

**Karen L. Blondeau, CNMT  
Chairperson**

The NMTCB certification examination helps to provide our profession with a basis of evidence that an individual is prepared to practice nuclear medicine technology at the entry level. Elements of the examination process (1) include: content base, exam matrix, and item development.

The content base is developed from the results of the task analysis surveys periodically conducted by the NMTCB in which respondents evaluate job-related tasks. The NMTCB exam has been validated by this method three times, most recently in 1988 (2). There were 182 tasks on the recent survey that respondents were asked to evaluate by answering the following questions:

1. Is the task performed in the nuclear medicine department?
2. Is the task performed by entry-level technologists?
3. How often is this task performed?
4. Is performance of the task important to the technologist's job success or is it unrelated?
5. What is the most likely outcome if this task is not performed competently.

The 1988 validated task list eventually contained 108 items. The September 1989 NMTCB exam was the first to reflect this most recent task analysis. The task analysis process is critical to the NMTCB exam because it is from this that the test matrix is developed.

The matrix is a way of displaying the content specifications of an exam by category. For the NMTCB exam, there are four task groups: radiation protection and radiopharmacy; instrumentation; imaging; and nonimaging. The tasks are divided into two additional divisions: core and associated. Core

tasks include calibrating and operating imaging equipment while associated tasks are those such as performing radioassay procedures. A percentage (76.5%) of the exam is comprised of core tasks and the remaining 23.5% is comprised of associated tasks. The exam matrix also addresses question (item) and test format, test length, design of the test booklets and answers sheets as well as test result reporting. In much the same way that the task analysis provides the basis for the matrix, the matrix provides the basis for item development.

The NMTCB item writing is performed by experts within the nuclear medicine field (technologists, physicians, and scientists). To assist in the effort, the NMTCB conducts item writer workshops at the SNM annual meeting and at SNM chapter meetings

to provide instruction on writing questions that conform to the NMTCB examination style. Once an item is submitted by an item writer, it is reviewed for content and task relevance by an appropriate subgroup after which it is then edited for grammar and syntax prior to pretesting.

Pretesting, is a method for identifying those items requiring further revision. In pretesting, new items are not identified as such on the exam nor do they contribute to the examinees scores or affect certification decisions.

Pretested items join the item bank, which includes both the exam questions and the performance data of each item. The NMTCB item bank is computerized and allows easy access, retrieval, and revision of items. Consequently, items are regularly reviewed to ensure that they reflect the current practice of nuclear medicine technology. Furthermore, outdated items are eliminated and replaced with new ones.

From this bank of task-referenced questions, the NMTCB exam is developed. After the assembled test undergoes final review, the test booklets are prepared. Careful attention is given to the test format and other production characteristics to ensure that examinees will not be distracted by typos or poor quality images during the test session.

In the next report, test administration, exam equating, scoring and analysis, and passing score determination will be discussed.

## References

1. The American College Testing Program. Elements of a sound certification testing program. 1988.
2. Blosser N, Drew H, Steves A. NMTCB task analysis validation update. *J Nucl Med Technol* 1988;16:216-221.

### Examination Dates The Nuclear Medicine Technology Certification Board 1990-1992

Year	Exam Date	Application Deadline
1990	June 23	April 21
1990	September 22	July 21
1991	June 22	April 20
1991	September 28	July 20
1992	June 27	April 18
1992	September 26	July 18

For more information or to request an application, contact:

**NMTCB**  
P.O. Box 29103  
Atlanta, GA 30329  
(404) 315-1739

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phlets and posters also were strategically located throughout the hospital. One way Shane engaged the interest of physicians entailed placing a viewbox for displaying cases in the doctor's lounge. During NMW, a anonymous case would be displayed along with the patient's history. Physicians would complete forms giving their diagnosis of the case, the results of which would be revealed the following day.

Judging by the responses sent in by contestants regarding the results of their NMW activities, the week was an unqualified success. Attendance to educational functions within medical centers was high and informational materials were used and well received. Most importantly, many respondents noted that they believed they had successfully conveyed the nuclear medicine message to their audiences.

Laura Burns

*Laura Burns works for the public relation's firm that administers the test for GE.*

## ■ Advisory Groups Intensify Efforts on Recruitment and Retention Issues

In response to the critical shortage of qualified nuclear medicine technologists (NMTs), Mallinckrodt, Inc. formed a Technologist Advisory Group, comprised of technologists from across the nation who regularly meet to address the profession's concerns and develop educational programs.

At a technologist workshop session in Orlando, Florida on February 17, the Advisory Group discussed possible activities Mallinckrodt could implement to address the problem areas of recruitment and retention of qualified NMTs. The following recommendations were made to Mallinckrodt:

- Generate educational materials to focus on clinical applications of imaging.
- Utilize the marketing and manage-

ment experience of NMTs who have entered industry to help suggest ideas to solve the technologist shortage issue.

- Cultivate the support of industry in Nuclear Medicine Week activities.
- Publish a newsletter that promotes nuclear medicine technology as a career alternative, targeted towards high school counselors and parents.
- Encourage the financial support of nuclear medicine training programs.
- Develop a series of articles, on communication, retention, job experience, and career profiles for *The Journal of Nuclear Medicine Technology*.
- Sponsor categorical seminars or co-sponsor symposia workshops and local educational workshops.

Patrick Hastings, CNMT, Advisory Board liaison and a marketing consultant with Mallinckrodt stated that "Mallinckrodt's position is not to duplicate the efforts of other groups working on the technologist shortage problem, but to work in concert with the Society of Nuclear Medicine. Industry as a whole, including Mallinckrodt, has responded to the technologists shortage in a joint effort through the ACNP Corporate Committee." Mr. Hastings also discussed projects currently under consideration—one is an educational resource Mallinckrodt will develop for technologists in the fields of oncology and radioimmunoimaging. "This is related to Mallinckrodt's exclusive distribution of NeoRx, Inc. antibody products," said Mr. Hastings. "This will be a how-to educational program for techs relating to handling of antibodies."

In addition to Mr. Hastings, other Advisory Group members are: Stuart Dees, CNMT, Susan Gilbert, CNMT, Art Hall, CNMT, Jenny Keppler, CNMT, Daniel Leahey, RT(N), Ken Lingenfelter, CNMT, Susan Weiss, CNMT, Jim Wirrell, CNMT, and Donald Bernier, CNMT.

Comments and ideas regarding retention and recruitment of NMTs are welcome and should be addressed to:

Patrick Hastings, CNMT, c/o Mallinckrodt Medical Inc., Technical Advisory Group, 675 McDonnell Blvd., PO BOX 5840, St. Louis, MO, 63134.

The shortage crisis and other technologist-related issues have been addressed by the Dupont Nuclear Medicine Technologist Advisory Board, which was formed in response to the various challenges facing the nuclear medicine technology community. Dave Pendleton, Technical Services Manager for Imaging Agents at Dupont and coordinator of the Board's activities, attributes the technologist shortage to the occupation's relatively low salary, limited opportunity for advancement, low professional image (compared to physicians), and the general public's unfamiliarity with the profession. "We have a two-fold image problem. One with the public, and the other with hospital administrators," said Pendleton. "We need to address both areas."

To address these issues, the Dupont Advisory Board has undertaken a series of projects to educate and enlighten the public about nuclear medicine technology. According to Pendleton, the Board's recent publication dealing with communication skills, "Nuclear Medicine Technologist Professional Development Program" has received positive feedback from the hospitals and institutions who have received it. The Advisory Board (also known as TAB) has begun work on the creation of videotapes geared towards high school students, informing them of career opportunities in nuclear medicine technology. "We have to spread the news to high school students that a two-year college degree can lead to a job that pays about \$30,000 a year," says Board member John Reilley, CNMT, of the Hospital of the University of Pennsylvania.

"One of the things we're currently looking into is a drug-awareness tape that we hope to distribute to high school students" said Board member Marcia Boyd, CNMT, of Baptist Memorial Hospital, Memphis, Tennessee. "It will demonstrate how cocaine affects the brain by showing cerebral SPECT images. So, indirectly

it will promote nuclear medicine." Ms. Boyd is also submitting an article to *Modern Health Care*, a publication read primarily by hospital administrators, that will publicize efforts to promote nuclear medicine technologists. "Ironically," said Dave Pendleton, "the image of technologists is probably higher among patients than among physicians and administrators, since they [technologists] are in extensive, daily contact with patients."

"Industry is finally responding to the outcry from technologists that something must be done to make nuclear medicine an attractive career choice by increased recruitment and advertisement efforts and by improving our image," says Theresa Boyce, CNMT, Methodist Hospital, Houston, Texas. "They also realized that to retain good technologists, the profession itself must be upgraded."

**Palash R. Ghosh**

*Associate Production Editor  
JNMT*

#### **JNMT 1989 Outstanding Paper Award**

Herrick J. Siegel, David C.P. Chen, Lynn Jacobs, and Geante Melchiorre are the recipients of the *Journal of Nuclear Medicine Technology* Outstanding Paper for 1989 award. Their winning paper, "The Impact of Operator Decision on Quantitative Profile Analysis of Myocardial Thallium-201 Scintigraphy: A Systematic Evaluation, was selected from over 30 submitted entries. Papers are judged on their educational utility, innovation, timeliness, and method of publication by the *Journal's* Associate Editors.

Presentation of the award will be made during the Technologist Section's Business Meeting in Washington, DC. As primary author, Mr. Siegel will receive a plaque inscribed with the author's names and a \$100 honorarium.

## ■ Annual Meeting Preview

The Washington Convention Center, Washington, DC, will be the locale of the 37th Annual Meeting of the Society of Nuclear Medicine. Convening the week of Monday, June 18, the meeting will present more than one thousand scientific papers, posters, and exhibits treating a wide variety of subjects, including cardiovascular nuclear medicine, SPECT, PET, NMR, computers, instrumentation, pediatric nuclear medicine, neurology, hematology, radiopharmaceuticals, and oncology. Participants also will get the chance to visit with Congressional representatives and staff members of federal agencies affecting nuclear medicine.

Emphasizing the educational format of the Meeting, participants of the Technologist Section program will have the opportunity to attend 25 continuing education (CE) courses as well as the annual nuclear medicine review course. The CE presentations and seminars which are eligible for AMA Category 1, ACPE, and VOICE credits, will cover radioassay, hematology, nuclear cardiology, public relations issues, radiation safety and other topics. The Technologist Section program is presented on pages 128-158 of this issue.

Of particular interest in the Technologist Section program is a categorical seminar on "The Fundamentals of Departmental Financial Management" to be moderated by Michael L. Cianci, CNMT, and Cynthia Wharton, CNMT. This seminar is designed to furnish middle- and upper-level managers with an understanding of techniques to be used in the administration and evaluation of budgets beyond the basic level of budget preparation.

Among the CE courses sponsored by the Technologist Section will be "A Mock NRC Inspection for Physicians and Technologists" which will simulate an actual inspection of a nuclear medicine facility. A panel, including an NRC inspector, will discuss the different facets of radiation inspection.

"The Scientific and Teaching Committee has worked hard this year to create a program that has something

to offer everyone," says Nellie Kelty, CNMT, chairman of the Committee. "Our continuing education tracks have been structured to meet the needs and interests of technologists at all [professional] levels."

Scientific exhibits and posters for both the Society and Technologist Section will be available for viewing in the Exhibit Hall of the Convention Center. The Technologist Section program will conclude with a party on Thursday evening, June 21, at the Washington Hilton.

Of additional interest to technologists are the following: "New Member Orientation Sessions" on Wednesday, June 20. These informal discussions will provide new members with information on both Society and Section activities and membership benefits. The Technologist Section Business meeting will be held on Thursday, June 21, from 5:00 to 6:00 pm in Rooms 10-12.

Additional information about the Annual Meeting may be obtained by contacting: Valerie Lenes, The Society of Nuclear Medicine, 136 Madison Avenue, New York, New York 10016-6760, or call (212) 889-0717.

## ■ Nuclear Medicine Week 1990

Nuclear medicine departments around the country are preparing for the fifth annual observance of Nuclear Medicine Week (NMW) that will occur July 29 through August 4. Sponsored by The Society of Nuclear Medicine (SNM) and the Technologist Section, NMW provides a forum for the medical community and the general public about the status and progress made by nuclear medicine in the diagnosis and treatment of disease.

Once again, the Society will make available "Guidelines for Promoting Nuclear Medicine Week," a pamphlet outlining information on various promotional activities. A special button and a poster have been designed to commemorate the event. A small number of these items shall be sent to each chapter. Additional posters, buttons, and stickers will be sold to hospitals, institutions, and other individuals

interested in promoting NMW. These materials may also be purchased at the SNM's 37th Annual Meeting in Washington, DC. The poster and button can be seen on page 7A of this issue.

In association with the observation of NMW, General Electric Medical Systems again is sponsoring the Media Stars Contest that will award a \$250 honorarium to three individuals who devise and conduct the most effective public relations campaign for NMW, and a \$1,000 donation to each individual's institution. Entry forms for the contest are included in the Guidelines package. Awards to the winners of the 1989 Media Stars Contest will be presented at the SNM 37th Annual Meeting in Washington, DC.

For additional information about NMW, please contact Virginia Pappas, CAE, The Society of Nuclear Medicine, 136 Madison Avenue, New York, NY 10016-6760, (212)-889-0717.

### ■ Technologist Section Testifies Before Senate Subcommittee on FY '91 Title VII Appropriations

On March 21, 1990, Marcia Boyd, CNMT, representing the Government Relations Committee, Technologist Section, The Society of Nuclear Medicine, testified in front of the Senate Subcommittee on Labor, Health and Human Services, Education and Related Agencies on fiscal year 1991 (FY '91) appropriations for allied health project grants and contracts authorized under Title VII of the Public Health Service Act.

The House Subcommittee hearings on these appropriations will be held in April and the Technologist Section will be represented by Sharon Surrel, CNMT. The Senate and House should reach a decision on how much they will appropriate to allied health by late spring or early summer.

Last year, the Senate initially authorized two million dollars for allied health but the House did not authorize any appropriation. The House and Senate compromised and agreed on an appropriation of \$750,000. However,

the Gramm-Rudman cuts reduced this amount to \$726,000.

The Technologist Section is asking for an increase in the appropriation for FY '91. Marcia Boyd briefed the Senate Subcommittee on the current state of recruitment and retention of nuclear medicine technologists (NMTs) and the expected demand for technologists in the 1990s. She concluded that the current appropriation is inadequate to meet the needs of nuclear medicine technology.

During her testimony, Ms. Boyd outlined the following points to support her contention that there is a severe shortage of NMTs. She noted that the Nuclear Medicine Technology Certification Board (NMTCB) reported a 25% drop in the number of students taking and passing the

NMTCB examination from 1985 to 1989. Ultimately, the decrease in enrollees and prospective examinees will result in fewer practitioners. The Technologist Section conducted a survey in 1987 to determine the impact of the Prospective Payment System (PPS) on the delivery of nuclear medicine services. Over 34% of the respondents required more than three months to fill a technologist position. In addition, 43% of the respondents indicated that the supply of NMTs in their area had decreased. The Institute of Medicine study, conducted in June 1988, reported that job openings for NMTs will increase 23% by the year 2000.

Ms. Boyd noted that with the advent of the PPS in 1983, cost control has become a decisive factor in hospital management. Changes in reimbursement have contributed to the shortage of qualified NMTs by the closing of hospital-based programs, which are recorded as non-revenue producing, and a shift in utilization from inpatient to outpatient diagnostic imaging centers. Nuclear medicine exams are a cost-effective means of providing patient care and will be utilized even more heavily in the future. Another factor that will contribute to heavy utilization of nuclear medicine is the aging of the population.

Technological changes have resulted in an increase in the number and complexity of nuclear medicine procedures being performed. As new radiopharmaceuticals and advanced imaging modalities are introduced into the clinical setting and practice, NMTs will require additional training to perform the more complex procedures. The newer, more complex procedures will take longer to perform, resulting in a need for additional technologists. This growing demand for NMTs, coupled with the existing shortage, will result in a drastic shortage of NMTs. This leads Ms. Boyd to declare that the Technologist Section believes that the manpower shortage is the most critical issue facing nuclear medicine technology today.

#### 1990 ERF Nuclear Medicine Technologist Award

"Effects of Cyclosporine in lowering Red Blood Cell Labeling" by Mel L. Allen, Allan J. McPherson, Bernie J. Mertes, David F. Preston, and Ralph G. Robinson of the Division of Nuclear Medicine, Department of Diagnostic Radiology, University of Kansas Medical Center, Kansas City, Kansas, was selected as the winning manuscript for the Education and Research Foundation's 1990 Technologist Award.

The award is given annually for an original paper submitted by a technologist as senior author. The paper must relate to a new technique or to an adaptation of an existing technique for a nuclear medicine procedure. The abstract of this year's winning paper may be seen on p. 142 in this issue. The complete manuscript will be published in the September issue of *JNMT*. As senior author, Mr. Allen will receive a \$1,000 honorarium.

Joan Hiam  
Section Editor, *JNMT*

## ■ News Brief

### **New Portable Radionuclide Generator Increases Duration of Isotope Effectiveness**

Robert Atcher of Chicago, Illinois and John Hines of Glen Ellyn, Illinois, both researchers at Argonne National Laboratory, have devised a radionuclide generator that produces isotopes that can be used in cancer therapy or for suppressing organ transplant rejection. Until now, only a few of the large, expensive cyclotrons needed to produce these isotopes existed and most hospitals are located at a considerable distance from them. The most effective isotopes for cancer treatment, certain radionuclide alpha emitters, have a very short half-life and lose their potency in transport. The new portable generator is a breakthrough because it enables distant

hospitals to use alpha emitters in therapy.

Researchers have focused on the use of alpha emitters in cancer treatment because these emitters have two major attributes: they can be introduced directly into the tumor site and they have a very short half-life. The ability to target the cancer saves normal tissue from destruction and the short half-life reduces the duration of the body's exposure to radiation. Alpha particles are a natural product of radioactive decay and are hundreds of times more effective than the electrons or gamma rays used in conventional cancer treatment, according to Atcher and Hines.

One of the best alpha emitters for cancer treatment is the radionuclide astatine-211, which has a half-life of only seven hours. The creation of a local generator that can produce this isotope on the site where it is needed

will allow much wider use of this alpha emitter in treatment.

Atcher and Hines' new radionuclide generator uses a super-strength resin to trap relatively stable radium-224 inside a lead capsule, which is then shipped to its destination. En route, some of the radium decays naturally into short-lived bismuth-212, which can be removed from the resin with an acid solution and used in cancer therapy. Atcher reports that collection of sufficient amounts for several treatment doses can be accomplished within a few hours. He further notes that on the second day, the amount of bismuth-212 extracted will be around 80% of the amount extracted on the first day. The capsule can be "milked" of bismuth several times a day for about a week, according to Hines, assuring a full-strength dose of the isotope every time.

## NMTCB RECOGNIZES ARRT AND ASCP CERTIFICATION

Effective January 1, 1990 through December 31, 1990, the NMTCB will recognize previous certification for those individuals holding ARRT(N)RT or ASCP(NM) certification granted prior to December 31, 1985. Once certification is recognized, technologists will receive full benefits of NMTCB registry including:

- **Certificate**
- **Annual membership card**
- **Listing in the next annual directory of NMTCB certificants**
- **NMTCB newsletter**
- **CNMT designation**

Technologists who would like to be certified by the NMTCB should send a letter of request, a copy of their certificate showing the date of issuance, and a check made payable to the NMTCB in the amount of \$40.00 to: NMTCB, P.O. Box 29103, Atlanta, GA 30329; Telephone (404) 315-1739. Please note that *all materials must be received during the 1990 calendar year for certification recognition.*

## TECHNOLOGIST JOB NETWORK

The New England Chapter—SNM/TS announces “**The Job Hotline**,” a national toll-free, hotline for nuclear medicine. The hotline is designed to provide a quick link for technologists seeking jobs and for hospitals seeking technologists. Institutions seeking technologists should call the hotline number, leave the name of the institution, title of the job opening, and name and number of the contact person; data are then stored for three months in a database for anyone who calls the hotline seeking employment. Technologists seeking employment should call the hotline number, specify state(s) which are of interest, specify type of job desired, and leave name and address. A listing will then be sent out in 48 hours; all inquiries are kept confidential. If an opening has not been filled within three months, the institution should call again to have it listed. The institution should also call if an opening has been filled so that it can be deleted from the database. The hotline numbers are **1-800-562-6387** or **1-990-4212 in Maine**. Questions or comments should be directed to: Tom Starno, President, New England Chapter—TS at 207-945-7195.

### EDITOR'S NOTE

The **TECHNOLOGIST JOB NETWORK** will be a regular feature in *JNMT*. SNM chapters are invited to submit job referral service listings for publication. Pertinent information—name and brief description of the service, telephone numbers and/or address, name or number of contact person for inquiries—should be sent to: Joan Hiam, Section Editor, *JNMT*, Society of Nuclear Medicine, 136 Madison Avenue, New York, NY 10016-6760.

### NOMINATIONS FOR NMTCB DIRECTORS

The Nuclear Medicine Technology Certification Board is seeking nominations for NMTCB Directors from the nuclear medicine technology community. Terms for New Directors will be from January 1991 through December 1994. Individuals interested in serving should contact the NMTCB office at (404) 315-1739.