Nurse practitioners in primary care
I. The McMaster University educational program*

Walter O. Spitzer, M.D., M.P.H. and Dorothy J. Kergin, R.N., PH.D.,
Hamilton, Ont.

Summary: In 1971 McMaster University offered an educational program for nurse practitioners sponsored jointly by the Faculty of Medicine and the School of Nursing. Priority in the pilot program was given to nurses employed in family practice settings and to those participating in related McMaster studies. Because of the implications of a change in role for both nurse and physician, one requirement for acceptance of a nurse in the program was participation of the physician-associate in the educational program.

The program prepares registered nurses to extend their responsibilities in primary health care activities for the assessment and management of patients in family practice. The current evaluations of the pilot-study results suggest that such programs can contribute effective resources towards meeting expectations of ready access to primary care by the people of Canada.

*Pilot program supported by the Ontario Health Resources Development Plan of the Ontario Ministry of Health (Project D.M.36)

W. O. SPITZER, Associate Professor, Department of Clinical Epidemiology and Biostatistics, Faculty of Medicine, McMaster University, Hamilton, Ontario

D. J. KERGIN, Professor and Director, School of Nursing, McMaster University, Hamilton, Ontario

Rationale

Background

In discussions about health professionals allied to the physician, the realm of ambulatory care[1,2] has been identified for priority in consideration and development. This decision does not deny the fact that for at least two decades health professionals associated with the physician have been effectively and desirably expanding their roles in the hospital setting and in the care of reposing patients. Nor does it overlook the fact that the role of the physician has also changed. The constant, gradual evolutionary process throughout the whole health field can be expected to continue. However, because of the current emphasis and the apparent requirements of the Canadian health-care delivery system in the early seventies, our focus is the delivery of ambulatory health care and particularly primary or first-contact care.

No serious challenge in Canada has arisen to the multidisciplinary consensus[3] that the nurse is the professional most appropriate to assume a broader and better delineated role in ambulatory service and to supplement physician care. Moreover, the deployment of outpost nurses as the principal providers of care has been documented for decades by the Department of National Health and Welfare in remote northern jurisdictions across the country, by the International Grenfell Association in Newfoundland, by the United Church of Canada in British Columbia, and by most provincial health departments.

There has been evidence of a surplus of nurses in Ontario during recent years.[4] The surplus has continued and has been verified through formal study.[5] Ratios of population to physicians in Ontario are now seldom unfavourable except for primary care physicians in non-urban areas.[6] These facts influenced program planners at McMaster University to adopt the following course of action for a nurse-practitioner educational program: only nurses would be enrolled; priority would be given to the development of nurse practitioners in primary care (family practice nurses); and in the long run, preference for admission to the educational program would be given to candidates residing in underserviced areas and committed to return to those areas.

The appropriate Councils and Committees of the Division of Health Sciences at McMaster University concurred with the consensus among nurses, physicians and others that there was no need in Canada to develop a new category of worker called "physician assistant".[7]

Reprint requests to: Dr. W. O. Spitzer, Dept. of Clinical Epidemiology and Biostatistics, Health Sciences Centre, McMaster University, Hamilton, Ontario

Consequently, a new Canadian Educational Program for Nurse Practitioners was established during 1971. The program was operated with joint sponsorship of the Faculty of Medicine and the School of Nursing and funded by the Ontario Ministry of Health. On February 2, 1972 the first 22 graduates were awarded Certificates by the Division of Health Sciences and the School of Adult Education to signify their attainment of the educational objectives of the program.*

This paper presents an account of the conceptual framework of a university educational program for nurse practitioners. We shall also describe the instructional objectives of the curriculum, the method of implementation and the strategy of evaluation.

Conceptual framework

The gradual process of change in the health field is occasionally punctuated by deliberate, explicit definition of roles of health professionals. In redefining the role of the nurse in ambulatory care, we recognized the importance of one particular criterion in classifying workers allied to the physician† — the exercise of clinical judgement. By this criterion we distinguish true health professionals from technicians. Examples of the former are psychologists, social workers and physiotherapists. Examples of the latter are operating-room technicians, ophthalmic assistants and inhalation therapists. The technical personnel are generally oriented to implement decisions resulting from the clinical judgement exercised by another health professional.

We believe that the exercise of clinical judgement is the characteristic that best discriminates the nurse practitioner from the individual who serves as a technician or managerial assistant to the physician. To acquire clinical judgement a nurse must enhance her ability to assess the need for care and to plan care. This is accomplished by augmenting her skills in data gathering and problem solving. We view the proposed designation "physician assistant" for any worker who meets the criterion of a true health professional as inappropriate and perhaps misleading.

Depending on the setting where they work, nurses with redefined roles in primary care develop distinctive emphasis in their patterns of practice. They may work in close association with physicians in family practices where patients are usually exposed to both the nurse and the physician in individual episodes of care. Most nurse practitioners (or family practice nurses) who have graduated from the McMaster Program now practice in this way. On the other hand, a nurse may be the principal purveyor of primary care services in underserviced areas. In that capacity the nurse works with considerable professional independence in discharging most of her responsibilities. The Report of the Committee on Nurse Practitioners[8] used the term "physician surrogate" to describe this category because many of her activities (sometimes including midwifery) are ordinarily performed only by physicians in other geographic areas. Such nurses are usually designated "outpost nurses".

As will become apparent in the description of skills and knowledge required of nurse practitioner graduates, we do not advocate that they become "junior physicians". The nurse's abilities are augmented to encompass an appropriately delineated scope of responsibility and authority for the clinical management of patients. The McMaster nurse practitioner learns to assess patients in a manner that leads to a correct action decision, regardless of whether or not it always leads to a precise diagnosis. Three broad categories of action decisions are: (a) recommendation of a specific treatment, (b) no intervention other than reassurance, and (c) referral to the associated physician.

The definition of the nurse practitioner developed for the program is as follows:

> A nurse practitioner (family practice nurse) is a nurse in an expanded role oriented to the provision of primary health care as a member of a team of health professionals, relating to families on a long-term basis and who, through a combination of special education and experience beyond a baccalaureate degree or a diploma, is qualified to fulfil the expectations of this role.[9,10]

Key principles influencing adopted educational policy

1. The orientation of the curriculum should emphasize the nurse's development of added skills in clinical problem solving. An orientation that is primarily procedural is undesirable.
2. To develop nurse practitioners by an apprentice system would handicap assessment of the nurse's performance and might impair the evolution of desirable patterns of practice. Therefore the education of nurse practitioners should take place in post-secondary institutions. Reasonable comparability between educational programs should be sought within provincial or national jurisdictions.
3. The educational program should be interdisciplinary. Faculties of medicine and nursing should be jointly deployed; nurses should learn new skills together with physicians who learn new roles.

Implementation

Planning and execution

Planning for the Nurse Practitioner Educational Program began in July 1970, when a Sub-Committee on Primary Care Education was formed to develop a continuing education program for nurses employed in family physicians' offices.[11] The Committee, consisting of nurses, physicians (educators and practitioners) and a social worker, together with a full-time

*At the time that McMaster's first class of nurse practitioners qualified in December 1971, one other comparable program (Community Nurse Program) had begun (September 1971) at the University of Montreal. Six other universities in four provinces had definite plans to sponsor projects with target dates for launching in early 1972. The goal of all proposed programs was to prepare nurses for northern outpost assignments; the combined annual enrolment for the seven projects other than that described in this paper was to be 38. Dalhousie University initiated its two-year course leading to credentials in midwifery and outpost nursing in 1967; this is well known as Canada's first program for outpost nurses.

†Excluded from this scheme of classification are support staff who do not have differentiated skills oriented to health care (e.g. janitors, clerks, typists, etc.)

nurse educator, was responsible for guiding the program through the developmental and operational phases. Four student representatives joined the Committee when the program began.

Admission procedures and criteria

In January 1971 it was agreed that applications for the Nurse Practitioner Program would be received from nurses associated with practices participating in several collaborative research studies involving nurses and physicians in family practice settings. Criteria for admission of a nurse to the program were defined as follows:

1. Current registration with the College of Nurses of Ontario.
2. Employment in the office of a family physician or in a family health-care centre.
3. Participation of the associated physician in the program.

All applicants (physicians and nurses) were interviewed by the Admissions Committee to ensure mutual commitment to the concepts of the teaching program. Required of the physician was agreement to participate in "on-campus" sessions and to serve as a preceptor when the nurse was practising her newly learned skills. When screening had been completed 27 nurses were accepted. Four nurses withdrew in March when the Family Medicine Unit in which they were to have been employed failed to develop financial support. One other nurse withdrew from the course in June. The remaining 22 nurses completed the program successfully.

Curriculum

The curriculum was designed to assist the nurses to develop the following categories of skills and knowledge:

1. Interviewing and history-taking.
2. Physical examination.
3. Pre- and postnatal care.
4. Well-child assessment and advisement.
5. Evaluation and management of common acute and chronic disorders.
6. Evaluation and management of common emotional disorders.
7. Evaluation and management of common disorders of the family unit.
8. Geriatrics — assessment and advisement.
9. Utilization of community health and welfare services.

Since the students were being prepared to function as first-contact health professionals, heavy emphasis was given to distinguishing the normal from the abnormal. The fact that the distinction between normality and abnormality is often equivocal and arbitrary was stressed, as was the need for continued assessment of criteria of normality and abnormality. The student was not expected to diagnose different kinds of "abnormality".

Teaching and learning methods

The course involved some full-time and mainly part-time activities for a calendar year. The program could be conducted, if given full-time, in four months of classroom instruction and an additional three to four months of clinical work.**

The program began in February 1971 and continued through to December. It was a work-study program — the nurses continued to work in their home practices, attending classes or tutorials for four to eight hours each Wednesday except during March, when they were full-time students at the university. During the winter and spring segments of the program the basic methods of learning were: (a) instruction in small groups, (b) seminars, (c) lecture/discussions, (d) clinical practice, and (e) individualized self-learning, utilizing library and audiovisual resources. The students met each Wednesday afternoon to discuss problems and topics of general interest to all the group. Small group tutorials dealt with application of knowledge and skills, the problems of attitudes and roles, barriers to achievement of objectives, and integration of subject matter.

The fall session followed a summer of sharpening of skills and clarifying of roles in the "home" practices. In the fall each student was an active participant in the preparation and presentation of two sessions. This experience enabled students to learn more about specific content areas and to become familiar with different kinds and uses of resource materials for solving patients' problems.

Once monthly, the family physicians with whom the nurses worked attended the Wednesday sessions. These sessions were especially designed to facilitate the role change process and to assist the nurses and physicians engaged in rendering primary health care to better understand their complementary responsibilities and abilities.

At the time of the mid-term evaluations in June, it was found that most students had great difficulty in carrying out a physical assessment and in organizing the information gathered. To overcome these problems, hospital rounds were scheduled one-half day per week for 12 weeks during the fall term, six weeks with a pediatrician and six weeks with an internist. These in-hospital experiences also served to focus the nurses' attention on events that had brought patients for admission to hospital and to permit discussion of the primary care nurse's and physician's roles in continuing management of the observed patients.

Each student also spent a half-day session in a home for the elderly. This additional experience was designed to assist the nurses to develop a perspective on ageing and chronic illness useful in planning care, to form a clearer conception of the complex picture of chronic illness, and to deal with patients' problems one by one.

Evaluation of students

Various techniques were used to evaluate the students. Common to all was the goal of determining whether the candidates successfully attained the pre-established standards of professional behaviour as set forth by the instructional objectives.

Because this was a pilot program, at least one third of the examiners and evaluators (nurses and physicians) were external. They were either private practitioners, not based in McMaster-affiliated hospitals, or colleagues from other Canadian health-science university faculties and from professional associations.

**The continuing permanent program is now being given as four months' full-time instruction on campus plus four months' supervised practice experience.

Evaluation techniques included (a) a written examination, including multiple-choice, short answer and clinical problem-solving questions; (b) ongoing evaluation by tutor-supervisors; and (c) oral and practical evaluations.

The greatest emphasis was placed on the last two forms of assessment. In particular, the oral practical evaluations seemed to discriminate well between levels of competency among students. Three such evaluations were conducted during the course. Although certain modifications were made each time, the basic format was as follows:

1. Each student conducted an interview and physical assessment of a real patient, in the presence of two examiners, a nurse and a physician.
2. Immediately afterwards, each student and the examining team viewed a 10-minute videotaped case presentation of a simulated (or instructed) patient.
3. The student then discussed the real and simulated patients with the examiners, describing her evaluation of the presenting problem and recommendations for action.
4. The student's performance was scored according to standardized marking sheets.
5. After each individual student evaluation, a McMaster faculty member met with evaluators and then with the student to interpret the examiners' report.

This mechanism was used to provide consistency throughout the evaluations, as well as to provide immediate constructive "feedback" for the students and faculty. To facilitate recall of the evaluation, all evaluative sessions were audiotape recorded. The tapes and copies of the examiners' reports were later made available to the students for individual review.

Of the 23 students who enrolled initially, 22 attempted the first-term assessments and 20 were successful. In the final evaluations 22 students fulfilled the overall criteria. Two students were deficient in two sections of the curriculum as determined in "paper and pencil tests". However, they were granted a satisfactory overall rating because they had demonstrated their abilities effectively in an "action setting" corresponding to the same categories in the first-term evaluations.

Costs

Total cost of the program excluding evaluation was $69,420, an average of $3100 per successful graduate. The amount granted by the Ontario Health Resources Development Plan (OHRDP) of the Ministry of Health was $40,192 or 60%. The balance represents faculty contributions of McMaster University. The cost of evaluating the program ($17,700) included 90% support from OHRDP.

Continuing evaluation

On-going semi-formal surveillance of the graduates is under way. Records are being kept to document whether the nurse practitioners are practising or not, in what modality, in what setting and in what geographic location. Informal contacts and continuing educational activities for alumni will facilitate data gathering.

Four formal studies will provide more rigorous evidence for the effects of the nurse-practitioner concept upon family physicians, nurses and patients.

In the first of the series the instrument and methodology for assessing the activities and role expectations of the nurse were developed. The project, entitled "A Study of the Nurse Activities in Primary Care Settings",[12] is a description of the activities of nurses employed in a sample of 50 family physicians' offices within the Hamilton region. The conclusions of the study were that nurse activities related to direct patient care involved less than one third of conventional office nurses' time, and almost equal time was devoted to activities that could be carried out by a non-trained nurse alternate or receptionist.

The second project, "The Smithville-McMaster Family Medical Centre Study", has a "before and after" design and, in a semi-rural population of the Niagara peninsula, assesses the impact of a primary care team that incorporates the nurse practitioner. The most important variable assessed is population acceptance of the nurse in the new role.

Two complementary randomized controlled trials of the nurse practitioner have now been concluded. The first trial examines the consequences of the new concept for physicians and nurses. In 14 practices, with physicians' support and commitment to participation, the nurses had applied for enrolment in the educational program. Seven applicants were randomly assigned to an experimental group and admitted to the program, the remaining nurses and practices being retained as controls. This is designated as "The Southern Ontario Randomized Trial of the Nurse Practitioner". The second trial was planned to focus upon the effects on patients. The families of two suburban family-medicine practices were randomly assigned to receive care from nurse practitioners on the one hand or family physicians on the other. This study is known as "The Burlington Randomized Trial of the Nurse Practitioner". The variables under assessment in both foregoing trials include the following: in the patients—functional capacity, medical services' utilization, acceptance of the nurse, and general satisfaction; in the nurses and physicians—alterations in clinical/non-clinical activities and professional attitudes; in quality of care — managerial strategy for "indicator conditions", use of medications and appraisal of referral decisions; and in the practices — growth and profitability. Analysis of the results is nearing completion and results will be reported shortly.

The future

The University has given its approval to continuing the program under the joint auspices of the School of Nursing, the Faculty of Medicine and the School of Adult Education. Support for three years has been approved by the Department of National Health and Welfare. This will permit education of at least 100 more nurse practitioners during that time. Priority of admission to the certificate program will be accorded to residents of medically underserviced areas who are committed to serve in such localities. The incorporation of clinical assessment and systematic history-taking skills in the undergraduate B.Sc.N. curriculum and a fam-

ily practice elective in the final year are now being implemented, as recommended by the Committee on Nurse Practitioners.[13]

Although a firm verdict concerning the effect of nurse practitioners in primary care awaits further evidence from health care trials and other studies, preliminary indicators of satisfaction, acceptance and financial viability suggest that these programs will effectively serve important health care expectations of the population.

We should like to acknowledge the indispensable role played by Mrs. Joan Davis, the full-time faculty member responsible for the day-to-day administration of the pilot program. We are also indebted to Mr. Mark Magenheim who served as administrative assistant. The program became a reality as a result of extensive contributions of scores of faculty members and community practitioners. Of these, Drs. J. C. Sibley, R. G. McAuley and W. A. M. Russell, Miss Norma A. Wylie and Prof. L. E. Levine invested a very high number of hours in the development of policy and curriculum planning.

References

1. Department of National Health and Welfare: *National Conference on Assistance to the Physician.* Ottawa, April 6-8, 1971
2. *Proceedings of the Workshop on the Role of Allied Professionals in the Delivery of Primary Health Care.* Toronto, College of Family Physicians of Canada, 1971
3. Department of National Health and Welfare: *Report of the Committee on Nurse Practitioners* (Chairman: Thomas J Boudreau). Ottawa, April 1972, p 41
4. SMILEY JR: *Mobility, Service and Attitudes of Active and Inactive Nurses. A Preliminary Report.* Research and Planning Branch, Department of Health, Province of Ontario, December 1968, p 13
5. IMAI HR: *Report of a Preliminary Survey to Explore the Nursing Employment Situation in Canada in Terms of the Number of 1971 Graduates of Canadian Schools of Nursing Registered/Licensed for the First Time in 1971 Who Were Able or Unable to obtain Permanent Employment in Nursing as of September 30, 1971.* Canadian Nurses Association, Ottawa, March 1972, p 18
6. SPAULDING WB, SPITZER WO: Implications of medical manpower trends in Ontario, 1961-1971. *Ont Med Rev* 39: 527, 1972
7. Department of National Health and Welfare: *National Conference on Assistance to the Physician.* Ottawa, April 6-8, 1971
8. Department of National Health and Welfare: *Report of the Committee on Nurse Practitioners* (Chairman: Thomas J Boudreau). Ottawa, April 1972, p 43
9. KERGIN DJ, SPITZER WO: *An Educational Program for Nurse Practitioners.* Demonstration Project funded by OHRDP (Award DM36), Ministry of Health, Government of Ontario, Toronto, 1970
10. SPITZER WO, KERGIN DJ: The nurse practitioner: calling the spade a spade. *Ont Med Rev* 38: 166, 1971
11. KERGIN DJ, SPITZER WO: *Final Report — A Pilot Educational Program for Nurse Practitioners.* McMaster University, Hamilton, Ont, October 1972
12. KERGIN DJ, YOSHIDA MA, TIDEY M: *Study of Nurse Activities in Primary Care Settings.* McMaster University, Hamilton, Ont. June 1971 (National Health Grant Project No 606-21-48)
13. Department of National Health and Welfare: *Report of the Committee on Nurse Practitioners* (Chairman: Thomas J Boudreau). Ottawa, April 1972, p 14