



FINAL REPORT

IMPROVING THE EFFECTIVENESS OF PRIMARY HEALTH CARE THROUGH NURSE PRACTITIONER/FAMILY PHYSICIAN STRUCTURED COLLABORATIVE PRACTICE

PROJECT NUMBER NA342

March 31, 2001



Authors

Daniel Way

Linda Jones

Neill B. Baskerville

Research Team

Neill B. Baskerville
Suzanne Doucette
Daniel Way

Celeste Burnie
Jennie Humbert

Nick Busing
Linda Jones

43 Bruyère Street, Floor 3YB, Room B350
Ottawa, Ontario K1N 5C8
Tel: (613) 562-6335 Fax: (613) 562-6336

"This project was supported by a financial contribution from the Health Transition Fund, Health Canada. The views expressed herein do not necessarily represent the official policy of federal, provincial or territorial governments".

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	vi
ACKNOWLEDGEMENT	ix
SECTION A: INTRODUCTION	1
A1 Project Rationale and Purpose	1
A1.1 Project Goals and Objectives	3
SECTION B: EVALUATION METHODOLOGY	4
B1 Study Design	4
B2 Study Participants and Sampling	4
B2.1 Research Sites/Settings	4
B2.2 Clients/Patients	5
B2.3 Health Care Providers	5
B2.4 Key Informants	5
B2.5 Postgraduate Students	5
B3 Data Collection Methods	6
B3.1 Monitoring Program Intervention and Implementation Progress	6
B3.2 Client/Patient Satisfaction Survey	6
B3.3 Patient Encounter Forms	6
B3.4 Provider Collaboration Survey	7
B3.5 Provider Interviews	7
B3.6 Key Informant Surveys	7
B3.7 Student Pre and Post Test Questionnaire	8
B3.8 Student Interviews	8
B3.9 Student Journal Entries	8
B4 Data Analysis Methods	8
B4.1 Statistical Analysis	8
B4.2 Response Rate	9
B4.3 Qualitative Analysis Approach	9
B4.4 Analysis of Student Intervention	11
SECTION C: PROGRAM DESIGN	11
C1 Curriculum Development	11
C1.1 Structured Outreach Intervention Development	11
C1.2 Student Intervention Development	12
C2 Intervention Description and Activities	12
C2.1 Structured Outreach Intervention Description and Activities	12
C2.1.1 Intervention: Rural Eastern Ontario	14
C2.1.2 Intervention North Eastern Ontario	14
C2.2 Student Intervention Description and Activities	14
C2.2.1 Intervention: North Eastern Ontario	15
C2.2.2 Intervention: Eastern Ontario Urban Community Health Centre	15

TABLE OF CONTENTS (Cont'd)

	Page
SECTION D: RESULTS	16
D1 Monitoring of Program Intervention and Implementation Process	16
D1.1 Intervention: Rural Eastern Ontario	16
D1.2 Intervention: North Eastern Ontario	18
D1.3 Control Sites	19
D2 Outcome Evaluation Results Intervention	20
D2.1 Demographic Descriptions	20
D3 Evaluation of Objectives	20
D3.1 Objective 1a: Comprehensiveness and Appropriateness of Care	20
D3.1.1 Appropriateness	25
D3.2 Objective 1b: Patient Satisfaction	26
D3.3 Objective 1c: Provider Satisfaction	27
D3.3.1 Provider Collaboration Surveys	27
D3.3.2 Provider Interviews	28
D3.4 Objective 1d: Role Guidelines	30
D3.5 Objective 2a: Student Intervention	31
D3.6 Objective 3: Sustainability	32
D3.7 Objective 3a: Partnership for Future Development of Structured NP/FP Collaborative Practice	32
D3.8 Objective 3b: Obstacles to the Development of Sustainable NP/FP Practice Opportunities	32
D3.9 Objective 4: Use of Telehealth Technology	33
SECTION E: DISCUSSION	34
E1 Participation	34
E2 Fidelity	35
E2.1 Education	35
E2.2 Action Plan Achievement	36
E3 Program Effectiveness	37
SECTION F: STUDY LIMITATIONS	38
F1 Limitations	38
F2 Unintended Consequences	39
SECTION G: DISSEMINATION PLAN	39
SECTION H: FUTURE DIRECTIONS AND RECOMMENDATIONS	39
REFERENCES	41

TABLE OF CONTENTS (Cont'd)

		Page
TABLES		
Table 1	Project Sites	5
Table 2	Response Rates on Patient Encounters	9
Table 3	Provider Classification System	13
Table 4	Top Five Reasons for Patient Visits by Health Care Provider and Site at Baseline and Follow-up	22
Table 5	Frequency of Primary Care Service Provided by Practitioner and Site at Baseline and Follow-up	23
Table 6	Overall Frequency of Primary Care Service Provision and Ratio of Services Performed per Practitioner by Site at Baseline and Follow-up	24
Table 7	Site Comparison of In-house Referrals by Practitioner Seen at Patient Encounter for Baseline and Follow-up	24
Table 8	Intervention and Comparison Site Mean Scores on Appropriateness of the Nurse Practitioner (NP) and Family Physician (FP) Roles for Nine Patient Vignettes at Baseline and Follow-up	25
Table 9	Intervention and Comparison Site Mean Patient Satisfaction Ratings for Seven Elements of Satisfaction at Baseline and Follow-up	26
FIGURES		
Figure 1	Mean Level of Disagreement on Collaboration between Intervention and Comparison Site Providers at Baseline and Follow-up	27
Figure 2	Mean Level of Satisfaction with Collaboration between Intervention and Comparison Site Providers at Baseline and Follow-up	28
APPENDICES		
A	Study Design Evaluation Framework	
B	Site Descriptions	
C	Sample Consent Form	
D	Sample Agenda Intervention Site Discussions	
E	Client/Patient Satisfaction Survey	
F	Patient Encounter Form	
G	Provider Collaboration Surveys	
H	Provider Interview: Interviewer's Guides	
I	Key Informants Surveys	
J	Qualitative Analysis Approach: Analytic Strategy	
K	Logic Model	
L	List of Participants: Curriculum Development	
M	Comparison of Provider and Student Intervention Learning Modules	
N	Family Medicine Resident/Nurse Practitioner Postgraduate Student Learning Module Components	
O	Provider Intervention Components: An Overview	
P	Intervention Documents: Rural Eastern Ontario	
Q	Intervention Documents: North Eastern Ontario	

TABLE OF CONTENTS (Cont'd)

R	Rural IS Activity Log
S	Shared and Separate Functions
T	North IS Activity Log
U	Role Guidelines: Table 10
V	Postgraduate Student Intervention: Journal Example
W	Telehealth Chronology
X	Key Informants: Open Ended Question Synopsis
Y	Dissemination Plan
Z	Glossary and Acronyms

EXECUTIVE SUMMARY

The necessity for reform in the primary health care sector presents multiple challenges for health care planners and providers. With reduced fiscal resources, significant cost reductions will need to be realised through initiatives such as physician resource management and changes in primary health care delivery. Structured collaborative practice with nurse practitioners (NPs) and family physicians (FPs) as the primary health care specialists sharing a patient base is potentially an efficient and effective strategy for delivery of primary health care.

The purpose of this pilot project was to develop, implement and evaluate an intervention to:

- Support nurse practitioner/family physician (NP/FP) structured collaborative practice, and
- Develop postgraduate education for family medicine residents and student nurse practitioners.

The project set out to achieve four goals as summarised below. Associated with each goal is a set of objectives and sub-objectives.

1. Goal: To determine the most optimal structure of NP/FP collaborative practice for the delivery of primary care.

Objective: Develop and describe the optimum structured NP/FP collaborative practice where NP responsibilities are legislated.

Sub-objectives:

- Evaluate the comprehensiveness and appropriateness of care;
- Compare patient satisfaction with services delivered by the structured NP/FP collaborative practice;
- Compare provider satisfaction with the collaborative experience; and
- Evaluate the use of role guidelines.

2. Goal: To determine if structured NP/FP collaborative practice can be learned experientially by Family Medicine residents and Nurse Practitioner students.

Objective: Develop teaching materials for the learner NP/FP dyads and train the practitioners to teach structured NP/FP collaborative practice in primary health care.

Sub-objectives:

- Determine if knowledge and attitudes about structured NP/FP collaborative practice have changed in residents and nurse practitioner students.
- Determine if structured NP/FP collaboration facilitates possible retention of health practitioners.

3. Goal: To determine the future requirements for sustaining structured NP/FP collaborative practice in primary health care delivery.

Objectives: Establish what partnerships are required for future structured NP/FP collaborative practice education.

Sub-objective:

- Identify barriers and supports for collaborative practice in primary health care.

4. Goal: To determine the usefulness of telehealth technology for program implementation, monitoring and training.

Objective: Establish a “hub-and-spoke” videoconferencing capability linking project sites with the project team at the University of Ottawa.

Sub-objective:

- Identify lessons learned in implementing and using the videoconferencing system as a telehealth network as it applies to the project.

This project evaluated structured collaboration. The evaluation involved a combination of descriptive quantitative and qualitative data collection and analysis methods. The combination of different units of analysis, data sources, and data collection methods supported the reliability and validity of the evaluation. Data was collected pre and post intervention from health care providers, patients and students. Data was also collected from key informants post intervention. The evaluation methods involved a detailed monitoring of program implementation and progress as well as surveys and interviews of providers, patient surveys, patient encounter forms, key informant surveys, and a questionnaire and interview of students.

The following are key findings from the evaluation:

- The intervention was implemented as evidenced by the provider participation in all of the learning modules and the creation of action plans for structured collaboration.
- A shift in the comprehensiveness and appropriateness of care provision for the NP was shown at the intervention site where patient encounter data was evaluated. The NP in the intervention site provided more service in the curative, rehabilitative and supportive care domains as compared to NPs in the comparison site. Appropriate use of NP skill sets had improved and the delivery of care provided was more comprehensive covering more than health promotive and preventive health services. In addition, post intervention ratings by NPs of appropriate provider for patients show less distinction between the FP and the NP as to whom is the most appropriate provider. Physicians in the intervention sites were unchanged in the comprehensiveness and appropriateness of care provision.
- Referral of patients changed dramatically. The NP in the intervention site referred 19% of patients to a FP pre intervention. At post intervention only 8% of patients were referred to the FPs while the majority (>90%) were referred to herself. FPs did not change their patterns of bi-directional referral preferring to refer the majority of their patients (>90%) to themselves for follow-up both pre and post intervention.
- The majority (75%) of patients were very satisfied with the health care they had received from participating sites both pre and post intervention.
- Providers in intervention sites rated their level of collaboration higher at post intervention and were more satisfied with their collaboration at post intervention as compared to providers in comparison sites. The stories told by providers in intervention and comparison sites confirm the changes that occurred in their

collaboration with regard to scope of practice, competence, control, and role distinction. Post intervention narrative analysis reflected increased physician and nurse practitioner confidence in the NP role at the intervention sites.

- Providers in the intervention sites met their personal goals for collaborative practice in the curative domain for one intervention site and in the domains of disease prevention, acute episodic illness and minor injury, and monitoring of stable chronic illness for the other intervention site.
- Student family physician and nurse practitioner pairs spoke positively of the relevance of the content for the student intervention, and of their change in understanding of and attitudes toward collaboration. They made recommendations regarding placement of the content in their respective curriculums and stressed the importance of having mentors versed in the language of collaborative practice.

The following are recommendations and directions for further work on the structured collaborative model as well as challenges that need to be addressed to support NP/FP structured collaboration.

- Broader introduction of an intervention on structured collaboration to include a larger representative sample of Canadian sites where NPs and FPs work together
- Other primary health care professionals working with the NPs and FPs in any given setting need to be studied as well to determine their role and contribution to collaborative care.
- Include cost-effectiveness measures in any future intervention on structured collaborative practice.
- Future interventions on structured collaboration need to promote the implementation of practice guidelines and be of sufficient duration to monitor patient outcomes to determine structured collaboration's contribution to the quality of care provided.
- Develop resources to support primary care sites wishing to add Nurse Practitioner services to existing Family Physician resources to meet their practice's primary health care needs.
- Assist sites in Canada where nurses function in an extended role to identify and address barriers to collaboration and strengthen their supports.
- Policy and health care system changes are needed to find creative reimbursement mechanisms for NPs and the FPs who collaborate with them.
- Medico-legal issues that prevent practitioners from working as collaboratively as possible need to be addressed.
- Applied research into the seven essential elements of collaboration is required to determine which elements are of strategic importance and to further develop content and tools to assist in the implementation of each element.
- Support implementation of the recommendations of the Ontario Chairs of Family Medicine and the Council of Ontario University Programs of Nursing calling for undergraduate, postgraduate and continuing education opportunities in the classroom and clinically for joint education on collaboration.

The evidence that we have gathered from the four study sites demonstrates that a structured outreach intervention is feasible and does indeed make a difference in how FPs and NPs behave in organising their work. The intervention offered a framework and a common language

for collaborative decision making. Increased understanding of one another's roles and increased confidence in NP competence supported their improved collaboration over the nine months after the learning module. It is our belief that over time the intervention will support further improvement, toward increased co-provision of care and bi-directional referral. Further study is needed to evaluate whether the intervention can improve care, patient outcomes and be cost-effective.

ACKNOWLEDGEMENTS

This report is in memory of Pat Anderson, Nurse Practitioner.

The Project Team is grateful to the leadership, management and participants from the various sites that joined in this study and, in particular, to the Aboriginal community Band Councils, site administrators, staff and health care providers.

Executive and Operational Review Committees with representation from a number of key stakeholders were formed to provide input and advice on the project. Focus and working groups, with representation from the Research Team as well as outside experts were formed to evaluate research tools, develop curriculum and address multi-cultural issues. The Research Team would like to thank the following for their valuable contribution. Without their commitment and help this project would not have been possible.

Executive Committee:

Neill B. Baskerville, BA (Hons) MHA PhD Candidate
Assistant Professor
Senior Research Associate
Department of Family Medicine
University of Ottawa

Celeste Burnie
Project Officer

Nick Busing, MD CCFP FCFP
Professor and Chair
Department of Family Medicine
University of Ottawa

Suzanne Doucette, RN OPN MHA
NP Program
Curriculum and Francophone Program
School of Nursing
University of Ottawa

Jennie Humbert, RN(EC) MHSc
NP Program
Regional Co-ordinator
School of Nursing
University of Ottawa

Linda Jones, BSN RN(EC) CFNP
Lead Investigator
NP Co-ordinator
Clinical Assistant
School of Nursing
University of Ottawa

Daniel Way, BA MD CCFP FCFP
Lead Investigator
FP Co-ordinator
Assistant Professor and
Director of Postgraduate Education
Department of Family Medicine
University of Ottawa

Operational Review Committee:

Marc Aubrey
Director – General Accounting
SCOHS

Bernie Hammond, BA MA PhD
Associate Professor
Department of Sociology
King's College
University of Western Ontario

Janet Mann, RN BScN MEd
Senior Nursing Consultant
First Nation and Inuit Health Branch
Health Canada

Research Advisory Working Group:

Pat Bailey, RN PhD
Associate Professor
Laurentian University

Barb Davies, RN PhD
School of Nursing
University of Ottawa

Stefan Grzybowski MSc CCFP
Assistant Professor and Director of Research
and Family Practice
University of British Columbia

Annette O'Connor, RN PhD
Clinical Epidemiology Unit
LOEB Research Institute
Ottawa Hospital, Civic Campus

Curriculum Advisory Working Group:

Betty Cragg, RN EdD
Director, School of Nursing
Associate Dean of Health Sciences
University of Ottawa

Nadine Cross, RN MHSc PhD Candidate
Assistant Professor
Faculty of Nursing
York University

Pamela Khan, RN MSc(A)
Senior Lecturer / Faculty Liaison
Primary Health Care Nurse Practitioner Program
Faculty of Nursing
University of Toronto

Lisa Moore, MD CCFP
Assistant Professor
Department of Family Medicine
University of Ottawa

Team Support:

Hazel Burns, Sarah Chritchley, Diane Curtin, Heather Dennison, Judy Dougherty, Lynn Dunikowski, Diane Ehlers, Neels Ehlers, Steve Feder, Wency Goodine, Ciara Guigley, Althea House, Claudia Hubbus, Cathy Jordan, Emer Kelly, Francis Kilbertus, Cynthia Kitson, Peggy Lathwell, Carmella Leroux, Lynn Lawson, Karine Lortie, Christine MacLeod, Peter MacKinnon, Nora McBean, Laurie Martell, Nathalie Moisan-Harris, Anne Moller, Tina Morison, Candace Nykiforuk, Monica Prince, Donna Ree, Lorraine Thomson, Pat Topp and Jane Thomas Yager.

IMPROVING THE EFFECTIVENESS OF PRIMARY HEALTH CARE THROUGH NURSE PRACTITIONER/FAMILY PHYSICIAN STRUCTURED COLLABORATIVE PRACTICE

SECTION A INTRODUCTION

A1 Project Rationale and Purpose

The necessity for reform in the primary health care sector presents multiple challenges for health care planners and providers. With reduced fiscal resources, significant cost reductions will need to be realised through initiatives such as physician resource management and changes in primary health care delivery. Many studies, task force reports, and federal and provincial policy statements since the 1970s and through the 1990s have called for changes in the delivery of primary health care. They have emphasised patient involvement, community based care, health promotion, disease prevention and the more efficient, effective use of all health care providers. (1-5)

The unique circumstances of Canadian rural and remote communities present a particular challenge in respect to health care delivery among both Aboriginal and non-Aboriginal populations. In particular, there are disproportionately higher levels of morbidity relative to southern and non-rural Canadians and there are chronic problems with recruitment and retention of family physicians (FPs) and nurse practitioners (NPs) in these areas. In resolving these problems there is a need to find alternative methods of health care provision. Therefore, the purpose of this project was to develop, implement and evaluate a pilot project of intervention to:

- Support nurse practitioner/family physician (NP/FP) structured collaborative practice, and
- Develop postgraduate education for family medicine residents and student nurse practitioners.

The project involved a select number of providers serving Aboriginal communities in North Eastern Ontario and Rural Communities in Eastern Ontario. To maintain participant anonymity all sites discussed in this report are referred to only according to their general geographic location.

It is our belief that structured NP/FP collaborative practice with NPs and FPs as the primary health care specialists sharing a patient base is potentially an efficient and effective strategy for delivery of primary health care. This project evaluated this kind of collaboration at four sites – two intervention sites and two control sites.

The literature suggests that such collaboration has distinct teachable elements.(6-8) Consequently, the NPs and FPs at the intervention sites received learning modules on collaboration. These sites were compared and contrasted to the control sites. The four sites were evaluated in a consistent manner so that a reliable analysis of the impact of structured collaboration could be determined.

Structured collaborative NP/FP practice is consistent with the need to integrate various health professionals to work in inter-disciplinary teams where their professional skills are optimised. It also provides an opportunity to shift from an illness-based service to NP/FP models working and learning collaboratively to provide curative services, as well as rehabilitative and support services, disease prevention and health promotion. Consequently, this project aimed to demonstrate a potential positive impact on the development of primary health care in both Aboriginal and non-Aboriginal communities located in rural and remote areas.

Primary health care can play a significant role in improving the health status of the target populations. However, there is a recognised lack of primary care providers in the remote and rural parts of Canada. Currently, nurses, often with limited formal training, serve northern areas of predominantly Aboriginal populations. Furthermore, nurses often have inadequate physician backup.

The education of primary health care nurses with advanced assessment and therapeutic skills is experiencing a renaissance. Nine provinces and the three territories have begun primary health care NP projects since the mid-1990s. Projects in Alberta, Newfoundland and Ontario are most advanced with formal educational preparation, legislated authority, and separate registration (9). Nursing and medical associations and faculties also have endorsed the development of collaborative practice models between nurse practitioners and family physicians as well as the need to develop innovative educational models (10;11). Furthermore, the literature supports the cost-effective use of advanced practice nurses in primary health care when operating in tandem with adequate physician support. Collaborative models promote effective utilisation of nurse practitioners and allow family physicians to more effectively apply their medical care skills to populations in need (12).

As part of this project, nurse practitioner students and family medicine residents from the University of Ottawa were paired and placed in the intervention site in North Eastern Ontario and an urban community health centre in Eastern Ontario.

The NP/FP structured collaborative practice involves the development of a working relationship based upon seven essential elements that serve as a framework for recognising the shared and separate experience, knowledge and skills of each provider. The seven essential elements of collaboration are: 1) Co-operation; 2) Assertiveness; 3) Responsibility/Accountability; 4) Autonomy; 5) Communications; 6) Co-ordination; and 7) Mutual Trust and Respect. It is a truly collaborative practice offering a full range of primary health care services. Furthermore, it is client-centred and offers a holistic approach that fosters the development of trust between the care provider and client. This approach results in decision making that is synergistic and strives for efficiency and cost-effectiveness by offering a provider that is appropriate for the level of care needed. Thus, the project also evaluated the optimal use of NP and FP skill sets. To achieve this required that the project team develop 'role guidelines'. The practices that received the intervention on structured collaboration were compared to the control sites in terms of activities performed by providers, and the satisfaction levels of providers and patients.

A1.1 Project Goals and Objectives

The project set out to achieve four goals as summarised below. Associated with each goal is a set of objectives and sub-objectives.

1. Goal: To determine the most optimal structure of NP/FP collaborative practice for the delivery of primary care.

Objective: Develop and describe the optimum structured NP/FP collaborative practice where NP responsibilities are legislated.

Sub-objectives:

- Evaluate the comprehensiveness and appropriateness of care;
- Compare patient satisfaction with services delivered by the structured NP/FP collaborative practice;
- Compare provider satisfaction with the collaborative experience ; and,
- Evaluate the use of role guidelines.

2. Goal: To determine if structured NP/FP collaborative practice can be learned experientially by Family Medicine residents and Nurse Practitioner students.

Objective: Develop teaching materials for the learner NP/FP dyads and train the practitioners to teach structured NP/FP collaborative practice in primary health care.

Sub-objectives:

- Determine if knowledge and attitudes about structured NP/FP collaborative practice have changed in residents and nurse practitioner students.
- Determine if structured NP/FP collaboration facilitates possible retention of health practitioners.

3. Goal: To determine the future requirements for sustaining structured NP/FP collaborative practice in primary health care delivery.

Objectives: Establish what partnerships are required for future structured NP/FP collaborative practice education.

Sub-objective:

- Identify barriers and supports for collaborative practice in primary health care.

4. Goal: To determine the usefulness of telehealth technology for program implementation, monitoring and training.

Objective: Establish a 'hub-and-spoke' videoconferencing capability linking project sites with the project team at the University of Ottawa.

Sub-objective:

- Identify lessons learned in implementing and using the videoconferencing system as a telehealth network as it applies to the project.

SECTION B EVALUATION METHODOLOGY

B1 Study Design

The evaluation phase of the project involved a combination of quantitative and qualitative data collection and analysis methods as outlined below. A triangulated approach (13) was adopted in order to achieve as complete an understanding of the effect of the NP/FP structured collaborative model of care as possible. The combination of different units of analysis, data sources, and data collection methods enhances the reliability and validity of the evaluation.(14) Further details can be found in Appendix A, which contains the evaluation framework and provides information on the data sources and methods used to address each of the evaluation research objectives.

The evaluation research design is a quasi-experimental non-equivalent control group with measurement associated with pre and post intervention (15). It should be noted that intervention and control group primary health care practices were not randomly assigned. Rather, intervention sites were recruited into the study and a suitable control site was then selected that matched the intervention site as closely as possible according to population served and size of the primary health care practice. Thus, each site was treated as a case study of collaborative practice.

Family medicine residents and student nurse practitioners enrolled in University of Ottawa programs were approached and volunteers obtained to participate in piloting the student learning module.

B2 Study Participants and Sampling

B2.1 Research Sites/Settings

Sites that had existing NPs and FPs were eligible for inclusion in the study. Based on an investigation into the number and distribution of such sites potential participants were approached from Baffin Island, Saskatchewan and Ontario. However, due to the reorganisation and restructuring of new territorial ministries, Baffin Island was not able to participate in the project. Furthermore, in Saskatchewan, the aboriginal community and the health services under its jurisdiction declined participation.

Recruitment of two sites from aboriginal communities in Ontario was facilitated through the North Eastern Ontario Medical Education Corporation (NOMECE). After identification of candidate communities with eligible community practices, the appropriate authorities were consulted about participating in the project. The study was approved by the chair of the Ottawa Hospital Research Ethics Board. Appropriate protocols seeking community participation were followed and approval to proceed was granted. Similarly, two-community health centres in Rural Eastern Ontario also agreed to participate in the project. Unfortunately, the intervention and the control site from North Eastern Ontario withdrew their participation in the use of patient data for evaluation purposes. As a consequence, no patient or community information from North Eastern Ontario is presented. Thus, the target population of the research project consisted of the care providers from two intervention sites and patients of the rural intervention site as shown in Table 1.

Table 1: Project Sites

Community	Location	Project Code
Aboriginal Intervention Site	North Eastern Ontario	North IS
Aboriginal Control Site	North Eastern Ontario	North CS
Rural Intervention Site	Rural Eastern Ontario	Rural IS
Rural Control Site	Rural Eastern Ontario	Rural CS

Appendix B provides descriptions of the practice settings for each of these sites except for North IS and North CS.

B2.2 Clients/Patients

During a three month period prior to the start of the intervention (September to November, 1999) and one year later (October to December, 2000), providers completed an 'encounter form' for every patient encounter. Patients were selected by convenience immediately after visiting with the provider and approached for an interview by a data collector assigned to the practice. Data collectors received training in administering a questionnaire and were provided with a manual for the survey questionnaire. All patients provided informed consent before participating in the interview process. (See Appendix C for a sample Consent Form). Parents or guardians provided consent on behalf of minors who participated in the study.

B2.3 Health Care Providers

All providers within the participating sites took part in the evaluation study by completing self-administered questionnaires and providing interviews both pre and post intervention. All physicians involved were certified family physicians and all nurse practitioners were formally educated for the extended role and certified in the province of Ontario as registered nurses in the extended class (RN (EC)). Each site had at least one NP and two FPs. A total of five NPs and thirteen FPs participated in the study. Providers gave informed consent prior to completing non-nominal patient encounter forms, the questionnaire and participating in the interview process. The questionnaire was completed by mail and the interviews were conducted in person.

B2.4 Key Informants

Two groups of individuals considered to have some knowledge of the project were approached to complete a self-administered questionnaire at post-intervention. A total of 15 questionnaires were sent out. The questionnaire distribution and response were handled by mail. The members of the first group were comprised of nine administrators and registered nurses. They were selected because they were known to be aware of the project and were directly involved as a consequence of their relationship with the practice sites. The second group, comprised of six individuals, including several site board members, was considered not to be directly involved in the project. However, these individuals may have had some knowledge of the project and an opinion on its impact.

B2.5 Postgraduate Students

Two family medicine resident and student nurse practitioner pairs participated in the piloting of the student learning module. Both family medicine residents were in their first year of their residency. Both student nurse practitioners were experienced registered nurses. One student

nurse practitioner participated during the therapeutics course, the other during the integrated practicum. Students provided informed consent prior to completing the pre-test questionnaire and interview. Questionnaires were completed by mail and the interviews conducted in person.

B3 Data Collection Methods

B3.1 Monitoring Program Intervention and Implementation Progress

Detailed records were kept by the lead investigators in the form of a site activity log to monitor progress during program intervention and implementation. A two-hour discussion was conducted every three months after completion of the learning module and over the nine month follow-up phase. The agenda for each discussion was prepared and sent prior to each session (See Appendix D for a sample agenda). These discussions were facilitated by the lead investigators through a combination of audio-conferences, videoconferences and on-site visits.

Other contacts with individual participants were made related to the need to discuss major events or in response to requests for information. Typically, these occurred by telephone, audioconference, fax, or e-mail exchange.

B3.2 Client/Patient Satisfaction Survey

The patient satisfaction survey contained 33 Likert scale question items and was adapted from the Primary Care Assessment Survey of Safran and Colleagues (16). (For details see Appendix E). The satisfaction survey was designed to address the objective of determining the impact of structured collaborative practice on patient satisfaction. In addition to containing questions that measured overall satisfaction with care received, the instrument had seven sub-scales covering satisfaction with: 1) accessibility; 2) practitioner-patient communication; 3) integration with other health services/providers; 4) practitioner-patient relationship; 5) provider competency; 6) quality of care; and, 7) health promotion service. The survey instrument also contained a few demographic questions, questions on 'who the patient saw during the visit' and 'how they were referred to the specific care giver'.

The questionnaire was piloted with two different patient focus groups prior to implementation. One focus group of three individuals was made up of patients from an Eastern Ontario urban community health centre. The second focus group of five individuals was drawn from patients in an urban Ontario aboriginal health access centre. Feedback on the length of time to complete the questionnaire as well as the understandability and wording of questions was received from focus group members and revisions as needed were made to the questionnaire.

B3.3 Patient Encounter Forms

The patient encounter form was designed by the evaluation research team to address the impact of the structured collaborative practice intervention on comprehensiveness and appropriateness of care delivered to patients. (see Appendix F). This form was completed by both family physicians and nurse practitioners for every patient encounter. This survey instrument consisted of eighteen dichotomous items that covered health promotion, preventive, curative, rehabilitative and supportive primary care services provided to patients. In addition, the instrument collected non-nominal demographic information, reasons for each patient visit and information on patient disposition (e.g., in-house follow-up and/or external referrals).

B3.4 Provider Collaboration Surveys

The provider self-administered survey consisted of nine items that measured the provider's experience of collaborative practice, eleven items measuring the provider's satisfaction with the collaborative experience, and eighteen items measuring the provider's perception of the appropriateness of various patient scenarios for either provider. Demographic information covering gender, age, education, work experience and years of experience with collaboration were also collected via the questionnaire. (See Appendix G). Measures of the collaborative experience based on essential elements and satisfaction with collaboration were adapted from Baggs' (7) work on the development of an instrument to measure collaboration and satisfaction about care decisions. Measures concerning the provider perceptions of role appropriateness were adopted from the work of Davidson and Lauver (17). This latter approach involved using nine patient vignettes concerning health education, psychosocial support and high-risk medical conditions. Post intervention providers completed an open-ended question that asked for their definition of appropriateness.

The provider self-administered questionnaire was piloted by five FPs and four NPs at three sites in Ontario, including an urban health centre in Eastern Ontario, (3 FPs and 2 NPs), a rural community health centre in South Western Ontario (1 FP and 1 NP), and a community health centre in Central Ontario (1 FP and 1 NP). Piloting of this survey instrument confirmed that the questions were understandable, relevant, and valid. Minor revisions were made to the questionnaire based upon the feedback from pilot participants.

B3.5 Provider Interviews

As background information the interview questions included a request that the participants describe their professional education and previous work experience, as well as any prior experience in collaboration with the other professional group (See *Provider Interview: Interviewer's Guides*, in Appendix H). They were also asked to describe their current practice and the characteristics of their client population, including the receptivity of this population to health promotion and disease prevention strategies. This was done in order to obtain an overall picture of their work. The remaining questions related to the essential elements that make up collaborative practice, namely: bi-directional consultation and referral, shared decision making and responsibility, open communication, and judgements based on mutual trust and respect. Participants were also asked to identify any factors that were most important to or best-supported collaboration. They were also asked to provide any other information regarding current collaboration that they wished to add. These questions described their current collaboration. The provider interview was piloted by three FPs and two NPs at an urban community health centre in Eastern Ontario. Feedback from the pilot was incorporated and minor revisions to the interview guide were made.

B3.6 Key Informant Surveys

The key informant self-administered survey for group one and two consisted of demographic information, and ten open-ended question items about experience and perceptions regarding interdisciplinary collaboration in their organisation. The group one survey also included nine items that measured the degree of collaborative practice, eleven items measuring satisfaction with the collaborative experience, and eighteen items measuring beliefs about the appropriateness of various patient scenarios for either provider. This survey was similar in nature to the 'provider collaboration survey' (See Appendix I for more details). The key

informant instrument was reviewed by two administrators one each from an Eastern Ontario urban community health centre and from an Ontario aboriginal health access centre.

B3.7 Student Pre and Post Test Questionnaire

The student pre and post test questionnaire consisted of nine true and false and multiple choice questions based upon the learning module content, and the same eighteen items measuring beliefs about appropriateness used in the provider interview survey.

B3.8 Student Interviews

The provider interview questions were used and modified for the students to reflect future involvement in collaboration.

B3.9 Student Journal Entries

On a weekly basis each student recorded an incident of collaboration and analysed the incident for the degree of collaboration. This was done using the same measurement items included in part A of the Provider Collaboration Survey.

B4 Data Analysis Methods

B4.1 Statistical Analysis

Data analysis was conducted to address the evaluation objectives as noted in Section A1.1. First, provider and patient questionnaires and encounter forms were coded and entered into a statistical software program called SPSS (Version 10.0). Second, the quality of data entry was checked by conducting initial frequency runs on all data elements to ensure that responses were correct and consistent. Third, data were analysed with SPSS to address the research goals. Frequency tables were generated for categorical and nominal data. Descriptive statistical procedures were used on continuous variables. To compare sites over time, contingency table analysis and a chi-square statistic were generated for categorical data and for continuous data a repeated 'measures' analysis of variance was used along with tests for multiple comparisons. Multiple response tables were generated as appropriate. Patient encounter sheets were coded to capture services provided to patients across the five domains of primary health care by practitioner. An index of health promotion, disease prevention, curative, rehabilitative and supportive service delivery was created for each patient encounter. This represented the frequency of service delivery within each of the domains by NPs and FPs. To normalise the index of activity across the practice sites, a practitioner ratio was calculated by dividing the number of patient encounters within a primary health care activity domain by the total number of full-time equivalent NPs (4.3) and FPs (4.2) at baseline and NPs (2.6) and FPs (4.8) at follow-up. In order to address the evaluation objectives, analysis was conducted on the data set of the patients with both a completed interview and an encounter sheet. Missing data points were excluded from analyses as appropriate.

B4.2 Response Rates

Table 2 provides information on the number of completed encounters and patient questionnaires by site.

Table 2: Response Rates on Patient Encounters

Practice Site	Encounters Completed	Approached for Interview	Consented to Interview
Pre-Intervention:			
Rural IS	584	279	200
Rural CS	374	287	200
TOTAL	958	566	400
Post-Intervention:			
Rural IS	330	288	196
Rural CS	380	294	200
TOTAL	710	582	396

The overall response rate to the patient interview at pre-intervention was 70% and at post-intervention the response rate was 68%. Patient reasons for not participating at pre-intervention included: "unwilling to participate" (25%), "interviewed previously" (58%), "no time to complete" (10%), "not fluent in English" (4%) and "too ill to interview" (3%). Patient reasons for not participating at post-intervention included: "interviewed previously" (56%), "no time to complete" (25%), "too ill to interview" (6.5%), "unwilling to participate" (5%), "not fluent in English" (2%), and "other reasons" (5.5%).

To address evaluation objectives, the final data set for analysis was the 400 patients interviewed at pre-intervention with both an encounter and a completed questionnaire and the 396 patients interviewed at post-intervention with both an encounter and completed questionnaire. Patient encounters and patient questionnaires were not collected from either the North IS or North CS sites due to a decision by both sites to withdraw from further participation in the study.

Eighteen providers were mailed questionnaires at pre intervention. All eighteen responded. Sixteen providers were mailed questionnaires at post intervention. All sixteen responded. One NP provider died during the intervention period and a FP resigned from a practice. At post-intervention, fifteen key informants were mailed a questionnaire and twelve responded.

B4.3 Qualitative Analysis Approach

Within the context of the interviews, the identified stories were analysed systematically using an analysis approach developed by Bailey (18;19). This process included a combination of two narrative analysis strategies: Labov and Waletzky's (20) functional model and Agar and Hobbs' (21;22) coherence model. Analysis was also informed by attention to discursive and rhetorical aspects of the stories (20;23-25). This analytic strategy involved six steps as illustrated in Figure 1, of Appendix J. Although these steps are presented in a linear manner, this is not a linear process. Some steps are overlapping and often steps are revisited as the analysis progresses. These systematic steps reflect concern for the maintenance of 'goodness' in the uncovering of meaning. The transparent process allows fellow researchers and consumers to participate in the evaluation of the researcher's analysis (26).

The narrative analysis steps employed in this study included the following:

Description of the interview context. A description of the interview context was developed for each research site. Data used for this description were obtained from the participant interviews and site annual reports.

Development of the interview database. Each interview was transcribed completely. Notations were made on the transcriptions to indicate aspects of oral text such as pitch/loudness, pauses and non-lexical expressions, overlaps in speech, and discourse markers. The transcriptions were not tidied. The phrasing was marked and each line of the transcribed text was sequentially numbered. All interviews were listened to a minimum of two times during the course of the transcription process.

Identification of stories throughout the data. First-person event-specific, generic, and kernel stories as the basic unit of analysis were identified in each interview. Each story was examined for structural elements as outlined by Labov and Waletzky (20). Identification of both a complicating action or plot and some form of evaluation or interpretation clause was necessary for a section of text to be designated as a first-person event-specific or generic story (27-29). Kernel stories consisted of abstract and evaluation clauses but lacked a complicating action element (30;31). When available, the impetus for the story, the stimulus, was also identified, particularly if the story was told in response to an interview question or statement. Comments of the interviewer were also included to acknowledge the inter-subjectivity of story construction within the interview process.

Identification of story events and story meanings. Each story was initially categorised according to story event. Story events were then reviewed to identify linked story meanings.

Presentation of content, structural components, and functions of stories by story meaning. This step involved the rereading and analysis of the content and structure of the stories in each meaning category across the database. A discourse was developed for each meaning category presenting the common content, structural elements, and discursive strategies for each linked meaning so that they cogently supported the conclusions of the analysis. This discourse was informed by the context in which the stories were told.

Presentation of story segments. Excerpts for several stories from across the database within each story group are included in each meaning discourse presentation. These data segments are presented to provide analytic evidence to warrant the conclusions presented regarding the common structural elements and function of specific story meaning.

Presentation of extended narrative segments. Longer segments of narrative texts as case example of stories for each research site are also presented. Complete stories are presented to illustrate the development of each linked story meaning within each site. Finally, the extended narrative segments are also included to make the analysis process transparent and to facilitate the reader's audit of the described process of narrative inquiry.

In order to assess the reliability of the qualitative analysis, a second reader independently conducted a review of the transcripts to determine story meanings and the results were compared with the first reader.

B4.4 Analysis of Student Intervention

Pre and post-test answers were compiled and compared. Pre and post interviews were reviewed and compared for changes in response. Journal incidents were reviewed to determine the students' ability to identify collaborative elements. Student comments regarding the relevance and completeness of the learning module content and exercises were collected for future revision.

SECTION C PROGRAM DESIGN

C1 Curriculum Development

C1.1 Structured Outreach Intervention Development

This section describes the development of the structured outreach intervention for the intervention site providers. The initial step involved reviewing the proposal content and developing a logic model. The logic model technique has proven to be a useful tool for gaining an understanding of an intervention in terms of its processes and outcomes and in the evaluation design of the intervention. The logic model helped to structure the evaluation measures and to ensure as comprehensive an evaluation as possible (32;33). (For more details on this model see Appendix K.) Based on the logic model, key content themes were identified. These included: collaborative practice, primary health care activities related to comprehensive care delivery, and lead and support role guidelines related to the appropriate use of providers.

The original collaborative model developed by the lead investigators was revised to be more inclusive for application to all FP/NP practice settings (34;35). Role guidelines for each of the five domains of primary health care were developed based on lead and support roles.

The initial literature review, conducted from April to July 1999, focused on the characteristics of and the identification of distinct elements essential to collaborative practice that could be taught and measured (6-8;34;36-52).

Both a focus group and key informant interviews involving experienced NP and FP pairs were conducted in May and June 1999 (See Appendix L for the List of Participants). The participants were asked for input related to the essential elements of collaborative practice and the role guidelines for service delivery. Based on their discussion a fourth major content theme emerged. This new theme identified as 'supports or constraints' included the impact of practice setting variables on the implementation of the essential elements and role guidelines.

The content for the learning module, its introduction, the self-instructional guide and the small group discussions were developed during August and September 1999 with the assistance of the Curriculum Advisory Committee and an external faculty reviewer. (See Appendix L for a List of Participants.) In September, the introduction and the self-instructional guide were pilot tested by three family physicians and four nurse practitioners experienced in collaborative practice. A summary of their written evaluations was compiled and the content revised accordingly. The learning module was prepared for implementation in November 1999 after receiving final approval from the Curriculum Advisory Working Group and the project's Executive Committee.

C1.2 Student Intervention Development

The Family Medicine Resident/Nurse Practitioner postgraduate student learning module was developed based on a modification of the Structured Outreach Intervention for family physicians and nurse practitioners. (See Appendix M on Comparison of Provider and Student Intervention Learning Modules).

The major thrust for provider learning was operational, that is, the application of collaborative practice theory to a specific practice whereas the major thrust for student learning was educational, in particular application of collaborative practice theory to their main concern, role acquisition. Literature relevant to interdisciplinary curriculum development was reviewed (53-56).

As with development of the 'provider intervention', the Curriculum Advisory Working Group made recommendations on content and format and with the Executive Committee, approved the final learning module for implementation in January 2000. (See Appendix N concerning Family Medicine Resident/Nurse Practitioner Student Postgraduate Learning Module Components).

C2 Intervention Description and Activities

C2.1 Structured Outreach Intervention Description and Activities

The components of the intervention included the following four elements:

- A two hour group introduction session;
- The self-instructional guide;
- Two, three hour small group discussions; and
- Follow up contacts until the end of the study.

Note that Appendix O, the 'Provider Intervention Components: An Overview' lists the objectives and describes an overview of the learning module content and the purpose and process for the follow-up contacts.

Providers at the intervention sites received the introduction and completed the learning module over a five-week period in November and December 1999. As part of site recruitment, the intervention providers had met with the project team members and had received initial information regarding the project purpose and design, and a beginning description of the learning module. At the intervention introduction, further details regarding the project were given and the providers and the lead investigators shared information regarding their past experience in collaborative practice.

The lead investigators presented their collaborative practice model, supported by case studies and explained their role in the study. The providers were introduced to the specifics of the learning module and their role in participating in the project. Providers were assigned chapter one of the self-instructional guide to be completed over the next two weeks. At the first small group discussion they met with the lead investigators during which time they collectively developed a purpose for their collaborative practice and a list of major supports for, and constraints against, improving their collaboration. They also began to identify strategies for their action plan. The providers were directed to develop their plan, based on their knowledge of the elements essential for collaboration, and with reference to their purpose and their list of practice setting variables. The goal of their plan was to improve their current collaboration by

strengthening or maintaining the supports and/or eliminating, avoiding or modifying the constraints. Providers were encouraged to select five actions that realistically could be changed during the study time frame.

Chapter two of the self-instructional guide was then completed over the next two-week period. At the second small group discussion the providers shared their individual inventories of their competencies and preferences and then combined their lists. This exercise gave the providers an opportunity to clarify their understanding of one another's roles and to gain an appreciation of their collective and rich skill base. Discussion was held regarding the role guidelines and the lead and support model. The previously developed list of supports and constraints was reviewed and revised. The providers continued to work on their plan for improved collaboration. A schedule for follow-up monitoring and support was developed.

The follow-up contacts occurred between January and October 2000. An activity log for each intervention site was kept of each contact. The activity log was used to describe the implementation process and to evaluate achievement of the action plans.

In order to discuss results while maintaining participant anonymity required the need for a coded system of screening the identity of individual providers and their affiliated communities as shown in Table 3.

Table 3: Provider Classification System

Community	Project Code	Nurse Practitioner Code	Family Physician Code	Student Nurse Practitioner Code	Family Medicine Residents Code	Registered Nurse Code
North Eastern Intervention Site	North IS	NP1-NIS	FP1-NIS	SNP1-NIS	FMR1-NIS	
		NP2-NIS	FP2-NIS			
			FP3-NIS			
			FP4-NIS			
			FP5-NIS			
			FP6-NIS			
North Eastern Control Site	North CS	NP1-NCS	FP1-NCS			
			FP2-NCS			
Rural Eastern Intervention Site	Rural IS	NP1-RIS	FP1-RIS			RN1-RIS
			FP2-RIS			
			FP3-RIS			
Rural Eastern Control Site	Rural CS	NP1-RCS	FP1-RCS			
			FP2-RCS			
Urban Community Health Centre				SNP1-UCH	FMR1-UCH	

The coding convention shows a numerical identifier as to the number of distinct providers groups dealt with in the study. The provider groups are identified as follows. For Nurse Practitioner the generic code is structured as in 'NPx-y', where 'x' is a sequential number for each health care professional at a particular site that was involved in the project and 'y' stands

for the code of the NP's site. This pattern is repeated for Family Physician (FP), Student Nurse Practitioner (SNP), Family Medicine Resident (FMR) and Registered Nurse (RN).

C2.1.1 *Intervention: Rural Eastern Ontario*

Providers received the introductory content about intervention on November 8, 1999 and participated in group discussions November 23rd and December 7th. A complete package of their work at these meetings, including purpose, a practice setting variables list, provider activities inventory, role guidelines and action plans was sent to each provider. The content of this package was reviewed and discussed by telephone during February and March with FP1-RIS, FP3-RIS and NP1-RIS. The action plans were then finalised. (See Appendix P for the intervention documents.)

C2.1.2 *Intervention: North Eastern Ontario*

Providers received the introductory content on November 2, 1999 and participated in small group discussions on November 11th and December 3^d. A complete package of their work resulting from these meetings including purpose, practice setting variables list, provider activities inventory, role guidelines and action plan was sent to each provider (NP1-NIS, NP2-NIS and FP1-NIS to FP6-NIS) prior to the first follow-up discussion held January 28, 2000. (See Appendix Q for the intervention documents.)

C2.2 *Student Intervention Description and Activities*

The six components of the student intervention included:

- A two hour introduction;
- Self-instructional guide;
- Three hour facilitated small group discussion and presentation;
- Clinical placement;
- Journal of collaborative incidents;
- Post-pilot discussion.

Note that the learning objectives and an overview of the content is included in Appendix N which discusses the Postgraduate Student Learning Module Components.

After completing the pre-test and the taped interview, the students were assigned the self-instructional guide, to be completed prior to the discussion.

The self-instructional guide 'Collaborative Practice the Game and the Players' consists of two chapters. Chapter one, 'the game', includes content, and practice and reflective exercises related to the purpose and benefit of collaboration, a comparison of hierarchical and collaborative relationships, and a structure for collaborative practice based on the seven essential elements of collaboration. The summary exercise teaches the students to observe for and to measure the degree of collaboration based on these essential elements. This exercise served as part of the format for their journal. Chapter two, 'the players', includes content, and practice and reflective exercises on who are physicians and nurses and who are nurse practitioners and family physicians with an emphasis on 1) comparing educational preparation and professional beliefs 2) describing what are the activities of primary health care; and 3) what are the shared and separate functions of family physicians and nurse practitioners. The

summary exercise requires the students to complete an activity inventory similar to the provider exercise.

The first hour of the two hour facilitated small group discussion included discussion of the benefits of collaboration, sharing of participants specific educational program preparation for collaboration and a summary of the 'chapter one' and 'chapter two' summary exercises. The second hour offered discussion on 'how to play the game'. The students were introduced to content and tools regarding lead and support role guidelines and practice setting variables that could be applied to their future collaborative practices following graduation. The students were then assigned the task of weekly documenting a client situation that involved collaborative interaction. This interaction could be between the two students or between the family medicine resident and the nurse practitioner or the nurse practitioner student and the family physician. The students would then measure the degree of collaboration involved with each incident.

At the completion of their clinical placement the students completed the post-test and participated in a taped interview. They also participated in a one-hour post-pilot meeting to discuss the intervention and their learning outcomes.

C2.2.1 *Intervention: North Eastern Ontario*

Initial plans included piloting the student invention at the North Eastern Ontario intervention site, in the winter and again in the spring of 2000 with the intent to involve two learner dyads. The winter intervention was to include one family medicine resident for 16 weeks and two nurse practitioner students, each for eight weeks. Changes at the intervention site resulted in cancellation of the first eight weeks of the winter intervention and the entire spring intervention.

The postgraduate students, their program tutors and their clinical supervising family physician and nurse practitioner received an orientation to the learning module in December 1999. The students completed their pre-pilot test and taped interview on March 6th. They were assigned the self-instructional guide chapters to be completed before their small group discussion on March 13th. The March 13th discussion was by audioconference, facilitated by the NP Lead Investigator. Journal entries were then collected over the next six weeks. At the end of their clinical placement the students completed the 'post-test' and a taped interview prior to their post-pilot one hour discussion on April 26th. This discussion was by audioconference and was facilitated by both Lead Investigators.

C2.2.2 *Intervention: Eastern Ontario Urban Community Health Centre*

The Curriculum Advisory Committee supported recruiting outside of the research project to find a second site to pilot the student curriculum. Providers and students on clinical placement at an Eastern Ontario urban community health centre agreed to participate. This centre was selected because it has practising NPs and FPs

Introductory material was sent to the students, their respective program co-ordinators and their supervising clinical providers on May 30, 2000. Following completion of the pre-pilot test and taped interview, the project NP Lead Investigator assigned the self-instructional guide to be completed before the facilitated small group discussion scheduled for June 23rd. The students collected journal entries over the last two weeks of their shared placement and then for the first four weeks of their next respective separate placements. The post-tests, exit interviews, and post placement discussion were completed the last week in July 2000.

SECTION D RESULTS

D1 Monitoring of Program Intervention and Implementation Process

This section summarises the results of the process evaluation that occurred from November 1999 through October 2000. This coincides to the period during completion of the learning module and during the follow-up contact phase of the intervention. The process evaluation chronicles major events and their impact on the intervention, as well as significant activity log information pertaining to implementation of the providers' plans for improving their collaboration.

The providers at each site agreed to participate in discussions for two hours every three months over the nine-month follow-up phase. Shorter contacts with individual participants also were made and related to the need to discuss major events or the response to requests for information. Typically these interactions occurred by telephone, audioconference, fax, or e-mail. Five such contacts were made with North Eastern Ontario participants and four with the site in Rural Eastern Ontario.

The process evaluation also includes narrative examples from the qualitative analysis of the provider pre and post interviews for the intervention as well as the control sites.

D1.1 Intervention: Rural Eastern Ontario

The rural intervention site, referred to as Rural IS, developed an Action Plan as part of the initial intervention process. (See Appendix P Action Plans for details.) Two of the five strategies within this plan focused on strengthening supports to them as primary providers through changes in support staff roles and staffing policies (actions two and three). Actions one, four, and five focused on improving their own service delivery as a clinical team.

The NP1-RIS, FP1-RIS and FP2-RIS, having worked together for 3.5 to 4.5 years, referred to their pre-intervention collaboration as "parallel independent practices with supported access to the FPs for NP consultation and referral, with little consultation and referral back to the NP". They referred to the development of their current relationship as "by happenstance and not design". FP1-RIS and FP2-RIS "fell into" the pattern of collaboration first started by NP1-RIS and the first FP when the Centre opened in 1993. Within their independent practices, they recognised that there was a group of patients with complex needs who could be better serviced through co-provision of care or a shared approach (action four). They were unclear about how to best do this and needed to develop strategies to support bi-directional consultation and referral (NP to FP and FP to NP). Part of supporting action 4 was developing an understanding of one another's' skill sets including the RN (action one). They identified that the RN position was an essential part of their collaboration and needed to be included in the intervention. They also recognised the need to enhance their service delivery to meet gaps in service (action five).

Major changes in physician staffing occurred during the follow up intervention phase that resulted in major changes in the implementation of the action plan. In January 2000, FP2-RIS left on maternity leave and FP3-RIS assumed her practice, as was anticipated. Unanticipated, however, was FP3-RIS's resignation effective the end of March, leaving the Centre with one FP until August 2000. Action three was altered to support service delivery with reduced staff by reassigning RN and NP functions, and increasing FP access by shortening FP appointment times.

Implementing action four now focused on the establishment of the new NP/FP relationship between NP1-RIS and FP3-RIS, rather than focusing on improving collaboration between practitioners, well used to working together, to deliver more shared care. Strategies were required to support FP3-RIS's adaptation to the Centre's interdisciplinary practice. Strategies were also required to support NP/FP collaboration in view of FP3-RIS's medico-legal concerns related to co-provision of care.

Appendix R contains the Activity Log for the Rural IS. It chronicles the process with the plan and highlights significant observations and activities with each follow-up contact. At the last contact, October 26, 2001, actions one, two, three, and five had been accomplished. Providers, including the RN, had completed their inventory. (See Appendix P Part 3.) Reception triage skills had been strengthened with increased understanding of roles. Policies had been changed to support full vacation relief. RN clinical activities and responsibilities were increased during the period of physician shortage. A part time clinical RN position was created to support RN1-RIS to resume her outreach, health promotion role. Providers were committed to the best use of their skill sets. To meet gaps in service, the NP began a daily two-hour Walk-in service and an outreach clinic for youth, linked to youth social events. A pharmacy service on site was begun. As an unanticipated effect, the resignation of FP1-RIS with her special interest in diabetes, and the increased clinical involvement of RN1-RIS with her diabetes educator certificate, has resulted in a gap in service to the diabetic population.

Action four had not been accomplished related to the original intent to improve bi-directional consultation and referral. Some progress had been made prior to FP1-RIS's resignation. Before her leaving, FP1-RIS had spoken of her intent to increase referral to NP1-RIS by 'returning' stable patients referred to her by NP1-RIS, and sharing diabetic patients.

Medico-legal concerns, related to shared responsibility for care that occurs with NP consultation and referral to FPs of patients unknown to FP3-RIS, and medical delegation to NPs, served as major barriers to this practice's plans for improvement during the intervention time frame.

Providers continue to be open to improving their collaboration. Upon her return in August, FP2-RIS listened to FP3-RIS's medico-legal concerns and began to question past practices. She was reassured by the discussion October 26th. FP3-RIS continues to feel uncomfortable "makes me a bit uncomfortable and I think that NP1-RIS is fantastic I try to reassure her "it's not a reflection on you, it's my discomfort". NP1-RIS has altered her practice by referring patients to FP3-RIS if a referral to a medical specialist is required, and is accommodating to his need to complete his own assessments when consulting. Regarding his adjustment from fee-for-service practice, FP3-RIS has indicated his enthusiasm for interdisciplinary work. "I really enjoy the collaboration with the four of us" "FP2-RIS and I alternate hospital patients so we both know the same patients" "RN1-RIS organises the care" "Work with NP1-RIS is more parallel but we have some shared patients".

A narrative segment from the post interview describes FP3-RIS's ideal collaboration.

Collaborative practice would be I think sharing uh decision making about patients in a patient both the nurse practitioner and the physician knew reasonably well and that in fact share the ongoing care.

As an unanticipated addition, the inclusion of the RN as part of the intervention allowed the investigators to adapt learning exercises to include RN functions and to observe the interaction of these three provider types, FP, RN, and NP. (See Appendices P Part 4 Role Guidelines and Separate and Shared Functions for further details.)

D1.2 Intervention: North Eastern Ontario

Based on the stated purpose for collaboration and assessment of variables that supported or constrained the collaborative practice at North IS, the two NPs and six FPs selected a plan with five actions to improve their collaboration at their site. (See Appendix Q Part 5 Action Plan.)

Actions one, two and three involved learning about one another's roles and the medico-legal issues related to co-provision of care, reflecting the newness of their working relationships. A NP position had been first introduced to North IS, in January 1998. Two new full time NP positions had been created for North IS in July 1999. Thus, at the time of the study intervention, FPs had had some experience working with the original NP, now reassigned to North CS, and respectively 2.5 and 4 months experience with the current NPs. Action five referred to the newness of the NP role from the community's perspective.

Action four is based on the work setting variables. (See Appendix Q Part 2.) The providers chose to focus on one action that they felt was realistic and would have the most impact in the long run. Although assigned full-time to the site, the two NPs were employed by the local Aboriginal health access centre. The six FPs operated their own group practice. Each FP is contracted by the Aboriginal health access centre to give service one day per week to the North IS. Thus, both sets of providers are 'guests' with little input into the running of the clinics. The formation of a provider advisory committee was thus their choice of action to attempt to increase their input and thus improve their opportunity for collaboration.

Major changes in NP staffing occurred during the follow-up intervention period. The local Aboriginal health access centre employed four NP positions, two assigned full-time to service North IS, one assigned principally at North CS, and one to serve two other Aboriginal health centres in the region. In December 1999, NP1-NIS tragically died. In March 2000, the NP assigned to serve the two other Aboriginal health centres resigned. Neither of these positions was filled during the remaining months of the study. These changes had a major impact on the accessibility of NP2-NIS and the FPs to one another. In March, NP2-NIS was reassigned from North IS to the two other Aboriginal sites, markedly decreasing her interaction with the FPs for a three month period. The FPs had applied for and received under-served area funding for a NP position to work with them at a local clinic. NP2-NIS applied for this position and began her new role July 16th. From mid-July until the last contact, September 18th, interaction between the participating providers greatly increased.

The North IS/IS2 Activity Log chronicles the process with the plan and highlights significant observations and activities with each follow-up contact. (See Appendix T.) At the last contact, September 18, 2001, actions one, and three had been accomplished. Collaborative program development, action two, was underway at IS2.

Slow, but steady progress had been made regarding action four. The providers expressed increased hope for the appointment of a provider advisory committee for North IS. The Band Council members and the new Executive Director at North IS were reported to be supportive of such a committee.

Efforts to increase community understanding of the NP role, action five, now focused on the IS2 practice population. The providers reported increasing acceptance of the NP role.

Narrative segments from the pre and post-intervention interviews highlight the changes in the NP/FP working relationships.

Pre-intervention interview: FP4-NIS: Control Story/Collaboration

there are these people out there doing a job that I'm not really at all in touch with/ so/ you know/ it may be sort of a / paternalistic medical thing /but I/ I sort of like to have an idea of what they are doing/ because I perceive it as impacting on my practice/ but I don't know what's going on out there/ and that makes me a bit uncomfortable

Post-intervention interview: FP4-NIS: Values/Control/Collaboration

/but I feel the big big difference is that idea that she is helping me to follow my patients along/ and as a consequence they are getting better service that they did before

Post-intervention interview: NP2-NIS: Values/Control Stories/ Collaboration

I mean there has been (changes) but just because my role has changed/ I'm now part of their practice/ and that's what I mean when I say when it's convenient for them they collaborate/ when I worked in NIS ummm/ the collaboration was a little more difficult/ now that I'm working with them and with their client base it's a lot easier/ and ummm so that what I've I mean that's what I've learned is that (exhale) that collaboration occurs when it's good for them and their practice/ but when they need to collaborate with somebody outside of their practice it's not as easy

D1.3 Control Sites

Qualitative analysis of the pre and post interviews at the two control sites provided a comparison to the process at intervention sites. At baseline NP1-NCS had been working for ten months with two FPs contracted to North CS. Narrative stories highlight that NP1-NCS works 'for' the FPs in a more traditional nurse-doctor relationship. Difficulties with NP retention and recruitment resulted in NP1-NCS spending less time at North CS. Since late spring of 2000, four new FPs had been recruited to join the original FPs' practice.

Post-intervention interview: NP1-NCS: Control / Scope of Practice

I think the last time we met I had had a good year I had spent eleven straight months or ten at North CS/ now the what had happened is last year beginning of 2000 is a problem with NP retention so/ that's when we started to notice a shortage/ which meant that I wasn't in one spot so care became very fragmented/ with me travelling to cover for other NPs' so you're dealing with seven different doctors for one community/ six different doctors for another community/ two other physicians for the far reaching communities/ so I didn't have a really good chance to set up rapport with 15 doctors in this fragmented kind of system.

At the Rural CS the baseline stories reflected the lack of experience with collaboration and the newness of the relationship within a traditional primary care practice. FP1-NCS had been working at Rural CS for six years and FP2-RCS for 2 months. The NP position had been established for 6 months and was filled by a new NP graduate.

Pre-intervention interview: FP1-NCS: NP Scope of Practice

/ none of the staff here had any input into/ or experience working with a nurse practitioner/ therefore we didn't know really how to collaborate within a primary care setting with a nurse practitioner/ ahum it ah/ for what ever reason/ ah the health centre applied for a nurse practitioner/ and got one/ ah I don't think any of us were/ apprehensive or negative about working

with a nurse practitioner/ we/ ah just didn't know the ROLE if a nurse practitioner within our sort of classic/ ah primary care set-up.

The end of study narratives indicate that important differences regarding the nature of collaborative practice and the utilisation of the NP's extended role skill set exist between NP1-RCS and FP1-NCS.

Post- intervention interview: FP1-NCS Ideology/ Values/ Collaboration

Well uh...for I think the missing ingredient when you look at the nurse practitioner joining the collaborative practice/ is the nurse practitioner buying into the idea that the role has a primary group of people that they're responsible for /what we have here is not collaboration but a provider who sees herself as a special consulting service for wellness

D2 Outcome Evaluation Results Intervention

The outcome evaluation results are presented in relation to the objectives for the evaluation as outlined in A1.1, following demographic descriptions of the patients, providers, and the sites. Each objective is addressed by presenting quantitative and qualitative results from various sources as appropriate.

D2.1 Demographic Descriptions

Thirty-five percent of the 400 patients interviewed at pre intervention were male and the remaining 65% were female. Similarly, 36% of the 396 patients interviewed at post intervention were male and 64% female. The average age of these patients was 49 years (the range was from 1 to 93 years) at both pre and post intervention. Among the participants 98% spoke English at home at both pre and post intervention. Sixteen providers completed interviews and questionnaires at both pre and post intervention. Of the twelve FPs and four NPs, 56% were male and 44% were female. The average age of providers was 39 years with a range from 34 to 48 years. Collectively, the providers had an average of 10.5 years of practice experience with a range of 3 to 27 years.

D3 Evaluation of Objectives

Each objective as presented in section A1.1 will now be examined in the context of the project results.

D3.1 Objective 1.a: Comprehensiveness and Appropriateness of Care

Comprehensiveness and appropriateness of care was determined through the analysis of the changes in the types of patient problems addressed by NPs and FPs over time as well as changes over time in the frequency of activity within the five domains of primary care using patient encounter sheet data. In addition, the extent to which providing shared care to patients changed over time was analysed.

Table 4 provides the top five reasons for patient visits by health care provider at both baseline and follow-up. For the intervention site a shift occurred in the use of the skill sets for the NP. The periodic health exam was the main reason for visiting the NP at baseline and post intervention. The periodic health exam made up 36% of the NP visits at baseline, and 21% at

post intervention. Table 4 shows that at the intervention site, the NP was seeing more minor acute illnesses at follow-up than at baseline. In contrast, the NP at the Rural CS saw more patients for the periodic health exam at follow-up (26%) than at baseline (17.4%) and was seeing approximately the same percentage of patients for diabetes mellitus.

Table 4 also shows that physicians at the intervention site saw more patients for chronic conditions such as diabetes and cardiovascular disease than the NP. There were no large shifts in use of skill sets between baseline and follow-up, although periodic health exam visits were no longer in the top five at follow-up for physicians in the Rural IS. Similarly, the Rural CS showed no marked shifts in the types of patients seen by physicians over time.

Table 4: Top Five Reasons for Patient Visits by Health Care Provider and Site at Baseline and Follow-up

BASELINE		FOLLOW-UP	
Nurse Practitioner	Family Physician	Nurse Practitioner	Family Physician
Rural IS			
Periodic Health Exam (35.8%) Acute respiratory illness (10.4%) Reproductive issues (9.0%) Dermatological conditions (7.5%) Unspecified reason (4.5%)	Periodic Health Exam (10.8%) Acute Musculoskeletal conditions (8.2%) Cardiovascular Disease (7.7%) Acute Mental Health (7.7%) Diabetes Mellitus (6.2%)	Periodic Health Exam (20.7%) Acute Respiratory illness (17.2%) Eye/ear/nose and throat (12.1%) Urinary conditions (8.6%) Acute Musculoskeletal conditions (8.6%)	Acute Mental Health (11.0%) Hypertension (8.5%) Reproductive Health Issues (7.3%) General symptoms, fatigue, pain (6.7%) Procedures (6.1%)
Rural CS			
Periodic Health Exam (17.4%) Acute respiratory illness (17.4%) Diabetes Mellitus (15.2%) Hypertension (8.7%) Acute musculoskeletal illness (6.5%)	Cardiovascular disease (11.5%) Acute respiratory illness (7.5%) Acute Musculoskeletal conditions (7.5%) Diabetes Mellitus (6.9%) Chronic Musculoskeletal conditions (6.9%)	Periodic Health Exam (25.9%) Diabetes Mellitus (15.5%) Unspecified reason (10.3%) Dermatological reasons (5.2%) Acute Respiratory illness (5.2%)	Chronic musculoskeletal conditions (8.6%) Diabetes Mellitus (8.0%) Acute respiratory illness (8.0%) Acute musculoskeletal conditions (7.4%) Hypertension (7.4%)

Table 5 Frequency of Primary Care Service Provision by Practitioner and Site at Baseline and Follow-up

Primary Care Service Domain	BASELINE				FOLLOW-UP			
	Nurse Practitioner		Family Physician		Nurse Practitioner		Family Physician	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Rural IS								
Prevention	89	47.0%	149	36.4%	55	35.7%	106	31.5%
Hlth Promotion	16	8.5%	27	6.6%	7	4.6%	11	3.3%
Curative	20	10.5%	50	12.2%	38	24.7%	48	14.3%
Rehabilitative	10	5.4%	90	22.0%	7	4.5%	100	29.8%
Supportive	54	28.6%	93	22.7%	47	30.5%	71	21.1%
	189	100.0%	409	100.0%	154	100.0%	336	100.0%
Rural CS								
Prevention	37	46.8%	18	10.7%	77	57.0%	35	19.3%
Hlth Promotion	2	2.5%	3	1.8%	10	7.4%	8	4.4%
Curative	10	12.7%	38	22.6%	9	6.7%	51	28.2%
Rehabilitative	14	17.7%	101	60.1%	12	8.9%	78	43.1%
Supportive	16	20.3%	8	4.8%	27	20.0%	9	5.0%
	79	100.0%	168	100.0%	135	100.0%	181	100%

Table 5 shows that overall frequency and percentage of primary care service activity by practitioner at baseline and follow-up. For the NP in the intervention site the table shows that at baseline 56% of activity was spent delivering disease prevention and health promotion measures to patients and 11% for curative services. At follow-up the shift in use of skill sets is evident at the Rural IS with 25% of encounters in the area of curative medicine. The Rural CS shows that the NP is doing more disease prevention patient encounters and fewer encounters in the curative and rehabilitative domains. In contrast, physician activity within the intervention site is more or less the same across the five domains of primary health care before and twelve months after the intervention. The Rural CS physicians showed a drop in rehabilitative activity from 60% to 43% with no corresponding adjustment in NP activity.

Table 6 provides another look at patient encounter activity by dividing the number of encounters by full-time equivalent practitioners within the sites to create a ratio of encounters per practitioner. The ratio confirms the same trend of less prevention and health promotion encounters and more curative encounters for the NP in the Rural IS from baseline to follow-up. For the Rural CS, Table 6 confirms that the NP is doing more disease prevention encounters at follow-up than at baseline and little of anything else.

Table 6: Overall Frequency of Primary Care Service Provision and Ratio of Services Performed per Practitioner by Site at Baseline and Follow-up

Primary Care Service Domain	BASELINE				FOLLOW-UP			
	Nurse Practitioner		Family Physician		Nurse Practitioner		Family Physician	
	Count	Ratio	Count	Ratio	Count	Ratio	Count	Ratio
Rural IS								
Prevention	89	89.0	149	74.5	55	55.0	106	58.89
Hlth Promotion	16	16.0	27	13.5	7	7.0	11	6.11
Curative	20	20.0	50	25.0	38	38.0	48	26.67
Rehabilitative	10	10.0	90	45.0	7	7.0	100	55.56
Supportive	<u>54</u>	<u>54.0</u>	<u>93</u>	<u>46.5</u>	<u>47</u>	<u>47.0</u>	<u>71</u>	<u>39.44</u>
	189		409		154		336	
Rural CS								
Prevention	37	61.67	18	18.0	77	128.33	35	35.0
Hlth Promotion	2	3.33	3	3.0	10	16.67	8	8.0
Curative	11	18.33	38	38.0	9	15.0	51	51.0
Rehabilitative	14	23.33	101	101.0	12	20.0	78	78.0
Supportive	<u>16</u>	<u>26.67</u>	<u>8</u>	<u>8.0</u>	<u>27</u>	<u>45.0</u>	<u>9</u>	<u>9.0</u>
	79		168		135		181	

Table 7: Site Comparison of In-house Referrals by Practitioner Seen at Patient Encounter for Baseline and Follow-up

In-house Referral	Baseline				Follow-up			
	Rural IS		Rural CS		Rural IS		Rural CS	
	Patient Seen by		Patient Seen by		Patient Seen by		Patient Seen by	
	FP	NP	FP	NP	FP	NP	FP	NP
FP	74	10	75	17	87	5	130	17
	71.8%	18.9%	97.4%	50%	89.7%	8.6%	98.5%	65.4%
NP	14	36	3	16	7	50	3	13
	13.6%	67.9%	3.9%	47.1%	7.2%	86.2%	2.3%	50%
RN	4	5	0	5	3	3	0	9
	3.9%	9.4%		14.7%	3.1%	5.2%		34.6%
Other	26	5	1	1	7	1	1	4
	25.2%	9.4%	1.3%	2.9%	7.2%	1.7%	.8%	15.4%

Columns add to more than 100% due to multiple response.

Table 7 shows the proportion of patient encounters requiring a follow-up visit and referred to another practitioner within the practice pre and post intervention. At baseline when patients are seen by the FP the follow-up visit referral is primarily to themselves 72% and 97% the time at the Rural IS and Rural CS, respectively. At follow-up, this pattern of self-referral among physicians remains substantially unchanged post intervention. In comparison, NPs refer their patients to

themselves for a follow-up visit 68% and 47% of the time depending on site at baseline and 86% and 50% of the time post intervention. The Rural CS remains unchanged with regard to follow-up referrals over time. However, Rural IS shows an increase in the NP referring patients to herself. Bi-directional referral patterns are less evident post-intervention.

Table 8: Intervention and Comparison Site Mean Scores on Appropriateness of the Nurse Practitioner (NP) and Family Physician (FP) Roles for Nine Patient Vignettes at Baseline and Follow-up

Vignettes (Davidson & Lauver)	Baseline				Follow-up			
	NPs		FPs		NPs		FPs	
	Self	FP	Self	NP	Self	FP	Self	NP
Intervention								
1 NP	7.0	3.0	4.9	5.4	6.5	4.5	5.9	6.1
2 NP	7.0	3.0	5.3	4.4	7.5	5.5	5.9	6.3
3 NP	7.0	3.0	5.8	5.4	4.0	8.0	7.0	5.0
4 FP	3.0	7.0	5.0	5.6	4.5	6.5	6.1	6.4
5 FP	5.0	3.0	7.2	4.2	5.0	7.5	6.8	4.5
6 FP	5.0	3.0	7.3	3.2	5.0	6.5	6.9	4.4
7 Mixed	7.0	3.0	4.2	6.7	7.5	3.5	5.4	6.5
8 Mixed	6.5	3.0	5.2	4.9	6.5	5.5	6.1	5.4
9 Mixed	7.0	3.0	5.0	5.3	7.5	3.5	6.3	5.8
Comparison								
1 NP	6.0	4.3	5.5	7.3	7.0	3.0	6.3	7.0
2 NP	6.7	5.0	6.5	7.3	7.0	5.0	5.5	6.5
3 NP	7.3	4.3	6.3	7.8	7.0	4.0	6.0	6.0
4 FP	5.0	6.0	7.3	6.3	3.0	7.0	5.8	6.3
5 FP	6.0	6.7	6.5	5.8	4.5	7.0	7.5	3.8
6 FP	4.0	7.7	6.5	6.0	1.0	8.0	7.8	4.5
7 Mixed	8.0	3.3	6.5	7.3	7.5	1.0	5.8	7.0
8 Mixed	5.3	5.7	6.3	6.8	6.5	6.5	7.5	5.3
9 Mixed	6.3	4.7	6.8	7.0	7.0	3.0	6.3	6.8

0 – ‘Highly Inappropriate’ to 8 – ‘Highly Appropriate’

D3.1.1 Appropriateness

Appropriateness of care was also determined through analysis of the provider questionnaire responses, in particular to questions about role appropriateness for nine patient vignettes. (See Appendix G FP Questionnaire part 3 for vignette descriptions) Davidson and Lauver’s (17) work on role perceptions of NPs and physicians was used for the interpretation of the results.

The small number of participating providers prevented tests for significant differences between providers’ pre and post intervention. Table 8 reveals that for NP providers in intervention practices patient vignettes 1, 2, and 3 judged to be appropriate for NPs show that NPs rate themselves as the most appropriate provider for the patient and the FP as the least appropriate. Rating of FPs as least appropriate is given to all vignettes except for vignette 4. At follow-up however these ratings vary with less distinction between the FP and the NP as being the most appropriate. Intervention FP appropriate ratings do not change substantially between pre and post intervention. In contrast, NP providers in comparison sites rate appropriateness at follow-up clearly within the areas judged to be appropriate for NPs and FPs. Again, FPs in comparison sites tend to view all patient vignettes as appropriate for them.

The providers identified multiple variables that they considered when defining “appropriateness” in their responses to the post intervention open-ended question. All providers assessed each

vignette according to its degree of medical complexity. Appropriateness was then assigned based on the discipline’s scope of practice (7 responses), the ability of the NP to make the initial assessment and then consult or refer to the FP (4), the best individual provider based on experience (10), the need for health education (1) and the most effective use of the resource (1).

D3.2 Objective 1.b: Patient Satisfaction

Table 9 depicts patient satisfaction pre and post intervention for seven attributes of satisfaction for the one intervention and one comparison site where patient questionnaires were administered at both baseline and follow-up. Lower scores equate to greater levels of satisfaction. Overall, patients report high levels of satisfaction between groups and over time. There are no significant differences between groups. However, there is a trend towards higher levels of satisfaction on all satisfaction scales at follow-up for both intervention and comparison sites. Overall, 75% of patients in the intervention site and 76% of patients in the comparison site are ‘very satisfied’ with the health care they have received at baseline. At follow-up, 76% of patients in the intervention site and 78% of patients in the comparison site are ‘very satisfied’.

Table 9: Intervention and Comparison Site Mean Patient Satisfaction Ratings for Seven Elements of Satisfaction at Baseline and Follow-up

Satisfaction Scale Item	Baseline	Follow-up
Intervention	(n=200)	(n=196)
Accessibility	1.43	1.39
Communication	1.42	1.34
Integration	1.53	1.50
Affective/Caring	1.38	1.32
Competency	1.43	1.35
Quality	1.44	1.36
Health Promotion	1.89	1.72
Comparison	(n=200)	(n=200)
Accessibility	1.58	1.56
Communication	1.41	1.38
Integration	1.59	1.45
Affective/Caring	1.38	1.37
Competency	1.46	1.44
Quality	1.43	1.38
Health Promotion	1.92	1.73

1 – ‘Very Satisfied’ to 5 ‘Very Dissatisfied’

Some 95% of patients at baseline reported that they were asked about their lifestyle in intervention sites and 89% in comparison sites at baseline. At follow-up, 93% of patients in intervention and comparison sites were asked about their lifestyle. Sixty-seven percent of patients in the intervention site and 62% of patients in the comparison site reported that they were asked about their life circumstances at baseline. At follow-up, 70% of intervention site patients were asked about life circumstances compared to 57% of the comparison site patients (p =.009).

Patients were also asked about duplication of services at the centre. Twenty-five percent of intervention site patients and 6.0% of comparison site patients indicated that they perceived duplication of services at baseline (p < .001). In contrast, at follow-up only 2% of intervention

site patients and 3.5% of comparison site patients reported that they perceived duplication of services.

D3.3 Objective 1.c: Provider Satisfaction

D3.3.1 Provider Collaboration Surveys

Provider satisfaction was measured by the providers' level of collaboration and their satisfaction with that collaboration. Providers rated their level of disagreement with level of current collaboration both pre and post intervention on nine, seven item Likert scales where higher scores meant that they disagreed that they planned together, communicated openly, shared responsibility, co-operated in making decisions, co-ordinated implementation of a shared plan, demonstrated trust in the other's decision making, respected the other's knowledge and skills, and fully collaborate in decisions about patient care (See Appendix G Part 2 for description of the items). Figure 1 shows the mean collaborative scores (average of nine items combined) between intervention (n=10) and control providers (n=6). At baseline intervention and control providers "somewhat" agree that they currently collaborate. However, at follow-up intervention providers have moved towards agreement that they collaborate whereas providers in comparison sites have moved towards neither agreeing or disagreeing that they collaborate ($p = .071$).

Figure 1: Mean Level of Disagreement on Collaboration between Intervention and Comparison Site Providers at Baseline and Follow-up

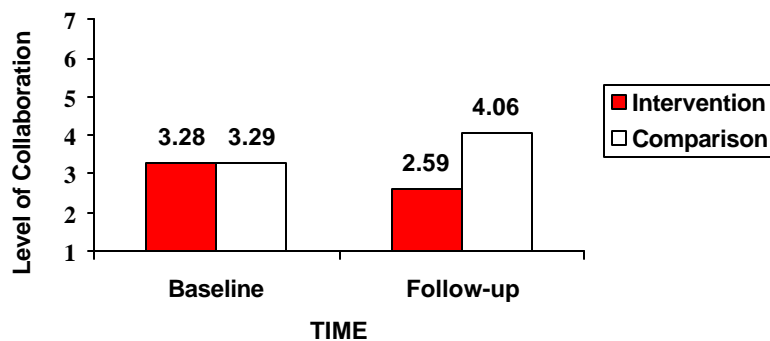
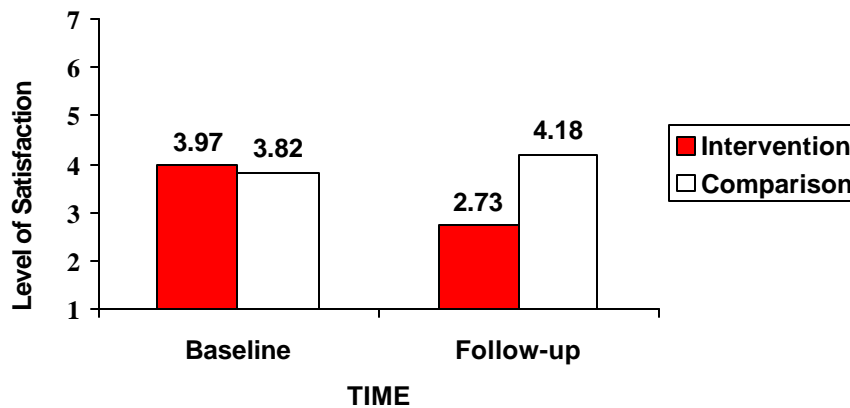


Figure 2 is the mean level of satisfaction with their current experience with collaboration. Satisfaction scores are a composite of a total of eleven 'seven item' Likert scales where providers rate their level of satisfaction as very satisfied to very dissatisfied (For further details see Appendix G). Lower overall scores represent higher levels of satisfaction. Providers in the intervention (n=10) and comparison sites (n=6) rate their level of satisfaction with the collaborative experience as neutral at baseline. At follow-up, intervention providers are more satisfied with their collaborative experience whereas providers in comparison sites have shifted towards more dissatisfaction. ($p = .064$)

Figure 2: Mean Level of Satisfaction with Collaboration between Intervention and Comparison Site Providers at Baseline and Follow-up



D3.3.2 Provider Interviews

Narrative analysis of the pre and post-interviews describe the providers' collaborative practice. Five event categories included stories about the supports and constraints of collaboration, the participants' professional qualifications and work experience, experiences related to health promotion and disease prevention, consultation and referral events, the circumstances of the practice setting, and triage events. Four linked story meanings were identified. These meaning categories included stories about the NP scope of practice, the competence of NP practice, the control of the participants' practice and the distinctions in practice and values between NPs and FPs.

The results of the second reader's review of the pre and post- transcripts compare with those of the first reader. Both readers identified the same number of total stories with the pre-transcripts reviewed (100% agreement). For the post-transcripts reviewed, the second reader identified 147 stories compared to the first reader's 159 stories for 93% agreement. A cross section of stories where there was story category disagreement was selected by the investigators and discussed with the two readers. Each reader could see the other's rationale for selection for all stories reviewed.

The identified stories told by the participants shed light on the NP's and FP's understanding of the meaning of working in a collaborative NP/FP primary care practice and on provider satisfaction with that collaboration. In the initial interviews NPs and FPs told stories about the scope of NP practice, the competence of NPs within each practice, the control both NPs and FPs had over their practice, and the place of health promotion and disease prevention within each practice. In the second group of interviews, the NPs and FPs again told stories about the scope of NPs' practice, the competence of NPs within each practice, and the control both NPs and FPs had over patient triage. In contrast, however, a final group of stories in these second interviews, centred on the structure of the collaborative practices in general and values/ideologies that affected collaborative practice. Most importantly, the stories highlight the differences in the NP/FP collaborative practice between the intervention and control sites after implementation of the Structured Outreach Intervention.

In the scope of practice stories participants in both groups of interviews described the work of NPs in relation to FPs. In the initial interviews these stories, usually told around consultation and

referral interactions, highlighted the FPs' confusion regarding the NP role and illustrated the parallel, independent, and/or hierarchical structure of the models of practice identified in each site.

In the second group of interviews these stories, again usually told around consultation and referral interactions, demonstrated that appropriate consultation and referral behaviour demonstrating a clear knowledge of the boundaries of a NPs' practice was used by FPs as a proxy for competence. That is, NPs at the conclusion of this study were considered competent *because* they practised within their scope of practice. Physicians judged the NPs as competent because they were confident that these practitioners *would appropriately consult* and/or *refer* with the physician for care outside of their scope of practice. Similar to the initial interviews, FPs from both the control and intervention sites indicated that, in contrast to NPs, they rarely consulted with NPs in their clinic. In addition, it is important to note that the stories told by practitioners in the intervention sites appeared more frequently to positively address the actual ongoing positive collaborative practice that the participants were presently engaged in.

In the initial interviews a number of the stories told in response to questions about educational preparation, practice background, and consulting and referral practices, centred on the competence of the NP, competence stories. In their background stories, NPs usually represented their educational and practice information as a sign of competence. In their consulting and referral stories these participants described their expectation of functioning in collegial partnerships with FPs. However, in three of the four sites, NPs suggested that they worked in more traditional hierarchical relationships, continually needing to demonstrate their competence. Competence stories told by FPs suggested that the FPs were either unsure about or uncomfortable with the legal responsibility and professional liability of NP/FP collaborative practice.

In the second interviews, questions about the participant's educational preparation and practice background were not repeated. Nevertheless, in response to questions about their collaborative practice, interactions within the collaborative relationship and changes in the clinical practice, participants again talked about the competence of the nurse practitioner. As indicated in the scope of practice stories for FPs in a collaborative practice, competence, in part, was related to a perception of reliability that the NP recognised and worked within the specified scope of NP practice. By juxtaposing time, experience, and practice structure in their stories, the FPs also emphasised their perception that the establishment of effective collaboration is evolutionary. However, there is a "learning curve". All participants suggested that their perception of a NP's competence was related to previous practice experience. In addition, intervention site participants associated an increased perception of NP when NPs and FPs had the opportunity to work side by side in the same clinic setting.

In the initial interviews control stories told by NPs and FPs describing the client assignment practices that occurred across the research, focused attention on the importance of this process for these participants in the development of their individual professional practice. These stories indicated that NPs and FPs were generally not involved in the triage decision making process within the clinic. The initial interview FP control stories suggested that control of patient assignment was reflective of the administrative control of the entire clinic. Physicians who had limited input into the management of the work setting itself suggested that, although it was professionally inappropriate, it was not surprisingly, therefore, that they had little control over client assignment, the development of their individual practice and the collaborative partnership.

Control stories told by NPs and FPs in the second group of interviews again described the client assignment practices that occurred across the research sites. As in the initial interviews, these stories demonstrated that some NPs and FPs were unsure and generally not involved in the triage decision making process. All participants, nevertheless, appear to acknowledge the right of the patient to select a care provider. In one intervention site, the triage process has now been formally delegated to the receptionists and/or nursing staff. However, it is clear that the stories told in the second group of interviews, in both the control and intervention sites, do not appear to embody the same issues of professional practice control as evidenced in the initial interviews.

In the initial interviews, role distinction and values stories served a particular function in defining the differences in the health promotion and disease prevention behaviour between the NPs and FPs in this study. By definition primary health care practice implies a broad scope of health promotion and disease prevention practice for both practitioner groups. Characteristically, health promotion and disease prevention behaviour for NPs involved population and group interventions, whereas, FPs consistently represented their role in health promotion and disease prevention within the context of individual client interactions. The health promotion and disease prevention stories also suggested a difference in values between NPs and FPs. Stories about the creation and conducting of community programming demonstrated the NPs' perception of the fundamental value of this element of health care practice for them. FPs, however, described health promotion and disease prevention as a valued but secondary component of their practice.

In the second group of interviews, participants were not asked about health promotion behaviours within their clinics. However, in answer to questions about their collaborative practice consultation and referral, decision making, changes in their clinic practice since the initial interviews, and their definitions of collaboration, participants told practice structure and values/ideology stories. These stories in both the control and intervention sites suggest that there are factors that can negatively and/or positively impact any form of collaborative practice. These factors were presented as either structural or ideological supports or barriers. The participant stories emphasise the need to address these factors if NP and family physician collaboration is to be effectively implemented. For example, in the control sites where ideological issues had not been addressed it was clear that collaborative practice was minimal. However, in both intervention sites where formal discussion had occurred regarding NP/FP collaboration a clear, albeit individualised model of collaborative function was instituted and embraced by both NPs and FPs.

D3.4 Objective 1d: Role Guidelines

Each of the intervention practices identified the lead and support roles based upon their goals for collaborative practice for each of the primary health care domains. (See Appendix P and Q Part 4 Role Guidelines) The rural intervention site identified the split between lead and support roles for disease prevention as 50/50, acute episodic illness as 50/50, minor injury as 50/50, and acute complex illness and major injury as entirely the physicians' responsibility. The Table 10 in Appendix U provides the percentage breakdown across sites between NP and FPs for each of the primary care health domains. Prior to intervention the NP in the rural practice was performing episodic illness care 38% of the time and the physician 62% of the time. Minor injury was 19% covered by the NP and 81% covered by the physicians. At post-intervention, patient encounter data reveals that the NP and the physicians in the rural intervention practice are evenly split (i.e., 50% and 50%) in the provision of episodic illness care and care for minor injuries. Physicians provide 100% of the care for complex cases. Disease prevention services were unchanged at approximately 35% NP and 65% FP. Similarly, NPs and FPs had set a goal

to share the ongoing treatment and care for rehabilitative services, but the NP was only providing 20% of this care compared to the FPs at 80%.

The NPs and FPs of North IS showed similar progress in meeting their goals for improved collaborative practice. (See Appendix Q Part 4.) Unfortunately, the aboriginal health centre included in the site withdrew permission to release the baseline patient data so no details can be given. However, the NP and the FPs had set as targets 50/50 involvement for disease prevention services, episodic illness care, minor injury care, and monitoring of stable chronic illness. The practice had maintained its shared goals for disease prevention and met its goals for episodic illness and minor injury as well as monitoring of stable chronic illness. As agreed to in their plan, physicians provided the entire complex illness care and the initial diagnosis and treatment for rehabilitative care. The NP also improved the treatment and adjustment of chronic illness care as described in the goals for collaborative practice. In comparison, the rural practice where no intervention took place did not shift in service provision between the NP and FPs from pre to post intervention.

D3.5 Objective 2a: Student Intervention

Correct responses given for the nine true and false and multiple choice questions are as follows: pre-test 2/9, 6/9, 7/9 and 5/9; post-test 7/9, 9/9, 7/9 and 8/9. As with the providers, the small number of students makes analysis of the appropriateness items difficult. FMRs identified the NP as inappropriate for all 3 FP vignettes at post-intervention; SNP1 identified the NP as equally appropriate for two and more appropriate than the FP for one; SNP2-NIS identified the NP as less appropriate for two and more appropriate than the FP for one. FMRs, as did the FPs, identified themselves as appropriate for all vignettes, pre and post intervention. For the NP vignettes, the SNPs identified the NP as most appropriate post-intervention; FMR1-NIS identified the NP as less appropriate for two and most appropriate for one; FMR2 identified the NP as less appropriate, equally appropriate and more appropriate. Pre-interview definitions of collaboration for all students included phrases regarding “team work” and “sharing care to benefit patients”. Post-interview definitions for all were more expansive and included process details. At post-interview, both SNPs examples for NP and FP referral are more specific. SNP1-NIS identifies consultation with FPs both pre and post-interview as “when outside my scope of practice”; FP consultation with NPs pre and post-interview reflect her continued belief that “it doesn’t happen”. SNP2-NIS with 20 years of RN experience gives examples of FP consultation with NPs that reflect her confidence as a nursing resource both pre and post-interview. FMR1-NIS’s examples post-intervention are more specific; examples regarding FP consultation and referral to NPs specify “because NP has more time”. At pre-interview, FMR2’s examples indicate confusion regarding the NP’s role in diagnosis and treatment versus the RN role; referral examples to the NP are phrased as “delegation”; post-interview examples correctly reflect the NP’s extended role.

Journal examples indicate that all students were able to document collaborative incidents and to identify and measure the degree of each collaborative element. (Appendix V Journal example)

During the post intervention discussion, both FMR-SNP pairs spoke positively of the relevance of the content and their change in understanding of and attitudes toward collaboration. They made recommendations regarding placement of the content in their respective curriculums and stressed the importance of having mentors versed in the language of collaborative practice. As part of the project’s second objective, the intervention providers’ ability to teach collaboration and the impact of structured collaboration on the possible retention of health practitioners were not evaluated.

D3.6 Objective 3: Sustainability

Sustainability of the intervention was determined through summary of key informant data (Appendix X), information obtained from preliminary dissemination, surveys of Family Medicine and Nurse Practitioner education programs in Canada (57) and from experiences of the team in completing the project.

D3.7 Objective 3.a: Partnerships for Future Development of Structured NP/FP Collaborative Practice

For innovation in health care service delivery to occur in any community, full consultation and participation is required at all stages of a project's development. As the supply of NPs in Canada is not extensive, the interface where NP's and FPs meet is determined largely by the NP's geographical location. For the most part, in Canada this means a community supported structure such as an aboriginal health access centre or a community health centre. Consultation with these groups needs to begin meaningfully in the early stages of program development. Since the basis of structured collaborative NP/FP practice models involves comprehensive primary health care, such consultation needs to involve as broad a cross section of the community as possible.

Many of the communities in Canada where NPs practice with FP support are in remote locations. Our experience shows that partnerships with parties involved with technology development and implementation are necessary to support structured collaborative practice.

By definition collaboration in health care involves an inter-disciplinary approach to service delivery. Involvement of multiple disciplines should occur in the early planning stages with each discipline as an equal partner. For structured NP/FP collaboration in a primary health care setting, this involves Nursing and Family Medicine. It is important that at any given site of primary health care delivery all disciplines present be involved. This is crucial to determining the appropriate contribution of each discipline to the care of the population being served by this group when operating in an NP/FP collaborative framework.

Both federal and provincial policy planning in primary health care provision needs to occur with professional bodies for FPs and NPs. National, provincial and territorial professional bodies and health policy commissions have called for the more effective utilisation of NPs in primary care (10;11;58-74). The College of Family Physicians of Canada makes a strong recommendation for collaboration between NPs and FPs in interdisciplinary integrated teams. This recommendation was presented by the College as part of a national strategy released in October 2000 to create Family Practice Networks (10).

D3.8 Objective 3.b: Obstacles to the Development of Sustainable NP/FP Practice Opportunities

Government needs to encourage the development of sustainable alternative models of practice organisation other than the traditional fee for service model. This is supported by many organisations, both community and professional, including those mentioned in a) above. The College of Family Physicians of Canada, in their description of Family Practice Networks, encourages the use of NP's and other primary health care providers to their full scope of legislated practice (10).

As our health care system begins to examine alternative models of primary health care delivery, the role of collaboration to improve the comprehensiveness and efficiency of service needs to be facilitated, supported and monitored for quality assurance purposes. This will require the development and distribution of a 'tool box' of resources including the availability of ongoing active support. A mechanism for monitoring the progress of the development of collaboration and its evaluation within primary health care delivery models is essential.

Our survey about the teaching of collaboration showed that there was no active teaching in this area in any of the sixteen Canadian Family Medicine Education programs (57). There is a desire to pursue discussion in this area with their Nursing colleagues but no active plans were apparent in our survey. A co-ordinated educational approach between Nursing and Medicine is desirable for many reasons. It is recognised that more effective utilisation of limited professional resources in under-serviced areas decreases professional stress levels, promoting better retention and recruitment of the service providers.

Systemic obstacles for collaboration exist beyond the education of the involved health professionals. These include jurisdictional issues, lack of policy development in nursing and medicine's respective associations and regulatory bodies, clarification of the medico-legal implications of joint decision making inherent in collaborative models of care, and creative strategies to appropriately utilise technology to minimise the impact of geographic separation of nurses and physicians where this exists in delivering primary health care. A key obstacle is sustained and available funding that provides incentive for FPs and NPs to collaborate with the goal of maximum utilisation of their respective full scopes of practice. This could include adjustments to the provincial remuneration systems to encourage FPs to collaborate with NPs as an initial step. It is recognised that alternatives to fee for service are necessary to fully realise the potential of the FP/NP collaborative relationship. Strategies to address all these obstacles are essential for successful development of collaborative interdisciplinary working environments in primary health care. This is an area of international need where Canada can demonstrate leadership.

It is recognised that a co-ordinated plan for public education needs to focus upon the development of the public's awareness of the potential benefits of FPs collaborating with NPs to deliver primary health care. As consumers of these services, the public needs to better understand the roles of these two health professionals. With improved understanding, the public will be better able to partner with these primary health care providers in obtaining care. It is this partnering with the client, whether it is a community, an interest group, a family or an individual seeking care, that holds much potential to maximise the power of any collaborative undertaking within the primary health care system.

D3.9 Objective 4: Use of Telehealth Technology

In the initial development of this project telehealth technology was proposed to have a significant role in connecting the study sites with the research team at the University of Ottawa. The vision was to connect existing telehealth capabilities in two of the originally proposed study sites (Saskatchewan and Nunavut) with new equipment in Ottawa jointly funded by our project and the Sisters of Charity of Ottawa Health Services, where our project office was located and in one other study site in Northern Ontario funded through a group of partners lead by FEDNOR, the federal agency responsible for economic development in Northern Ontario. It was anticipated that creating such a network would facilitate the transfer of project and clinical information to assist the researchers in implementing the project intervention, monitoring the site collaboration plans and assist each site where necessary with troubleshooting project problems.

As well the presence of the network would allow the sites to develop other clinical partnerships to assist them in meeting their primary care support needs.

Considerable logistical problems beyond the control of the project team resulted in only the North intervention site being able to establish telehealth services to link with Ottawa. Implementation delays in Northern Ontario further limited the usefulness of this technology to the project. The initiation of the structured collaborative intervention was completed without the use of telehealth. Its use was limited to the support of the collaboration plan developed in the initial phase. It was also used for implementation of the student curriculum at the Northern Ontario study site. There was also consultation with the administrator in that study site as to how best to develop their use of the telehealth technology to meet other clinical needs. Possible clinical support contacts in the Ottawa telehealth network were explored. Appendix W details the chronology of our project experience in this area.

Our experience has caused the project team to reflect upon what key factors need to be in place to foster success with this type of information technology. Not only are administrative and technical support key features of a successful integration for clinical purposes but also 1) clearly identified clinical needs, 2) initiation of the technology in clinical areas with immediate need as identified by the health care providers 3) begin with a clinical area that is easily deliverable and showcases the potential utility of the technology (i.e., to show how telehealth can reduce the clinical team's workload and increase the quality of the care delivered) 4) there is a need to identify a local "champion" for the technology within the professional team and 5) there must be a willingness on the part of the local community to support the implementation of information technology in the delivery of health care to their community.

SECTION E DISCUSSION

This pilot of the structured NP/FP collaborative practice has provided a great deal of information on the development of an educational program for NPs and FPs to work collaboratively. The evaluation has provided information on the intervention and has pointed towards where the success and impact from the intervention may be found. According to Kolbe (75), "the impact of an intervention program is a product of participation, program effectiveness, and fidelity". The discussion will address each of these elements for the structured NP/FP collaborative model of care.

E1 Participation

This program encountered difficulties in the recruitment and the retention of practice sites. Four of the six aboriginal practice sites originally approached declined to participate and two of the four practice sites that agreed to participate did not continue to the end of data collection and withdrew their participation all together. The reasons for the problems in recruitment and retention of sites are understood to be directly related to the lack of understanding of the time commitments involved in securing participation and in approaching sites in such a manner as to make the research truly participatory.

Recruitment at the community level began in earnest after proposal development and funding approval. Written agreements that detailed mutual expectations of the project from the sites were not obtained. In addition, the process for obtaining approval in aboriginal sites and extensive time needed to complete that process, were not fully understood by the project team

prior to recruitment. Project sites were located at a distance from the project team necessitating more indirect versus face-to-face communication. As a consequence, aboriginal sites did not readily recognise the value of the project to their situation and needed to be educated about the potential benefits. Without the foundation of a relationship with the research team members, communication was not always clear and misunderstandings about the research and its impact on the community developed. In aboriginal sites participation can be made successful if the community is accepting of the research project and a strong relationship has been developed with the researchers before study implementation. Participation can be further enhanced if a community liaison with intimate up to date knowledge of the study is present in the community and ideally is a member of that community.

The two rural community health centres participated fully in the study. Factors that supported their full participation are as follows: common to all Ontario community health centres is a culture and a commitment to interdisciplinary service delivery; and, although recruited late in the pre-operational phase of the study, the community boards and administrators at both sites readily recognised the potential positive impact of the project to their specific service delivery and to the Community Health Centre sector as a whole.

In contrast to the experience of recruiting the participation of community intervention sites, initial recruitment at the provider level was very successful. All practitioners agreed to participate. One NP tragically died and one FP resigned during the study period. The remaining FPs and NPs at all four sites participated fully through out the study. Factors that supported this included: providers engaged in new relationships and/or recognised a need to improve their collaboration; the format and content of the learning module was selected to be relevant to their practice and to involve as little time to complete as possible; the learning process engaged each group in its own discussion and problem solving to determine their own realistic action plan resulting in a sense of ownership; follow up contacts continued to ensure provider involvement; lead investigators were recognised mentors in collaboration. In addition, at the control sites the promise of the intervention post study was viewed as important.

Four students volunteered to participate in the pilot of the Postgraduate Student Learning Module. All the students completed the intervention and participated fully.

E2 Fidelity

Quality of implementation of an intervention even among very competent educators is a problem for ensuring program effectiveness. In order to ensure that the outcomes of this intervention could be attributed to the work of the intervention itself; the evaluation systematically monitored the delivery of the intervention in order to document the extent to which the intervention happened as planned. The intervention involved 1) the education of participating providers on structured collaboration, 2) the development of an action plan tailored to the needs of participants to build collaboration, 3) monitoring of the implementation of the action plans; and 4) providing positive feedback and advice on the constraints and supports to collaboration. The following summarises the findings from the evaluation of program implementation.

E2.1 Education

The content of the education was tailored to the needs of the practice through consideration of practice setting variables, shared and separate functions, lead and support roles, and tools for self-assessment. Providers offered suggestions freely and tools were adapted to increase relevance to their practice. Content was flexible enough and sufficiently complete to be used

with both experienced and inexperienced providers although lead and support guidelines for overall practice were more easily recognised by experienced providers.

Review of the work books indicated a variation in the completion of practice and reflective exercises, as would be expected from adult learners. All providers however completed the required exercises necessary for the small group discussions, and providers were consistently engaged during the discussions. Intervention and follow up group discussions encouraged open dialogue and joint problem solving, thus, engaging the providers in a collaborative experience. Discussion and decision making was based on equality of contribution and not hierarchy; and on taking shared responsibility for decisions made and their implementation. The involvement of facilitators experienced in collaborative practice was key to implementation.

The learning module objectives: ability to assess, plan for and evaluate actions to improve their collaborative practice were achieved at both sites. The time frame for the intervention was appropriate.

E2.2 Action Plan Achievement

The action plan objectives developed by each of the sites remained the same during the intervention. However, the strategies for attaining those objectives varied based on major changes occurring at both sites, and the strength of work setting and jurisdictional constraints. At one site decreased physician staffing, the establishment of a new NP/FP relationship, and medico-legal concerns regarding co-provision of care when the patient was unknown to the new FP influenced their plan implementation. At the second site, decreased NP staffing and relocation of the NP to a new site while continuing to work with the FPs influenced their plan implementation.

Monitoring of action plans was better achieved at the site where a key contact for each action was identified. One intervention site accomplished four out of five action goals. The providers remain committed to accomplish the fourth action related to co-provision of care for complex patient situations. In the other intervention site two out of five action goals were achieved. The action concerning joint learning on a specific patient care program and the action on community acceptance of NP role have been refocused to the new practice setting. Slow but steady progress is being made related to action four concerning the improvement of administrative support for collaborative practice at the original site.

The fidelity of program implementation was effected by variables within the practice setting beyond the collaborative relationship between NPs and FPs. Work setting and jurisdictional factors were identified as constraints to collaboration in the development of action plans. These constraints may have had a negative influence on the intervention outcomes. The learning module focused on improving collaboration by attending to the practice setting variables and identifying role guidelines, not on setting practice goals based on best practices or patient outcomes.

In regard to the postgraduate student intervention, the content of the learning module was tailored to meet the needs of students involved in role acquisition. These students completed the work book exercises and all the required readings. Furthermore, they participated fully in the small group discussions, making insightful contributions and asking relevant questions. They especially valued facilitation of the discussion by providers experienced in collaboration.

The original intervention plan called for the students to work together in a clinical setting under the supervision of both a NP and a FP involved in the provider intervention. Unanticipated changes in NP staffing resulted in minimal opportunity for the first student pair to work together and for a planned placement of summer students to be cancelled. At the urban community health centre, changes in scheduling meant this NP/FP dyad also had little chance to work together.

The students unanimously agreed that the opportunity to jointly discuss 'role differentiation' was more essential than to work together clinically. Both FMRs found it "artificial" to have student NPs consulting with them. However, all the students felt it more important to have the opportunity to work clinically with a NP and FP experienced in collaboration.

SNP1-NIS participated at the beginning of her therapeutics course; SNP1-UCH during her integrated practicum after formal coursing had been completed; FMR1-NIS was in mid-first year residency and FMR1-UCH2 at the end of the first year of residency. When the students were asked the most appropriate placement for this course content in their programs they recommended it for the integrated practicum for the NP students and at the end of first-year or into the start of second-year for family medicine.

The Curriculum Advisory Working Group made the decision to extend its mandate beyond support for the research project and to move toward integration of content on collaboration into Ontario Family Medicine and Nurse Practitioner programs.

E3 Program Effectiveness

The focus of this pilot study was mainly on program feasibility rather than efficacy. The small sample size especially after attrition was not adequate for detecting all the effects of the intervention. However, findings indicate that important changes occurred at the intervention site. Patient encounter data indicates that the NP assumed increased responsibility for curative activities. As the NP took on more complex care of patients, referral to the FPs who traditionally deal with issues of complex care decreased; whereas the FPs did not change their in-house referral patterns over time. As well, the scores of intervention NPs regarding appropriateness of the role of the NP also showed a change overtime with less distinction regarding the appropriateness of the role between themselves and the FP after the intervention. Finally, adoption of the agreed to role guidelines between NPs and FPs was successful in the intervention practices. One practice showed achievement of goals in the rehabilitative, curative and preventive areas while the other showed achievement in the curative service area.

In contrast, the NP in the comparison site saw patients predominantly for periodic health exams. The provision of preventive services by the NP increased over the time and involvement in rehabilitative, curative and supportive care decreased. Opinions on role appropriateness did not change. Furthermore, in-house referrals to the FPs increased, even though care was less complex, and follow-up referrals to self remained similar. This is opposite to the collaborative experience at the intervention sites where NPs increased use of their extended role skill sets. In contrast, the NP at the comparison site increased involvement in traditional RN services with less utilisation of the extended role skill set.

FP practice patterns and opinions on role appropriateness at both intervention and comparison sites remain essentially unchanged. Intervention site FPs collaborated to encourage NPs to take on an extended role. Pre and post intervention stories reflect FP increased perception of NP competence.

Provider self-reports of satisfaction with the collaborative experience, and the extent to which agreement that the 'seven elements of collaboration' exist, show substantive changes from baseline to follow-up. As supported by the shift in practice patterns, providers in the intervention sites are more satisfied and agree that collaboration exists as compared to providers in the control sites which report less satisfaction with collaboration. Providers benefited from the intervention by improving their collaboration.

Full or optimal collaboration was not achieved. Theory holds that a high level of bi-directional referral is indicative of a high level of collaboration and that the collaborative relationship evolves (6;8;40-43;46;56;76-80). The lack of substantive practice pattern change on behalf of physicians, the referral patterns, and the substantive progress of the NPs indicates that the intervention was able to move the providers to one level of collaboration and that time and further experience is needed to shift to a more mature level of collaborative practice. The majority of relationships were new. New NPs are involved in 'role transition' as they adapt from being experienced RNs to beginner NPs, and 'role acquisition', focusing on their newly acquired medical skills and responsibility. NPs may first feel comforted functioning in a more hierarchical fashion with FPs. However, as their confidence increases they are able to assert themselves as co-partners. FPs are also adapting to a new role. FPs need to evolve from a role of sole responsibility for care to a more interdependent role in association with NPs.

Initially, the FP perspective of the NP role was that of 'physician extender'. The FPs needed to be assured of the NP's medical competence. An evolving relationship allows the FP to learn to appreciate the NP's unique nursing functions. (6) These themes are clearly evident in the narrative analysis of the provider interviews. Both NPs and FPs told stories related to NP scope of practice, NP competence, control of practice and role value and distinction. The NPs were considered competent by the FPs because they worked within their scope of practice.

The intervention did not detect any changes in patient self-reported satisfaction with the services received from the providers at the one intervention and the one comparison site. Satisfaction levels remained high and constant. The intervention did not negatively influence patient satisfaction with delivery of service.

The student intervention results from the pre and post tests, pre and post interviews and journal incidents reflect positive changes in understanding and attitudes regarding both working in collaboration and understanding one another's roles. Objectives regarding the provider's ability to teach collaboration and the impact on rural retention were not addressed.

SECTION F STUDY LIMITATIONS AND UNINTENDED CONSEQUENCES

F1 Limitations

As with most applied evaluation research, this study has the following limitations:

- The methodology involved case studies and as a consequence there was no randomisation of practice sites between intervention and control groups;
- Attraction and retention of practice sites proved difficult and therefore findings may not be generalised to all settings;
- Reliability and consistency checks for provider encounter form completion was not undertaken;

- Small sample sizes for providers indicate that caution should be used when interpreting findings; and
- Findings can not be generalised to other practice settings due to the small number of cases as well as problems in attraction and retention.

These limitations are offset by the number and variation in data collection tools that were used in evaluating the impact of the intervention. The combination of qualitative and quantitative methods and detailed process evaluation has provided confidence in the interpretation of intervention findings.

F2 Unintended Consequences

The following are the negative and positive unintended consequences of the project:

- Collection of patient cost data, in addition to the multiple other data sources, was recognised as onerous by the project and the participating sites, and, therefore, a cost analysis of the intervention was not completed;
- Waiting for confirmation from Health Canada on an extension for the project introduced delays in the project plan and prevented providing feedback on roles to providers in intervention sites;
- Underestimating the strength of the practice setting environment in affecting intervention outcomes;
- Neglecting to identify outcomes for the intervention practices that went beyond working collaboratively and focused on patient clinical and preventive outcomes;
- Communicating with settings administrators to secure ongoing participation;
- Fully recognising the dominance of curative and rehabilitative services, and the need to protect service delivery in the other three domains, health promotion, disease prevention, and supportive care, in the face of under staffing and/or increased patient needs for illness services.
- The degree to which physician practice patterns remained much less affected by the model in comparison to nurse practitioners.
- The need to seek a common understanding of the meaning of “appropriateness”
- Flexibility of the structured collaborative practice model allowed other practice providers such as the RN to be incorporated; and
- Commitment of the Curriculum Advisory Working Group to work toward integration of collaboration content into Ontario Family Medicine and Nurse Practitioner programs.

SECTION G DISSEMINATION PLANS

Appendix Y lists the project team’s plans for dissemination of the results of this research project, as well as, dissemination events that occurred during the project. To date we have presented at 11 conferences and meetings, have developed a discussion paper on collaboration for the Ontario College of Family Physicians, and have had accepted a paper for publication on what primary health care services NPs and FPs perform.

SECTION H

FUTURE DIRECTIONS & RECOMMENDATIONS

The following are recommendations and directions for further work on the structured collaborative model as well as challenges that need to be addressed to support NP/FP structured collaboration.

- Broader introduction of an intervention on structured collaboration to include a larger representative sample of Canadian sites where NPs and FPs work together
- Other primary health care professionals working with the NPs and FPs in any given setting need to be studied as well to determine their role and contribution to collaborative care.
- Include cost-effectiveness measures in any future intervention on structured collaborative practice.
- Future interventions on structured collaboration need to promote the implementation of practice guidelines and be of sufficient duration to monitor patient outcomes to determine structured collaboration's contribution to the quality of care provided.
- Develop resources to support primary care sites wishing to add Nurse Practitioner services to existing Family Physician resources to meet their practice's primary health care needs.
- Assist sites in Canada where nurses function in an extended role to identify and address barriers to collaboration and strengthen their supports.
- Policy and health care system changes are needed to find creative reimbursement mechanisms for NPs and the FPs who collaborate with them.
- Medico-legal issues that prevent practitioners from working as collaboratively as possible need to be addressed.
- Applied research into the seven essential elements of collaboration is required to determine which elements are of strategic importance and to further develop content and tools to assist in the implementation of each element.
- Support implementation of the recommendations of the Ontario Chairs of Family Medicine and the Council of Ontario University Programs of Nursing calling for undergraduate, postgraduate, and continuing education opportunities in the classroom and clinically for joint education on collaboration.

Reference List

- (1) Hall EM. Canada's national provincial health program for the 1980s. Ottawa, Department of National Health and Welfare. 1980.
- (2) Lalonde M. A new perspective on the health of Canadians: a working document. . Ottawa, Department of National Health and Welfare. 1975
- (3) Epp J. Achieving health for all: a framework for health promotion. Ottawa, Department of National Health and Welfare. 1996.
- (4) Advisory Committee on Health Services. What we heard: a national consultation on primary health care. Ottawa, Health Canada. 1996.
- (5) Subcommittee on Primary Health Care. New directions for primary health care. Toronto: Provincial Coordinating Committee on Community and Academic Health Science Centre Relations. 1996.
- (6) Weiss S, Davis HP. Validity and reliability of a collaborative practice scale. *Nursing Research*. Sept. / Oct. 1985:299-305.
- (7) Baggs JG. Development of an instrument to measure collaboration and satisfaction about care Decisions. *Journal of Advanced Nursing* 1994; 20:176-182.
- (8) Norsen L, Oplen J, Quinn, J. Practice model collaborative practice. *Critical Care Nursing Clinics of North America* 1995; 7(1):43-52.
- (9) Jones, L. Realizing our potential: the primary health care nurse practitioner. Presentation for Canadian Nurses Association Biennial Conference, Vancouver, June 20, 2000. Unpublished.
- (10) College of Family Physicians of Canada. Primary care and family medicine in Canada a prescription for renewal: a position paper. 2000.
- (11) Canadian Nurses Association. The role of the nurse in primary health care. Policy statement. Ottawa: Author, 1995.
- (12) Mitchell A, Pinelli J, Patterson C, Southwell D. Utilization of nurse practitioners in Ontario: a discussion paper requested by the Ontario Ministry of Health. 2000.
- (13) Knafle K, Breitmayer B. Triangulation in qualitative research: issues of conceptual clarity and purpose. In: M.Morse, editor. *Qualitative nursing research: a contemporary dialogue*. Rockville, Maryland: Aspen Publishing, Inc., 1989: 209-220.
- (14) Goodwin L, Goodwin H. Qualitative vs. quantitative research or qualitative and quantitative research. *Nursing Research* 33, 378-380. 1984.
- (15) Campbell Donald T., Stanley JC. *Experimental and quasi-experimental design for research*. Boston: Houghton Mifflin Company, 1966.

- (16) Safran DG, Kosinski M, Tarlov AR, Rogers WH, Taira DH, Lieberman N et al. The primary care assessment survey: tests of data quality and measurement performance. *Med Care* 1998; 36(5):728-739.
- (17) Davidson RA, Lauver D. Nurse practitioner and physician roles: delineation and complementarity of practice. *Research in Nursing and Health* 7, 3-9. 1984.
- (18) Bailey P.H. Patients', family caregivers' and nurses stories of acute exacerbation events of chronic obstructive pulmonary disease. 1998.
- (19) Bailey P.H. Death stories: acute exacerbations of COPD. *Qualitative Health Research*. In press.
- (20) Labov W., Waletzky J. Narrative analysis: oral versions of personal experience. In: J.Helms, editor. *Essays on the verbal and visual arts*. Seattle: University of Washington Press, 1972: 12-44.
- (21) Agar M, Hobbs J.R. Natural plans: using A1 planning in the analysis of ethnographic interviews. *Ethos* 1983; 11(1/2):33-48.
- (22) Agar M, Hobbs JR. Interpreting discourse: coherence and the analysis of ethnographic interviews. *Discourse Process* 5, 1-32. 1982.
- (23) Antaki C. *Exploring and arguing: the social organization of accounts*. London: Sage Publications, 1994.
- (24) Labov W. *Language in the inner city: studies in the Black English vernacular*. Philadelphia: University of Pennsylvania Press, 1972.
- (25) Labov W, Fanshel D. *Therapeutic discourse: psychotherapy as conversation*. London: Academic Press, 1977.
- (26) Bailey P.H. Assuring quality in narrative analysis. *Western Journal of Nursing Research* 1996; 18(2):186-194.
- (27) Bennett G. Narrative as expository discourse. *Journal of American Folklore* 1986; 99:415-434.
- (28) Polanyi L. Conversational storytelling. In: T.A.Van Dijk, editor. *Handbook of discourse analysis*. London: Academic Press, 1985: 183-201.
- (29) Polanyi L. *Telling the American story: a structural and cultural analysis of conversational storytelling*. London: The MIT Press, 1989.
- (30) Kalcik S. "... like Ann's gynaecologist or the time I was almost raped": Personal narrative in women's rape groups. In: C.R.Farrer, editor. *Women and Folklore*. Austin, Texas: University of Texas, 1975.
- (31) Viney L.L., Bousfield L. Narrative analysis: a method of psychological research for AIDS-affected people. *Social Science & Medicine* 1991; 32(7):757-765.

- (32) Rush B, Ogborne A. Program logic models: expanding their role and structure for program planning and evaluation. *Canadian Journal of Program Evaluation* 6[2], 96-106. 1991.
- (33) Wong-Reiger D, David L. Using program logic models to plan and evaluate education and prevention programs. 1995. Toronto, Canadian Evaluation Society. Love, A.
- (34) Jones L, Way D. Is there room for NPs and FPs ... in community health centres. In: Patterson C, editor. *Visions and Voices: the Nurse Practitioner Today*. Toronto: Lugus, 1997: 112-128.
- (35) Way D, Jones L. The family physician - nurse practitioner dyad: indications and guidelines. *CMAJ* 1994; 151:29-34.
- (36) Alpert HB, Goldman L.D, Kilroy, C.M, Pike AW. Seven Grymish: toward an understanding of collaboration. *Nursing Clinics of North America* 1992; 27(1):47-59.
- (37) Arcangelo V, Fitzgerald M, Carroll D.. Collaborative care between nurse practitioners and primary care physicians. *Models of Ambulatory Care* 1996; 23(1):103-113.
- (38) Coeling HV, Wilcox J.R.. Steps to collaboration. *Nursing Administration Quarterly* 1994; 18(4):44-55.
- (39) Coluccio M, Maguire P.. Collaborative practice: becoming a reality through primary nursing. *Nursing Administration Quarterly* 1983; 7:59-63.
- (40) Devereux PM. Does joint practice work? *The Journal of Nursing Administration* 1981;39-43.
- (41) Devereux PM. Nurse / physician collaboration: nursing practice considerations. *The Journal of Nursing Administration* 1981;37-39.
- (42) Dontje K.J., Sparks BT, Given BA. Establishing a collaborative practice in a comprehensive breast clinic. *Clinical Nurse Specialist* 1996; 10(2):95-101.
- (43) Grady G, Wojner AW. Collaborative practice teams: the infrastructure of outcomes management. *AACN* 1996; 7(1):153-158.
- (44) Kyle M. Collaboration. In: Synder M, Mirr MP, editors. *Advanced practice nursing: a guide to professional development*. New York: Springer Publications, 1995: 169-181.
- (45) Lamb GS, Napodano R. Physician-nurse practitioner interaction in primary care practice. *AJPH* 1984; 74(1):26-29.
- (46) Lorenz AD, Mauksch LB, Gawinski BA. Models of collaboration. *Primary Care* 1995; 26(2):401-410.
- (47) Macleod M, Brown A.J, Leipert B. International perspective: issues for nurses in rural and remote Canada. *Aust J Rural Health* 1998; 6:72-78.
- (48) Moody NB, Smith PL. Client characteristics and practice patterns of nurse practitioners and physicians. *The Nurse Practitioner* 1999; 24(3):94-103.

- (49) Seigier EL, Whitney Fay W. What is collaboration? In: Seigier EL, Whitney Fay W., editors. Nurse - physician collaboration: care of adults and the elderly. New York: Springer Publishing Co, 1994: 3-10.
- (50) Giardino AP, R.Jones. Instruments for studying collaboration. In: Seigier EL,.Whitney Fay W. editors. Nurse-physician collaboration : care of adults and the elderly. New York: Springer Publishing Company, 1994: 171-192.
- (51) Seigier EL, Whitney Fay W.. Social and economic barriers to collaboration. In: Seigier EL Whitney, Fay W., editors. Nurse-physician collaboration: care of adults and the elderly. New York: Springer Publishing Company, 1994: 21-32.
- (52) Seigier EL,.Whitney Fay W Schmitt, MH.. Collaborative practice research questions. In: Seigier EL,.Whitney Fay W, editors. Nurse - physician collaboration: care of adults and the elderly. New York: Springer Publishing Company, 1994: 193-206.
- (53) Giardino AP,.,Giardino ER,.,Sieger EL. Teaching collaboration to nursing and medical undergraduates. In: Seigier EL, Fay W.Whitney, editors. Nurse - physician collaboration: care of adults and the elderly. New York: Springer Publishing Co, 1994: 127-157.
- (54) Pringle D, Levitt C, Horsburgh M, Wilson R, Whittaker M. Collaboration and primary health care reform: a statement from the Ontario Chairs of Family Medicine and the Council of Ontario University Programs in Nursing. 1-10. 1999.
- (55) Seigier EL, Whitney Fay W. Education of physicians and nurses. In: Seigier EL,.Whitney Fay W, editors. Nurse - physician collaboration: care of the adults and the elderly. New York: Springer Publishing Co, 2001: 11-20.
- (56) Strumpf N, Whitney Fay W. Teaching collaborative skills to nurse practitioner students. In: Seigier EL, Whitney Fay W. editors. Nurse - physician collaboration: care of adults and the elderly. New York: Springer Publishing Co, 1994: 159-167.
- (57) Way D, Jones L. Collaborative education: survey of Canadian family medicine and nurse practitioner programs. Jan. 2001. Unpublished.
- (58) Canadian Nurses Association. The nurse practitioner: a discussion paper. Feb. 1993. Ottawa: Author
- (59) Ministry of Health Ontario. Nurse practitioners in Ontario: a plan for their education and employment. ISBN 0-777B-3572-X. 1994. Queen's Printer for Ontario, 1995.
- (60) Registered Nurses Association of Ontario. Putting nursing back into health care: who will respond? Toronto: Author. March, 1999.
- (61) College of Nurses of Ontario. Standards of practice for registered nurses in the extended class. May, 1998.
- (62) The Ontario College of Family Physicians. Family medicine in the 21st century : a prescription for excellent healthcare. Toronto: Author. Nov. 30, 1999.

- (63) The Ontario College of Family Physicians. Family medicine in the 21st century-implementation strategies. Discussion paper. Toronto: Author. Mar. 27, 2000.
- (64) Health Services Restructuring Commission. Primary health care strategy. Report to the Ontario Ministry of Health. Nov., 1999.
- (65) Short, P. Nurse practitioners in New Brunswick: a background paper requested by the Worklife Reassign Committee. April, 1996
- (66) Registered Nurses' Association of Nova Scotia. Position statement on the advanced nurse practitioner. April, 1995, Halifax: Author.
- (67) Alberta Association of Registered Nurses. Competencies for registered nurses providing extended health services in the province of Alberta. Edmonton: Author. 1995.
- (68) Mass, H., McKay, R. Expanding the role of nursing. Nursing B.C. Aug-Sept., 1995, 7-9.
- (69) Saskatchewan Registered nurses Association, Saskatchewan college of Physicians and Surgeons, & Saskatchewan Pharmaceutical Association. A letter of understanding between the Saskatchewan Registered Nurses Association, the Saskatchewan College of Physicians and Surgeons, and the Saskatchewan Pharmaceutical Association in respect to the Beechy Project. Regina: Saskatchewan Registered Nurses Association 1995.
- (70) Association of Registered Nurses of Newfoundland. Plan of action for the utilization of nurses in advanced practices throughout Newfoundland and Labrador. St. Johns Author. May, 1997.
- (71) Northwest Territories Medical Association and Northwest Territories Registered Nurses Association. The provision of primary health care in the Northwest Territories: a joint statement on health care reform in the NWT. Yellowknife: Author. Sept., 1998,
- (72) Association of Ontario Health Centres. Community Health Centres: a cost-effective solution to primary health care reform. Toronto: Author. 1-37, 2000.
- (73) Rachlis, M, Kushner, C. Community Health Centres: the better way to health reform. A discussion paper commissioned by the British Columbia Nurses' Union, the Staff Nurses association of Alberta, and the New Brunswick Nurses Union. 1994.
- (74) Manga, P, Campbell, T. Health human resources substitution: a major area of reform towards a more cost-effective health care system. Ottawa: Cost-effectiveness of the Canadian Health Care System Project, school of Graduate Studies, University of Ottawa. 1994.
- (75) Kolbe LJ. Health education and youth: a review of research and developments. Philadelphia, PA: Palmer Press, 1984.
- (76) Ryan, J.W. Collaboration of the nurse practitioner and physician in long-term care. Lippincott's Primary Care Practice. 3 (2): 127-134, 1999.
- (77) Benner P. From novice to expert: excellence and power in clinical nursing practice. Menlo Park, California :Addison-Wesley Publishing Company, 1984

- (78) Benner P, Tanner CA, Chesla CA. The Nurse-physician relationship: negotiating clinical knowledge. In: Expertise in nursing practice: caring, clinical judgement, and ethics, edited by Benner P, Tanner C A, and Chelsa C A, New York: Springer Publishing Company. 280-306, 1996,
- (79) BR McLain. Collaborative practice : the nurse practitioner's role in its success or failure. The Nurse Practitioner. 13 (5):31-38, 1988.
- (80) Prescott P, Bowen S A. Physician-nurse relationships. Annuals of Internal Medicine 103:127-133, 1985.