

The Evolution of Accredited Nuclear Medicine Technology Programs: A Comparative Study of Eleven Years of Change (1982 to 1993)

Art Meyers

College of Health Sciences, University of Nevada, Las Vegas, Nevada

Objective: Since their inception in 1970, educationally accredited programs in nuclear medicine have been greatly diversified. These programs have been accredited by the Joint Review Committee for over 20 yr in a variety of educational settings including hospital-based programs, community colleges, technical colleges, universities and 4-yr colleges. Equally diverse has been the variation in student class size ranging from a few students to over 60 students in a single program. This article evaluates changes in accredited nuclear medicine programs over an 11-yr period.

Methods: This research compares accredited programs in 1982 to programs in 1993.

Results: The data suggest that the primary educational setting has substantially changed from hospital-based to community college and university settings.

Conclusions: From 1982 to 1993, an overall decrease in the total number of accredited nuclear medicine programs, a significant reduction in very small programs (less than five students) and a consolidation of larger programs has occurred.

Key Words: accredited nuclear medicine technology programs; Joint Review Committee

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Health care, with all its interrelated manifestations, is the country's second largest industry and promises to soon become number one (1). Many diverse allied health professionals, especially those trained in the radiological sciences, are needed to meet the ever-changing complexity of modern medical health care.

The growth phenomenon was most easily noted in the marked increase in the number of educational programs that became operative in technical schools, junior and senior colleges and universities. Students registered in increasing

numbers, reaching peak enrollments in the late 1970s and early 1980s. Large numbers of females were attracted to the more than 100 allied health careers that provided rewarding positions and were readily available (2).

Based on this growth and development, new modalities in the field of radiological technology, such as nuclear medicine technology, began establishing their own set of standards for educational programs. The separate accreditation of nuclear medicine programs began in January 1970. The Joint Review Committee on Educational Programs in Nuclear Medicine was formed by the Society of Nuclear Medicine, the Society of Nuclear Medicine-Technologist Section, the American College of Radiologists, the American Society of Clinical Pathologists, the American Society for Medical Technologists and the American Society of Radiological Technologists (3).

The responsibilities of the Joint Review Committee include coordinating the preparation and revision of educational standards for adoption by collaborating organizations and conducting program reviews. The essentials for accredited educational programs in nuclear medicine were substantially revised in 1976, 1984 and 1991 (4).

As the responsibilities and duties became more sophisticated for allied health professionals, hospitals and physicians recognized that colleges and universities were the appropriate sites to provide the background in science, mathematics and communication needed for frequent inferential thinking and decision making (5).

The purpose of this article is to evaluate the evolutionary characteristics of accredited nuclear medicine programs over an 11-yr period. The research compares accredited nuclear medicine programs in 1982 to levels in 1993 by examining three major areas:

1. The primary educational setting for these programs, categorized as either hospital-based or based at community colleges, universities and 4-yr colleges;
2. The number of students in each accredited program; and

For reprints contact: Art Meyers, EdD, R.T., Department of Radiological Sciences, College of Health Sciences, University of Nevada, 4505 Maryland Parkway, Las Vegas, Nevada 89154-3017.

- Evaluating closed nuclear medicine programs (operational in 1982 that are no longer in existence in 1993) and new nuclear medicine programs (currently operational in 1993, but not in 1982).

METHODOLOGY

The data in this study were obtained from the Allied Health Directory of Accredited Nuclear Medicine Program sections from the 1982 edition and compared to the 1993 edition.

The specific data collected from these directories were utilized to evaluate changes in nuclear medicine technologist educational training. The following data were extrapolated out of the 1982 and 1993 Allied Health Directories of Accredited Nuclear Medicine Programs:

- The total number of accredited nuclear medicine programs in 1982 and 1993.
- Categorical classification. The study created three distinct educational settings: university (4-yr college-based education), community college or hospital-based education. Programs were categorized based on their primary educational affiliation.
- Class size comparison. Each program was characterized in terms of the number of students approved for enrollment per program. The study established five distinct class-size groupings: fewer than 5 students; 5–9 students; 10–13 students; 14–17 students; and more than 17 students. Each program was categorized into one of these groupings.
- An overall average number of students per program in 1982 compared to 1993. This was accomplished by adding up the total number of programs in each specific year and dividing by the total number of students in nuclear medicine technology programs nationwide for each of the years analyzed.
- An analysis of the type of nuclear medicine educational programs that were in existence in 1982 and are now closed. This data was gathered by evaluating the 1982 nuclear medicine accredited programs and identifying those programs no longer listed in the Allied Health Directory of 1993.
- Evaluating the characteristics of new nuclear medicine accredited programs. This study defines these programs as accredited nuclear medicine programs listed in the 1993 Allied Health Directory that were nonexistent in 1982.

RESULTS AND DISCUSSION

Over 11 yr (1982–1993), the total number of accredited nuclear medicine programs declined from 137 to 115. At the same time, the educational settings of these programs seem to have changed significantly as well.

Educational Settings

The data reveal some major changes and trends in the educational settings of nuclear medicine programs. In 1982,

TABLE 1
Comparison Between Nuclear Medicine Educational Program Affiliations Between 1982 and 1993

	1982 Programs (%)	1993 Programs (%)
University*	49 (36%)	57 (50%)
CC/Tech.†	21 (15%)	24 (21%)
Hospital‡	67 (49%)	34 (29%)
Total	137 (100%)	115 (100%)

*University = affiliated with a 4-yr college or university.
†CC/Tech. = affiliated with a community college or technical school.
‡Hospital = affiliated with a hospital.

hospital-based programs (primarily affiliated with a hospital or health care system) were by far the majority, with 67 accredited programs, making up 49% of all programs. In 1992, the number of hospital-based programs dropped to 34, making up 29% of all 1993 programs (Table 1).

The educational setting for community college or technical colleges (primarily affiliated with a community college or technical college) has only changed slightly over the 11-yr comparison. In 1982, the total number of programs housed in community colleges or technical colleges was 21, representing 15% of all programs. In 1993, the number of these programs was 24, representing a slight overall increase of 21%.

The data gathered relating to university-based programs (primary affiliation at a university or 4-yr college) seem to indicate a significant trend from 1982 to 1993. A total of 49 programs were housed in a university setting in 1982, representing 36% of the total number of accredited programs. In 1993, there were 57 nuclear medicine programs primarily affiliated with a university or 4-yr college, representing 50% of all programs which reflects a 14% increase.

Class Size

The second section of results analyzes data pertaining to the overall class size of nuclear medicine programs nationwide and the average number of students per program. The study compared the number of students approved for enrollment in 1982 to levels in 1993. Each accredited program was categorized into one of the five categories as shown in Table 2.

The data suggest a significant reduction in the overall number of very small programs (less than 5 students per program). In 1982, there were a total of 35 nuclear medicine programs with less than 5 students per program, representing 26% of all accredited educational offerings. In 1993, the number of these small programs was reduced to 11, representing only 10% of all programs.

In 1982, the total number of programs categorized with 5–9 students per program were 43, or 31% of all accredited schools. In 1993, this number increased to 52, or 44% of the overall total.

The overall number of programs categorized in the range of 10–13 students per program remained fairly stable over

TABLE 2
Comparison Between Class Size of Nuclear
Medicine Educational Programs Between 1982
and 1993

Program size	1982 (%)	1993 (%)
<5 students	35 (26%)	11 (10%)
5-9 students	43 (31%)	52 (44%)
10-13 students	22 (16%)	18 (16%)
14-17 students	11 (8%)	9 (8%)
>17 students	26 (19%)	25 (22%)
Total programs	137 (100%)	115 (100%)
Total students*	1500	1508

*Total number of all nuclear medicine program students approved for enrollment.

the 11-yr period. In 1982, 22 programs (or 16%) were in this category. In 1993, 18 programs representing the same percentage of 16% of the total had 10-13 students per program.

In the two largest groupings of students per program (14-17, more than 17), the total number of programs and the overall percentage of total programs remained fairly steady. In 1982, the total number of nuclear medicine programs with 14-17 students was 11 (8%). The largest grouping for that same year of more than 17 students per program was 26 (19%). These data are close to our results of 1993 in which 9 programs (8%) were in the 14-17 student category. The largest student grouping of that same year (more than 17 students/program) had 25, or 22% of all programs in that size range.

While the total number of accredited nuclear medicine programs has declined by 16% from 1982 (137 programs) to 1993 (115 programs), the average number of students per program has increased from 10.95 students per program in 1982 to 13.11 students per program in 1993.

Though the data seem to suggest there have been significant changes in the number of accredited nuclear medicine programs and the average number of students per program over 11 yr, the total number of actual students in nuclear medicine educational settings nationwide has remained remarkably close: 1500 in 1982 and 1508 in 1993.

New Programs Versus Old Programs

This last section discusses new nuclear medicine programs which were operational in 1993, but were not in existence in 1982, and closed nuclear medicine programs that were operational in 1982 but were no longer in existence in 1993. New and closed programs were evaluated based on their primary educational settings. Two main categories were grouped together: hospital-based programs and college-based settings. These categories were selected in order to determine if nuclear medicine programs have become more academically oriented on their primary educational affiliation over the last 11 yr.

The data reveal that 27 of the 33 new programs are currently housed in community colleges or university settings,

TABLE 3
New Nuclear Medicine Programs*

Hospital-based	6	18%
Community college or university-based	27	82%
Total	33	100%

*New nuclear medicine programs refers to those in operation in 1993 but not yet started in 1982.

representing 82% of all new programs. Only 6 of the 33 new programs (18%) were established and became accredited at a primary hospital-based affiliation (Table 3).

An examination of the programs that have been closed revealed that 39 of the 55 such programs were hospital-based, representing 71% of the total. The remaining 29%, or 16 of the 55, were at community college or university settings (Table 4).

CONCLUSION

All of allied health education has undergone tremendous change over the last decade. This research attempted to compare various characteristics of accredited nuclear medicine technology educational programs in 1982 to their standing 11 yr later in 1993.

The data indicated that the primary educational settings for nuclear medicine programs in 1982 were hospital-based, representing 49% of the total. In 1992, this number had declined by 20%. Nuclear medicine programs primarily affiliated with community colleges or technical colleges increased by 6% from 1982 to 1993. The largest increase was found in programs affiliated with universities and 4-yr colleges with an increase of 14% over the 11-yr period.

This study compared the number of students approved for enrollment per program in 1982 to 1993. The largest reduction in group size was in very small programs. Programs with fewer than 5 students per program decreased from 26% in 1982 to 10% in 1993. The largest increase in group size was in the 5-9 students per program category: 31% in 1982 to 44% in 1993.

The data regarding closed programs and new nuclear medicine programs support the educational movement away from hospital-based programs to community colleges and university settings.

TABLE 4
Closed Nuclear Medicine Programs*

Hospital-based	39	71%
Community college or university-based	16	29%
Total	55	100%

*Closed nuclear medicine programs refers to those in operation in 1982 but no longer in existence in 1993.

The project's data imply that students entering the field of nuclear medicine will need to be more academically oriented and less technically minded, since accredited nuclear medicine programs are being found more frequently at community colleges and universities. Graduating nuclear medicine students will possess greater diversity of educational experiences, cultivate problem-solving skills and be more sophisticated about instrumentation and radiopharmaceutical use. This should translate into a more competent nuclear medicine technologist who can better understand and effectively utilize complex SPECT systems and computer applications.

Hopefully, this trend as indicated within this study will raise the professional status and standard of care provided by certified nuclear medicine technologists.

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