

time of its use.

Although we have no analytic data on the content of the problematic normal saline, we believe that it may have contained excessive quantities of oxidizing agents. The presence of bacteriostatic compounds can interfere with  $^{99m}\text{Tc}$  labeling of many radiopharmaceuticals, presumably by an oxidative mechanism (9); the normal saline used, however, did not list bacteriostatic agents in its labeling. One possible explanation may relate to the concentration of dissolved oxygen in the normal saline used for reconstitution of the Sn-PYP (10). Another possible explanation may relate to the selection of the elastomeric material used for the vial stopper since certain closures can affect the stability of stannous ion (11) and can leach potent chemicals used in its manufacture into the vial contents (12).

In summary, our observed cluster of poor quality  $^{99m}\text{Tc}$ -RBC labeling procedures was apparently related to the source of normal saline used for reconstitution of the Sn-PYP. Product-specific incompatibility should be considered whenever product-related problems are not readily explained.

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## NOTES

\* TechneScan PYP, Mallinckrodt, St. Louis.

† Abbott, North Chicago, IL

‡ Invenex, Orlando, FL

§ Lyphomed, Rosemont, IL

¶ American Regent Laboratories, Shirley, NY

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## TECHS AS RESEARCHERS

**To the Editor:** After reading Maria Nagel's article "Research As An Integral Part of a Nuclear Medicine Technology Curriculum", September 1989, I had mixed feelings. The idea of teaching basic research skills to technologists is beneficial for a variety of reasons, notably it would improve the ability to read and evaluate the field's literature. This could be accomplished in several lectures.

In a four-year program (or even the "three and one" program), there would be enough elective hours available to add a two-credit hour course. But, how does one integrate an additional two-credit hour course into the two-year associate degree program?

Especially a program whose curriculum is already overcrowded?

Her statement that "as part of the nuclear medicine team, the nuclear medicine technologist must be able to conduct and assist in research activities" struck a raw nerve. Based on manpower surveys published in the *Journal of Nuclear Medicine Technology* as well as other health-related publications, it is clear that there exists a critical shortage of nuclear medicine technologists. I feel that the first priority of any program should be to educate and train good clinical technologists. My experience, admittedly limited, indicates there are more technologists working in community-based hospitals and medical centers than in large research-oriented facilities.

Although research is an important venue, it should be subordinate to the training of competent clinical technologists. Moreover, it is imperative that we seek ways to fill vacant positions and maintain our current technologists in the field before total burnout occurs.

Are we trying to teach our students to become researchers rather than staff technologists?

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**Reply:** I read Ms. Garrett's letter with interest. She made some points which I should like to address: I believe that her supposition that students could learn to "read and evaluate the field's literature" after a series of "several" "lectures" would instead give them only a superficial set of tools and would not imbue in them the ability to think independently.

Her point about there not being enough time for a two-hour research course in the two-year associate degree program is inappropriate. We have been teaching this course to not only two-year students in nuclear medicine technology and radiography, but also to students pursuing one-year pro-

grams in nuclear medicine technology, radiation therapy technology, and diagnostic medical sonography. The course's value lies in its integration into the curriculum as part of the expansion of clinical activities. There is adequate time available to teach research methodologies. In a two-year program, approximately 3,000 hours are available for didactic and clinical activities.

One of the reasons we face a critical shortage of nuclear medicine technologists is because they have found no advancement in the field and have become bored with the routine of daily imaging. Research, on the other hand, offers technologists the opportunity to become involved in the development of new procedures and different techniques. I do not want our area to become a "monkey-see, monkey-do" profession, without anyone asking what can be done to improve it. Research is a new horizon.

Technologists who are on the front-line have the best opportunity to par-

ticipate in research, for they are the most knowledgeable on techniques and instrumentation. As Ms. Garrett points out, we need to "maintain our current technologists in the field before total burnout occurs." The insertion of research into our daily routine can keep technologists interested in remaining in the field.

There was never a claim in the article that we should teach students to become researchers rather than staff technologists. Our contention is that they are one and the same. Good staff technologists are good researchers, once they learn the basics. Why wait until they are on-the-job to teach the basics when we have education programs that are capable of teaching the basics? Why have so many technologists contributed papers at Chapter and National Society of Nuclear Medicine meetings and to the *Journal of Nuclear Medicine Technology* if research is not an integral part of a technologist's job?

Lastly, the comment indicating that community hospitals and medical

centers do not conduct research is not true. I can speak best from my own experience. We have four affiliate hospitals for the nuclear medicine technology program in Omaha. None of them are "large research-oriented facilities" but they do conduct research with nuclear medicine technologists actively involved. In addition, as the sponsoring institution, the University of Nebraska Medical Center actively does research and currently has a position for a research nuclear medicine technologist.

I believe we must stop thinking of the nuclear medicine technologist as fitting one particular mold. Only with increased opportunities will nuclear medicine technology continue to be a viable profession.

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