The evolving role of the nurse practitioner in neurosurgery

Rebecca W. Rimel, R.N., N.P., and Thomas W. Langfitt, M.D.

Department of Neurosurgery, University of Virginia Medical Center, Charlottesville, Virginia, and Division of Neurosurgery, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania

The authors examine the many important roles for the nurse practitioner in neurosurgery, including patient care in academic departments and private practice, and research and scholarship. The responsibilities of nurse practitioners in a hospital can be varied: they may take some responsibility for all patients on the neurosurgery service, or their assignment may be more specific, such as to the intensive care unit; or they may be assigned to all patients with a specified neurosurgical disorder, such as head injury or intractable pain. Nurse practitioners can become coordinators of clinical research programs, with responsibility for collecting and collating the data and assisting in data analysis and manuscript preparation. Detailed clinical protocols must be developed for nurse practitioners, and those protocols then become the basis for their employment and legal status. Licensure requirements vary greatly among states, and are continuing to change.

Key Words • neurosurgical nursing • nurse practitioner • licensure • medical research

The roles of the nurse in health care have expanded greatly in recent decades. Although the need for bedside nursing is as great as ever and occupies the largest number of nurses, they are now also involved in primary care and in specialty care in pediatric nursing, psychiatric nursing, midwifery, and a number of other specialties, in research and scholarship, and more and more in teaching as the nursing profession has grown. In recent years, nursing has assumed an expanded role in the surgical specialties, including neurosurgery, the subject of this report.

Expansion of the role of the nurse has been fostered by several different developments. A number of health-care responsibilities can be assumed by appropriately trained nurses, thus providing a means of increasing the supply of health services and improving their distribution.1 Concern about a physician shortage, and particularly a maldistribution of physicians away from inner city areas, was a major impetus for the movement toward the family nurse practitioner. The reasons for the advent of the neurosurgical nurse practitioner program are quite different. The number of first-year positions in neurosurgical residency training programs in the United States has increased greatly in the past 20 years. There is general agreement that the number need not be further increased at this time, and in recent years the number of residents-in-training has leveled off. However, it appears that, on the whole, service needs are continuing to increase, and those needs must be met by persons other than neurosurgical residents. The need can be met by staff neurosurgeons, but this requires training those neurosurgeons and increases costs, and many of the services can be provided by less well trained individuals. House officers from other specialties are limited in the effectiveness of their contributions because their rotations on neurosurgery are generally short and they are not as interested as are neurosurgical residents. Furthermore, there will be fewer candidates in this category because of growth restrictions in the other surgical and medical specialties. The neurosurgical nurse practitioner can fill this role quite well.

The concept of the nurse practitioner is relatively new, evolving as it has over the past 15 years. Although the nurse assistant has been a fixture in the operating room for many years, it is only recently that the nurse practitioner began to fill the middle ground between nurses and surgical attending and house
Role of the nurse practitioner in neurosurgery

They engage in decision-making and the implementation of diagnostic and therapeutic actions with other settings of primary, acute, or chronic care. Nurse practitioners are responsible for assessing patients' physical and psychosocial health/illness status by means of history-taking and physical examination. They engage in decision-making and the implementation of diagnostic and therapeutic actions with other members of the health-care team, especially with physicians who have the primary responsibility for the patients' care.

In recent years, more and more neurosurgeons have expressed an interest in the neurosurgical nurse practitioner concept. The purpose of this report is to describe the many roles that the nurse practitioner can play in the field of neurosurgery. Since there are few such programs throughout the nation, much of the description is based on the 5-year experience at the University of Virginia.

Clinical Roles of Nurse Practitioners

There are several clinical roles that a nurse practitioner can fill. Nurse practitioners can carry out general duty on the neurosurgical service, taking some responsibility for all of the patients on the service, or accepting responsibility for a specialized group of patients in some type of rotation system. A second alternative is specific assignment to a designated clinical area, such as the neurosurgical intensive care unit. In a third possibility, the nurse practitioner can be responsible for all patients with a specified disorder, such as head and spinal cord injuries or intractable pain. The latter role should be particularly valuable on neurosurgical services with special clinical interests, and, therefore, a large number of patients with one particular disorder.

General Duties

In the clinical setting, the practitioner is responsible for the history-taking and physical examination for all admissions or designated admissions to the service. Evaluation of the patient includes a history of the present illness and the social, family, and past medical histories. A complete physical examination is performed, and all of this information is documented in the patient's record. Admission orders are written according to protocols established by the neurosurgical staff for the different types of patients admitted to the service. Routine diagnostic tests, including x-ray films, blood studies, and electrocardiograms, are ordered by the practitioner. The practitioner and house officer then develop a plan of management for the patient under the supervision of the attending neurosurgeon.

Nurse practitioners make daily rounds with the clinical staff, and order additional studies, arrange for consultations, and at the end of the day have at least verbal information on all studies performed that day to present at evening rounds. During the course of the day, the nurse practitioners spend most of their time with patients discussing their illness, ways to cope with that illness, and the general prospects for the future. They work closely with the social workers and the family in discharge planning. Special attention is directed to patients during the pre- and postoperative period. They counsel patients on the nature of the operative procedure that is to be performed and the expected results. They then explain the findings at surgery to the patient and relate those findings to the preoperative counselling of the patient. The practitioner also spends much time on the telephone each day responding to inquiries from patients and discussing patient progress with referring physicians.

Neurosurgical nurse practitioners are not substitutes for neurosurgical residents. Because they are not physicians, they cannot take sole responsibility for the management of any portion of the patient's care; this is in contrast to residents who, especially in their senior years, exercise a great deal of autonomy in most neurosurgical training programs. We believe that for the most part nurse practitioners should not assist in the operating room. This is the most precious experience for neurosurgical residents, and they become dissatisfied if they believe that the nurse practitioner is pre-empting their role in the operating theater. It is also true that nurse practitioners occupy roles that ordinarily are not filled to completion by house officers or attending neurosurgeons. They provide a continuity of patient care on the floors that is difficult to achieve for surgeons who spend nearly all of their days in the operating room, in the office, or in teaching or research. Thus, they overlap the functions of the house officer, the floor nurse, and the attending neurosurgeon, relieving all of them of some of their duties while at the same time providing important additional services to the patients.

The Neurosurgical Intensive Care Unit

A large neurosurgical intensive care unit with complex subspecialty care can occupy a nurse practitioner full time. For example, observation and management of patients with severe head injuries or subarachnoid hemorrhage can require continuous recording of intracranial pressure and systemic arterial pressure. In some units, periodic measurements of pulmonary vascular pressures, cerebral blood flow, brain metabolism, and other physiological variables also are performed. Patients with spinal cord injury require careful attention in general management, and averaged evoked potentials are recorded periodically in some units. A nurse practitioner who is assigned full time to such a unit can take responsibility for organizing the management and daily care of these patients.

The continuity of care that the nurse practitioner can provide in the intensive care unit is as important as continuity of care on the neurosurgical floor.
Specific Neurosurgical Disorders

A second type of subspecialty care appropriate for the nurse practitioner is the shared responsibility for all patients with one specified neurosurgical disorder, from admission to discharge from the hospital, and in follow-up visits. For example, instead of having responsibility for all patients in the neurosurgical intensive care unit, irrespective of diagnosis, the nurse practitioner can share responsibilities for patients within a given diagnostic group in the intensive care unit, on the neurological floors, and in the clinic. This can be a particularly important role in neurological programs with a special interest in head injury, spinal cord injury, subarachnoid hemorrhage, or occlusive cerebrovascular disease, because the volume of patients is often large and the management of the patients is complex.

At the University of Virginia, the neurosurgical nurse practitioner is involved in the management of all patients with head injuries. She sees each patient on admission to the hospital and joins the neurosurgeons in the acute phase of treatment and in planning the overall management of the patients. She has primary responsibility for collating all of the pertinent clinical data on each patient, and for maintaining a detailed registry on head-injured patients that currently is being used in the development of a traumatic coma data base, a national program supported by the National Institute of Neurological and Communicative Disorders and Stroke. She serves as the research coordinator of the University of Virginia's portion of the program. The nurse practitioner sees all head-injured patients in follow-up examination along with members of the neurosurgical staff, and these important long-term observations are also entered in the registry. Currently, she maintains contact by personal visit, telephone, or letter with approximately 1500 patients.

Acceptance of the Nurse Practitioner

The experience to date indicates that the nurse practitioner is usually well accepted in a variety of clinical settings, but neurosurgical nurse practitioners are still too few in number to permit broad statements about their general performance and acceptance. In other settings, the nurse practitioner has been considered a competitor, but with the passage of time opposition declines. Recent medical graduates, physicians in group practice and academic settings, and specialists tend to be more positive about nurse practitioners. Both staff physicians and residents support the new role because it is viewed as providing more time for reading, teaching, attending conferences, and dealing with more difficult patient management problems.

Acceptance by the nursing staff is mandatory if the nurse practitioner is to perform effectively. It begins with the official relationships established between nurse practitioners and the nursing staff of the hospital on the one hand and the clinical service in which they function on the other. If they are considered to be fully responsible to one of these authorities and not the other, the position probably will not work. Because nurse practitioners are nurses, they should be included in the table of organization of the nursing department and should be employed by the hospital. However, they should report primarily to the chief of the clinical service in which they function, because all of their professional activities fall within the purview of that service. The arrangements should be similar to house officer employment, where the resident is employed by the hospital, but training and service are the responsibility of the clinical department. The establishment of effective relationships between nurse practitioners and the nursing staff on the hospital floor and in the intensive care unit is critical. Success is dependent on a clear understanding of respective roles and sensitivity to the threat that the nurse practitioner may pose for some nurses.

As long as the physician and nursing staffs are satisfied, acceptance of the nurse practitioners by the hospital administration is generally not a problem. The hospital administrator does want to be sure that the patients are satisfied with the role, and that the legal status of the practitioners within the hospital setting is clearly defined.

There is ample evidence that patients are very receptive to nurse practitioners. Some patients believe that their primary physician and the house officer responsible for them are too busy to discuss all aspects of their care, especially very personal concerns about the abilities to cope within the family and the workplace after discharge from the hospital. Although these matters are the primary responsibility of the attending physicians, in practice one of the most important functions of the nurse practitioner is to counsel patients on future problems and opportunities and, in general, make an attempt to bolster their spirits in that difficult transition from a major neurosurgical procedure to an effective return to society.

The Association of Academic Health Centers recently completed a study of the organization and governance of academic health centers. One part of the study was an anticipated conditions questionnaire sent throughout the nation to university presidents, vice-presidents for health affairs, deans of health schools,
Role of the nurse practitioner in neurosurgery

and executive directors of university hospitals. Each respondent was asked to indicate whether a particular condition anticipated for 1990 was most or least likely to occur and most or least desirable. One anticipated condition was: “The number of non-physician health providers involved in direct patient care will expand.” Among all respondents, 72% thought this condition most likely to occur, 27% were uncertain, and only 1% thought it least likely. Nearly all deans of allied health, nursing, and pharmacy schools considered the condition to be most desirable, compared to only 30% of deans of medicine. A corollary condition was: “The number of professionals other than physicians and dentists who work on a fee for service basis will increase.” Only 13% of all respondents thought this condition was least likely to occur, but there was an even split on desirability. Once again, deans of pharmacy and nursing were heavily in favor, and deans of medicine largely opposed to that eventuality. These observations indicate that the expanded roles of nurses are generally well accepted and will continue into the foreseeable future.

The Nurse Practitioner in Research

Nurse practitioners can be trained to participate in research in the clinical neurosciences. The specialized intensive care unit is a good example of a setting where they can contribute to a clinical research program. For example, since they have intimate knowledge of the clinical course of the head-injured patients they are following, they serve as the link between the research team that comes to the unit to perform studies on cerebral blood flow, brain metabolism, and evoked potentials, and the neurosurgical house staff and attending staff who have primary responsibility for the management of the patients. They participate actively in the research studies and take responsibility for collating the clinical and research data on a daily basis. Since they are in the intensive care unit throughout the day, they are probably in the best position to summarize all the clinical and research information when the management of the patients is completed. This is a unique role. It cannot be filled by the intensive care unit nurses, well trained and competent as they are, because these nurses must spend most of their time in bedside care. The neurosurgical attending and resident staffs are busy elsewhere in the hospital most of the day, and the research team may have limited knowledge of the overall management of the patient under study.

Perhaps a major role of the neurosurgical nurse practitioner in the future will be in the study of the epidemiology of neurosurgical disorders. There is a paucity of information on the natural history of degenerative disc disease and the long-term benefits of neurosurgical intervention to relieve nerve root and spinal cord compression. As is true with head injury, the clinical outcome in these patients must be measured in much more than neurological terms.

Many other examples could be given. Neurosurgeon clinician/investigators have been too busy, or have not had the inclination, to study these problems in depth. This is an appropriate role for nurse practitioners because they are trained to have a special interest in the emotional, social, and economic adjustments of their patients to their illnesses. In fact, in the future, a neurosurgical nurse practitioner with a Ph.D. in epidemiology may become a sought-after member of the clinical research team in departments of neurosurgery.

Education and Training

The first nurse practitioner program was introduced in 1965 in pediatrics at the University of Colorado. Training consisted of 4 months of a didactic curriculum followed by 20 months of field work with the pediatrician. By 1975, there were over 150 programs that offered formal training designed to expand the clinical skills of professional nurses, and presently there are approximately 6000 nurse clinicians and practitioners working in the United States in a variety of specialties. The programs vary greatly in both prerequisites and in their length and content. Some practitioner programs require baccalaureate preparation, others do not. There is general agreement that the nurse practitioner program should be affiliated with an accredited school of nursing and with the participation of a medical school.

At the University of Virginia, the nurse practitioner course lasts 18 months, and there are several different clinical tracks. Courses are offered at the graduate level following completion of a baccalaureate program in nursing, and can be taken as part of the requirements for a master’s degree in nursing. Six months are spent in developing skills in history-taking and physical assessment, followed by 3 months of didactic material covering the disease entities that make up a particular clinical track, then 3 months of laboratory experience that includes instruction in areas as diverse as the physical examination, suturing techniques, and the insertion of intravascular lines. Emphasis is placed on both acute care and management of clinical problems within a given discipline. This 12-month, largely didactic, program is followed by a 6-month preceptorship that involves treatment of patients under the supervision of a physician preceptor. There is evidence that nurse practitioners can carry out physical examinations as competently as do physicians.

A nurse practitioner training program in neurosurgery was described by Moody. This program at the Cook County Hospital is conducted primarily by neurosurgeons with a large component of on-the-job training. The program does not include the detailed instruction in physical assessment and patient management in general medicine provided by many nurse practitioner programs in other disciplines. Many neurosurgeons have trained registered nurses to func-
and at the time of this writing there are still 11 states included expanded roles for nurses. Until recent years, have amended their statutes, and 33 states have in-
has been revised in many states. Thirty-nine states

tlon in expanded roles through on-the-job training and

ment by the practitioners? is the development of protocols for patient manage-

is clear.

Licensure Requirements

During the past decade, nurse practice legislation has been revised in many states. Thirty-nine states have amended their statutes, and 33 states have included expanded roles for nurses. Until recent years, state laws proscribed nurses from the diagnosis and for the most part the treatment of medical illnesses, and at the time of this writing there are still 11 states that prohibit diagnosis and treatment by nurses under all circumstances. They are Alabama, Arkansas, Delaware, Hawaii, Kansas, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, and Texas.

Although nurses are now permitted to perform expanded roles in most states, professional certification is usually required. According to the American Nurses Association, which supports specific certification, the advantages of that certification include recognition of clinical expertise and the standardization of the education and the employment conditions among the states. Table 1 summarizes the current requirements for each of the states.

An essential feature for nurse practitioner programs is the development of protocols for patient management by the practitioners. The protocols, developed jointly by the nurse practitioner and the neurosurgeon, become in effect a job description while at the same time they form the instrument that is the legal basis of the clinical responsibilities assigned to the nurse practitioner. In time, it is likely that state licensing boards as well as physician and nurse professional associations will look upon the protocols as the principal description of the respective responsibilities and accountability of the physicians and nurse practitioners.

Financial Implications of the Nurse Practitioner Program

Because of growing public and government interest in comprehensive health care, there has been increasing interest in the expanded role for nurses by those responsible for planning health care services and drafting legislation. There has also been considerable interest in methods for reimbursement of non-physician health providers, and the federal government has authorized demonstration projects to test appropriate methods for reimbursing nurses functioning in expanded roles. The American Nurses Association believes that professional nurses ought to be recognized as providers of direct care and become eligible for direct reimbursement, and in 1976 the American Academy of Pediatrics stated that pediatric nurse practitioners should be reimbursed like pedi-

Third-party insurers have been ambivalent concerning reimbursement for nurse practitioners. Insurance companies have almost universally denied payment for services rendered by practitioners. Recently, a few companies have modified their policies to permit their subscribers to seek out and be reimbursed for nurse practitioner services.

Another financial implication of nurse practitioner programs, and a concern to both private and federal insurance providers, is the impact of another fee-for-service practitioner in the health care system. If the services provided by the nurse practitioner can be entirely substituted for services performed by the physi-

practitioner services. The support of the University of Virginia Neurosurgical attendings, residents, nurses, and secretarial staffs is grate-

Acknowledgments

The support of the University of Virginia Neurosurgical attendings, residents, nurses, and secretarial staffs is grate-

Without them the successful implementation of the nurse practitioner role would not have been possible.
Role of the nurse practitioner in neurosurgery

References


Address reprint requests to: Miss Rebecca W. Rimel, R.N., N.P., Department of Neurosurgery, University of Virginia, Charlottesville, Virginia 22908.