The serious nursing shortage of the late 1980s is reviewed in relation to the impact it has had on the recruitment and training of nurse anesthetists. A rapid expansion of the nurse anesthesia educational system and improved practice conditions for all nurses are advocated.

Nursing shortages have been cyclic within the United States over the past several decades. However, the nursing shortage that was identified in the latter part of the 1980s was more acute and more problematic than previous shortages because of its causes.

This shortage resulted from both a decline in the number of graduates from schools of nursing and a concomitant increase in demands for professional registered nurses. The opening up of many career options for women, resulting from the civil rights movement, led to a decrease in the number of women choosing nursing as a career, because they believed that other fields had more to offer in the areas of pay, hours, prestige and autonomy.

The demand for more professional nurses resulted from an increased number of physicians performing a greater number of procedures; an increased percentage of those age groups within the population that require greater health care resources, e.g., the very young and those over 65 years of age; scientific and technological advances that permit health interventions, including anesthesia and surgery, on poorer-risk patients and, finally, the passage of the Medicare prospective payment system (PPS) legislation.

This legislation changed hospital payment for Medicare beneficiaries from a cost plus system to a prospectively determined diagnosis-related group (DRG) payment for bundled services, which served as an incentive to get patients out of the hospital earlier. This factor resulted in an increased patient acuity within hospitals, necessitating increased professional nurse staffing and bringing to life the home health care industry, which siphoned off an ever-increasing number of professional nurses. Some of the greatest shortages were identified among critical care nurses, the kind that most often apply for admission to nurse anesthesia educational programs. All these factors mandate that a long-term solution for nursing shortages must be found, since many of these health care and social changes will have lasting effects.

An American Hospital Association (AHA) publication, "Report of the Hospital Nursing Personnel Survey, 1987," documented that the nursing shortage existed in more than 50% of hospitals reporting staff RN vacancies. In fact, about one-fifth of the hospitals reporting (18.8%), had an average vacancy of 16% of their staff RN spaces. The shortage remains today, despite increased enrollments in nursing programs at all levels and efforts at utilizing nurse extenders in some hospitals.

This shortage of nurses hit at about the same time that the nurse anesthetist shortage was identified and became acute. Of interest is the fact that applicants for nurse anesthesia educational programs did not appear to be adversely affected by the nursing shortage. One could postulate that perhaps nurse anesthesia saved some nurses from dropping out of the profession altogether as a result of burnout or dissatisfaction with their employment setting.

Nurse anesthesia has traditionally been an attractive field, in that the care of the patient is one-on-one, and perhaps there is more autonomy and intellectual stimulation for those nurses seeking such satisfaction. Through working in an intensely interprofessional relationship with other providers, anesthesia, as a discrete service, most often affords achievement of short-term goals and provides the practitioner with the benefit of evaluating his/her services more easily on the basis of the outcome of the care of each patient. This results in early personal rewards for jobs well done. Income for nurse anesthetists has traditionally exceeded that of most nurses, and there are a variety of practice modes that can be undertaken, based on personal ambition, values and other factors.
Another factor that must be addressed in discussing nursing, its shortage and its impact on nurse anesthesia is the gender gap within the profession. Traditionally, professional nursing has been identified as a woman's profession. Even today, only 3-5% of the profession and its students are men. Yet in the nurse anesthesia specialty, men represent almost 45% of CRNAs.

Nurse anesthesia has been an attractive field to men for many of the reasons cited above. In fact, when querying many male CRNAs, they respond that they went into nursing to become nurse anesthetists; this has also been true, but to a lesser extent, among women. Among nursing students today, a significant portion chose nurse anesthesia as their ultimate goal before seeking their nursing program. In fact, some "second career" nurses came into the profession to further prepare as nurse anesthetists, so the gender gap has significantly closed in this specialty and is likely to disappear altogether, based on the number of male students in these programs (Table 1).

If the number of applicants to nurse anesthesia programs has not dropped during this nursing shortage, why is there a shortage of nurse anesthetists? There are two factors associated with the shortage of certified registered nurse anesthetists. These first relates to the decrease in the number of nurse anesthesia educational programs and the number of training spaces allotted for nurse anesthesia clinical education. The decrease in training spaces has resulted principally from three reasons: financial, philosophical and political.

The enactment of the PPS legislation, which changed reimbursement methodology for Medicare hospital payments, led some hospitals to anticipate or, in fact, have financial difficulties. Since many nurse anesthesia programs were hospital-based, with the hospital paying the cost of education, some hospitals closed their educational programs, including their nurse anesthesia programs.

Secondly, since the number of graduates from medical schools has almost doubled between 1975-1990, more medical graduates chose to enter the anesthesiology specialty for a variety of reasons. Thus, some anesthesiology educators, including leaders within the American Society of Anesthesiologists (ASA), renewed their long-term goal of trying to make anesthesia an all-physician service. Since it is customary for the anesthesiology department chairman to control clinical access, many nurse anesthesia educational spaces were transferred to anesthesiology residency spaces, and some nurse anesthesia programs were eliminated or reduced in size.

The third basis for program closures was political in nature. It resulted from the American Association of Nurse Anesthetists' (AANA) efforts to correct the inadvertent reimbursement disincentives to the utilization of certified registered nurse anesthetists (CRNAs) that were

<table>
<thead>
<tr>
<th>Year</th>
<th>All reporting RN programs</th>
<th>Baccalaureate programs</th>
<th>Associate degree programs</th>
<th>Diploma programs</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Number of Programs Reporting</td>
<td>Men</td>
<td>Blacks</td>
<td>Hispanic</td>
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<tr>
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<tr>
<td>1986</td>
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<td>3,916</td>
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<td>643</td>
<td>2,326</td>
<td>6.8</td>
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</tbody>
</table>

Table I: Trends in graduations of men and minority students in basic RN programs, 1978 to 1986

Excludes American Samoa, Guam, Puerto Rico and the Virgin Islands.

*American Indian/Oriental was one category before 1984.
in the PPS legislation. This legislative initiative resulted in Medicare direct reimbursement for CRNAs. Some anesthesiologists, perceiving such legislation as giving CRNAs more competitive capability, observed off the record that they did not want to participate in preparing their own competitors. As a result, they closed clinical access to the nurse anesthesia program. Between 1983 and 1987, approximately 600 nurse anesthesia educational spaces were lost for these and other reasons.

Of note, when the CRNA payment fee schedule was adopted by the Health Care Financing Administration (HCFA) for implementing the CRNA direct reimbursement legislation, HCFA neglected to address reimbursement for direction of nurse anesthesia student services. This created a reimbursement disincentive for conducting a nurse anesthesia education program as compared to a anesthesiology residency program. While HCFA representatives have stated that they are correcting that disincentive when they promulgate new regulations, these have been under departmental review for the past two years and remain unpublished to date.

As the demand for nurses rose, so did the demand for CRNAs, despite the significant increase in the number of anesthesiologists being prepared. This demand stems from many of the same or related factors that produced the nursing shortage, e.g., the aging population and its need for health care services requiring anesthesia; the advances in neonatal care by which more premature infants or those with congenital anomalies requiring multiple surgeries are being saved; the complexity of medical interventions necessitating two or more anesthesia providers; the decentralization of surgery from hospitals into surgicenters, specialty surgical centers, and physicians' offices; the increasing number of surgical procedures necessitating anesthesia and the expanding services being offered by anesthesia providers within obstetrics and for pain management, etc.

Another factor supporting the demand for CRNAs relates to the cost crisis in health care, whereby CRNAs are key to moderating the costs for anesthesia services. The cost of health care has more than doubled in the decade of the 80s, (from $1,016 per person per annum to $2,425). It is estimated to increase to the point where it will cost each American $5,115 in the year 2000. It has also been estimated that adequate numbers of CRNAs in the marketplace could save this nation $1 billion annually for anesthesia care between now and the year 2000. The U.S. Department of Health and Human Services study on CRNA manpower needs documents a current shortage of approximately 7,000 CRNAs and projects a need for 35,433 full-time equivalent CRNAs by the year 2010.

This need, identified in the U.S. DHHS study, necessitates preparing 1,800 CRNAs annually between now and the year 2000, and 1,500 thereafter to reach the projected need by 2010. Had there been no decline in the number of training spaces, there would have been a need to expand the educational system by about a third. Now, it will be necessary to approximately triple the number of training spaces and students enrolled in nurse anesthesia educational programs. The question is, in light of the nursing shortage, are there sufficient applicants available to achieve this goal?

In a recent survey conducted by the AANA Department of Education and Research, it was found that for every available training space, there were approximately three qualified applicants to these programs. Some programs indicated that they had as many as 12 applicants for every space. The greater ratio of applicants to student slots has been identified in the graduate nurse anesthesia programs. Therefore, it is evident that there are adequate applicants to justify a significant increase in the educational capability within these programs.

The extent to which this expansion can be accomplished without outstripping the applicant pool requires answers to additional questions. What is the average number of nurse anesthesia educational programs to which each applicant applies? To what extent are applicants committed to the programs of their choice? How mobile are applicants, e.g., capable of moving to areas where there are available spaces? Are there deterrents to potential applicants for nurse anesthesia programs, and to what extent could these be overcome?

Since most programs require students to be enrolled full-time, are they losing potential candidates, or are potential students aware of those programs that allow students to take the academic component on a part-time basis? Would it be advantageous for the Council on Accreditation to indicate those programs on its list of approved programs that admit part-time students.

Minimum requirements for admission to a nurse anesthesia educational program are a baccalaureate degree in nursing or another appropriate field, a current license to practice professional nursing and a minimum of one year of nursing experience in an acute care setting. Each program may add additional requirements.

Those in the graduate framework, approximately 70% of the current programs, usually require a 3.0 grade point average and an acceptable score on the Graduate Record Examination, Miller Analogy or another standardized test. While each college or university may allow some flexibility related to these scores, some will require that selected courses such as statistics or biochemistry be on the student's transcript prior to enrollment in their program. The other 30% of nurse anesthesia educational programs are offered either in a baccalaureate or certificate framework.

Graduates of all accredited programs, regardless of their academic frameworks, meet the basic requirements for eligibility to write the certification examination. The Council on Accreditation has announced
that, in 1998, accreditation requirements will mandate that each nurse anesthesia educational program offer a graduate degree for successful completion of its curriculum.

Today, many existing nurse anesthesia educational programs have expanded their educational capability. Some new programs have received pre-accreditation status, while other potential programs are on the drawing board. There is a need to establish more new programs, particularly in the western United States, and to develop additional freestanding clinical sites that could affiliate with existing academic programs.

The U.S. Congress has recognized the need for preparing additional nurse anesthetists through passage of legislation that has offered traineeships to second-year students enrolled in accredited programs. In 1985, the Secretary of Health and Human Services was empowered to make grants to nurse anesthesia institutions to (1) cover the cost of projects to develop and conduct nurse anesthesia educational programs and (2) provide financial assistance and support to CRNA faculty to obtain advanced education relevant to their teaching functions. Grants supporting faculty development were not awarded until 1989.

Monies for support of the development and conduct of nurse anesthesia educational programs were appropriated in 1990 for 1991. It should be noted that several graduate nurse anesthesia educational programs that exist within colleges of nursing have received funding from the allocations for support of graduate nursing education. These funds are administered by the Division of Nursing of the Department of Health and Human Services.

Many hospitals participate in nurse anesthesia education as a basis for recruitment of graduates for their own anesthesia services. Others, which do not participate in such programs, provide scholarships, usually in return for an agreement to work for the hospital's anesthesia service for a defined period. The need for nurse anesthetists is so acute that, in some instances, students' contracts have been bought out by other hospitals. To what extent such activity will adversely affect the future availability of hospital scholarships for nurse anesthesia students is unknown.

In summary, the shortage of professional nurses has not adversely affected applicants to nurse anesthesia educational programs to date. In fact, the applicant pool for nurse anesthesia programs could support at least a doubling of enrollment, if not the capability to triple the enrollment. Since some potential qualified applicants appear to be discouraged by the odds of being selected by the program of their choice at the time they desire to be, it is imperative that the educational capability for preparing nurse anesthetists be expanded as expeditiously as possible, if the need for CRNAs in 2010 is to be met.

While the demographics of the 1990s appear problematic for all career fields because of the competition among career opportunities for high school graduates, this is one nursing specialty that is truly competitive, both within and without the health care field. Every effort should be made by local and state nurse anesthetist groups to address the potential of this specialty as a career choice for students, beginning in the primary grades, so it can be among the options high school students seriously consider when they plan their future.

Since males have been attracted to this nursing specialty in greater numbers than any other specialty, directing some recruitment efforts to them may be one of the best chances to recruit additional men into nursing. Many CRNAs—men and women—have gone through long and circuitous routes to attain credentialing in this specialty. More direct educational routes will reduce the length of time and cost of preparation to become CRNAs.

The health care delivery crisis within the United States is multifaceted and, as such, will require a broad array of efforts if it is to be resolved without impeding recruitment into those health occupations that are key to containing costs and making health care accessible to all in our society. Since CRNAs are the key to cost-containment and accessibility to anesthesia services across this nation, the nurse anesthetist shortage must be resolved. This necessitates the expedient expansion of the nurse anesthesia educational system and the improvement of practice conditions for all nurses. In so doing, we might also be able to help resolve the nursing shortage itself.

REFERENCES