

Continuing Education Topics Most Beneficial to Nuclear Medicine Departments: Results of a Nationwide Survey

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One of the most important questions facing nuclear medicine technology educators who want to improve educational programs for nuclear medicine professionals is "Where should emphasis be placed in training?" Likewise, the development of continuing education programs by educational institutions and professional associations is also dependent on the answer to this question. A mail survey of 2,223 nuclear medicine technologists who were members of the Society of Nuclear Medicine was conducted in June 1977 in an effort to have working technologists provide information. The questionnaire solicited comments from technologists, including which educational topics would be most beneficial to their continuing professional education. The responses to this question were analyzed through the use of a frequency table. The most frequently requested topics were: patient psychology, radiopharmacy quality control, use of computers, and imaging techniques. The total list of requested topics and representative respondent questions are also discussed.

There is general agreement in the literature for continuing education.

Based upon her questionnaire, Hibbard (1) recommends that more effort be made to involve the working technologist in an ongoing educational process. Working technologists commonly perceive a need to keep abreast with the field of nuclear medicine technology. Simmons (2) cites training as crucial to resolving the serious shortage of qualified technologists. Their education and training must qualify them to be capable of performing highly technical skills with a minimum of supervision.

Little attention, however, has been directed toward identifying the direction and emphasis of continuing education. A survey of the literature covering the past eight years failed to reveal studies concerning which continuing education topics are perceived to be most beneficial. The purpose of our study was to identify the generalized perceived needs of nuclear medicine technologists on a nationwide basis.

Materials and Methods

The survey to determine continuing education needs

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as perceived by nuclear medicine technologists was conducted within a larger study on the general efficiency and effectiveness of present nuclear medicine technology curricula in meeting job expectations.

The total questionnaire consisted of 61 questions; 52 surveyed the frequency of performance, perceived importance to the job, and past educational preparation for specific skills performed by the nuclear medicine technologist in his job. An example of a sampled skill concerning radiotracer preparation was: "Manage and record the usage of the tracer."

The nine remaining questions solicited information concerning various characteristics of the technologist or his working environment. The question representing the focus of our present study—list the types of specialty short courses that would be most beneficial for your department—was contained in this section.

Approximately 2,200 members of the Society of Nuclear Medicine, Technologist Section, were selected to receive the questionnaire, as representative of nuclear medicine professionals. Of the 2,223 questionnaires mailed during May 1977, returned surveys through June totaled 585, or about 26%.

Of the returned questionnaires, 414 responses were recorded for the question concerning continuing education, about 18% of the total population sampled. Responses recorded for this question were partitioned into general categories through systematic review by a committee of nuclear medicine educators at the University of Arkansas for Medical Sciences. A frequency table was set up for each general category, further partitioning each into classes of specific topics.

Eight major categories of continuing education short courses perceived to be most beneficial by working technologists were identified through an analysis of questionnaires. These categories (listed in order of respondents' priority) are:

- Nursing;
- Quality Control;
- Management;
- Radiation Safety;
- Instrumentation;
- Imaging;
- Education; and
- Course Fundamentals.

TABLE 1. Frequency for Requested Continuing Education Topics

Category	Topic	Frequency
Nursing	General Procedures	16
	Patient Psychology	58
	Emergency Medical Care	26
	Patient Mechanics	22
	Injections	6
	Diseases	3
	Terminology	3
Quality Control	General	44
	Radiopharmacy	49
	Instrumentation	28
	Radioimmunoassay	14
Management	General	26
	Department	17
	Personnel	20
	Ethics	13
Radiation Safety	General	5
	Techniques	26
	License	20
	Fundamentals	12
Instrumentation (NaI)	General	23
	Troubleshooting	19
	Electronics	5
Instrumentation (other)	Computed Tomography	8
	Ultrasound	11
	Dark Room Equipment	8
	Computers	95
Imaging	Tracer principles	12
	Techniques	80
	Evaluation	18
Education	General	6
	Techniques	11
	Workshop Presentations	12
	Logic	3
Course Fundamentals	Physics	20
	Mathematics (graph analysis)	13
	Statistics	13
	Research Techniques	4
	Radiation Biology	4

Within these eight categories, a total of 37 topical areas were isolated and a frequency table was constructed (Table 1). Table 2 shows exemplary responses selected randomly from each general category for the purpose of showing typical raw data before partitioning into categories or topics.

Discussion and Conclusion

Analysis of the frequency tables leads to the following conclusions:

1. It appears that additional instruction in various nursing skills would be desired from many nuclear medicine technologists (134 responses). The most frequently

cited nursing skills involved aspects of dealing with and understanding the motivations of patients. This may be due in part to increasing case load rates, which necessitate more effective technologist-to-patient communication. Other topics frequently identified were patient mechanics (such as lifting and moving patients) and emergency medical care (such as cardiopulmonary resuscitation). Interest in these topics may be possibly attributed to technologists assigned to smaller nuclear medicine departments, where responsibilities would ordinarily be of a wider range.

2. The most frequently identified specific topic that appeared in the instrumentation category involved theory and usage of computers (95 responses). This may be linked to the increasingly widespread use of computer-assisted data analysis often used in dynamic studies. Other instrumentation topics frequently cited were: instrumentation in general, minor troubleshooting dealing with NaI detection devices, and theory and techniques for use of ultrasound devices.

3. One particularly frequent topic of interest concerned specific imaging techniques (patient-to-camera

TABLE 2. Examples of Typical Comments within the Eight Major Continuing Education Categories

Category	Comments
Nursing	How do I speak to a patient
	How do I show the patient that I care about his welfare
	How do I convince the aged patient that his tests are important
Quality Control	How is chromatography done
	How long after preparation is a kit usable
	What is a good flood field
	What phantom should be used
Management	What are good quality control techniques
	How to prepare a budget
	How to motivate the staff
	Why and when should I talk to a salesman
Radiation Safety Techniques	What can I tell a patient
	How do I do a wipe survey
	How do I monitor a department
Instrumentation	How often should I change my gloves
	How do I judge a camera's performance
	How does a computer work
	What do existing programs tell me
Imaging	Programming
	Why does sulfur colloid go to the liver
	Which collimators do I use in a brain scan
	What distance should the patient be from the camera in a bone scan
	How many pictures are needed
Education	What is a good picture
	How do I present material
	When is the best time to hold classes
Course Fundamentals	What does a graph tell me

distances, etc.). This topic received the second largest number of responses (80) in the survey. It appears that continuing education efforts in imaging techniques are considered high priority by technologists. This may be due, in part, to inadequate on-the-job training programs in the field, or to the apparent lack of standardization of imaging procedures on a nationwide basis.

4. The most frequently cited category involved quality control measures (135 responses). The most typical comments concerning quality control were: quality control in general, radiopharmacy, and quality control instrumentation. It is possible that these responses are precipitating effects that are due to increased general knowledge, complexity of tasks, and desire for greater confidence in doing these tasks.

Finally, nuclear medicine technologists in the field recognize the need for and want to see improvement in many areas of their professional skills, especially as they concern patient care. Therefore, additional training is needed in several areas—both through continuing education programs and re-emphasis within existing pro-

fessional programs designed to train new nuclear medicine technologists.

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