health System section, para. 2). This program was originally instituted in Northern Kentucky in 2002 through a hospital based program. Since then, the MCHP program as been utilized in several regions throughout the United States with these programs

being operated "under the auspices of a health system, a hospital, a home health agency or an HMO" (Sanders & Harahan, 2008, p. 4).

Synthesis of Evidence Based Research with Models of Integrated Health Care

The Federal/Provincial/Territorial Committee (Seniors) for the Ministers Responsible for Seniors developed a report entitled *Innovations in Best Practice Models of Continuing Care for Seniors* (Minister of Public Works and Government Services Canada, 1999). The report was formulated to assist "planners, practitioners, researchers and policy makers regarding innovative best practice models of continuing care for seniors" (Minister of Public Works and Government Services Canada, 1999, p. 3). Six common features of best practice models were identified by respondents who consisted of key contacts in continuing care divisions in all Canadian provinces and territories. Six best practice features towards the relevance for analysis of health care service delivery models were identified: (1) consumer/client focus; (2) coordination and integration; (3) efficiency and flexibility; (4) access; (5) program assessment; and (6) program evaluation and education for staff. The first four listed features of best practice models will be utilized to analyze the SIPA, PRISMA and MHCP health care service delivery models. The two best practice features of program assessment, and program evaluation and education for staff, are assumed to be aspects of each of these health care delivery models, and thus will not be utilized as part this review.

Consumer/Client Focus

Consumer/client focus is defined as "the degree to which the client's right to provide input into service planning is recognized and the extent to which the services are relevant to the client's needs" (Minister of Public Works and Government Services Canada, 1999, p. 11). Neither the SIPA nor the PRISMA models key features specifically lists or recognizes

consumer/client focused care. The MHCP model explicitly recognizes and values the role of families and caregivers which coincidentally was one of the successful program intervention themes identified in the review of the literature. Education and support of informal caregivers is emphasized in the MHCP model, as the burden of care giving is incremental. And yet for elderly persons to remain in their own homes these same care givers are considered to be a vital part of the team (Gammel, 2005). The aim of the Northern Health Authority Integrated Health Network for At-Risk Seniors is for client-centered care and value is placed on approaches and strategies which "evolve the care/practice model and the relationships that will both support frail seniors and care providers (both formal and informal)" (Northern Health, 2007, p. 7). The Care North strategy emphasizes that "we will work in partnership with patients and communities in making decisions – respecting choices that are made (Northern Health, 2008, p. 18). The MHCP model is integrally aligned with this objective of the Care North strategy. Thus, for the purpose of selecting a best practice service delivery model in Fort St. John, B.C., it could be argued that with respect to client focused/consumer care, the Medical Health Call Program (MHCP) service delivery model would be a most appropriate fit.

Coordination and Integration

Coordination and integration is defined as "the ability to provide uninterrupted, coordinated service across programs, practitioners, organizations and levels of care, over time" (Minister of Public Works and Government Services Canada, 1999, p. 12). The aim of the Integrated Health Network for At-Risk Seniors in Northern Health Authority is "to improve care provided to frail elders living in the community through a coordinated, multidisciplinary approach" (Northern Health, 2007, p. 6). Key elements of both the SIPA

and PRISMA models are that these models have "umbrella organizational structures to guide integration of strategic, managerial and service delivery levels; encourage and support effective joint/collaborative working; ensure operations; and maintain overall accountability for service, quality, and cost outcomes (MacAdams, 2008, p. 10). The MHCP model acknowledges the importance of the continuity of care for frail elders by providing care in the home and in the hospital, and coordination of all support services" (Gammel, 20007, Medical House Call Program Overview section, para. 3). The review of the literature in this paper revealed that comprehensive geriatric assessments, comprehensive, collaborative, and coordinated discharge planning and subsequent follow-up with early home based intervention(s) within a 48 hour time period after discharge home from hospital are successful implementation strategies. Consequently, the SIPA, PRISMA and MHCP models of health care service delivery to frail elders all meet this best practice feature of coordination and integration. Using this best practice feature of coordination and evaluation, all three models could serve as the framework for health care service delivery for the Integrated Health Network for At-Risk Seniors in Northern Health Authority.

Flexibility and Efficiency

In *Innovations of Best Practice Models of Continuing Care for Seniors* (Minister of Public Works and Government Services Canada, 1999), flexibility was defined as the "ability to respond to changing client demographics and needs" and efficiency was defined as "achieving the desired results with the most cost-effective use of resources" (p. 12). The review of the evidence based literature ascertained four successful intervention strategies that all encompass the best practice feature of efficiency and flexibility and include: (1) comprehensive geriatric assessments (CGAs) linked to overall plans for treatment and strong

long-term management; (2) 24 hour 7 day per week access to a home health care team; (3) comprehensive, collaborative, and coordinated discharge planning and subsequent at-home follow-up by a nurse practitioner and the attending physician within at least a 48 hour time period after discharge home from hospital; (4) education and support for informal caregivers providing care for at-risk seniors in the community setting. The SIPA, PRISMA and MHCP models all provide overall flexible health care service provision as their key features to address the ability to respond to changing client demographics and needs.

The Care North strategy has recognized that "system-wide change – deliberate, participative, supportive change" (Northern Health, 2008, p. 5) is required. As a part of this shift in thinking, Northern Health is planning on "quality initiatives/milestones for comprehensive services for those living with chronic conditions including the frail elderly through multidisciplinary teams including the nurse practitioner role" (Northern Health, 2008, p. 22). The MHCP model recognizes and incorporates the role of nurse practitioners as part of the interdisciplinary medical team (Sanders & Harahan, 2008), whereas the SIPA model and PRISMA models do not. In regards to this aspect of flexibility, the MCHP model would be the most integrally aligned with this goal of the Care North strategy.

In terms of the best practice feature of efficiency, the SIPA model has been evaluated through a randomized control trial. Results revealed that this model achieved overall reductions in hospital and nursing home use but no significant differences in emergency department, hospital or nursing home stays or any of these associated costs. Additionally, no differences in health outcomes or total costs were found between control and experimental groups (Kodner, 2006). A quasi experimental evaluation of the PRISMA model revealed a declining trend in institutionalization and maintenance of functional capacity at the beginning

of the experiment but the effect disappeared by the end of the experiment. No formal research evaluations of the MHCP model are known to have taken place at this time and the cost effectiveness of this model is only through observations reported by Gammel (2007) as discussed previously in this paper. However, it should be recognized that "while client outcomes improve, cost savings are not immediate. Investments have to be made to realize the potential of integrated care" (Singer, 2008, as cited by MacAdam, 2008, Forward section, para. 3). It is impossible at this point to comment on the efficiency or cost effectiveness of any of these health care delivery models. Thus it could be recommended that any of these three delivery models could serve as the overarching framework in regard to efficiency for service to frail elders in northern British Columbia.

Access

Access is defined as "the ability of the individual to obtain services at the right place and at the right time, based on respective need" (Minister of Public Works and Government Services of Canada, 1999, p. 13). The Northern Health Authority Integrated Network for At-Risk Seniors is aiming to take 24/7 responsibility "meaning that this requires the ability to respond to crisis when they happen" (Northern Health, 2007, p. 6). The research evidence uncovered in the review of the literature in the paper indicated that 24 hour 7 day per week access to a home health care team and early home based interventions within at least 48 hours after discharge home from hospital are successful implementation strategies to provide accessibility to frail elders and their care providers. The SIPA model promotes intensive home care, 24 hour on-call availability and rapid team immobilization (Kodner, 2006). The PRISMA model promotes a single point of entry through 24 hour 7 day per week access (Kodner, 2006) as does the MHCP model (Gammel, 2005).

Northern Health Authority has placed emphasis on the establishment of "primary care homes - early access and long term relationships for patients with a multidisciplinary primary care team" (Northern Health, 2008, p. 3). The SIPA and MHCP models both emphasize ongoing-follow-up of patients. The PRISMA model does not recognize this aspect as one of its key features. MacAdams (2008) states that ongoing follow-up of patients is one of the main characteristics of care coordination programs that accomplish their goals. The MCHP health service delivery model additionally emphasizes and recognizes end-of-life care. The Care North Strategy has recognized end of life care as a primary care access issue (Northern Health, 2008). This component of end-of life care is only assumed to be an aspect of the SIPA and PRISMA models as direct mention of end-of-life care is not listed as a key feature of these models as per the discussion in Hebert, et al. (2003), Kodner (2006), and MacAdams (2008). The SIPA, PRISMA or MHCP model could all be utilized as frameworks to promote accessibility for frail elders in northern British Columbia. However, the MHCP model stands out in regards to the provision for client centered primary care homes and of end-of-life care health care service provision.

Discussion

For the purpose of this project, the SIPA model appears to be the most validated framework to recommend as serving as the overarching framework to implement into the Northern Health Authority Integrated Health Network for At-Risk Seniors. According to criteria for best-practice models, the SIPA model would appear to be the most consistent framework in answering the question of inquiry: In frail and elderly persons living in community settings, how does primary health care service provision provided collaboratively through nurse practitioner and physician services, reduce emergency department utilization,

and reduce admissions to hospital and long term care institutions, and maintain or improve functional capacity? Even though the Medical Health Calls Program (MHCP) model is formally unevaluated, it deserves consideration.

Through means of a randomized control trial, the SIPA model was found to contribute to reductions in acute care hospitalizations of alternate level of care patients and is a "community based primary care system based on a patient-focused model designed to meet the needs of the frail elderly to assure comprehensive care, integration of all available services and continuity of care by all professions and institutions involved" (Bergman et al., 1997, p. 1,117-1,118). The Medical Health Calls Program (MHCP) model, even though it is an American model and has not been formally evaluated, appears to align very well with objectives set forth by the Care North strategy in more aspects of the best practice features of health care service delivery models than even the SIPA model. Unlike the SIPA and PRISMA models, the MHCP model recognizes the utility, and indeed the necessity of informal care providers, to provide support and care to frail elders in the community setting. "Family caregivers provide a vast array of emotional, financial, nursing, social, homemaking, and other services on a daily or intermittent basis" (Gammel, 2005, p. 42). Additionally, the MHCP model promotes end-of-life care to provide medical care for patients to die in their own homes. Furthermore, nurse practitioners are recognized as valued care providers in multidisciplinary care teams. Thus, the MHCP model could provide great utility to the Integrated Health Network for At Risk Seniors in northern British Columbia especially if it was blended with the SIPA model. At the time of writing of this project paper, the Northern Health Authority Integrated Health Care Network for At-Risk Seniors had not yet selected a service delivery model (R. Schellenberg, personal communication, August 2008) and as such

this evaluation of these integrated health care service delivery models could serve as a broader scope of insight for health policy makers in Northern Health Authority when determining appropriate and cost effective health care service provision for frail elders.

Summary

In summary, this research critique has demonstrated that nurse practitioner and physician collaborative practice has the potential to decrease emergency department utilization, decrease admissions to hospitals and long term care institutions, and maintain health status/functional capacity of frail elders. Four emergent implementation strategies were identified through this literature review and include: (1) comprehensive geriatric assessments (CGAs) linked to overall plans for treatment and strong long-term management; (2) 24 hour 7 day per week access to a home health care team; (3) comprehensive, collaborative, and coordinated discharge planning and subsequent at-home follow-up by a nurse practitioner and the attending physician within at least a 48 hour time period after discharge home from hospital; (4) education and support for informal caregivers providing care for at-risk seniors in the community setting. These implementation strategies were woven together with best practice key features used to evaluate three health care service delivery models that could serve as a framework and be integrated into the Northern Health Authority Integrated Health Network for At-Risk Seniors in Fort St. John, B.C.

Limitations, Implications for Practice and Research, and Concluding Recommendations

Introduction

The findings of this project provide insight and direction to collaborative nurse *practitioner* and physician health care service provision for at-risk seniors living in northern British Columbia. The question of inquiry set forth in this project was addressed through a review of the literature. The evidence indicates that primary health care service provision provided collaboratively through nurse practitioner and physician services reduces emergency department utilization, reduces admissions to hospitals and long term care institutions, and maintains or improves functional status of frail elders. Successful implementation strategies were extracted through this same literature review and were encompassed through a synthesis health care service delivery models that could serve as a framework and be integrated into the Northern Health Authority Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. However, research evidence is never absolute and thus limitations of the literature review and the consequent assumptions drawn will be discussed. Implications for nurse practitioner practice and nursing research will be explored and concluding recommendations will be proposed to improve continuity and increase efficiency of community based primary health care services in the Northern Health Authority Integrated Health Network for At-Risk Seniors in Fort St. John, B.C.

Limitations and Assumptions

The literature review is limited to articles found in a non-exhaustive search utilizing specific search engines during the time span from October 2007 to February 2008 focusing only upon retrieving the "gold standard" of research evidence including systematic reviews, meta-analyses and randomized control trials. The assumption has been made that these were

the best method for studying the diversity of the field for the application of collaborative nurse practitioner and physician primary health care service provision for at-risk seniors in northern British Columbia.

Additional investigation is warranted to ensure that all relevant data regarding collaborative nurse practitioner and physician primary health care service provision for the frail elderly have been identified. Further consultations with stakeholders for the Northern Health Authority Integrated Health Network for At-Risk Seniors must also be completed to obtain additional information upon which to comprehensively plan collaborative practice in the provision primary health care services to frail elders living in rural and remote regions of northern British Columbia. Additionally, complete analysis of the medical data bases for at-risk seniors through the Fort St. John and District Hospital and the Home and Community Care Departments should be undertaken to form a baseline for evaluation.

One recurring limitation was discovered in the research articles utilized for this project paper. The systematic reviews, meta-analyses and several of the randomized control trials failed to describe the particular aspects of interventions that led to their described outcome measures. Overall, this acts as a substantial impediment in drawing further conclusions about interventions in which collaborative nurse practitioner and physician practice provide acute, emergent, and primary health care services to the frail elderly and limits insight towards the application of these study findings for the care of at-risk seniors in Fort St. John, B.C.

Implications for Nurse Practitioner Practice

The critical appraisal of the evidence based literature illustrated in this paper provides an in-depth portrayal of collaborative nurse practitioner and physician practice in the delivery of primary health care services to the frail elderly. The implementation of nurse practitioner

collaborative services into community settings is the crux of inquiry and thus this project paper will contribute to nursing practice by substantiating the unique contributions of nurse practitioner practice towards health service care provision for the frail elderly and at-risk seniors. This project paper has raised issues regarding the specifics of collaborative practice. The implementation strategies in the review of literature demonstrated the positive effects of collaborative nurse practitioner and physician practice on patient outcomes; however few of these studies described the exact organizational arrangements. Therefore, implications for practice are that existing structures need to change to enable collaborative roles to be developed towards achieving expected positive outcomes of integrated health service delivery. The question remains as to how these should change. Additional implications for nurse practitioner practice are that through an evolution of projects such as the Integrated Health Network for At-Risk Seniors in northern British Columbia and the possible incorporation of nurse practitioners into this initiative, nurse practitioner practice may very well expand to settings such as seniors centers and nursing homes and long term care institutions in British Columbia and across Canada.

Implications for Future Research

It can be surmised that this project will contribute to a broader context of knowledge by substantiating the unique contributions of nurse practitioners in the care of the frail and elderly; however, there is a need for further research regarding the relevance and validity of these contributions. Existing health care organizational structures have been deemed to be ineffective. Integrated health care service delivery models have been developed as a means to address issues of inefficient and fragmented health care service delivery. However, integrated health care service delivery models are currently being researched and the

incorporation of one of these or a combination of these into the Integrated Health Network for At-Risk Seniors in Northern Health Authority would lend itself to this present day research as the impetus for change in health care service delivery models is so new.

Implications for further research also arise from the literature review in regards to what structures or processes would best encourage health care providers and health and social service agencies with the ability to successfully integrate and collaborate. Future research implications would also include the need to determine if additional specialized training for nurse practitioners and physicians is needed, and what role specialists who are available through the Geriatric Outreach Services Team would have in the care of frail elders for successful outcomes in the Integrated Health Network for At-Risk Seniors in Northern Health Authority. Additionally, this review of the literature indicates that more research into what comprises the successful makeup of comprehensive geriatric assessments and the linkage to overall plans for treatment and long-term care management needs to occur.

Recommendations

It is recommended that:

1. Northern Health Authority consider implementation of the role of a nurse practitioner into the Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. to work collaboratively with physicians (and additional health care service providers) to establish an interdisciplinary team for the provision of community based primary health care services to the frail elderly.
2. The Integrated Health Network (IHN) for At-Risk Seniors consider comprehensive geriatric assessments (CGAs) linked to overall plans for

treatment and strong long-term care management to assist with the provision of coordinated, cohesive health care service provision for frail elders. Additionally, this IHN consider the integration and syntheses of the SIPA (Système de services integers pour personnes âgées en perte d'antonomie) and the MHCP (Medical House Call Program) models to serve as an overarching framework for health care service delivery for at-risk seniors in Fort St. John, B.C.

3. Fort St. John, B.C. serve as a pilot project to research how nurse practitioner and physician collaborative practice could best contribute to reductions in emergency department utilization, reductions in admissions to hospital, reductions in admissions to long term care facilities, and maintenance of health status for frail elders.
4. The Integrated Health Network for At-Risk Seniors in Fort St. John, B. C., develop and implement 24 hour 7 day per week access to the interdisciplinary health care team as already planned by this IHN.
5. The Integrated Health Network for At-Risk Seniors in Fort St. John, B.C. consider nurse practitioner and/or physician collaboration and implementation of comprehensive, collaborative, and coordinated acute and long term care hospital discharge planning and timely subsequent in-home follow-up within 24-48 hours.
6. Northern Health Authority consider the development of a seniors center chronic illness self management and disability prevention program to maximize opportunities for group visits for at-risk seniors.

Conclusion

Successfully implementing health care service provision for frail elderly persons is an enormously complex and difficult challenge. The care of community dwelling frail elders requires collaborative, coordinated, consistent care focused on prevention, as well as acute and chronic condition management. Integrated health care systems were developed in response to problems and issues with current health care systems. The literature identified successful implementation strategies to serve as part of the foundation of integrated health care service delivery models. It can be surmised that integration of nurse practitioner and physician collaborative primary health care services could provide comprehensive continuity of care to underserved at-risk seniors and ultimately lead to reductions in emergency department utilization, admissions to hospitals and long term care institutions, and maintenance of functional capacity for as long as possible. The aim of Northern Health Authority's Integrated Health Network (IHN) for At-Risk Seniors in British Columbia is to improve care for at risk seniors through a coordinated, multidisciplinary, proactive approach (Northern Health, 2007b). Consideration of the integration of nurse practitioners into collaborative practice with physicians in community based primary health care provision in rural and remote regions of British Columbia, in conjunction with the evidence extrapolated from the review of the literature in this paper, may serve as a means for Northern Health Authority to reach this goal.

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