

NMTCB Report

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Since the first NMTCB exam administration in September 1978, most examinees have reported favorably on the quality of the exam content. The exam is designed to test the application of job-related knowledge and skills essential for nuclear medicine technology practice at entry level. Some examinees, however, question the lack of factual recall items such as basic science principles, specifics about anatomy and physiology, or math formulae. Also, applicants frequently request assistance in preparing for the NMTCB exam. While it is not possible for the NMTCB to recommend specific study materials, a review of how a competency-based criterion-referenced exam, such as the NMTCB exam, is developed may help to answer these questions and suggest ways for applicants to prepare for this exam.

The founding fathers for the NMTCB set out to develop a criterion-referenced as opposed to a norm-referenced exam for the purpose of determining an individual preparedness to practice nuclear medicine technology at entry level. In a norm-referenced exam, pass/fail decisions are based upon how well the entire group performed. In this type of testing, an individual's score would be dependent upon the ability of the entire group. Thus, if a highly able group took the exam some will automatically fail when they otherwise would have passed if they had taken the test with a less able group. Furthermore, comparing examinees performance to each other does not indicate whether the examinees have reached a minimum level of preparedness to practice. In a criterion-referenced exam, an individual's score is determined with respect to a well defined domain of knowledge and skills. Thus, the pass/fail determination for an individual is based upon how many questions he/she answers correctly.

During the process of examination development, the Board is constantly self-evaluating its content by asking questions such as: "Is our exam testing what it is intended to test?" and "Does the

NMTCB exam measure entry-level preparedness to practice?" Certification exam development involves several steps including: (1) defining the domain of behavior; (2) exam development; (3) exam administration; (4) exam scoring; (5) setting pass/fail standards; and (6) reporting scores. Content validity depends upon first defining the domain of behavior you wish to test (step 1), then obtaining as much empirical support defining the importance of these behaviors to entry-level practice. In order to establish content validity, it is absolutely necessary to produce a well defined domain of content and skills. Once this domain of knowledge and skills, called a task list, has been developed and validated, the Board can determine test specifications or matrices, develop examination items, and define relative content areas.

During the process of defining which domain of behaviors to test, a committee made up of experts in the field writes a task outline. The NMTCB exam initially was based upon such a list considered by experts to be performed by technologists at entry level. Validation of this task list must be performed periodically to ensure that the list is comprehensive and current. The most recent survey of a revised task list was conducted in 1987. Results of this survey have been published in the December 1988 issue of *JNMT* and will be incorporated into the examination matrix in September 1989.

It is easy to identify differences in the focus of certification versus education. Educational programs in nuclear medicine technology teach students through the use of a curriculum developed from the "Essentials" as provided by the Joint Review Committee on Nuclear Medicine Technology. Educational programs focus upon developing a well rounded individual who can function successfully in a clinical setting. Certification exams, on the other hand, determine an individual's preparedness to practice at entry level by testing the application of acquired knowledge. Certification exams are not based upon the "Essentials," but on the well defined professionally validated domain

of behaviors—a task list. The NMTCB exam focuses on those skills identified as crucial to successful entry-level practice not on the recall of basic knowledge. These skills may be identified in the following ways.

1. Recall of modes of radioactive decay and interaction of radiation and matter are not tested, but the examinee must apply this knowledge to choose appropriate shielding or selecting the optimum collimator for imaging.
2. Recall of mathematical principles and formulae are not tested, but the examinee must apply or use principles or formulae to solve or analyze a problem.
3. Recall of specific anatomy of the human body is not tested, but the NMTCB asks examinees to apply this knowledge to patient imaging.
4. Historical developments are important to the general education of an individual, however it is not relevant to entry-level practice.
5. Questions are phrased to determine not only what an individual knows but how that knowledge is applied in a given situation.

Candidates can best prepare for the NMTCB exam in two ways:

1. Review their practical clinical experience and compare it to those tasks outlined in the Task Analysis to identify their own strengths and weaknesses.
2. Review a current textbook of nuclear medicine technology and issues of nuclear medicine technology journals from the previous two years. Although the NMTCB exam does not address research topics, teaching editorials and continuing education articles appearing in recent journals may provide a useful review for current clinical practice.

Since its conception in 1977 the NMTCB has made great strides in the development of the best certification ex-

examination in nuclear medicine technology. This exam is based upon a validated domain of knowledge and skills required for entry-level nuclear medicine

practice. This accomplishment has been dependent upon the cooperation and support of the nuclear medicine community. By following the above recommen-

dations, it is hoped that candidates taking the NMTCB examination will be well prepared and will soon become an active part of this community.